Chapter 9

The Digital Economy in Thailand: Potential and Policies

Juthathip Jongwanich

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Chapter 9
The Digital Economy in Thailand: Potential and Policies

Juthathip Jongwanich

1. Introduction

The importance of the digital economy in Thailand has become increasingly evident over the past 5 years. According to a broad definition by the Organisation for Economic Co-operation and Development (OECD) (2020), the digital economy in Thailand grew substantially in 2017–2021, expanding from US$41 billion in 2017 to US$66 billion in 2021, representing an annual growth rate of around 12%. During this period, its contribution to GDP increased from 9.0% in 2017 to 13% in 2021 (Table 9.1). The digital industry – particularly in areas such as hardware, communications, software, digital services, digital contents, and smart devices – has been a major driver of this growth, followed by digital trade, digital finance, and digital tourism (Figure 9.1). Thus far, digital technology has been more concentrated in the service sector, with its utilisation in the manufacturing and agriculture sectors remaining relatively limited.

From an expenditure perspective, trade in digital goods and services has played a crucial role in the development of the digital economy in Thailand, in line with the trade of traditional products, where the shares of exports and imports in GDP are around 60% and 50%, respectively.

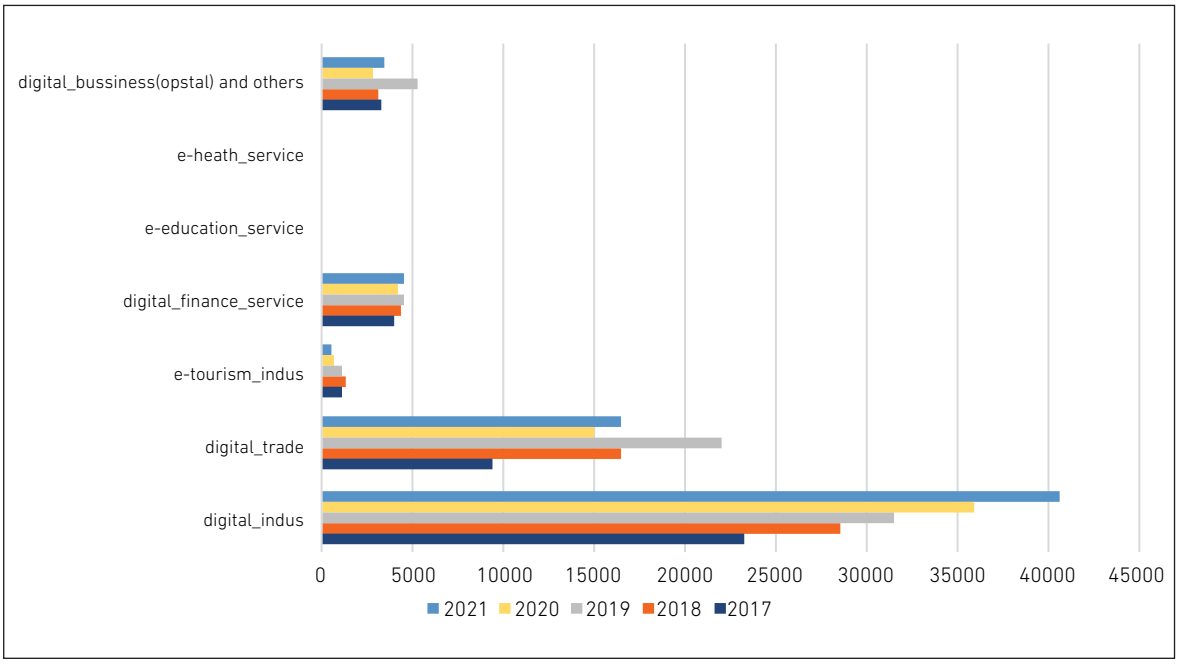
Table 9.1. Digital Contributions to Gross Domestic

Years	Value* (Million US$)		Exchange rate (bath/ US$)	Growth		Contribution of digital to GDP
	Digital related activities	GDP		Digital industries	GDP	
2017	41,107	302,310	33.9		4.2	9.0
2018	54,097	330,847	32.3	25.3	4.2	10.7
2019	64,655	351,831	31.0	14.8	2.3	11.9
2020	59,023	327,412	31.3	-8.0	-4.2	11.8
2021	66,051	325,416	32.0	14.4	1.6	13.0

GDP = gross domestic product.

Source: Office of the National Digital Economy and Society Commission.

Figure 9.1. Digital Economy, by Product in Thailand (constant prices in 2017) Sub-category



GDP = gross domestic product.

Source: Office of the National Digital Economy and Society Commission.

Like many other countries, Thailand has placed significant policy emphasis on harnessing the new and emerging opportunities brought about by the digital economy. Policy responses have been adopted at the national level and through action plans for all government agencies. For example, the Thailand 4.0 Policy was launched in 2018 to transform the economy into a value-based digital economy. The Ministry of Digital Economy and Society (MDES) launched the 20-year National Master Plan for Digital Development (2018–2037) and the Thailand Strategic Digital Plan for Economic and Social Development (2020–2024), whilst organisations such as the Digital Economy Promotion Agency (DEPA) announced the Thailand Digital Plan, DEPA for 2018–2022. Beyond policies directly related to digital economy, such as investment strategies, digital infrastructure, and regulations, strategic investment plans and various decrees have been introduced to drive economic transformation.

