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*Southeast Asian Studies*, Vol. 13, No. 2, August 2024, pp. 229-253.

### **How to Cite:**

Zeng Damei and Duan Haosheng. Inter-Construction Goals: Navigating Thailand's Digital Economy from a Sustainable Development Perspective. *Southeast Asian Studies*, Vol. 13, No. 2, August 2024, pp. 229-253. DOI: 10.20495/seas.13.2\_229.

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# Inter-Construction Goals: Navigating Thailand’s Digital Economy from a Sustainable Development Perspective

Zeng Damei\* and Duan Haosheng\*\*

The digital economy has become a powerful engine for global economic resurgence in the post-pandemic era. As an ASEAN developing country, Thailand greatly values the digital economy, which facilitates its “Thailand 4.0” Sustainable Development Goals (SDGs). By focusing on digitalization trends in Thailand, this article examines whether new technological trends will have beneficial or detrimental impacts on the socioeconomic flowering of the Global South in the digital age. The “Constructive-Sustainable Development Theoretical Framework” is formulated by combining constructivism and the SDGs for conducting analysis. According to empirical research, bridging the digital divide and reducing poverty need to be Thailand’s top priorities. Therefore, Thai policy instruments should promote equal distribution of socioeconomic resources and close the digital divide, accelerate digital talent cultivation to fill the talent gap, build partnership networks that support transnational governance in cyberspace, promote third-party market cooperation, and share the reciprocal profits of development.

**Keywords:** digital economy, digital divide, SDGs, constructivism, Thailand

## Introduction

The digital economy is fueling global economic recovery and prosperity. States have started working on their digital economies to take advantage of the fourth industrial revolution, and economists are paying attention to the expansion of digital technology on the global and regional scales. Southeast Asia is a newly emerging digital market with incredible consumption potential and increasing importance.

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To take advantage of the new wave of digitalization, Thailand, ASEAN's second-largest economy, is proactively seeking new drivers for stagnant development. For the last ten years it has been committed to rescuing itself from the "inequality trap" and the "middle-income trap." Thailand's economy saw three development stages over the past few decades: agricultural "Thailand 1.0," light-industrial "Thailand 2.0," and heavy-industrial "Thailand 3.0." To break out of the past few years' economic stagnation, the Thai government has launched the "Thailand 4.0" economic growth strategy, which encourages industrial transformation and a restructuring of the development model. The main goal of Thailand 4.0 is to develop a high-value-added economy driven by innovation, technology, and creativity in order to achieve prosperity, security, and sustainable development (Usa 2018). One of the top ten S-curve industries of Thailand 4.0 is the digital sector.<sup>1)</sup> Digital technology undoubtedly creates attractive opportunities, which makes it one of the integral instruments for achieving Thailand 4.0 and promoting sustainable economic growth. However, whether Thailand's ambitious goals will ultimately have the desired effect needs to be further researched.

The worldwide Covid-19 pandemic became a catalyst for the enhancement of the digital economy in Thailand and accelerated the country's society-wide digital transformation. Against this backdrop, digital finance, e-commerce, remote learning, and food distribution quickly grew or developed on Internet-based platforms in order to lower the danger of viral transmission. The diffusion of digital technology has significantly affected Thailand's industrial structure transformation and socioeconomic recovery. AI has even proliferated into the religious sphere, illustrating how digital technology has penetrated beyond the financial realm and is now starting to progressively converge with the requirements of local cultural public goods in Thai society: for instance, the Thai virtual monk named Phra Mana went live in January 2022 (Petch 2022). However, under the intertwined influence of Covid-19 and the sustainable development dilemma, the digital economy has brought unprecedented opportunities and challenges at the social, national, and international levels. Public, academic, and policy-making agencies have all expressed interest in and engaged in discussions about the ongoing digitalization process.

In general, it is reasonable to acknowledge the admirable accomplishments of

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1) An S-curve in project management refers to reaching critical mass by investing in innovative technology products to reach optimality. Thailand 4.0 borrows this concept to refer to its focus on industries that will become optimal as innovative technology is invested in. The strategy focuses on ten industries: biofuels and biochemistry, digital economy, healthcare, automated robotics, aviation and logistics, agriculture and biotechnology, smart electronics, health tourism, next-generation self-driving cars, and food processing.

global digitalization. However, any new technology has its pros and cons, and if the public sector ignores the potential drawbacks of digitalization, it may thwart Thailand's efforts to achieve the global Sustainable Development Goals (SDGs). Accordingly, there should be a long-term critical observation of how the expansion of digital technology can serve as a stimulus for the Thai economy and accelerate industrial transformation. From the standpoint of International Development Studies, this discussion concentrates on the following closely related issues: What opportunities and challenges will the digital economy present for Thailand in achieving the SDGs at the social, national, and international levels? How can Thailand effectively take advantage of favorable trends for progress toward the SDGs?

The analysis examines the advantages and disadvantages of the societal, national, and international dimensions before elaborating on how the three relate and interact with one another. The study's main contribution is connecting the inevitable digitalization trends in Thailand to the SDGs by investigating the potentially beneficial or detrimental impacts of new technological trends on the universal Sustainable Development Goals of the Global South. This article contends that the inter-constructed or mutually influential effects at the social, national, and international levels must be taken into account to ensure the sustainable growth of the digital economy.

This paper is structured as follows. Following the introduction, the section titled "The Thai Digital Economy through Multiple Lenses" briefly profiles the current research landscape. The methodology and theoretical framework are introduced in "Normative SDGs in the Multilevel Digital Economy of Thailand." "Assessing the Thai Digital Economy from a Sustainability Perspective" forms the main body of the article. The final two sections present strategic recommendations and the conclusion.

