

DIGITAL ECONOMY ECOSYSTEM



ASEAN & CAMBODIA'S INSIGHTS

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FOREWORD

As the National Assembly of Cambodia (The NA) has taken over the chairmanship of the ASEAN Inter-Parliamentary Assembly (AIPA) from Brunei, the year 2022 marks a significant commitment of the legislative branch to be ready and hopeful for a momentous physical gathering of the 43rd AIPA Summit, in terms of both hospitality and substance of various subject matters.

In my capability as the Secretary General of the NA, I interpret the stewardship as an extraordinary privilege for Cambodia's Parliaments to take the lead of parliamentary voice to echo the pressing issues in the region; to name some:

- Strengthening parliamentary diplomacy for security concerns i.e. humanitarian crises and conflicts
- Being committed to inclusiveness in the address of poverty reduction & the UN's pledge of "leaving no one behind"
- Accelerating climate ambition, impact, and accountability,

whilst the Covid-19 response and recovery remain paramount.

On top of that, a new challenge arises in no time; it is when digital transformation is compulsory for every nation to adapt and adopt, particularly during the influx of industrial 4.0 in which the digital economy shares a great deal of economic stimulus. Government leaders are more captivated by the need to be ready for digital transformation in terms of relevancy in their political agendas and policies i.e. education, health, and trades amongst others.

In such instances, I am more than positive that the future of our region will be profoundly navigated by digital talents. By then, political considerations on "Digital Economy" come into play, requiring lawmakers and policymakers to be likely obligated to shape their agenda of policy debates on growth, equity, equality, and other subject matters relevant to digital dimensions and their associated risks & challenges. With this prophecy, it is now or never that AIPA shall further exercise their parliamentary supremacy to uphold and support parliamentary character and perspectives to resolute what makes sense to transform the challenges into opportunities.

But as one may claim: it is easier said than done. The parliamentary intervention may not be in fine shape as the scarcity of parliamentary knowledge on the issue is more than obvious,

particularly amongst senior parliamentarians who are probably not tech-savvy compared to their young colleagues. The inclination of acquiring information to keep parliaments informed, therefore, becomes more vivid and relevant these days. That is why I believe the “Digital Economy Ecosystem: ASEAN & Cambodia’s Perspectives” portfolio would be handy for parliamentarians locally and regionally, at least to some extent.

Needless to say, growth is not simply attainable. It would be at the expense of political, social, and environmental effects that jeopardize the future welfare of communities across the region. As a solution-oriented publication with key messages at the end, I hope the substance in this portfolio would keep parliamentarians at the pace of the latest development in the digital sphere, reflecting a glimmer of light on practical policy answers that can reasonably ascertain the public that: the **resources be sustainable and green**, the **citizens are resilient to new normal** & the **cultures of decision making be inclusive**.

Digitalization and the digital economy are already here and will transform at a greater scale on short notice. With this piece of digital insights, I cannot be proud enough to serve you well in the midst of the transformation, either in my role as the Secretary General of Cambodia’s National Assembly or in the rotating capability as the AIPA’s host Secretary for this year. That being said, may this publication contribute also to the Summit of AIPA 43rd under the Cambodian National Assembly’s stewardship.

I wish you, honorable parliamentarians and dear readers, a perspicacious and hopefully intriguing read, that would hopefully generate a rich and stimulating perspective on the subject.

Phnom Penh, 15 October 2022,

Secretary General

A handwritten signature in blue ink, consisting of a stylized 'L' shape followed by a horizontal line that curves upwards at the end.

LENG PENG LONG

PREFACE

The portfolio on “Digital Economy Ecosystem” was delivered by the parliamentary research substance team of the General Directorate of Legislation and Research (GDLR), with its familiar function as Cambodia’s Parliamentary Research Service (Cam-PRS).

The paper examines the developments of digital economy during the influx of industrial revolution 4.0 (4IR) alongside the survival, necessity, and adaptation to the uncertainty of rapidly-changing world under the threat of the pandemic that changes the way how people live, learn, socialize, and particularly engage in economic activities to build their resilience in the new normal.

It also provides an overview of recommendations with respect to trust in privacy and security in cyberspace, amongst others.

Correspondence & Persons in Charge

The digital economy portfolio responded to the proposal of **Secretary General LENG PENG LONG** and was thereby prepared for publication by the GDLR’s pool of talents, as listed in each Chapter.

The substances were also reflected by the contributions of all Chiefs of Offices from the two research Departments.

The course of research production was made possible under the support of the two Directory Heads: **Ratha HENG** and **Chanlinda MITH**.

Suonvisal SETH led the research process with overall supervision, edition, and proofreading, alongside with the inputs from **Dr. Kimlong CHHENG**.

The ultimate quality of publication was approved by the GDLR’s Leadership: **Kethnin KAY** and **Prakath PEN**.

This publication is a contribution to the “strengthening of parliamentary roles”, particularly addressing the dimension of legislation. It is also to support the work of international parliamentary meetings and forums in future instances where the digital economy topic might be relevant. AIPA being hosted in Cambodia in 2022 could be the immediate reflection of this portfolio, benefiting a great deal of substance in the panel of economic matters.

EXECUTIVE SUMMARY

In the revolutionary age of technological advancement, the digital economy rises in popularity where business transactions turn into an online world as a convergence of brand recognition and status within their industries whilst also hoping for a prodigious return on investment with growth and success. The convenience and benefits harnessed by the digital economy also come with a price to pay; those are challenges and risks that include, inter alia, controversial debates on unemployment, inequality, threats to the environment, and cyber risks.

Thereby, it is significant for an economy, a business, or a government to embed and embrace the online digital strategies and policies for the digital economy to be exercised in a safe, secure, inclusive and sustainable environment. The necessity becomes a motive that lays out the blueprint for this Digital Economy portfolio, structured in Chapters covering various spectrum of subject matter.

Chapter I kicks off by providing preliminary knowledge and an introduction to the **Foundation of Digital Economy**. The general information highlights the ecosystem around the concept of economy generated in the digital sphere that includes, but not limited to, E-Commerce, FinTech, and their drivers as well as the enabling environment.

Chapter II showcases an **ASEAN Digital Outlook** to prep for digital transformation as an upgrade tool of the economy, followed by the **Opportunity** and impactful change that Digital Economy could provide in shaping ASEAN economy, leading further to an investigation on **Drawbacks** hampering digital economy advancement before mapping and discussing on **ASEAN Policies Context** & Other AMS (ASEAN Member States)' Initiatives/Best Practices in relevance of building a prosperous ASEAN Digital Transformation and Digital Economy.

Cambodia's Case Study is schematized in Chapter III to provide an understanding of the **country's position in digital transformation and economy**. This considers existing policies, frameworks, action plans and initiatives to promote the cause under stipulated authorities and ministries such as taxation, education, labor, finance and banking amongst others.

"**Trustworthiness**" is projected in the Final Chapter, highlighting why **digital trust** matters, what **standards for ethics** shall be considered, and how **data governance** shall be appropriately addressed; all of which aim at addressing security in cyberspace and protecting personal data as the two facets would drive temptation of online users to be more actively engaged in the digital economy without fear of their data being jeopardized by unethical manners such as cyberattack, theft of intellectual property, personal identity threat, and information extortion.

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Suonvisal SETH

Acronyms



3D	3 Dimensions
4IR	Fourth Industrial Revolution
ACRF	ASEAN Comprehensive Recovery Framework
AEC	ASEAN Economic Community
AI	Artificial Intelligence
AMS	ASEAN Member States
DIFAP	Digital Integration Framework Action Plan
E-Commerce	Electronic Commerce
EdTech	Education Technology
EU	European Union
FinTech	Financial Technology
GDLR	General Department of Legislation and Research
GDPR	General Data Protection Regulation
ICT	Information Communication Technology
IMF	International Monetary Fund
IoT	Internet of Things
IT	Internet Technology
ITU	International Telecommunication Union
LDCs	Least Developed Countries
MLVT	Ministry of Labor and Vocational Trainings
MoEYS	Ministry of Education, Youth, and Sport
MPVT	Ministry of Public Works and Transport
MSAP	Mandatory Standard on Access Pricing
PDPA	Personal Data Protection Act
PPP	Public-Private Partnership
SDGs	Sustainable Development Goals
SMEs	Small and Medium Enterprises
STEM	Science, Technology, Engineering, and Mathematics
TVET	Technical and Vocational Education Training



Reading Time: 12 Minutes

Chapter I

Digital Economy: Foundation: Drive, Enablers & Trend

Author: Khuneary HAS
Editor: Nary VAN & Ketty BUNSONG



Blueprint

Innovations and development in technology introduce an emergence of economy based on digital goods and services; that is digital economy. The paradigm empowers businesses to adapt and adopt scalable and inclusive approaches with tools supported and enabled by the ICT (Information and Communication Technology) evolution, connecting a worldwide network of economic activities, commercial transactions, and professional interactions. Thus, the complexity of digital economy requires a foundation of understanding of its ecosystem, drive and enabling environment.

The chapter continues to touch on the surface of global perspectives and trends of digital economy, coupled with the highlight of rewards and threats as expected from the economy. The insights into digital aspects are also in a relationship with how organized and equipped the world is to evolve in the age of “digital readiness”.

1.1. Digital Economy Drive

The digital economy refers to the economy in which a wide range of activities using digitized information and knowledge as main factors of production.¹ At first, the digital economy was called the internet economy, the new economy or the web economy because of its reliance on the connection with internet, but according to the economists and leaders in the field of business emphasize that the digital economy is more advanced and complex compared to the internet economy which is just economic value obtained from the internet.²

The evolvement of digital economy's definition since the mid of 1990s reflected through the rapid transformation of the nature of technology, including the surge of using advanced robotics, Artificial Intelligence (AI), the Internet of thing (IoT), cloud computing, big data analytics and 3D printing, used by consumers and enterprises; in addition, the significant elements of the digital economy are digital platforms and interoperable systems.³

(Remark: Examples of these terminologies are provided in the Annex: Additional Explanation on Key Terms)

The definition of digital economy is therefore defined as the “the global network of economic and social activities that are enabled by information and communications

technologies such as the internet, mobile and sensor networks” which it also includes the conducts in the sectors as such education, entertainment, transactions in finance, business and communications involving with utilizing computers, phones as well as other devices.⁴

The popularity of the digital economy has increased since the late 1990s and the beginning of 2000s due to the internet and technology are acknowledged as the essential tools in improving the competition among firms leading to the practice of datafication, digitization, virtualization and generativity; this emergence is regarded as a part of the world's moment toward Industrial Revolution 4.0 (4IR).⁵

In order to have a higher chance of survival in the long-term in the realm of industrial revolution, the companies have to digitally transform, otherwise, competitors will disrupt them suffering within their existing industries or running out of business and they even don't aware of brand-new players appearing from an industry.⁶ Regarding to this, adaptation is also seen as a key element for companies to survive within the era of revolution changing life rapidly in almost every aspect which they need to adjust their setups and methodologies—meaning transforming in digital in order to be successful;⁷ it is necessity to do so because of shifting in the present and in the future as such the behavior and expectations of customers, society, new economic realities,

¹ ADB, Understanding the Digital Economy: What Is It and How Can It Transform Asia? (New Delhi, 2018) <<https://www.adb.org/news/events/understanding-digital-economy-what-it-and-how-can-it-transform-asia>>

² Mary K. Pratt, digital economy (TechTarget, 2017) <<https://www.techtarget.com/searchcio/definition/digital-economy>>

³ UNCTAD, DIGITAL ECONOMY REPORT 2019: VALUE CREATION AND CAPTURE: IMPLICATIONS FOR DEVELOPING COUNTRIES (UNITED NATIONS, Geneva, 2019) p. 4 <https://unctad.org/system/files/official-document/der2019_en.pdf>

⁴ Australian Government: Australian Law Reform Commission, The concept of the digital economy (alrc, 2013)

<<https://www.alrc.gov.au/publication/copyright->

[and-the-digital-economy-dp-79/3-policy-context-of-the-inquiry/the-concept-of-the-digital-economy/](https://www.alrc.gov.au/publication/copyright-)>

⁵ Chan Pirun, Chhem Siriwat, and Nay Darlin, Developing Cambodia's Digital Economy: Youth's Perspective (nbc, 2021) p.1

<https://www.nbc.org.kh/download_files/macro_conference/english/S6_Development_Cambodia_Digital_Economy_Youth_Perspective.pdf>

⁶ Nick Ismail, Digital transformation is now a matter of survival (Information Age, 2017)

<<https://www.information-age.com/digital-transformation-matter-survival-123467460/>>

⁷ ENTERPRISE WORLD, Why Digital Transformation is necessary for your Company in 2021

<<https://theenterpriseworld.com/why-digital-transformation-is-necessary/>>

disruption within the industry, and digital technologies.⁸

1.2. Rewards & Threats

• Rewards of Digital Economy

Digital economy provides significant benefits to the economy by creating new opportunities and its digital data is much more important in solving social problems and using for development purposes including those related to the SDGs (further elaboration could be found in other section). What is more, it supports the improvement on the outcomes of the economy and society, in particular, it influences for growth in innovation and productivity. For platform, it plays an essential role in facilitating transactions, networking and information exchange. Digitalization for all sectors and markets reduces costs and fosters production of goods and services with higher quality.⁹

For the emerging economies, digital economy is very potential for them because it encourages investment through the decreasing price of information and communication technology (ICT) and it enables firms to enter the global value chains and accesses consumers directly in foreign markets which previously it is possible for only companies from advanced economies. Not only for private sector but digital economy also provides benefits for public sector and government, allowing them to have access to technologies that enable them to improve the quality of delivering

public services with a better result in term of governance and policies evaluation.¹⁰

• Threats of Digital Economy

Besides its benefits, digital economy also has its disadvantages as well, for example, losing jobs as depending more on technology; it changes the natural way of using human resources which affects our societies, resulting to an increase in unemployment rate. According to the 2016 report of Global Human Capital, it predicted that in 2020, 7 million jobs may disappear from the world including both types of worker, basic white-collar and blue-collar.¹¹

Furthermore, it is costly, requires enormous investment, resources, and lengthy process in building a vibrant digital economy¹². That is challenging for governments, especially for the governments of emerging economies in dealing with many fronts in order to gain benefits. For instance, they may need to cope up with constraints by building up digital skills, fostering competition and conditions in the market through regulatory frameworks whilst also boosting investment and innovation via policies.¹³

Technological adoption is also disproportionately and uneven geographically incentivized. A larger scale and rapidity of technology adoption is generally found in developed world whilst the least developed countries (LDCs) are quite behind due to the lack of ICT access and infrastructure, such as digital devices including computers, smart devices (phones & tablets). Disproportionate allocation of ICT

⁸ i-SCOOP, What is digital business transformation? The essential guide to DX
<<https://www.i-scoop.eu/digital-transformation/>>

⁹ UNCTAD, DIGITAL ECONOMY REPORT 2019: VALUE CREATION AND CAPTURE: IMPLICATIONS FOR DEVELOPING COUNTRIES (UNITED NATIONS, Geneva, 2019) p. XVI
<https://unctad.org/system/files/official-document/der2019_en.pdf>

¹⁰ Jorge Arbache, Seizing the benefits of the digital economy for development (voxeu, 2018)
<<https://voxeu.org/content/seizing-benefits-digital-economy-development>>

¹¹ Xia Tian and Pei Jingsong, The Impact of Digital Economy on Employment—Thinking Based on the

Epidemic Situation in 2020 (E3S Web of Conferences 235, 03034 (2021))

https://www.e3s-conferences.org/articles/e3sconf/pdf/2021/11/e3sconf_netid2021_03034.pdf

¹² Altaf Shaikh, What is Digital Economy? Meaning, Advantages & Disadvantages (FinanceNInsurance, 2022) <<https://financeninsurance.com/digital-economy/>>

¹³ Jorge Arbache, Seizing the benefits of the digital economy for development (voxeu, 2018)
<<https://voxeu.org/content/seizing-benefits-digital-economy-development>>

access was backed up by data as found in 2019, only one-third of Pakistani households had the privileged to ICT access, a similar trend to Peruvian and Bangladeshi, if

compared to a much more favorable data consumer in Swiss households having accounted for 92%.¹⁴

• Global Digital Readiness Index

The digital readiness index 2019 was based on seven components such as basic needs, human resources, ease of doing business, business and government investment, start-up environment, technology infrastructure and technology adoption, in which the score was ranged from 0 to 25 by classifying into 3 stages:

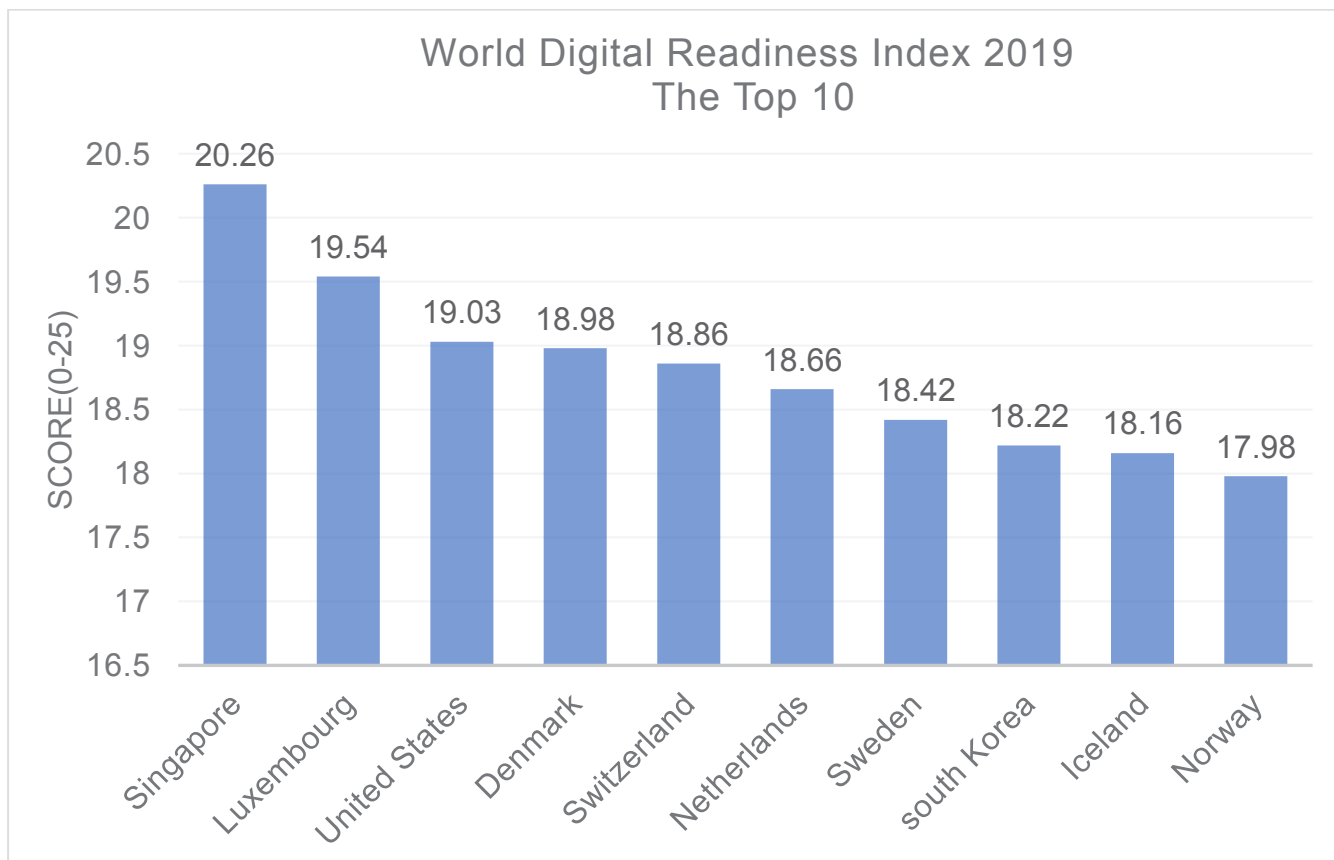
1/ activate stage is for countries that are in the earliest stages of digitalization dynamics (average digital readiness score of 6.24)

