Chapter 4

China's Digital Economy

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Chapter 4
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1. Introduction

As a general concept, the digital economy refers to economic activities that are driven by digital technologies and the internet. As an economic form, the digital economy builds upon digitised knowledge and information to innovate and promote economic progress in general. Over the course of the past 2 decades, China has embraced the advancement and application of digital technology, which has led to rapid development across a wide range of sectors, from e-commerce and online payments to digital media and the sharing economy. The Chinese authorities recognise the digital economy as a form of economy that has succeeded the agricultural economy and the industrial economy. In the era of the digital economy, data resources are considered the key productive factor, and modern information networks are the fundamental basis.

In the context of China, the digital economy essentially refers to the use of digital information and network technology to promote economic development, involving e-commerce, digital payment, the Internet of Things (IoT), big data, and other fields of economic activities. In line with this conceptualisation, the integrated application of information and communication technology, as well as the digital transformation of all elements, are seen as the driving force that propels the advancement of China's digital economy.

The key areas of China's digital economy include e-commerce (e.g. online shopping, e-commerce platforms, and cross-border e-commerce), digital payment (mobile payment and e-payment), digital financial services other than payment (digital lending, digital investment and wealth management, digital currency and other digital financial services), digital content (online entertainment, digital reading, digital music, online video and other digital content services), big data and artificial intelligence (AI) (big data analytics and AI applications), the IoT (where the development of IoT technology has driven the development of smart homes, smart cities and other fields), and cloud computing and cloud services (where the application of cloud computing technology promotes the digital transformation of enterprises and the digital upgrading of services).

The platform economy is a special form of digital economy, which refers to a new economic model that relies on network infrastructure such as cloud, network, and mobile terminals and makes use of digital technological tools such as AI, big data analytics, blockchain and other tools to facilitate transactions, transmit content, and manage processes. Numerous well-established digital platforms have emerged in the fields of e-commerce, online car rental, entertainment, social media, search and digital finance. Some of these platforms have grown to become top performers internationally.

From a micro perspective, on the one hand, the digital economy can drive enterprises to adopt digital technology, such as big data, cloud computing, AI, the IoT, blockchain, etc., to improve their efficiency, management, and market promotion and create new business opportunities. On the other hand, the digital economy can help individuals utilise digital technology to enhance the quality of their lives and meet various needs, such as making cross-border transactions with convenience through digital payment methods, using smartphones to obtain information, communicate, entertain, and go shopping, and enhancing skills and knowledge through online education. In addition, the digital economy can encourage financial innovation, including digital payments, virtual currencies, and financial technology (fintech).

2. Growth

The global digital economy is expanding fast, and China is playing a significant role. According to the Global Digital Economy White Paper, the total scale of the digital economy of five major countries in the world, including the United States, China, Germany, Japan, and the Republic of Korea, reached US$31 trillion in 2022, with a nominal year-on-year growth of 7.6%, accounting for 58% of gross domestic product (GDP). As a key player, China's digital economy ranked the second largest in the world, with a value of US$6.86 trillion and the world's most rapid year-on-year growth of 10.3 % (Ren, Xu, and Hu, 2023). To this end, the growth rate of China's digital economy has been consistently high, with an average annual growth rate of 14.2% from 2016 to 2022, and it has served as an engine of growth. According to research findings produced by scholars at Peking University, the contribution of the digital economy to GDP growth reached 15.92 % between 2012 and 2022 (Li et al., 2023).

China's digital economy has reached a substantial size, and it has become a prominent part of China's overall GDP. According to the China Internet Network Information Center, China's digital economy reached CNY35.8 trillion (approximately US$5.5 trillion) in 2019, accounting for 36.2% of the country's GDP (National Internet Information Office, 2022). Subsequently, in July 2021, the Internet Society of China released the China Internet Development Report (2021), in which the market size of China's is shown to have reached CNY39.2 trillion in 2020, an increase of CNY3.3 trillion from the previous year and the share of the digital economy in the GDP increased to 38.6% (Renrui HR and Deloitte, 2023). By then, the country's total value of digital economy has jumped to be the second largest in the world. According to an estimate by the China Academy of Information and Communications Technology, the breakdown of China's digital economy indicates that in 2021, the scale of digital industrialisation in China was CNY8.35 trillion, accounting for 7.3% of GDP, whilst the scale of industrial digitisation reached CNY37.18 trillion, accounting for 32.5% of GDP (National Internet Information Office, 2022; Xiong et al., 2023).[1] In the same year, the United States' digital economy reigned as the world's largest, at the value of US$15.3 trillion. China maintained second place with a total size of US$7.1 trillion.

[1] In the Chinese context, the digital economy consists of five categories of industries: digital product manufacturing, digital product services, digital technology application, digital factor-driven industries, and digital efficiency enhancement industries. Together, the first four categories constitute 'digital industrialisation', which refers to the provision of digital technologies, products, services, infrastructure, and solutions for industrial digitisation, as well as other kinds of economic activities that rely entirely on digital technologies and data as a productive factor. Digital industrialisation is also considered the core industries of the digital economy. The fifth category is industrial digitalisation, which refers to the process of upgrading, transforming, and reengineering traditional industries using data and digital technologies.

More recently, based on the State Internet Information Office report, the Digital China Development Report released in 2023, the scale of China's digital economy in 2022 has exceeded CNY50 trillion, and the proportion of GDP increased to 41.5%, more than 40%.

Whilst China boasts the world's largest market, a staggering number of internet users (1.06 billion as of 2022) and enterprises, it is believed that there remains a long way for China to build high-quality and technological advantages and strengthen its innovation capacity in key areas. In addition, the development of the digital economy has demonstrated an uneven pattern, with top performers concentrated in a number of sectors and localities. For example, data from the Ministry of Industry and Information Technology (MIIT) showed that in 2022, the pace of construction of China's advanced manufacturing industry clusters was further accelerated, with the output value of 45 national-level clusters exceeding CNY20 trillion, accounting for nearly 20% of GDP. From a spatial perspective, the concentration of the digital economy is self-evident. In 2021, the added value of Beijing's digital economy amounted to CNY1,625.19 billion, accounting for 40.4% of the local GDP, a proportion that ranked first in the country, and the core industries of the digital economy achieved an added value of CNY8,918.1 billion, accounting for 54.87% of the digital economy. Over the past 3 years, the number of newly established enterprises in the core industries of digital economy has increased by 10,000 per year on average, and more than 8,000 above-scale enterprises (with annual revenue greater than CNY20 million or approximately US$2.8 million) in the core industries of digital economy in the city, accounting for 19% of the total number of above-scale enterprises in the city. The number of large enterprises in the digital economy has been increasing over time. In specific terms, the number of enterprises with revenues of CNY100 billion grew from two in 2018 to five in 2021.

3. Development Stages

The digital economy in China has experienced significant growth over the past 2 decades. Since the 1990s, China's digital economy has gone through a number of development stages, including the early stage of internet adoption, the emergence of e-commerce and online payments, and the rise of the sharing economy and digital innovation (Ren, Xu and Hu, 2023).

- Beginning stage (1990s to early 2000s): China began to introduce and explore the development of the digital economy. In 1994, China had its first access to the Internet, and the earliest Internet companies, such as China Online and Sohu, were established. The scale and penetration of the digital economy were minimal.

- Preliminary development stage (early 2000s to early 2010s): With the rapid growth of China's economy and the advancement of internet technology, e-commerce gradually emerged. With the founding of Alibaba in 2003, China's e-commerce experienced a transformation that paved the way for subsequent phenomenal advancement. In the meantime, digital payments began to gain popularity, and Alipay was established in 2004, becoming the leading mobile payment platform.

- High-speed growth stage (early to mid-2010s): E-commerce developed rapidly, and China became the world's largest e-commerce market. The popularity of mobile networks, smartphones, and mobile applications drove the rapid growth of the digital economy. Online payment, online entertainment, social media, and other areas of digital economy flourished (Wu and Yang, 2022).

