

Digital Tomorrow: How ASEAN Is Catalyzing Major Growth in the Digital Economy

Alexander Titov, Oliver Nalevanko, Roman Gaintdinov, Duane Dizon, and Amor Maclang

Alexander Titov — PhD, deputy secretary general of International Digital Economies Association (IDEA); international business head at GeiserMaclang Marketing Communications Inc & Digital Pilipinas; co-founder of Astrolabe.

Oliver Nalevanko — international business and marketing manager at International Digital Economies Association (IDEA), GeiserMaclang Marketing Communications Inc, Digital Pilipinas & Astrolabe.

Roman Gaintdinov — independent expert on the South-East Asia region.

Duane Dizon — strategic and crisis communications manager at GeiserMaclang Marketing Communications and Digital Pilipinas.

Amor Maclang — doctor of philosophy (h.c.) from Rai University; UID-MIT IDEAS Asia Pacific fellow, The Sloan School of Management, Massachusetts Institute of Technology; secretary general & co-founder of International Digital Economies Association (IDEA); founder and lead convenor of Digital Pilipinas, co-founder of GeiserMaclang Marketing Communications Inc.

For citation: Titov, A., Nalevanko, O., Gaintdinov, R., Dizon, D., and Maclang, A., 2024. Digital Tomorrow: How ASEAN Is Catalyzing Major Growth in the Digital Economy. *Contemporary World Economy*, Vol. 2, No 1.

DOI: <https://doi.org/10.17323/2949-5776-2024-2-1-105-127>

Keywords: ASEAN, digital economy, Global Majority, digitalization, economic development, emerging region.

Abstract

The emergence of digitalization presents an unparalleled opportunity for transformation in our era. Crucial sectors fundamental to human advancement, such as healthcare, education, energy, and agriculture, increasingly rely on global connectivity and data exchange. However, the infrastructure supporting these connections must meet the criteria of accessibility, affordability, and security to ensure seamless utilization.

The internet, continuously evolving with innovations like artificial intelligence (AI), presents unprecedented prospects for many. Yet disparities persist, particularly in developing nations where access to daily internet use and proficiency in digital technologies lag behind their developed counterparts. Without equitable access and the requisite skills, billions of people, especially in the Global Majority countries, risk marginalization from modern technological advancements.

As of 2023, approximately one-third of the global population—roughly 3 billion individuals—remained without internet access.¹ Addressing this digital divide demands heightened global collaboration to expedite technology adoption and extend connectivity benefits to all.

Navigating digitalization necessitates a delicate equilibrium between risk mitigation and opportunity maximization. As individuals and businesses embrace digital transformation, establishing protective measures to instill user confidence becomes paramount. Foundational policies encompassing data privacy regulations, cybersecurity protocols, and robust institutional frameworks are imperative to cultivate resilient, interconnected digital ecosystems. Advanced systems should not only verify identities but also facilitate secure, expedient transactions while promoting responsible data sharing.

Asia, among the most dynamic and rapidly evolving regions, epitomizes the expansive progress within the global digital economy. This article's main focus is on the remarkable advancements observed within the Southeast Asia region, collectively constituting a focal point of burgeoning digitalization.

Introduction to ASEAN and its role in the global majority

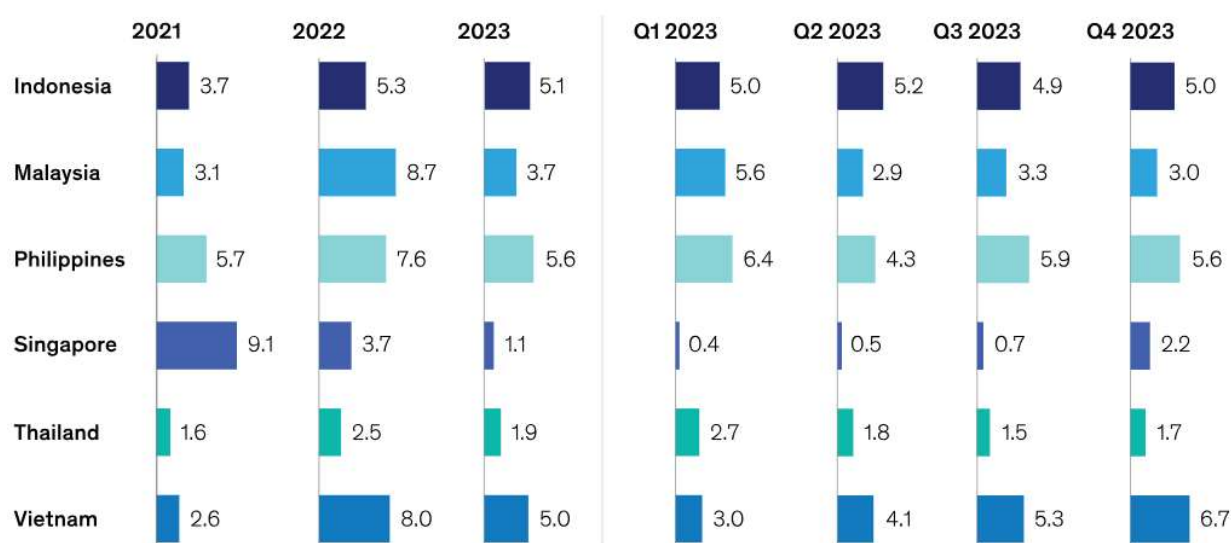
The Association of Southeast Asian Nations (ASEAN) stands out as a successful model of regional integration, fostering economic growth, stability, and regional diplomacy among its ten member states. Established in 1967, ASEAN initially focused on economic cooperation and conflict resolution. However, it has evolved into a multifaceted organization tackling security, sociocultural issues, and regional diplomacy. Principles like non-interference, respect for sovereignty, and consensus-based decisionmaking have been instrumental in maintaining stability and boosting ASEAN's standing on the global stage.

This emphasis on regional integration has been a key driver of ASEAN's progress. By collectively addressing economic, security, and social issues, member states have achieved significant economic growth—with a GDP of \$3.3 trillion in 2021, ranking ASEAN as the fifth-largest global economy. This economic strength positions ASEAN as a major force in global trade and investment.

¹ The World Economic Forum, 2023. These are the places in the world where internet access is still an issue – and why. [online] Available at: <https://www.weforum.org/agenda/2023/09/broadband-no-luxury-basic-necessity/> (accessed 10 April 2024).

The global shift towards a multipolar world presents exciting opportunities for ASEAN. As a prominent member of the emerging global south, ASEAN exemplifies successful development strategies for other developing regions. Its integrated approach serves as a valuable model for South-South cooperation, highlighting the importance of regional collaboration in addressing shared challenges and promoting inclusive global governance.

Figure 1. Real GDP growth rate vs previous period, %



Source: Countries' national statistics offices; Oxford Economics [McKinsey 2024].