2/ accelerate stage was for countries that several steps had been taken to accelerate their digital readiness (average digital readiness scores of 11.82)

3/ amplify stage was for countries that were matured into digital but sustainability was not guaranteed (average digital readiness score of 17.89).¹⁵

(Note: The ASEAN Digital Readiness is discussed in further details in the next Chapter)

Graph 1: World Digital Readiness Index 2019 (Top 10)

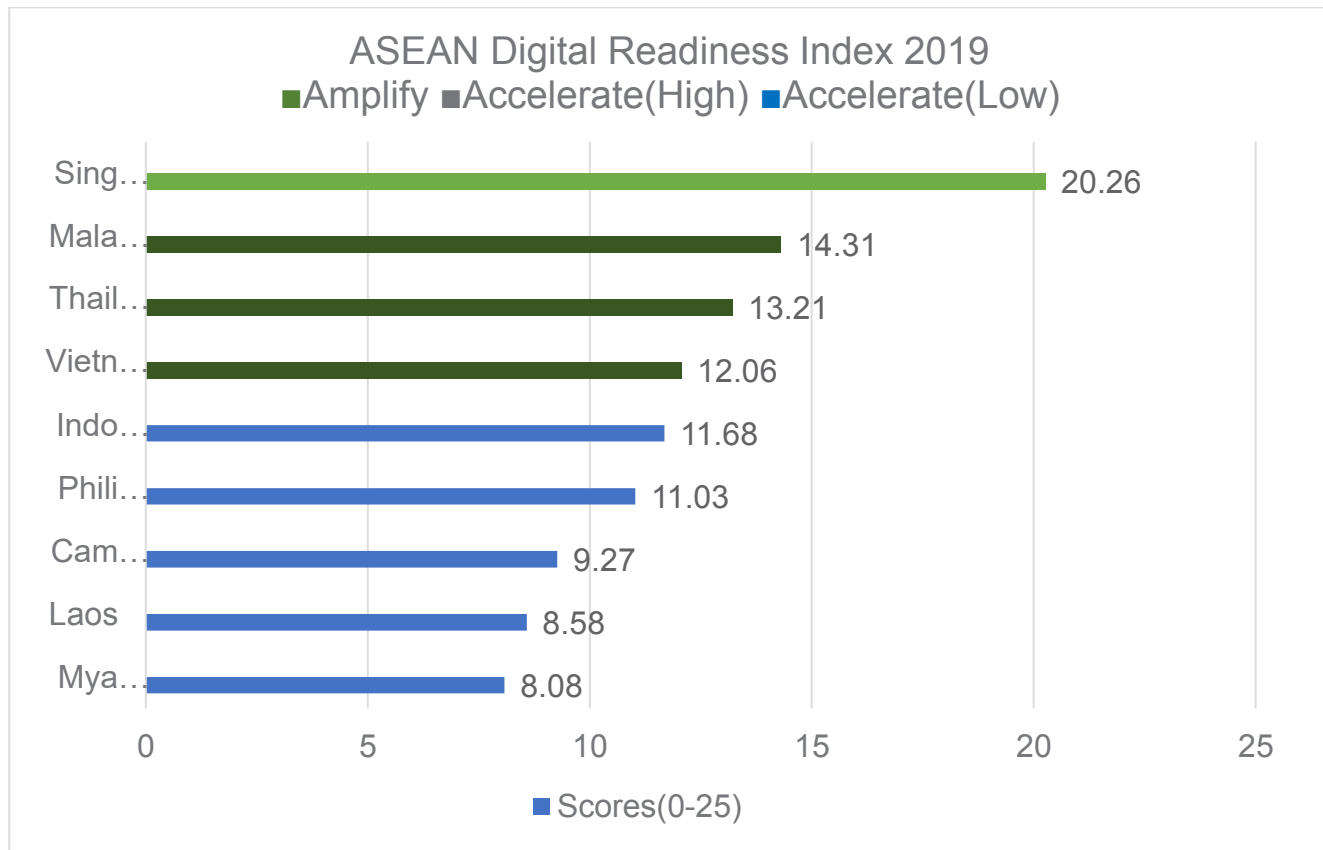


Source: CISCO, Digital Readiness Index 2019

¹⁴ number 11 of UNIDO

¹⁵ Afriyadi Cahyadi and Róbert Magda, Digital Leadership in the Economies of the G20 Countries: A Secondary Research (MDPI: Economies, 2021)

Graph 2: ASEAN Digital Readiness Index 2019



Source: CISCO, Digital Readiness Index 2019

Remark: ASEAN Digital Readiness will be discussed in further details in “Chapter III on ASEAN Matters”. The presentation in this block of Chapter II aims at providing an overview only to link with the Global Digital Readiness.

According to CISCO, the top ten of global digital readiness index in 2019 in the amplify stage were: only one from North America, the United States; two countries from Asia: Singapore and South Korea; and the rest is from Europe, Luxembourg, Denmark, Switzerland, Netherlands, Sweden, Iceland and Norway.

Even though China was ranked 54th for digital readiness index, but its innovation score was higher than Japan, France, Canada, Australia, Italy, Saudi Arabia and Argentina, while the innovation score of India, 101st in the digital readiness index, was ranked higher than Mexico, South Africa, Brazil, Saudi Arabia, and Argentina. The countries of G20 were seen as leaders in global

digitization since they adopted digital technology, creating new opportunities as driving force for growth in modern global economy.^{16 17}

For the digital readiness index within ASEAN, Singapore was ranked 1st in amplify stage, whereas Malaysia, Thailand and Vietnam were in accelerate(high) stage and at the same time, Indonesia, Philippines, Cambodia, Lao and Myanmar were in accelerate(low) stage. To date, the data related to Brunei has not been found yet or is not available on the internet, but for Artificial Intelligence (AI) Readiness Index, Brunei was ranked 57th in the global and 4th within

¹⁶ CISCO, Digital Readiness Index 2019
[https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/>](https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-resources/digital-readiness-index.html#/)

¹⁷ Afriyadi Cahyadi and Róbert Magda, Digital Leadership in the Economies of the G20 Countries: A Secondary Research (MDPI: Economies, 2021)

ASEAN after Singapore, Malaysia and Indonesia).¹⁸

1.3. Digital Economy Enablers

The digital economy grows or not depending on its enablers which can be:

- **Cybersecurity**

Cybersecurity is recognized as one of the key enablers of a digital economy.¹⁹ The risks associated with cyber could be potentially impeding trust and resilience in digital economy.²⁰ Thus, strengthening cybersecurity is needed in order to protect networking, devices and data from accessing it unlawfully or using it in a criminal action. It is also to guarantee the information being utilized with confidentiality, integrity and availability.²¹

- **Digital Literacy**

Digital skills are required as the role of digital technologies increases in workplaces and the skill is categorized into two aspects; one of which is at the core of ICT skills covering on programming, applications, infrastructure, data analytics and cybersecurity. The second type of skills is generic ICT skills for those who work in the digitalized environment. Since technology evolves rapidly, the skills that are provided at schools falling short and becoming outdated quickly. Therefore, it is essential to enhance the ICT skills for

students who graduated and the workforce for the digital economy which evolves in the long term.²²

- **Digital Infrastructure**

Digital Infrastructure is needed because the digital economy requires a smooth connection between organizations and individuals regardless of their location, so it depends on digital infrastructure which is robust, reliable, responsive, scalable and secure.²³

Data is the element that cannot be ignored in digital economy because it is the most precious resource²⁴ or we can say data is everything in digital economy.²⁵ Data is “a critical enabler to personalized customer experiences, digital business models, industry ecosystems and automation.” Hence, in developing the digital economy, open data economy should be created on where data is shared extensively supporting data privacy and having laws to deal with potential threats.²⁶

- **Policies**

Last but not least, policies are needed in order to fuel digital economy at its maximum potential, requiring governments, digital key players, and stakeholders to embed dialogue that defines complete reflections on effective implications, impactful change and trusted

¹⁸ Azlan Othman, Brunei in top 4 for AI Readiness report (Borneo Bulletin, 2022)

<<https://borneobulletin.com.bn/brunei-in-top-4-for-ai-readiness-report-2/#:~:text=Brunei%20Darussalam%20ranked%2057th%20globally,43.50%20in%20the%20technology%20sector.>

¹⁹ Lilia Guan, Cyber security a key enabler of a digital economy(CIOTECHASIA,2020)

<<https://ciotechasia.com/cyber-security-a-key-enabler-of-a-digital-economy/>>

²⁰ ATKearney, Cybersecurity in ASEAN: An Urgent Call to Action, p. 1

<<https://www.kearney.com/documents/20152/989824/Cybersecurity+in+ASEAN.pdf/2e0fb55c-8a50-b1e3-4954-2c5c573dd121>>

²¹ CISA,CYBERSECURITY AWARENESS MONTH 2021YOU'RE YOUR PART.#BECYBERSMART <<https://www.cisa.gov/sites/default/files/publications/Cybersecurity%20Awareness%20Month%202021%20%20Why%20is%20Cybersecurity%20Important.pdf>

²² Safdar Nazir, Accelerating the Digital Economy: Four Key Enablers(HUAWEI, 2021)

<<https://e.huawei.com/ua/eblog/industries/insights/2021/accelerating-digital-economy>>

²³ Safdar Nazir, Accelerating the Digital Economy: Four Key Enablers(HUAWEI, 2021)

<<https://e.huawei.com/ua/eblog/industries/insights/2021/accelerating-digital-economy>>

²⁴ Safdar Nazir, Accelerating the Digital Economy: Four Key Enablers(HUAWEI, 2021)

<<https://e.huawei.com/ua/eblog/industries/insights/2021/accelerating-digital-economy>>

²⁵ UNCTAD,DIGITAL ECONOMY REPORT 2021: Cross-border data flows and development: For whom the data flow (Geneva, 2021)

<https://unctad.org/system/files/official-document/der2021_en.pdf

²⁶ Safdar Nazir, Accelerating the Digital Economy: Four Key Enablers(HUAWEI, 2021)

<<https://e.huawei.com/ua/eblog/industries/insights/2021/accelerating-digital-economy>>

rules in shaping the digital economy. A reasonable sense of logics and balance between equity and growth shall be placed in the center of a desirable digital future where policymakers can critically reflect on the reverse of inequalities and power imbalances that might be the consequences of digital economy. The consideration involves with the adaptation of existing policies, laws and regulations and/or it must adopt new ones in many areas.²⁷

- **Digital Ecosystem**

As a result of digitalization, digital ecosystem emerges that organizations come together by collaborating with each other in their specializes and building bonds, but competition remains between them.²⁸

Because of digital ecosystem, businesses have shifted the way how they collaborate. At first, the companies collaborate with each other through a joint venture or a strategic alliance with a few numbers of partners in sharing risk and in entering a new market. In the new fashion (of businesses operated under digital sphere), digital ecosystem attracts them to modify their conventional strategies in order to survive and to compete within the market. It is not a few, but dozens or even hundreds of companies from several industries work together in entering the market. This kind of collaboration establishes more value in products or services than a

single company does.²⁹ Moreover, digital ecosystem provides company an opportunity to expand and to innovate enabling for faster growth which it works, not only for the big corporates, but for the small and medium-sized businesses as well.³⁰

- **Digital Governance**

In modern life, digital technology and the internet enable almost the limitless of the generation, storage and exchange of private data and information. Thus digital governance is needed in order to protect the rights and privacy of consumers through regulations giving corporates to modify or to shape their privacy policies and their usage of data along with the preservation of freedom and online openness.³¹

Good governance is not only the requirement for the politics and the society but also for the economy where good corporate governance is regarded as a significant factor in maintaining digital economy's sustainability and decentralization. It plays a very important role in resolving trust issues of customers which demand accountability and transparency from the companies. Also, it improves faith and confidence among all relevant stakeholders such as the public, professionals, businesses, corporate sectors and government.³²

(This space is intentionally left blank)

²⁷ UNCTAD, DIGITAL ECONOMY REPORT 2019: VALUE CREATION AND CAPTURE: IMPLICATIONS FOR DEVELOPING COUNTRIES (UNITED NATIONS, Geneva, 2019) p. xviii
<https://unctad.org/system/files/official-document/der2019_en.pdf>

²⁸ Michael G. Jacobides, Arun Sundararajan and Marshall Van Alstyne, Platforms and Ecosystems: Enabling the Digital Economy (World Economic Forum, 2019) p.14
<https://www3.weforum.org/docs/WEF_Digital_Platforms_and_Ecosystems_2019.pdf>

²⁹ BCG, DIGITAL ECOSYSTEMS
<<https://www.bcg.com/capabilities/digital-technology-data/digital-ecosystems>>

³⁰ Tarsus distribution, The Rise of Digital Eco Systems (2022)
<<https://tarsusdistribution.co.za/the-rise-of-digital-ecosystems/>>

³¹ Daniel F. Runde and Sundar R. Ramanujam, Global Digital Governance: Here's What You Need to Know (CSIS, 2021)
<<https://www.csis.org/analysis/global-digital-governance-heres-what-you-need-know>>

³² Cen Cai, Ran Qiu and Yongqian Tu, Role of Digital Economy in Rebuilding and Sustaining the Space Governance Mechanisms (frontiers, 2022)
<<https://www.frontiersin.org/articles/10.3389/fpsyg.2021.828406/full>>

I.4. Current State and Trend of Digital Economy: A Global-scale Perspectives

According to IMF in measuring the digital economy by value-added, income or employment, it was less than 10 percent of the total of economic activities in most countries in 2018. In comparison with Mining, Utilities, Agriculture, Education and Transportation, Digital Economy is larger for most of the G-20 and the percentage that it shared to the global GDP was 4.5% in developed countries to 15.5% in developing countries, according to the 2019 report of UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT (UNCTAD).³³

The UNCTAD also indicated that only the United States and China covered 75% of all patents related to blockchain technologies, 50% of global spending on Internet of Thing (IoT), 75% of the cloud computing market and 90% of the market capitalization value of the world's seventieth largest digital platforms (US:68%, China:22%).³⁴

- **FinTech**

In a digital context, all applications of technology that are related to financial services exist in Fintech³⁵ which changes the way one deals with money and banking model whilst also assisting in financial business transaction with better fashion of

convenience³⁶, and therefore allowing optimum tracking information over buyers, sellers, kind of products and method of paying which are conducted in the physical realm to override the necessity of buyers and sellers to meet up but instead engage in a more accessible and fast interaction within a digital world.³⁷

- **EdTech & Skills**

To build an inclusive digital economy, enhancement digital skills for people are significant to meet the firms' requirement.³⁸ The education technology (Edtech) comprises of IT tools and educational practices to facilitate and enhance learning.³⁹ "It also has a crucial role in providing new and innovative forms of support to teachers, students, and the learning process more broadly."⁴⁰

Even though, the future of the pandemic is still under uncertainty, this ambiguity does not prevent the interest of learning community from being withdrawn or instinct due to the existence of disruptive technology that is supportive to both givers and receivers (teachers and students) of education made broadly available via an online learning environment⁴¹, that defines the extents and significance that EdTech can influence the education system in the digital age.⁴²

³³ Derek Webster, Data centres: Enablers of the Digital Economy (TECHERATI, 2020) <<https://www.techerati.com/features-hub/opinions/data-centres-enablers-of-the-digital-economy/>>

³⁴ UNCTAD, DIGITAL ECONOMY REPORT 2019: VALUE CREATION AND CAPTURE: IMPLICATIONS FOR DEVELOPING COUNTRIES (UNITED NATIONS, Geneva, 2019) p.2 <https://unctad.org/system/files/official-document/der2019_en.pdf>

³⁵ European Commission, Fintech, distributed-ledger technology and the token economy <https://ec.europa.eu/growth/access-finance-smes/policy-areas/fintech-distributed-ledger-technology-and-token-economy_en>

³⁶ Amit Raje, Is FinTech Driving the Digital Economy? (Linkedin, 2018) <<https://www.linkedin.com/pulse/fintech-driving-digital-economy-amit-raje>>

³⁷ Pranay Gupta and Tham, T. Mandy,

Chapter 2. Fintech in the Context of the Digital Economy <<https://www.degruyter.com/document/doi/10.1515/9781547400904-002/html?lang=en>>

³⁸ CTPECC, Understanding Digital Skills in the Digital Skills in the Digital Economy Era (pecc, 2021) p.4 <<https://www.pecc.org/resources/digital-economy/2706-pecc-international-project-understanding-digital-skills-in-the-digital-economy-era/file>>

³⁹ BuiltIn, Education Technology: What Is Edtech? A Guide <<https://builtin.com/edtech>>

⁴⁰ THE WORLD BANK, Digital Technologies in Education <<https://www.worldbank.org/en/topic/edutech#1>>

⁴¹ Al Kingsley, It's never too late to boost your edtech skills (GLOBAL EDTECH, 2021) <<https://global-edtech.com/its-never-too-late-to-boost-your-edtech-skills/>>

⁴² European Commission, Digital Education Action Plan (2021-2027). <<https://education.ec.europa.eu/focus-topics/digital->

- **E-Commerce**

Electronic commerce (E-commerce) is a digital platform and a business model that buying and selling are conducted through online or made on the internet.

According to the 2021 report of UNCTAD, in some European countries, internet users

shopped online more than 80%, compared to less than 10% in many least developed countries.⁴³

The UNCTAD's 2017 report, the world value of e-commerce was about \$29 trillion which was accounted for 36 percent of GDP.⁴⁴

Figure 1: Top 5 countries for e-commerce sales in 2017

Rank	Country	Total e-commerce sales (\$ billion)	Annual average expenditure per online consumer (\$)
1	United States	8 883	3 851
2	Japan	2 975	3 248
3	China	1 931	2 574
4	Germany	1 503	1 668
5	Rep. of Korea	1 290	2 983

Source: UNCTAD, Digital Economy Report 2019

___End of Chapter I___

[education/digital-education-action-plan](https://education.ec.europa.eu/focus-topics/digital-education/digital-education-action-plan)
<https://education.ec.europa.eu/focus-topics/digital-education/digital-education-action-plan>

⁴³ UNCTAD, DIGITAL ECONOMY REPORT 2021: Cross-border data flows and development: For whom the data flow (UNITED NATIONS Geneva, 2021) p.13, 15

⁴⁴ UNCTAD, DIGITAL ECONOMY REPORT 2019: VALUE CREATION AND CAPTURE: IMPLICATIONS FOR DEVELOPING COUNTRIES (UNITED NATIONS, Geneva, 2019) p.15
 <https://unctad.org/system/files/official-document/der2019_en.pdf>



Reading Time: 18 Minutes

Chapter II

Digital Economy as Apparatus for ASEAN Transformation in Digital Age

Author: Samnang NOU
Editor: Viry SY & Hen HOR



Blueprint

Advancing ASEAN's digital transformation is key to societal development and economic booster not just only for the post-COVID-19 era but also for the influx of industrial revolution 4.0 (4IR), as projected by a joint statement of ASEAN Leaders. Herewith, Digital ASEAN lays the foundation for the region to prosper digital age whilst the latest ASEAN economic integration also specifies the necessity of digital transformation as an appealing build-back-better approach.