## **The Thai Digital Economy through Multiple Lenses**

In terms of research, views on the Thai digital economy may be categorized into two levels and two schools: the domestic and international levels, and the schools of realism and neoliberalism.

First, some realists have paid attention to digital industries such as e-commerce, digital payments, online education, and digital tourism in Thailand and believe that the digital economy has become a key force in Thailand's resistance to Covid-19 shocks (Ma'rifat and Sesar 2020; Mi 2020; Song 2020; Li *et al.* 2022). In the case of Uber's suspension, Suebwong Kalawong and Nuntnidhi Bongsebodhidhamma (2017) argued that Thailand's patronage and rent-seeking activities might negatively impact the digital

economy's development. However, realists prefer to consider the nexus between the digital economy and social impacts as a sort of simple unidirectional relationship. Furthermore, though it is still a domestic-level discussion, a growing body of literature has shed light on the social impacts of the Thai digital economy's development. These impacts include the ways in which small and medium-sized enterprises have adapted to digital transformation trends, the development of a cashless society, information leakage, and whether the digital skills of Thai youth match the labor market (Bukht and Heeks 2018; Calderwood and Popova 2019; Suepphong *et al.* 2021). The realists' studies concluded that traditional socioeconomic relations could sometimes impede the improvement of the digital economy, because the latest trending technology inevitably exposes marginalized groups that cannot adapt to tech trends to wage cuts or unemployment. When digital technology disrupts the traditional business model, some social groups inevitably suffer economically. However, Thailand's digitalization is not only a domestic problem but is also relevant to sustainable development in the context of complex international relations. Various bilateral and multilateral mechanisms also influence its development positively or negatively.

Second, some neoliberalists investigated the state of the digital economy in the Lancang-Mekong region and ASEAN through the lens of institutionalism. They emphasized the roles of Thai digital legislation, 5G application, and official digital policy (Liu 2021; Rhee *et al.* 2022). Some of them examined the expansion of the digital economy in the region from a macro perspective, focusing on the promotion of economic progress through regional organizations such as ASEAN and policy coordination among member countries. Meanwhile, potential challenges such as the digital divide, insufficient cross-border logistics and payment systems, and technical competition among major powers are viewed as the primary impediments to Southeast Asia's digital cooperation (Xu and Wu 2020; Niu *et al.* 2022). Comparing the digital-economic policies of Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam, Joey Erh (2021) argues that the policies of the six major ASEAN digital economies lack regional coordination and suggests that ASEAN could take a leadership role by entering into cooperative agreements with specific countries. Kim Heejin (2019) examined the e-signature laws in Singapore, Thailand, Malaysia, and Vietnam and concluded that ASEAN had been essential in regionalizing international standards. Overall, neoliberal studies recognize the role of institutionalization as key to promoting state actors' digital economies in Southeast Asia. However, in the sense of people-oriented sustainable development, the positive effects of international institutions on state actors depend to a large extent on a benign environment of international cooperation. In other words, a lot depends on the degree to which state actors and local society can internalize the

norms and values of international mechanisms. Meanwhile, the degree of internalization depends on the normative socialization at the local, state, and international levels as well as the impacts of great-power rivalries.

In a nutshell, research on the subject needs a more dynamic and comprehensive analytical perspective. In order to elucidate the research questions beyond the material-centric and institutional-centric philosophies, this article will adopt a constructivist approach incorporating the concept of sustainable development to carry out an in-depth analysis.

### **Normative SDGs in the Multilevel Digital Economy of Thailand**

This research employs a qualitative methodology supplemented by documentary analysis and interviews to develop a theoretical framework for analysis.

First, per constructivist consensus, the internalization of norms by state actors is jointly influenced by the process of mutual socialization between the state actors themselves and others (Finnemore and Sikkink 1998; Keck and Sikkink 1998; Wendt 1998; 1999). Second, Amitav Acharya (2004) criticizes the “old” constructivist theories as being based primarily on Western empirical thinking in order to reinterpret the theories or emphasize existing influencing factors rather than rethinking or constructing theoretical development frameworks based on non-Western cases. The old theories ignore the mutual socialization processes of localization among domestic societies, state actors, and the regional and international aspects of development issues. Acharya suggests that “localization” or “domestic society” is another element that affects state actors based on the “national-international” or “self-other” binary structure.

Therefore, from the interdisciplinary lens of international relations and International Development Studies, this paper adopts Acharya's constructivist theory of normative localization to investigate the dynamic of development issues in a non-Western developing country. More specifically, this paper examines the developing sustainability of Thailand's digital economy at three levels—social (domestic/local), national (state), and international—and explores their dynamic and inter-constructive nexus. However, unlike Acharya's purely normative approach to international relations, this study introduces a consensus, idea, and developing norm broadly accepted worldwide—the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda for Sustainable Development—as an evaluative and normative criterion to conduct the analysis. SDGs are comprised of 17 goals. They respectively are Goal 1 No Poverty, Goal 2 Zero Hunger, Goal 3 Good Health and Well-Being, Goal 4 Quality Education, Goal 5 Gender

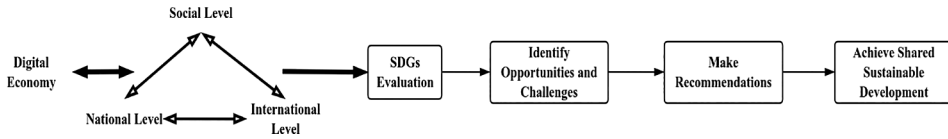


**Fig. 1** Sustainable Development Goals (SDGs), United Nations Department of Economic and Social Affairs

Source: United Nations (n.d.)