This evolving global landscape underscores the importance of ASEAN's integration and as a model of regional and global cooperation. Indeed, in recent times, the global geopolitical and economic landscape has witnessed a notable transition towards multipolarity. This reflects the rising influence of countries from the global majority, encompassing regions typically characterized by lower income levels, developing economies, and diverse cultural backgrounds, which are situated primarily in Africa, Latin America, Asia, and parts of the Middle East. In recent years, however, many of these countries have experienced significant economic growth and development, propelled by factors such as natural resource wealth, industrialization, technological advancements, and strategic geopolitical positioning. ASEAN, as one of the most progressive regional associations, serves as a great example for many.

Furthermore, the rise of these countries has brought attention to issues such as South-South cooperation, development assistance, and the need for more inclusive global governance structures that reflect the diversity of the world's population and address the unique challenges faced by countries in these regions. Therefore, the shift towards multipolarity underscores the evolving dynamics of the international community, signaling a more diverse and complex global landscape where traditional power structures are being reshaped by emerging forces from previously marginalized regions.

The United Nations is also appreciating and endorsing ASEAN as a vital player within the global majority. The United Nations expresses deep gratitude for ASEAN's robust partnership and unwavering dedication to multilateralism and regional collaboration. ASEAN's pivotal role in promoting human rights, fundamental freedoms, and inclusive political engagement are integral components in the construction of genuine, resilient, and harmonious societies. Additionally, ASEAN's contributions are vital in fostering a robust global economy on a worldwide scale. The United Nations reaffirms its steadfast commitment to stand as a dependable partner alongside ASEAN in navigating the challenges that lie ahead [United Nations].

This article delves deeper into this model, specifically examining how ASEAN's integrated approach shapes its participation in the digital economy. We will explore ASEAN's historical engagement with digitalization, the opportunities and challenges it faces, its unique contributions, and its future trajectory. Through this analysis, we will gain a comprehensive understanding of ASEAN's critical role in driving regional and global digital development.

1. Evolution of ASEAN's digital agenda over the years

For over a quarter-century, ASEAN has been actively engaged in digital transformation efforts, commencing in 1997 with the adoption of the ASEAN Vision 2020. This visionary document is aimed at fostering an integrated ASEAN community and has kickstarted initiatives focused on information and communication technology advancement across the region [ASEAN 1997]. Subsequently, in 2000, ASEAN leaders signed the e-ASEAN Framework Agreement, marking a significant step forward into the "digital realm" [ASEAN]. Since then, dozens of other initiatives have been launched to drive digitalization within ASEAN.

Since the beginning of the 21st century, Southeast Asia, and ASEAN in particular, has been witnessing a rapid uptake of digital technologies, buoyed by tech-savvy younger generations and a population of almost 700 million, in which 61% of the region's inhabitants, which amounts to about 383 million people, are under the age of 35. The ASEAN region saw a remarkable surge in internet users, adding 100 million within just four years from 2015, and another 100 million since 2019, culminating in a total of 460 million internet users by 2022 [The Asean 2022].

Ever since the internet boom, messaging apps, social networks, ridesharing, mobile app-based delivery services, internet banking, and many other "digital products" have over time become an integral part of life for most people across Southeast Asia. The prevalence of online shopping has been solidified by the availability and usage of digital devices. This was the case particularly in light of the COVID-19 pandemic, leading to a significant shift in the retail landscape away from traditional brick-and-mortar stores. In 2022, when the pandemic was still causing concerns to some industries, the gross merchandise value of Southeast Asia's digital economy reached nearly \$200 billion [Bain & Company 2022].

Over the past two decades, ASEAN has established around 70 agreements, master plans, frameworks, action plans, and related declarations, which shows how seriously

this topic has been covered in the region. It transcends mere policy alignment among ASEAN Member States (AMS) to foster trade and investment in ICT products and digital services, akin to the multifaceted economic integration within ASEAN, which extends beyond the liberalization and facilitation of goods, services, and investment. Such a digital integration encompasses several key components, including the advancement of ICT infrastructure, encouragement of digital innovation, collaboration on cybersecurity, the establishment of supportive institutions for ASEAN Member States, enhancement of digital education, and development of digital workforce skills. Importantly, it involves transactions both between nations and within domestic settings, such as initiatives aimed at expanding broadband access to rural areas lacking adequate connectivity.

However, it is essential to highlight the significant variances prevailing among ASEAN members in terms of their preparedness for the digital economy. For instance, in the Network Readiness Index 2023, Singapore claimed the 2nd position out of 131 countries globally, while Malaysia ranked 40th, Indonesia 59th, and the Philippines 69th. In stark contrast, Cambodia and Lao PDR secured considerably lower rankings at 108th and 109th, respectively. This diversity underscores the notion that ASEAN's progress in digitalization is not uniform across its member states.

Nevertheless, even among those trailing behind, efforts to fortify their digital economies are palpable. Take Laos, for example, which is taking substantial strides towards embracing a digital future. The country has made telecommunications infrastructure accessible to over 98% of its population. Furthermore, approximately one million Laotians have embraced mobile banking services, evidencing a growing digital finance ecosystem. Moreover, within the capital, digital startups are emerging with confidence, signaling a burgeoning entrepreneurial landscape in the digital sphere [The World Bank 2022].

Cambodia has also undertaken serious steps, thanks to which they were able to achieve a rapid development path towards digital transformation. The nation has achieved one of the world's swiftest rates of digital adoption. In 2023, the number of mobile and internet usage exceeded Cambodia's population of 16 million, while active social media users accounted for 65% of the total population [UNESCO 2023]. That said, outperforming countries are now shifting focus to increase their digital presence, which will strengthen ASEAN's position in the global digital economy.

2. Key milestones and Initiatives in ASEAN's digital journey

The journey of ASEAN into the digital realm has been marked by pivotal milestones and strategic initiatives, shaping its trajectory towards a digitally integrated community.

The first significant milestone emerged with the inception of the e-ASEAN Framework Agreement in 2000. This landmark agreement outlined key objectives, including the promotion of cooperation to bolster the ICT sector's development and competitiveness, bridging the digital divide within and among member states, and fostering collaboration between the public and private sectors to realize the vision of e-ASEAN and facilitate trade liberalization in ICT products, services, and investments.

Subsequently, the signing of the ASEAN Economic Community Blueprint in 2007 marked another crucial milestone. Aligned with the overarching goal of achieving enhanced economic dynamism, sustained prosperity, inclusive growth, and integrated development, this blueprint integrated digital-related endeavors into the broader framework of economic integration [ASEAN 2012a].

The following milestone arrived with the unveiling of the ICT Masterplan 2015, highlighting notable advancements in ICT across ASEAN. Noteworthy achievements included the expansion of ICT service exports, reduced costs associated with internet access and mobile subscriptions, and significant strides in areas such as ICT-driven employment growth, digitization of government services, and heightened cybersecurity awareness [ASEAN 2015].

The year 2015 also brought the AEC (ASEAN Economic Community) Blueprint, representing a comprehensive strategic plan aimed at achieving economic integration among ASEAN member states. The Blueprint outlines a roadmap for transforming ASEAN into a single market and production base, fostering economic growth and development across the region. The blueprint is structured around four key pillars, namely single market and production base, competitive economic region, equitable economic development, and integration into the global economy [The ASEAN Secretariat 2008].