- Intelligence- and innovation-led stage (mid-2010s to present): China's digital economy has gradually shifted to be driven by intelligence and innovation. The increasingly widespread application of AI, big data, the IoT, and other technologies has fuelled new developments in the digital economy. Emerging fields such as digital financial services, smart manufacturing, and intelligent transport have flourished (Guo et al., 2023).

China's digital economy development journey continues to evolve, and government support and investment in the digital economy continue to grow, making China one of the key drivers of the global digital economy development.

4 . Impacts

The digital economy has transformed how people produce, live, and how society is governed. The application of digital technologies has also reshaped the ways in which the economy operates (Bai et al., 2023). The economy was scaled up and has become more efficient and innovative. With better user experience and lower costs, risks are better managed and direct contact has become largely unnecessary. Many new digital economy businesses were allowed to emerge, and employing digital technology has contributed to the transformation of traditional industries and enabled the improvement of quality and efficiency.

China's digital financial innovation provides a remarkable example of a financial revolution that is both rooted in China and at the forefront of international financial transformation. The two biggest Chinese mobile payment service providers (WeChat Pay and Alipay) are global leaders, given their size of active users and more importantly, in terms of payment efficiency and security. A number of Chinese digital banks (notably, WeBank and MYbank) took advantage of the digital platforms and built up a massive customer base within a short period and at a relatively low cost. Using big data and machine learning technology for credit risk assessment, an innovative business model called 'big tech credit' now serves a large number of households and small and micro businesses who were formerly under-served due to the absence of credit profiles or lack of collaterals.

Taking the digital economy as a whole, its impact is multi-faceted and substantial. First, the rapid development of the digital economy has fuelled China's economic growth. In addition to enhancing production efficiency, the booming development of e-commerce, digital payment, digital finance, and other fields provides more business opportunities for enterprises, promotes the growth of consumption and investment, and fuels new growth of the national economy (Li, Li, and Tao, 2023). Second, the digital economy has created employment opportunities for hundreds of millions of people, including new professions, from managerial positions on e-commerce platforms, research and development positions of digital technologies, and data analysis, which promote employment stability and people's income growth. Third, the digital economy has given consumers a more convenient and efficient experience. Digital services such as online shopping and mobile payment improved consumer satisfaction greatly whilst promoting consumption upgrading. Fourth, the digital economy has encouraged the digital transformation and intelligent upgrading of traditional industries. The application of technologies such as big data, AI, and the IoT has improved production efficiency and product quality and promoted industrial innovation and upgrading. Fifth, the digital economy accelerated the integration of urban and rural development. The popularisation of the internet and the application of digital technologies have enabled the integration of urban and rural 'informationalisation.' It is manifested in a process in which information and communication technologies are integrated into all aspects of society, economy, or organisation and thereby significantly influence economic, social, and cultural development. Sixth, the rise of the digital economy has made China a key player in the global digital industry, with enhanced international competitiveness. Chinese digital technology companies and e-commerce platforms are playing an important role in the global market.

5 . Underlying Determinants

A host of underlying factors has driven the development of China's digital economy. Amongst these factors, the key is to allow the government and the market to serve its designated roles. The government is to provide a conducive business environment and lay the groundwork for digital economic development by building digital infrastructure. For instance, due to the government's 'moderately ahead of the schedule' approach, China has built the world's largest and most technologically advanced network infrastructure. By the end of 2021, 1.425 million 5G base stations had been built, accounting for more than 60% of the world's total, the number of 5G subscribers is over 355 million, and every administrative village in the country has been connected to broadband (National Internet Information Office, 2022). On the other hand, what is equally crucial is that the market is given the 'driver's seat' for resource allocation with minimal Intervention.

Both the Chinese government and various institutions and enterprises have maintained an encouraging attitude towards innovation, especially in the fields of AI, big data, cloud computing, and blockchain, as well as at the earlier stage of fintech development.

A large number of universities, research institutions, and start-ups are committed to cultivating a stock of talent with digital skills (see Box), and the research and development of digital technology and the government's policy and financial support have also provided strong impetus for digital innovation.

Data governance: China implemented three major laws, established its data localisation and transfer regime, and rigorously enforced data rules, mainly through cybersecurity reviews. In content moderation, China imposed rules on various content types, focusing on minor protection and live streaming, and enforced rules with dedicated moderation campaigns. Lastly, with regard to competition, China amended its anti-monopoly law, advanced a substantial body of secondary legislation, and pursued a domestic 'tech crackdown' in enforcement.

Scientific and technological development and innovation: China has made great progress in the fields of information technology, the internet and communications, providing a solid foundation for the development of the digital economy. Scientific and technological innovation has promoted the application of AI, big data, the IoT, and other technologies, facilitating the continuous growth of the digital economy.

Box 4.1. China's Digital Talent

To advance the development of the digital economy, scientific and technological development and innovation activities need to be conducted by trained personnel. According to official data 'National Statistical Communiqué on the Development of Education', 4.72 million students graduated from college in China in 2022, with a compound annual growth rate of 5.08% for the past 5 years. Amongst them, approximately 80,000 are digital technology talents according to the Ministry of Human Resources and Social Security (https://www.gov.cn/zhengce/202404/content_6945917.htm). As suggested by employment data from Liepin Data, information technology, communication, and scientific research industries accounted for 38.6% of the new positions in 2022, and the average annual salary increased by 7.40%, 13.32%, and 8.00%, respectively from 2021. Whilst the number of trained digital talents is substantial, with the presence of the increasing demand for their service, the digital talent gap in China is widening, now reaching 25 million to 30 million based on the Report on Research and Development of Industrial Digital Talents (Renrui HR and Deloitte, 2023).

Source: Author.

Internet penetration: China has a large base of Internet users, and the increase in Internet penetration has promoted the rapid development of the digital economy. The large number of online users provides a huge market for innovation and experimentation with new products and business models. The large-scale coverage of 4G and 5G networks, as well as high-speed broadband internet connections, have provided a firm foundation for the development of the digital economy, enabling China to support large-scale data transmission, cloud computing, the IoT, and other digital technologies.

Mobile internet penetration: With the popularity of smartphones and the development of mobile internet, digital economic activities such as mobile payment and mobile shopping have been able to grow rapidly. The popularisation of mobile internet has improved the convenience and user experience of the digital economy.

E-commerce development and the rise of fintech: China has the world's second-largest population, which provides a huge domestic demand market for China's digital economy. The wide application in fields such as e-commerce and online payments provides broad opportunities for emerging technologies and digital innovation. China is one of the largest e-commerce markets in the world, and the rapid development of e-commerce has fuelled the growth of the digital economy.

Changes in consumer behaviour and demand: As the economy develops and society changes, consumer demand for digital services and convenience increases, leading to innovation and development in the digital economy sector.

Segregation of domestic and international markets: The domestic digital economy industry has so far been segregated from the international market, which has allowed critical time and breathing space for domestic companies to grow, but it can be expected that the situation of segregation between domestic and international markets is unlikely to last forever.

6 . Future Outlook and Challenges

The development of China's digital economy has entered a new phase with promising growth prospects whilst facing critical challenges. On the one hand, China is expected to continue innovating and investing in digital technologies and infrastructure. On the other hand, policies and regulations that govern China's digital economy need to address urgent issues such as data privacy, cybersecurity, intellectual property protection, and the digital divide. With the continuous development of technology and the support of government policies, China's digital economy is expected to continue to grow at a rapid pace. The application of new technologies and digital transformation will further drive industrial upgrading and innovation.

The rapid development of emerging technologies such as AI, big data, and the IoT will bring new opportunities for the digital economy. Intelligence, automation, and smart manufacturing will become an important development direction.

China actively promotes international cooperation in the realm of the digital economy. China strengthens digital economy cooperation with other countries and facilitates cross-border digital trade and digital technology exchanges (Okpalaoka, 2023).

