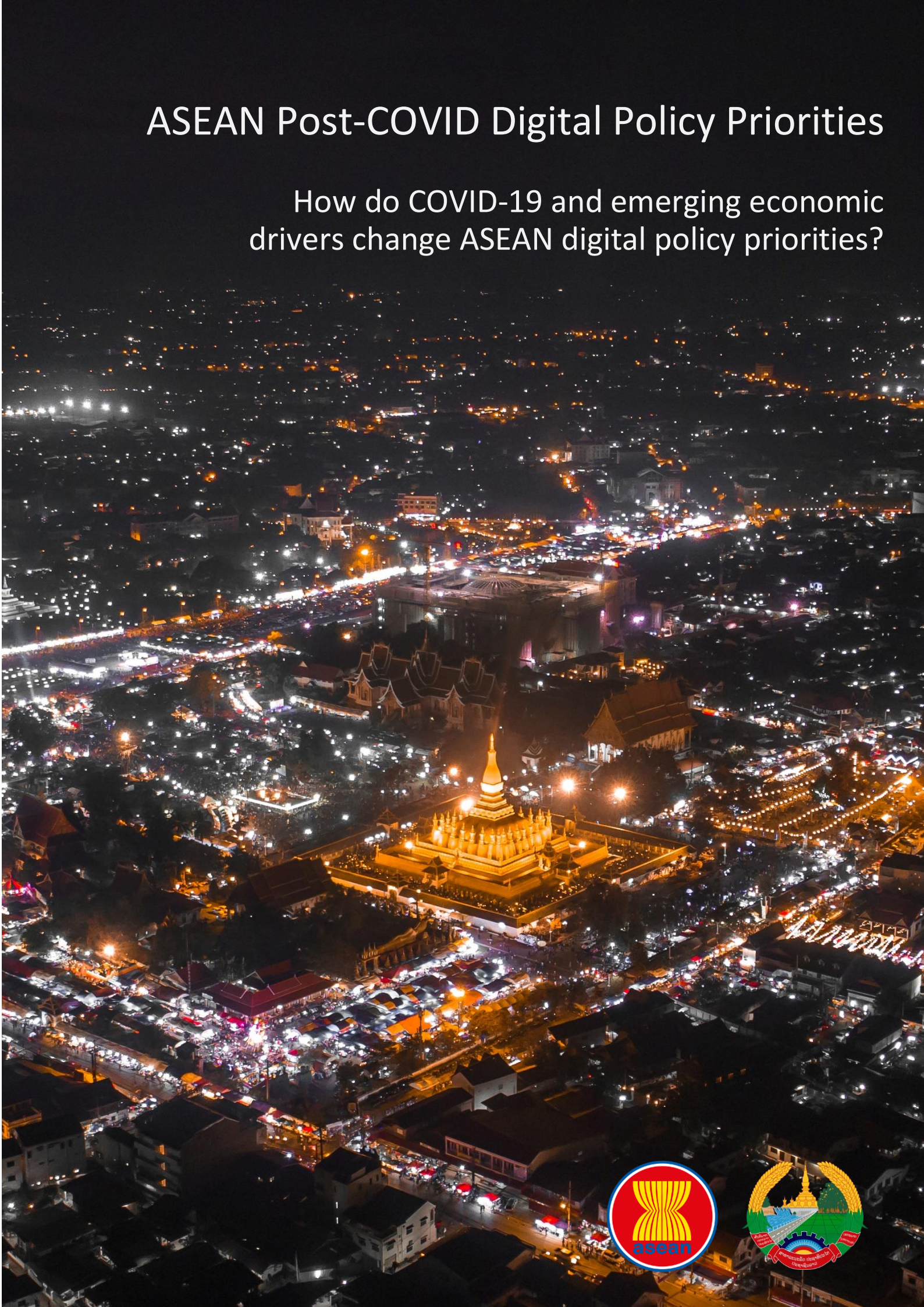
ASEAN Post-COVID Digital Policy Priorities

How do COVID-19 and emerging economic drivers change ASEAN digital policy priorities?



CONTENTS

ACKNOWLEDGEMENTS

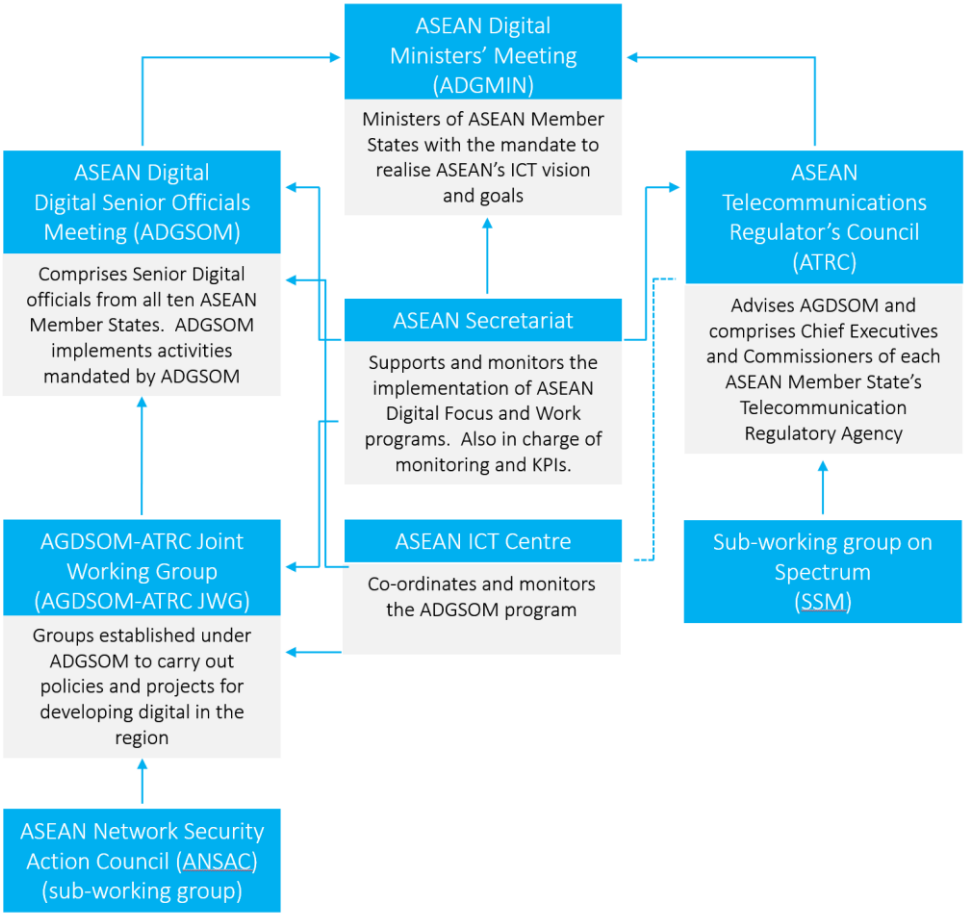
The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967. The Member States of the Association are Brunei Darussalam, Cambodia, Indonesia, Lao P.D.R., Malaysia, Myanmar, Philippines, Singapore, Thailand and Viet Nam. The ASEAN Secretariat is based in Jakarta, Indonesia.

General information on ASEAN is available online at http://www.asean.org

This report is part of an ongoing research series by the ASEAN Secretariat on ICT-related policy.

Exhibit 1: ASEAN Member States Map

Exhibit 2: ASEAN Member States Map



1 EXECUTIVE SUMMARY

The economies of ASEAN span the full spectrum from high income to middle income to emerging. This inevitably means that they have different economic and social policy priorities. Nonetheless, all the nations of ASEAN have important common characteristics: they are located in one of the most economically regions of the world and they are relatively dependent on international trade.

In a very real sense, the region is even more economically dynamic than it was in the pre-Covid period. COVID-19 disrupted both global and regional economic growth and international trade and supply chains. It made many countries aware, for the first time, of their dependency on distant nations for vital supplies. Covid also exacerbated emerging geopolitical tensions that have precipitated a decisive move towards economic decoupling from autocratic regimes particularly in the United States.

Within ASEAN these developments are likely to mean a relative increase in opportunities for trade and economic development in areas that, until now, have been dominated by China. The middle and less-developed nations of ASEAN are in an critical economic race to avoid middle income trap, to accelerate economic development to reach middle to high average income levels.

Maximizing opportunities for economic growth will require a range of reform and policy initiatives that are specific to each ASEAN member. But again, there are commonalities. It becomes clearer and more obvious each year that information and communications technologies are playing an increasingly important role in innovation, productivity, competitiveness, and national economic growth. In addition, high levels of digital connectivity and digital literacy support important goals of social inclusion, access to government services and the promotion of more widespread education.

Each ASEAN nation has a different profile in terms of its 'digital readiness' or what the ITU used to describe as 'ICT Development Index' or IDI. Although it is no longer published by the ITU (as of 2018), the IDI provided a useful summary of each country's ICT development. Sections 3.1 and 3.2 of this report discuss the digital development characteristics of each ASEAN Member State (AMS) and compares these characteristics across the region and internationally. All ASEAN governments have responded to the growing role of ICT in economic development by formulating national digital plans (see Section 3.3). These reports express a range of concerns and priorities but also converge on a core set of digital policy objectives. These are:

1. Equality of access: includes infrastructure/coverage, service quality
2. Digital skills (creating 'digital citizens')
3. Improving accessibility, quality and cost effectiveness of government services via digital processes and delivery
4. Digital adoption by business as a growth driver via greater innovation, productivity and competitiveness
5. The digital economy sector itself as national growth driver
6. Local digital entrepreneurialism and innovation, locally produced services and content

7. Digital institutions: digital ID, privacy, trust, transparency, accountability, adopting ‘fifth generation’ regulation, best practice communications legislation.

The combination of existing digital development characteristics and each nations’ digital policy objectives will interact to determine each nations’ digital development priorities. For example, some nations need to urgently make available and allocate additional spectrum, some need to prioritise infrastructure investment for less well served regions, and others need to be focused on building digital skills and literacy.

Adding to this complexity, the interactions between the COVID-19 pandemic and the region’s digital development are multifaceted. Clearly, digital tools and systems have been essential in management of the pandemic in several ways including: facilitating public communications, providing tele-health communications, enable electronic track-and-trace systems, assisting with the generation of epidemiological data and assisting with the management and distribution of medical resources. Furthermore, digital infrastructure and services enabled economies to function much better than they could otherwise during periods of lockdown or stringent social distancing. Videoconferencing, work from home arrangements and tele-education all help to minimise the economic impacts of the pandemic period. Given this experience, governments now have a much better understanding of how to use digital tools to manage future pandemics and other emergencies and also how to identify the weaker points in each country’s digital readiness. In many cases, enabling digital tools to be more effective has required policy and legislative adaptations which required rapid and accommodating changes on the part of most governments in the region (see Section 4.3).

As described above, COVID-19 has disrupted trade and supply chains throughout the world. Countries that have higher levels of digital development are more likely to be able to respond the opportunities that have been created by this disruption. Modern supply chains require high levels of integration and highly functioning communications systems. Overseas investors and supply chains are more likely to invest where digital readiness is higher and where higher levels of digital skills exist. The fact that trade and investment patterns are in the process of rearranging now creates a heightened sense of urgency across ASEAN for designing and implementing policies to improve digital capabilities and readiness (see Section 4.4).

The creation of local digital businesses remains an opportunity for ASEAN nations to create employment, incomes and wealth. This is notwithstanding the recent reductions in value of global tech companies as a result of changing financial conditions, primarily higher inflation and interest rates. The existence of multiple billion-dollar-plus tech companies (unicorns) in Indonesia (Blibli, Gojek, Bukalapak) and Singapore (Carousell, Carro) as well as Malaysia (Carsome) and Thailand (Flash Group) strongly suggest that ASEAN companies can follow the example of US tech companies in generating large and sustainable valuations.

