CHAPTER 1

INTRODUCTION

Lurong Chen
Kalamullah Ramli
**Muhammad Suryanegara**

Digital technology has been one of the major transformational forces of human society, fuelling great prosperity in the world economy. Digital transformation can be seen as the transition from a classic organisation that relies on real-world resources to a digital organisation that relies on information and virtual resources (Delgado, 2017). This includes (i) changing organisational processes and culture (Iljins, Skvarciany, and Gaile-Sarkane, 2015); (ii) enabling and optimising the use of information and communication technology (ICT) to improve public service (Meijer and Bekkers, 2015); and (iii) new value-added creation. Countries around the world are rushing to harness opportunities induced by digitalisation. Globally, development of the digital economy has been an integral component of the United Nations Sustainable Development Goals. At the World Economic Forum Annual Meeting in May 2022, leaders from around the world agreed that technology would be key to meeting the Sustainable Development Goals.

ICT is a pervasive technology that has the potential to radically change the foundation of our society (Mansell and Silverstone, 1998). In this decade (2020–2030), the rapid enhancement of ICT has been concentrated in several fields. ITU (2017) identified the internet of things, cloud computing, big data analytics, and artificial intelligence (AI) as the four game-changing technologies that will drive the digital transformation. Figure 1.1 shows their market size in 2015 and the projection for 2025.

Figure 1.1 Global Market for Emerging Technologies, 2015 Versus 2025
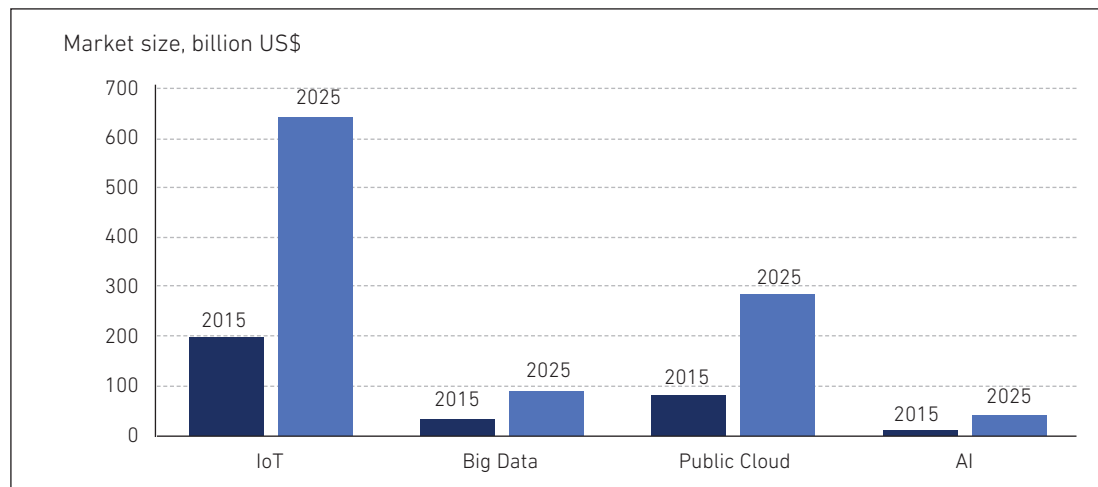
AI = artificial intelligence, IoT = internet of things.
Source: Bauer (2017).

ACCELERATING DIGITAL TRANSFORMATION IN INDONESIA:
Technology, Market, and Policy

Digital transformation policy analyses cannot be separated from technological adoption factors. When a technology is introduced to the market, users exhibit a subjective value of how they perceive the technology and how they will use it. The ideal condition is for the technology to increase the welfare and economic power of its users. Thus, at the centre of the digital transformation, policymakers should be able to understand messages from the market/society during the diffusion of technologies and synchronise them with the relevant strategic policies.

In a similar way, policy design for digital transformation cannot be separated from market and technological adoption factors. According to Flacher and Jennequin (2008), regulatory policies are made to develop competition, with the purpose of ultimately increasing efficiency and social welfare. This is one of the primary functions of policy – to structure the implementation of digital technology in the market so that society will obtain the greatest benefit. However, different countries deploy different policy approaches aimed at pursuing social welfare in their respective societies.