First, from the private sector, a series of cross-border e-commerce platforms has paved the way for cross-border trade to reach international markets, such as Alibaba's Tmall Global and JD Global. Second, the Chinese government has issued a series of policies to support digital trade, including reducing tariffs, improving customs clearance efficiency, and reducing trade barriers (Zhang et al., 2023). In addition, China's leading digital payment platform provides convenient payment solutions for international trade and also attracts international merchants to accept these payment methods, including Alipay, WeChat payment, etc. Meanwhile, China actively engages in technological cooperation with other countries. In addition, China has made substantial efforts aimed at the standardisation of various key technologies and products, including information technology, electronics and communications products, advanced manufacturing technology, energy and energy efficiency, as well as information security.

In the meantime, challenges facing further development of fintech are numerous.

1. Data security and privacy protection: As the digital economy continues to develop, ensuring data security and privacy compliance have become key issues in the development of the digital economy (Chen, Teng, and Chen, 2022).

2. Shortage of talents and skills: The rapid development of the digital economy requires a large number of talents with relevant skills, and the imbalance between the supply and demand of talent may become a constraint.

3. Regulatory and policy adjustments: The rapid development of the digital economy may exceed the existing regulatory framework and policies, and timely policy adjustments are needed to ensure the healthy development of the digital economy.

4. Digital divide: The digital divide between urban and rural areas and regions may increase in the development of the digital economy, and measures need to be taken to ensure that digital opportunities are more inclusive (Chen et al., 2023).

7 . Policy Directions

As China's economy embarks on a new journey in a new era, the development of the digital economy is also entering a new phase. On the one hand, given its formidable scale, China's digital economy is expected to make a great contribution to high-quality development. Whilst China's digital economy is rapidly moving ahead in a range of technological fields, more attention should be paid to the innovation capacity in key fields on the basis of business model innovation so as to improve the quality of digital economic development.

To further develop China's digital economy, the official roadmap outlined by the State Council for the promotion of digital economy states that the integration of digital technology and the real economy is the main approach (State Council, '14th Five-Year Plan for the Development of the Digital Economy', National Agency [2021] No. 29, 12 December 2021). To this end, the Five-Year Plan for the Development of the Digital Economy identifies five areas of importance to promote and strengthen the development of China's digital economy: (i) construction of digital infrastructure; (ii) improvement of the governance system of the digital economy; (iii) collaboration in promoting the industrialisation of digital industries and the digitisation of industries; (iv) enabling the transformation and upgrading of traditional industries, and cultivate new industries; and (v) fostering new business forms and new models (Xin et al., 2023). Together, the promotion of the digital economy is considered an integral part of the national development strategy to achieve China's aspiration for growth and prosperity. The related key policy strategies include:

1. Made in China 2025: Released in 2015, the policy aims to promote the development of digital technologies and smart manufacturing and to strengthen the application of the industrial internet and the integration of the digital economy in order to improve the innovation capacity and competitiveness of China's manufacturing sector.

2. National Big Data Strategy: Released in 2015, the strategy emphasises strengthening the application and security of big data, promoting the opening and sharing of data resources, and facilitating the integration of big data and the digital economy.

3. The Internet Plus Action Plan: Launched in 2015, the plan aims to promote the deep integration of the digital economy and the real economy, facilitate the development of new technologies, new business forms and new modes, and promote economic upgrading and transformation.

4. The Development Plan for a New Generation of Artificial Intelligence: Released in 2017, the plan focuses on the development of AI technology, promoting the deep integration of AI and the digital economy, and enhancing China's international competitiveness in the field of AI.

5. Development Strategy for the Construction of Digital China: Released in 2018, the strategy aims to promote the innovative development of the digital economy, emphasises the construction of a digital China and smart society, and promotes the synergistic development of digital industries.

Data Security Law: The law came into force on 1 September 2021, with the aim of regulating cross-border data flows, regulating the digital economy, and protecting the reasonable demands of Chinese netizens to safeguard their data security.

On the other hand, the role of economic regulation is mainly to maintain the effective functioning of the market, including safeguarding fair competition and protecting consumer interests. Given that the digital economy is highly innovative in nature, it is recommended that a 'responsive' regulatory approach be adopted, whereby daily communication is maintained between the regulator and the enterprises so as to identify and resolve problems in a timely manner whilst allowing the subjects of regulation to provide feedback and to lodge complaints. For example, a regulatory sandbox is a commonly used approach in the digital finance sector, whereby the digital economy enterprises propose innovative programmes and then operate new businesses on a trial basis under full regulatory monitoring.

The purpose of the digital economy governance system is to create a favourable policy environment and form stable policy expectations. Ultimately, the goal is to achieve a 'stronger, bigger and better' digital economy through 'development in the midst of regulation and regulation in the midst of development'. In accordance with this approach, The Central Economic Work Conference at the end of 2022 clearly stated that 'we should vigorously develop the digital economy, enhance the level of normalised regulation, and support platform enterprises to make their presence felt in leading development, job creation, and international competition.' As China moves from specialised regulation to normalised regulation, the governance system can become clearer and more stable, which will be conducive to the high-quality development of the digital economy.

An option worth considering for domestic policymakers is to set up a high-profile digital economy governance body to coordinate policy formulation and policy implementation (Oloyede et al., 2023). The recently established National Bureau of Data has reflected such an intention. Officially unveiled on 25 October 2023, the organisation is the regulator of China's data regulation and data governance. It is managed by the National Development and Reform Commission, with its main responsibilities being to coordinate and promote the construction of data infrastructure systems, coordinate the integration, sharing, and development of data resources, and coordinate the planning and construction of digital China, the digital economy, and digital society.

Aside from a top national regulator, the relevant legal framework of the digital economy, such as the Digital Economy Law, also needs to be defined. In addition, at the implementation and practical level, industry regulators such as the People's Bank of China and the Ministry of Industry and Information Technology, as well as general regulators such as the General Administration of Market Supervision and the Office of Internet Information, should be involved. Furthermore, the digital economy needs to be incorporated into the country's fiscal and taxation system to improve the rules for the distribution of income from the digital economy, amongst other factors, to ensure a health and balanced income distribution, to regulate the mechanism for accumulating wealth, and promote the common good.

On the international front, China should actively participate in the establishment of the international digital economy and digital trade rules, promoting the realisation of a high-level, institutional openness of China's digital economy and vigorously fostering the development of the digital economy. More specifically, to contribute to the Association of Southeast Asian Nations (ASEAN) Digital Community 2045, first, China needs to actively promote digital economic trade cooperation with ASEAN countries, including reciprocal trade in digital products and services and the elimination of trade barriers. Second, Chinese enterprises should be encouraged to invest in ASEAN countries to support digital infrastructure construction and digital innovation, including cloud computing data centres, 5G networks, digital payment solutions, etc. (Zhang and Li, 2023). It would also be useful for China to work with ASEAN countries and improve the level of digitalisation in ASEAN countries through training, collaborative research projects, and technical cooperation. At the same time, China can cooperate with ASEAN countries to cultivate talents in the digital economy field, such as providing scholarships, organising training courses, and collaborating on research projects in order to improve the level of digital technologies in ASEAN countries to foster greater development of the digital economy. In addition, China should cooperate with ASEAN countries to develop standards and norms so that digital products and services from different countries are compatible, improve interoperability, and promote cross-border cooperation. Lastly, China can cooperate with ASEAN countries to jointly build digital infrastructure, such as cross-border internet cables and data centres, to support the development of the digital economy.

References

Bai, T., Y. Qi, Z. Li, and D. Xu (2023), 'Digital Economy, Industrial Transformation and Upgrading, and Spatial Transfer of Carbon Emissions: The Paths for Low-carbon Transformation of Chinese Cities', *Journal of Environmental Management*, 344, 118528.

Chen, X., L. Teng, and W. Chen (2022), 'How does FinTech Affect the Development of the Digital Economy? Evidence from China', *The North American Journal of Economics and Finance,* 61, 101697.

