Digital economy in Southeast Asia: challenges, opportunities and future development

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Abstract

Purpose – The purpose of this paper is to (a) examine the current state of the digital economy in Southeast Asia (SEA), the challenges and opportunities derived from digital transformation and the digital economy, and the impact of the digital economy on SEA, especially human and physical capital development, and (b) propose policy recommendations for SEA countries to better manage digital transformation.

Design/methodology/approach – This is a conceptual paper. The theoretical framework has been built from the three-sector governance approach to identify the issues of the digital economy and propose solutions to address the issues. Specifically, it examines the role and activities of the public sector, the private sector and the third sector to address the challenges posed by the digital economy, especially human and physical capital development.

Findings – This paper revealed challenges and opportunities derived from the experience of Southeast Asian countries and proposed several policies recommendations, including a common data policy and payment platform for the Asian region, a good training and development policy to equip the workforce with digital skills, and digital mindset as well as build cybersecurity capability and capacity at the regional level.

Originality/value – This paper is significant as it examines the development of the digital economy from an interdisciplinary perspective – including economics, digitalisation, governance, management, public policy, technology and human resource development. It also provides better insights into how SEA’s digital economic development can be further improved to contribute to a sustainable regional economy.

Keywords Digital economy, Three-sector governance approach, Southeast Asia, ASEAN, Digitalisation, Digital transformation, Disruptive technology, Digital divide, Digital infrastructure, Human capital development

Paper type Research paper

Introduction

The eleven countries in Southeast Asia (SEA), namely Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Testimo Leslie, Thailand and Vietnam, have different political regimes and different levels of socio-cultural development. While these countries have different economic structures, development, growth rates and patterns, most of them put effort to embark on the digital transformation journey that is expected to contribute to the development of their economies.

The advancement and proliferation of the Internet and advanced technology, such as mobile technology, virtual reality, big data, artificial intelligence and the Internet of things (IoT) have connected consumers, suppliers, businesses, regulators, devices, data and processes across sectors and across countries. This changes the way we communicate with others, and the manner we produce, market and consume various offerings, including information, products, services and experiences. Digital economy – also known as Internet economy, new economy, web economy, IoT economy or economy (Bukht & Heeks, 2017) – refers to economic activities
that connect different groups of stakeholders in an economy via online transactions, communication, exchanges and connectivity. The Asian Development Bank (ADB) (2021) defines the digital economy as “the contribution of any economic transaction involving both digital products and digital industries to GDP” (p. 5). In addition, the digital economy can be considered in both broad and narrow views as depicted in Figure 1. For a digital economy to function well, the digital (IT/ICT) sector requires both hardware (e.g. manufacture information services, information system management), and software and IT consulting and telecommunications services. Also both social and technical aspects should be considered in the digital transformation process.

In recent years, the digital economy in SEA has received attention from various public and private organisations due to its potential and its profound impact on SEA countries’ economies, as well as in other countries, and their trading partners. Google and Temasek have been conducting a multi-year research project, titled e-Conomy SEA, in Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam since 2016 to track the state of the digital economy in the SEA region. Subsequently, Bain and Company joined Google and Temasek in 2019 as the lead research partner. The latest report was released around late 2022. In addition, the Monetary Authority of Singapore (2018) and the World Bank (2019) have both conducted similar studies to understand the potential and impact of digital transformation and the digital economy in the SEA region. Meta and Bain and Company (2022) also published a report on SEA’s digital consumers that provides insights for companies to understand changes in digital consumer behaviour. This report also shares the views of senior executives from well-known organisations regarding various areas of the digital economy, for example, uncertainties in the external environment, the growth of technology (e.g. metaverse, IoT, Industry 4.0), new forms of the economy (e.g. circular economy) and sustainability, as well as what businesses should do to adapt to the new economic order and develop their full potential in the digital age (Meta and Bain and Company, 2022).