In 2016, the establishment of the ASEAN Coordinating Committee on Electronic Commerce underscored ASEAN's commitment to digital integration. This committee, formed by the Senior Economic Officials Meeting, plays a pivotal role in fostering convergence between the ICT and e-commerce sectors and driving digital integration initiatives within the association.

Another milestone, the Digital Integration Framework Action Plan (DIFAP), consolidates efforts outlined in various strategic blueprints, including the AEC Blueprint 2025 and ASEAN ICT Masterplan 2020. As the most comprehensive framework document within ASEAN, DIFAP spans a wide array of areas, marking a significant achievement in digital policy consolidation [Economic Research Institute for ASEAN and East Asia 2023].

The rapid digital transformation accelerated by the COVID-19 pandemic has further underscored the importance of digitalization within ASEAN's economic integration framework. This acknowledgment has propelled ASEAN towards a strategic pivot in digital policy priorities, positioning digital initiatives at the forefront of its agenda.

Looking ahead, the Digital Economic Framework Agreement (DEFA) and the Post-2025 Agenda are anticipated to serve as forthcoming milestones, charting the course for ASEAN's digital future. These initiatives collectively reflect ASEAN's commitment to fostering the expansion of its digital economy and realizing its vision of a digitally integrated community.

3. Opportunities ASEAN presents in the new digital economy

ASEAN stands at the forefront of the world's fastest-growing digital market, marked by a daily influx of over 100,000 new users. The COVID-19 pandemic catalyzed a profound shift towards digital transformation, welcoming an additional 60 million digital consumers

into the fold. This surge has propelled ASEAN’s internet users to over 460 million in 2022 and continues to expand.

Table 1. Total internet users in Southeast Asia, million

2019	2020	2021	2022
360	400	440	460

Source: Google, Temasek, and Bain & Co [The Asean Magazine 2022].

Beyond traditional digital products, five interconnected technology trends—the Internet of Things (IoT), big data, artificial intelligence (AI), blockchain, and fintech—are poised to reshape ASEAN economies, influencing production, industrial structure, and trade patterns [Asia-Nikei 2021]. Advancements in IoT, including cloud computing, machine-to-machine communication, and sensor technology, are poised to revolutionize various sectors within ASEAN. Projections suggest that by 2030, approximately 25 billion interconnected “smart” devices will drive efficiency across manufacturing, logistics, and supply chains, reducing waste and enhancing productivity, all of which will find use within ASEAN.

Big data, powered by sophisticated analytics, enables businesses, governments, and individuals to harness vast datasets for real-time decisionmaking and product refinement. Understanding data allows businesses, governments, and individuals to monitor and enhance their operations and make real-time decisions informed by insights. It also enables entities to refine their products and services to better meet customer needs. When combined with AI, big data is reshaping industries like finance, enhancing algorithmic trading and market insights, while paving the way for quantum computing and telecommunication advancements.

3.1. Deep dive into the technologies of the region

AI represents a transformative force, exemplified by the emergence of generative AI such as ChatGPT [Innoma 2023]. Leveraging data analysis and machine learning, AI drives autonomous decisionmaking and adaptive robotics, enabling them to function across diverse working environments and learn independently. Moreover, AI startups have garnered more than \$2.5 billion [Innoma 2023]. in Southeast Asian countries, highlighting the burgeoning interest in artificial intelligence within the region.

Artificial intelligence, 5G, blockchain, and Web 3.0 are driving development in the region’s technology sector. AI, in particular, is gaining traction, with 149 companies [The New York Times 2023] actively exploring its capabilities. These companies utilize a range of AI technologies, including machine learning, deep learning, natural language processing (NLP), computer vision, predictive analytics, neural networks, decision trees, and clustering.

The significant investments in AI companies underscore the crucial role of artificial intelligence in driving innovation. This surge in investments reflects the growing

popularity of data-driven strategies, automation, and intelligent solutions, aimed at revolutionizing industry norms and improving work efficiency.

Meanwhile, blockchain, often associated with cryptocurrencies, represents a revolutionary technology. It serves as a decentralized database, functioning as an open, shared, and trusted public ledger resistant to tampering and accessible to all. By enabling the transfer of value within computer networks, blockchain's underlying protocols instill trust in transactions without the need for a central authority. While initially linked primarily to cryptocurrencies, blockchain has demonstrated the potential to transcend its origins. Its applications span various sectors, including financial transactions, record-keeping, verification systems, and smart contracts. For instance, blockchain could revolutionize cross-border remittances, substantially reducing transaction costs. Furthermore, it holds promise in enhancing the transparency and accessibility of land registration and asset ownership proof, while fortifying the integrity of government records and services, such as tax collection.

Another opportunity that ASEAN presents in the new digital economy is in the realm of financial technology (fintech), which is experiencing explosive growth in the region. This is fueled by a young, tech-savvy population comfortable with digital transactions and a booming digital economy. Mobile wallets and QR code payments are king, and with better internet access, seamless cross-border payments are on the horizon. Fintech is also making a big impact on financial inclusion by providing faster loan approvals and integrating financing options into everyday online activities. The insurance industry is being revamped by InsurTech, offering innovative products like microinsurance that cater to the underbanked. But that's not all. Fintech is also looking to attract top talent, seamlessly integrate financial services into daily life, and strike a balance between cutting-edge development and profitability.

Indeed, the technologies discussed above are poised to yield substantial impacts on productivity, economic growth, skills development, income distribution, wellbeing, and environmental sustainability across ASEAN member states. Numerous studies underscore the productivity advantages associated with the "next production revolution," also known as Industry 4.0. This revolution entails the integration of digital technologies into industrial production, fostering innovation, efficiency, and occasionally, the creation of novel goods and services [Rayhan 2023].

However, how can this technology translate into success and profitability for the people in ASEAN? What makes this region worthy of global attention, and what opportunities await exploration within its borders?

3.2. A youthful and tech-savvy population

The COVID-19 pandemic has posed a formidable test of resilience and adaptability, particularly for the younger generation. Despite the challenges it brought forth, individuals in Southeast Asia have exhibited remarkable success in navigating contemporary realities and challenges. By embracing digital connectivity, ASEAN's youth have demonstrated increased innovation, skillfulness, and readiness to seize opportunities in the post-pandemic era [The World Economic Forum 2020].