Equality, Goal 6 Clean Water and Sanitation, Goal 7 Affordable and Clean Energy, Goal 8 Decent Work and Economic Growth, Goal 9 Industry, Innovation, and Infrastructure, Goal 10 Reduced Inequalities, Goal 11 Sustainable Cities and Communities, Goal 12 Responsible Consumption and Production, Goal 13 Climate Action, Goal 14 Life Below Water, Goal 15 Life On Land, Goal 16 Peace, Justice, and Strong Institutions, Goal 17 Partnerships for the Goals (Please see in the Fig. 1). International Development Studies believe that these goals are inter-constructed in achieving sustainable development. Constructivism emphasizes norm diffusion and internalization, and because SDGs are a universal agenda and norm for global sustainable development, internalizing them will ultimately lead to the implementation of socioeconomic development processes. This study therefore examines digitalization in Thailand using this globally recognized development norm as an evaluative criterion.

In terms of methodology, qualitative documentary analysis is the primary method used throughout this paper. The primary documentary data were obtained from policy documents and reports from Thai official agencies, such as the Ministry of Digital Economy and Society; Ministry of Industry; and Ministry of Higher Education, Science, Research, and Innovation. Pertinent evaluation reports from the United Nations Department of Economic and Social Affairs and the World Bank also provided crucial supporting data and information. Furthermore, to better understand the internalization of SDGs in the development of Thailand's digital economy along with the attitudes of participants in Thai digitalization, other important data from the media news and interviews were collected. The authors also held in-depth discussions with students from three Thai universities (Chulalongkorn University, Thammasat University, and Khon Kaen University) to better understand how the young generation perceive Thai digi-



**Fig. 2** Constructive-Sustainable Development Theoretical Framework

Source: By the authors

talization. Based on the methodology, a “Constructive-Sustainable Development Theoretical Framework” (Fig. 2) was devised to answer the research questions and formulate practical recommendations for a sustainable digital economy.

This multidimensional study anchors the relevant SDGs on three levels—social, national, and international—as the normative criteria that need to be achieved or internalized for the sustainable development of the Thai digital economy. Given the complexities of digital technology expansion for state actors, the study identifies the impacts on the three levels based on the SDG criteria. From the aforementioned systematic analysis, the study ultimately provides targeted recommendations for the sustainable growth of the Thai digital economy.

## Assessing the Thai Digital Economy from a Sustainability Perspective

### *Thai Digital Economy Development Status*

Compared to other ASEAN developing countries, Thailand has an advanced digital infrastructure, which is essential for satisfying consumer demand and accelerating industrial digitalization. Krung Thep Maha Nakhon (Bangkok) has been more eager than ever to use digital technology to foster economic resilience since the start of the Covid-19 pandemic. Following are the features of Thailand's digital infrastructure.

First, the 5G digital infrastructure is the overarching focus for driving the economy and society toward the Thailand 4.0 era. The government is actively supporting the 5G network infrastructure and related technologies in order to revive socioeconomic development, which was negatively impacted by the pandemic. Thailand's three largest mobile operators (AIS, True, and dtac) and two state-owned telecom companies successfully bid for 5G spectrum at an auction held by the Office of the National Broadcasting and Telecommunications Commission in February 2020 for a total of 100 billion baht (Komsan *et al.* 2020). Then the three major mobile network operators accelerated the deployment of 5G infrastructure and services. Thailand has deployed 20,000 5G base stations, with 4.3 million 5G users (2.5 times the total number of 5G users in other



ASEAN countries) (Komsan 2021). The Global System for Mobile Communications Association reports that in the third quarter of 2021, Bangkok was among the top 20 capitals in the world for 5G download speed (McKetta 2021). Thailand's fixed broadband download speed in June 2023 was 206.60 Mbps, ranking sixth in the Speedtest Global Index (Speedtest 2023).

Second, thanks to official policies, the adaptation of market profiles, and consumer demand, ubiquitous digital technology widely reshaped Thai consumption patterns during the Covid-19 lockdowns. For instance, there was a boost in e-commerce activity, with a 7 percent increase in new online consumer users in 2021 (Bain & Company 2021, 16). Zero-contact, high-efficiency, and low-cost digital payments, particularly e-wallets, are rapidly emerging as a reliable form of payment. Furthermore, following the pandemic-driven lockdowns, social media and restaurant takeout/delivery have been incorporated into daily lives. Besides its traditional uses for networking and entertainment, social media serves as a significant online shopping channel. And due to the potential risk of viral transmission when dining in during the pandemic, restaurants adapted to provide delivery services via digital platforms. During the pandemic lockdowns, food delivery orders surged on Grab Food, Line Man, Foodpanda, and Uber Eats. Unsurprisingly, food delivery has become the digital service with the highest penetration rate, with 71 percent of Internet users having ordered food online at least once in their lives (Bain & Company 2021, 52). Gradually, products that were available via delivery services expanded beyond the food and beverage industry to include cosmetics, daily necessities, and pharmaceuticals.

Third, Thailand's adoption of digital technology is closely related to the surging demand for pandemic prevention and healthcare. The Covid-19 pandemic accelerated the healthcare sector's digital transformation. Thai medical institutions' innovative 5G medical solutions are committed to improving patient care effectiveness and lowering the risk of infection. High-tech medical devices enable doctors to communicate and keep track of patient health through contactless interactions. AIS, Thailand's leading 5G network provider, invested 100 million baht to create 5G care robots and provide them to 22 hospitals (Kanokchan 2022). Digital robots can disinfect, deliver medications, serve meals, take patient temperatures, and check vital signs. It is worth mentioning that Thai laws and regulations governing digital healthcare are constantly being improved. The Thai Medical Council, Pharmacy Council, and Ministry of Public Health have released "Telemedicine Guidelines," "Telepharmacy Guidelines," and "Standards of Telemedicine Service Provided by Medical Facilities" respectively (Peerapan *et al.* 2022). Thus, digital technology has helped Thailand to achieve SDG 3: ensuring healthy lives and promoting well-being for people of all ages.