![Figure 1. The scope of the digital economy](image_url)

**Source(s):** Adapted from Bukht and Hecks (2017) and Monetary Authority of Singapore (2018)
Besides the benefits offered by digital adoption, such as new business and job opportunities, potential economic growth, improvement of public services, addressing the shortage of manpower, increase in efficiency and productivity, etc., there are threats of job loss due to disruptive technology in many sectors, digital divide, privacy and security issues, and others. Although many researchers have examined the impacts of digital adoption in SEA, few studies have focused on the linkages between digital adoption and the digital economy in SEA as well as the role of various players, for example, the public sector, the private sector and civil society organisations, in the digital transformation process. Also, there is no one-size-fits-all and clear answer to the following questions: (1) Can the digital economy create miracles to economic development? (2) Can the digital economy facilitate job creation and boost economic growth in a sustainable manner? (3) What are the challenges and opportunities that are faced by SEA countries in the digital playfield? (4) What is the role of the digital economy in SEA countries’ economies?

Thus, this paper aims to fill the gaps by examining (1) the key features of the digital economy in SEA, (2) the opportunities and challenges presented by digital transformation and the digital economy, and (3) the impact of the digital economy on SEA, especially human and physical capital development. This paper will also make some policy recommendations, including the role of the various sectors/players, for SEA countries to better manage digital transformation.

This study is significant as it examines the digital development from an interdisciplinary perspective, including economics, digitilisation, governance, management, public policy, technology, privacy, security and human resource development. Positive and negative lessons from the experience of SEA countries will provide better insights into how SEA’s digital economy can be further improved to remain competitive and sustainable given the global political and economic uncertainties.

Research method and conceptual framework
This is a conceptual paper. The method of inquiry is to discuss the current state and key features of the digital economy in SEA countries, the challenges and opportunities posed by digital transformation to SEA countries.

It also examines the role and activities of the public sector (state, government), the private sector (businesses) and the third sector to address the challenges posed by digital transformation, especially human capital development. In this paper, the third sector refers to civil society organisations which include professional associations, independent research institutes, industry and consumer associations, non-profit organisations, community-based organisations and other non-profit organisations (Asian Development Bank, 2009).

The theoretical framework of this study has been developed from the arguments that a governance approach to develop human capital, technological capabilities and adopt digital transformation should comprise all three sectors which need to work closely with one another (refer to Figure 2). The public sector should play key roles regarding decision-making, legislation making, resource allocation, coordination activities of multi-stakeholders, law enforcement, developing infrastructure and engaging stakeholders. The private sector is a partner in human capital development, regulatory compliance, resource provision and various public-private initiatives. Thus, they should be involved in this process. Also, the third sector (civil society organisations) should contribute to this transformation by performing balance and check activities, supporting the public and the private sectors by educating the public, contributing to research initiatives, providing feedback to the public and private sectors, engaging the public, etc. (Lynn et al., 2022).

The key features of the digital economy in Southeast Asia
According to the Digital 2022 Global Overview Report: The Essential Guide to the World’s Connected Behaviours published by We are Social and Hootsuite (2022), among the 7.91
billion of the world population, 67.1% are mobile phone users, 62.5% are Internet users, and 58.4% are active social media users. In SEA, the Internet penetration rate is 75.6% with over 400 million Internet users in most SEA countries except Laos, Myanmar and Timor-Leste (von Kameke, 2023). As an emerging regional market, the digital economy in SEA is expanding, especially in the segments including e-commerce, transport and food, online media, online travel and e-financial services partly due to the pandemic (Google, Temasek and Bain, 2022; von Kameke, 2023). In fact, it is predicted that the digital economy in SEA is expected to exceed US $300 billion by 2025 or reach up to US $1 trillion in Gross Merchandise Volume (GMV) by 2030 (Google, Temasek and Bain, 2022). The biggest digital economy in SEA is Indonesia with a GMV of US $27 billion in 2018 and US $100 billion by 2050, followed by Singapore’s digital economy with a GMV of US $10 billion in 2018 (Tan, 2018).

The key indicators of the digital economy in selected SEA countries shown in Figure 3 include connectivity, payment, logistics, skills and policy and regulation. Specifically, Thailand has the highest index of mobile broadband and fixed broadband subscribers, while Malaysia has the highest percentage of online firms using digital payment. Surprisingly, Laos has the highest Human Capital Development Index global rank. In terms of policy and regulation, only four countries, namely Indonesia, Thailand, Malaysia and the Philippines have enacted data privacy law; whereas Singapore has introduced PDPA (Personal Data Protection Act 2012) since 2014 (Personal Data Protection Commission, 2018). Finally, most countries have enacted or drafted consumer protection regulations.