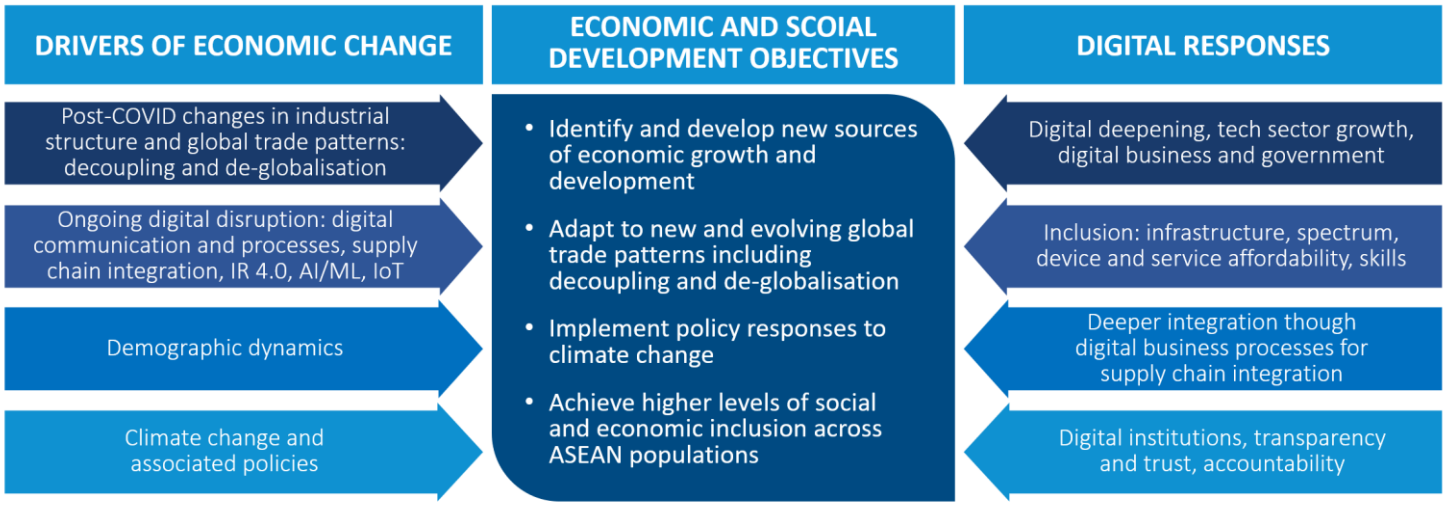
A survey was undertaken as part of this project among ASEAN digital policy stakeholders. The survey was conducted between October and December 2022 and attracted 52 responses mostly from relevant department offices, regulatory authorities, policymakers and ministerial offices. Responses were primarily from public sector organisations with the private sector making up 13.5% of responses.

It was overwhelmingly the view of stakeholders that COVID-19 had accelerated general progress towards ASEAN digital goals with 86% of respondents saying that COVID-19 had a ‘Somewhat positive impact’ or ‘Overall positive impact on progress’

towards digital goals. This view approximately the same in relation to progress towards digital government, progress towards adoption of digital processes and service delivery by the private sector, and the adoption of digital practices by private citizens and consumers within each country. Over 88% of respondents believe that COVID-19 had caused an increase in digital skills among the general population of each country. Thus, across the board, digital policy stakeholders are confirming the widely held view that Covid accelerated progress towards the digital economy.

Exhibit 1 summarises the various factors impinging upon economic and social policy making in ASEAN in addition to COVID-19 and how digital policies represent important response to these higher-level policy goals.

Exhibit 3: Drivers of economic change and digital policy responses



Source: Windsor Place Consulting Pty Ltd

As described previously, all ASEAN nations have formulated digital policy goals and, while there are important differences, the seven digital policy goals identified above represent common ground in ASEAN digital policy. Similarly, there are important common digital policy priorities that have emerged in the research for this report and these are:

- the primacy of spectrum in ASEAN's digital future
- importance and increasing achievability of inclusion
- building the tech sector and digital entrepreneurialism
- the ongoing need for regulatory innovation.

The following seven key recommendations arising from this report are provided below (see Section 7 for more detail).

1. **Allocate more IMT spectrum intelligently and sustainably and as soon as possible**
2. **Balance increasing spectrum allocations with encouraging infrastructure investment**
3. **Seek, promote and invest in investment for access**
4. **Drive regulatory innovation**
5. **Develop digital institutions**
6. **Develop digital skills at all levels**
7. **Support growth of local tech sector companies.**

These recommendations should be seen as complementing rather than cutting across any existing set of recommendations from AMS National digital plans and the ASEAN Digital Masterplan. The list is intentionally short, seeking to avoid so many recommendations that they become, in effect, unactionable. The high priority given to spectrum allocation and infrastructure investment reflects the increased need for reliable high performing connectivity in the post COVID-19. The progress towards the digital economy has been greatly accelerated by the pandemic and ASEAN's digital connectivity needs to be improved across the board to accommodate this new reality.

The emphasis on access and inclusion is necessary to reflect the greater role digital services are playing and will play in the future of all ASEAN citizens. The acceleration of progress towards the digital economy means that everyone must be able to participate in the relative disadvantage of not being able to participate has been heightened. This, in turn, drives the need for better digital skills, facilitating digital institutions and better regulatory performance in communications and digital spaces.

Finally progress towards the digital economy sets the stage for the development of domestic tech businesses that meet the needs of ASEAN citizens and businesses and generate income, employment and wealth as the economic and social development of the ASEAN region continues.

2 ANALYSIS OF EXISTING DIGITAL POLICIES ACROSS ASEAN

In trying to determine how COVID-19 may have impacted the digital priorities of each AMS it is necessary to consider the following questions:

1. What was each AMS's starting point in terms of national digital development and digital policy goals before COVID?
2. How was each AMS economy impacted by COVID? What were the impacts of COVID on progress towards digital goals?
3. How have national priorities changed due to COVID and how can a revision of digital polices support these changed priorities?
4. If policy priorities have changed, what are now the digital policy priority rankings for AMSs post-COVID?
5. What other lessons have emerged regarding digital policies from the experience of COVID?

This chapter discusses levels of 'digital development' for each AMS in the pre-COVID and COVID periods and the current state of digital policies for each nation. At the end of the chapter common digital policy themes and groupings are examined as well as emerging post-COVID policy priorities that have already been articulated by AMSs in government publications.

2.1 ASEAN Digital Development Assessment

2.1.1 National digital development and connectivity

Developing post-COVID digital policy priorities requires, first, understanding the level of 'digital development' for each AMS. The concept of digital development encompasses many variables, perspectives and areas of emphasis. The essence of the term 'digital development' is the extent to which citizens, businesses and governments use digital technologies to their fullest potential to improve quality of life, achieve economic competitiveness and innovation, and deliver high-quality government services cost effectively.

One of the most prominent and comprehensive measures of digital development is the International Telecommunication Union (ITU) ICT Development Index (IDI) which rates almost every country in the world on the basis of many connectivity variables. Unfortunately, this index was discontinued in 2018. The index has, to some extent, been replaced by the ITU Digital Development Dashboard[1] which presents most recent data for most countries. The most recent IDI data is presented in Exhibit 4.

[1] https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf

Exhibit 4: The ITU ICT Development Index AMS

Country	ICT IDI 2016	ICT IDI 2017	Index change 2017/16	World Rank
Cambodia	3.04	3.28	0.24	128
Viet Nam	4.18	4.43	0.25	108
Thailand	5.31	5.67	0.36	78
Malaysia	6.22	6.38	0.16	63
Singapore	7.85	8.05	0.20	18
Lao PDR	2.43	2.91	0.48	139
Myanmar	2.59	3.00	0.41	135
Indonesia	3.85	4.33	0.48	111
Philippines	4.52	4.67	0.15	101
Brunei	6.56	6.75	0.19	53

Source: ITU, 2017.

Additional data from the ITU Digital Development Dashboard is provided in Exhibit 5. These connectivity indicators have been chosen based on their relevance and importance representing the current state of digital economies of ASEAN countries. The indicators include:

- 4G Network Coverage;
- Mobile phone ownership;
- ICT home access, rural;
- ICT home access, urban;
- Telecommunication Infrastructure Index; and
- Mobile data and voice basket as a percentage of GNI per capita
- Individuals with basic skills (the average value among the following computer-based activities: copying or moving a file or folder; using copy and paste tools to duplicate or move information within a document; sending e-mails with attached files; and transferring files between a computer and other devices).

Exhibit 5: ITU Digital Development Dashboard, ASEAN countries

Country	4G Network Population Coverage	Smart phone ownership	ICT home access, rural	ICT home access, urban	Tele-communications Infrastructure Index (TII)	Mobile data and voice basket as a % of GNI p.c	Individuals with basic skills
Brunei Darussalam	95%	88%	NA	NA	82%	0.60%	57%
Cambodia	91%	47%	30%	50%	55%	11.70%	29%
Indonesia	96%	67%	67%	87%	57%	2.50%	49%
Lao PDR	43%	40%	NA	NA	24%	7.50%	NA
Malaysia	97%	88%	84%	94%	76%	1.30%	60%
Myanmar	94%	54%	NA	NA	52%	3.30%	NA
Philippines	80%	79%	NA	NA	58%	3.30%	6%
Singapore	100%	88%	NA	91%	89%	0.30%	53%
Thailand	98%	84%	82%	89%	70%	3%	17%
Viet Nam	99%	79%	70%	88%	67%	2.90%	17%

Source: ITU, 2021[2]; Statista, 2020[3]

These two tables immediately make clear some significant differences in levels of digital development between ASEAN nations. Singapore, Brunei Darussalam and to some extent Malaysia perform at the top of ASEAN in terms of connectivity. Next is a grouping of Indonesia, Philippines, Thailand and Viet Nam followed by Cambodia and Lao PDR with generally lower values for the main connectivity measures.

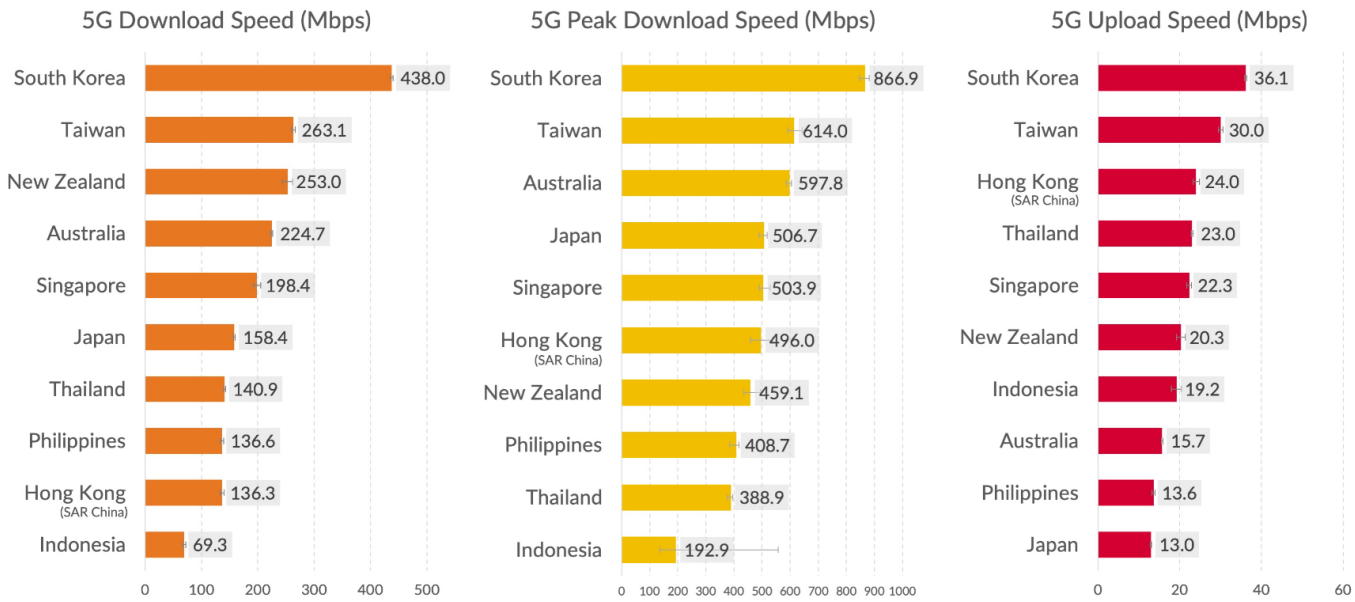
2.1.2 ASEAN 5G performance

Given the importance of 5G as the leading market-ready mobile technology, it is important to be aware of the status of its rollout across ASEAN. Exhibit 6 provides data for South-east Asian nations including the ASEAN members that have begun 5G rollout as at November 2021. It can be seen that Singapore, Thailand, the Philippines? and Indonesia have all made strong starts on 5G rollouts. Perhaps Thailand's performance stands out given that, although it is still an emerging economy, its average 5G download speeds are just below that of Japan's.