Digitalization may provide support in overcoming uncertainties and promoting a strong and durable economic recovery in the post-pandemic era. However, opportunities and challenges coexist, inextricably linked, and interact on the social, national, and international levels. Hence, this study will unpack in more detail the compound effect brought about by the digitalization process and how it relates to Thailand's accomplishment of the SDGs.

### *Analysis at the Social Level*

Regarding opportunities at the social level, active digital consumers, a supportive business ecosystem, attractive market size, and high Internet penetration rates form a solid foundation for the sustainable growth of the Thai digital economy.

Thailand is ranked 30th globally and third in Southeast Asia in the World Digital Competitiveness Ranking 2023, released by the International Management Institute in Lausanne, Switzerland (The 2023 IMD World Competitiveness Ranking). Thailand's Internet economy jumped to \$30 billion in 2021 (Bain & Company 2021, 8). The country's total population is about 69.88 million, of which active digital consumers aged 15–64 account for about 70.2 percent (United Nations Population Fund 2022). A stable digital consumer population means the country can maintain an attractive digital market size. Thailand is also one of the ASEAN nations with a relatively high Internet penetration rate and the most active Internet users. There are about 48.59 million users, and each spends more than eight hours online daily (Kemp 2021).

Thailand's telecom industry database indicates a 184.97 percent mobile penetration rate in 2022 (Thailand Telecom Industry 2023b). The country's digital payments industry has also snowballed, driven primarily by e-commerce and mobile broadband penetration. As a case study of the inclusive development of the Thai digital economy, in addition to PromptPay from the Central Bank of Thailand, commercial banking giants such as Kasikornbank, Siam Commercial Bank, Bank of Ayudhya, and Bangkok Bank have launched digital banking services. Digital payment platforms such as TrueMoney, Rabbit Line Pay, and Alipay are also active in the Thai consumer market. Data from relevant authorities show that digital payments doubled from 2019 to 2021 (Satawasin *et al.* 2021). The growth has led to a bright outlook for Thailand's digital economy, with the 5G technology ecosystem expected to create 130,000 jobs by 2030 (Phakdeetham 2021a). Digital technology “will boost the GDP of Thailand by 10% or approximately 2.3 trillion baht by 2035” (Phakdeetham 2021b). These figures show the future opportunities for prosperity and economic recovery from the shock of Covid-19. A vibrant and inclusive market and business ecosystem can act as the driving force behind Thailand's digital economy.

Applying SDGs as normative assessment standards, fully utilizing the opportunities presented by the digital wave will contribute to Thailand's social-economic development, thereby benefiting SDG 8: promoting a sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

However, unemployment or income disparities that may result from digital penetration have also inevitably hampered Thailand's accomplishment of the SDGs. The digital economy relies more on technology and information resources than traditional industries, which depend primarily on labor and material resources. The use of digital technology can increase the effectiveness, intelligence, and automation of production processes, resulting in significant improvement in production effectiveness and quality while lowering costs. Meanwhile, some traditional industry employees will inevitably face wage cuts or structural unemployment as a result of disruptive digital penetration. In addition, the gap between the rich and the poor has relentlessly widened because low-income groups are not resilient enough to handle technological evolution. In other words, digital penetration is not conducive to achieving SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities).

Acting as a catalyst, the Covid-19 pandemic has accelerated Thai digital transformation across industries, a technology trend that may continue in the long term to stimulate economic efficiency. However, the disruption effects of new technology and the digital divide have also exacerbated income inequality and social tensions. There may be an amplified sense of deprivation among low-income groups as a result of platform expansion and the widening income gap between online and offline practitioners in some established industries. Traditional motorcycle drivers, for instance, wear numbered orange undershirts to identify themselves and have attracted customers in the business area under sheltered social relations for a long time. However, with the proliferation and popularity of online taxi platforms in Thailand, the number of traditional motorcycle drivers has decreased by 20 percent—due mainly to competition from Grab—and they complain that their livelihoods are threatened by “illegal entrants” on online platforms (Thodsapol 2019). Moreover, tensions and conflicts of interest between registered riders on online platforms and traditional motorcycle drivers have emerged. Thai motorcycle drivers complained in interviews that online taxi platforms were stealing jobs that used to be theirs, and this had reduced their income. They decided to use demonstrations and protests to voice their concerns because they felt strongly deprived. Their actions did have some results—for example, the Thai Ministry of Transport announced an extension of sixty days for Grab/GrabBike rider registration (the previously stated deadline was July 15, 2022); after the publication of the notice, groups of motorcycle and taxi drivers under the Thai Motorcycle Association gathered in front of the

Thai Ministry of Transport, burning orange safety vests and blue taxi driver uniforms in protest. They claimed that the latest notice from the Thai Ministry of Transport seriously harmed their interests and requested that the policy be withdrawn.

Overall, the winner-takes-all effect of the digital economy model, combined with the unemployment crisis during the pandemic, exacerbated income differentiation and inequality among social groups. Against the backdrop of the multiple opportunities and disruptive challenges presented by digital technology, it is particularly important for the Thai government to respond to the interests of different social groups and to bridge social concerns. These challenges also imply that certain social groups might be wary of digitalization trends because their interests are somewhat jeopardized. The proliferation of digital technology has harmed the interests of social groups who cannot adapt to new trends, and the digital divide and uneven resource distribution could thus lead to or intensify Thailand's income gap at the social level. The authors argue that intensified new technologies may marginalize certain groups of people, thereby slowing down the implementation of the SDGs.