Chen, Y., Z. Peng, C. Peng, and W. Xu (2023), Impact of New Government–Business Relations on Urban Digital Economy: Empirical Evidence from China', *Finance Research Letters*, 58, Part A, 104325.

Guo, B., Y. Wang, H. Zhang, C. Liang, Y. Feng, and F. Hu (2023), Impact of the Digital Economy on High-quality Urban Economic Development: Evidence from Chinese Cities', *Economic Modelling*, 120, 106194.

Li, C., H. Li, and C. Tao (2023), 'Evolutionary Game of Platform Enterprises, Government and Consumers in the Context of Digital Economy', *Journal of Business Research*, 167, 113758.

Li, Q., H. Chen, Y. Chen, X. Tong, and L. Wang (2023), 'Digital Economy, Financing Constraints, and Corporate Innovation', *Pacific-Basin Finance Journal*, 80, 102081.

National Internet Information Office (2022), *Digital China Development Report (2021).* Fuzhou: National Development and Reform Commission. https://www.cac.gov.cn/2022-08/02/c_1661066515613920.htm (in Chinese)

Okpalaoka, C.I. (2023), 'Research on the Digital Economy: Developing Trends and Future Directions', *Technological Forecasting and Social Change*, 193, 122635.

Oloyede, A.A., N. Faruk, N. Noma, E. Tebepah, and A.K. Nwaulune (2023), 'Measuring the Impact of the Digital Economy in Developing Countries: A Systematic Review and Meta-Analysis', *Heliyon*, 9(7), e17654.

Ren, J., Z. Xu, and M. Hu (2023), 'Digital Economy and Settlement Intention of Migrants in Urban China', *Telecommunications Policy*, 47(10), 102666.

Renrui HR and Deloitte (2023), *Report on Research and Development of Industrial Digital Talents.* Beijing: Social Sciences Academic Press.

Wu, B. and W. Yang (2022), 'Empirical Test of the Impact of the Digital Economy on China's Employment Structure', *Finance Research Letters,* 49, 103047.

Xin, Y., H. Song, Z. Shen, and J. Wang (2023), Measurement of the Integration Level Between the Digital Economy and Industry and its Impact on Energy Consumption', *Energy Economics,* 126, 106988.

Xiong, M., F. Zhang, H. Zhang, and H. Wang (2023), 'Digital Economy, Credit Expansion, and Modernization of Industrial Structure in China', *Finance Research Letters*, 58, Part C, 104500.

Zhang, R., Z. Li , C. Xiao, and J. You (2023), 'New Engines of Economic Growth: How Digital Currencies Lead the Way to Growth in the Era of Digital Economy', *Economic Analysis and Policy*, 80, pp.1597–617.

Zhang, T. and N. Li (2023), 'Measuring Digital Economy; From the Perspective of Digital Industrialization and Industry Digitalization', *Procedia Computer Science*, 221, pp.1006–12.

Chapter 5
Policy Issues in a Data-driven Society: A Perspective from Japan

Yasuhiko Taniwaki

1. Introduction

This chapter provides an overview of the state of digital policy, especially with regard to the contemporary data-driven society from the perspective of Japan. This is based on two recent digital strategy documents, the Priority Plan for the Realization of a Digital Society (approved by the Cabinet in June 2023),[1] and the Comprehensive Data Strategy formulated in June 2021, which is part of the priority plan.

The priority plan clarifies Japan's national data strategy, asserting that 'a consistent data strategy from data development to knowledge creation and AI [artificial intelligence] utilisation is necessary to realise an environment in which diverse, high-quality, and sufficient amounts of data can be easily, safely, and reliably used, and to maintain and improve Japan's international competitiveness whilst solving social issues and cooperating with the rest of the world.'

Based on this recognition, this chapter summarises the concept of a data-driven society and discusses a specific policy menu from the three perspectives of volume, quality, and speed of data flow as a policy agenda for realising a data-driven society.

2. The Data-driven Society

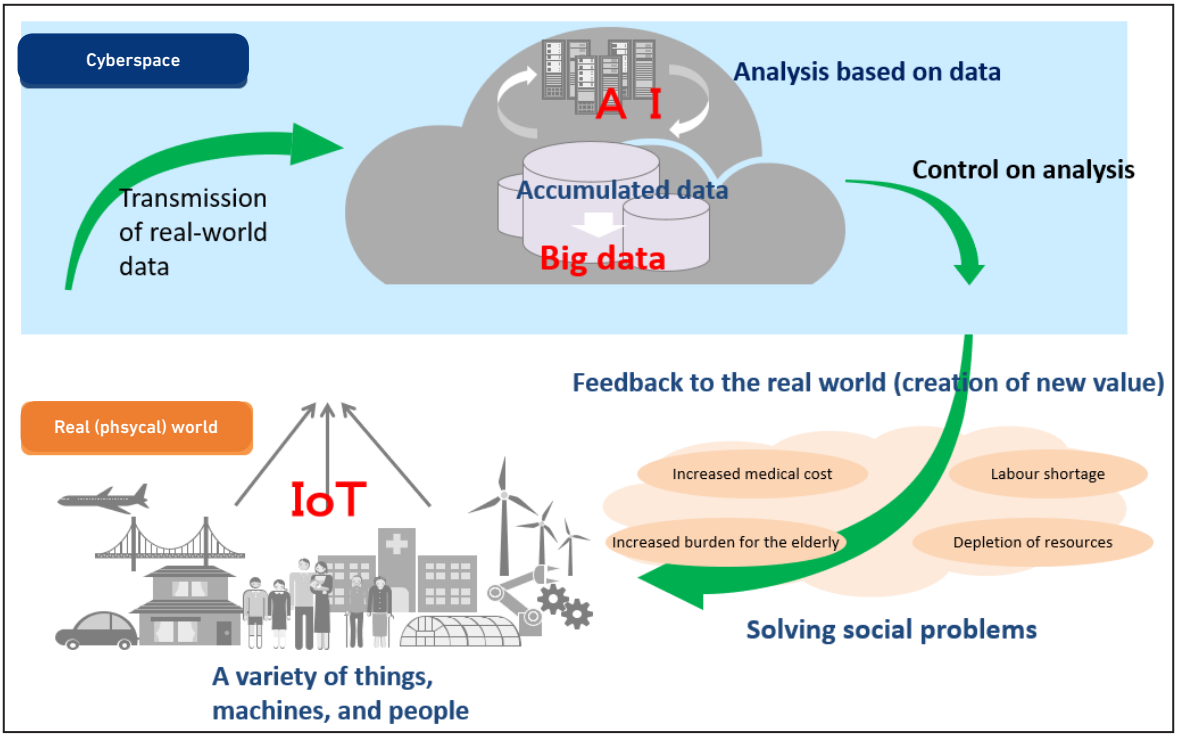
2.1. The Concept of a Data-driven Society

When implementing digital technologies into a socioeconomic system, it is first necessary to confirm the purpose. The greatest impact of digital technology on the socioeconomic system is that it enables collaboration beyond the boundaries of existing business categories because there are no physical constraints in cyberspace. Therefore, the use of digital technology is not simply 'digitisation' to improve efficiency and reduce costs of existing businesses, but 'digitalisation' to bring about reform of business models and the creation of new businesses.

[1] https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/bc5a569f-71d0-44d9-b5c9-cc9b59405507/47b4badd/20231228_en_priority_summary_01.pdf

The concept of a data-driven society is illustrated in Figure 5.1. The lower half of this figure shows the real world, and the upper half shows cyberspace. In the real world, a vast and diverse amount of data is collected via Internet of Things (IoT) devices etc. and stored as big data in cyberspace. This big data is analysed by maximising the use of AI, and the analysis results are fed back to society.

Figure 5.1. Data-driven Society



IoT = Internet of Things.

Source: Prepared by the author.

The results of data analysis will be utilised in the development of solutions to deal with various issues faced by society. The status of operation and areas for improvement of such solutions will also be monitored based on the results of data analysis, and the solutions will be upgraded.