According to the International Monetary Fund (IMF) (2018), there is a correlation between the gross domestic product (GDP) per capita and the usage of digitilisation index (UDI) (2016), i.e. the higher the GDP per capita is, the higher the usage digitalisation index is (refer to Figure 4). Singapore has the highest UDI, followed by Malaysia, Thailand, the Philippines and Vietnam. Myanmar has the lowest UDI, whereas Indonesia, Cambodia and Laos are in between these two groups.

In terms of the ICT value-added volumes as a proportion of GDP, there is a significant difference among SEA countries, ranging from 0.7% to 5.4% (Monetary Authority of Singapore, 2018). Malaysia and Singapore have a high level of ICT development, followed by Indonesia and the Philippines. The ICT investment in ASEAN countries also reached more than US$100 billion in 2014, and this volume increases by about 15% every year (AT Kearney, 2020; Monetary Authority of Singapore, 2018).
Digital economy in Southeast Asia

Figure 3. Key digital economy indicators of selected SEA countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Connectivity</th>
<th>Payments</th>
<th>Logistics</th>
<th>Skills</th>
<th>Policy &amp; Regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mobile Broadband Subscribers (as % of population)</td>
<td>Mobile Internet Users (as % of total population)</td>
<td>Fixed Broadband Subscribers (as % of population)</td>
<td>Mobile Users (as % of adult population)</td>
<td>Mobile Data (as % of total data)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>100%</td>
<td>1.4%</td>
<td>3.1%</td>
<td>34%</td>
<td>49%</td>
</tr>
<tr>
<td>Vietnam</td>
<td>82%</td>
<td>1.4%</td>
<td>12%</td>
<td>22%</td>
<td>10%</td>
</tr>
<tr>
<td>Thailand</td>
<td>170%</td>
<td>1.2%</td>
<td>11%</td>
<td>62%</td>
<td>—</td>
</tr>
<tr>
<td>Malaysia</td>
<td>116%</td>
<td>0.9%</td>
<td>8%</td>
<td>76%</td>
<td>52%</td>
</tr>
<tr>
<td>Cambodia</td>
<td>67%</td>
<td>1.1%</td>
<td>1.5%</td>
<td>16%</td>
<td>—</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>51%</td>
<td>—</td>
<td>1%</td>
<td>12%</td>
<td>—</td>
</tr>
<tr>
<td>Philippines</td>
<td>40%</td>
<td>1.5%</td>
<td>3%</td>
<td>23%</td>
<td>—</td>
</tr>
</tbody>
</table>

Note(s): — = Not available
Source(s): A. T. Kearney (2015); Digital Adoption Index; Global Findex; GSMA (2018); ITU Measuring the information Society (2017); Telegeography (June 2018); UPU (2016); World Bank (2016); WEF (2017); World Bank, OECD, and Facebook (2018). Adapted from World Bank (2019, p. 18)

Figure 4. GDP per capita and usage of digitalisation (Index 0 to 10) (2016)

Source(s): International Monetary Fund (2018, p.16)
From Figure 5, the volumes of the e-commerce markets in SEA countries have increased from 2019 to 2022. It is estimated that the volume of the e-commerce markets in Indonesia, Vietnam and Thailand will reach US$95 billion and US$32 billion, respectively, in 2025.

Obviously, the digital economy in SEA countries has been growing at a fast pace and contributing a great deal to their economies. The next section will discuss the challenges and opportunities derived from the digital economy.

Opportunities and challenges derived from digital transformation

Opportunities presented by digital transformation

The development of the digital economy creates several benefits for individuals, companies and countries.

First, employment in the technology sector has been generally increased at the national level (OECD, 2014). At the corporate and individual levels, small and medium enterprises (SMEs) can expand their market shares across nations via digital platforms, and aspiring entrepreneurs can start a new business without a physical office. To illustrate, a villager in a small village “who has never ventured far beyond his or her hometown can now become a baker selling cookies all over Indonesia” (The Economist Intelligence Unit, 2019, p. 6). In a survey by the Economic Research Institute for ASEAN and East Asia (n.d.), 72% of the micro, small and medium enterprises (MSMEs) respondents agreed that they had a wider customer reach and better marketing by adopting digital technology.