#### *Analysis at the National Level*

State actors play an active role in the process of norm internalization. Acharya (2004) argues that local actors' active reconstruction of foreign norms ultimately aligns foreign norms with local norms and practices. Regarding opportunities at the national level, the Thai government has set in place solid policy support to build "Digital Thailand" and has continued to strengthen its institutionalization framework. The official rhetoric prioritizes digital technology in order to capitalize on opportunities created by the fourth industrial revolution and transform the export-dependent economic model in order to overcome the inequality and middle-income traps. Therefore, it is accelerating the pace of policy adjustment to make Thailand one of ASEAN's digital hubs by reorganizing administrative agencies, enacting laws and regulations, and promoting Thailand 4.0, which aims to create "Digital Thailand" and ultimately achieve national economic and social stability, prosperity, and sustainable development.

The most notable example of policy adjustment is the reorganization and renaming of Thailand's former Ministry of Information and Communication Technology into the Ministry of Digital Economy and Society in September 2016. In addition, new agencies were established, such as the Digital Economy Promotion Agency and the National 5G Committee. The policy alliances formed on digital economy development issues indicate the determination of Thai government departments. Thailand has also introduced laws and regulations regarding digital matters (Wendy 2016). It has enacted the Economic and Social Digital Development Act (B.E.2560), Personal Data Protection Act (B.E.2562),

Electronic Transactions Act, Thailand Computer Crime Act, Payment System Act, Thailand Network Security Law, and other regulations related to digital technology and the digital economy. In short, by issuing policy initiatives, restructuring institutions, and improving laws and regulations, government agencies are further signaling that the digital economy is beneficial to the country.

Using the SDGs as normative evaluation criteria, the digital economy assists the Thai government in adjusting its institutional settings to be more effective in creating an efficient, accountable, and inclusive public service sector. The government also strengthens the laws and rules regarding digital governance and creates a more regulated digital ecosystem, both of which will contribute to Thailand's achievement of SDG 16: this SDG calls for promoting peaceful and inclusive societies for sustainable development; providing access to justice for all; and building effective, accountable, and inclusive institutions at all levels. Alongside the above opportunities, the author noted the following roadblocks affecting Thailand's SDGs at the national level.

First, Thailand's digital divide will be difficult to bridge in a short period. The Organisation for Economic Co-operation and Development (OECD) defines the digital divide as the gap between individuals, households, businesses, and geographical areas at different socioeconomic levels regarding access to information and communications technology (ICT) and the use of the Internet in various activities. The unbalanced economy and infrastructure among various regions and groups is the primary cause of the digital divide. In the context of inequality in economic and communication technology infrastructure development in Thailand's rural-urban dichotomy, the development divide in the digital domain is most visibly manifested in the disparity in digital infrastructure availability between different regions of the country. There is a divide in the use of digital technologies between Bangkok and the less developed countryside. Households in underdeveloped rural regions lack adequate and affordable high-speed Internet. According to the Thailand Telecom Industry database, Thailand's broadband penetration rate per capita was 19.36 percent in 2022. Bangkok has a higher percentage of computer-owning households (42 percent) than other provinces (21 percent in Central Thailand, 19 percent in the North, 17 percent in the South, and only 14 percent in the Isan Northeast) (Saowaruj 2020; Thailand Telecom Industry 2023a).

The raging Covid-19 pandemic further amplified the impact of digital divide barriers. Because of a lack of smartphones or bank accounts, socially marginalized and vulnerable groups severely impacted by the pandemic were unable to get government assistance. Some people were even deceived when asking for help because they lacked the necessary digital knowledge (Paritta 2020). For instance, a UNESCO (Thailand) staff member stated that "the digital divide was also reflected in the unequal opportunities for Thai

students to participate in online courses. Schools in the northern and northeastern mountain areas have lower Internet connectivity than the national average.” In addition, technical obstacles such as power outages, lack of electronic devices, and unstable Internet signal seriously hinder students’ efficiency in online learning in rural areas. According to a study by Thailand’s Education Equity Fund, 271,888 of the country’s 1.9 million students who are from low-income or impoverished families do not have access to computers or the Internet (Porpor 2021). The above analysis shows that the digital divide in Thailand poses a severe challenge to achieving SDG 1 (No Poverty), SDG 4 (Quality Education), and SDG 10 (Reduced Inequalities).

Second, from the standpoint of digital talent cultivation, Thailand suffers from a shortage of digital human capital and a mismatch between labor force skills and market demand. There is projected to be a shortage of 47 million technology professionals in Asia-Pacific by 2030, due to the digital transformation of the business and technology landscape brought on by the fourth industrial revolution (Huawei 2022). In Thailand, booming e-commerce, digital finance, and start-ups have increased demand for workers with skills in artificial intelligence and machine learning, data analysis, and strategic planning. The mismatch between the supply and demand of digital talent may become a stumbling block to the country’s industrial transformation and digitalization. International data on digital technology and skills use show that Thai youths and adults have less advanced digital skills than the average of OECD countries (Vandeweyer *et al.* 2020, 9). Only 54.9 percent of Thai workers, according to the World Economic Forum, possess the necessary digital skills (World Economic Forum 2020). Education is a structural factor in the nurturing of digital talent. The challenge for the Thai labor market is that graduates from higher education institutions often lack the skills that employers are looking for. There is a mismatch between the competencies required by employers and graduates, according to an empirical study of the competency gap among Thai IT students (Veeraporn *et al.* 2017). The minister of science and technology urged Thai universities to keep up with technological trends and advance students’ technical and digital skills, because 70 percent of university students in Thailand major in social sciences (Chanita 2016, 9). The country needs to urgently address the issue of how to match the talents produced by the education system with the labor market demands.