Thus, a data-driven society aims to realise a cyber-physical system in which data constantly circulates between society and cyberspace, integrating them and leading to the resolution of issues and the creation of new value in the socioeconomic system.

2.2. Three Transformations Brought about by a Data-driven Society

We identify the following three factors (transformations) brought about by the advent of a data-driven society: individualisation, automation, and optimisation.

2.2.1. Individualisation

The traditional business model entails manufacturing and selling goods. In this case, the value of a good is at its maximum when it is sold, and then it decreases over time. This is the basic concept of 'goods-dominant logic.' With the rapid progress of digital technology, however, the value of digital goods is depleting faster than ever before, and investment costs cannot be recovered solely from the sale of goods. Therefore, it is necessary to shift to 'service-dominant logic', in which companies are in continuous contact with customers to obtain usage data and create added value by individualising services according to user preferences and other factors. As a result, subscription-type services based on 'X as a service,' which shift from 'owning' to 'using,' will account for a larger share of the market, and there will be an increasing tendency to provide individualised services to users by utilising data.

2.2.2. Automation

With the evolution of AI technology, automation, such as autonomous driving of cars and autonomous aviation of drones, is expected to spread rapidly in the future. In such cases, mechanisms such as smart contracts, which automatically execute the contents of contracts without human intervention, are expected to become common, as already implemented by Ethereum, a cryptographic asset that utilises blockchain technology. The automation of such transactions is expected to accelerate the realisation of a data-driven society, as it will enable the automation of data analysis, including the understanding of correlations between different data sets, as well as the linkage of different forms of data through AI.

2.2.3. Optimisation

Through the development of IoT technology and the technological evolution of communication networks, it will become possible to economically collect, store, and analyse data in areas where it has been difficult to collect data in the past. This is expected to make it possible to realise optimisation based on sufficient data analysis, whereas in the past, this was limited to partial optimisation.

For example, optimisation approaches are expected to increase in the future, such as using the IoT to quickly identify damaged areas of roads and bridges and then using more accurate data analysis to compare and consider the degree of damage to determine the priority of repair areas and optimise maintenance to minimise maintenance costs for social infrastructure.

2.3. Need for Policies based on Data Characteristics

In a data-driven society, where data plays a central role in the socioeconomic system, we must pay close attention to the characteristics of data when considering policies that should be pursued in the future. Three typical characteristics of data are zero marginal cost, non-rivalrous, and network effects.

Unlike physical goods, which incur additional cost or marginal cost when an additional unit of physical goods is produced, data has zero marginal cost because it is non-decreasingly used. This characteristic is called non-rivalrous. [2]

In the case of a platformer such as Google, Amazon, Facebook or Apple, for example, when a company that wants to sell something registers on the platform, users will be attracted to the platform by its product lineup. As the number of users increases, the platform becomes more attractive to companies, and the number of registered companies also increases. In this way, the number of users and the number of companies increase in a spiral, creating a snowball synergistic effect or network effect.

The characteristics of such data are very different from those of traditional goods and services and can easily increase the oligopoly of a small number of platform operators in the market, but on the other hand, the current system is not sufficiently equipped to counter the new oligopoly brought about by the intangible asset of data,[3] and there are no institutional arrangements to encourage data distribution. Therefore, for the realisation of a data-driven society, it will be necessary to conduct an agile review of competition laws or antimonopoly acts and improve the data distribution environment simultaneously.

Furthermore, as we move towards a data-driven society, it will be important to establish a mechanism for calculating the value of data as an intangible asset. In addition to analysing the impact of data generation and distribution on the macroeconomy (Cabinet Office, 2023), companies should reflect the value of their data assets in their corporate accounting in the same manner as intellectual property and other intangible assets. In addition, it is important to deepen international cooperation in this field, as such studies need to be conducted on an international scale.

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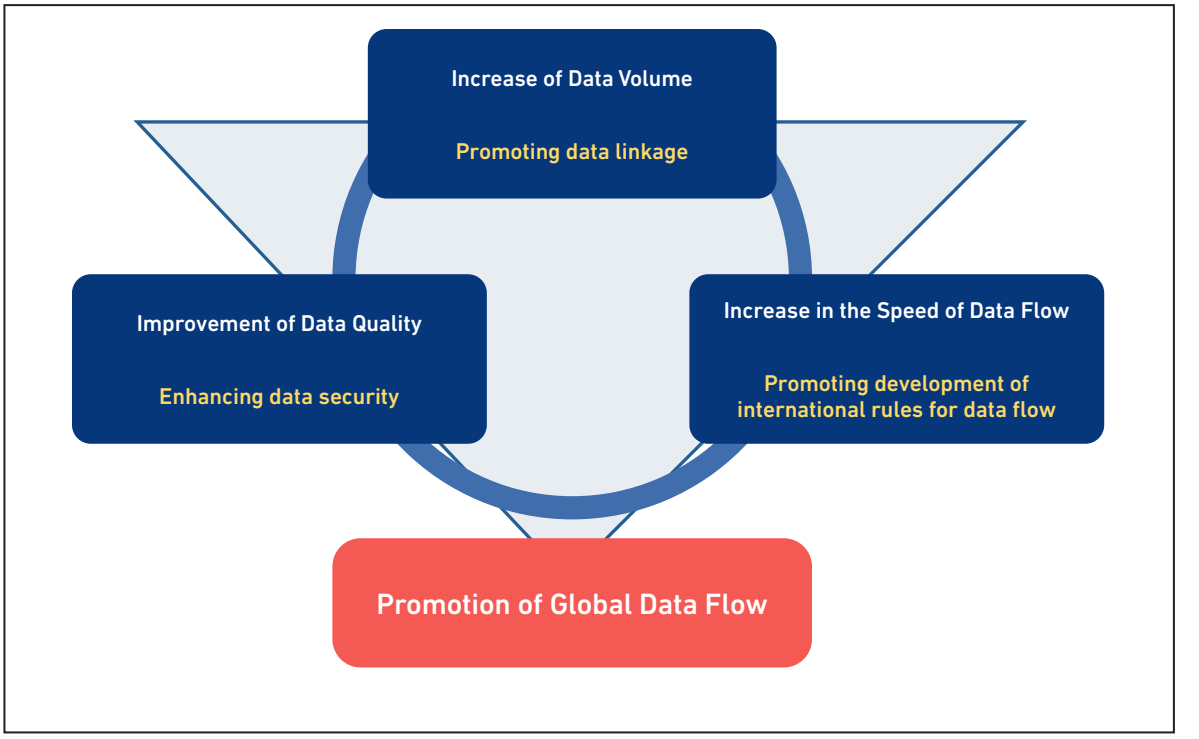
[2] In general, businesses with network effects have diminishing marginal costs, resulting in increased oligopoly in the market. When goods and services are non-rivalrous, meaning that multiple consumers can consume them simultaneously, the marginal cost is not diminishing, but is zero from the beginning, resulting in extremely high oligopoly in the market and a relatively high likelihood that a competitive market will not be established.

[3] It has been pointed out that the concept of 'modified capitalism,' which holds that there is rationality in a certain level of public involvement in the market based on the limitations of the market mechanism, rather than 'neoliberalism,' which maximally respects the functions performed by the conventional market mechanism, is gaining importance.

3 . Policy Agenda for a Data-driven Society

As policies to promote the generation, accumulation, and distribution of data for the realisation of a data-driven society, this chapter classifies data into three elements: data volume, data quality or granularity, and speed of data flow, and examines specific policies to expand the three elements, as shown in Figure 5.2. This chapter discusses specific policies to achieve the expansion of data volume, improve data quality, and increase the speed of data flow to realise a data-driven society.

Figure 5.2. Three Perspectives for Promoting Data Distribution



Source: Prepared by the author.