Second, digital transformation has facilitated business recovery after the COVID-19 pandemic. Due to the disruption of the COVID-19 pandemic across the globe, the process of digitalisation has been accelerated in all sectors of the economy (Kochetkov, Zabavina, & Gafarov, 2021), played a critical role in crisis recovery (Banga & te Velde, 2020), and had great impacts on individuals, businesses and society (Schneider & Kokshagina, 2021). For instance, the call for remote working, virtual collaboration, virtual learning and social distancing restrictions have increased the demand for digital infrastructure and connectivity, ICT-enabled services, online learning, telemedicine and e-commerce platforms (Banga & te Velde, 2020). Similarly, the application of digital solutions has unlocked numerous benefits for MSMEs (Schulz, 2021).

![Figure 5. E-commerce market volume in some Southeast Asian countries (figures in 2019–2021 and forecasted figures in 2025)](image_url)

Source(s): Adapted from Google, Temasek, and Brain (2022)
Third, digital transformation can stimulate creativity and innovation. Those who have been involved in digital transformation projects would argue that “digital transformation is about people and not about technology” (Laker, 2021, p. 1). In fact, a more successful digital transformation project needs to balance the latest technologies, the right human capabilities, creativity, an innovative mindset and a sustainable business model, to name a few (Laker, 2021). Successful transformation facilitates productivity growth across many sectors, improves public services and improves the public’s well-being due to the availability of information, knowledge and data. As suggested by the OECD (2017), digital transformation has shaped the development and growth patterns that focus more on the supply side by increasing productivity. Such changes enable countries to move away from low-value production to manufacture higher-value products (OECD, 2017).

Fourth, digital transformation can contribute to addressing policy challenges, namely (i) meeting the current and future needs of energy, food and clean water or (ii) enhancing the delivery of quality health and education services (OECD, 2017). It facilitates the implementation and enforcement of policies as well as improve public services via digital means. At the corporate level, it helps organisations improve performance via more efficient processes and procedures.

Fifth, digital technologies can also promote social inclusion by fostering access to good education, public health care, financial services and opportunities for employment, and training and development, especially reskilling and upskilling for older workers and those who wish to have more job opportunities in the digital age (Laker, 2021; OECD, 2017). Digital technologies enable the implementation and evaluation of policies that encourage inclusive innovation. Such policies aim to develop “the innovation capacities and opportunities of individuals and social groups that are underrepresented in innovation, research, and entrepreneurship activities” (OECD, 2017, p. 5). Such policies are important in the digital economy and when aging population becomes an urgent issue to be addressed in many countries.

Other benefits of digitalisation include ease of business operations, better supply chain management, improvement of cost-efficiency, increase brand awareness, empowerment of information-based decision-making, better customer service and increased ease of market expansion. According to the interview by the Economic Research Institute for ASEAN and East Asia (n.d.), the main benefits of digitalisation enjoyed by organisations are the ability to reach a wide range of customers and the ease of business operations. Digitalisation also help to lower costs for organisations as well as increase customers’ brand awareness (refer to Figure 6).

**Challenges posed by digital transformation**

According to the draft ASEAN Cybersecurity Cooperation Strategy (2021–2025) report by ASEAN Secretariat (n.d.), the rapid adoption of digitalisation has facilitated the development of the digital economy in the region, but it has also posed new and novel challenges.

The first challenge faced by SEA countries is the digital divide among different groups of people within a country, and between the developing and the developed countries in the SEA region, for example, the broadband Internet speed in different countries (refer to Figure 7 adapted from Speedtest (2023)). Furthermore, the percentage of the population who use the Internet in Cambodia, Laos and Myanmar is much smaller (50%) than those in Singapore, Thailand and Malaysia (80%) (Kaushik, 2019). Within a country, there are various variables of the digital divide due to age, level of IT literacy, level of income, skills, access to the Internet, etc. However, from a positive perspective, there is potential for those who do not have access to the Internet or who do not engage in the online marketplace to embark on the wave of digital transformation to reap the benefits of digitalisation and the digital revolution.