Finally, Thailand faces thorny cybersecurity challenges. There are numerous cybersecurity risks in the digital age, along with massive data generation, storage, and sharing in the cloud. Phishing, malware, extortion, identity theft, data leakage, and other cybercrimes have unpredictable negative impacts on the information and property security of individuals, companies, and sovereign countries. Most student interviewees said they had antivirus software installed on their computers. It appears clear that the

proliferation of network security risks is an unavoidable obstacle for the Thai digital economy. For example, over 120,000 bank customers' personal or business information was compromised in July 2018 when the Kasikornbank and Krungthai Bank computer systems were attacked. Despite no monetary losses, the potential damage was severe (Orathai *et al.* 2018). Furthermore, in August 2021 a British cybersecurity researcher discovered that the personal information of 106 million Thai tourists had been freely accessible since 2011, with a 200GB database containing the full name, gender, passport number, and other personal information of each tourist (Coble 2021). Within 24 hours, the Thai government took protective action against the database breach.

Thailand's cybersecurity sector needs to improve the relevant hardware configuration. According to the World Bank, the number of secure Internet servers (servers that use encryption technology in Internet matters) per million people in Thailand in 2020 was 1,863, while Singapore's secure Internet servers were about 68 times that number (World Bank 2020). The aforementioned cases demonstrate that cybersecurity threats pose a serious obstacle to SDG 11, which aims to make cities and communities inclusive, safe, resilient, and sustainable. Since cyber threats are typically nontraditional security concerns with transnational and covert characteristics, Thailand needs to establish international cybersecurity governance partnerships in order to build harmonious digital ecosystems.

### *Analysis at the International Level*

In terms of opportunities at the international level, localization of international norms can enhance the status and prestige of actors (Wolters 2018). Thailand thus actively creates networks for digital-economic cooperation through bilateral and multilateral channels. The analysis begins with bilateral collaboration and then goes on to multilateral collaboration and collaboration with global organizations.

PromptPay, an essential pillar of Thailand's national electronic payments plan, is actively developing its cross-border payments business. The first cross-border real-time payment link was established between Thailand's PromptPay and Singapore's PayNow electronic payment platform in April 2021. This partnership increased the effectiveness of cross-border payments between Thailand and Singapore (Monetary Authority of Singapore 2021).

With regard to multilateral cooperation, Thailand actively participates in the Lancang-Mekong Cooperation (LMC) and ASEAN digital economy cooperation. The LMC countries have deepened their collaboration through forums and seminars. For example, the 2020 Lancang-Mekong Combating Cybercrime Forum was held in Kunming City, Yunnan Province, China. The meeting reached a consensus on gradually establishing a

cooperative mechanism for multilateral crackdown and comprehensive governance along the Lancang-Mekong basin, enhancing cyberspace governance and regulatory capacity, strengthening information sharing among countries by taking advantage of multilateral platforms, and providing training opportunities for cyber technology enforcement capabilities (Ren Min Zi Xun 2021). In addition, ASEAN regards the digital economy as providing an impetus for high-quality development. The Masterplan on ASEAN Connectivity 2025, AEC Blueprint 2025, and e-ASEAN Framework Agreement aim to build ASEAN communities into leading, safe, and transformative digital service-, technology-, and ecosystem-driven digital communities (Association of Southeast Asian Nations 2021). The Thai government recognizes the positive impact of ASEAN-wide digital cooperation on sustainable economic growth. At the third ASEAN Digital Ministers Meeting, Chaiwut Thanakhanamusorn, Thailand's former minister of digital economy and society, suggested that an ASEAN committee be formed to concentrate on combating telecom fraud (*Bangkok Post* February 9, 2023).

Thailand has significant collaborations with global organizations. When it comes to working with international organizations—such as the United Nations and OECD—they attach importance to developing the digital economy and encourage coalition members to strengthen multilateral cooperation in ICT, cybersecurity governance, and other areas. Thailand actively participates in international dialogues on digital economic policy. For instance, its “Decade of Action, Decade of Innovation” campaign was launched on June 8, 2021 by the Digital Economy Promotion Agency (depa) in collaboration with the United Nations Office in Thailand to encourage the use of technology and creative solutions to achieve the Sustainable Development Goals essential to future development (Bovornpong 2021). Using the SDGs as a reference, digital economic cooperation through multiple international channels will facilitate Thailand's attainment of SDG 17: strengthening the means of implementation and revitalizing the Global Partnership for Sustainable Development.

However, the obvious externalities that characterize the digital economy make it susceptible to the multiple power dynamics of world politics. International competition is focused primarily on digital technology, and Thailand's long-term digital economic development is susceptible to the international commercial environment. First, the largest digital businesses are run by high-tech firms that control the most cutting-edge digital technologies. Over-reliance on large tech firms' technology and data resources may exacerbate Thailand's digital vulnerability, threatening data sovereignty and security. Second, digital technology advantages and digital trade rule-setting are the main focus of competition among great digital powers. Some nations make an effort to prevent international cooperation in advanced digital technology.