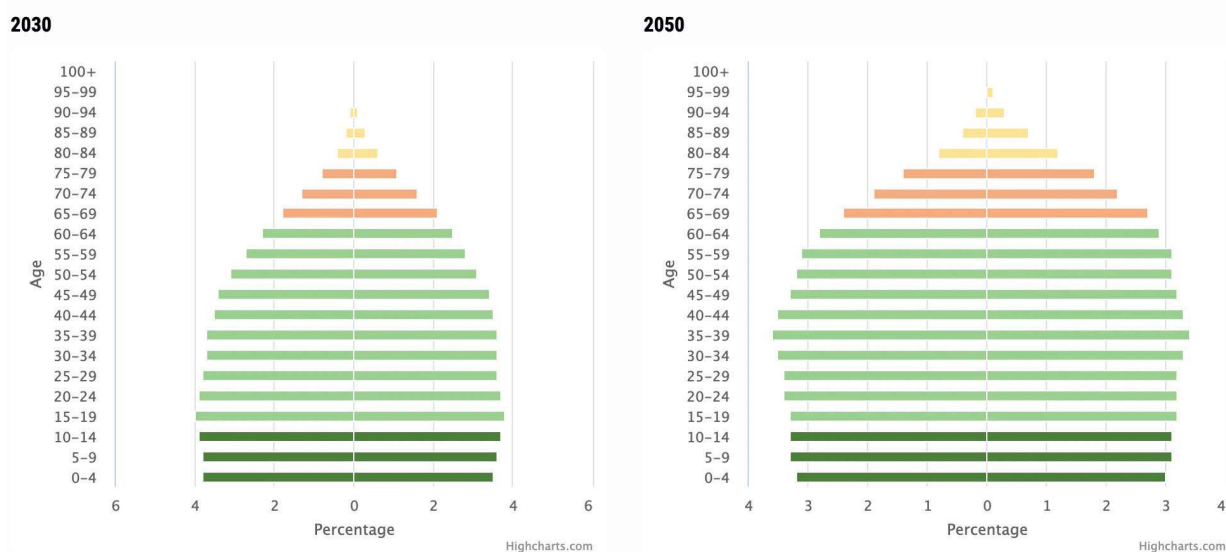
Consequently, ASEAN member states are witnessing a surge in digital transformation, fostering a generation adept at technology, poised to drive sustainable growth in the digital economy. A survey conducted among over 68,000 individuals aged 16-35 across six ASEAN countries revealed compelling insights. Nearly nine out of ten young people reported heightened usage of at least one digital tool during the pandemic, with almost half (42%) adopting at least one new digital tool [The World Economic Forum 2020]. Moreover, young people in the region showcased increased engagement in various digital activities, including online shopping, digital education, food delivery services, e-banking, e-wallets, online gaming (GameFi, Play-To-Earn), and metaverse exploration.

This digital shift was not confined to consumers alone; sellers also embraced the digital sphere. The survey indicated that one-third of entrepreneurs observed increased usage of e-commerce platforms, with a quarter of them venturing into them for the first time in response to the pandemic.

3.3. A thriving digital economy

Foreign direct investors are increasingly recognizing technology and innovation as pivotal drivers for investment in ASEAN, closely followed by the allure of emerging consumer markets and reduced production costs. With a population exceeding 660 million, the region is projected to contribute \$1 trillion to the digital economy by 2030. This surge in foreign direct investment is predominantly fueled by the vast potential of digital commerce. Against the backdrop of an innovative business landscape, approximately 70% of the new economic value created in ASEAN over the next decade is anticipated to emanate from digitally empowered platforms [Bloomberg].

Figure 2. 2030-2050: Age distribution in Southeast Asian countries



Source: [Economic and Social Commission for Asia and the Pacific].

For instance, the revenue generated from the Internet of Things (IoT) in ASEAN is forecasted to surpass \$60 billion by 2024. Moreover, the region has witnessed the establishment of over 600 crypto and blockchain startups, attracting over \$737 million in funding to date [Korea Blockchain Week 2023]. With Singapore leading as the region’s most advanced economy and ascending to fifth place in the Global Innovation Index, investors are increasingly drawn to the burgeoning opportunities within ASEAN’s digital landscape.

Digital payments in the region are experiencing a significant upsurge, exceeding \$800 billion in 2022. To remain competitive, e-commerce businesses must ensure seamless integration between cash and digital payments in real time to optimize their operations. Addressing these challenges, online merchants are increasingly adopting innovative plug-and-play financial solutions for tasks such as cash flow reconciliation and payment cycle management [Bloomberg Sponsored (by Standard Chartered) 2023].

These processes are facilitated by a plethora of innovative financial services solutions. Amidst the proliferation of digital ecosystems and evolving regulatory frameworks, a new wave of bank-fintech partnerships is leveraging application programming interfaces (APIs) to enable real-time interactions. User-friendly and accessible applications are of paramount importance, especially in a region where approximately 70% of the adult population remains unbanked or underbanked [Temenos 2023]. Thus, the ongoing development of open digital banking solutions represents a significant stride towards greater financial inclusion for Southeast Asians.

Table 2. World’s most unbanked countries

	Morocco	Vietnam	Egypt	Philippines	Mexico	Nigeria	Peru	Columbia	Indonesia	Argentina
Population, million	36.9	97.3	102.3	109.6	128.9	206.1	33.0	50.9	273.5	45.2
Unbanked population, %	71	69	67	66	63	60	57	54	51	51
Cash transactions, %	41	26	55	37	21	24	22	15	13	18
Card transactions, %	27	35	27	22	44	27	62	55	34	45
% of ATM per 100,000 adults	28.6	25.9	20.1	29.0	61.5	16.9	126.7	41.3	53.3	60.9
Internet penetration, %	62	66	45	60	66	70	49	62	55	76

Source: World’s Most Unbanked Countries, fintechnews.sg [Mercuryo].

3.4. Regional collaboration

ASEAN’s commitment to regional integration through initiatives like the ASEAN Digital Master Plan 2025 (ADM) lays the groundwork for harmonized policies, infrastructure development, and joint efforts in cybersecurity and digital skills development. This

collaborative approach can maximize the region's collective impact in the digital space. Released in January 2021 following the inaugural Digital Ministers' Meeting, the document reaffirms the urgency of accelerating digitization efforts outlined in previous plans. However, ADM 2025 introduces a significantly broader focus on the adoption of digital services and the development of supporting infrastructure [ASEAN 2021]. Achieving this outcome requires proactive policy adjustments, coupled with essential infrastructure development, support mechanisms, and seamless integration [Quah, Chen 2021].

3.5. An innovation ecosystem

ASEAN is cultivating a dynamic startup and innovation ecosystem, drawing investments and catalyzing the development of novel digital solutions tailored to local needs. This initiative not only creates employment opportunities but also fosters regional economic growth. ASEAN is proactively nurturing an appealing ecosystem encompassing innovators, developers, traders, clients, and consumers alike. In the wake of the transformative impact of COVID-19, there is a global quest for innovation-driven hubs that empower entrepreneurs and businesses to explore new opportunities through innovative processes, products, and services.