The second challenge is the level of human capital development. The Human Capital Index, adopted by the World Economic Forum, is used to measure how countries develop and deploy their human resources (World Bank, 2019). The index evaluates several variables (the level of
education, skills, employment, and how well countries utilise their human capital to improve their economies, etc.) that are grouped into four main components, namely capacity, development, deployment and know-how (World Economic Forum, 2017).

**Table 1**

<table>
<thead>
<tr>
<th>Benefits of Digitalisation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wider Customer reach and better marketing</td>
<td>72%</td>
</tr>
<tr>
<td>Ease of business operation</td>
<td>51%</td>
</tr>
<tr>
<td>Cost reduction</td>
<td>44%</td>
</tr>
<tr>
<td>Higher brand awareness</td>
<td>41%</td>
</tr>
<tr>
<td>Empowering information-based decision making</td>
<td>28%</td>
</tr>
<tr>
<td>Better customer service</td>
<td>15%</td>
</tr>
<tr>
<td>Enabling overseas sales</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Note(s):** The percentage represents the responses of 40 MSMEs in an in-depth interview study conducted by the Economic Research Institute for ASEAN and East Asia

**Source(s):** Adapted from Economic Research Institute for ASEAN and East Asia (n.d.)

**Figure 6.** Benefits of digitalisation perceived by the MSME respondents

**Figure 7.** Broadband Internet speed among ASEAN countries (2023)
According to Figure 8, adapted from von Kameke (2022) and World Bank (2022), Singapore was ranked the top-performing economy in the SEA region. Apparently, there is a big gap between Singapore and SEA countries at the bottom of the list, such as Myanmar and Cambodia, regarding human development. Above all, the lack of home-grown tech talent is the most pressing issue for companies, especially SMEs in the region to sustain and grow their e-businesses (Google, Temasek and Bain, 2022).

The third challenge is how data privacy is protected online and the security of online systems. Cyber security and cybercrimes have been growing concerns of the e-community, including consumers, sellers and governments (CyberSecurity Malaysia, 2021). In fact, the COVID-19 pandemic has created near-perfect conditions for cybercriminals (Zahra, Chishti, Baba, & Wu, 2022). Not only do cyber threats put online businesses at risk, but they also cause intensive economic impact. For example, “the hacks at HBO and Sony, and ransomware campaigns like the GoldenEye, have caused significant economic losses” (Global-is-Asian Staff, 2018). There have been cases that thousands or even millions of personal data were stolen. For example, hackers stole the personal data of about 1.5 million people in Singapore in 2018 (BBC, 2018) and about 79,400 mobile subscribers of MyRepublic (Chee & Chia, 2021), and about 46 million mobile subscribers’ personal data in Malaysia were compromised in 2017 (The ASEAN Post, 2018) and staggering losses of RM2.23 billion were recorded from 2017 to Jun 2021 due to cybercrime (The Star, 2022). Zheng and Tarabay (2023) reported that hackers have recently accelerated their activities to attack the online platforms and systems of government bodies and military agencies in many countries in SEA. There are many forms of online risks, such as cyber identity theft, credit card fraud, hacking, malware and many others, that may deter consumers to go online, and incur operational and legal costs (Aon Plc, 2015). Such cyber incidents can happen to any industry, anytime and anywhere in any country. In addition, cyber incidents can lead to “legal exposure, reputational harm, and business interruptions that may result can wreak havoc on an organisation’s bottom line” (Aon Plc, 2015, p. 3).

The fourth challenge is taxation together with jurisdiction. As explained by the OECD (2014), the digital economy offers opportunities for companies to operate beyond the country where they register their business with. This has resulted in “non-resident companies operating in a market jurisdiction in a fundamentally different manner today than at the time international tax rules were designed” (OECD, 2014, p. 124). Offline companies must comply with the tax rules

<table>
<thead>
<tr>
<th>Country</th>
<th>Score</th>
<th>Rank*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>0.88</td>
<td>1</td>
</tr>
<tr>
<td>Vietnam</td>
<td>0.69</td>
<td>8</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>0.63</td>
<td>10</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.61</td>
<td>11</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.61</td>
<td>13</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.54</td>
<td>15</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.52</td>
<td>16</td>
</tr>
<tr>
<td>Cambodia</td>
<td>0.49</td>
<td>18</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.48</td>
<td>20</td>
</tr>
<tr>
<td>Laos PDR</td>
<td>0.46</td>
<td>22</td>
</tr>
</tbody>
</table>

Note(s): #Ranking based on position in APAC Region
Source(s): Adapted from von Kameke (2020) and World Bank (2022)
and regulations of the country where they register and operate; whereas online companies may not need to pay any tax due to non-physical presence in a certain country. Apart from administrative complications, this has raised a big issue for policymakers on how to ensure free and fair competition in both the online and offline markets.