Given the importance of the digital economy and the various policy shifts, this research project aims to examine the potential of the digital economy and review the key policies that have been introduced or altered to steer the country towards a digital future. Section 2 of the chapter presents the potential for the development of the digital economy, whilst section 3 discusses four policy aspects. The final section provides conclusions and policy recommendations.

2. Potential for Developing the Digital Economy

Two official sources provide data on the digital economy: (1) The Digital Contribution to GDP, compiled by the Office of the National Digital Economy and Society Commission (ONDE); and (2) the Digital Market Survey and Forecast, conducted by the Digital Economy Promotion Agency (DEPA) under MDES, in partnership with the IMC Institute (Jongwanich, 2023). The former uses a broad definition of the digital economy as outlined by the Organisation for Economic Co-operation and Development (OECD) (2020), whilst the latter applies a narrower definition, closer to those proposed by the OECD (2020) and the United Nations Trade and Development (UNCTAD) (2019) focusing on the supply side of the digital market.

Thailand's digital economy experienced substantial growth, outpacing GDP growth in 2018–2021. From the expenditure perspective, consumption grew faster than other components in 2017–2020. However, in 2021, following the easing of the coronavirus disease (COVID-19) pandemic, investments and exports grew markedly, indicating a positive outlook for the digital economy in the medium to long term (Table 9.2).

When considering subcategories, high growth was concentrated in digital hardware, such as electronics and computer parts, medical electronic equipment, and sonar and control equipment, whilst investment in software slightly declined by 0.82% in 2021 (Figure 9.3). The proportion of smart devices remained relatively low at around 20%, with traditional hardware investment accounting for more than 70% of total investment (Figure 9.4). Stimulating more investment in software and smart devices could help balance the digital development path.

Digital technology has been concentrated more in services, followed by manufacturing. Its application in agriculture has been limited. Prioritising the use of technology in agriculture and manufacturing should be a key focus moving forward.

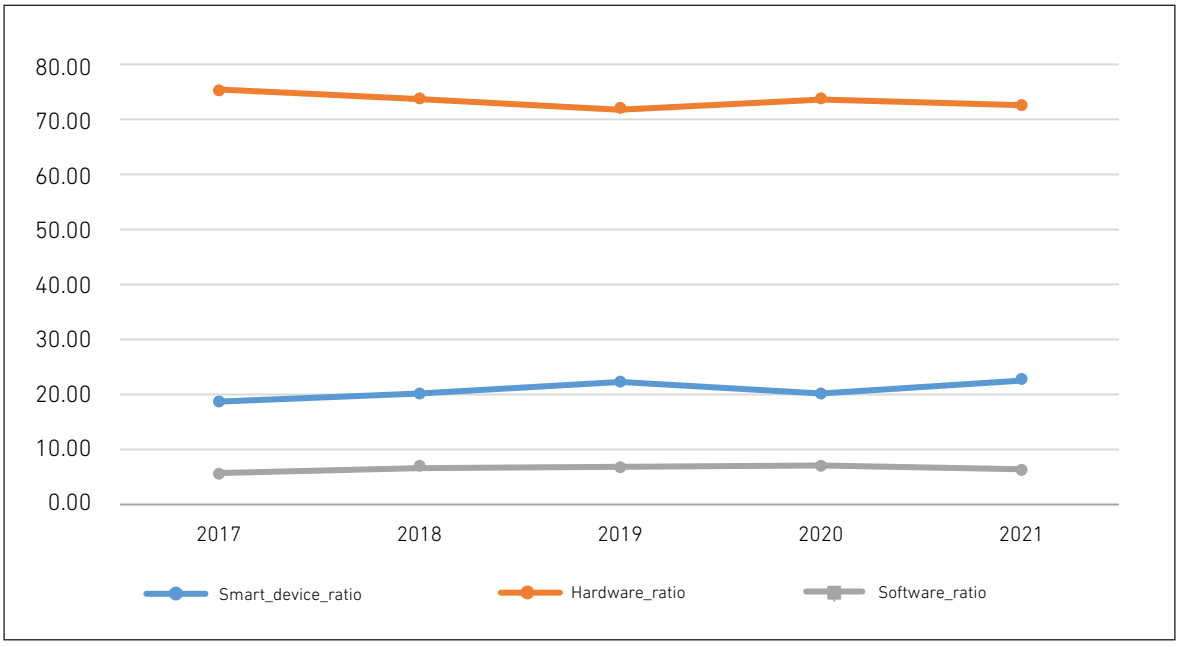
Table 9.2. Components of Digital Gross Domestic Product at 2017 Prices (US$ million) and Growth Rate (%)

Years	Consumption	Government	Investment	Export	Import	C_ growth	G_ growth	I_ growth	X_ growth	M_ growth
2017	10,516	483	3,919	70,165	55,066					
2018	12,155	476	4,357	71,518	59,672	10.0	-6.4	5.8	-3.0	3.2
2019	12,946	573	4,484	70,121	56,590	2.4	15.5	-1.1	-5.8	-8.9
2020	13,672	517	4,527	60,811	48,642	6.5	-9.0	1.8	-12.6	-13.4
2021	13,818	501	5,432	63,393	53,410	3.3	-1.0	22.6	6.5	12.2

Note: Investment refers to gross fixed capital formation.