3.1. Increasing Data Volume

3.1.1. Strengthen data linkage

In order to increase the volume of data available to realise a data-driven society, it is necessary to not only increase the absolute amount of data but also expand the availability of data by promoting data linkage.

Japan's successive information technology (IT) strategies have promoted the introduction of digital technologies and the use of data within each domain or system, such as administration, healthcare, and education. One of the goals of data linkage, however, is to form a virtual 'system of systems' by linking data from each of these domains or systems and to organically link data that were not previously linked to each other to realise 'hidden relationships' and create new value.

One such initiative for data collaboration is Europe's GAIA-X. The European Commission's European Data Strategy, published in February 2020, states that 'the Commission will foster synergies between the work on European cloud federation and Member States' initiatives such as GAIA-X. This is necessary to avoid the multiplication of fragmented cloud federations and data-sharing initiatives (European Commission, 2020).

In Japan, a similar project to GAIA-X is DATA-EX, promoted by the Data Society Alliance (DSA). This project is building a platform to realise 'federated cross-disciplinary data collaboration' and is working to ensure interoperability with GAIA-X and other overseas data collaboration platforms.[4]

In Japan, a concrete and effective example of data linkage at the local level exists in a project called 'Digital Communication Notebook' (*Denshi Renraku-tyou*),[5] which is used to operate medical care services for the elderly at home. In order to realise seamless medical care support in the community, it is necessary for doctors and many other related parties to cooperate with each other, but in reality, information sharing has been limited to telephone calls, faxes, and notebooks. In the Digital Communication Notebook project, each person has a mobile device and uses software as a service-type system to input, view, and share patient information in the style of a social networking service. Of particular importance is that a team of professionals is set up for each patient to share information so that only those who need to can view the data.

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[4] As a recent initiative, the DSA announced the start of a demonstration experiment of 'data usage rights trading' (November 2023), in which the rights to use data will be converted into certificates of rights and made subject to trading, from the viewpoint of promoting data distribution. An overview of the DSA's activities can be found in *https://data-society-alliance.org/en/data-ex/*

[5] The Digital Communication Notebook service was launched by Internet Initiative Japan in 2017. It is currently used by 73 local governments (eight prefectures) and is the largest information sharing platform in the medical care field in Japan, with 23,000 registered medical care-related professional personnel and 41,000 registered support targets (data as at December 2023).

The system can also superimpose data, and various attempts are being made to maximise the effectiveness of data linkage, such as combining patient information with local disaster occurrence information to identify priorities for elderly people in need of assistance.

3.2. Facilitate Data Sharing

In order to expand the volume of data, it is necessary to make the data linkable and to develop an environment that allows more users to share data. Specifically, a review of competition laws and the development of systems to promote data distribution and sharing are required.

3.2.1. Review of competition law

First, with regard to the review of competition law, as mentioned earlier, data have characteristics not found in conventional goods, such as zero marginal cost, non-rivalrous, and network effects, which makes it an environment in which players with market dominance, such as platformers, can easily appear, and the economic losses caused by the abuse of market dominance are often enormous and difficult to repair.

Therefore, in addition to the traditional *ex post* regulation approach in competition law, in which the competition authority determines the market, finds the facts related to the abuse of market dominance, and tries to recover the economic loss of the market by issuing a cease and desist order, it is possible to introduce *ex ante* regulation, like the Digital Markets Act in Europe, in which a certain amount of preventative discipline[6] is applied to platform operators that exceed a certain threshold such as a certain number of monthly active users in advance even if there is no abuse of market dominance.

In Japan, the Act on Improving Transparency and Fairness of Digital Platforms came into effect in February 2021.[7]

[6] For example, in the European Digital Markets Act, there are regulations such as the prohibition of combining data collected from two different services belonging to the same company.

[7] *https://www.meti.go.jp/english/policy/mono_info_service/information_economy/digital_platforms/pdf/1012_001a.pdf*

The act designates platform providers specifically with a high need to enhance the transparency and fairness of transactions as specified digital platform providers and requires them to establish voluntary procedures and systems, including disclosure of information on transaction terms and conditions, prior notification to users when transaction terms are changed, and procedures for dispute resolution, and to submit a report with a self-evaluation of the measures implemented and an overview of their business to the Minister of Economy, Trade and Industry every year. In response, the minister is to conduct a review of the platform's operation status, publish a summary of the report and the results of the evaluation, and request the Fair Trade Commission to take action under the Antimonopoly Law if it becomes aware of a case that is deemed likely to violate the Antimonopoly Law.[8]

In addition to this, in April 2024, the government submitted new legislation to Parliament to designate and regulate larger platform operators that provide specific software (e.g. mobile operating systems, app stores, browsers, and search engines) for smartphone use. The bill will be under the jurisdiction of the Fair Trade Commission and will introduce pre-regulatory targets for the provision of certain apps for smartphones, such as prohibiting other operators from preventing similar provision, and will allow for fines and other measures to be taken if this provision is breached.

3.2.2. Promote data distribution and sharing

It would also be beneficial to promote the development of a market environment to facilitate data distribution. In Europe, the Data Governance Act, which came into effect in September 2023, has institutionalised data intermediary operators (see more details in the next section) and rules for promoting data sharing, such as the Data Act, which entered into force in January 2024.[9]

In Japan, there is currently no legal system in place to promote data distribution. However, efforts are being made as a private-sector-led measure. Specifically, a voluntary certification system for personal data trust banks, which serve as intermediaries between data providers and data users, is implemented under the rules developed by private-sector groups, following the discussion at a study group of the Ministry of Internal Affairs and Communications, and a guideline for personal data trust banks, the Guidelines on Certification of Information Trust Functions were formulated for the implementation (Version 2.0 of the guidelines was released in October 2020). Specifically, the certification service has been conducted by the IT Federation of Japan.

For data trading markets, the DSA has also developed Guidelines for Entry and Participation in Data Trading Markets, the latest version of which was published in January 2024. These guidelines summarise the functions that a data trading market should have and the requirements to realise these functions.

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[8] Based on this law, specified digital platform providers have been designated in three areas: online malls, app stores, and digital advertising. Specifically, Amazon, Rakuten, and Yahoo are designated for online malls, Apple and Google for app stores, and Google, Meta, and Yahoo for digital advertising.

[9] The Data Act will start to apply in September 2025.

3.3. Improvement of Data Quality

3.3.1. Realisation of reliable data

Efforts to ensure data quality are essential to promote data distribution. In a data-driven society, 'data integrity' must be ensured that data in circulation is not being falsified. If data is falsified whilst in circulation, it could cause social and economic confusion through malfunctions of various systems. In addition, there is concern that the deliberate falsification of training data for AI, which is rapidly being developed, could prevent AI from operating properly and cause widespread confusion. Therefore, it is necessary to establish a system to ensure the reliability of data.

Specifically, a system of trust services is required. Trust services consist of the following elements:
(a) electric signature related to the authenticity of the sender of the data;
(b) e-seal related to the authenticity of the sender's affiliation;
(c) timestamp to prove that the data content has not been tampered with; and,
(d) e-delivery, which proves that the data was correctly delivered.

In Japan, the institutionalisation of electronic signatures and time stamps has been completed, and studies are underway to institutionalise e-seals as well.[10] In addition, studies on e-delivery are also continuing within the government. Since data are distributed across national borders, international cooperation and coordination are extremely important in the development of trust services.[11]

3.3.2. Strengthen data security

To improve data quality, data security must be strengthened to reduce the risk of data falsification as much as possible. Falsification of data reduces the integrity of data for the entire country, including AI training data. In particular, there are concerns that the dissemination of disinformation in which the involvement of the state is suspected could seriously affect important decision-making in the country, concerned as cognitive warfare, and this is an important issue to consider from the perspective of national security. Strengthening data security and countermeasures against disinformation are addressed below.

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[10] The report of the Study Group on e-Seals was published in March 2024 by the Ministry of Internal Affairs and Communications (MIC). Based on this report, in April 2024, the MIC published guidelines for e-seals. The MIC also announced its plan to establish an e-seal accreditation system by the Minister of Internal Affairs and Communications by March 2025.