Finally, other challenges include lack of resources, weak financial institutions and online payment systems, weak intellectual property protection, infrastructure-related issues (e.g. network connectivity, speed and quality of broadband), regulation (e.g. licensing restrictions), consumer protection issues, sustainability, etc. (Beschorner et al., 2019).

In general, although there are several benefits offered by the digital economy, the public sector has faced several challenges regarding policymaking and institution establishment. These challenges can be cross-border and entail several implications for international law, intellectual property rights, data protection, banking and finance, and many others (CyberSecurity Malaysia, 2021; OECD, 2014; Zahra et al., 2022). Many countries do not have institutions and resources in place to manage new technologies, new regulations, new business models, and new global competition and threats.

The impact of the digital economy on Southeast Asia

The digital transformation has facilitated the integration of the ASEAN Economic Community (AEC). Deloitte and Touche LLP (2016), Google, Temasek and Bain (2022), and the key contributors to The ASEAN magazine on digital transformation (refer to the November 2022 issue) explained that the digital economy has affected SEA in several ways.

A number of positive impacts generated by the digital economy are discussed below. First, millions of people in SEA will have opportunities to be connected and conduct commercial and non-commercial transactions online (Bush & Najar, 2022). However, this can only be materialised with the right policy framework and effective enforcement. During the COVID-19 pandemic, more consumers in SEA have embarked on digital services and online shopping. For those who did not appreciate the benefits of the digital economy, they will join the bandwagon, sooner or later because they can enjoy the convenience of online transactions, select goods/services from a wide variety, and get better prices and better value from what traditional channels can offer to them (Deloitte and Touche LLP, 2016).

Second, digitalisation will reduce the operational costs that can make manufacturing, supply chain and procurement management in SEA more competitive (Beard et al., 2022; Schrauf & Berttram, 2016). Companies in SEA will be able more agile and customer-focused via the adoption of e-commerce, digital marketing and branding, social media platforms, and software to manage customers within and across countries more easily. Also, digitalisation, digital platforms and digital technologies will improve organisations’ operations and supply chain management, especially during the COVID-19 pandemic (Cui, Wu, Wu, Kumar, & Tan, 2022; Zhao, Hong, & Lau, 2023). Cost reduction and operational continuity were well observed during the COVID-19 pandemic when most of business activities and operations were shifted from offline to online.

Third, according to Harun, Carter, Khan and MacLennan (2018), SMEs has been accounted for between 88.8% and 99.9% of total commercial entities in ASEAN member states (AMSs) and employed between 51.7% and 97.2% of the total labour force and contributed about between 30% and 53% to the GDP of the respective AMSs. When there is more consumer demand, and manufacturing supply chains and financial infrastructure have been upgraded via digitalisation more opportunities will open to such SMEs, i.e. they will be able to expand their business within and across countries in the region as well as in other continents. Without the online platforms and digital technology, more SMEs and businesses had to cease their operations during the COVID-19 pandemic.

Fourth, digitalisation provides opportunities for financial institutes to be innovative, develop and grow in the ever-changing external environment, such as the introduction of blockchain technology, digital banking, internet banking, e-wallet, e-payment, mobile
banking, banking applications, etc. This will enable commercial and e-commercial transactions to be more seamless, cost-efficient and faster. SEA will be able to increase investors’ confidence and thus can attract more inflow investment. As proposed by Deloitte and Touche LLP (2016), such investment will enhance SEA’s economic position in the Asian region and will fuel growth in the region due to the domino effect of SEA’s economic growth. For example, SEA’s e-commerce spending is estimated to increase to over US$90b by 2025 (Wong & Low, 2019). Zaman (2022) also explained that SEA countries have been leading social media in Asia with a higher penetration rate than that of South Asian countries. For instance, the social media penetration rate of Indonesia, Malaysia, the Philippines, Singapore and Thailand ranges from 59% to 81% in 2020 (Zaman, 2022). The impact of social media on economic activities (e.g., sales and marketing, providing feedback and review of products/services, etc.) and political activities (e.g., fund raising, providing public opinions, etc.) has been well recognised by stakeholders.