Therefore, there is a pressing need for a supportive entrepreneurial ecosystem that encompasses access to critical markets, funding, networks, and skilled human resources, emphasizing in particular the importance of new knowledge and education. To foster the growth of innovation-driven entrepreneurial ventures, it is imperative to map out geographical and sectoral distributions. This is where ASEAN plays a pivotal role, offering burgeoning markets, a pool of skilled human resources, and inclusive frameworks, such as the framework for promoting the growth of digital startups in ASEAN. The primary objective of this framework is “to develop an enabling ecosystem framework for digital startups in ASEAN... and to facilitate the creation of best-practice-based policies by relevant ministries in the AMS to nurture and foster startup ecosystems, particularly in promoting the growth of digital startups in their respective countries” [ASEAN 2023]. As more startups scale, the entrepreneurial ecosystem in Southeast Asia matures, paving the way for subsequent generations of startups and innovations, serving as an exemplar for others on the global scale.

Additionally, it is paramount to consider the strategic location and stature ASEAN has cultivated over the past decades. Firstly, its geographical position, often referred to as the “crossroads of the world” [Alberts 2013], holds significance in connecting major markets like China and India, thereby sustaining the potential for regional and global trade flow. Furthermore, ASEAN is actively embracing leapfrog development strategies, bypassing traditional stages of development by adopting innovative solutions not only in e-commerce and entertainment, but also in critical sectors such as healthcare, education, and financial inclusion. These solutions hold the promise of addressing challenges in these spheres and empowering marginalized communities, bridging the development gap within and between member states.

4. Challenges

Digital transformation has emerged as one of the most impactful innovations shaping modern life over the past decade. Despite a slight slowdown in 2022, technology startups in Southeast Asia secured over \$8 billion in funding from 2020 onwards, with ASEAN boasting over 30 unicorns in 2021—startups valued at \$1 billion or more—indicative of the region's increasing internet user base and improved internet accessibility [Yan Ing, Markus 2023]. However, amidst this digital transformation journey, the region still grapples with various challenges.

Foremost among these challenges is the digital divide, characterized by significant disparities in internet speed, usage, and technology production across different segments of society. Additionally, cybersecurity threats loom large as a concern, posing risks to individuals, businesses, and governments alike. The issue of digital literacy remains a pervasive challenge, with many lacking the necessary skills to navigate the digital landscape effectively.

Furthermore, a notable skills gap exists in the workforce, hindering the adoption and utilization of digital technologies to their full potential. Data governance issues, regulatory fragmentation, and ethical concerns further compound the complexities of digital transformation in the ASEAN region. Addressing these multifaceted challenges will be crucial in ensuring that the benefits of digitalization are equitably distributed and harnessed to drive inclusive growth and development across ASEAN.

4.1. The digital divide

One of the foremost challenges in digital transformation lies in the uneven distribution of modern technologies, stemming from limited access and opportunities. Countries vary significantly in their readiness for the new digital era, characterized by three key indicators: internet speed, internet usage, and technology production.

For instance, Cambodia and Myanmar exhibit internet speeds of 44 Megabits per second (Mbps) and 20 Mbps, respectively, markedly lower than Singapore's leading speed of over 270 Mbps, underscoring the pronounced disparities in this domain.

Another critical divide lies in internet usage. In 2020, while high-income countries boasted nearly 90% internet penetration, middle-income countries saw around 45%, and low-income countries recorded less than 21%. Brunei Darussalam led with the highest proportion of internet users (95.0% of the population), followed by Singapore (92.0%) and Malaysia (89.6%). In contrast, Myanmar (35.1%) and the Lao People's Democratic Republic (33.8%) reported the lowest percentages of internet users.

Infrastructure disparity:

Singapore and Malaysia stand out as regional leaders in digital infrastructure. Singapore boasts near-universal internet penetration and advanced fiber optic networks, while Malaysia prioritizes expanding mobile broadband coverage, particularly in rural areas [Infocomm Media Development Authority]. In contrast, members like Laos and Myanmar

face challenges with limited internet access, particularly in remote regions. The Asian Development Bank (ADB) highlights the need for infrastructure development to bridge the digital divide within ASEAN [Asian Development Bank 2017].

Digital literacy gap:

The digital skills gap is another key differentiator. Singapore and Thailand have established education systems that prioritize digital literacy and STEM programs, preparing their workforce for the digital economy. However, other members struggle with limited access to quality education, particularly in rural areas. This results in a workforce less equipped to participate fully in the digital revolution [Bangkok Post 2022].

Uneven e-commerce:

The adoption of e-commerce platforms also varies widely. Singapore, with its well-developed digital infrastructure and high internet penetration, is a leader in e-commerce adoption [Singapore Business Federation]. Conversely, some members are in earlier stages, with a larger portion of the population relying on traditional brick-and-mortar businesses. Disparities exist in digital payment infrastructure and logistics networks, impacting e-commerce growth across the region [Bloomberg].

Government policy and digitalization:

Government initiatives play a crucial role in shaping digitalization efforts. Some ASEAN members, like Singapore, have established clear policies and regulations to promote digitalization and attract tech investments [Smartnation]. These policies often focus on infrastructure development, talent development, and fostering innovation. Other members are at earlier stages of crafting a supportive regulatory environment for the digital economy.

Digital government services:

Singapore is again a frontrunner in offering digital government services. Citizens and businesses can access a wide range of services online, streamlining processes and improving efficiency [Singapore Government Agency Website]. Other members are at varying stages of implementing similar initiatives, with some facing challenges in digital government service adoption due to factors like limited infrastructure or lower levels of digital literacy among the population.

4.2. Cybersecurity threats

In the contemporary digital landscape, cyber threats have evolved from occasional concerns to daily challenges for many businesses. From sophisticated phishing schemes to ransomware attacks and espionage, organizations confront a myriad of cyber risks

that continually evolve in complexity. Exploiting even the smallest vulnerabilities, these threats underscore the critical need for advanced cybersecurity measures to safeguard assets and customer data, including the recruitment of cybersecurity professionals.

Fortunately, ASEAN governments have adopted a proactive stance in bolstering cybersecurity measures. Through the establishment and implementation of robust regulatory frameworks, they are committed to enhancing the region's cyber resilience. Initiatives like the ASEAN Cybersecurity Cooperation Strategy exemplify a steadfast dedication to raising cybersecurity awareness and capabilities across member states [ASEAN 2022].

4.3. Data governance across the region

The imperative to balance data privacy concerns with the imperative for data-driven innovation underscores the necessity of developing clear and harmonized data governance frameworks across the ASEAN region. Despite ASEAN's emphasis on digital integration, progress on data regulation has been slow. Existing frameworks and plans for data governance primarily consist of broad principles. For instance, the ASEAN Framework on Personal Data Protection outlines principles for safeguarding personal data [ASEAN 2012c], while the ASEAN Framework on Digital Data Governance offers general guiding principles, albeit non-binding [ASEAN 2012b].

Data regulatory frameworks vary among ASEAN member states, reflecting differences in preferences and harmonization efforts. Some countries have enacted comprehensive legislation on data flow restrictions, while others prioritize data protection laws. For example, Indonesia and Vietnam have implemented data localization laws. In free trade agreements (FTAs), ASEAN member states' adoption of data rules remains inconsistent. Singapore stands out for its numerous FTAs containing data-related provisions, whereas others have made limited commitments [Lee 2023].