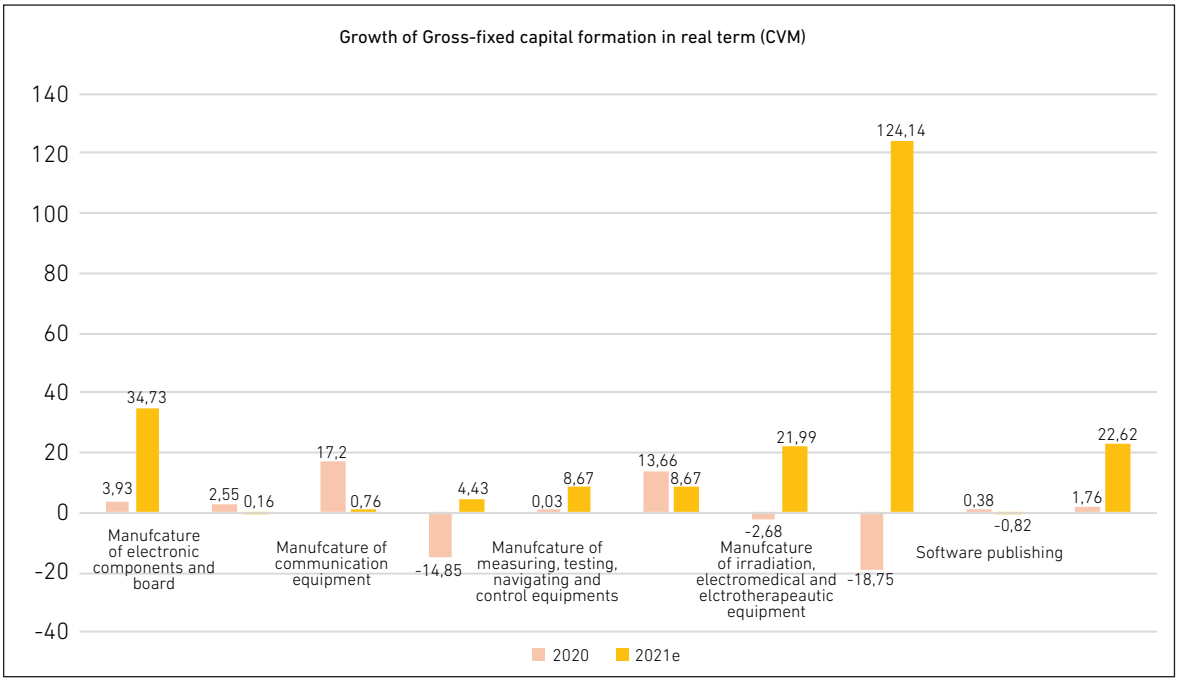
Source: Office of the National Digital Economy and Society Commission.

Figure 9.2. Proportion of Investment (%)



Source: Office of the National Digital Economy and Society Commission.

Figure 9.3. Investment Growth (at 2017 prices)



Source: Office of the National Digital Economy and Society Commission.

The importance of the digital economy is further revealed when the narrower definition is applied. Table 9.3 shows that the growth rates of hardware and smart devices, digital services, and software and software services increased substantially in 2021–2022 and are expected to keep growing at a similar pace over the next 3 years. However, whilst hardware (including smart devices) considerably dominates the digital industry, accounting for about 70%, the growth of software and digital services is expected to lag.[1] Increasing investment in software and software services has the potential to balance the development path of the digital industry in the country.

[1] The value of e-commerce increased significantly, rising from B2.76 trillion in 2017 to B4.01 trillion in 2021, with an average annual growth rate of about 10%. However, it is important to note that the value of e-commerce declined by around 6% in 2020, dropping from B4.05 trillion in 2019 to B3.78 trillion in 2020 amidst the pandemic. Business-to-consumer transactions dominate the e-commerce sector, accounting for 51% of the total value, followed by business-to-business at 27% and business-to-government at around 22%. Consumer-to-consumer (C2C) transactions are on the rise. This trend is reflected in the significant increase in monthly web visits to leading C2C e-commerce sites, which jumped from 49.6 million in the second quarter (Q2) of 2020 to 90 million in Q2 2021 and further to 103 million in Q3 2021. For more detailed information, you may refer to Statista and EDTA. The link of EDTA is as follows: https://www.etda.or.th/th/Useful-Resource/publications/Value-of-e-Commerce-Survey-in-Thailand-2021-Slides.aspx.

Employment in the digital industry continued to grow in 2022, except for digital services, which saw significant growth in 2021 (Table 9.4). However, the survey revealed a concerning trend: whilst the number of students enrolling in digital industry-related faculties has increased, the number of graduates has declined (Figure 9.4). If this trend persists, it could have an adverse implication on human capital and the future development of the digital industry.