Nevertheless, a few negative impacts of SEA’s digital economy in the region are observed. Countries in the Asian region may have difficulty in reviewing and harmonising regulations and policies regarding the rapid development of digitalisation and rapid development of technology (for example, the release of ChatGPT has disturbed the traditional assessment approaches at educational institutes although it provides an alternative platform for business to gather business intelligence in the market.). Traditionally, regulatory costs have been considered heavy burdens to businesses. Similarly, there are several obstacles to enter to a digital economy, for instance, “slow regulatory reforms, extensive bureaucracy and lack of government incentives and promotion in various parts of the region” (Wong & Low, 2019, para. 10).

Another barrier is how to ensure digital infrastructure, namely networks, hardware and software, is in place for all SEA countries to improve effective and efficient connectivity among SEA countries. Currently, the Internet penetration percentage in Brunei and Malaysia is only 86% and 71%, respectively; whereas only 26% of the people in Laos and Myanmar “have access to the Internet” (Wong & Low, 2019, para. 14). If the digital divide within each SEA country and across SEA countries is too wide, there will be uneven economic development in the region. This will, in turn, result in ongoing socioeconomic problems, such as economic migration, uneven social mobility and social unrest. Furthermore, the social and human aspects of a digital economy should not be neglected, i.e. the workforce should be well prepared for technological changes, especially older workers.

Finally, financial constraints may limit public investment in STEM education and research and development (R&D) that are necessary for developing human capital for countries to remain competitive in the digital era (Mulyani, 2017).

Given the complexity of digital adoption and digital transformation and the involvement of various stakeholders, it requires multi-sector involvement as well as a “whole-of-government approach” to address the identified challenges (OECD, 2017, p. 4). Yet, insufficient research discusses the role of various players in the digital transformation process in the region. Therefore, this paper has proposed the role of the public sector, the private sector and the third sector in the recommendations (Figure 1).

The way forward

Given the pros and cons of the development of a digital economy, the following policy recommendations are proposed. It is important to develop a common data policy for not only the SEA but also for the Asian region, i.e. a policy framework that is aligned with regional and international requirements. Policy development should focus on three areas, namely digital finance, digital training and development, and digital infrastructure, both physical and institutional (The Association of Southeast Asian Nations (ASEAN), 2021). A common e-payment platform and more innovation in e-payment, m-payment and d-payment across SEA...
countries are necessary as they will facilitate more online transactions, e-public services and e-investment (Liew & Mittal, 2018). A good training and development policy would help SEA countries to reduce the digital literacy gaps and improve digital inclusion. Further, a strong digital infrastructure foundation would facilitate regional and national integration, cooperation and development. The public and the private sector should work with each other to pool resources and develop such infrastructure for a win–win partnership; whereas the third sector (civil society organisations) should play their role in public education to enhance aware of the importance and benefits of digital adoption, and check and balance. The third sector should also encourage public participation and participate in relevant digital projects to support the public and the private sectors (Lynn et al., 2022; Asian Development Bank, 2009).

A regional digital market cannot be fully developed without a digital-ready workforce. Thus, SEA countries need to reduce the digital divide by increasing connectivity, i.e. pursuing a broadband revolution across SEA countries as well as equipping their workforce with the necessary digital skills and a mindset for change to embrace digitalisation. To enhance digital inclusion, SEA countries should focus on educating both young and old generations to respond to the high demand for digital skills and lifelong learning (Bush & Najar, 2022; Chao, 2022; International Monetary Fund, 2018; Phanthavong, 2022) and companies must focus on building digital cultures (Laker, 2021). Governments should focus on training and retraining workers, especially seniors, who are negatively affected by the rapid development of digital technologies. Many older workers are anxious about being replaced by machines and robots, and are reluctant to change, i.e. resistance to changes is one of the barriers to digital adoption. Thus, they should be trained in a way that makes them willingly embrace digital transformation. Nevertheless, hard skills are not sufficient for workers to excel in their jobs/careers because technical and soft skills are equally important in the digital economy (The Economist Intelligence Unit, 2019). The third sector and the private sector can also play their part by offering relevant training programmes to improve relevant knowledge and skills of the current and future workforce in the digital era (Fung, Taal, & Sim, 2021). Social interactions and public education are important in the development of a digital economy because the public may fear that many economic and manufacturing activities will be outsourced or relocated to those economies where productivity is high due to automation and robotisation (OECD, 2017). Thus, it is important for governments to provide clear policies and guidelines regarding training and retraining the workforce so that trainers, with relevant skills and knowledge, are able to stay competitive in the labour market (Asian Development Bank Institute, 2019).