[2] https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/Digital-Development.aspx
https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf

[3] https://www.statista.com/forecasts/1169108/smartphone-penetration-in-asia-by-country

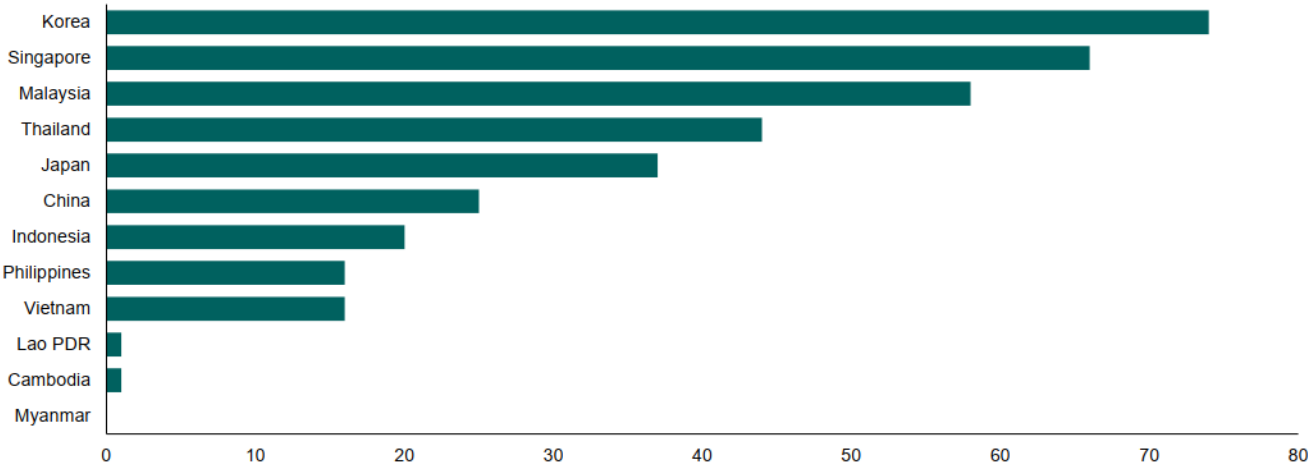
Exhibit 6: 5G Asia Pacific Speeds



Source: OPENSIGNAL: https://www.opensignal.com/2022/03/17/benchmarking-the-5g-experience-asia-pacific-march-2022

Differences are also apparent in data showing penetration of digital practices among ASEAN populations. Exhibit 7 show penetration of online banking among 'ASEAN +3' nations. There is still challenges in adoption in Lao PDR and Cambodia are likely the result of low levels of 4G coverage and smartphone handset ownership as well as low levels of digital skills. Interestingly, the next obvious grouping includes Vietnam, Philippines, Indonesia and China. It is interesting to note that Malaysia and Thailand have online banking penetration rates comparable with Singapore and higher than that of Japan.

Exhibit 7: Selected ASEAN+3 Online Banking Penetration Rate (%), 2020



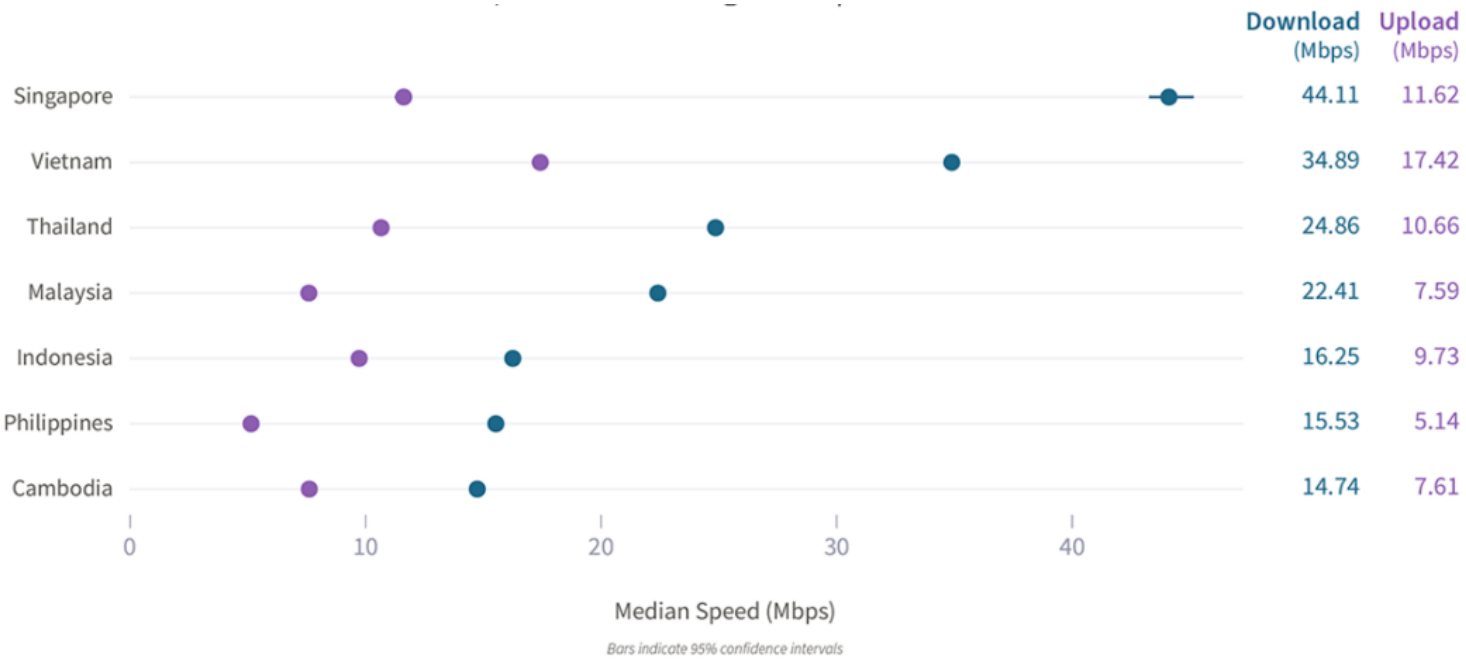
Source: Statista.
Note: Data for Brunei and Hong Kong are not available. Data refer to the share of individuals who use the internet (through mobile or computer) for online banking, as opposed to a mobile app.

Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

Another important indicator of digital development is average download speeds. Exhibit 8 shows average download speeds for ASEAN (note Lao PDR was not included

in this dataset). These data show a similar pattern but Viet Nam stands out with second highest download and highest average upload speeds for 4G services.

Exhibit 8: 4G Performance in ASEAN Countries, Q1 2022



Source: Ookla: https://www.ookla.com/articles/malaysia-4g-5g-performance-q2-2022

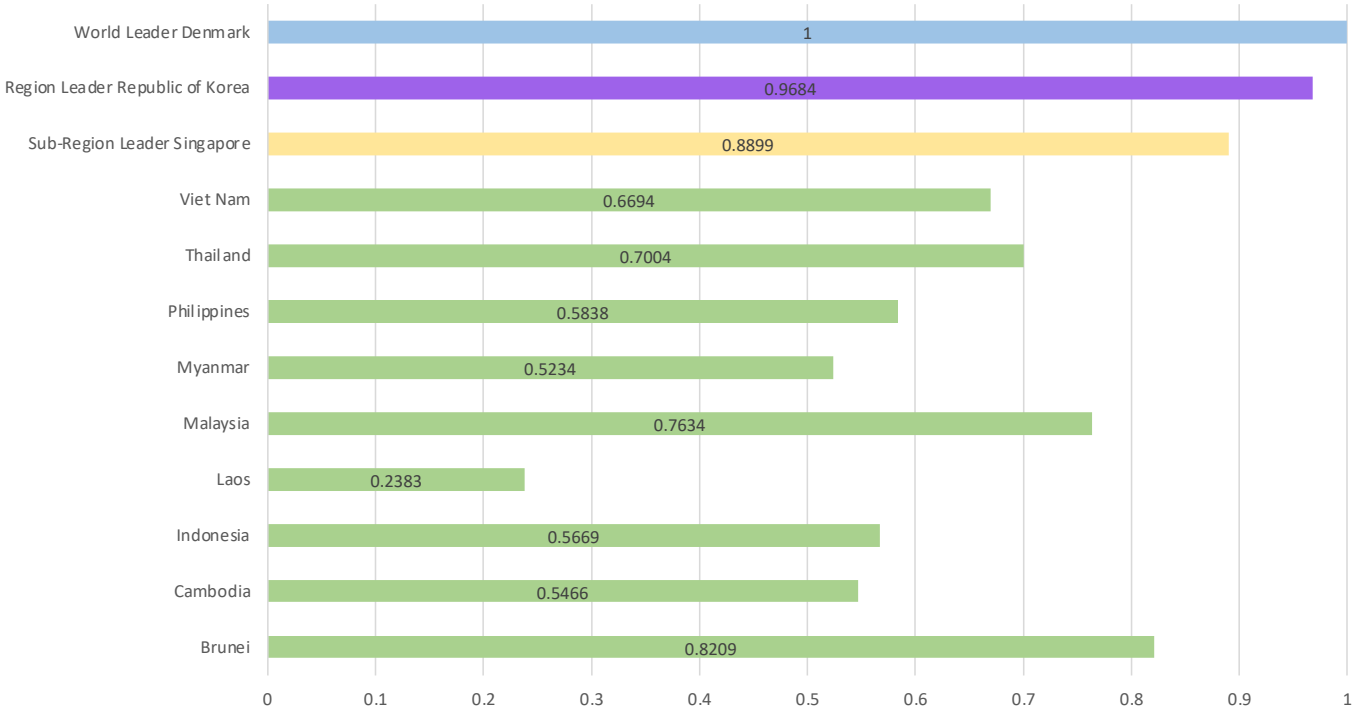
2.1.3 Digital Infrastructure

The Telecommunication Infrastructure Index was used in the United Nations E-Government Survey as a component indicator of the E-Government Development Index (EGDI). It reflects the status of the development of telecommunication infrastructure in a given country. It is an arithmetic average composite of four indicators: (i) estimated internet users per 100 inhabitants; (ii) number of mobile subscribers per 100 inhabitants; (iii) active mobile-broadband subscription; and (iv) number of fixed broadband subscriptions per 100 inhabitants. The International Telecommunication Union is the primary source of data in each case.[4]

The pattern that emerges from these data is similar to that from the connectivity variables. Again, Singapore and Brunei Darussalam and, to a slightly lesser extent, Malaysia all have good infrastructure although somewhat below the regional best performer, Republic of Korea. Lao PDR, Cambodia, and Myanmar still have room for improvement on the basis of infrastructure with the other countries being somewhere in between.

[4] https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf

Exhibit 9: Telecommunication Infrastructure Index of ASEAN Countries, 2020



Source: ITU, 2020.

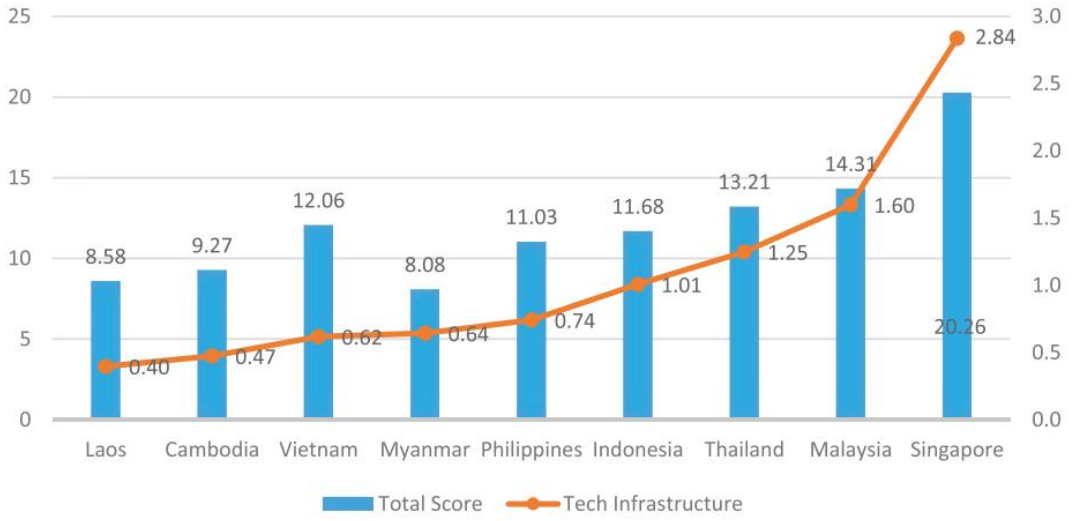
2.1.4 Digital Readiness

The Cisco Global Digital Readiness Index has been created to help nations understand how well-positioned they are to take advantage of the benefits of digitization. The seven components analysed to determine a country's digital readiness were:

- Basic needs
- Human capital
- Ease of doing business
- Business and government investment
- Start-up environment
- Technology infrastructure
- Technology adoption.[5]

[5] https://www.cisco.com/c/dam/en_us/about/csr/reports/global-digital-readiness-index.pdf

Exhibit 10: Digital Readiness Index Score of countries in ASEAN



Source: CISCO, Digital Readiness Index, 2019.