Table 9.3. The Value of the Digital Industry (baht million) and Growth Rate (%)

	Value (Baht million)						Growth (%)				
	2020	2021	2022	2023e	2024e	2025e	2021	2022	2023e	2024e	2025e
Software and software services	114,978	160,872	190,766	218,999	241,775	265,469	11.0	18.6	14.8	10.4	9.8
Hardware and smart devices	1,021,442	1,218,588	1,431,980	1,472,075	1,744,409	2,065,381	19.3	17.5	2.8	18.5	18.4
Digital services	162,357	233,088	281,515	341,283	403,397	454,628	43.6	20.8	21.2	18.2	12.7
Digital content	39,332	42,065	40,518	41,143	42,710	44,983	6.9	-3.7	1.5	3.8	5.3
Telecommunication	630,250	647,654	669,330				2.8	3.3			

Note: Software includes system integration, software maintenance, customised software, and consultancy and training, whilst digital services include e-content, e-entertainment, e-retail, e-advertising, e-transactions, and fintech.

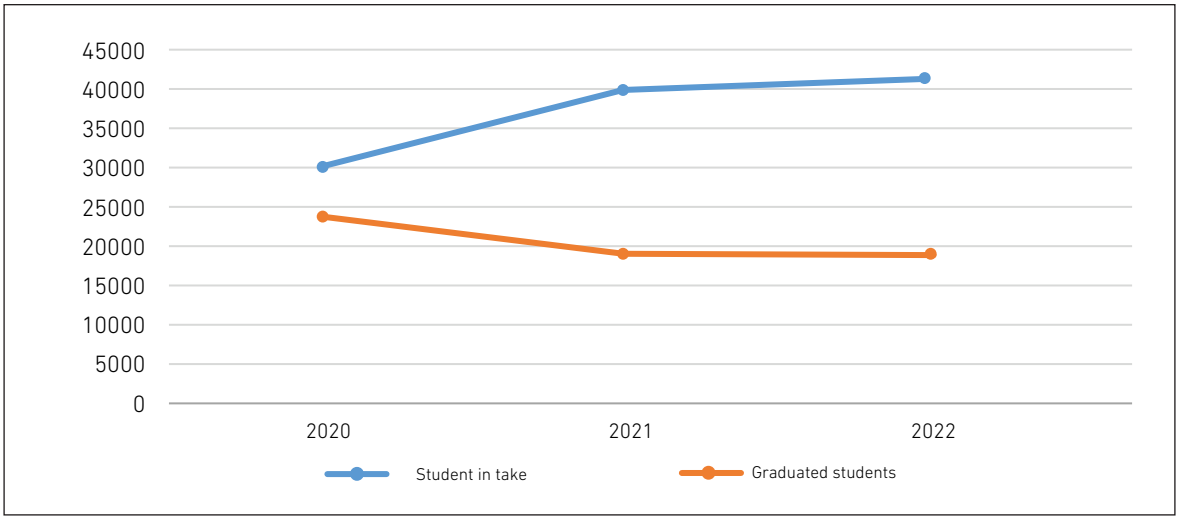
Source: Author, based on data from the Digital Economy Promotion Agency, Ministry of Digital Economy and Society, and the IMC Institute.

Table 9.4. Number of People Employed in the Digital Industry

	Persons			Growth rate (%)	
	2020	2021	2022	2021	2022
Software and software services	132,761	138,917	144,672	4.6	4.1
Hardware and smart devices	312,460	311,051	324,760	-0.5	4.4
Digital services	60,008	79,115	73,782	31.8	-6.7
Digital content	6,614	5,397	6,225	-18.4	15.3

Source: Author, based on data from the Digital Economy Promotion Agency, Ministry of Digital Economy and Society and the IMC Institute.

Figure 9.4. Number of Enrolled and Graduated Students



Source: Author, based on data from the Digital Economy Promotion Agency, Ministry of Digital Economy and Society and the IMC Institute

3. Policies for the Digital Economy

This section reviews key policies relevant to the digital economy. Using the broad definition of the digital economy as outlined by OECD (2020), the study focuses on three key policies: industrial transformation, digital plans, and rules and regulations. Some policies, such as those related to industrial transformation and investment, have been amended to support the digital economy, whilst others, such as the Personal Data Protection Act and the Cyber Security Act, have been designed for the digital sector.

3.1. Industrial Transformation

The Thailand 4.0 Policy, launched in 2018, aims to transform the economy into a value-based digital economy. The establishment of the Eastern Economic Corridor (EEC), which spans the three eastern provinces of Chonburi, Rayong, and Chachoengsao, is a key part of this strategy. Launched in 2018, the EEC includes the EEC-D (Digital Park) in Sriracha, Chonburi, which is designed to support digital

business innovators.[2] The government has made substantial investments in infrastructure to enhance the connectivity of the three provinces with the global market. Key projects include the high-speed train route linking Suvarnabhumi, Don Mueang, and U-Tapao airports; the development of U-Tapao airport; the third phase of Map Ta Phut and Laem Chabang ports; and a centre for the maintenance, repair, and overhaul of aircraft. A double-track railway and the expansion of the inter-city motorway network have been prioritised.