The Chapter highlights:

- Digital ASEAN: Status & Readiness
- Opportunity of Digital Economy in ASEAN: Role of Digital Economy in Shaping ASEAN Economic Community 2025
- Challenges/Drawbacks Facing ASEAN Digital Economy
- Mapping Initiatives & Policies Accelerating ASEAN Digital Economy

In brief, the blueprint covers the ASEAN Digital Economy, including the investigation on its status, the region's potential scale of opportunity, challenges in adoption/adaptation, and an overview of policies and initiatives being carried out in AMS (ASEAN Member States) to fuel the region's digital economy.

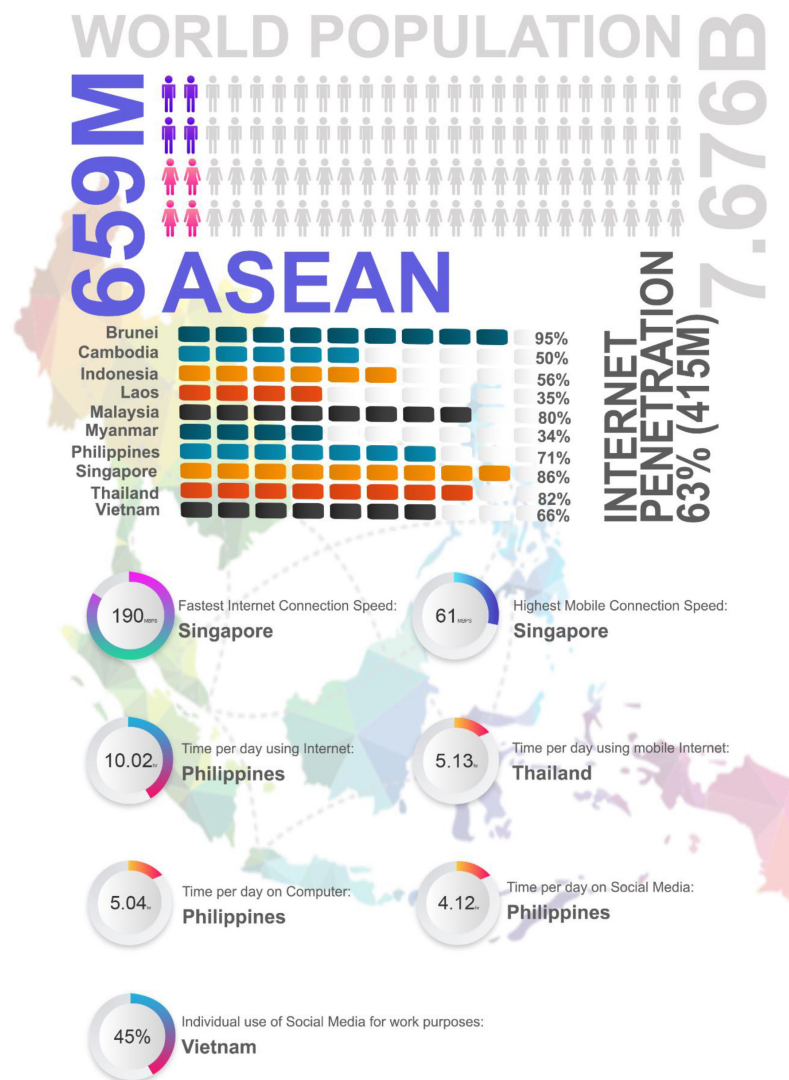
II.1. Digital ASEAN: Status, Readiness & Role in Shaping ASEAN's Digital Economy

- **ASEAN Digital Status**

With its overall population of about 659 million, sharing a combined GDP of more

than \$2.7 trillion, with a forecasting trajectory to reach \$4 trillion in 2022. Such advantage predominantly leads to an influence on the world's market transactions if it is aware of the know-how to benefit from digital sphere as ASEAN has the potential to maximize its economy with additional \$1 trillion in the next decade. Below infographics shows ASEAN key digital figures (2019).⁴⁵

Figure 2: ASEAN key digital figures



Source: ASEAN Cyberthreat Assessment 2020

⁴⁵ The Interpol 2020: https://www.interpol.int/content/download/14922/file/ASEAN_CyberThreatAssessment_2020.pdf

The infographic depicts the region's major digital figures with the highlight that whilst Southeast Asia's total population reached over 659 million people in 2019, the internet penetration rate across the region hit 63 percent, translating to 415 million internet users. This projection could demonstrate the internet economy's potential for growth in this region.

As the Internet penetration rates are the number of internet users in a nation in relation to its population, and therefore representing countries' level of digital adoption that may lead to digital transformation across sectors. 63 percent of ASEAN citizens having the internet access set up a good starting point; however, some AMS may be quite behind the likelihood to succeed in the digital sphere.

For instance, specific countries' internet penetration rates compared to their total population could be identified as: Brunei Darussalam (95 percent) and Singapore (86 percent) stand on the top whilst Laos (35 percent) and Myanmar (34 percent) have the least per-country penetration rates.

However, the fact that some countries (like Brunei Darussalam and Singapore) may have the highest internet penetration rate, this incidence does not represent their correlate proportion of all online users in the region due to the relatively large population of their neighboring countries such as, the Philippines (71 percent), Viet Nam (66 percent), and Indonesia (56 percent).

To ease the understanding in comparison to what extent the internet penetration compared to each country's population, the below table provides an update of AMS' population in the year 2022.

Figure 3: AMS' population in 2022

<u>Indonesia</u>	275,501,339
<u>Philippines</u>	115,559,009
<u>Vietnam</u>	98,186,856
<u>Thailand</u>	71,697,030
<u>Myanmar</u>	54,179,306
<u>Malaysia</u>	33,938,221
<u>Cambodia</u>	16,767,842
<u>Laos</u>	7,529,475
<u>Singapore</u>	5,975,689
<u>Brunei</u>	449,002

Source: World Population Review, as retrieved from [ASEAN Countries | Association of Southeast Asian Nations 2022](https://www.worldpopulationreview.com/ASEAN-Countries-Association-of-Southeast-Asian-Nations-2022) ([worldpopulationreview.com](https://www.worldpopulationreview.com))

From the above figures, Cambodia is standing in the middle ground in both terms, penetration rates and the number of populations, requiring crucial attention to learn from the best practices possible if considering the prepping for competitiveness in digital world.

For the preliminary observation, Singapore is the most prominent tech-advance nation as a modeling for other AMS due to its fastest internet connection speed & highest mobile connection speed. This might prove the case that Singapore is quite ready in term of digital transformation.

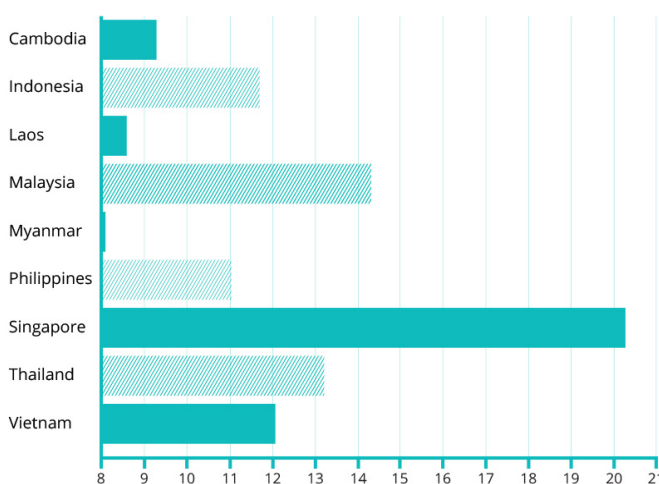
To support the claim, the following section discusses further on the context of digital readiness in ASEAN.

• ASEAN Digital Readiness

ASEAN has a favorable degree of digital connectedness, including internet use, mobile cellular subscriptions, and electronic and mobile commerce (e-commerce)⁴⁶ with the expectation that ASEAN countries' significant penetration of e-commerce would leverage 40% of annual growth rate⁴⁷. The growing number of digital companies make used e-commerce platforms to introduce technological goods or services to market; Grab is one of examples.⁴⁸

Below diagram compares "Digital Readiness" of AMS (ASEAN Member States).

Figure 4: ASEAN Digital Readiness Index



Source: Konrad-Adenauer-Stiftung (2021): *SUSTAINABILITY & DIGITAL INNOVATION 2021*

Singapore does have an extraordinary performance in digital readiness; Myanmar is classified as the least-ready country in the region for digital transformation. Whilst different indicators may have different value added into the above index, it is obvious that digital preparedness includes not only infrastructure but also digital skills and competencies⁴⁹, particularly for forthcoming world of work.

It is estimated that Asia's job market is expected to rise from 1.9 billion in 2015 to 2.1 billion in 2030 and 2.2 billion in 2050. Thus Southeast Asia, as a region inside Asia, constitutes a rising source of workforce to educate. Amongst them, some AMS (Vietnam, Thailand, Malaysia and Singapore) prepare their young population quite well for the influx of digital economy. The cases prove that there is a strong need for connectivity improvement to bridge the gap of digital readiness throughout the region, not just only through infrastructure but also by equipping the workforce with skills and competencies from a digital angle.⁵⁰

To accomplish digital readiness within and between ASEAN Community members, the ASEAN Ministers Responsible for Information (AMRI) held virtually in March 2021 adopted the **Framework for Developing Digital Readiness** between all of ASEAN Community members, outlining three inter-related components, notably: (1) digital access, (2) computer literacy, and (3) online participation. This means the Framework considers the significance of: the inclusion of digital access, digital skills, and digital participation to build digital readiness.⁵¹

⁴⁶ World Bank, 2022: <https://tradingEconomy.com/united-states/mobile-cellular-subscriptions-per-100-people-wb-data.html>

⁴⁷ ASEAN 2021, The ASEAN Creative Economy Culture, Identity and the Business of Creativity: <https://asean.org/wp-content/uploads/2021/11/The-ASEAN-Oct-Nov-2021-Digital-v1.pdf>

⁴⁸ ASEAN 2021, The ASEAN Creative Economy Culture, Identity and the Business of Creativity: <https://asean.org/wp-content/uploads/2021/11/The-ASEAN-Oct-Nov-2021-Digital-v1.pdf>

⁴⁹ ASEAN 2021, The ASEAN Creative Economy Culture, Identity and the Business of Creativity:

<https://asean.org/wp-content/uploads/2021/11/The-ASEAN-Oct-Nov-2021-Digital-v1.pdf>

⁵⁰ ASEAN 2021, The ASEAN Creative Economy Culture, Identity and the Business of Creativity: <https://asean.org/wp-content/uploads/2021/11/The-ASEAN-Oct-Nov-2021-Digital-v1.pdf>

⁵¹ ASEAN 2021: FRAMEWORK FOR DEVELOPING DIGITAL READINESS AMONG ASEAN CITIZENS <https://asean.org/wp-content/uploads/2021/09/Framework-for-Developing-Digital-Readiness-among-ASEAN-Citizen.pdf>

II.2. Role of Digital Economy in Shaping ASEAN Economic Community 2025

As ASEAN is populated by majority of citizens under the age of thirty and tech-savvy, the region of 660 million people is seen to be attractive for the internet market.⁵²

In addition, approximately 3.8 million new users join the region's internet every month.⁵³ Furthermore, ASEAN's digital economy, which encompasses tourism, e-commerce, and the media sector, is predicted to reach US\$200 billion by 2025.^{54,55} This allows ASEAN the opportunity to expand its economy outside the traditional areas of investment and trade in order to achieve the region's second phase of integration, as mentioned in the ASEAN Economic Community Blueprint 2025. This new global megatrend of the digital era provides a good incentive for ASEAN to improve economic performance and people's prosperity inside the region.⁵⁶

Like other regions, AMS could be the potential beneficiaries of digital economy in many dimensions. Digital Economy, for instance, will strongly contribute to economic development by increasing economic efficiency and productivity through better asset utilization, business networking, knowledge transfer, and improved connection in value chains. This has also resulted in an increase in investment opportunities, increased trade, and improved access to goods and services. In a more positive sense, it creates chances and inclusion for people to participate in the economy by allowing people, particularly women, to run their businesses from the

⁵²ON THE CUSP 2019, Accessed March 26: <https://www.imf.org/external/pubs/ft/fandd/2018/09/pdf/asean-digital-economy-infographic-feng.pdf>

⁵³ Southeast Asia's digital boom By Penny Burt, Group CEO, Asialink. Accessed March 26 2022: <https://asialinkbusiness.com.au/news-media/southeast-asias-digital-boom>

⁵⁴ The study by Google and TEMASEK (2016). Accessed March 26 2022: https://www.thinkwithgoogle.com/qs/documents/4859/e-economy_handout_1_20160525_eXq5Gdl.pdf

comfort of their homes or any other places of convenience. ASEAN can also benefit greatly from innovation and creativity inspired by tech-savvy youngsters whose intuitive knowledge on marching learning and operation of modern devices are beyond extraordinary. Regionally, digital economy encourages further integration of economic activity such as cross-border data flows, building connectivity for countries, businesses, and people.⁵⁷

Having acknowledged the momentous role digital economy can play in shaping ASEAN, it is greatly significant to understand the barriers that prevent the expansion of digital economy from happening.

II.3. Challenges & Drawbacks Facing ASEAN Digital Transformation

- **Concern of Inequality, particularly in term of labor**

ASEAN, like all other countries and regions, has obstacles adopting the recent digital revolution, often known as the Fourth Industrial Revolution, being compatible with the system of governments, businesses, and communities. Since digital innovations have completely changed the way businesses and the governments work, there are different views on the impacts on jobs particularly for those people whose obsolete skills face unsuitability to meet the needs of these evolving business models. That means low-skilled employees are being displaced by machines, a phenomenon known as "automation," which is causing political pressures on whether to adopt it for now or

⁵⁵ E-commerce sector includes online spending on first-hand electronics, apparel/clothing, household goods, food/grocery; travel sector includes online spend on hotels, airlines, and ride hailing; whilst media sector includes online spend on ads and gaming.

⁵⁶ Advancing ASEAN in the Digital Age, Accessed March 26, 2022. <https://www.cariasean.org/publications/advancing-asean-in-the-digital-age/#.Yj8uMzUxXIU>

⁵⁷ Advancing ASEAN in the Digital Age, Accessed March 26, 2022. <https://www.cariasean.org/publications/advancing-asean-in-the-digital-age/#.Yj8uMzUxXIU>

later. The digital economy, as under umbrella of digital transformation, poses concern over the possibility of inequality, particularly if it is not supplemented by enhanced connectivity.

- **Development Gap**

Development among ASEAN member countries, notably in the field of digital technologies, requires various stages as different AMS have different levels and capability of digital transformation due to "development gap".⁵⁸

The limitation calls for immediate attention to explore further and expand existing cooperation in bridging the digital divide and ICT development gaps within ASEAN, particularly for Least Developed Countries (LDCs). The measures could be, but not limited to, the development of digital competencies in such terms as regulatory and cybersecurity best practices, market-driven approaches whilst reassuring the resilience in next generation ICT networks.⁵⁹

- **Concern over Upskilling and Reskilling**

Expanding the capabilities of the working population in the ASEAN region to deal with Industry 4.0 is highly debatable since upskilling and reskilling, for example, require seven million employees in Thailand alone to participate in the process for companies to be able to digitally transform, according to Management Consulting firm McKinsey & Company.⁶⁰ In this scenario, improving the digital capabilities of ASEAN's 659 million-strong population would guarantee that opportunities and advantages benefit all. Although the region already has significant levels of knowledge and comprehension,

schools and universities must become more flexible in order to acquire the expertise necessary to compete in a digital economy.⁶¹ These abilities extend from fundamental computer knowledge to sophisticated abilities such as coding and data analysis. Collaboration and communication are also important "soft skills."

- **Concerns about Privacy and Civil Rights**

Many shortcomings have been introduced by digital technology to the enjoyment of human rights, security, and government, as well as social relationships, which include chronic and escalating threats to human health, young disillusionment, and geopolitical disintegration. For instance, the use of smartphones for location tracking, Mobile internet use as a flexible tool across all member countries to help in recovery and mitigation efforts, enabling contact tracing, and movement monitoring, but the use of smartphones has also generated privacy and civil rights concerns. This is only one of many challenges that governments face due to cultural norms, institutional frameworks, and financial constraints. Additionally, reaching an agreement on crucial issues such as freedom of information will be extremely difficult because each sovereign nation must weigh its own interests and national security. These instances highlight how, in the digital world, both human rights protections and the human rights governance framework are under threat. There is an urgent need to find a method to maximize on the benefits of digital technology while limiting the threats to human rights.⁶²

⁵⁸ Lurong Chen and Lydia Ruddy 2021, Improving Digital Connectivity: Policy Priority for ASEAN Digital Transformation, Accessed March 26, 2022:

<https://www.thinkasia.org/bitstream/handle/11540/12329/Improving-Digital-Connectivity-Policy-Priority-for-ASEAN-Digital.pdf?sequence=1>

⁵⁹ The White House (2021). ASEAN-US Leaders' Statement on Digital Development. Retrieved from: [ASEAN-U.S. Leaders' Statement on Digital Development | The White House](https://www.whitehouse.gov/the-press-office/2021/03/23/asean-us-leaders-statement-on-digital-development/)

⁶⁰ [Internet service for all Thai villages by end of this year | Phnom Penh Post](https://www.phnompenhpost.com/internet-service-for-all-thai-villages-by-end-of-this-year)

⁶¹ The Interpol 2020:

https://www.interpol.int/content/download/14922/file/ASEAN_CyberThreatAssessment_2020.pdf

⁶² WEF. 2021. The Global Risks Report 2021. 16th ed. Geneva (Switzerland): World Economic Forum: <https://www.weforum.org/reports/the-global-risks-report-2021>

- **Environmental Impact of Technologies**

Technologies have harmed our planet in two ways: pollution and the loss of natural resources, which continues to be an existential danger to humanity, risks combination with societal disintegration, resulting in serious consequences. Despite its seeming separation from the real world, digital activity has produced its own strange carbon footprint.⁶³ To simplify, technologies may endanger our planet in several means, such as, high energy consumption and increased carbon dioxide emission with ICT devices.