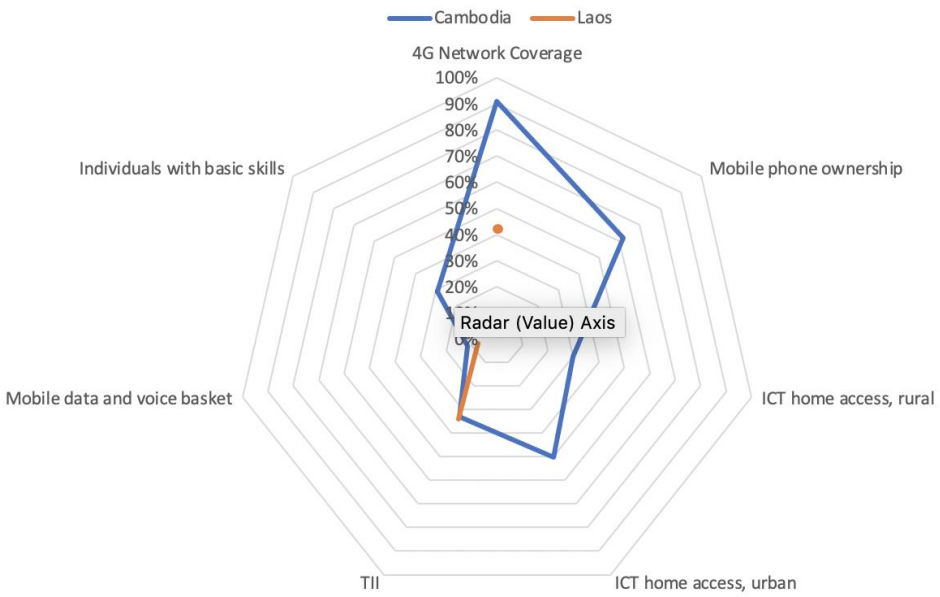
2.2 AMS Digital Characteristics and Groupings

Based on data from Exhibit 10 and the data from sections above, it is possible to define some broad digital development categories for ASEAN countries as follows:

Emerging ICT development nations include Cambodia and Lao PDR. In particular, Cambodia and Lao PDR have ~~higher~~ some cost challenges of access comparing to other countries in the region as a percentage of GNI per capita (11.7% and 7.5% respectively). Both countries have a relatively low percentage of individuals using the internet (around 30%) and low percentage of individuals owning a mobile phone (around 60%). It is important for Lao PDR to first focus on improving 4G Network Coverage as it lags considerably in this aspect compared against other ASEAN countries.[6]

6 Using the 700 MHz band, which have excellent coverage characteristics, in Lao PDR would rapidly and efficiently extend wireless broadband coverage in the country.

Exhibit 11: Emerging ICT Development Countries

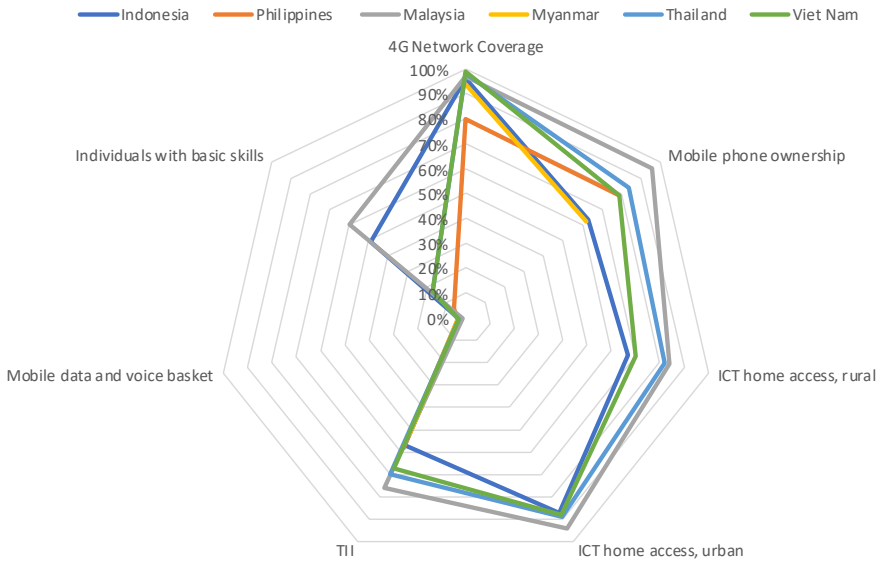


Source: ITU, 2021; Statista, 2020.

Intermediate ICT development countries include Indonesia, Myanmar, Malaysia, Philippines, Thailand and Viet Nam. All intermediate development countries have high 4G Network Coverage (80%+) and relatively low mobile data and voice basket percentages (3% or less). In the case of Thailand (with almost 85 percent population 5G coverage), and to a lesser extent the Philippines there is also extensive deployment of 5G services. Malaysia and Indonesia are seeing the growth in 5G services with more extensive coverage by 2023. The general trending trajectory between intermediate ICT development countries can be seen below in Exhibit 12.

Within intermediate developed countries there are two subcategories: low smart phone ownership, and low percentage of individuals with basic ICT skills. ASEAN countries with lower smart phone ownership include Indonesia and Myanmar. Countries with a low percentage of individuals with basic ICT skills include Philippines, Thailand and Viet Nam (20% or less).

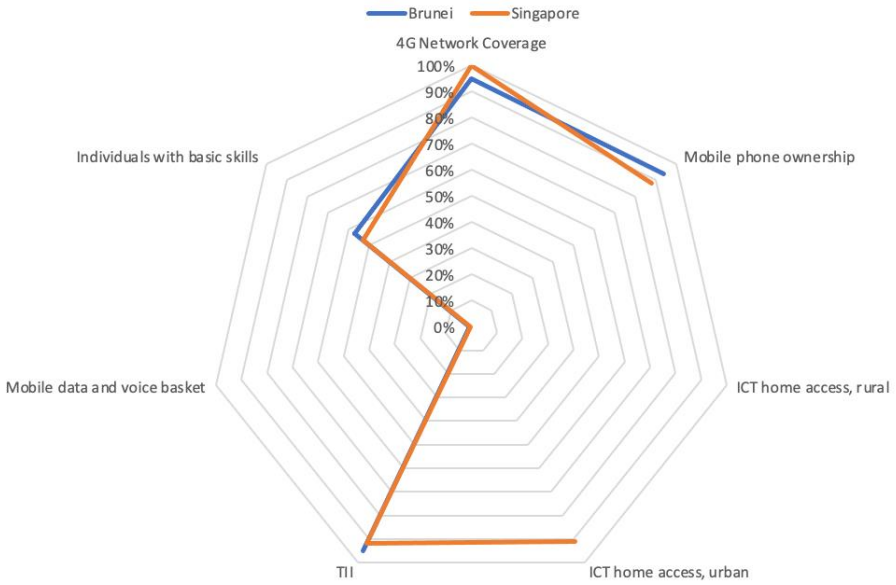
Exhibit 12: Intermediate ICT Development Countries



Source: ITU, 2021; Statista, 2020.

Advanced ICT development countries include Singapore and Brunei Darussalam with high percentage figures across all indicators, and a low percentage of a mobile data and voice basket. In particular, both Tele-communications Infrastructure Index values (see Exhibit 5) are above 80%.

Exhibit 13: Advanced ICT Development Countries



Source: ITU, 2021; Statista, 2020.

2.3 AMS Digital Polices Overview

In this Section the digital policies of ASEAN nations are briefly described in order to understand current priorities. This is now happening with the framework of the ASEAN Digital Masterplan 2025 (ADM2025).[7]

2.3.1 BRUNEI DARUSSALAM

Brunei Darussalam's 2015-2020 Digital Government Strategy was intended to support greater efficiency and collaboration, to improve stakeholders' experience, and to transform and continually improve Government processes and services. Six focus areas were identified to realise this vision including service innovation, security, capability and mindset, enterprise information management optimization and collaboration and integration.[8]

The Brunei Government's updated Digital Economy Masterplan 2025 promotes a vision of a 'Smart Nation through Digital Transformation' with a corresponding Mission to drive and enhance Bruni Darussalam's social-economic growth through Digital Transformation. Strategic outcomes for Brunei include a vibrant and sustainable economy, a digital and future-ready society, and a digitally conducive ecosystem.

In order to achieve these outcomes, the Masterplan describes four 'Strategic Thrusts': Industry Digitalization, Government Digitalization, a Thriving Digital Industry, and Manpower and Talent Development. These will be supported by five 'Strategic Enablers':

- A Smart Nation Platform to support seamless service delivery amongst government agencies, businesses and citizens.
- Digital Data Policy and Governance Framework to establish a national data office to oversee policy and governance of data for personal, commercial and official purposes in the long run.
- Addressing and prioritizing cybersecurity with the establishment of Cyber Security Brunei.
- A Policy and Regulatory Framework in line with innovation and technological trends to guide digital economy initiatives.
- Research and Development and Innovation in Digital Technologies to power sustainable digital transformation plans.[9]

2.3.2 KINGDOM OF CAMBODIA

In 2021, with intentions to accelerate inclusive and sustainable post-pandemic growth, the Royal Government of Cambodia launched the 'Cambodia Digital Economy and Social Policy Framework 2021-2035' to evolve Cambodia's digital socioeconomic environment and pave the way for a thriving digital economy. The Framework is to be achieved in accordance with three principles – building a digital foundation, digital capture and digital transformation.

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7 https://asean.org/wp-content/uploads/2021/09/ASEAN-Digital-Masterplan-EDITED.pdf

8 http://www.digitalstrategy.gov.bn/Themed/index.aspx

9 https://edtech.moe.gov.bn/digital-economy-masterplan-2025/

The Framework focuses on five major priorities: two foundational elements – (1) developing digital infrastructure; and (2) fostering digital trust and confidence, as well as three pillars of a digital economy:

- creating digital citizens through digital leadership and a pool of digitally talented human resources
- building a digital government through public services, improving digital performance, and data-based governance
- promoting digital businesses including elements such as enterprise digital transformation, entrepreneurship, startup ecosystems, and digital value chains.

The Cambodia Digital Economy and Society Policy Framework 2021–2035 defines a vision to "build a vibrant digital economy and society by laying the foundations for promoting digital adoption and transformation in all sectors of society – the state, citizens, and businesses – to promote new economic growth and improve social welfare in the new normal". It will have key economic benefits including:

- Job creation
- Skills development
- Improved Investment climate
- Trade and business activity boosts
- Links in regional and global production and value chains
- More efficient public service delivery.[10]

In the context of the COVID-19 crisis, the policy framework is integral to the post COVID-19 economic recovery plan. The framework will "fuel a new engine of economic growth through the construction of digital infrastructure, attracting domestic and foreign investment, promoting new start-ups, increasing productivity and promoting economic competitiveness."[11]

2.3.3 INDONESIA

The Indonesian government has adopted a four-pronged strategy to accelerate Indonesia's digital transformation and develop an ASEAN digital community through digital infrastructure, digital governance, digital economy and digital citizenship.[12]

The first strategy requires putting in place an Indonesia Digital Roadmap for the years 2021-2024 as a strategic guide to achieving national digital transformation, which will entail equal access to high-quality telecommunications services. The guide contains 100 key initiatives to be implemented in collaboration with all ministries, central and regional institutions, business actors, and the general public in Indonesia in the 10 priority sectors. The government intends to provide 4G network that can cover 83,218 villages by the end of 2022, and there will be further work to create dependable and consistent connectivity in closing the digital divide.[13] Also applicable is Ministry of Communication and Information Technology's 2020-2024 Strategic Plan known as Renstra. [14] The focus of the Strategic Plan is directed at achieving three

10 https://mef.gov.kh/news/cambodia-digital-economy-and-societypolicy/

11 https://www.phnompenhpost.com/business/digital-policy-framework-launched

12 https://en.antaranews.com/news/195165/indonesia-accentuates-digital-transformation-expediting-strategies

13 https://opengovasia.com/indonesia-unveils-its-latest-digital-transformation-strategy/

14 https://web.kominfo.go.id/sites/default/files/Lampiran%202%20Rancangan%20Rencana%20Strategis%20Kemenkominfo%202020-2024.pdf

main objectives, namely accelerating the provision of ICT infrastructure throughout Indonesia, accelerating digital transformation in three national frameworks, namely industry, government, and society, and improving the quality of public communication management.

There will also be a focus on enhancing collaboration in the recovery and strengthening resilience against the COVID-19 pandemic using digital technologies through Indonesia's presidency of the 2022 G20 Forum, "Recover Together, Recover Stronger".