Hence, the relationship between technology and the market, where the market or society, as technology users, must be understood as a whole and comprehensively. This relationship must be combined with an understanding of the relevant technological regime, defined as the attributes of a technological environment where firms' innovation activities take place. Such a holistic understanding allows policymakers to extract lessons learnt so that they can design the optimal strategies to support the desired digital transformation. Asia could benefit more than any other region by turning the potential induced by digital technology into reality. The next Asian miracle of growth could be born through the region's digital transformation in the new era, whose new ideas, new technologies, new mindset, new tools, and new business are changing the way people live, work, and study. The ASEAN Economic Community Blueprint 2025 (AEC 2025) highlights the importance of incorporating economic digitalisation in regional development. Considering the rapid growth of the digital economy and the region's potential in this area, the concept of digital integration has been part of the content of the AEC 2025 and has shown its importance in contributing to the success of the Consolidated Strategic Action Plan. Moreover, digital transformation will help the region achieve the five objectives defined in the ASEAN Social-Cultural Community Blueprint 2025 (ASCC 2025).

Indonesia is the largest Association of Southeast Asian Nations (ASEAN) economy in terms of gross domestic product (GDP) and population. It also has a fast-growing online market. By the end of 2019, the rate of 3G/4G coverage reached 93%, and the country had about 130 million internet users (Statistics Indonesia, 2022). Nearly 90%

of these users used e-commerce (Statista, 2022). From 2017 to 2019, the number of internet and e-commerce users increased by 50% and 70%, respectively. During this period, e-commerce revenue rose from $9 billion to more than $20 billion annually. The Indonesian e-commerce market is projected to keep growing at an average rate of 25% per year from 2021 to 2025 and achieve as much as $90 billion in 2025 (Figure 1.2).

Figure 1.2 Indonesian E-commerce Market
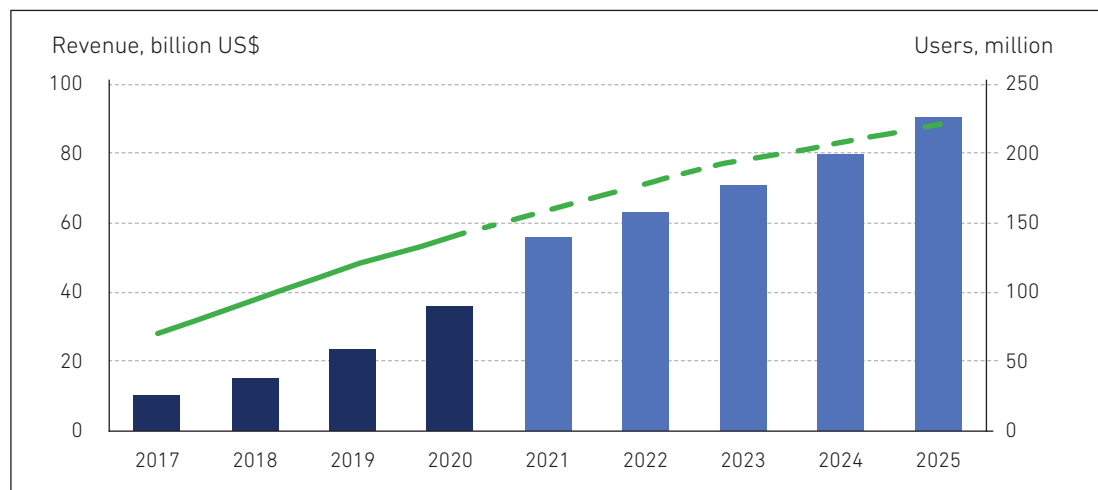
Source: Authors. Raw data from Statista (2022).

Indonesia will benefit from its relatively young population and high literacy rate. The 2020 census showed that the country's median age was 31.1 years, with 71% of the population aged 15–64.[1] Thanks to the compulsory education for children through age 18, 93% of Indonesians aged 15 and above can read and write in Bahasa Indonesian (World Bank, 2022). With digitalisation facilitating self-learning and online training, a large pool of educated youth will be an asset for economic development in Indonesia.