According to a 2019 Shift Project analysis, the world's collective digital carbon footprint was reported to be almost an average of 3.7 percent (as between 1.4% to 5.9%, and could be doubled in 2025)⁶⁴ of total greenhouse emissions; also, energy consumed by digital

technology usages increased by 70% between 2013 and 2022.⁶⁵

To add, from video streaming and online gaming to cryptocurrency trading and digital banking, digital activity has evolved into a multidimensional entity. These mediums, while frequently beneficial and progressive in their own way, come at the expense of the environment. They contribute to a growing influx of data, fueling the data processing cycle and subsequent production of emissions.⁶⁶

Carbon emissions could be in different forms: direct and indirect. The direct one involves with ICT manufacturing, using and disposing of waste of ICT's carbon footprint.⁶⁷ Shipping the internet's hardware, such as computers, smartphones and servers, also causes energy depletion whilst powering the devices and cooling them also require energy consumption.⁶⁸

(This space is intentionally left blank)

⁶³ Geneva environment network 2021: <https://www.genevaenvironmentnetwork.org/resources/updates/data-digital-technology-and-the-environment/>

⁶⁴ Futuro Innovation Research (2021). Are Digital Technologies Carbon Footprint Neutral or Not? Retrieved from: <https://www.cristobalcobo.net/blog/post/are-digital-technologies-carbon-footprint-neutral-or-not>

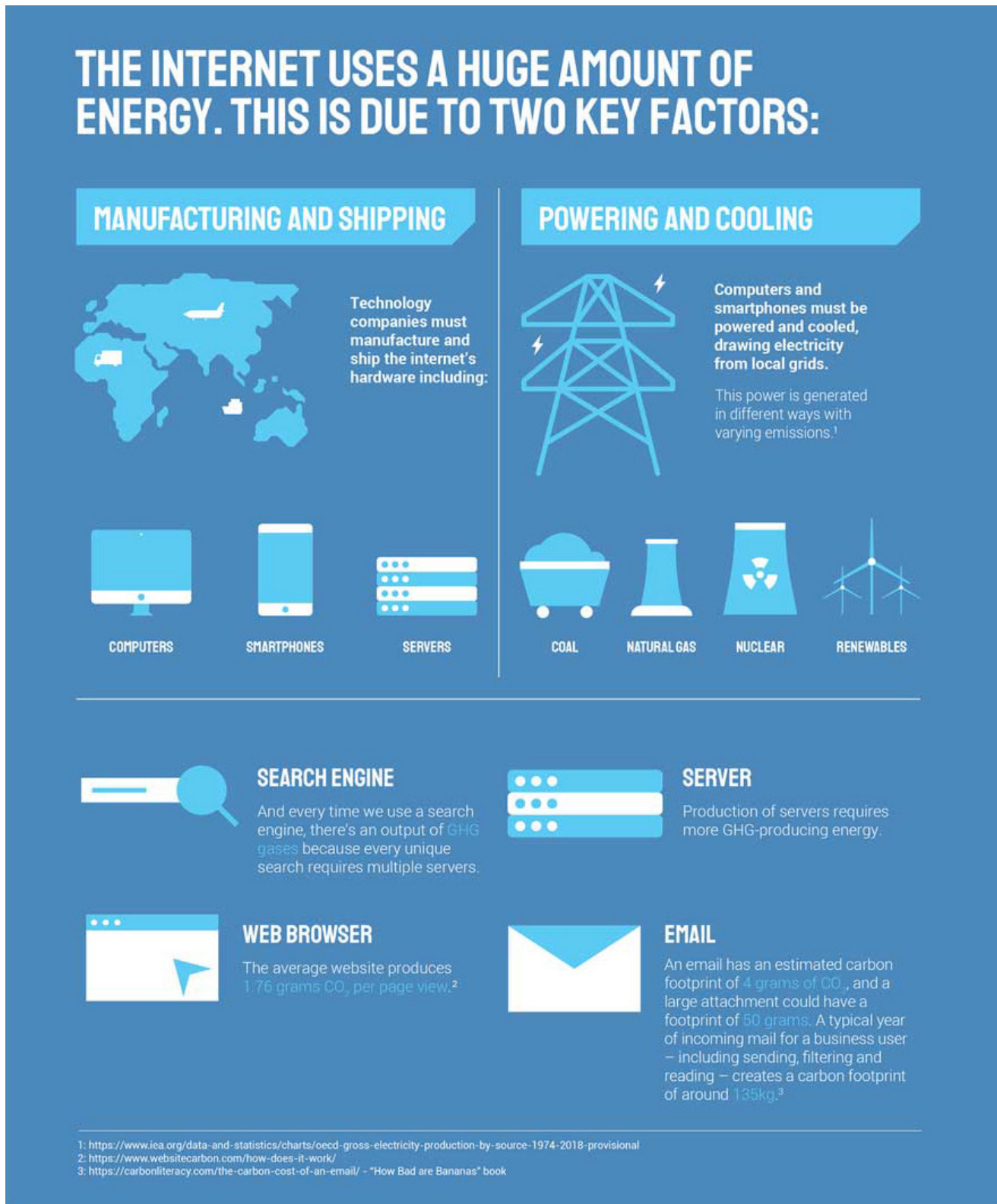
⁶⁵ Geneva environment network 2021: <https://www.genevaenvironmentnetwork.org/resources/updates/data-digital-technology-and-the-environment/>

⁶⁶ Geneva environment network 2021: <https://www.genevaenvironmentnetwork.org/resources/updates/data-digital-technology-and-the-environment/>

⁶⁷ Futuro Innovation Research (2021). Are Digital Technologies Carbon Footprint Neutral or Not? Retrieved from: <https://www.cristobalcobo.net/blog/post/are-digital-technologies-carbon-footprint-neutral-or-not>

⁶⁸ Climatecare (2021). Infographic: The Carbon Footprint of the Internet. Retrieved from: <https://www.climatecare.org/resources/news/infographic-carbon-footprint-internet/>

Figure 5: Carbon Footprint of the Internet

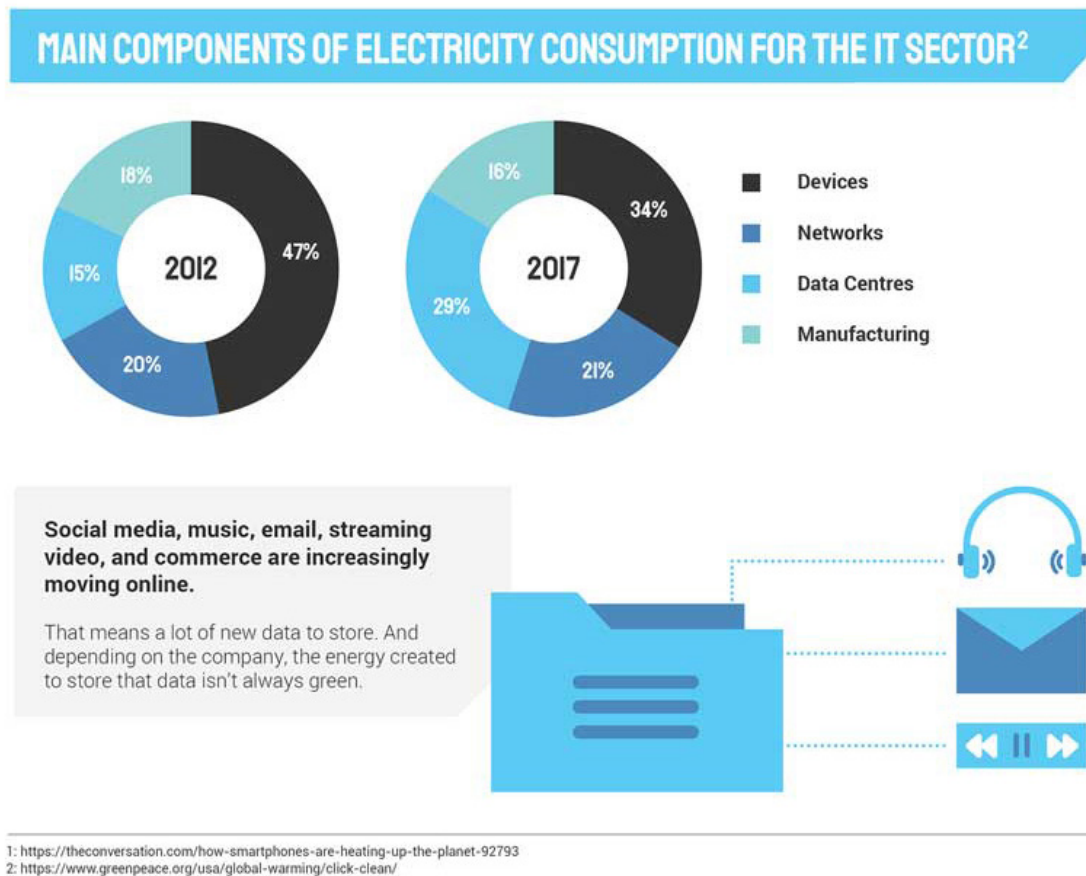


Source: Climatecare (2021). Infographic: The Carbon Footprint of the Internet. Retrieved from: <https://www.climatecare.org/resources/news/infographic-carbon-footprint-internet/>

Thereby, whereas technological devices with the systems supported them i.e. the internet, email, and cloud-based services are worthwhile in saving plenty of physical

resources like papers, “the carbon emitted from manufacturing, powering, and cooling the devices (computers/smartphones) and data centers can add up the carbon footprint.

Figure 6: Electricity Consumption for IT Sector



Source: Climatecare (2021). Infographic: The Carbon Footprint of the Internet. Retrieved from: <https://www.climatecare.org/resources/news/infographic-carbon-footprint-internet/>

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⁶⁹ Climatecare (2021). Infographic: The Carbon Footprint of the Internet. Retrieved from: <https://www.climatecare.org/resources/news/infographic-carbon-footprint-internet/>

II.4. Challenges of SMEs to Go Digital

Before investigating on “Mapping Initiatives & Policies Accelerating ASEAN Digital Economy” in the next section, this section briefly exposes specific challenges facing SMEs to excel in digital sphere. Since “SMEs to go digital” would definitely support digital economy, it is necessary to study their challenges in order to formulate effective to-do lists at a later instance as recommendation/commitment/resolution.

Barriers of “SMEs to go digital” are:

- **Limited capacity in entrepreneurship and occupational skills**

The United Nations General Assembly Resolution A/RES/71/279 (as adopted in 2017)⁷⁰, provided significant acknowledgment of SMEs in achieving Agenda 2030 and its related goals – in particular, SDG 8 (Decent Work and Economic Growth) via innovation, creativity, and decent work for all.

However, leveraging SMEs can be challenging due to the lack of capacity in entrepreneurship, particularly to perform in a digital sphere. Promoting SMEs in digital age is then in a relationship with the consideration of SDG 4 (Quality Education), considering the need to build competencies, in particular, technical and professional levels to be ready for the world of work and entrepreneurship / business.⁷¹ Hiring qualified staff or developing a pool of talents in SMEs can hardly be found whilst launching training programs by themselves is rare, given the nature and size of their businesses and thus seeking government support programs.⁷²

⁷⁰ UN’s General Assembly (2017). Seventy-first session’s Resolution adopted by the General Assembly. Retrieved from [UNITED](#)

⁷¹ United Nations (n.d). Do you know all 17 SDGs?. Retrieved from: [THE 17 GOALS | Sustainable Development \(un.org\)](#)

⁷² ADB (2016). Skills Training by SMEs: Innovative Cases and the Consortium Approach in Korea: Retrieved from [Skills Training by Small and Medium-Sized Enterprises: Innovative Cases and the Consortium Approach in the Republic of Korea | Asian Development Bank \(adb.org\)](#)

- **Unfavorable financial access & Lack of financial information**

From a financial-aspect perspective, that would mean affordable microfinance and credit shall be made available for SMEs; without affordable financial products (loans with suitable interest rates), SMEs may not excel to full potential.⁷³ This requires solid political commitment from governments to put forward concrete policies and actions that ease the implementation targets, particularly in terms of addressing the challenge of financing. Financial access could also be a part of SDG 10 (Reduced Inequality); that means everyone, including youth and women, shall be treated fairly in terms of accessing finance or loan for SMEs. If this would be done with the right approach, SMEs in the digital age can also contribute to poverty alleviation (as in SDG 1- Poverty Reduction).⁷⁴

Absence of a credit information sharing system, due to weak accounting standards and norms in developing countries that do not orient citizens to saving scores for loan credit such as in the West and Europe, also limit trust from banks to consider and evaluate the creditworthiness of borrowers.⁷⁵ The lack of financial information for which banks would provide loans and options for funding SMEs & the lack of financial records and proper accounting procedures to convince banks to credit loans is another obstacle to hinder financial access to SMEs and start-ups.

⁷³ GIZ (2021). Promotion of Access to Financial Services for SMEs. Retrieved from: [Promotion of Access to Financial Services for Small and Medium Enterprises \(giz.de\)](#)

⁷⁴ United Nations (n.d). Do you know all 17 SDGs?. Retrieved from: [THE 17 GOALS | Sustainable Development \(un.org\)](#)

⁷⁵ GIZ (2021). Promotion of Access to Financial Services for SMEs. Retrieved from: [Promotion of Access to Financial Services for Small and Medium Enterprises \(giz.de\)](#)

- **Inadequate access to market information**

For SMEs to access to a global market, access to market information in combination with support technology tools and services is key to expanding their horizons. Unfortunately, most SMEs operate only in the countryside landscape with limited tools or infrastructures to access international markets for their products.

- **Other constraints: Legal, Technological, and Competitiveness & Taxation hindrance**

Apart from financial constraints, other economies face impediments as a hindrance to promoting SMEs due to several rationalities behind the background; those include (1) legal and regulatory issues, (2) sluggish technology adoption⁷⁶, and (3) Unfair market competition and tax enforcement, as true examples of SMEs' challenges.⁷⁷

(Remark: A list of recommendations will be provided in the Final Message section to shed light on thought-provoking resolutions for AIPA and other future meetings on the familiar subject matter of promoting SMEs in Digital Transformation)

II.5. Mapping Initiatives & Policies Accelerating ASEAN Digital Economy

- **Digital-economy Policies Oriented in ASEAN Community**

⁷⁶ GIZ (2021). Promotion of Access to Financial Services for SMEs. Retrieved from: [Promotion of Access to Financial Services for Small and Medium Enterprises \(giz.de\)](https://www.giz.de/en/press-releases/2021/03/20210301-promotion-of-access-to-financial-services-for-smes)

⁷⁷ The Phnom Penh Post (2018). Ministry Changes SME Data: Retrieved from [Ministry changes SME data | Phnom Penh Post](https://www.phnompenhpost.com/business/ministry-changes-sme-data)

⁷⁸ World Economic Forum (2022). Digital ASEAN. Retrieved from: <https://www.weforum.org/projects/digital-asean>

⁷⁹ ASEAN (2020). ASEAN Comprehensive Recovery Framework. Retrieved from: [2-FINAL-ACRF adopted-37th-ASEAN-Summit 12112020.pdf](https://www.asean.org/wp-content/uploads/2020/12/2-2020-ASEAN-Summit-12112020.pdf)

With 125,000 new users joining the Internet every day, ASEAN is the world's fastest expanding Internet market. Herewith, the ASEAN digital economy is expected to develop considerably, contributing an estimated \$1 trillion to regional GDP over the next ten years.⁷⁸

Impediments of digital transformation, as discussed earlier, hinder digital economy to reach its fullest potential though there is a remarkable momentum of digital economy amidst COVID-19. To maximize the benefits, **ASEAN Comprehensive Recovery Framework (ACRF)** placed "Accelerating Inclusive Digital Transformation" as one of five major measures for revitalizing ASEAN out of the COVID 19 crisis.⁷⁹

Earlier, **ASEAN Agreement on Electronic Commerce (2020)** also came into force⁸⁰, recognizing digital economy potential by advancing trade principles, rules and conducive environment to promote e-commerce capacity and growth towards a regionally integrated digital economy and greater digital connectivity in the midst of economic recovery from the pandemic⁸¹.

In short, the Agreement aims at advancing cross-border e-commerce transactions within ASEAN whilst scaling up greater digital connectivity in the region as ASEAN is projected to predominantly benefit from e-commerce, particularly amidst COVID-19, and to become the major digital transformation's driving force. As expected and similarly to the previous claim⁸², ASEAN's digital economy would reach US\$1 trillion by 2030, pushed forward by emerging trend of digital consumers and merchants in e-commerce, such as in food

⁸⁰ ASEAN (2021). ASEAN Agreement on Electronic Commerce Officially Enters into Force. Retrieved from: [ASEAN Agreement on Electronic Commerce officially enters into force - ASEAN](https://www.asean.org/wp-content/uploads/2021/03/ASEAN-Agreement-on-Electronic-Commerce-officially-enters-into-force-ASEAN)

⁸¹ ASEAN (2021). ASEAN Agreement on Electronic Commerce. Retrieved from: [ASEAN-Agreement-on-Electronic-Commerce-2019.pdf](https://www.asean.org/wp-content/uploads/2021/03/ASEAN-Agreement-on-Electronic-Commerce-2019.pdf)

⁸² World Economic Forum (2022). Digital ASEAN. Retrieved from: <https://www.weforum.org/projects/digital-asean>

delivery and other transactions.⁸³ Other source predicted the region's digital economy, as fueled by e-commerce, food delivery, digital financial services, and more segments, would hit \$360 billion by 2025.⁸⁴ This means the potential of digital economy would be triple during the five-year period between 2025 and 2030.

To further address, ASEAN has adopted a roadmap to navigate the ASEAN economy via **ASEAN Economic Community (AEC) Blueprint 2025**⁸⁵, building on the previous 2015 version with five elements:

- (i) A Highly Integrated and Cohesive Economy;
- (ii) A Competitive, Innovative, and Dynamic ASEAN;
- (iii) Enhanced Connectivity and Sectoral Cooperation;

- (iv) A Resilient, Inclusive, People-Oriented, and People-Centered ASEAN;
- (v) A Global ASEAN.

The 2025 update, in addition, spotlights on promoting and broadening infrastructure connectivity; narrowing the development gap; fostering growth via technology, innovation and human resource development; intensifying R&D for commercial application to increase ASEAN's competitiveness for global value chains of high-tech manufacturing and services industries. The new version (2025) also prioritizes "Good Governance", enticing FDI towards ASEAN and thus improving ASEAN's connectivity globally.⁸⁶

ASEAN has also recognized additional frameworks to diminish blockades and accelerate the transformation:



⁸³ ASEAN (2021). ASEAN Agreement on Electronic Commerce Officially Enters into Force. Retrieved from: [ASEAN Agreement on Electronic Commerce officially enters into force - ASEAN](https://asean.org/asean-agreement-on-electronic-commerce-officially-enters-into-force-asean)

⁸⁴ Report E-Conomy SEA 2021 Roaring 20s: the SEA Digital Decade: <https://seads.adb.org/report/e-conomy-sea-2021-roaring-20s-sea-digital-decade>

⁸⁵ ASEAN (2015). ASEAN Economic Community Blueprint 2025. Retrieved from: [ASEAN Economic Community Blueprint 2025 - ASEAN & AECBP 2025r FINAL.pdf \(asean.org\)](https://asean.org/asean-economic-community-blueprint-2025-asean-aecbp-2025r-final.pdf)

⁸⁶ ASEAN (2015). ASEAN Economic Community Blueprint 2025. Retrieved from: [ASEAN Economic Community Blueprint 2025 - ASEAN & AECBP 2025r FINAL.pdf \(asean.org\)](https://asean.org/asean-economic-community-blueprint-2025-asean-aecbp-2025r-final.pdf)

Table 1: Frameworks Accelerating Digital Transformation & Economy in ASEAN

Frameworks	Brief Description
ASEAN Digital Integration Framework (DIF) ⁸⁷ Remark: DIF, followed by an Action Plan to be known as ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025 (to be discussed later)	* Adopted in 2018 with plans to realize digital integration in areas: data protection, digital trade innovation, digital payments, digital talent base. * Five policy areas: (1) Digital connectivity and affordable access, (2) Commerce and trade, (3) Financial ecosystem, (4) Workforce transformation, (5) Business ecosystem like start-up support and regulations for digital MSMEs to participate in digital economy & (6) Designated Institutional Management, to coordinate, manage actions, and track progress against timelines and objectives.
e-ASEAN Framework Agreement ⁸⁸	Adopted in 2000; Measures to: establish ASEAN Information Infrastructure, facilitate e-commerce growth, promote investment in ICT, and build capacity to narrow digital divide within AMS, amongst others.