As tension and competition intensified, Thailand ran the risk of “picking sides” when it imported specific digital technologies and products. For example, according to Reuters, the US launched a 5G technology test bed even as it placed Huawei on a controlled list and urged its allies to bar Huawei’s 5G technology. Thailand was faced with an international relations challenge when it chose to enter into a digital technology partnership with Huawei (Patpicha 2019). As an influential regional economy, Thailand will find it worthwhile to coordinate its policies with other ASEAN countries. In a nutshell, trends in digital economy at the international level present both opportunities and challenges for Thailand, which could undermine the implementation of SDG 17 (Partnerships for the Goals).

### *Summary and Discussion*

Following is a summary of the above section, before coming to the strategic recommendations. The above analysis largely confirms that the digital economy presents interrelated opportunities and challenges for Thailand to achieve the normative SDGs at the social, national, and international levels. In this sense, the opportunities and challenges are intertwined with one another rather than existing independently. First, the opportunities presented by the digitalization wave are mutually reinforcing. A supportive business ecosystem, an attractive market size, and supportive official policies, for example, are all positive factors that will assist Thailand in relieving the unemployment crisis and recovering the economy (SDG 8) in the post-pandemic era. The groundwork will also be laid for a global network of digital partnerships through bilateral and multilateral cooperation channels (SDG 17).

The challenges to the SDGs are also mutually interconnected and have overlapping effects. For instance, the digital divide interacts with the widening wealth gap in society (SDG 1, SDG 10), implying that unequal distribution of socioeconomic resources, such as income, is also reflected in digital technology accessibility. Moreover, inequalities caused by the wealth gap not only undermine the effectiveness of official policy implementation (SDG 16) but also contribute to problems such as human resource deficiency (SDG 8), educational inequality (SDG 4), and the ongoing deterioration of cybersecurity (SDG 11).

Finally, Table 1 demonstrates that SDG 1 and SDG 10 have the highest frequency of occurrence (both twice) among the challenges posed by the digital economy wave for achieving the SDGs. It is worth noting that the main missions for Thailand in the future will be poverty reduction and bridging the development gap. All of the foreseeable spillover effects of challenges generated from digitalization will affect the economic dynamics. Based on the above analysis, Thailand needs to be aware of the dynamic,

**Table 1** Assessing Thailand's Digital Economy by SDGs

Level	Opportunities	SDGs	Challenges	SDGs
Social	Digital consumers and market size, good business environment, high Internet penetration rate	SDG 8: Decent Work and Economic Growth	Slowing economic recovery, poor performance of the service sector, widening gap between rich and poor	SDG 1: No Poverty SDG 8: Decent Work and Economic Growth SDG 10: Reduced Inequalities
National	Restructuring of administrative agencies, enacting laws and regulations	SDG 16: Peace, Justice, and Strong Institutions	Digital divide, talent scarcity, cybersecurity	SDG 1: No Poverty SDG 4: Quality Education SDG 10: Reduced Inequalities SDG 11: Sustainable Cities and Communities
International	Bilateral and multilateral cooperation channels	SDG 17: Partnerships for the Goals	Digital technology monopoly, digital competition among major powers, ASEAN countries	SDG 17: Partnerships for the Goals

Note: This table is based on the analysis in Section 4: Assessing the Thai Digital Economy from a Sustainability Perspective.

mutually influential nexus among the opportunities and challenges at different levels and that the realization of SDGs at each level will not be independent but interconnected. This means that the process of promoting or internalizing normative SDGs at one level should also take into account the facilitation and improvement effects at other levels. Ultimately, a comprehensive practice will lead to a sustainable Thai digital economy model and meet the four objectives of Thailand 4.0: economic prosperity, social well-being, raising human values, and environmental protection.

## Strategic Recommendations for Thai Digital Economy's Sustainable Growth

The technological revolution is gaining momentum, and global socioeconomic prosperity is irresistibly shifting toward digitalization. As previously discussed, the Thai digital economy has the potential for remarkable accomplishments but is also confronted with tricky challenges. Taking advantage of emerging technological trends will be beneficial for Thailand, where the digital industry is in its early stages, with regard to putting into practice the UN-promoted norms for sustainable development. Therefore, the following recommendations are proposed based on the above analysis.

First of all, promoting equal distribution of socioeconomic resources and digital

inclusion needs to be Thailand's primary policy priority. The interregional and intergenerational digital divides in Thailand have negatively impacted household income and children's education among marginalized social groups. For example, students in underdeveloped areas could not participate in online classes during the pandemic because they lacked electronic devices and Internet access. The implementation of SDG 1 (No Poverty) and SDG 10 (Reduced Inequalities) means urgently bridging the digital divide. Therefore, the research suggests that actions and cooperation for bridging the digital divide should be centered on poverty eradication or reduction. Greater investment in digital infrastructure is necessary to close the digital divide, with the first step being to increase telecommunications infrastructure investment in rural areas, particularly in the country's mountainous north and Isan. Digital infrastructure can be built by national initiatives, private enterprises, or international cooperation, such as through the LMC "3 + 5 + X" framework, to strengthen poverty reduction cooperation in the subregion.

Second, the public service sector of Thailand should provide more technical support and humanistic care for the elderly, disabled, and residents in rural areas who are vulnerable due to the "digital literacy deficit." Technical assistance can be provided to these groups through volunteer services and regular training, to help them more easily adapt to changes in the digital world and enjoy modern conveniences. Developing specialized software programs/apps to improve the digital service usage of the country's digitally underprivileged citizens is also possible.