However, many FTAs across ASEAN include stringent provisions that allow exceptions for data protection, particularly concerning national security. The divergent data regulatory frameworks in Southeast Asia impede ASEAN's objective of nurturing a unified digital economy and expose the region to challenges in global data governance, highlighting the need for substantial enhancements.

4.4. Regulatory fragmentation

Fragmented regulatory frameworks pose a significant obstacle to the efficient operation of the ASEAN digital economy. Enhanced coherence in regulations would empower regional firms to expand beyond local markets and tap into the burgeoning consumer base, thereby driving revenue growth. Currently, many companies operating within ASEAN face constraints imposed by incomplete digital regulations at the national level, compounded by varying rules enforced by global trading partners. Divergent cross-border data regulations require firms engaged in cross-border electronic activities, such as e-commerce, to navigate disparate regulatory landscapes. This not only escalates the costs associated with regulatory compliance but may also impede their participation in

the digital economy and access to ASEAN markets. Research indicates that restrictions on cross-border data transfers in countries like Indonesia or Vietnam could potentially reduce their gross domestic product (GDP) by 0.5 percent and 1.7 percent, respectively. The primary barrier to digital trade, as confirmed by most surveyed companies, is the limitations on information flows [Cory 2020].

To foster a cohesive regulatory framework for the regional digital economy, ASEAN and its trading partners must prioritize transparency in the design and implementation of digital regulations. The ASEAN Trade Repository should be expanded to encompass areas impacting digital business operations, such as data governance and content moderation, and should integrate with the national trade repositories of key trading partners.

ASEAN requires a systematic approach, akin to the Framework on Digital Data Governance and ASEAN Agreement on E-Commerce, with a focus on facilitating secure cross-border data flows and supporting priority sectors to stimulate growth in the regional digital economy. Accelerating the implementation of the ASEAN Digital Economy Framework Agreement (DEFA) and ASEAN-Plus DEFA will bolster the openness, security, interoperability, and competitiveness of digital economies in the region [Sithanoxay 2023].

The emerging regional digital economy holds immense potential to modernize ASEAN through the adoption of digital technology, fostering private sector-led growth. To realize these aspirations, there must be increased transparency in digital regulations, a more cohesive regulatory framework in Southeast Asia, and strategic collaboration with major trade partners worldwide.

4.5. Digital literacy and skills gap

Closing the digital literacy and skills gap across diverse demographics is paramount for ensuring inclusive participation in the digital economy and harnessing the benefits of digital transformation. Surveys indicate that while most young individuals recognize the importance of digital literacy for their future, many feel they lack sufficient digital skills [Marwaan 2024]. Certain demographic groups, such as rural residents, ethnic minorities, and older individuals tend to exhibit lower levels of digital literacy compared to younger cohorts.

Individuals who lack these skills perceive digital literacy as crucial for developing transferable skills and facilitating enhanced learning. While activities like online information searching are common, fewer individuals engage in more advanced tasks such as creating digital content or problem-solving. There exists a notable disparity in digital literacy education among ASEAN countries, with Myanmar and Lao PDR reporting fewer students learning digital skills in schools. Even in other countries, a significant portion of young people lack a formal digital education, with the quality of instruction often perceived as moderate.

Limited access to technical resources and infrastructure, coupled with inadequate training in schools, pose significant barriers to improving digital literacy. To address these challenges, young individuals advocate for increased practice time, enhanced access to technology, qualified teachers, and heightened awareness among stakeholders.

4.6. Ethical concerns

The widespread adoption of digital platforms has brought forth ethical concerns surrounding data privacy, online content moderation, and the potential exacerbation of social and economic inequalities. Governments across ASEAN are closely monitoring digital developments and have initiated strategies and frameworks to tackle these pressing issues. Moreover, ASEAN is collectively preparing a regional guide to address ethical challenges, among other pertinent matters. Collaborative efforts involving governments, industry stakeholders, academia, and civil society are imperative to maximize the benefits of the digital economy while effectively and sustainably mitigating associated risks [Lee Kok Thong 2024]. ASEAN members should persist in developing robust frameworks that not only address these ethical concerns but also foster innovation in the digital sphere.

5. What's next?

Despite the initial challenges posed by the global COVID-19 pandemic and ongoing geopolitical tensions, sectors harnessing digitalization have demonstrated resilience and sustained growth, with promising prospects for the years ahead. In Southeast Asia, digitalization has experienced rapid acceleration, driven by the influx of new internet users and heightened activity in e-commerce, fintech, the crypto sphere, AI, and other domains. Looking forward, the future of the digital economy in the region appears highly promising, presenting substantial opportunities for new investors seeking to diversify their portfolios and explore dynamic markets poised for sustained positive development across various sectors.

As previously mentioned, the digital economy of ASEAN member countries is projected to surpass a total value of \$1 trillion by 2030. This growth trajectory is fueled by the robust internet penetration rate in ASEAN, currently standing at 75%, resulting in a total digital consumer population of 350 million users [YCP Solidiance 2021].

ASEAN is anticipated to witness a significant surge of 62% in e-commerce gross merchandise value, potentially reaching \$234 billion by 2025, surpassing previous estimates of \$172 billion. Such rapid expansion within the industry presents promising opportunities for all stakeholders involved, drawing increasing interest from investors eyeing opportunities in the region, where ASEAN holds a leading position.

For instance, e-commerce platforms, regardless of their current market standing, are projected to require a continual influx of new vendors to sustain their growth trajectory, thereby presenting significant opportunities for new entrants and SMEs as suppliers. Furthermore, businesses in related sectors such as logistics stand to benefit from the success of e-commerce, with rising demand for services like same-day and long-distance deliveries [YCP Solidiance 2021].

Despite the challenges, the ASEAN region remains one of the most attractive investment destinations globally. Governments within the association are actively focusing on developing areas that are currently underdeveloped, as evidenced by initiatives like the ASEAN Master Plan on Rural Development 2022 to 2026. Here,

governments have articulated their commitment to leveraging new digital technologies and innovation to foster rural development, further bolstering the region's digital transformation journey [ASEAN 2021].

The bottom line

The digital economy presents a transformative pathway for regional growth, unlocking a wealth of opportunities for ASEAN member states. With its increasingly high internet penetration rates, ASEAN demonstrates a strong foundation for digital progress, potentially serving as a model for other developing regions within the Global Majority. However, the full potential of digitalization remains unrealized, with significant gaps in business adoption and monetization despite success stories in the private sector. Recognizing this potential, ASEAN countries are actively formulating national and regional digital economy plans.

For ASEAN to fully embrace the digital revolution, fostering a collaborative and integrated approach is crucial. Governments across the region must continue to work together to create a secure and attractive environment for the digital economy. This includes prioritizing five key areas: payment infrastructure, digital skills development, harmonized policies and regulations, efficient logistics networks, and robust data governance frameworks. Collaborative efforts are needed to address regulatory gaps, particularly in areas like consumer protection and data privacy. Additionally, harmonizing regulations across member states will be essential for promoting cross-border data flows and fostering regional innovation.