Source: Multi-sources to be compiled, summarized, and designed by the author.

To further push forward the aforementioned blueprint and frameworks, ASEAN continues to structure regional master plans and action plans.

One of which is **ASEAN Digital Master Plan 2025**⁸⁹, an update on the previous ASEAN ICT Master Plan 2020 that measured support of e-commerce development such as:

- (i) promoting digital trade in ASEAN,
- (ii) nurturing the free flow of ICT products and services in ASEAN, and

(iii) developing regional data protection principles.

The new version of 2025 upgrades to eight desired outputs, including (1) quality and coverage of broadband infrastructure, (2) trusted digital services, (3) cross-border trade with digital connectivity, (4) capacity building for people and businesses in digital economy, (5) digitally inclusive ASEAN, amongst others.

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⁸⁷ ASEAN (2020). ASEAN Digital Framework. Retrieved from: <https://asean.org/wp-content/uploads/2020/12/Adopted-ASEAN-Digital-Integration-Framework.pdf>

⁸⁸ ASEAN (2000). e-ASEAN Framework Agreement. Retrieved from: <http://agreement.asean.org/media/download/20140119121135.pdf>

⁸⁹ ASEAN (2021). ASEAN Digital Master Plan 2025. Retrieved from: <https://asean.org/wp-content/uploads/2021/09/ASEAN-Digital-Masterplan-EDITED.pdf>

Other master plans and action plans are summarized into below table:

Table 2: Summary of Other Action Plans & Master Plans in ASEAN

Action Plans & Master Plans	Brief Description
<u>ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025</u> ⁹⁰	Lists down 5 policy areas for ASEAN digital integration, namely (1) Digital connectivity and affordable access, (2) Financial ecosystem, (3) Commerce and Trade, (4) Workforce transformation, and (5) Business ecosystem.
ASEAN Work Program on Electronic Commerce (AWPEC) 2017-2025 ⁹¹	Lays out plans to implement initiatives of ASEAN program on e-commerce: infrastructure, education and tech competency, consumer protection, modernizing legal framework, security of e-transactions, payment systems, trade facilitation, competition, logistics, and e-commerce framework.
Master Plan on ASEAN Connectivity (MPAC) 2025 ⁹² (Later identify the development of ASEAN Framework on Digital Data Governance)	Focuses on five strategic areas of: (a) Sustainable Infrastructure; (b) Digital Innovation; (c) Seamless Logistics; (d) Regulatory Excellence; and (e) People Mobility
ASEAN Strategic Action Plan for SME Development (SAP SMED) 2016-2025 ⁹³	Aims at five strategic goals: (1) promote productivity, technology and innovation, (2) increase access to finance, (3) enhance market access and internationalization, (4) enhance policy and regulatory environment, and (5) promote entrepreneurship and human capital development.

Source: Multi-sources to be compiled, summarized, and designed by the author.

*Special Note: Aforementioned Frameworks and Plans as marked in **Underline & Bold** have a broad spectrum of influence on ASEAN digital transformation. With this remark, **ASEAN Digital Integration***

***Framework Action Plan (DIFAP) 2019-2025**⁹⁴, for instance, shall also be worth investigating further. The Below table summarizes the action plan of DIFAP.*

⁹⁰ ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025: https://asean.org/wp-content/uploads/2018/02/AECC18-ASEAN-DIFAP_Endorsed.pdf

⁹¹ ASEAN (2021). ASEAN Work Program on Electronic Commerce. Retrieved from: https://asean.org/wp-content/uploads/2021/09/ASEAN-Work-Programme-on-Electronic-Commerce_published.pdf

⁹² Connectivity ASEAN (2021). Master Plan on ASEAN Connectivity 2025. Retrieved from: [07-MPAC-MTR-Executive-Summary.pdf \(asean.org\)](https://asean.org/wp-content/uploads/2021/07/MPAC-MTR-Executive-Summary.pdf)

⁹³ ASEAN (2015). ASEAN Strategic Action Plan for SME Development 2016-2025. Retrieved from: <https://asean.org/wp-content/uploads/2015/12/SAP-SMED-Final.pdf>

⁹⁴ ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025: https://asean.org/wp-content/uploads/2018/02/AECC18-ASEAN-DIFAP_Endorsed.pdf

Table 3: Summary of ASEAN Digital Integration Framework Action Plan (DIFAP)

Actions of DIFAP (2019-2025)	Expected results	Milestones
Action 1: Mechanisms to coordinate the enforcement of intellectual property (IP) rights in the digital sphere	Digital IP rights' coordination mechanism be developed	2019
Action 2: Modernization of Legal Framework	AM's Laws and Regulations on e-commerce be adopted, covering, e-transactions/ contracts, e-commerce platform, e-signatures, online consumer protection & personal data protection	2020
Action 3: Simplification of customs procedures with digitalization i.e. e- certificates for e-commerce deliveries	Customs procedures be amended, improved, and simplified, making use of technological tools	2020
Action 4: Capacity building in relevant ministries & authorities i.e. Education, Technology, Innovation, amongst others	Sectoral Roadmaps on Capacity Building be developed	2025
Action 5: Development and application of best practices in businesses such as MSMEs in terms of internet penetration for business improvement i.e. in management, information technology and control.	Best practices, informative and educational materials/programs for digital mainstreaming in MSMEs be developed	2025

Note: Action 4 & Action 5 is under ongoing process to be achieved by 2025.

Source: ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025⁹⁵, developed with summary and design by the author.

In short, the combined materials (in Table 1, 2 & 3) cover mechanisms, measures, actions plans and related aspects of the cross-border e-Commerce value chain, highlighting efforts to promote digital trade ecosystem i.e.

electronic payment usage, customs procedures simplification, Internet access improvement, ICT infrastructure development, and e-commerce laws harmonization.

⁹⁵ ASEAN Digital Integration Framework Action Plan (DIFAP) 2019-2025: https://asean.org/wp-content/uploads/2018/02/AECC18-ASEAN-DIFAP_Endorsed.pdf

- **Digital-economy Policies in AMS (ASEAN Member States)**

Numerous actions in AMS have been found for the cause of expanding their economies and boosting public welfare; one of which is to stimulate digital transformation. Herewith, Southeast Asian countries must implement comprehensive and suitable policies. A well-rounded policy framework would direct and highlight sectors of the digital economy that policymakers should focus on as different countries may have dissimilar levels of adaption with various paces i.e. digital literacy, digital infrastructure, coordinating mechanisms and conducive environment. Since these countries are at distinct stages of digital economy development, their policy coverage, intensity, and implementation vary.⁹⁶

Better developed digital economies, such as Malaysia and Singapore, tend to take a higher priority on the provision of necessary tools and skills for enterprises, whereas nations such as Indonesia and the Philippines appear to take a higher priority on the availability of connection infrastructure.⁹⁷

Besides that, the governments of Vietnam, Thailand, the Philippines, and Indonesia have made significant investments in developing their digital infrastructure to accommodate greater connectivity, with

projects such as the Net Pracharat Project (Thailand), the National Broadband Plan (Philippines), and the Palapa Ring (Indonesia). Aside from free WiFi in public places, Vietnam, Indonesia, and the Philippines do not have any government-led programs to increase the affordability of broadband connections.⁹⁸

Countries such as Singapore and Thailand, on the other hand, have established broadband subscription subsidies for the low-income or elderly population. Malaysia has made significant investments in infrastructure. Nevertheless, market structural concerns in its fixed broadband market have impacted not just the service pricing, but also fixed broadband rollout, internet speed, and quality.⁹⁹

Although the Malaysian government has previously implemented the Mandatory Standard on Access Pricing (MSAP) to tackle the affordability issue, broader changes to stimulate competition in this sector are required to solve other concerns that Malaysians confront. Almost all countries have government policies and legislation in place to promote Digital Literacy and Skills among the young and working population, such as incorporating it into education curricula, offering supplementary training for employees, or giving public education to the general population.¹⁰⁰

___End of Chapter II___

⁹⁶ ISEAS 2021: <https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-50-assessing-digital-economy-policies-in-six-southeast-asian-countries-by-joey-erh>

⁹⁷ ISEAS 2021: <https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-50-assessing-digital-economy-policies-in-six-southeast-asian-countries-by-joey-erh>

⁹⁸ ISEAS 2021: <https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-50-assessing-digital-economy-policies-in-six-southeast-asian-countries-by-joey-erh>

⁹⁹ ISEAS 2021: <https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-50-assessing-digital-economy-policies-in-six-southeast-asian-countries-by-joey-erh>

¹⁰⁰ ISEAS 2021: <https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-50-assessing-digital-economy-policies-in-six-southeast-asian-countries-by-joey-erh>



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Chapter III Cambodia's Prepping for Digital Economy

**Author: Sotheara UN
Editor: Savan CHAN & Rath SAM**



Blueprint

Impactful change implied by digital economy is tremendous as such esteemed opportunities as advanced by digital world would introduce the upgrade efficiency and pleasure in products and services, being available to ordinary people. Examples may include: convenience in ordering a cap via digital devices; speedy transaction in purchase with e-shopping apps and digital platforms; and enjoyment of entertainment at a fingertip without leaving the comfort of their homes, such as listening to music, watching films, and even playing online games.

Concurrently, changes have been remarked on, for instance, customer engagement, consumer behavior, and transparency, amongst others, requiring adjustment and adaptation to the new platforms. Cambodia, as one of the AMS (ASEAN Member States), needs to adapt itself to the digital economy sphere to be on a similar track as other AMS.

The Chapter examines what the Royal Government of Cambodia (RGC) has planned in terms of policies, regulations, and legal frameworks within their responsible authorities and line ministries.

III.1. Core Frameworks for Cambodia’s Digital Economy

Cambodia has adopted strategies in prepping for the influx of digitalization, particularly in response to the impediment of COVID-19 where operations have shifted the way they function to digital adaption. “**Cambodia Digital Economy and Society Policy Framework 2021-2035**”, aims to prioritize the digital economy whilst minimizing negative consequences. The framework lays out a twofold-foundations where (1) digital transformation infrastructure, and (2) trust in digital system would have to be addressed.¹⁰¹

This RGC’s 2021-2035 policy framework marks the commitment of Cambodia’s RGC in its adaptation to evolve in digital socioeconomic environment that optimally facilitates economic growth, with other three major priorities –creating digital citizens,

building the digital government and promoting digital businesses. RGC also sees the framework as an opportunity to recover and thrive in the “new normal” perspective.¹⁰²

However, the fact that Cambodia’s population is not yet digitally and financially inclusive demands a clear vision that break down into various line ministries to layout the **policies / legislations & initiatives**, bolstering digital adoption and transformation and finally building a vibrant digital socio-economic ecosystem of the country.¹⁰³

The following are some other legal frameworks that could be applied as the foundation leading to further consideration for digital economy in Cambodia:

Table 4: Legal frameworks for Cambodia’s digital economy

Legal Framework	Extent
Law on Consumer Protection	Promoting fair competition and preventing unfair business practices in Cambodia. This law will strengthen Cambodia’s relations with ASEAN Member States (AMS) and the World. ¹⁰⁴
Law on E-Commerce	Providing important basic rules for promoting e-commerce in local and abroad with confidence through validation, power, feasibility and acceptability of electronic communications, electronic Records, and electronic contracts, as well as the authenticity of electronic records and electronic signatures identified by technology and administered by our state institutions. This law will enable small and medium enterprises (SMEs) in Cambodia to integrate into the production chain, and domestic and international markets, as well as encourage the innovation and development of new products and services. ¹⁰⁵

¹⁰¹ Royal Government of Cambodia. (2021). Cambodia’s Digital Economy and Society Policy Framework (2021).

¹⁰² [Digital economy and social policy framework of Cambodia \(2021-2035\) \[English\] - Digital economy and social policy framework of Cambodia \(2021-2035\) \[English\] OD Mekong Datahub \(opendevelopmentcambodia.net\)](https://www.odmekongdatahub.com/odm/2021/04/2021-2035-digital-economy-and-social-policy-framework-of-cambodia/)

¹⁰³ [Chinese start-up body set to ‘create impact’ in fintech | Phnom Penh Post](https://www.phnompenhpost.com/fintech/chinese-start-up-body-set-to-create-impact-in-fintech)

¹⁰⁴ ព្រះរាជក្រម, ច្បាប់ស្តីពី កិច្ចការពារអ្នកប្រើប្រាស់, accessed on April 10, 2022, available at <https://www.ocm.gov.kh/wp-content/uploads/2019/11/.pdf>

¹⁰⁵ ព្រះរាជក្រម, ច្បាប់ស្តីពី ពាណិជ្ជកម្មតាមប្រព័ន្ធអេឡិចត្រូនិក, accessed on April 10, 2022, available at <https://www.ocm.gov.kh/wp-content/uploads/2019/11/.pdf>

Law on Telecommunications

Empowering state authorities to interfere in the internal operations of private telecom operators. This law applies to all telecommunications operations in the Kingdom of Cambodia except for security and defense.¹⁰⁶

Maximizing the benefits of technological advances and digitalization, as well as the implementation of a free-market economy would make a positive impact on economic growth, promote socio-economic restructuring, and create quality jobs for young people.¹⁰⁷

III.2. Respective Line Ministries' Accelerating Scheme for Digital Economy

- **DIGITAL LITERACY & STEM:**
Ministry of Education, Youth and Sports

World Economic Forum acknowledged digital literacy would secure the country with good use of technology.¹⁰⁸ With a similar concept, the Ministry of Education, Youth and Sports (MoEYS) has focused on digital literacy, allowing students to adapt to changing educational contexts by reflection on what they are seeing, sharing insights, and involvement related to the promotion of digital education through the use of the internet and implement digital education in various mechanisms with the education sector.¹⁰⁹

At the same time, the promotion of digital literacy and digital skills is encouraged and encouraged, in order for Cambodians to take advantage of technology in the context of the digital economy and industry 4.0, as well as

focusing on policies to strengthen the digital capabilities of young people, such as¹¹⁰:

- * Integrate information and communication technology (ICT) tools for teaching and learning in order to equip students with subject knowledge and also the ICT skills, necessarily for them to be ready for the transition to the 21st century's world of work.
- * Promote effective learning experience that equips students with the ability to make decisions based on evidence and knowledge sharing by using information systematically; at the same time to increase capacity in the administration of education, transaction, and digital data collection.

It is remarkable that the Ministry of Education, Youth, and Sports (MoEYS) also works in collaboration with the Ministry of Labor and Vocational Training (MLVT) in terms of modernizing Cambodia's education system, through both general education and TVET (Technical and Vocational Education and Training). Via the Education Strategic Plan (2019–2023), MoEYS is integrating science, technology, engineering, and mathematics (STEM) into curricula and textbooks. STEM is also integrated into higher education, incubators and accelerators, and through workshops and seminars.¹¹¹

¹⁰⁶ ព្រះរាជក្រម, ច្បាប់ស្តីពី ទូរគមនាគមន៍, accessed on April 10, 2022, available at <http://www.coj.gov.kh/wp-content/uploads/.pdf>

¹⁰⁷ Page: 2/45, accessed on April 10, 2022, available at <http://era.gov.kh/eraasset/uploads/2020/02/.pdf>

¹⁰⁸ [ASEAN 4.0: How Cambodia is using technology for good | World Economic Forum \(weforum.org\)](https://www.weforum.org/publications/ASEAN-4.0-How-Cambodia-is-using-technology-for-good)

¹⁰⁹ ជំនួយស្តារតី, ហេតុអ្វីអង្គការកម្ពុជាដឹងថាមានសារៈសំខាន់, page: 1, accessed on March 27, 2022, available at https://cd-center.org/wp-content/uploads/2019/11/P127_20191018_V1IS6_KH.pdf

¹¹⁰ ក្រសួងអប់រំ យុវជន និងកីឡា, ផែនការយុទ្ធសាស្ត្រវិស័យអប់រំឆ្នាំ២០១៩-២០២៣, page: 84/171, accessed on March 27, 2022, available at

https://planipolis.iiep.unesco.org/sites/default/files/ressources/cambodia_education_sector_plan_2019-2023_khm.pdf

¹¹¹ MoEYS (n.d). Education Strategic Plan 2019-2023. [Education Strategic Plan 2019-2023 \(moeys.gov.kh\)](https://moeys.gov.kh)

Further details of STEM effort at MLVT is described in a different section.

- **DIGITAL SKILL DEVELOPMENT FOR LABOURS: Ministry of Labor and Vocational Training**

The Ministry of Labor and Vocational Training (MLVT) works to integrate digital technology into technical and vocational trainings, under collaboration and cooperation with development partners and private sectors. The aim is to build a professional, creative and competitive workforce for domestic and regional labor markets, particularly to prep for digital economy and the industrial revolution 4.0 (4IR). Curriculum design embraces the integration of digital technology, skills development and training in line with the skillset needed in the labor market. Partnership mechanisms between Business Firms and Vocational Training Institutions are also initiated to aim for more effective action plans¹¹², and thereby shall address the mismatch between demand and supply of skills, favorably to excel in the digital context.

MLVT made the above objectives possible via the “Strategic Action Plan for Modernization of Technical and Vocational Education and Training 2019– 2023”, embracing TVET modernization to anticipate labor market demand, particularly amidst the Fourth Industrial Revolution and the digital economy. “Promotion of research, innovation, and applied technology in TVET institutions” is one of its five prioritized areas.¹¹³

- **DIGITAL SMEs & E-COMMERCE: Ministry of Commerce & Trade**

Ministry of Trade’s strives for reform, and consistently has implemented policy programs, and strategies for business development whilst strengthening market diversification to promote growth and accelerate economic integration on a regional and global scale.¹¹⁴ “Small and Medium Enterprises (SMEs)” is one of the active agents that have the potential to push forward the country’s economy.

In Cambodia, SMEs accelerate the Royal Government's rectangular strategy for promoting the digital economy in 3 major sectors¹¹⁵:

- 1) Production sector i.e., processing of agricultural products, manufacturing and minerals
- 2) Services sector i.e., real estate, hotels and restaurants
- 3) The trade sector i.e., wholesale and retail.

SMEs are considered to be the backbone of the national economy in accelerating growth, and thereby its expansion is the subject of policy incentives provided in the form of tax reduction, tax exemption, and specific support programs funded by relevant ministries or international organizations.