Third, digital talent cultivation via SDG 4 (Quality Education) is an essential strategy for tackling Thailand's tricky issues of poverty, inequality, and employment dilemmas. Thai authorities need to accelerate digital talent training to fill the talent gap. Talent cultivation is vital for alleviating employment pressure and promoting economic recovery in order to achieve SDG 1 (No Poverty), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities). It is also an essential booster for "Digital Thailand." To begin with, there is strong demand for highly qualified personnel with digital skills in the labor market as a result of the digital transformation of Thai industries. However, unless the government and educational institutions adapt training and education programs to suit market conditions, graduates may find it difficult to gain employment. Therefore, it will be good if Thai universities, research institutions, and digital enterprises carry out various forms of digital talent cultivation cooperation projects based on the strengths of each stakeholder and promote effective interaction between talent, industry, and the public service sector. Market demand-oriented talent cultivation can ensure that labor market needs are continuously met. Moreover, cooperation can be enhanced through bilateral or multilateral diplomatic frameworks such as the ASEAN

Regional Cooperation Program on Technical and Vocational Education and Training or Lancang-Mekong Vocational Education Cooperation. In short, it would be beneficial to implement multiple channels of cooperation to address workforce issues that are impeding the sustainable growth of the digital economy.

Fourth, Thailand's cybersecurity sector should be more active in building partnership networks and promoting transnational governance in cyberspace. Fighting cybercrime is becoming increasingly difficult in the globalized world due to radical technological advancements and the ongoing updating of cybercriminals' attack tactics. Building partnership networks with regional and global stakeholders is essential to establish cybersecurity, because cybercrimes are transnational and covert. With regard to bilateral cooperation, Thailand can promote trust and consensus with ASEAN members, China, Japan, and other countries on the basis of respecting "digital sovereignty" in the areas of privacy protection, data security, digital taxation, information sharing, and extradition of criminals, so as to establish a robust transnational cybersecurity ecosystem. In addition, the existing multilateral cooperation framework should be fully utilized. For example, multilateral collaboration can be implemented to combat online gambling, online fraud, and other crimes under the ASEAN Network Security Cooperation Strategy (2021–25) and the Lancang-Mekong Law Enforcement Security Cooperation Mechanism. Building bilateral and multilateral partnerships, as mentioned above, can result in a healthy cyberspace community, which will contribute to achieving the blueprint outlined in SDG 17 (Partnerships for the Goals) and SDG 11 (Sustainable Cities and Communities).

Lastly, Thailand can promote third-party market cooperation and share the fruits of reciprocal prosperity with its economic partners. The digital economy represents the emerging direction of global economic flowering, and digital technology competition has increased among major powers. Thailand is vulnerable to potential geopolitical risks when choosing digital technology providers and engaging in cooperation, due to the politicization of technology and competition among major powers. Third-party market cooperation is a viable strategy for achieving sustainable development in order to reduce the risk of technology politicization. For instance, in recent years there has been a trend of cooperation between China and Japan in the Greater Mekong Subregion, and Thailand has taken the initiative to coordinate and participate in collaborative projects with China and Japan (Zhao 2020). Through trilateral cooperation, Thailand, Japan, and China can combine their comparative advantages and dispel unwarranted skepticism while avoiding interest rivalry. The three have jointly outlined their initial vision of economic cooperation. In April 2019, the Japan External Trade Organization and the China Council for the Promotion of International Trade held a seminar on business

cooperation in third-party markets between China and Japan under the sponsorship of the Eastern Economic Corridor Office in Thailand. Representatives of enterprises from the three nations held a symposium focusing on critical cooperation areas, including transportation and logistics, energy and environment, and smart cities (JETRO 2019). Third-party market cooperation can effectively mitigate the negative impact of geopolitics and great-power games on SDG 17 and is therefore a rational choice for establishing high-quality economic partnerships.

## Conclusion

Based on constructivist theory, this research employs the UN's SDGs as standards for evaluation and offers an integrated picture of Thai digitalization. More specifically, it analyzes the symbiosis of opportunities and challenges encountered by the Thai digital economy at the social, national, and international levels. Our findings contribute to the existing scholarship by examining how enhancement of the digital economy is entwined with the achievement of SDGs in ASEAN developing countries, reflecting the potentially beneficial or detrimental impact of newly generated ICT on the Sustainable Development Goals of the Global South. On the social level, active digital consumers, a supportive business ecosystem, an attractive market size, and a high Internet penetration rate form the basis for the digital economy, but the "winner-takes-all" effect combined with an unemployment wave has exacerbated the inequality among social groups. At the national level, Thai governmental policy support and its ongoing institutionalization are opportunities for "Digital Thailand." Still, the digital divide, digital human capital shortages, and cybersecurity challenges are obstacles that need attention. At the international level, Thailand can create bilateral and multilateral channels for international cooperation to advance its digital competitiveness. In brief, the Thai government has played an active role in the country's digital transformation process. However, in order to support the SDGs, a set of global development norms set by the UN, it is still necessary to address the disruptive effects of digitalization. Last but not least, Thailand's opportunities and challenges in achieving a resilient digital economy are interrelated and overlapping at the three levels. The analysis further suggests that the main missions of Thai policy instruments in the future will be poverty reduction and bridging the digital divide. The authors hope the findings of this study will contribute to understanding the complex interplay of global digital reforms and SDGs.

## Acknowledgments

The authors would like to express their gratitude to the anonymous reviewers for their detailed, insightful, and valuable suggestions. We gratefully acknowledge the generous guidance from the authors' advisers, Prof. Dr. Li Yiping and Asst. Prof. Dr. Pongphisoot Busbarat. The authors would also like to express their sincere gratitude to the Center for Southeast Asian Studies, Xiamen University, and the MAIDS-GRID Program, Chulalongkorn University, as well as Prof. Dr. Zhang Xizhen and Ajarn Dr. Montheinee Teeramungcalanon from Thammasat University.

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