[11] In Japan, the Japan Digital Trust Forum conducts research and studies on trust services; international cooperation can be handled by this organisation.

3.3.3. Development of institutional frameworks for data intermediary services

In order to strengthen data security, it is first necessary to strengthen measures for data integrity in organisations that mediate data distribution. For example, the European Data Governance Act systematically defines data intermediation services that mediate between data owners and data users, requires that such services be notified to the supervisory authority and that advanced security measures be taken for data storage and transmission. The promotion of data utilisation and data security are to be promoted in an integrated manner. Thus, it is necessary to develop institutional frameworks to strengthen data security for data intermediary services also in other countries outside Europe.

3.3.4. Countermeasures against disinformation in Europe

Efforts to combat disinformation are also important. Here again, European efforts can serve as a certain reference. In Europe, in preparation for the European Parliamentary in May 2019, there were concerns about the possibility that certain countries could distort the results of the elections by spreading disinformation.

Therefore, in April 2018, the European Commission developed a Code of Practice on Disinformation (Code of Conduct) (European Commission, 2022). The Code of Practice includes efforts to ensure transparency in advertising serving, sponsored advertisements, etc. and to identify and close fake accounts. In addition, the European Commission called on relevant parties to comply with the Code of Practice on a voluntary basis. In response, Google and other related businesses and organisations agreed to comply with the Code of Conduct. The companies submitted monthly reports to the Commission on their compliance with this Code of Conduct from January to May 2019. In response, the European Commission verified the effectiveness of the Code of Conduct and published a report in June 2019, shortly after the European Parliament elections were concluded. The report stated, amongst other things, that approximately 1,000 cases of disinformation had been identified during the period in question.

In this way, companies voluntarily adopt the operation policy against disinformation established by the public sector, each company periodically reports on the status of its compliance with the operation policy, and the public sector considers whether the operation policy needs to be revised based on the evaluation results. This process is called co-regulation, in which the public and private sectors work together to achieve certain policy objectives.

Based on these achievements, Europe developed the Digital Services Act, which entered into force in August 2023. The new legislation implements the previous approach of co-regulation as a legal system. Specifically, very large online platform (VLOP) operators and very large online search engine (VLOSE) operators, which have more than 45 million users in the European Union, are required to clarify their policies on content moderation, provided the act obliges them to clarify their policies on content moderation, explain to users when content is deleted, and publish a transparency report on the operation status of the system. The specific details are, however, basically left to the voluntary judgement of the VLOP and VLOSE operators, taking an approach that combines the institutionalisation of co-regulation with the autonomy of specific measures to be taken.

3.3.5. Countermeasures against disinformation in Japan

Countermeasures against disinformation in Japan were discussed at an expert meeting held by the Ministry of Internal Affairs and Communications (MIC), and a report was published in February 2020. The government has been promoting countermeasures against disinformation in accordance with the contents of this report. Specifically, the government's basic policy on countermeasures against disinformation is to promote measures based on voluntary efforts by the private sector, taking into consideration the chilling effect on freedom of expression and the difficulty of determining the applicability of disinformation, etc. The government respects the voluntary efforts of the private sector and monitors the status of such efforts. In this way, the countermeasures against disinformation in Japan are based on voluntary measures by the private sector, whilst the government adopts an approach similar to co-regulation that monitors such measures, but from the viewpoint of the private sector, ensuring transparency of the measures and assuming accountability, the government also observes involvement to a certain extent.

Under these circumstances, the government submitted the bill to amend the Provider Limitation of Liability Law in March 2024. In May 2024, Parliament passed the law, which requires platform operators that meet certain requirements for illegal and harmful information, such as slander and libel, to establish and publish removal guidelines, provide explanations to the senders of such information, and publicise the status of removal operations.

3.4. Adoption of Appropriate Level of AI Regulation

The rapid development of AI-related technologies, including generative AI, has prompted debate in many countries on how to introduce regulations for AI. The reliability of AI functions is directly related to the maintenance of data quality.

In July 2023, the United States White House agreed with seven AI-related companies to comply with a voluntary commitment to generative AI (US White House, 2023a). This is the co-regulatory approach described above. In addition, an executive order on AI was issued in October of the same year, clarifying that government agencies should consider developing new standards for AI safety and security US White House, 2023b).

In addition, there have been moves to introduce legal regulations (hard law), such as China's Regulations for the Management of Generative AI Services (effective August 2023) and Europe's AI Act, which was adopted by the Council of the European Union and the European Parliament in May 2024,[12] and other countries are also considering the introduction of AI rules or regulations at an appropriate level. In Japan, the government has decided to start considering the introduction of a new legal system for AI at the AI Strategy Council.

3.5. Increase in the Speed of Data Flow

Increasing the speed of data flow is expected to hasten the matching of data demand and supply, thereby accelerating the realisation of a data-driven society. To this end, it is effective to take the aforementioned domestic measures to expand the volume of data and to improve the quality of data. Since cyberspace has no national borders, however, facilitating data distribution across borders will contribute to increasing the speed of international data flow.

To this end, this section summarises measures that Japan and the Association of Southeast Asian Nations (ASEAN), in particular, can promote cooperation towards the realisation of a data-driven society.

3.6. Knowledge Sharing for Data-driven Projects

In Japan, there are many data linkage projects, many of which are aimed at solving social issues and specifically address such issues as the structuring of wisdom and know-how in the fields of elderly care, traffic accident countermeasures, natural disaster response, disease countermeasures, and agriculture, amongst others.

For example, in March 2011, Japan experienced the Great East Japan Earthquake, and the northeastern region of Japan was devastated by the earthquake and ensuing tsunami. Immediately after the disaster, the probe data on which roads the vehicles were able to pass through were collected in collaboration with car manufacturing companies and a project to display this information on an open map was initiated by the organisation called ITS Japan (Figure 5.3).

[12] This Act is due to come into full force in 2026.

This data was utilised to examine routes for the delivery of relief supplies. In addition, the project provided basic data for relief efforts, such as identifying isolated areas (and villages) in need of emergency assistance where no tyre tracks were visible. Similar efforts were also carried out by ITS Japan for the Noto Peninsula earthquake that occurred in January 2024.[13] Thus, whilst the occurrence of a natural disaster requires urgency, it is difficult to grasp the actual situation in the affected area, and data collection and analysis can help to improve the efficiency and speed of relief efforts.

Figure 5.3. Use of Probe Data in the Event of Natural Disasters

Source: 'Vehicle Traffic Information' provided at the time of the Great East Japan Earthquake (Map: Google, Probe Information: Honda Motor, Pioneer, Toyota Motor, and Nissan Motor) included in Press Release 'Establishing a mechanism to quickly disclose traffic performance information in the event of a large-scale disaster' released by ITS Japan (June 2012).

The implications of these efforts include the possibility of dramatically increasing the potential for data utilisation through intermediary functions between data collectors and data users, the effectiveness of a phase-free data utilisation mechanism from normal times to emergencies, the importance of developing technologies to anonymise and prevent re-identification when utilising personal data, and the importance of building an independent and financially self-reliant business model from data collection to utilisation.

[13] Participating in the ITS Japan initiative are Honda Motor, Pioneer, Toyota Motor, Nissan Motor, Isuzu Motors, UD Trucks, and Hino Motors. https://disaster-system.its-jp.org/map4/map/#map=9/37.255473/137.079162&layer=gsi

Many of these social issues can be shared with the ASEAN countries, and it is conceivable that a data-driven project could be launched as a Japan–ASEAN joint project to promote efforts to share knowledge amongst the parties concerned.