In addition, it is critical for SEA countries to cooperate and build capacity in terms of cybersecurity at the regional level. At the national level, they need to improve trust and security of the online platforms and marketplace as security and privacy incidents do deter consumers to go online (Ha, 2017; Ha & McGregor, 2013; Di, 2018). To mitigate cyber incidents, SEA countries need to develop a secure digital marketplace. This can be done by sharing important information, developing protocols and manuals to deal with hacking incidents, improving coordination among national cybersecurity agencies and developing a regional dispute settlement resolution framework (Global-is-Asian Staff, 2018). Again, all sectors can work closely with one another to fight against cyber hackers and cyber terrorists. Civil society organisations can promote cybersecurity awareness to the community, encourage adoption of cyber resilience management, participate in relevant cyber security projects, encourage cybersecurity capacity-building and build partnerships to improve cybersecurity (Un, Thinyane, & Christine, 2021).

Overall, SEA countries need to foster intra- and inter-digital transformation to grow national and regional economies. To materialise the digital transformation, SEA countries need to harmony and close the gaps between "Industry 4.0", “Technology 4.0”, “Education/
Training 4.0” and “Policy 4.0” at the local, national and regional levels (OECD, 2017). SEA countries should also develop and implement fair competition policies, adequately invest in digital education (human capital) and digital infrastructure that can promote digital innovation and digital inclusiveness, and contribute to a “secured and integrated digitally-connected region” (Mulyani, 2017, p. 31).

Conclusion

This paper has examined some key features of the digital economy in SEA countries, what has been done well and not done enough and the challenges and opportunities of digital transformation across countries. It has also explained the impact of digital transformation on SEA’s digital economy as well as the region’s development.

The volume of the digital transactions has increased, in many SEA countries, together with the development of digital platforms and other advanced technology. In addition, the COVID-19 pandemic has escalated the development of digital transformation, migration to digital platforms and a surge in demand for digital services (Kochetkov et al., 2021; Phanthavong, 2022; Zahra et al., 2022). Due to the population and market size advantage, Indonesia is the leader in SEA in terms of the participation rate in the digital economy, followed by Vietnam, Thailand, Malaysia and Singapore. However, Myanmar and the Philippines have shown potential in the digital race in the future.

Engaging in digital transformation generates several benefits to both consumers (e.g. convenience, cheaper products/services, more choices, ability to view other consumers’ reviews of products, etc.) and sellers (e.g. cost efficiency, ability to reach a wider range of customers, etc.) as well as other groups of stakeholders, such as policymakers, regulators, law enforcers, civil society groups, etc. It is noted that not all people will embrace digital technology and participate in the digital economy for many reasons. Yet, it is expected that reducing the digital divide would enable more people to adopt digital technology and join the digital transformation process.

The main impact of the digital economy on the overall economy of SEA countries includes broader market share, better brand awareness, wider reach to customers, facilitation of commercial transactions due to convenience, more choices (in terms of brands, products, designs, etc.), competitive prices, contributions to the overall economic growth and GDP. Yet, the digital divide, different levels of economic development and human capital development, cyber security threats, privacy concerns, taxation, financial infrastructure, technical skills, technological capabilities and jurisdiction remain challenges to SEA countries.

The OECD (2017) explained that countries should have inclusive and well-coordinated policies which can help them materialise the digital transformation and reap its benefits. Such policies should include all stakeholders, and SEA countries should adopt a whole-of-government approach to policy and decision-making in order not to marginalise anyone from this transformation process. In addition, SEA countries should also share the lessons and experiences gathered during this transformation process as well as learn from one another.

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