In 2017 and subsequent years, Thailand revised its investment incentives to attract higher-quality foreign direct investment and promote the digital economy. Thailand has made significant strides in both hard and soft digital infrastructure. In 2018, the government launched the country-wide village broadband network Connected Netpacharat, aiming to provide affordable high-speed internet to low-income households in more than 24,000 villages.[3] The Digital Park in Chonburi supports the country's digital development by introducing a submarine cable system, a cable landing station, and a data centre. In May 2020, a national 5G committee was formed to develop a clear roadmap for 5G adoption and enhance cooperation amongst agencies.

The Bank of Thailand has played a crucial role in accelerating the digital transformation of the financial sector. Initiatives include the central bank's e-payment platform, PromptPay, which links user accounts to their ID or phone number; the establishment of a new financial transaction report standard (ISO 20022) to facilitate e-invoicing and e-factoring; and the promotion of biometric and facial recognition systems in banking services. A peer-to-peer lending platform was created by the central bank in cooperation with the Ministry of Finance, enabling individual lenders to be matched with individual borrowers.

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[2] The EEC-D is envisioned as an innovation hub and destination for digital global players and business innovators. Key participants include hardware and software producers and service providers specialising in areas such as cloud computing, intelligent system, pervasive software, cognitive platforms, Internet of Things platforms, and machine learning. The park hosts digital content providers, including data centres, big data analytics, streaming content, content delivery platforms, virtual reality movies, holograms, and immersive animation, as well as digital tech start-ups. The EEC-D is equipped with ultra-high-speed broadband infrastructure, including an international submarine cable station, a satellite earth station, and a data management centre. It is crucial to note that the EEC-D faces competition within ASEAN from two other digital parks: Hoa Lac Hi-Tech Park in Viet Nam and Punggol Digital District in Singapore. These parks are also vying to attract foreign investment in the digital sector. Punggol Digital District aims to bring together global digital players, investors, innovators, start-ups, and professional researchers. The district will house the campus of Singapore Institute of Technology, which is planned to include the entire education system related to digital technology.

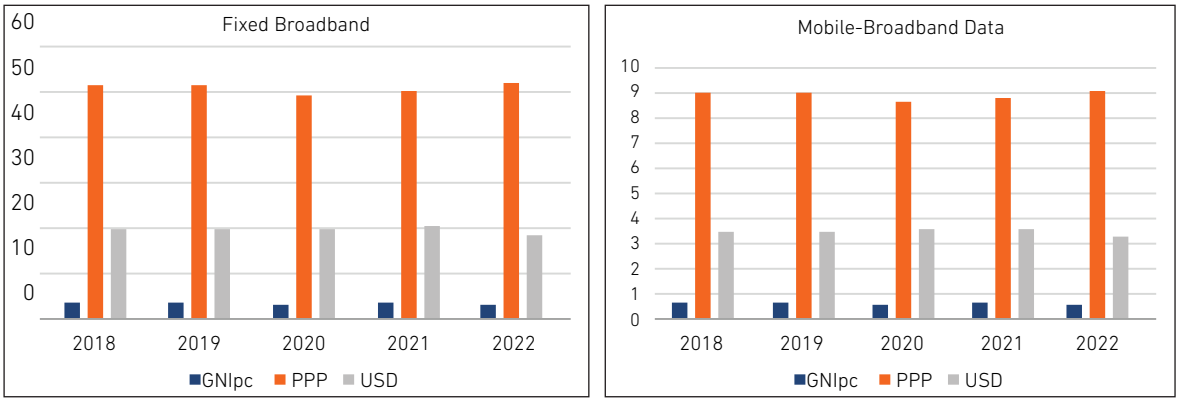
[3] The Ministry of Information and Communication Technology, in collaboration with the Office of the Non-formal and Informal Education, signed a memorandum of understanding in May 2018 to provide public internet services to approximately 10,000 remote locations over a 3-year period. In 2019, an additional 10,000 locations were included for a 6-month period. In 2021 and 2022, around 8,300 locations were covered, with service durations of 12 months and 6 months, respectively, offering improved internet quality. In addition, public internet access was provided to underprivileged groups, including non-formal education centres, public libraries, digital community centres, and border patrol police schools. However, the plan did not address how to ensure continued access to the internet after the projects ended, nor did it consider scaling-up public internet services for underprivileged groups.