The Indonesian government will also respond to concerns over digital talent skills by providing Digital Literacy Movement and Digital Talent scholarship programs, through which digital literacy training is planned to be provided to 15 million people by 2024. Through these programs, people are expected to adopt and develop digital technology productively, safely, and responsibly.[15]

Indonesia's digital transformation focuses on 10 priority sectors to expedite the realisation of these four strategies: digital transportation and tourism, digital trade, digital financial services, digital media and entertainment, digital agriculture and fisheries, digital real estate and urban, digital education, digital health, industrial digitisation, and government digitisation.[16]

The COVID-19 epidemic and the 4.0 Industrial Revolution are the two main catalysts for the digital transformation agenda. The momentum from this is hoped to encourage economic transformation.

2.3.4 LAO PDR

The COVID-19 pandemic has spurred the government of Lao PDR to integrate and accelerate digital connectivity. In July 2021, the Ministry of Technology and Telecommunications partnered with the UN Development Programme to launch the Digital Government Transformation project. This initiative will contribute to the development of a Digital Government Master Plan, Standards Framework of a Digital Government as well as the pilot initiatives on Digital Government services which will ultimately become a significant tool for ministries and government organizations to digitalize their administration and services.[17]

The Lao PDR government has officially approved the 20-year Visions (2021-2040), 10-year Strategies (2021-2030), and 5-year Plans (2021-2025) for Lao National Digital Economy Development in November 2021, which were incorporated into its 9th 5-Year National Socio-Economy Development Plan. The Masterplan focus on 8 strategic priorities including the development in legislation infrastructure, platform, human resource, product and service, security of digital technology, digital technology deployment, and international cooperation and connectivity. In addition, 14 workplans for the national digital economy development were also determined together with international and regional cooperation. These Masterplans will become the foundation and reference for determining the directions of Lao PDR digital development in the future as the government encourage all sectors and parties to

15 https://en.antaranews.com/news/233345/indonesia-focused-on-expediting-digital-transformation-in-four-sectors

16 https://en.antaranews.com/news/188221/indonesias-digital-transformation-focused-on-10-priority-sectors

17 https://www.undp.org/laopdr/press-releases/digital-government-transformation-project-rff-project-kickoff-and-digital-maturity-assessment-introduction

incorporate them into their own implementation plans. Ministry of Technology and Communications of Laos is assigned as focal point to coordinate in implementing.

2.3.5 MALAYSIA

In February 2021, the MyDIGITAL Initiative was launched, a new and comprehensive approach designed to anchor the country's digital economy by 2030. This initiative serves as part of the government's plans to be a regional leader in the digital economy and achieve inclusive, responsible and sustainable socioeconomic development. The initiative complements national development policies such as the 12th Malaysia Plan and the Vision for Shared Prosperity 2030.

The initiative includes a Digital Economy Blueprint which is a comprehensive planning document outlining 22 strategies, 48 national initiatives and 28 sectoral initiatives. Through the plan, by 2025, the digital economy of Malaysia is expected to contribute by 22.6% to the country's GDP. The plan aims to open 500,000 job opportunities in the digital economy. The Blueprint also sets outs the initiatives overall objectives to be to encourage industry players to become creators, users and adopters of innovative business models under a digital economy, to harness human capital in the digital economy and to nurture an integrated ecosystem that allows society to adopt a digital economy. [18]

Exhibit 14: Digital Economy Blueprint Overview

Source: Malaysia Digital Economy Blueprint, 2021.

Under the Blueprint, the MyDIGITAL Initiative sets out a combination of initiatives and targets across three phases of implementation until 2030:

- Phase 1 starts from 2021 to 2022 and will strengthen the foundation of digital adoption.
- Phase 2 covers 2023 to 2025 and will drive inclusive digital transformation.
- Phase 3, covering 2026 to 2030, will make Malaysia a digital content and cyber security lead in the regional market.

To accelerate innovation and create an effective digital ecosystem, it has been noted that the construction of four types of key digital infrastructure will be the backbone in forming a sustainable digital ecosystem. This construction effort will be done

18 https://www.epu.gov.my/sites/default/files/2021-02/malaysia-digital-economy-blueprint.pdf

through a Public-Private-Partnership where the private sector will contribute via capital and skills injections. In line with this, the government will continue to assist in strengthening this new ecosystem in several ways, including:

- By fostering a regulatory environment that supports digital use while protecting the privacy of citizens;
- By administering public data sources so that they can be jointly utilized by public and private organisations; and
- By facilitating the evolution of the labour market in industries that are likely to be disrupted by automation and digital technology.[19]

2.3.6 MYANMAR

In 2019, the Myanmar Digital Economy Roadmap 2018-2025 was published, aiming to rectify Myanmar's poor performance in digital readiness by enabling the use of digital technology in government, trade and investment, developing digital skills and security and encouraging innovation. The mission is outlined as enabling digital transformation, digital government, digital trade and innovation to develop a digital economy across all sectors for inclusive and sustainable socioeconomic development.

The plan lists 14 goals with targets for 2020 and 2025 organised under 6 different strategic frameworks including: digital transformation and digital trade, digital government, digital connectivity, digital skills and inclusion, digital security and digital innovation. Some goals the Myanmar government aspires towards include raising the share of online financial transactions in the economy from 0.5% in 2019 to 30% by 2025 and increasing foreign direct investment in digital industries from $6 billion to $12 billion over the same period.[20]

Exhibit 15: Myanmar Digital Economy Roadmap

Source: Myanmar National Portal, 2019.

The roadmap runs in tandem with the Myanmar e-Governance Master Plan 2016 - 2020, under which the country is working to digitize all areas of government. In actioning this plan, in 2019, the Central Statistical Organisation, along with Telenor and UNICEF, rolled out an electronic birth registration system in Mon State as part of

19 https://www.humanresourcesonline.net/key-highlights-of-the-new-malaysia-digital-economy-blueprint-a-part-of-the-mydigital-initiative

20 https://myanmar.gov.mm/documents/20143/9096339/2019-02-07+DEDC+RoadMap+for+Websites.pdf/

a Mobile Birth and Death Registration project.[21] And the White Paper – Facilitating Faster Broadband and 5G Adoption in Myanmar 2020.[22]

2.3.7 PHILIPPINES

In March 2022, the Philippines Department of Information and Communications Technology (DICT) unveiled the Digital Infrastructure Program, a PHP 50 billion (USD 960 million) spending plan for the next three years, with a focus on improving the country's digital infrastructure. The majority of the funds will be spent on the National Fibre Backbone and the Accelerated Fibre Build through regional and provincial rings.[23]

The Philippine Digital Transformation Strategy 2022 is also in action, having been created to prioritise the country's national interests and ambitions by continuing to enhance the country's e-government. The strategy includes the E-Government Masterplan (EGMP) 2022 serving as a blueprint for a harmonized government information system. The goal is to achieve a "One Digitized Government" for the country.[24] Known as e-government 2.0, it aims to achieve strong citizen engagement through institutionalising closed-loop, multidimensional and multidirectional communication channels. Built on the foundations of infrastructure development, human capital development and bridging the digital divide, the strategy is based on three pillars: economic transformation, people engagement and innovation.[25]

2.3.8 SINGAPORE

In 2014, Singapore launched the Smart Nation Program. Its main goal was to leverage technology to improve the quality of lives of the people and to transform the economy by creating more jobs and opportunities. The Digital Government initiative focuses on harnessing technology to enable efficient and user-centric public service delivery, Digital Economy focuses on guiding businesses and the workforce to leverage technology, and Digital Society aims to empower Singaporeans by increasing access to services, promoting inclusion and improving awareness and digital literacy.[26]

The Singapore Government has published numerous reports on digital policies and the digital economy. A 2018 report, *Digital economy framework for action*, published by the Infocomm Media Development Authority emphasises world-class digital infrastructure and strong enablers, a talented and high-skill workforce and optimizing the business environment and innovation in striving for a better Digital Economy.[27]

The *Digital Government Blueprint* (DGB) published in 2018 provided a comprehensive overview of digital government initiatives. The Blueprint emphasises efficiency, service quality, empowering public officers and encouraging business efficiency and innovation. Post COVID-19, the Singapore Government has introduced new policies and initiatives, reaffirming an emphasis on capability building and compelling

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21 https://oxfordbusinessgroup.com/overview/connection-roadmap-new-digital-strategy-government-trade-and-investment-improve-sector-development

22 https://www.ptd.gov.mm/Uploads/News/Attach/22020/8092151322020_White%20Paper-%20Facilitating%20Faster%20Broadband%20and%205G%20Adoption%20in%20Myanmar.pdf

23 https://dict.gov.ph/dict-highlights-the-digital-infrastructure-program-on-philippine-internet-day/

24 https://dict.gov.ph/ictstatistics/wp-content/uploads/2020/03/EGMP-2022.pdf

25 https://opengovasia.com/exclusive-accelerating-the-philippines-public-sector-technological-and-analytical-capabilities/

26 https://www.smartnation.gov.sg/

27 https://www.smartnation.gov.sg/about-smart-nation/digital-economy

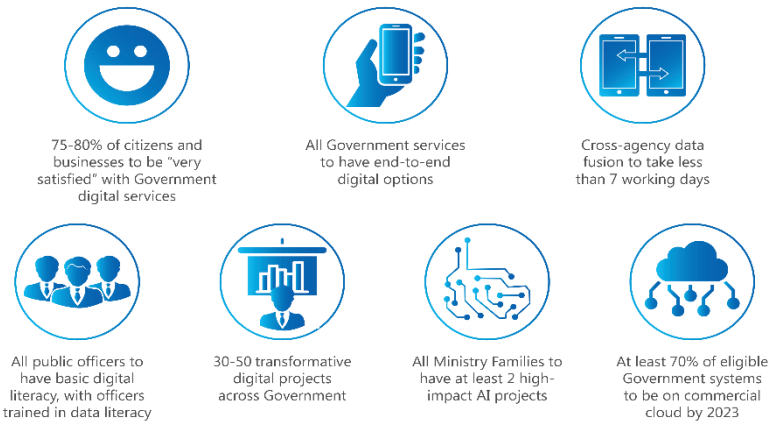
different parts of the Government to accelerate the use of data and of technology to offer digital services that minimise physical contact. Key recent changes made to the DBG include:

- Updated DGB strategies that stresses greater importance on user centricity and co-creation, improving how we work as digital organisations and harnessing new technology including Artificial Intelligence.
- New and updated KPIs including: at least 70% of eligible Government systems to be on commercial cloud by 2023 and the time required to fuse and share core data for cross-agency projects to be no more than 7 working days.
- A new section has been added in light of COVID-19 to signal the future direction and the steps that agencies need to undertake to progress towards being digital organisations, which requires deeper changes in organisational policy, structure, and culture.

The DGB sets forth a six-point agenda, with clear milestones to be achieved by 2023:

- Integrating services around citizen and business needs.
- Strengthening integration amongst policy, operations, and technology.
- Building common digital and data platforms.
- Operating reliable, resilient, and secure systems.
- Raising digital capabilities to pursue innovation.
- Co-creating with citizens and businesses, and facilitating the adoption of technology.[28]

Exhibit 16: Singapore's Digital Government Goals (to be achieved by 2023)



Source: GovTech Singapore, 2020.

2.3.9 THAILAND

Following the earlier Thailand Digital Economy and Society Development Plan[29] and Thailand has released a Digital Government Development Plan 2020 – 2022, in aspiring to create an open and connected digital government that is able to collaborate and provide valuable public services. There are four targets for which

28 https://www.tech.gov.sg/digital-government-blueprint

29 https://www.itu.int/en/ITU-D/Regional-Presence/AsiaPacific/Documents/Events/2016/Apr-Digital2016/S2_Present_Pansak_Siriruchatapong.pdf

four strategies have been implemented: enhancing the public service quality through utilisation of digital technology, facilitating the ease of doing business using digital technology, encouraging all government agencies to comply with the Data Governance Framework and improving public participation in all government sectors.[30]

On top of this, the government of Thailand have set aside approximately THB 2.5 billion for digital development projects subject to be financed by the Digital Economy and Society Development Fund in fiscal 2022.[31]

2.3.10 VIET NAM

In June 2021, The Viet Nam Government's Ministry of Industry and Trade published *Vietnam's Digital Transformation Plan Through 2025,* with an orientation towards 2030. The plan is a long-term strategy emphasising many digital Government initiatives including a shift to delivering the majority of Government services through online channels, and the majority of Government administration, documentation and data management to be online, connected and available country-wide.

In the private sector, the program will target businesses, cooperatives, and business households that want to adopt digital transformation to improve their production, business efficiency, and competitiveness.

In addition, the Government wants the digital economy to contribute 20 percent of economic activity by 2025 and 30 percent by 2030. It also aims to position Viet Nam be in the top 50 countries on the UN's ICT Development Index as early as 2025.

Digital transformation has been prioritized in eight sectors which include finance and banking, healthcare, education, agriculture, transport, logistics, energy, natural resources, and environment and manufacturing.