Despite its progress and growth potential, Indonesia needs to accelerate the pace of its digital transformation. It faces various challenges in this respect. Improving connectivity and minimising the digital divide are top priorities. The economic geography of Indonesia is characterised by its archipelagic profile. The interlinkages amongst different islands or regions are rather weak, and the cost of domestic logistics remains high. This has fragmentised national economic activities and created barriers for economic growth, making unevenness the key feature of the Indonesian economy as well as many other aspects of development (Kimura and Chen, 2018).

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[1] Life expectancy is 73 years.

Indonesia's Gini ratio was 0.38 in 2019 (World Bank, 2022). The GDP per capita of the Special Capital City District of Jakarta is more than 10 times higher than that of East Nusa Tenggara, one of the least developed regions of the country. Some 27 out of the 34 provinces had GDP per capita higher than the national average (Statistics Indonesia, 2022). Nearly three-fifths of the population live in Java. The island contributes 60% of Indonesia's GDP and has the highest internet penetration, at 52.5%. In comparison, less than one-third of the population living in Papua and Kepulauan Maluku were internet users at the end of 2019. Mobile subscribers reached 331 million in September 2020, surpassing the country's population of 270 million (Figure 1.3).

Figure 1.3 Economy Geography of Indonesia
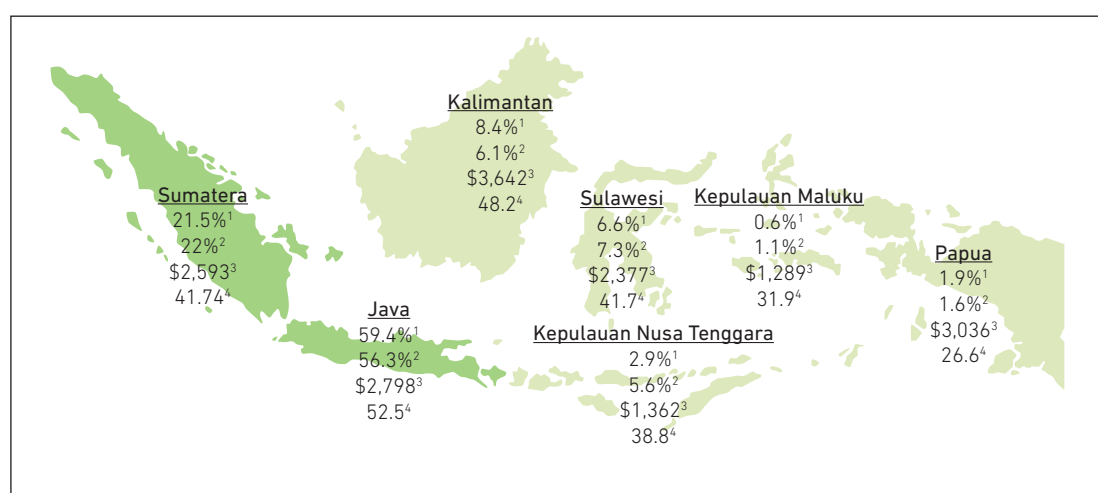
GDP = gross domestic product, US = United States.

Notes:

1. Share of national GDP of 2019

2. Share of national population of 2019

3. Average GDP per capita of 2019 (US dollars in constant 2010 prices)

4. Internet penetration of 2019

Source: Authors. Raw data from Statistics Indonesia (2022).

The table shows internet and cellular penetration at the provincial level. Two types of gaps are worth noting. First, wide gaps in cellular penetration persist between urban and rural areas – 70% of the urban population has owned at least one mobile phone, while only half of the population use mobile phones in rural areas. Second, the number of internet users is much lower than that of cellular users, meaning that a significant number of Indonesians still use mobile phones with 2G technology – without the capacity to access the internet.