Its active participation also increases employment for low-income and vulnerable

¹¹² ក្រសួងការងារ និងបណ្តុះបណ្តាលវិជ្ជាជីវៈ, ក្រុមការងារពិសេសមួយរបស់ក្រសួងការងារ កំពុងជំរុញបច្ចេកវិទ្យាឌីជីថលទៅក្នុងវិស័យអប់រំ បណ្តុះបណ្តាលបច្ចេកទេស និងវិជ្ជាជីវៈ, accessed on March 29, 2022, available at http://www.mlvt.gov.kh/index.php?option=com_k2&view=item&id=1050:

¹¹³ NGO Education Partnership (2019). Modernizing TVET Strategic Action Plan 2019-2023. Retrieved from [Modernizing TVET Strategic Action Plan 2019 – 2023 – NGO Education Partnership \(nepcambodia.org\)](http://www.nepcambodia.org/modernizing-tvet-strategic-action-plan-2019-2023)

¹¹⁴ ក្រសួងពាណិជ្ជកម្ម, រដ្ឋមន្ត្រីក្រសួងពាណិជ្ជកម្ម, accessed on March 28, 2022, available at <https://www.moc.gov.kh/page/message-from-minister>

¹¹⁵ រាជរដ្ឋាភិបាលកម្ពុជា, ក្របខណ្ឌគោលនយោបាយសេដ្ឋកិច្ច និង សង្គមឌីជីថលកម្ពុជា ២០២១ ២០៣៥, page: 56/160, accessed on March 28, 2022, available at <https://www.ocm.gov.kh/wp-content/uploads/2021/06/.pdf>

people, and contributes to the growth of the digital sector effectively.¹¹⁶

(Note: The promotion of SMEs & E-commerce is in strong relationship with boosting startup. This relationship is discussed in later section)

For SMEs to exercise in a regulated sphere, the Ministry of Commerce initiates such legal mechanisms:



¹¹⁶ រាជបណ្ឌិតសភាកម្ពុជា, ទស្សនទានស្តីពីមីក្រូសហគ្រាសសហគ្រាសធុនតូចនិងមធ្យម នៅប្រទេសកម្ពុជា, page: 6/11, accessed on March 28, 2022, available at <http://rac.gov.kh/royal-academy/research/attachments/original/21.pdf?1546423309>

Table 5: Legal frameworks for Cambodia’s SMEs and Commerce

LAW	REGULATED CONTENT
Law on "Amendments to the Law on Commercial Rules and Commercial Registration"	Requiring the Ministry of Commerce to send a copy of the business list and documents related to business registration to the Commercial Court. ¹¹⁷
Law on "E-Commerce":	Providing important basic rules for promoting e-commerce in local and abroad with confidence through validation, power, feasibility and acceptability of electronic communications, electronic records, and electronic contracts, as well as the authenticity of electronic records and electronic signatures identified by technology and administered by our state institutions. This law will enable small and medium enterprises (SMEs) in Cambodia to integrate into the production chain, and domestic and international markets, as well as encourage the innovation and development of new products and services . ¹¹⁸



¹¹⁷ ព្រះរាជក្រម, ច្បាប់ស្តីពី វិសោធកម្មច្បាប់ស្តីពីវិធានពាណិជ្ជកម្មនិងបញ្ជីពាណិជ្ជកម្ម, accessed on April 10, 2022, available at <https://www.registrationservices.gov.kh/wp-content/uploads/2022/02/.pdf>

¹¹⁸ ព្រះរាជក្រម, ច្បាប់ស្តីពី ពាណិជ្ជកម្មតាមប្រព័ន្ធអេឡិចត្រូនិក, accessed on April 10, 2022, available at <https://www.ocm.gov.kh/wp-content/uploads/2019/11/.pdf>

- **BANKING & E-FINANCIAL TRANSACTION: National Bank of Cambodia**

Access to banking services is limited, at least to 78% of the Cambodian citizens; financial inclusion can be addressed by technology to narrow the huge gap. To address this, the National Bank of Cambodia (NBC) in 2020 launched a block-chain based payment system called Project Bakong.¹¹⁹ With its modernization in digital payment system, the project aims at digitally upgrading retail payment to deliver better services at a lower cost, amongst other goals. Bakong introduces unbanked citizens with the experience of financial inclusion as the system (with just a Bakong account even without having a traditional bank account) serves as an e-wallet, allowing mobile payment with a personal QR code. With this technology, users' confidence is restored against the frustration of data/personal information being stolen.¹²⁰

The NBC encourages banking and financial institutions to take advantage of technological advancement in terms of new digital financial services with broader access, stronger security, and more reasonable fees (without interbank fees). The introduction of Bakong system, for example, provides benefits that “improve the financial environment and solve cross-institution payment problems”.¹²¹

Other independent banking systems include bank's mobile banking apps such as ABA and PiPay, also offer cash payment services through the Internet to promote cashless spending in Cambodia. Therefore, e-trade has proven to be a new era for shopping in

the market without the need for direct payments.¹²²

It is possible to conclude that trends in Cambodia's digital economy and fintech ecosystem count: digital payments, quick response [QR] code for digital payments, and other innovative financial solutions to tap the consumer and MSME segment, thus making the investment in areas such as digital banking, mobile payments, business-to-business (B2B) & business-to-consumer (B2C) financial solutions, as well as blockchain and decentralized financial applications, an ideal opportunity.¹²³

FinTech is also the interest of the Ministry of Economy and Finance.

- **FINTECH: Ministry of Economy and Finance**

Currently, a policy consultation towards “Financial Technology (FinTech) Development Policy” is hosted by the Ministry of Economy and Finance. It is expected that the inputs would reflect comprehensive framework over current FinTech development and its challenges, ultimately fostering the country's FinTech community and informing inclusive policy formulation/orientation. FinTech Policy is one of the approaches to frame the digital financial inclusion as the leverage of digital economy.¹²⁴

The National Consultative Workshop on “Policies and Directions of the Financial Technology Sector of Cambodia [Financial Technology (FinTech)]” will be an important part of building financial technology infrastructure, attracting local and foreign

¹¹⁹ [ASEAN 4.0: How Cambodia is using technology for good | World Economic Forum \(weforum.org\)](https://www.weforum.org/publications/ASEAN-4.0-How-Cambodia-is-using-technology-for-good)

¹²⁰ [Hyperledger CaseStudy Soramitsu Printable 1112 20.pdf](https://www.hyperledger.org/publications/casestudy-soramitsu-printable-1112-20.pdf)

¹²¹ KHMER TIMES, *ប្រព័ន្ធទូទាត់អេឡិចត្រូនិចត្រូវបានអភិវឌ្ឍនិងដាក់ឱ្យដំណើរការ ដើម្បីលើកម្ពស់ប្រសិទ្ធភាពសេដ្ឋកិច្ច បរិយាបន្នហិរញ្ញវត្ថុ និងការប្រើប្រាស់រូបិយវត្ថុជាតិ*, accessed on March 30, 2022, available at <https://www.khmertimeskh.com/501043174/>

¹²² មជ្ឈមណ្ឌលអភិវឌ្ឍន៍កម្ពុជា, *ស្វែងយល់ពីសេដ្ឋកិច្ចឌីជីថល*, page: 6/8 accessed on March 30, 2022, available at https://cd-center.org/wp-content/uploads/2019/08/P127_20190729_V1I55_K_H.pdf

¹²³ [Chinese start-up body set to 'create impact' in fintech | Phnom Penh Post](https://www.phnompenhpost.com/fintech/chinese-start-up-body-set-to-create-impact-in-fintech)

¹²⁴ freshnewsasia, *ក្រសួងសេដ្ឋកិច្ច រៀបចំសិក្ខាសាលាពិគ្រោះយោបល់ថ្នាក់ជាតិ ស្តីពីគោលនយោបាយ និងទិសដៅនៃវិស័យបច្ចេកវិទ្យាហិរញ្ញវត្ថុកម្ពុជា*, accessed on April 26, 2022, available at <http://m.freshnewsasia.com/index.php/en/localnews/238910-2022-04-19-10-00-41.html>

investors, promoting start-ups and financial technology companies, enhancing financial technology products and services, and also promoting economic competitiveness. Cambodia's FinTech system has increased its significance in recent years, in particular, digital payments and transfers as an accelerating trend amidst COVID-19 so many services have shifted to cashless transactions.¹²⁵

- **TECH STARTUPS: Ministry of Economy and Finance**

The Ministry of Economy and Finance (MEF) pushes forward various initiatives to leverage tech startups; one of which is the "Skills Development Fund" for upgrading the skills of SMEs and growth-stage startups. Other examples include:¹²⁶

- Khmer Enterprise (KE)
- Techo Startup Center (TSC)
- Startup Cambodia National Program
- SME Bank
- Credit Guarantee Corporation of Cambodia (CGCC)

(Note: Further projects are provided in next Table on the following page)

Tech startups can also be interconnected with e-commerce and SMEs. It is then a cross-cutting effort, requiring diverse stakeholder engagement to actively support both tech startup and entrepreneurship ecosystem. The collaborative frameworks are addressed in high-level policies and strategies such as:

- the Rectangular Strategy IV; National Strategic Development Plan (2019–2023)¹²⁷;
- Industrial Development Policy 2015–2025¹²⁸;
- Cambodia Digital Economy and Society Policy Framework (2021–2035)¹²⁹;
- Science, Technology, and Innovation (STI) Roadmap 2030¹³⁰; and
- E-commerce Law and Strategy¹³¹.

The draft Small and Medium Enterprise (SME) Development Framework also highlights the connection of startups with SMEs¹³².

¹²⁵ freshnewsasia, ក្រសួងសេដ្ឋកិច្ច រៀបចំសិទ្ធិសាលា ពិគ្រោះយោបល់ថ្នាក់ជាតិ ស្តីពីគោលនយោបាយ និងទិស ដៅនៃវិស័យបច្ចេកវិទ្យាហិរញ្ញវត្ថុកម្ពុជា, accessed on April 26, 2022, available at <http://m.freshnewsasia.com/index.php/en/localnews/238910-2022-04-19-10-00-41.html>

¹²⁶ ADB (2022). Cambodia's Ecosystem for Tech-Startups. Retrieved from: [Cambodia's Ecosystem for Technology Startups \(adb.org\)](https://www.adb.org/en/technology-startups)

¹²⁷ Cambodian Corner (2021). The National Strategic Development Plan (2019-2023). [The National Strategic Development Plan \(2019-2023\) – CAMBODIAN CORNER](https://www.cambodiancorner.com/strategic-development-plan-2019-2023/)

¹²⁸ Open Development Cambodia (n.d). Cambodia Industrial Development Policy 2015-2025. [Cambodia Industrial Development Policy 2015 – 2025 - Laws OD Mekong Datahub \(opendevelopmentcambodia.net\)](https://www.opendatahub.net/cambodia-industrial-development-policy-2015-2025-laws)

¹²⁹ MPVT (2021). Cambodia Digital Economy and Society Policy Framework 2021-2035. [Cambodia Digital Economy and Society Policy Framework 2021 - 2035 , 2021-05-10 | MPWT](https://www.mef.gov.kh/Portals/0/2021-05-10-MPWT-Digital-Economy-and-Society-Policy-Framework-2021-2035.pdf)

¹³⁰ MISTI (n.d). Cambodia's STI Roadmap 2030. [Cambodia-STI-Roadmap-2021-English.pdf \(mef.gov.kh\)](https://www.mef.gov.kh/Portals/0/2021-05-10-MPWT-Digital-Economy-and-Society-Policy-Framework-2021-2035.pdf)

¹³¹ UNDP (2020). E-commerce Strategy. [E-Commerce Strategy | United Nations Development Programme \(undp.org\)](https://www.undp.org/e-commerce-strategy)

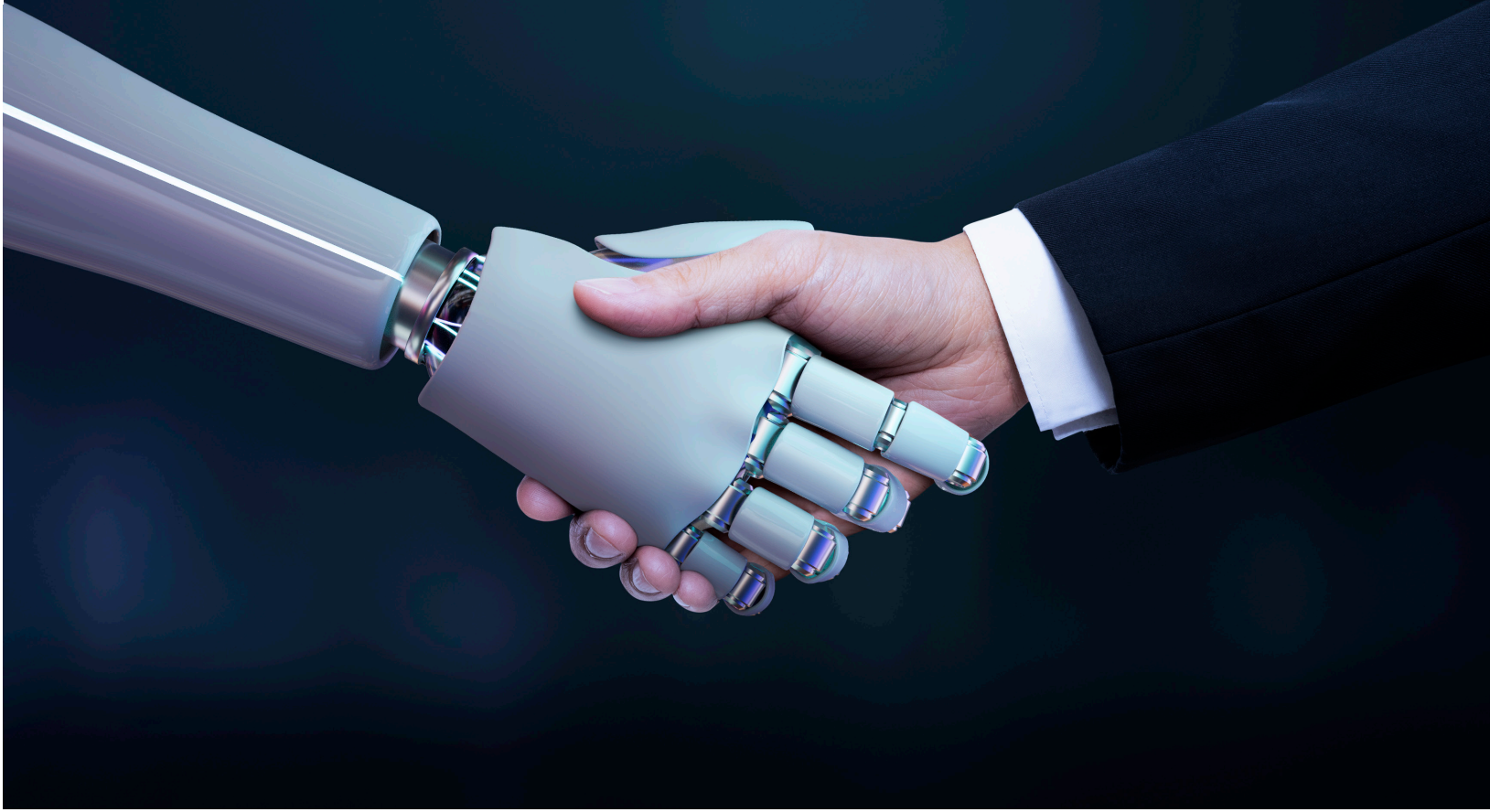
¹³² Phnom Penh Post (2021). Draft Law on SMEs finished, en route to industry minister | Phnom Penh Post

Table 6: RGC's Activities in Supporting Tech Startups

Programs/Centers	Activities	Implementing Agency	Year Implemented	Priority Sector/s
Skills Development Fund	<ul style="list-style-type: none"> Skills upgrading (training) for growth-stage startups 	MEF	2018	<ul style="list-style-type: none"> Manufacturing ICT Construction Electronics Tourism Other high demand skills
Khmer Enterprise	<ul style="list-style-type: none"> Capacity upgrading Entrepreneurial culture promotion Networking Seed funding 	MEF	2019	<ul style="list-style-type: none"> Services ICT Agriculture Manufacturing
Techo Startup Center	<ul style="list-style-type: none"> Pre-incubation Incubation 	MEF	2019	<ul style="list-style-type: none"> Agriculture Finance Technology
Startup Cambodia	<ul style="list-style-type: none"> Startup nurturing programs Community programs Digital platform programs Research and policy programs 	MEF	2021	<ul style="list-style-type: none"> Startups in all sectors
CamDX	<ul style="list-style-type: none"> Online business registration 	MEF	2021	<ul style="list-style-type: none"> SMEs and startups in all sectors
SME Bank	<ul style="list-style-type: none"> Loan 	MEF	2020	<ul style="list-style-type: none"> New innovative industry or manufacturing, high value added and high-tech content and others along with priority sectors of IDP
Credit Guarantee Corporation of Cambodia	<ul style="list-style-type: none"> Business recovery guarantee scheme Cofinancing guarantee scheme 	MEF	2020	<ul style="list-style-type: none"> Agriculture, industry, and service
Digital Innovation Center	<ul style="list-style-type: none"> Incubation/acceleration Makerspace Co-innovation space Event space 	MPTC	2020	<ul style="list-style-type: none"> Technology
Digital Technology R&D Center	<ul style="list-style-type: none"> R&D on digital innovation 	MPTC	2021	<ul style="list-style-type: none"> Technology
Technology Business Incubation	<ul style="list-style-type: none"> Training Pitching 	MISTI	2019	<ul style="list-style-type: none"> Food processing
Incubation	<ul style="list-style-type: none"> Training 	MISTI	2020	<ul style="list-style-type: none"> Agro-processing
Go4eCam	<ul style="list-style-type: none"> E-commerce marketplace Training and incubation program SME formalization for e-commerce Small grant Pitching event with investors (for growth-stage startups and SMEs) 	MoC	2021	<ul style="list-style-type: none"> Manufacturing Agro-processing Green/environmentally friendly products

ICT = information and communication technology; IDP = Industrial Development Policy; MEF = Ministry of Economy and Finance; MISTI = Ministry of Industry, Science, Technology, and Innovation; MoC = Ministry of Commerce; MPTC = Ministry of Posts and Telecommunications; R&D = research and development; SMEs = small and medium sized enterprises.
Sources: Interviews conducted by author, written inputs from the ministries, and respective websites.

End of Chapter III



Reading Time: 10 Minutes

Chapter IV

Trustworthiness in Digital Space

Author: Roth MONY

Editor: Nary VAN



Blueprint

Investment in tech and digital connectivity is believed to yield a positive impact on “data resilience” and “institutional capabilities in data governance”.

Nevertheless, there is much more for data resilience to cover in term of “digital trust” that invite positive and active engagement of users in the transaction and operation of digital economy. Trust embraces the standards for ethics in the digital sphere i.e. privacy, accountability, transparency of data, inter alia.

The Chapter entails consideration in relevance of digital trust & digital governance ecosystem; that includes coverage surrounding the **Trustworthiness**, highlighting significance of **Digital Trust**, consideration for **Standards for Ethics**, and practice for **Data Governance**. The content mainly aims to address security in cyberspace and protection of personal data so that digital economy would be more driven by active engagement of online users.

IV.1. Why “Digital Trust”?