Another report from the Ministry of Science and Technology, *Vietnam's future digital economy towards 2030 and 2045*, states that "The next wave of digital technologies has the potential to transform Vietnam into Asia's next high-performing economy, and to bring up the living standards of all Vietnam's citizens over the coming decades."

`The report emphasises the importance of timing: "The next 25 years represents a decisive window of opportunity for Vietnam to transition to a more digitalized economy and escape the middle-income trap." This view illustrates the significance of the digital economy for increasing competitiveness and economic growth and raising living standards.

2.4 The ASEAN Digital Masterplan 2025

The ASEAN Digital Masterplan 2025 represents the collective ASEAN vision for the digital future of the region. It states that "The next five years could see the ASEAN region make giant strides towards becoming both a digital economy and a digital society". The Masterplan vision encompasses digitally empowered citizens and businesses, its fees digital technologies driving the economic future of the ASEAN region and it explicitly recognises the role of digital technologies in assisting the recovery of the region from the COVID-19 pandemic stop

30 http://www.jfcct.org/wp-content/uploads/sites/1871/2021/01/20201208_DGAPlan2020-2022_EN.pdf?nocdn

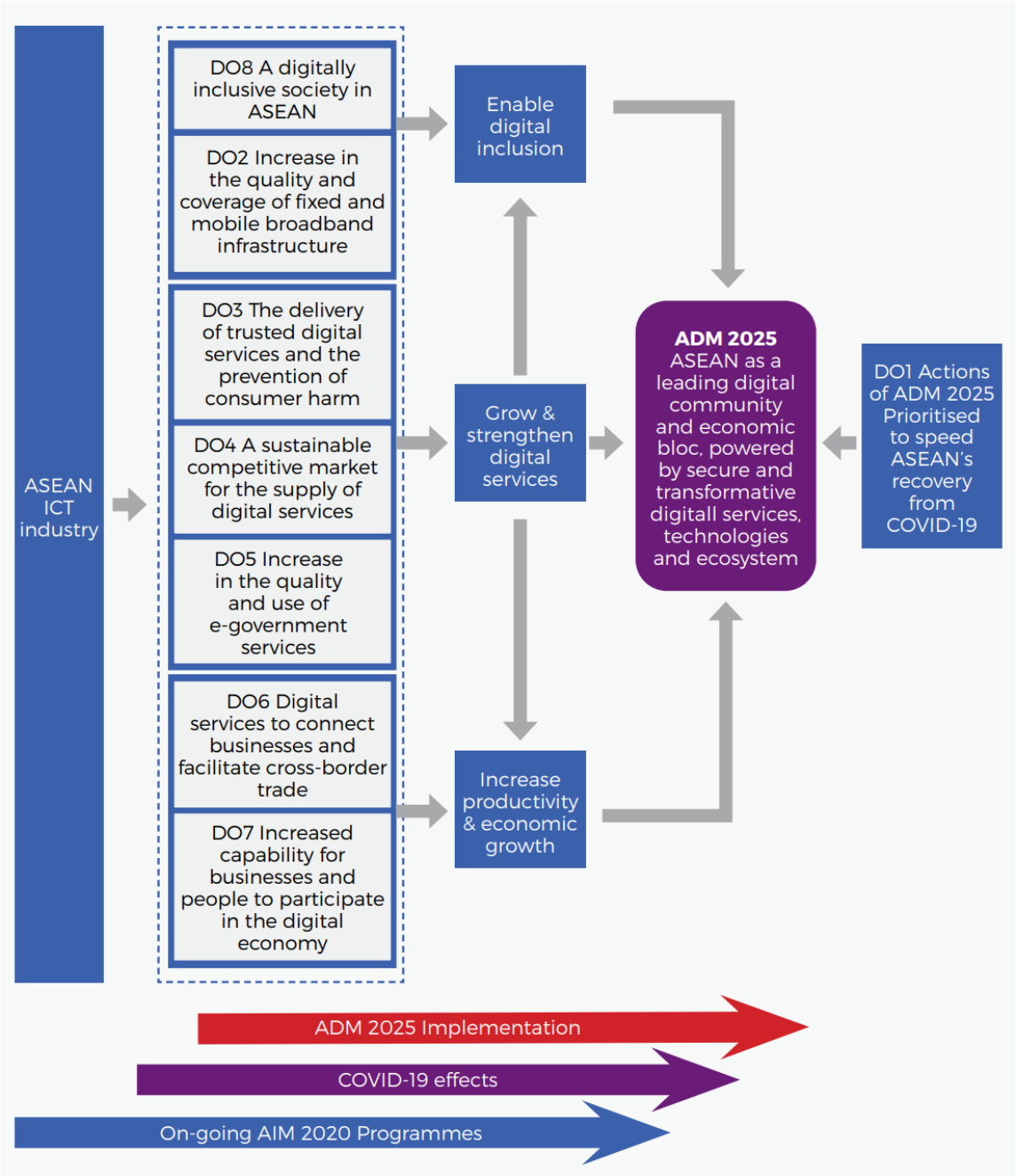
31 https://opengovasia.com/thailand-allots-thb2-5-billion-for-digital-development/

The Masterplan particulates eight Desired Outcomes (DO):

- DO1: Actions of ADM 2025 prioritised to speed ASEAN's recovery from COVID-19
- DO2: Increase in the quality and coverage of fixed and mobile broadband infrastructure
- DO3: The delivery of trusted digital services and the prevention of consumer harm
- DO4: A sustainable competitive market for the supply of digital services
- DO5: Increase in the quality and use of e-government services
- DO6: Digital services to connect business and to facilitate cross border trade
- DO7: Increased capability for business and people to participate in the digital economy
- DO8: A digitally inclusive society in ASEAN.

Exhibit 17 illustrates The ASEAN Digital Masterplan and shows that it overarching objectives are to enable digital inclusion and increase productivity and economic growth as well as speed ASEAN’s recovery from COVID-19. As discussed in the next section, these high-level goals and Desired Outcomes are a close match for seven primary digital goals that are described below.

Exhibit 17: The ASEAN Digital Masterplan 2025



Source: ASEAN Digital Masterplan 2025

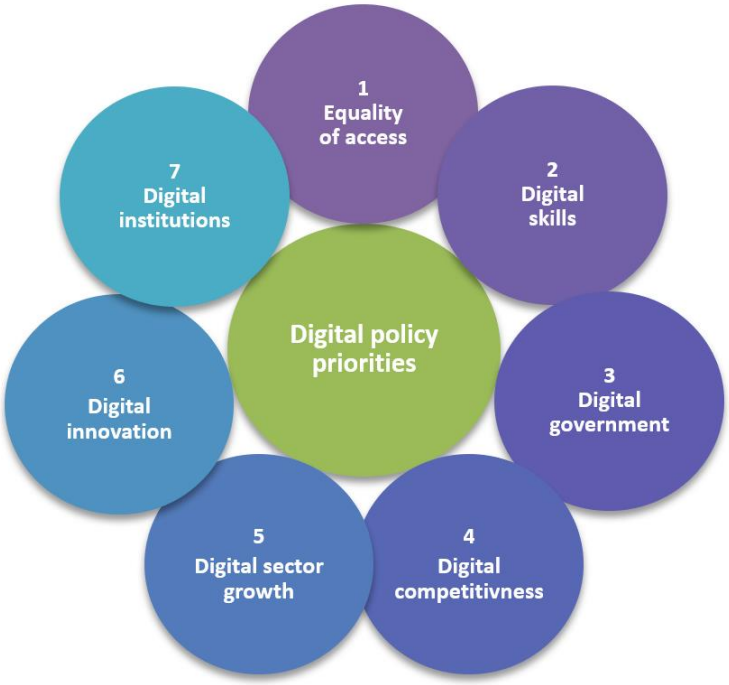
2.5 Themes, commonalities and groupings

The ASEAN digital and ICT development plans reflect underlying national economic development priorities and the differences in digital and connectivity development in each AMS. While there are differences in these plans and strategies, there are significant similarities and common themes are apparent. These common themes are also present in the ASEAN Digital Masterplan 2025.

The seven digital priorities below are present to, varying extents, in all of the national digital plans discussed above.

1. Equality of access: includes infrastructure/coverage, service quality
2. Digital skills (creating 'digital citizens')
3. Improving accessibility, quality and cost effectiveness of government services via digital processes and delivery
4. Digital adoption by business as a growth driver via greater innovation, productivity and competitiveness
5. The digital economy sector itself as national growth driver
6. Local digital entrepreneurialism and innovation, locally produced services and content
7. Digital institutions: digital ID, privacy, trust, transparency, accountability, 'fifth generation' regulation, best practice communications legislation.

Exhibit 18: ASEAN digital policy priorities



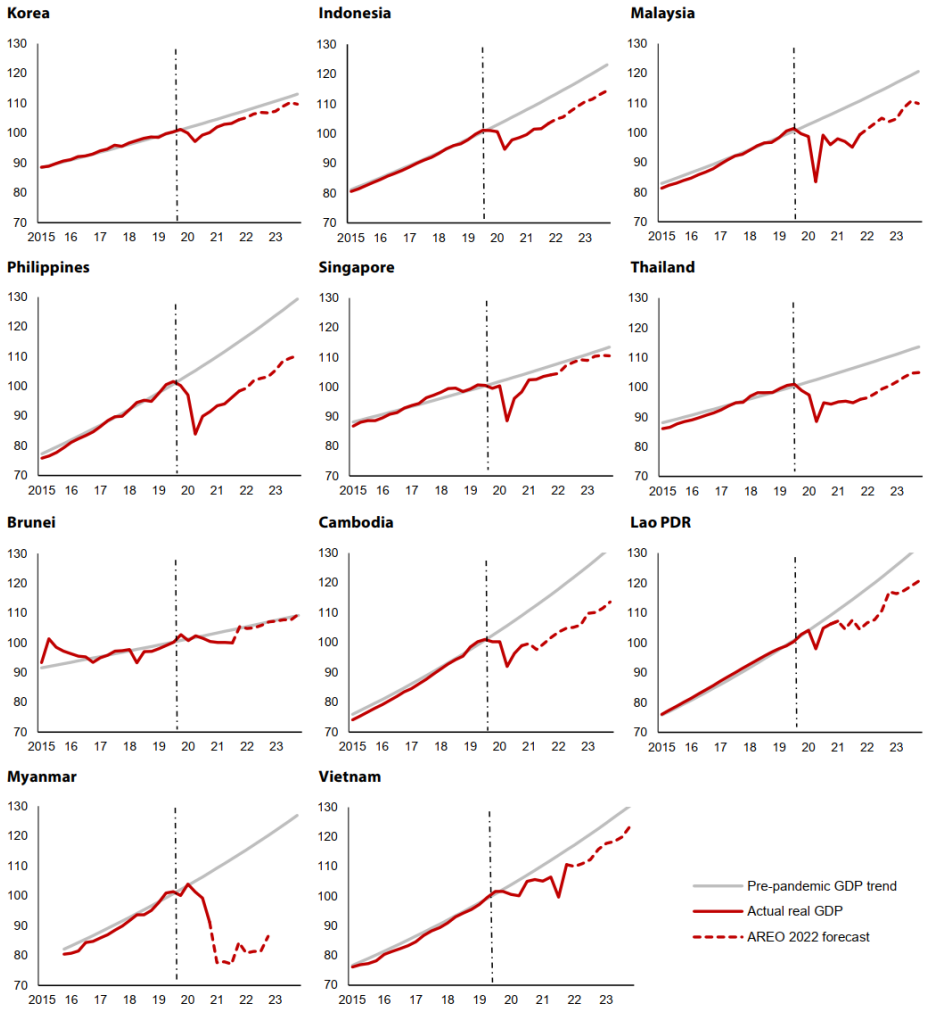
Source: WPC, September 2022

3 COVID-19 IN ASEAN: ECONOMIC IMPACTS AND ROLE OF DIGITAL TECHNOLOGY

3.1 General economic impacts of COVID-19

The most obvious and important economic impacts of COVID-19 have been a loss of economic activity and employment. This loss of economic activity, and therefore income, has taken different forms in different AMS. In all cases, the onset of COVID was associated with sharp economic declines due to lockdowns and border closures. Following this decline, economic activity has returned to varying degrees. Exhibit 19 illustrates these outcomes.

Exhibit 19: COVID-19 Impacts on Economic Activity



Sources: National authorities via Haver Analytics; and AMRO staff estimates and projections.
Note: The vertical dotted line at Q4 2019 demarcates the onset of the pandemic. The pre-pandemic trend growth rate of real GDP for each economy is calculated by averaging the quarterly logarithmic difference of real GDP from Q1 2015 to Q4 2019; this trend growth rate is extended through Q4 2023 to obtain the gray "pre-pandemic GDP trend" line. Quarterly real GDP data for Myanmar are only available starting from Q4 2015 and projections stop at 2022. Actual and trend real GDPs are normalized to 2019 = 100 for ease of cross-economy comparison.

Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

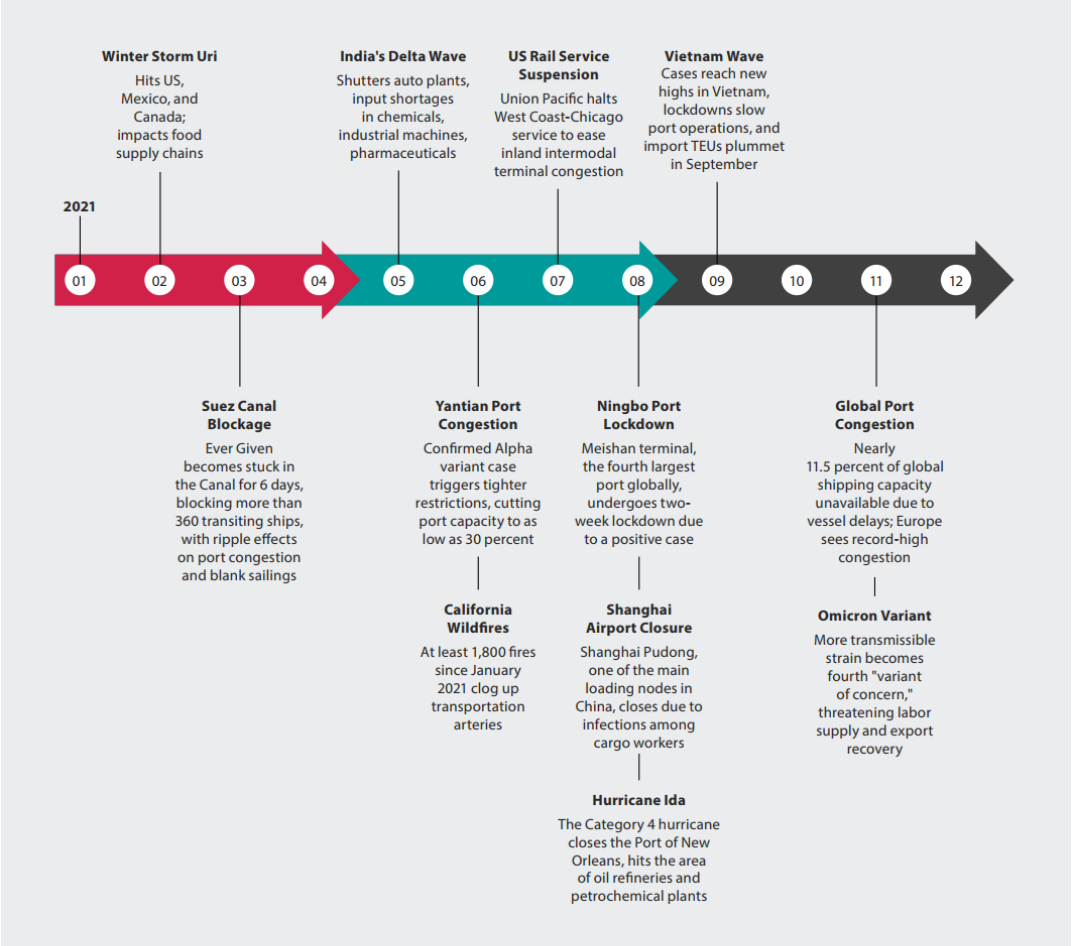
Some counties, for example, Indonesia, Malaysia, Cambodia, Thailand and Vietnam have re-established pre-COVID *rates* of economic growth but are still below their pre-

COVID trend levels of economic activity. Other Asian countries have managed to almost completely return to pre-COVID trend levels including Hong Kong, SAR, Japan, Singapore, Brunei Darussalam and South Korea. Myanmar suffered a large drop in economic activity at the onset of COVID and is now well below its pre-COVID trend although there are other significant contributing factors.

Contributing to this loss of economic activity across ASEAN and globally is ongoing supply chain disruption due to lockdowns, traffic restrictions at ports and falls in labour supply due to COVID infections.

Exhibit 20 provides information on supply chain disruptions in the COVID period. It can be seen that lockdowns cause holdups and congestion at ports around the globe. With global transport systems operating near capacity, this means that disruptions become cumulative over time.

Exhibit 20: Major Supply Chain Disruption Events in 2021

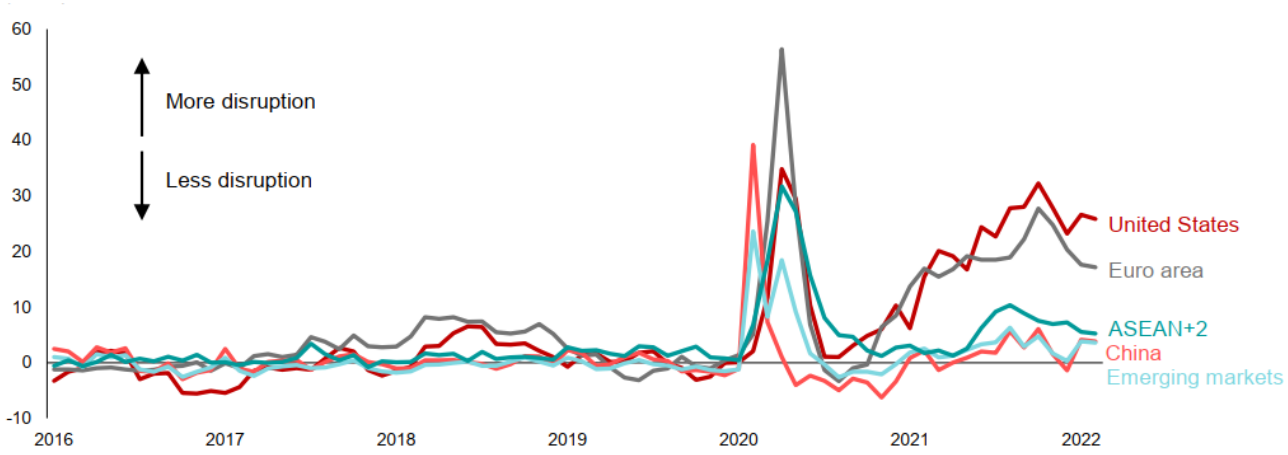


Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

Exhibit 21 shows clearly the timing of disruptions coinciding with the onset of the pandemic but also that disruptions are continuing at much higher than pre-COVID levels.

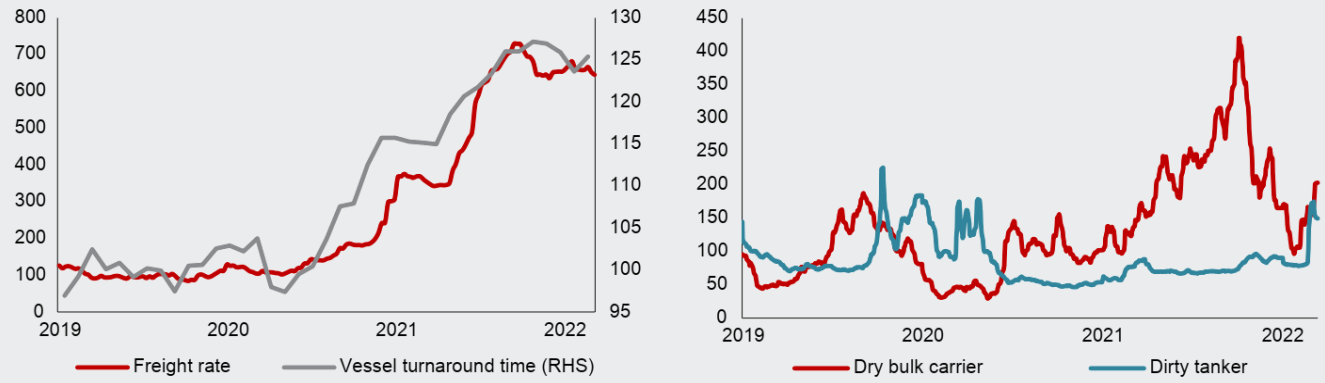
Exhibit 22 illustrates the impacts on shipping turnaround times and freight rates, both indicating that impacts on shipping continue to be significant.

Exhibit 21: ASEAN+3 and Selected Economies: Supply Chain Disruption



Sources: Haver Analytics; and AMRO staff calculations.
Note: Supply chain disruptions are calculated as the difference between the supply delivery times sub-index in the Purchasing Managers' Index (PMI) and a counterfactual, cyclical measure of supply delivery times based on the manufacturing output sub-index in the PMI. The extent of supply chain disruptions is measured by deviations from zero. ASEAN+2 = ASEAN economies, Japan, and Korea.

Exhibit 22: Container Freight Rate and Global Container Vessel Turnaround Time (Left, Index, 2019 = 100) Dry Bulk and Tanker Freight Rates (Right, Index, 2019 = 100)



Sources: Bloomberg Finance L.P. (accessed on March 15, 2022); and AMRO staff calculations.
Note: Container freight rate refers to the World Container Index, a weighted average by volume of the spot container freight rates of a 40-foot container box for eight major East–West trade routes. Dry bulk carrier rate refers to the Baltic Dry Index, which tracks freight rates for bulk commodities such as coal, iron ore, and grade. Dirty tanker rate refers to the Baltic Dirty Tanker Index, which tracks freight rates for crude oil.

Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

In addition to these negative impacts on economic activity and trade, ASEAN governments have incurred high levels of debt to support their populations during the COVID period. This step will limit governments' ability to engage in publicly funded infrastructure investment and other activities designed to increase productivity and competitiveness.

One of the most obvious characteristics of the pandemic's economic consequences has been the highly differential impacts on different industries. The travel and

tourism sectors, as well as the hospitality sector, have been severely impacted and have by no means fully recovered. In contrast, many services, and especially digitally delivered services, have thrived in the pandemic environment. There is no doubt that COVID-19 has boosted digital skills and the uptake of digital practices. It is still unclear how widespread this impact has been and to what extent particular groups have been left behind. As the ASEAN +3 Macroeconomic Research Office reported[32]:

> *COVID-19 has been a major disruptor—as well as a catalyst for change. The evolving virus and the policies implemented to contain it have exacted a heavy toll on economic activity and populations in the ASEAN+3 region. At the same time, the pandemic has precipitated changes in business operations, technology adoption, social norms, and consumer behavior that are likely to endure long after the crisis ends.*

3.2 Contributions of digital resources to pandemic management

The COVID-19 pandemic has highlighted the critical role of digital technologies to support public health programmes and outreach. The ITU has found that in the medium term, countries with top connectivity infrastructure could mitigate up to half of the negative economic impacts of the COVID-19 pandemic.[33] Digital resources have supported the public-health response to COVID-19 worldwide through responding to issues such as population surveillance, case identification, and contact tracing. Digital tools and technologies that have been deployed are summarised in Exhibit 23.

Exhibit 23: Digital technologies used in the COVID-19 pandemic

Public-health need	Digital tool or technology	Example of use
Digital epidemiological surveillance	**Machine learning**	**Web-based epidemic intelligence tools and online surveillance**
	Survey apps and websites	**Symptom reporting**
	Data extraction and visualization	**Data dashboard**
Rapid case identification	**Connected diagnostic device**	**Point-of-care diagnosis**
	Sensors including wearables	**Febrile symptoms checking**
	Machine learning	**Medical image analysis**
Interruption of community transmission	**Smartphone app, low-power Bluetooth technology**	**Digital contact tracing**
	Mobile-phone-location data	**Mobility-pattern analysis**
Public communication	**Social-media platforms**	**Targeted communication**
	Online search engine	**Prioritized information**
	Chat-bot	**Personalized information**
Clinical care	**Tele-conferencing**	**Telemedicine, referral**

Source: Digital technologies in the public-health response to COVID-19, 2020[34]

Online data and social media have had an ongoing, important role in public communication during a pandemic. Digital communication platforms also support adherence to social-distancing measures. Video conferencing allows people to work

32 ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

33 ITU, Digital Trends In Asia and the Pacific 2021: Information and Communication Technology Trends and Developments in the Asia-Pacific Region, 2017–2020, p 35.