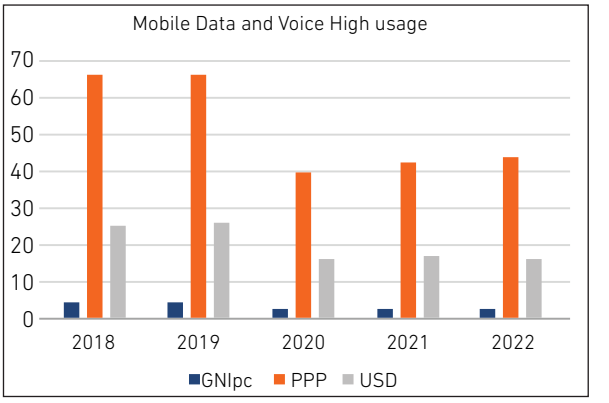
When considering infrastructure and accessibility, various indicators show that digital infrastructure has improved substantially over the past decade. By 2022, 99% of the population was covered by a mobile cellular network, and 98% had access to at least a 4G mobile connectivity. Household internet access increased from 64% in 2017 to 90% in 2022, with high acceleration observed during the COVID-19 pandemic. The gap in internet access between rural and urban areas narrowed from 12 percentage points in 2020 (69% for rural areas and 89% for urban areas) to 6 percentage points in 2022 (86% for rural areas and 92% for urban areas). Fixed broadband subscriptions per 100 inhabitants and active mobile broadband subscriptions have increased significantly since 2015. International bandwidth has improved, rising from 53 kbit/s in 2015 to 178 kbit/s in 2022.

However, compared to other countries in Asia, such as China, Singapore, Malaysia, and Viet Nam, Thailand still lags in certain aspects, particularly in terms of prices and information and communication technology (ICT) skills. In 2022, only 24% of the population had a computer at home. Whilst ICT skills have shown an upward trend, only 1% of the population is classified as having advanced ICT skills, with approximately 21% possessing basic ICT skills.

Over the past decade, the prices of fixed broadband, mobile broadband, and mobile cellular services in Thailand have declined noticeably, especially when measured as a percentage of gross national income (Jongwanich, 2023). However, since 2017, these prices have remained relatively unchanged. When adjusted for purchasing power parity, it appears that ICT prices, especially for fixed broadband and mobile broadband, have not yet declined as expected (Figure 9.5).

Figure 9.5. Prices of Fixed Broadband, Mobile Broadband, and Mobile Cellular in Thailand, 2018–2022





Source: Author's compilation from International Telecommunication Union (ITU).

3.2. Digital Plans

The government has long addressed the critical importance of ICT in enhancing productivity and promoting long-term growth. This focus dates back to the mid-1990s, when the first national information technology (IT) plan, the Thailand National IT Policy (1996–2000), was introduced. Since then, several national plans have followed, including the Thailand Information and Communication Technology Policy Framework (2001–2010), the Thailand Information and Communication Technology Master Plan (2002–2006, later extended to cover 2007–2008), the National Broadband Policy (2010), the Information and Communication Technology Policy Framework (2011–2020), and the Universal Service Obligation Master Plan for Provision of Basic Telecommunication Services (2012–2014).

In 2002, the Ministry of Information and Communication Technology (MICT) was established as the central body responsible for implementing these plans, coordinating measures, and overseeing related government agencies. In 2016, the ministry was restructured and renamed MDES, expanding its scope to include state-owned enterprises and public organisations involved in ICT activities, such as the Telephone Organization of Thailand, the Communications Authority of Thailand (CAT), the Electronic Government Agency (public organisation), and the Electronic Transactions Development Agency (public organisation). More importantly, the Software Industry Promotion Agency was replaced by the DEPA, which now plays a key role in promoting and supporting the development of the digital industry, innovation, and the adoption of digital technology.[4]

[4] The National Disaster Warning Center, formerly under MICT, is now being transferred to the Ministry of the Interior. MDES has set up a cybersecurity agency and a hacker training centre.

In 2018, MDES launched the 20-Year-National Master Plan for Digital Development (2018–2037), with four key goals: (1) enhancing the country's competitiveness; (2) ensuring equal opportunities, with broadband internet access for all as a basic utility; (3) developing human capital, ensuring that everyone is digitally literate; and (4) reforming government operations. Various government units have developed their own plans to align with the 20-Year National Master Plan for Digital Development. For example, MDES established the Strategic Digital Plan for Economic and Social Development for 2018–2021 and 2020–2024, the Office of the Permanent Secretary launched its strategic plan for 2020–2024, and DEPA introduced the Thailand Digital Plan for 2018–2022. Each government unit sets its own goals, strategies, and indicators to measure success, which has sometimes led to complications in aligning strategies and assessing the accomplishment of the overall plan.[5]

3.3. Rules and Regulations for Digital Activities and International Cooperation

Thailand has established rules and regulations governing the digital economy that align with those of other Asian countries and international standards. These include frameworks such as the United Nations Convention on the Use of Electronic Communications in International Contracts, OECD's Recommendation of the Council Concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data, the APEC Privacy Framework, and the European Union's General Data Protection Regulation.

Digital laws in Thailand can be categorised into three groups:

(1) **Laws related to digital infrastructure and business facilitation**. These include legislation such as the Electronic Transaction Act, digital ID laws, and provisions within the Penal Code.

(2) **Laws related to consumer protection and business trust.** Examples include the Consumer Protection Act, the Copyright Act, and the Direct Sales and Direct Marketing Act.

(3) **Laws related to securing the digital ecosystem.** This category includes the Personal Data Protection Act and the Cyber Security Act.