While government intervention is necessary to set the stage, it is equally important to empower the private sector as a driver of innovation and investment. Streamlining national and regional digital economy plans and ensuring strong public-private partnerships are critical for successful implementation. This collaborative approach can ensure the private sector has the necessary support and a clear regulatory framework to flourish.

The digital economy has the potential to promote inclusivity within ASEAN by increasing access to information and economic opportunities for a wider demographic. Falling mobile broadband costs are crucial in bridging the digital divide, allowing individuals and entrepreneurs to participate in the global digital marketplace. Fintech advancements are further democratizing financial services, while AI is streamlining tasks and boosting productivity across various sectors. However, it is crucial to acknowledge the existing digital divide within and between ASEAN countries. Unequal access to affordable internet, especially in rural and remote areas, poses a significant barrier to inclusion. Efforts to bridge this gap are essential for ensuring equitable participation in the digital revolution.

Foreign investment remains a vital source of capital for ASEAN's digital transformation. Governments across the region are actively creating attractive investment environments, offering incentives to entice foreign investors. It is important to note that investment opportunities extend beyond the digital sphere, with significant needs in sectors like logistics, retail, and manufacturing, creating a diversified landscape for investment ventures.

By leveraging its successful model of regional integration, ASEAN is well-positioned to become a leader in the digital age. Through collaborative efforts, targeted investments, and a focus on inclusivity, ASEAN can harness the immense potential of the digital economy, propelling the region towards a prosperous and interconnected future.

Bibliography

Alberts, T., 2013. *Conflict and Conversion: Catholicism in Southeast Asia, 1500-1700 (Introduction: The Crossroads of the World)*. Oxford: Oxford University Press

ASEAN, *e-ASEAN Framework Agreement*. [pdf] Available at: <https://agreement.asean.org/media/download/20140119121135.pdf> (Accessed 13 April 2024)

ASEAN, 2024. The Founding of ASEAN. Available at: <https://asean.org/the-founding-of-asean> [online] (Accessed 10 April 2024)

ASEAN +3 Macroeconomic Research Office, 2024. *ASEAN+3 Regional Economic Outlook 2024*. [online] Available at: <https://amro-asia.org/asean3-regional-economic-outlook-2024/> (Accessed 12 April 2024)

ASEAN, 2021. *ASEAN Master Plan on Rural Development 2022 to 2026*. [pdf] Available at: <https://asean.org/wp-content/uploads/2022/11/34-ASEAN-Master-Plan-on-Rural-Development-2022-2026.pdf> (Accessed 20 April 2024)

ASEAN, 1997. *1997 ASEAN Vision 2020*. [pdf] Available at: https://www.icnl.org/wp-content/uploads/Transnational_vision.pdf (Accessed 13 April 2024)

ASEAN, 2012a. *Declaration on the ASEAN Economic Community Blueprint*. [online] Available at: <https://asean.org/declaration-on-the-asean-economic-community-blueprint/> (Accessed 17 April 2024)

ASEAN, 2012b. *Framework on Digital Data Governance*. [pdf] Available at: https://asean.org/wp-content/uploads/2012/05/6B-ASEAN-Framework-on-Digital-Data-Governance_Endorsedv1.pdf (Accessed 19 April 2024)

ASEAN, 2012c. *Framework on Personal Data Protection*. [pdf] Available at: <https://asean.org/wp-content/uploads/2012/05/10-ASEAN-Framework-on-PDP.pdf> (Accessed 19 April 2024)

ASEAN, 2015. *ASEAN ICT Masterplan 2015*. [pdf] Available at: <https://asean.org/wp-content/uploads/images/2015/December/telmin/ASEAN%20ICT%20Completion%20Report.pdf> (Accessed 17 April 2024)

ASEAN, 2021. *ASEAN Digital Master Plan 2025*. [pdf] Available at: <https://asean.org/wp-content/uploads/2021/09/ASEAN-Digital-Masterplan-EDITED.pdf> (Accessed 19 April 2024)

ASEAN, 2022. *ASEAN Cybersecurity Cooperation Strategy*. [pdf] Available at: https://asean.org/wp-content/uploads/2022/02/01-ASEAN-Cybersecurity-Cooperation-Paper-2021-2025_final-23-0122.pdf (Accessed 19 April 2024)

ASEAN, 2023. *Framework for Promoting the Growth of Digital Startups in ASEAN*. [pdf] Available at: <https://asean.org/wp-content/uploads/2023/03/1.Framework-for-Promoting-the-Growth-of-Digital-Startups-in-ASEAN-1.pdf> (Accessed 19 April 2024)

Asian Development Bank, 2017. *Meeting Asia's Infrastructure Needs*. [online] Available at: <https://www.adb.org/publications/asia-infrastructure-needs> (Accessed 1 June 2024)

Asia-Nikkei, 2021. *ASEAN's digital economy projected to hit \$1tn by 2030*. [online] Available at: <https://asia.nikkei.com/Business/Business-trends/ASEAN-s-digital-economy-projected-to-hit-1tn-by-2030> (Accessed 17 April 2024)

Bain & Company, 2022. *e-Conomy SEA 2022*. [online] Available at: <https://www.bain.com/insights/e-conomy-sea-2022/> (Accessed 27 May 2024)

Bangkok Post, 2022. *Education Reform Project Aligns with Thailand 4.0*. [online] Available at: <https://www.bangkokpost.com/thailand/general/2258299/education-reform-project-aligns-with-thailand-4-0> (Accessed 1 June 2024)

Bloomberg – Sponsored. *Open for Business: Southeast Asia's Digital Payments Revolution*. [online] Available at: <https://sponsored.bloomberg.com/article/hsbcasean/open-for-business-southeast-asia-s-digital-payments-revolution> (Accessed 1 June 2024)

Bloomberg Sponsored (by Standard Chartered), 2023. [online] *Banking On ASEAN's Digital Economy*. Available at: https://sponsored.bloomberg.com/article/sc/banking-on-asean-s-digital-economy#_ftn13 (Accessed 18 April 2024)

Bloomberg. *How Digital Technology Is Transforming Asia's Economy*. [online] Available at: <https://sponsored.bloomberg.com/article/axa-investment-managers/whats-driving-asias-digital-evolution> (Accessed 18 April 2024)

Cory, N., 2020. *Surveying the Damage: Why We Must Accurately Measure Cross-Border Data Flows and Digital Trade Barriers*. [online] Available at: <https://itif.org/publications/2020/01/27/surveying-damage-why-we-must-accurately-measure-cross-border-data-flows-and/> (Accessed 19 April 2024)

Countries' national statistics offices; Oxford Economics - McKinsey, 2024. *Southeast Asia quarterly economic review: Proving resilient*. Available at: <https://www.mckinsey.com/featured-insights/future-of-asia/southeast-asia-quarterly-economic-review> (Accessed 12 April 2024)

Economic and Social Commission for Asia and the Pacific. *A significant proportion is made up of young generations who are receptive to blockchain*. [online] Available at: <https://www.population-trends-asiapacific.org/data/sea> (Accessed 28 May 2024)