On a global scale, World Economic Forum emphasizes the necessity of digital trust in a global economy and futuristic innovative technology. To be trustworthy, technology must be secured (ensuring connected systems’ confidentiality, integrity and availability) and responsibly used. Thus, two aspects of digital trust are “cybersecurity & responsible use of technology”. Whilst the first one (cybersecurity) makes a reference to the design of security in the cyberspace for cyber resilience, the latter (responsibility aspects of technology use) includes ethical and value-driven innovation, transparency in development, and accountability amongst others.¹³³

In ASEAN, digital trust is the essence of its economy in order for the region to digitally transform and generate greater confidence in security, safety, privacy and reliability in the communities, particularly for sustainable, inclusive and resilient development. Digital trust is compulsory across businesses and firms of all sizes, even more relevant to Micro, Small and Medium Enterprises (MSMEs) to divide dependable services from the corrupt ones, thereby assisting their consumers with judgmental decisions on secure and reliable companies.

As cyber and privacy risks happen alike in Corporates, MSMEs and government, eliminating possible risks is key to restore confidence levels of consumers. Business leaders have included cybersecurity and privacy personnel as security measures in their development process from the start of their service/device on the market instead of avoiding them.

Some businesses have also started adopting the “model of zero risk in digital trust” which

minimizes the potential risks of hacking by limiting authorization and privileged access to different machines or segments of the network.¹³⁴

Other claim also indicates that for optimal stimulus of digital economy, the assurances of Ethics, Accountability, Privacy and Transparency in digital sphere are obligatory. For instance, governments are required to take concrete consideration to ascertain trust of consumers in digital system, even more necessary during the influx of industrial revolution 4.0¹³⁵ that also counts in the digital economy.

“Trust in digital system” is emphasized in the recommendation of the UN Secretary General’s High-level Panel on Digital Cooperation in relevant concern of how data transformation can be navigated with trust, security, and stability in cyberspace:¹³⁶

“We recommend that the development of a global commitment on digital trust and security to shape a shared version, identify attributes of digital stability, elucidate and strengthen the implementation of norms for responsible users of technology, and propose priorities for action.”

Thus the subject of Digital Trust provides solid foundation for users’ confidence in the ability of people, technology and processes to create a secure digital world. To be specific, companies, businesses and digital service providers deal with their consumers via online surface or devices from which the consumers’ digital footprint safety, privacy and security are put at the forefront of risks, thereby demanding a proper safeguard of data ethics. When a person decides to use a

¹³³ <https://www.weforum.org/projects/digital-trust>. Retrieved: March 30 2022.

¹³⁴ Jeffrey Ritter (2019). Definition of Digital Trust. Source:

<https://whatis.techtarget.com/definition/digital-trust#:~:text=Digital%20trust%20is%20the%20confidence,their%20online%20programs%20or%20devices>

¹³⁵ Farida, Ida, Refly Setiawan, Anastasia Sri Maryatmi, and Masayu Nila Juwita. "The Implementation of E-Government in The Industrial Revolution Era 4.0 in Indonesia." *International Journal of Progressive Sciences and Technologies* 22, no. 2 (2020): 340-346.

¹³⁶ UN, High-Level Panel on Digital Cooperation 2019: The Age of Digital Interdependence, June 2019.

company's product, they are expecting their entitlement to digital trust in the business.¹³⁷

In brief, it can be implied that without sufficient trust, there is a strong risk that users may opt for other options which they believe to be safer than navigating their economic activities in the uncertainty of digital world. The loss is tremendous if the reluctance becomes obvious in future instances where the projection of ASEAN's digital economy to reach USD1 trillion by 2030¹³⁸ might be not realized due to distrust in the system.

When the need for digital trust is already convincing, it is herewith necessary to structure the governance and standards.

IV.2. Digital Governance & Standards in Digital Economy

• Global Perspectives on Data Governance

Digital governance encompasses the norms, institutions, and standards that shape the regulation around the development and use of these technologies¹³⁹. At the global level, there have been many efforts to streamline data standards, data governance or data protection frameworks, such as:

- * APEC Privacy Framework,
- * OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data,
- * Standards for Personal Data Protection (American standards)
- * EU General Data Protection Regulation (EU-GDPR's standards)

¹³⁷ Jeffrey Ritter (2019), Definition of Digital Trust.

Source:

<https://whatis.techtarget.com/definition/digital-trust#:~:text=Digital%20trust%20is%20the%20confidence,their%20online%20programs%20or%20devices>

¹³⁸ ASEAN's digital economy projected to hit USD1tn by 2030, NIKKEI Asia

* International Telecommunication Union (ITU) Framework (China's standards)

The existence of various standards above might also be of relevance to an understanding that there is no one-way-fit-all approach as the application of digital technology standards and new business models in the digital revolution is unlikely to be consistent with traditional political frameworks and regulations, because by their nature, previous governance models could not support the process of economic transformation in the digital age. Therefore, the rules and procedures for new technology governance need to be more speedy, flexible and resilient, such as through regulatory sandboxes, anticipatory approaches, the use of multilateral guidelines and standards, and the promotion of international initiatives.¹⁴⁰ These are to address the needs for digital technology perspectives in legal context at the national level at first, aiming to further expand cooperation within the region and to achieve international harmonization.

Nevertheless, there are a couple of outstanding standards of digital governance, practiced by different countries. This is because digital governance has been long-term associated with digital trade and digital technical standards. The two visions of standards have been developed for digital governance, in the manner of democratic value and illiberal perspective.

* First model: Illiberal perspective of standard

Authoritarian vision is China's standard for reinventing the Internet with New IP system and creating a cyber sovereignty that allows many countries to control access to the Internet, content and data on their own localizations without the risk of data protection for users at the national level. This

¹³⁹ *Ibid.*

¹⁴⁰ United Nation (2021), Standard and Digital Transformation. Source:

<https://www.unido.org/sites/default/files/files/2021->

10/Standard_digital_transformation_ONLINE_FINAL.pdf. Retrieved: 19 April 2022.

model is popular in many countries around the world, particularly in developing countries, as it ensures the long-term stability and sustainability of a free, open and interconnected Internet that is conducive to the digital economy. China has set up a multilateral body namely the International Telecommunication Union (ITU) to implement this standard. This standard has been adopted through the exports of China Silk Road technology, which has evolved into a Digital Silk Road due to its success in providing low-cost 5G communication technology to low and low-middle income countries.

*** Second model: Democratic value of standard**

The European Union's General Data Protection Regulation (GDPR) is a democratic concept for digital governance that is used to protect the privacy and rights of Internet users and online content. Approved by the European Parliament in 2014 and came to effect in May 2018, the GDPR was designed to pave the way for

global cyber governance where users are under unprecedented control over the online freedom of their data. It boosts companies' efforts to cybersecurity against data breaches, giving digital-based companies the opportunity to verify their data usage with their privacy policies, a power that boosts users' confidence in the companies. However, the GDPR seems to unwelcome private sector's innovation process. In 2022, EU adopted Digital Service Act (DSA) proposed by European Commission in 2018. DSA aims to add more restrictions to the Big Tech companies, namely Facebook, Instagram and YouTube on their online systemic risk management to ensure the right on personal data online. On the other hand, GDPR is not recognized by any other parts of the world as to be generally described that it can only be used in developed countries for the state power challenge. US, EU and UK have strengthened their cooperation in a way of joint leadership on digital technology governance at the global level, including in the World Trade organization, through the latest digital trade agreements.



Table 6: Summary of the two models of digital technical governance standards

China's approach (ITU)	EU's approach (GDPR)
Illiberal or authoritarian vision	multi-stakeholder participation and democratic value
for national data localization	for global cyber governance
favorable conditions for both public and private sectors' digital tech. development	unfavorable private sector's innovation process
recognized by developing countries including low and low-middle income countries.	recognized by developed countries, including Global South, for expanding their powers in the world digital economy

With various implications, the two models serve best for their own dimensions. Nevertheless, the adoption of the GDPR has been a turning point for global internet governance as consumers gained extraordinary control over their data in a manner that preserved freedom and openness online. As such, ASEAN has conducted efforts to replicate the comprehensive data governance framework.

The following section provides a deeper investigation on ASEAN Data Governance's effort to boost the digital economy.

- **ASEAN Perspectives on Data Governance**

As projected, ASEAN's digital economy is on track to grow to USD1 trillion by 2030 since millions of new internet users fuel online

businesses in fields including e-commerce and virtual finance¹⁴¹. The trend happened during the COVID-19 pandemic when 60 million new digital consumers have been added to the bloc's internet economy. With this substantial growth of the region's digital economy, it is important that digital governance structures are set in stone.

ASEAN perspectives on data governance do not come as a surprise, but have started quite a while. As early as 2010, ASEAN recognized the need for enhanced connectivity among its member states. The '**Master Plan on ASEAN Connectivity 2025**' has identified the development of an **ASEAN Framework on Digital Data Governance** as an initiative that is intended to enhance data management and harmonize data regulations. Below is the summary of frameworks and action plans concerning data governance in ASEAN.

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¹⁴¹ ASEAN's digital economy projected to hit USD1tn by 2030, NIKKEI Asia

Table 7: Summary Frameworks and action plans concerning data governance in ASEAN

Frameworks and Action Plan	Elaboration
ASEAN Framework on Digital Data Governance ¹⁴²	Promotes trade and flow of data in ASEAN digital economy, strengthens the governance of digital data, requiring the improvement of transparency and thereby enhancing data management, facilitating data regulation harmonization in AMS, and finally promoting intra-ASEAN data flows.
ASEAN Data Management Framework- DMF ¹⁴³	Earlier known as ASEAN Data Classification Framework, aims to ensure that higher levels of protection are guaranteed for certain types of data i.e. sensitive personal data, with stricter access controls compared to publicly-available data. The Framework thus categories level of data and recommends the security required for each data classification level, embracing data sensitivity, risk assessment, protection and impact management, and storage standards.
ASEAN Framework for Personal Data Protection ¹⁴⁴	Calls for the implementation of rules, regulations and laws concerning personal data protection principles i.e. consent, safeguard, access, accuracy, data transfer, and institutional accountability
ASEAN Strategic Action Plan on Consumer Protection (ASAPCP) 2016-2025 ¹⁴⁵	Focuses on four goals with initiatives to address consumer-related concerns i.e. protection via legislation and policy, confidence in cross-border commercial transactions, amongst others.

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¹⁴² ASEAN (2012). ASEAN Framework on Digital Data Governance. Retrieved from: https://asean.org/wp-content/uploads/2012/05/6B-ASEAN-Framework-on-Digital-Data-Governance_Endorsedv1.pdf

¹⁴³ ASEAN Data Management Framework 2021. Retrieved from: [untitled \(asean.org\)](https://asean.org/wp-content/uploads/2021/01/ASEAN-Data-Management-Framework-2021.pdf)

¹⁴⁴ ASEAN (2016). ASEAN Framework on Personal Data Protection. Retrieved from: <https://asean.org/wp-content/uploads/2012/05/10-ASEAN-Framework-on-PDP.pdf>

¹⁴⁵ ASEAN (2021). ASEAN Strategic Action Plan for Consumer Protection. Retrieved from: <https://asean.org/wp-content/uploads/2021/01/ASEAN-Strategic-Action-Plan-for-Consumer-Protection-2016-2025-ASAPCP-2025.pdf>

For complete mechanism, data/digital governance frameworks and plans also need to go in line with cybersecurity and digital data policy.

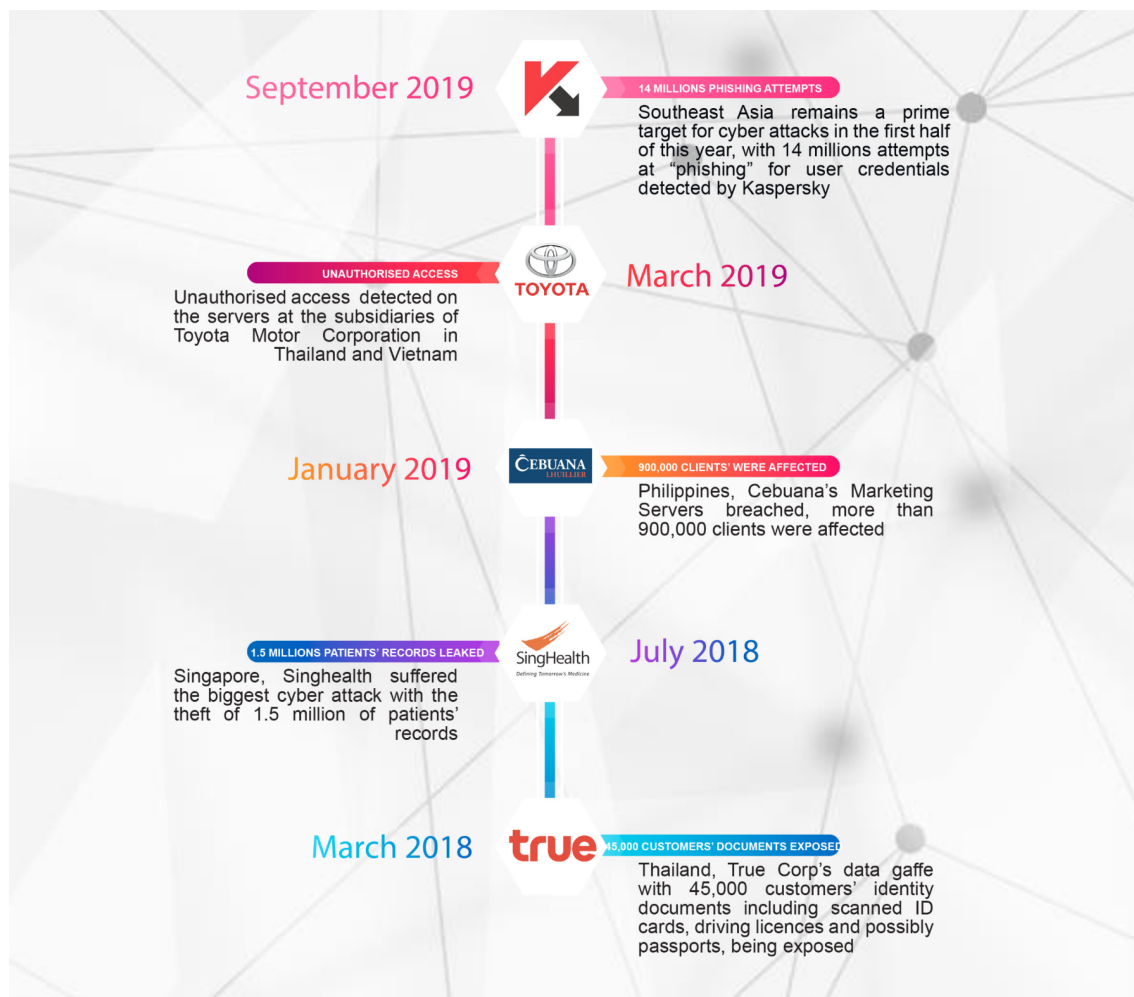
IV.3. Cybersecurity & Digital Data Policy

Cyber and technology risk must be governed in any up-to-date organizations. Leaders need a baseline understanding of the key issues in cybersecurity and require guidance

in order to take action on cybersecurity, anti-cybercrime and cyber resilience strategy.¹⁴⁶

The argument is pertinent, particularly in time of cyberattacks in global and regional-scale digital crisis. For instance, ASEAN Cyberthreat Assessment 2020 revealed major cyber incidents where millions of users are victims of data breaches:¹⁴⁷

Figure 7: ASEAN Cyberthreat Assessment 2020



(Source: ASEAN Cyberthreat Assessment 2020)

¹⁴⁶ Cyber Risk Leadership and Corporate Governance. Source: <https://www.weforum.org/projects/cyber-risk-leadership-and-corporate-governance>. Retrieved: March 30 2022.

¹⁴⁷ https://asean.org/wp-content/uploads/2021/01/ASEAN_CyberThreatAssesment_2020.pdf

Where cyber strategy is a key component of business strategy, and where cybersecurity issues threaten organizations' reputation and trust between all players in an ecosystem, leaders need tools and guidelines in order to fulfil their obligations. Organizations also need support in ensuring that information flows from cybersecurity managers up to business leaders in order to adequately assess and govern this new risk.¹⁴⁸

In order to ensure public trust on performing online transaction, most governments in ASEAN countries have developed cybersecurity policy with the three specific goals: (i) Ensuring open internet to promote Innovation; (ii) Combating Cybercrime; and (iii) Ensuring Privacy of their citizen.

Recently, there are six major ASEAN countries including Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam have developed and adopted legislative and policy regarding to the cybercrime protection¹⁴⁹ whilst Cambodia is also under drafting procedures. Pertaining to privacy data protection, Vietnam and Indonesia have no single privacy law that dedicates to Personal Data Protection Acts (PDPA), but admit other privacy-related regulations in effect.¹⁵⁰

Below is the summary table of the legislation of cybersecurity and personal data protection in the six countries.



¹⁴⁸ Cyber Risk Leadership and Corporate Governance. Source: <https://www.weforum.org/projects/cyber-risk-leadership-and-corporate-governance>. Retrieved: March 30 2022.

¹⁴⁹ Jirapon Sunkpho, Sarawat Ramjan, Chaiwat Ottamakor (2018), Cybersecurity Policy in ASEAN Countries. Source: https://www.researchgate.net/publication/324106226_Cybersecurity_Policy_in_ASEAN_Countries. Retrieved: April 04 2022.

¹⁵⁰ Erh, J. (2021). *Assessing Digital Economy Policies in Six Southeast Asian Countries*. p. 7. Singapore: ISEAS-Yusof Ishak Institute.

Table 8: Summary of Cybersecurity and Data Protection Acts in AMS

Name of Country	Cybersecurity	Personal data protection act (PDPA)
Cambodia	- Cybercrime Law ¹⁵¹ (has been drafted as reported in 2022)	- Personal data protection law (has been drafted as reported in 2022) ¹⁵²
Indonesia	- Law has been proposed but not yet enacted - Establishment of Indonesia's State Cyber and Crypto Agency (BSSN)	- Electronic Information and Transaction Law in effect from 2008
Malaysia	- No single piece of legislation. Regulation is currently scattered across various laws - Establishment of National Cyber Security Agency (NACSA) - National Cybersecurity Policy	- Establishment of Personal Data Protection Department - Bill passed for PDPA 2010
Philippines	- Cybercrime Prevention Act approved in 2021 - National Cybersecurity Plan 2022	- PDPA law passed in 2012
Singapore	- Cybersecurity act passed in 2018 - Establishment of Cybersecurity Singapore Agency	- Law enacted since 2012
Thailand	- Cybersecurity act enacted in 2019	- PDPA laws in force in 2019 - Establishment of the Personal Data Protection Committee
Vietnam	- Cybersecurity law in effect since 2019	- No single piece of legislation. Constitution recognizes the right to personal privacy

Source: ISEAS-Yusof Ishak Institute¹⁵³

¹⁵¹ CDRI (2020), *Cybergovernance in Cambodia: A Risk-Based Approach to Cybersecurity*. Source: https://cdri.org.kh/storage/pdf/SP18_cybersecurity_1620204216.pdf. Retrieved: 29 April 2022.