[5] There are differences in the indicators set by various government bodies, such as MDES and the Office of the Permanent Secretary. For example, under the 2018–2022 plan by DEPA, the indicators for strategy 2 include (1) achieving a 10% annual growth in the value of the digital industry (encompassing hardware, software, digital services, communication, and digital content); and (2) adding 1,000 digital small and medium-sized enterprises, digital transformation initiatives, and digital startups to the market during 2018–2022. In contrast, the indicators in the 2018–2021 and 2020–2024 plans of MDES focused on promoting the digital economy. For the earlier plan, the indicator was value of e-commerce, measured as 2% of total sales; for the latter plan, the target was set at 10% annual growth rate. Both plans aimed to increase the number of digital start-ups by 300 firms per year.

For example, under the first category, Thailand introduced the Electronic Transactions Act of B.E. 2544 in 2001. It acknowledges electronic transactions as having the same validity as traditional paper-based transactions. The act was amended in 2019 (the Electronic Transactions Act [No. 3] B.E. 2562 [A.D. 2019]) to strengthen the evidentiary weight of electronic transactions and to set conditions for legal consequences when documents lack a physical signature. The Digital ID Bill was approved in principle by the Cabinet in 2018. This digital ID system is designed to facilitate and expedite identity verification processes via online platforms.

In the second group, various laws have been enacted to protect consumers and build business trust, indirectly supporting the promotion of e-commerce. For example, the Consumer Protection Act of B.E. 2522 (1979) was amended in 2019 (The Consumer Protection Act [No. 4] B.E. 2562 [2019]). The Direct Selling and Direct Marketing Act of B.E. 2545 (2002) is another example, allowing customers the right to terminate contracts within an agreed period.

In the third category, Thailand has increasingly focused on securing its digital ecosystem. The Personal Data Protection Act B.E. 2562 and the Cyber Security Act B.E. 2562, both introduced in 2019, are key pieces of legislation. The Computer Crime Act of B.E. 2550 (2007) was amended in 2017 to address issues such as spam emails and to impose penalties for sending disruptive computer data or emails.

Regarding international cooperation in digital provisions, Thailand joined the World Trade Organization (WTO) Joint Initiative on Electronic Commerce (JIEC) in 2019. Progress under JIEC has mainly focused on laws related to digital infrastructure and business facilitation, as well as consumer protection and business trust, including electronic signatures, electronic contracts, paperless commerce, and online consumer protection.

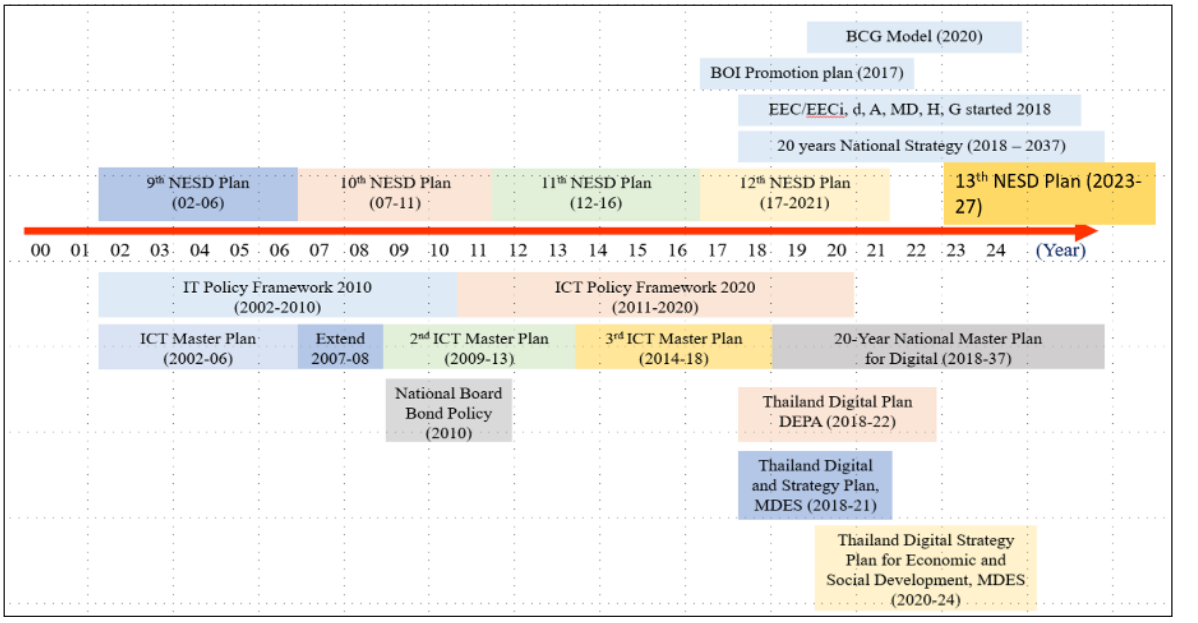
Thailand has included digital provisions in two bilateral free trade agreements (FTAs): the Thailand–Australia FTA (TAFTA) and the Thailand–New Zealand FTA. Most provisions in these agreements align with the WTO JIEC, although only TAFTA includes provisions relating to a moratorium on digital goods tariffs.

Regionally, the ASEAN–Australia–New Zealand FTA is notable for including a digital chapter that addresses issues such as consumer protection, online personal data protection, and paperless trade (see UN [2022] and Postigo [2023]). The Regional Comprehensive Economic Partnership includes a digital chapter, although its provisions are less restrictive than those in the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, of which Thailand is not yet a member.