Economic Research Institute for ASEAN and East Asia, 2023. *ASEAN's Digital Integration: Evolution of Framework Documents*. [pdf] Available at: https://www.eria.org/uploads/media/Books/2023-ASEAN-Digital/5_Executive-Summary.pdf (Accessed 17 April 2024)

Infocomm Media Development Authority. *Internet Penetration Rates*. [online] Available at <https://www.imda.gov.sg/about-imda/research-and-statistics/telecommunications> (Accessed 1 June 2024)

Innoma, 2023. *Southeast Asia's Venture Market Dynamics in Post-COVID Era*. [online] Available at: <https://innoma.vc/2024/02/09/southeast-asia-vc-report-2024/> (Accessed 17 April 2024)

Korea Blockchain Week, 2023. *Blockchain and crypto in Southeast Asian countries*. [online] Available at: <https://koreablockchainweek.com/blogs/kbw-blog/blockchain-and-crypto-in-southeast-asian-countries> (Accessed 18 April 2024)

Lee Kok Thong, J., 2024. *The Right to Data Privacy in the Digital Economy*. [online] Available at: <https://theseanmagazine.asean.org/article/the-right-to-data-privacy-in-the-digital-economy/> (Accessed 20 April 2024)

Lee, J., 2023. *ASEAN's Window of Opportunity for Shaping Global Data Governance*. [online] Available at: <https://thediplomat.com/2023/09/aseans-window-of-opportunity-for-shaping-global-data-governance/> (Accessed 19 April 2024)

Marwaan, M.M., 2024. *ASEAN's digital economy growth hinges on upskilling: BCG chair*. [online] Available at: <https://asia.nikkei.com/Editor-s-Picks/Interview/ASEAN-s-digital-economy-growth-hinges-on-upskilling-BCG-chair> (Accessed 20 April 2024)

McKinsey, 2024. *Southeast Asia quarterly economic review: Proving resilient* [e-journal]. Available at: <https://www.mckinsey.com/featured-insights/future-of-asia/southeast-asia-quarterly-economic-review> (Accessed 12 April 2024)

Mercuryo, *Unbanked Regions in Asia*. [online] Available at: <https://mercuryo.io/explore/article/unbanked-asia> (Accessed 28 May 2024)

Quah S., Chen K., 2021. Digital masterplan. Getting the next five years right for ASEAN, *The Business Times*, 19(1). [pdf] Available at: https://lkyspp.nus.edu.sg/docs/default-source/aci/digital-masterplan-getting-the-next-five-years-right-for-asean.pdf?Status=Temp&sfvrsn=a4632b0a_2 (Accessed 19 April 2024)

Rayhan, A., 2023. *The Future of Work: How AI and Automation Will Transform Industries*. [online] Available at: https://www.researchgate.net/publication/372589640_THE_FUTURE_OF_WORK_HOW_AI_AND_AUTOMATION_WILL_TRANSFORM_INDUSTRIES (Accessed 19 April 2024)

Singapore Business Federation. *E-commerce in Singapore*. [online] Available at: <https://www.sbf.org.sg/> (Accessed 1 June 2024)

Singapore Government Agency Website, *Singapore Government Services*. [online] Available at: <https://go.gov.sg/#/> (Accessed 1 June 2024)

Sithanoxay, S., 2023. *Fragmented Digital Regulations Are Constraining ASEAN's Digital Economy*. [online] Available at: <https://fulcrum.sg/fragmented-digital-regulations-are-constraining-aseans-digital-economy/> (Accessed 19 April 2024).

Smartnation. *Singapore's Smart Nation Initiative*. [online] Available at: <https://www.smartnation.gov.sg/> (Accessed 1 June 2024)

Temenos, 2023. *Charting the Future of Banking in ASEAN*. [online] Available at: <https://www.temenos.com/news/2023/08/21/charting-the-future-of-banking-in-asean/> (Accessed 18 April 2024)

The Asean Magazine, 2022. *Digital Economy: Facts and Figures*. [online] Available at: <https://theaseanmagazine.asean.org/article/digital-economy-facts-and-figures/> (Accessed 28 May 2024)

The ASEAN Secretariat, 2008. *ASEAN Economic Community Blueprint*. [pdf] Available at: <https://www.asean.org/wp-content/uploads/images/archive/5187-10.pdf> (Accessed 27 May 2024)

The Asean, 2022. *ASEAN goes full throttle on digital transition*. Available at: <https://theaseanmagazine.asean.org/article/asean-goes-full-throttle-on-digital-transition/> (Accessed 15 April 2024)

The New York Times, 2023. *How ChatGPT Kicked Off an A.I. Arms Race*. [online] Available at: <https://www.nytimes.com/2023/02/03/technology/chatgpt-openai-artificial-intelligence.html> (Accessed 17 April 2024)

The World Bank, 2022. *Positioning The Lao PDR for a Digital Future*. Available at: <https://thedocs.worldbank.org/en/doc/c01714a0bc2ca257bdfe8f3f75a64adc-0070062022/original/Positioning-The-Lao-PDR-for-a-Digital-Future-11-10-22.pdf> (Accessed 16 April 2024)

The World Economic Forum, 2020. *COVID-19—The True Test of ASEAN Youth's Resilience and Adaptability Impact of Social Distancing on ASEAN Youth*. [pdf] Available at: https://www3.weforum.org/docs/WEF_ASEAN_Youth_Survey_2020_Report.pdf (Accessed 18 April 2024)

The World Economic Forum, 2020. *Young people in ASEAN have emerged from lockdowns more resilient and digitally switched on. Here's how.* [online] Available at: <https://www.weforum.org/agenda/2020/10/young-people-asean-digital-adoption-covid-19/> (Accessed 17 April 2024)

The World Economic Forum, 2023. *These are the places in the world where internet access is still an issue – and why.* [online] Available at: <https://www.weforum.org/agenda/2023/09/broadband-no-luxury-basic-necessity/> (Accessed 10 April 2024)

UNESCO, 2023. *UNESCO and partners to lead workshop on digital transformation in Cambodia.* [online] Available at: <https://www.unesco.org/en/articles/unesco-and-partners-lead-workshop-digital-transformation-cambodia> (Accessed 16 April 2024)

United Nations, UN Chronicle, *A Special Partnership with the UN: An Asian Perspective.* Available at: <https://www.un.org/en/chronicle/article/special-partnership-un-asian-perspective> (Accessed 13 April 2024)

Yan Ing L., Markus I., 2023. *ASEAN Digital Community 2040, Economic Research Institute for ASEAN and East Asia.* [pdf] Available at: <https://www.eria.org/uploads/media/policy-brief/FY2022/ASEAN-Digital-Community-2040..pdf> (Accessed 19 April 2024)

YCP Solidiance, 2021, *Digital Economy Growth in ASEAN.* Available at: <https://ycpsolidiance.com/article/digital-economy-growth-in-ASEAN> (Accessed 20 April 2024)