3.7. Establishment of Global Data Distribution Rules

As knowledge sharing is promoted through data-driven projects under Japan–ASEAN collaboration, the next step is to promote linkage between Japan's DATA-EX and similar projects in ASEAN as a cross-disciplinary data collaboration project. In addition, data security is an important factor in promoting such linkage, and it is conceivable that the trust service, which is also being considered in Japan, will be in step with efforts in ASEAN. Furthermore, the most important element of data security is the protection of personal data, and it is appropriate to make efforts to promote and expand the Cross-Border Privacy Rules System, an international certification scheme for the protection of personal information based on the Privacy Framework established by the Asia-Pacific Economic Cooperation (APEC) forum in 2004.

3.8. Establish Digital Governance

As digital technology is increasingly implemented as a socioeconomic infrastructure, it becomes necessary to accelerate efforts to address digital governance issues in a data-driven society. In October 2023, the Internet Governance Forum was held in Kyoto by the United Nations, and the phrase 'From Internet Governance to Digital Governance' was positioned as one of the overall themes. Digital governance broadly sets the question of how to ensure the controllability of digital technologies, which includes three elements: AI governance, data governance, and security governance.

Of these, AI governance is, as already mentioned in this chapter, how to set the appropriate level of regulation between hard law and soft law regarding the controllability of AI. Second, data governance is how to set up a series of institutional arrangements to ensure data security. Third, security governance is how to facilitate the sharing of incident information across national borders and the consideration of a joint response system in the midst of increasingly intense cyber-attacks.

Therefore, as cyberspace becomes increasingly important towards a data-driven society, it would be beneficial for Japan and ASEAN to work together to promote a policy dialogue involving the public and private sectors on the state of digital governance over the controllability of such digital technologies.

3.9. Network Infrastructure Supporting a Data-driven Society

A data-driven society is built on a network infrastructure. Intelligence on the network has a history of repeated concentration and dispersion. For example, looking back at the history of computers, intelligence was dispersed with the spread of personal computers from the era of sharing large computers called mainframes, then intelligence was concentrated again with the emergence of cloud services along with the progress of parallel distributed processing and virtualisation technology. Here again, the importance of edge computing has been pointed out, and at present, the best mix of centralised and decentralised computing is being sought.

Cyberspace has no borders, and in light of the importance of economic collaboration between Japan and ASEAN, it is desirable to promote joint projects in terms of network infrastructure collaboration. In particular, it is significant for Japan and ASEAN to collaborate on projects using distributed ledger technology, as typified by blockchain technology. For example, Japan's ongoing digital currency project (Digital Currency Forum) (Decurret, 2022), which uses blockchain technology to automate the execution of contracts, is currently underway, and Japan–ASEAN collaboration may be considered in the near future.

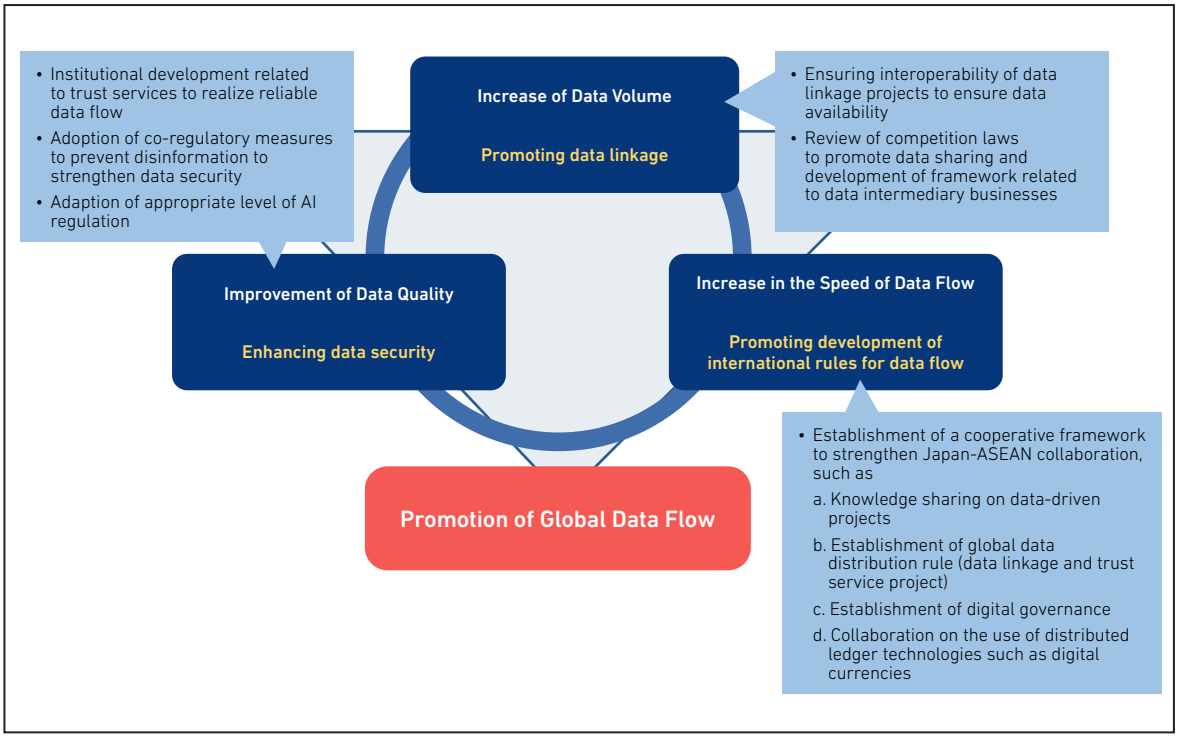
4 . Conclusion

This chapter summarises the policy issues that need addressing to realise a data-driven society. Specifically, it is necessary to shed light on the importance of the three elements of individualisation, automation, and optimisation in a data-driven society, where data is at the core of socioeconomic activities, keeping in mind the need to review institutions and mechanisms to adapt to the characteristics of data.

Based on this, as shown in Figure 5.4, this chapter proposed concrete measures organised from the three perspectives of (i) increasing the volume of data, (ii) improving the quality of data, and (iii) increasing the speed of data flow, as a policy agenda for the realisation of a data-driven society.

In order to build convincing trust in cyberspace, an appropriate balance amongst the three elements of convenience, security, and privacy related to digital technology is required. In particular, the three elements have mutually contradictory characteristics, making it difficult to strike a balance. Moreover, with the advent of generative AI, it is becoming even more difficult to ensure a balance amongst the three elements. Against this backdrop, there is a need to set a common agenda to realise a data-driven society and strategically promote specific initiatives in order to strengthen cooperation between Japan and ASEAN.

Figure 5.4. Policies for a Data-driven Society



AI = artificial intelligence, ASEAN = Association of Southeast Asian Nations.

Source: Prepared by the author.

References

Cabinet Office, Economic and Social Research Institute, Japan (2023),' Research Study on Measurement of Digital Economy Toward 2025SNA (tentative name) – How to Record Data as Capital'. https://www.esri.cao.go.jp/jp/esri/prj/hou/hou088/hou088.html (in Japanese)

Decurret (2022), 'The Digital Currency Forum, the Number of Participating Companies, Banks, and Local Organizations has Increased to 83, and 4 Demonstration Experiments of the DCJPY were Conducted', Press Release, 27 April. https://www.decurret-dcp.com/en/pressrelease/pr-20220427-dcforum.html

European Commission (2020), 'A European Strategy for Data'. https://eur-lex.europa.eu/legal-content/EN/TXT/ PDF/?uri=CELEX:52020DC0066

_____ (2022), '2018 Code of Practice on Disinformation', 16 June. https://digital-strategy.ec.europa.eu/en/library/2018-code-practice-disinformation

US White House (2023a), 'Fact Sheet: Biden-Harris Administration Secures Voluntary Commitments from Leading Artificial Intelligence Companies to Manage The Risks Opposed by AI', 21 July. https://www.whitehouse.gov/briefing-room/statements-releases/2023/07/21/fact-sheet-biden-harris-administration-secures-voluntary-commitments-from-leading-artificial-intelligence-companies-to-manage-the-risks-posed-by-ai/

_____ (2023b), 'Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence', 30 October. https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/