Thailand is also a participant in the ASEAN Digital Economic Framework Agreement, which is expected to be completed by 2025. The agreement will cover issues such as digital talent, digital IDs, cybersecurity, retraining and upskilling, digital infrastructure, and interoperability within ASEAN.

In June 2022, Thailand signed a memorandum of understanding (MOU) on DEPA, initiated by Singapore, Chile, and New Zealand in 2020. The MOU aims to promote eight issues, including digital transformation, e-commerce, the setting up of centres to combat fake news, the creation of government data centres and cloud services, personal data protection, cybersecurity, investment in Thailand's Digital Valley and IoT Institute in the Eastern Economic Corridor, and the development of digital skills and literacy.

Figure 9.6. Key Plans Relevant to Digital Development in Thailand



BCG = Bio-Circular-Green Economy, BOI = Board of Investment, DEPA = Digital Economy Promotion Agency, EEC = Eastern Economic Corridor, ICT = information and communication technology, MDES = Ministry of Digital Economy and Society, NESD = National Economic and Social Development.

Source: Author's compilation.

5. Conclusions and Policy Recommendations

This chapter examines the potential of the digital economy in Thailand and reviews key policies across three areas: industrial transformation, digital plans, and digital rules and regulations, including international cooperation. The digital economy experienced significant growth, outpacing GDP growth from 2017 to 2020. Before 2021, consumption grew faster than other components, but in 2021, following the easing of the pandemic, investment in digital sectors and exports increased markedly, indicating a promising outlook for digital development. However, this growth was primarily concentrated in digital hardware sectors such as electronics, computer parts, medical electronic equipment, and sonar and control equipment, whilst investment in software slightly declined in 2021. The proportion of investment in smart devices remained considerably smaller than that in traditional hardware. Although the number of students enrolled in digital-related faculties has steadily increased, the number of graduates has not kept pace. This trend is concerning, as it could have severe implications for human capital and the future development of the digital industry if it continues.

Thailand's digital infrastructure has improved over the past decade, but in comparison to other Asian countries, including China, Singapore, Malaysia, and Viet Nam, the country still lags in certain areas, particularly in ICT skills and affordability. Whilst various rules and regulations have been amended and introduced to support digital development, some aspects, such as the regulation of cross-border personal data transfers, remain unclear. These developments, along with certain programmes, have implications for improving political-security and socio-cultural pillars in addition to the economic pillar. Thailand has initiated international cooperation on digital provisions at bilateral, regional, and multilateral levels.

To transform Thailand into a digital economy, this study proposes four key policy recommendations:

(1) **Strengthen digital transformation plans.** It is crucial to reinforce digital transformation plans, ensuring continuity in the policy framework and prioritising clear policy coordination amongst government agencies. MDES should take an active role in coordinating these plans across institutions to avoid policy overlap and failures in coordination and enforcement. Adequate budget allocations should be made for both hard and soft digital infrastructure and for promoting the digital industry. The current lack of policy continuity, overlapping policies, and coordination failures amongst government agencies lead to inefficient budget utilisation, potentially delaying digital development and making it difficult to track progress. Given the dominance of digital hardware, stimulating more investment in software and smart devices would help balance the digital development path. Whilst digital technology has been more prevalent in services, its use in manufacturing and agriculture has been limited, making it essential to prioritise technological adoption in these areas.

(2) **Develop human capital, particularly ICT skills.** Further development of human capital, especially in ICT skills, is essential in the context of digital transformation. Whilst the government has plans to improve human capital, policy overlap and coordination failures remain key obstacles. The government should establish clear evaluation criteria for each project or policy and ensure an effective whole-of-government approach, particularly by establishing coordination processes and communication channels across institutions. Continued public–private partnerships in enhancing human capital development are also crucial, with a focus on encouraging large companies to support small and medium-sized enterprises in developing their workforce skills.

(3) **Enhance ICT infrastructure.** Improving ICT infrastructure is vital to ensure digital development, particularly in terms of accessibility and affordability. Investments in infrastructure, public–private partnerships to scale up potential infrastructure projects in remote areas, and modernised rules and regulations to support infrastructure development should be encouraged. This would not only improve economic aspects enhanced by digital development but also promote the political-security and socio-cultural pillars.

(4) **Modernise and monitor rules and regulations.** With the rapid pace of digitalisation, it is important to regularly monitor and modernise established rules and regulations – including those concerning data security, privacy, consumer protection, competition policy, cross-border data flow restrictions, and data localisation requirements – to address public concerns. Strengthening regional cooperation on regulatory compatibility should be encouraged to facilitate business in the region and protect consumers against privacy and security risks. As digital transformation could potentially have negative impacts (Jongwanich, Kohpaiboon, and Ayako, 2022; and works cited therein; Jongwanich, 2022), especially in traditional sectors, the government should develop a systematic evaluation process. This process should include monitoring and evaluating job creation, potential job and business losses, technology adoption, and technology transfer to mitigate any potential negative economic and social impacts of digital transformation.

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