¹⁵² KhmerTimes (2022). Cambodia to strengthen personal data protection measures. Retrieved: <https://www.khmertimeskh.com/501063124/cambodia-to-strengthen-personal-data-protection-measures/>

¹⁵³ Erh, J. (2021). *Assessing Digital Economy Policies in Six Southeast Asian Countries*. p.17. Singapore: ISEAS-Yusof Ishak Institute.

IV.4. Addressing Cybercrime: Actions & Way Forward

Digital governance plays a prominent role in shaping digital transformation process, complementing regulations whilst also facilitating ongoing digitalization of industries, and hereby accelerating change through innovation and quality of new tech with acceptable standards.

Standards do inform effective regulations, leading to enabling environment for “innovation” whilst minimizing risks for disruptors and investors. Well-rounded standards would ease the removal of international barriers to trade through effective responses and mechanisms to market barriers. Interoperability, productivity, and innovation, plus a successful scale-up solutions for global implementation and the feasibility of effective policy/legislation, in combination, is the ultimate outcome of standards stipulation. Henceforward the role of standards in digital transformation governance cannot be underestimated, requiring comprehensive review of developing international standards on policy/legislation, regulation development, governance in the digital tech landscape; all of which aim at ensuring that tech is human-centered and being aligned with the goals of sustainability.

Cyberattacks are hazardous and coping with those illegal encounters are draining but that

does not mean it is impossible. The milestone in cybersecurity can be met by:

- (1) Enhancing regional and global capacity/capabilities to combat cybercrime: shall be the institutional strategies to equip the existing institutional, operational, legal and technical entities with required cyber expertise to perform effective actions.
- (2) Strengthening cooperation for joint operations against cybercrime: shall consider intra-regional and inter-regional cooperation for law enforcement whereas PPP (Public-Private Partnership) might be worth being integrated into the concerned authority like INTERPOL in putting joint cybersecurity operational plan at the forefront of security mission to prevention and mitigation of cyberattack.
- (3) Enhancing Cybercrime Intelligence: shall be able to provide immediate response to operational and tactical intelligence on cyber threats relating to data breach, privacy invasion, banking malware infections, business email compromise scams, social engineering fraud, e-money laundering, hacking, amongst others.

___End of Chapter IV___





Reading Time: 07 Minutes

Final Messages

Suonvisal SETH

Way Forward for ASEAN:

Digital Economy as Digital ASEAN's Transformation

Traditional business and governance avenues are changing dramatically when social distancing regulations or lockdowns are implemented to assist control highly infectious epidemics. Utilizing various digital indicators such as e-commerce and internet usage, one can see that governments, businesses, and people are increasingly relying on digital services and platforms to meet their daily needs, from ordering groceries online to holding a meeting of key policymakers through online meetings to collaborating on projects via digital platforms. As a result of these new dynamics, ASEAN has experienced exceptional growth in digital transformation.

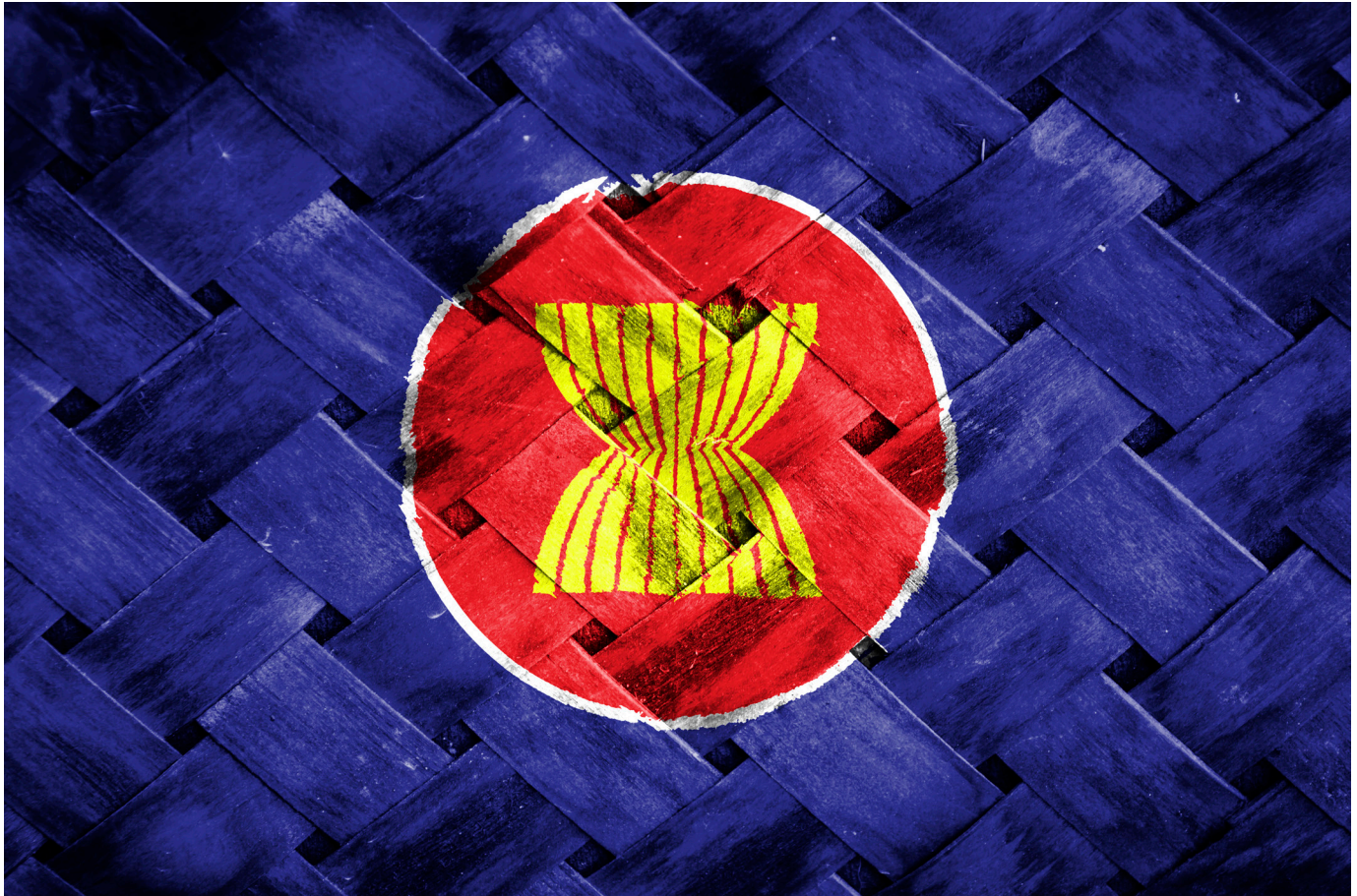
With these perspectives, Digital Transformation to empower the ASEAN Digital Economy could be an effective address for an inclusive, resilient and sustainable future of ASEAN if the following pre-conditions be considered:

- In response to the new ASEAN 2025 blueprint, "Forging Ahead Together," ASEAN must be prepared to embrace new opportunities from digital technology while also preparing strategies to handle the hazards it may bring in order to avoid anyone from lagging behind. Each separate group of specialists collaborates will need to capitalize on digital trends even more and incorporate them into various strategic action plans and future work programs in order to utilize digital technology for economic development, regional integration and cooperation.
- The problem for ASEAN's digital transformation is to address the "large development gap." As a result, ASEAN should continue to work closely in bridging the digital divide and ICT development gaps within ASEAN, including for Least Developed Countries (LDCs), through the development of digital competencies, including cybersecurity best practices, market-driven approaches, and the exchange of views on regulatory best practices, while promoting the importance of performance, security, and resilience in next-generation ICT networks.
- ASEAN's human capital development should enhance by promoting digital skills and literacy, as well as 21st-century skills in basic education, Technical and Vocational Education and Training through higher education, and human resource development toward 4IR and developing standards to meet the demands of the global labor market, reskilling and upskilling for employment, including digital skills.
- ASEAN countries are also expected to provide assistance to a rapidly rising community of technopreneurs and e-commerce companies. Governments are primarily obligated to guarantee fiscal prudence when deciding to invest more on the development of their digital economies. The strategy should next focus on optimizing revenue from the digital economy. Consultation and cooperation with digital intermediaries are required to increase government capabilities to track and record digital transactions, as well as to develop more credible tax policies for the digital economy.
- Another issue would be determining how to encourage and incentivize improved tax compliance among digital economy businesses and suppliers. One approach is to develop mechanisms that make it impossible for people to evade paying their taxes, a process known as digitization of tax systems, while also boosting taxpayer trust. It should be supported by modernizing revenue administration and strengthening tax collector effectiveness by providing them with the best IT tools and strengthening safeguard measures against digital

fraud threats.

- Ultimately, ASEAN must be adequately equipped to meet the requirements of the digital era. These include applicable government measures that facilitate the establishment of the digital economy as one of the region's primary sources of growth. The requirements in the

public policy spectrum include, among other things, the creation of an environment that promotes investment in digital infrastructure and develops a supporting regulatory framework related to digital technology developments in order to establish an innovative, inclusive, secure, and integrated digitally-connected region.



Way Forward for AIPA:

Commitments & Resolutions on SMEs' Digital Transformation- related Issues

As already covered in section related to SMEs' challenges in Chapter II (II.4), that highlights:

- Limited capacity in entrepreneurship and occupational skills
- Unfavorable financial access & Lack of financial information
- Inadequate access to market information
- Other constraints: Legal, Technological, and competitiveness & taxation hindrance

ASEAN or AIPA is therefore in need of embracing such priorities as “Capacity building, Financial access, and more” to formalize the growth and participation of SMEs in international, regional and national markets, particularly adapting to digital transformation. Thus, the following commitments and resolutions aim to address **“Promoting Capacity of Micro, Small and**

Medium Enterprises (MSMEs) in Digital Transformation” with considerations:

- ASEAN Member States to refine and integrate policies/programs that accelerate capacity in digital and entrepreneurship, innovation, science, and technology for SMEs whilst also embedding such policies in national development plans and strategies;
- ASEAN Member States to stimulate further investments in technology & STEM education and other schemes of training to generate skills for the 21st century crucial for SMEs. The skills include but not limited to: critical skills, communication, creativity, technology, and digital literacy, media and information literacy, financial literacy, global awareness, and innovation skills, amongst others; all of which are catalysts to fuel SMEs to navigate in the uncertainty of changing global business environment, particularly during the survival and resilience to new normal as well as the digital influx of 4.0 (4IR).



- ASEAN governments and parliaments to put forward policies/strategies to improve SMEs' financial access to various banking and financial services with equitable conditions so that they can perform better through different scenarios, in and outside the digital context. Modality of SMEs' access to finance could be loan guarantees, start-up grants, or crowd-funding facilitation. Financial inclusion is also worthwhile to be integrated into support policies.
- ASEAN Member States to encourage their local SMEs to embrace "financial records and proper accounting procedures" as it is one of the most crucial validations for assessing SMEs' credibility for loans;
- ASEAN Member States to administer legal frameworks to ascertain connectivity and competitiveness by simplifying and synchronizing regulations and administrative procedures for SMEs to excel in a conducive business environment with the fair-competition regulatory framework. In a more locally-oriented approach, each ASEAN government and parliaments shall legislate rules and regulations to streamline registration procedures for SMEs, both online and offline business modalities, to ascertain competitiveness for the same products and services under same law compliance, eliminating exploitation of the unfair business environment and cost structures.



- ASEAN governments and parliaments to leverage cooperation amongst the Member States on the exchange of best practices and lessons learned in relevance of (1) legal frameworks, (2) employability and entrepreneurship skill development via both formal and informal means, education & vocational training, (3) technology transfer to upsurge the optimum digital tools and platforms to transform SMEs go digital whilst also generating a pool of talents to best fit in digital-economy and digital-SMEs related scheme, ultimately reflecting on the economic growth and development of the region as a whole.
- ASEAN Member States to make available entities in charge of SMEs' Support in terms of information sharing on "access to finance and credit loans, market access and internationalization, technology and services, registration and tax compliance, amongst other SMEs' relevancy".
- ASEAN Member States to promote Digital SMEs' role as an entity of ASEAN economic integration and also global chain under multilateral trading system and other international trade mechanisms with fair respect of inclusiveness in adherence to WTO agreements. This would leverage the role and capacity of Digital SMEs to reap the benefits of global trade in the digital age of the 4th Industrial Revolution;



Way Forward for Cambodia:

Preparedness & Responses to Digital Economy

As a roadmap for Cambodia's effort to thrive for digital revolution to be on pace with the global trend of Industry 4.0, the RGC's **Digital Economy and Social Policy Framework of Cambodia 2021-2035** framework paves the way to shape policies concerning the digital transformation across sectors including digital government, economy and business. One of the priorities emphasizes the hope for economic growth being fueled by "building rich digital infrastructure, attracting investment, creating productivity and enhancing Cambodia's competitive edge". It is, therefore, significant to first place tools and mechanisms at core to promote the advancement of digital technology if aiming high for digital economy to function as expected. This is because digital economy, assisted by digital technology, internationalizes local products, expanding the horizon of product boundaries, as one example. In line with this fundamental framework, below are preliminary requisites for Cambodia to kick off, in terms of prepping for digital economy:

- **Digital Infrastructure**

The limitation of internet access might be hampering the process of digital economy; data has shown that only 40% of Cambodia's population has the access. With this concern, digital infrastructure is key to building up digitally-driven industries, such as agro-tech, health tech, e-commerce, mobile and fintech that Cambodian young entrepreneurs can benefit from.

- **Data Resilience & Data Governance:**

Governing structure for digital resilience is also a vitality in digital ecosystem; **Investment in tech & human connectivity** contributes to "data resilience" and institutional capabilities in "**data governance & accountability**".

- **Institutions for Digital-driven Subjects:**

There is a strong need for Cambodia to consider broadening STEM-oriented training institutions and post-graduate entities. Several institutions have been noted, for their focus on tech-driven subjects, such as: the Cambodia Academy of Digital Technology and Kirirom Institute of Technology.

Aiming high for at least 50% of STEM graduate and postgraduate levels by 2030, Master's and Ph.D. curricula shall be developed with the private sector's demand.

Technology platforms shall also be attached to the university and TVET level so that students can familiarize themselves to access such digital exposures.

National Research Agenda & Funding shall be reserved, to some extent, for R&D in innovation and digital economy themes. Granting the "Research Centers of Excellence" Awards would additionally encourage and scale up research capabilities for the nation.

- **Vibrant Ecosystem of Digital Platforms**

First Annual AI-Cambodia Forum, aiming to promote human intelligence in the augmented era, was hosted in 2018 as a platform for those whose passion is in AI and digital transformation. The significance of the event concludes the necessity for other similar platforms to have regular exhibitions and gatherings, such as "Innovation Days & Innovation Forums".

Science Libraries & science museums shall be made available, at least in the capital city, to stimulate the citizens' interest in innovation, tech, and other digital-economy-related schemes.

- **Partnership, Collaboration and Support**

A supportive partnership is also one of the priorities to broaden the scope of delivery in digital skills and career navigation. Evidence has made it crystal clear about the role of public-private partnership, including partnerships with donors to create a vibrant ecosystem on matters of importance, as in the example of “New Partnership to Enhance Cambodia’s Youth Entrepreneurship and SMEs”. This suggests such model shall be promoted in the vibrant digital ecosystem alike.

To match the demand and supply of STEM graduates for the emerging trend of digital-economy industries, “University-Industry Linkage Offices” shall be set up for the connected dots of the two entities.

Collaboration between educational establishments and industries could be more

vivid through administering contracts of internships as a required component of academic fulfillment.

- **Legal Framework**

“Technology Transfer Law” has to be in place, alongside with mechanisms to ensure equal access to the latest technology tools.

“Intellectual Property Law” and “Privacy Law” shall also guarantee trust and protection for all parties alike- merchants and consumers.

To end, apart from all of these considerations, Cambodia shall also take crucial attention to various indicators and toolkits for measuring the digital economy so that the country can be on a healthy line of the Regional Digital Economy Index in ASEAN or even on a global scale to correspond to Cambodia’s ambitious journey toward an upper-middle income country by 2030 and a high-income country by 2050.



Annex: Examples and Explanation on Key Terms

- **Artificial Intelligence:** refers to the impersonator of human intelligence which has computerized to think and act like human such as automated robotics, voice recognition (Siri), voice typing, virtual customer service, computer vision which suggests on tagging people in social media, uses in health sector to scan through human organs (Radiology imaging), suggests relevant ads on the internet based on the habit of user's browsing.
- **Robotics:** is the design and operation of devices that can execute physical tasks independently or semi-autonomously on behalf of humans. Generally, robotics execute repetitive actions or actions that are not really safe for human to implement. Such acts counting from harvesting agricultural yields to automobile assembly and healthcare industry. Mechanical robots interact with the physical environment via the use of sensors, actuators, and data processing. Robotics were categorized into two:
 - 1) Non-fixed robotics, automated running by using sensor and camera to detect the surrounding based on the computerized programming that has install in its memory system.
 - 2) Fixed robotics, are creating to work as human arms. Generally, they are used in assembling automobile or packaging.
- **Internet of thing (IoT):** refers to any internet connected devices to implement respective activity, for instance, internet connected camera, accessing into app for transaction recording, allow access to control someone's computer from distance and so on.
- **Cloud computing:** is the delivery of various services over the Internet including data storage, servers, databases, networking, and software. Instead of storing files on a proprietary hard drive or local storage device, cloud-based storage allows them to be saved to a distant database. As long as an electronic gadget has internet connectivity, it has access to data and the software applications needed to execute it. Cloud computing is becoming more popular among individuals and organizations for a variety of reasons, including cost savings, enhanced productivity, speed and efficiency, performance, and security. For example, the subscription to cloud accounting which allow the users to use tailor-made accounting software to record their accounting transaction, and store in cloud which can be used both online and offline. Such technology ease the business transactions in terms of monitoring from a distance, cost effective, saving on hire accountant professional to analyze cash flow and saving on extra payment for server maintenance.
- **How does 3D printing work?** It has started with the 3D machine printer which printing or produce small or big objects due to its digital model in 3D format, designed and controlled by computer. Such printing is the production of additive processes on thing's layer until its successive stage. Generally, such printing can produce complicated objects by using less material than prominent manufacturing.

Remark: The elaboration is based on consultations with various sources:

- 1- IBM, Artificial intelligence (AI), accessed on October 6, 2022, retrieved via: [What is Artificial Intelligence \(AI\)? | IBM](#)
- 2- IBM, IoT and IBM are creating solution for growth, Accessed on October 6, 2022, retrieved via: [IoT Solutions | IBM](#)
- 3- Intel, Types of Robots: How Robotics Technologies Are Shaping Today's World, accessed on October 6, 2022, <https://www.intel.com/content/www/us/en/robotics/types-and-applications.html>
- 4- Microsoft, What is cloud computing, Accessed on October 06, 2022, retrieved via: [What is cloud computing? A beginner's guide | Microsoft Azure](#)
- 5- Oracle Netsuite, What is cloud accounting, Accessed on October 6, 2022, retrieved via: [Cloud Accounting Basics: What It Is & Reasons to Use | NetSuite](#)
- 6- 3D printing.com, What is 3D printing, Accessed on October 7, 2022, retrieved via: [What is 3D printing? How does a 3D printer work? Learn 3D printing](#)