Table 1.1 Internet Penetration and Cellular Penetration in Indonesia: Provincial Data

Island Province	Internet users (% of popu- lation)	Cellular/mobile users (% of population)		
		Overall	Urban	Rural
Sumatera	41.7	62.5	71.2	56.0
Aceh	35.6	57.8	69.0	52.3
Sumatera Utara	41.4	60.7	67.6	52.3
Sumatera Barat	41.2	62.6	71.3	54.9
Riau	45.0	67.3	74.9	62.2
Jambi	42.7	64.8	75.3	59.7
Sumatera Selatan	38.1	60.7	71.3	54.4
Bengkulu	40.7	61.2	74.9	54.4
Lampung	40.2	61.5	71.3	57.2
Kep. Bangka Belitung	45.9	67.8	72.9	61.4
Kep. Riau	65.0	76.4	77.7	64.9
Java	52.5	64.9	69.1	52.0
DKI Jakarta	73.5	78.4	78.4	–
Jawa Barat	53.9	66.2	69.1	56.8
Jawa Tengah	47.7	61.7	66.0	57.1
Di Yogyakarta	61.7	67.7	71.7	56.8
Jawa Timur	47.1	62.2	68.5	54.9
Banten	56.3	65.2	70.5	52.0
Kepulauan Nusa Tenggara	38.8	56.3	67.7	48.9
Bali	54.1	69.6	74.4	59.1
Nusa Tenggara Barat	39.2	57.1	62.9	51.6
Nusa Tenggara Timur	26.3	45.0	66.9	38.1
Kalimantan	48.2	67.9	77.5	60.7
Kalimantan Barat	38.4	58.6	74.3	50.1
Kalimantan Tengah	46.7	70.3	79.8	63.8
Kalimantan Selatan	50.4	69.0	78.2	60.7
Kalimantan Timur	59.1	76.9	79.3	71.9
Kalimantan Utara	54.3	74.3	79.3	66.5

Island Province	Internet users (% of population)	Cellular/mobile users (% of population)		
		Overall	Urban	Rural
Sulawesi	41.7	62.8	72.2	56.5
Sulawesi Utara	46.7	67.9	74.7	60.4
Sulawesi Tengah	35.5	57.7	71.3	51.8
Sulawesi Selatan	43.9	65.1	73.8	58.4
Sulawesi Tenggara	41.9	62.7	72.5	56.3
Gorontalo	41.8	60.4	68.2	54.6
Sulawesi Barat	31.3	52.2	62.0	49.1
Kepulauan Maluku	31.9	55.6	71.5	46.2
Maluku	33.9	57.0	69.9	46.7
Maluku Utara	29.1	53.7	73.8	45.5
Papua	26.6	44.8	75.5	31.9
Papua Barat	43.5	66.5	76.8	59.0
Papua	21.7	38.5	75.2	24.0

Source: Authors. Raw data from Statistics Indonesia (2022).

Digitalisation is not a development status, but a continuous process of transformation. At each milestone, it is necessary to assess the achievements so far and the plan for the remainder of the journey. Indonesia has set up an important framework for its agenda for the Acceleration of National Digital Transformation. The Making Indonesia 4.0 Roadmap, launched in April 2018, is designed to respond to the challenges of economic diversification and address trade imbalances. This initiative is Indonesia's effort to reduce dependence on the extractive industries while increasing high-value exports, which will enable the country to compete economically with the newly developed economies in Asia.

This book provides insights on Indonesia's digital transformation. Its analysis covers three aspects – technology, the market, and policy.[2] It shows how the new international division of labour could expand the policy space – i.e. with digitalisation, policymakers will have more options to customise development strategies for different regions within the country, depending on their conditions and constraints. This volume investigates the technology–market–policy dynamics at the micro level and sheds light on how digitalisation, competition, innovation, and human development can interact to promote development.

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[2] Kimura and Chen (2018) revealed some of their interlinkages at the macro level.

The next chapter surveys the actions undertaken by the Government of Indonesia to accelerate digital transformation. It discusses how digitalisation will play a notable role in improving Indonesia's global competitiveness. Chapter 3 examines the underlying policy motivations and constraints from the perspective of technology progress and adoption. Chapter 4 explores the possible economic consequence of digital transformation. Chapter 5 summarises the findings and proposes policy recommendation on how Indonesia can unlock the potential of using new technology and better harness opportunities brought about by digital transformation.

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