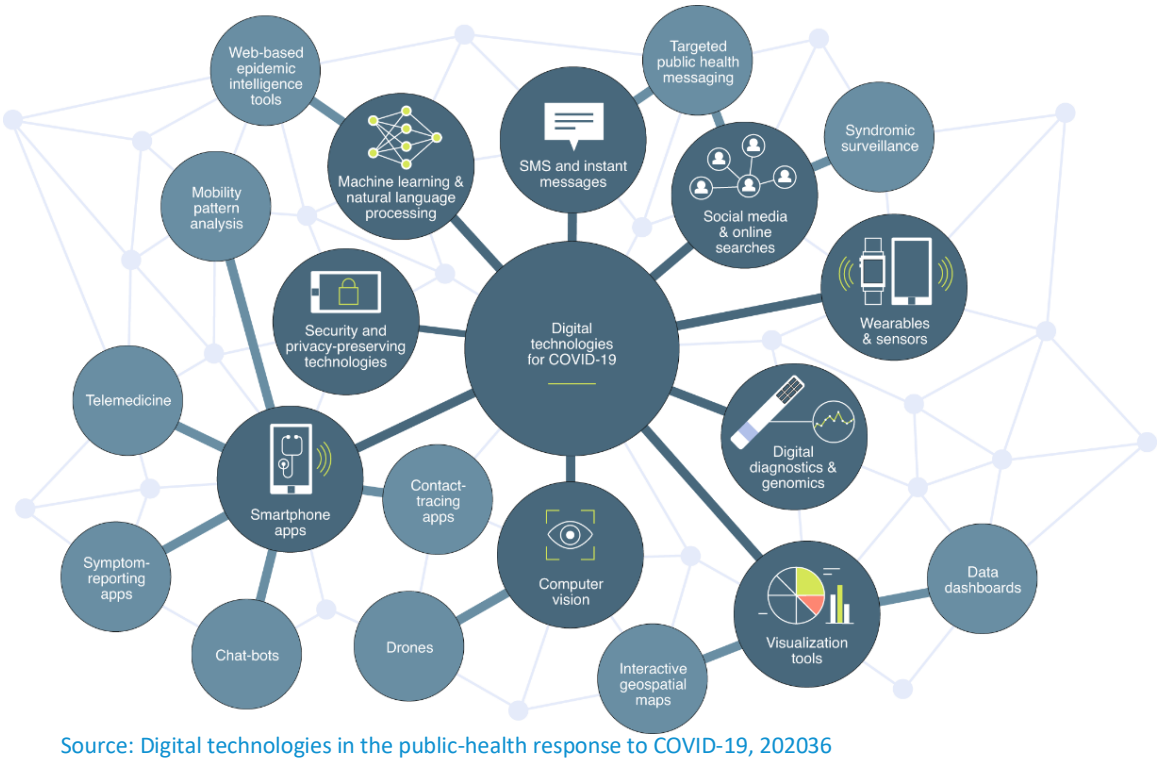
34 https://www.nature.com/articles/s41591-020-1011-4

and attend classes from home, online services support mental health and digital platforms enable community-mobilization efforts by providing ways to assist those in need. Key challenges include the rise of potentially harmful misinformation and digital inequalities. Efforts to mitigate the spread of misinformation and prioritize trusted news sites include Google's SOS alert intervention which prioritizes the WHO and other trusted sources at the top of search results.[35]

3.2.1 Internet-of-Things Solutions

The pandemic accelerated the digitalisation and automation of digital resources through the adoption of Internet-of-Things (IoT) solutions. This was the case even in areas that had previously lagged behind, such as the healthcare sector, that had been slow to adopt IoT solutions. Connected medical devices (both clinical and consumer grade) and e-health saw increased demand, due to the need for remote consultation and diagnoses. Furthermore, logistics and supply chains, connected solutions and asset tracking have enabled fast rerouting of supply chains to help fill gaps (for key goods, medicines and equipment), and support business resilience.

Exhibit 24: The interconnected digital technologies used in the public-health response to COVID-19.



Source: Digital technologies in the public-health response to COVID-19, 202036

Additionally, telecommunication service providers have actively repurposed IoT solutions including infrared cameras, home alarm systems, and autonomous delivery vehicles and drones, for monitoring, public health announcements, disinfectant spraying and deliveries to affected areas. In some cases, the shift to digital has been driven "bottom-up" by consumers, such as is seen in the adoption of connected thermometers by a broad base of consumers in the United States. Temperature data

35 Google. SOS alerts help. https://support.google.com/sosalerts/?hl=en

36 https://www.nature.com/articles/s41591-020-1011-4

points were being uploaded and shared at scale across that country and could be used to predict virus hotspots in advance.

3.2.2 Track and Trace Systems

The pandemic has further highlighted the value of digital resources through the use of track-and-trace applications, connected and integrated fleet management, and contactless payment terminals and solutions for retailers. This can lead to future increased investment in digital solutions encompassing not only telecommunications but also data management, automation, and artificial intelligence.[37]

Contact tracing technologies have provided public health officials, affected individuals, or both, with rapid access to relevant information. Digital proximity tracing apps were rolled out early in the COVID-19 pandemic in many countries to complement conventional contact tracing. Most digital contact tracing apps use Bluetooth technology, wherein the occurrence of a contact between two smartphone users is indicated by the duration, frequency, and transmission strength of Bluetooth signal exchanges. ASEAN examples, include PeduliLindungi in Indonesia, Morchana in Thailand and MySejahtera in Malaysia.

The effectiveness of digital proximity tracking tools depends on a high coverage and utilization rate among the population. Trust is a central issue, with laws on privacy and data security varying drastically throughout the world, as reflected in Singapore's contact tracing app debate.[38]

Exhibit 25: Box story: Singapore's COVID-19 contact tracing app, 'TraceTogether'

Singapore launched the TraceTogether mobile app on March 20, 2020, becoming the first country to deploy a digital contact-tracing tool nationwide during the COVID-19 pandemic. TraceTogether assisted contact tracers in identifying close contacts of a COVID-19 patient, which helped authorities identify the close contacts and locations visited by infected persons and stop the spread of the virus. The app used Bluetooth signals to record other nearby TraceTogether devices. If someone tested positive with the virus, the data allowed tracers to swiftly contact anyone that might have been infected. By January 2021, close to 80% of the Singaporean population were signed up to the TraceTogether programme, with its use required as proof of vaccination and to check in to most public venues, including restaurants, malls and attractions.[39]

However, the COVID-19 contact tracing app attracted controversy concerning government disclosures about its use for criminal investigations and its utilization in a murder case. The app had initially explicitly ruled out data usage for anything other than virus tracking. Authorities were forced to rush legislation early 2021 legalising alternate tapping of the information only where there is a clear and pressing need to use that data for criminal investigation of serious offences, despite opposition and rights groups criticizing the plan. Subsequently, data was still be used by the police and law enforcement for such purposes under the passed law.

In April 2022, it was announced by the health ministry that most venues will no longer require the public to check in using the TraceTogether app. Checking-in will continue to be conducted at larger events with more than 500 participants, and certain nightlife establishments where vaccination-proof remains a requirement.[40]

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37 Economic Impact of COVID-19 On Digital Infrastructure, Report of an Economic Experts Roundtable organised by ITU, GSR-20 Discussion Paper

38 https://www.who.int/news-room/feature-stories/detail/tracking-covid-19-contact-tracing-in-the-digital-age

39 https://www.bbc.com/news/world-asia-55541001

40 https://www.bloomberg.com/news/articles/2022-04-22/singapore-phases-out-use-of-controversial-contact-tracing-app

Exhibit 26: Box story: Indonesia's COVID-19 Vaccination One Data System

In preparation for the distribution of the COVID-19 vaccine in Indonesia, the Government appointed two State-owned companies, PT Bio Farma and PT Telkom, to develop new digital infrastructure to support both the government vaccination programme and independently purchased vaccinations. The COVID-19 Vaccination One-Data System integrated data from multiple sources into one datum in order to prevent data duplication. The data collected included personal details such as names and addresses. The system recorded vaccine recipients by filtering individual data on priority vaccine recipients (by name, by address). It was subsequently used to register for the two vaccination schemes, to map the vaccine supply and to distribute vaccines to vaccination locations.41

According to the digital health-care director of Bio Farma, the infrastructure comprised four phases: track and trace technology, distribution, pre-order facility and vaccination report.[42]

- The track and trace technology featured 2D barcodes on the vaccine packaging, containing important information such as the vaccine expiry date, batch number and serial number, to prevent counterfeit vaccines.
- Regarding distribution, the infrastructure sought to ensure that all vaccines were stored in a temperature-controlled system at between 2 and 8°C.
- Further benefits included a pre-order service for independently purchased vaccinations that prevented vaccine hoarding.
- The digital solution also offered an integrated reporting system, providing consumers with a report or digital certificate that can be used to travel by air or train.

The system being developed by the joint venture followed existing regulations relating to data privacy.

3.3 Examples of COVID policy and legislative adaptions

The previous section provided examples of how digital technologies have enabled unprecedented responses to the pandemic. But in order to realize the full potential of these technologies, it is necessary to undertake a range of policy and legislative changes to enable even further 'digital adaptation' in the COVID and post-COVID world.

This section provides some specific examples of policy and legislative changes which have been made by AMSs to enable social and economic adaptations to the COVID pandemic rather than be a comprehensive survey of AMS Government responses.

The emergency responses designed to minimise physical gatherings of people, in a range of settings, such as work/study from home and tele-conferencing were designed as temporary measures. It soon became clear, however, that the pandemic period would likely become protracted and that it would be necessary to make many policy and legislative changes in other to enable business and government processes to continue to operate. The alternative was significant medium-term suppression of economic activity, loss of business and unemployment.

One example is the need to develop some means to enable binding contracts over digital channels. With populations in lockdown, business meetings occurring over tele-conferencing and with logistical challenges for the movement of physical documentation, the need to devise a digital contracting system supported national

41 Office of the Assistant to the Deputy Cabinet Secretary for State Documents & Translation, VP Ma'ruf Amin Receives First COVID-19 Jab, Cabinet Secretariat of the Republic of Indonesia, 17 February 2021.

42 https://www.thejakartapost.com/news/2020/12/03/bio-farma-develops-digital-infrastructure-for-covid-19-vaccine.html

legal systems quickly became apparent. The Philippines Supreme Court, for example, issued 'Interim Rules on Remote Notarisation of Paper Documents' (see Exhibit 27).

Exhibit 27: Legislative Changes to Enable Legal Status for Digital Contacting, Business Meetings and Medical Consultations

Philippines	
Notarisation via video-conferencing[43]	**On 14 July 2020, the Supreme Court issued A M No 20-07-04-SC or the '2020 Interim Rules on Remote Notarisation of Paper Documents' ('Rules on Remote Notarisation'). The Rules allow the notarisation of documents with handwritten signatures through videoconferencing facilities in localities where the notary public or one of the parties resides or holds office in an area under community quarantine. Under the Rules, where the document requires an acknowledgment, affirmation, oath or *jurat*, the party to the document shall deliver the instrument or document to be notarised to the notary public in a sealed envelope via personal or courier service.**
Guidelines on working from home arrangements via the NPC PHE Bulletins44	**On 15 May 2020, the National Privacy Commission (NPC) issued PHE Bulletin No 12, entitled 'Protecting Personal Data in a Working from Home Arrangement', to address issues arising from telecommuting during the pandemic. PHE Bulletin No 12 sets guidelines for public and private organisations operating under a WFH arrangement to ensure that the privacy of employees and their company's data subjects are protected.[45] This was later supplemented with PHE Bulletin No 14 in 2021, covering privacy regulations and best practices on privacy matters involved in return to work and working from home arrangements.[46]**
Singapore	
Greater flexibility for the organization of general and board meetings through the COVID-19 (Temporary Measures) Act 2020[47]	**On 7 April 2020, the COVID-19 (Temporary Measures) Act 2020 was enacted by Parliament. The Act contains a new legislative provision aimed at providing legal certainty on the holding of meetings by companies, charities, societies, and other organisations amid the pandemic. The relevant provisions concerning meetings were deemed to have come into operation retrospectively on 27 March 2020. Accordingly, a relevant meeting or class of meetings held on or after 27 March 2020 that complies with alternative arrangements prescribed under the new law will be deemed to satisfy any requirements for the convening, holding, conduct or deferral of such meeting under the relevant written law or legal instrument. The provision is part of a suite of measures introduced by the Act to provide temporary measures aimed, among other things, at alleviating the unexpected pressures COVID-19 has caused to individuals, firms and businesses.**
Thailand	
From April 19, 2020, Thai law allows board and shareholder meetings to take place entirely online, and attendees are no longer required to be physically present in Thailand[48]	**Royal Decree on Teleconferences through Electronic Means B.E. 2563 (2020), which came into force on 19 April 2020, replacing the previous law. The key elements of the new royal decree are as follows: all attendees can attend meetings via electronic means, such as by phone or video call, from anywhere in the world; there is no physical attendance requirement; all attendees are able to vote during the meeting (whether by open or secret ballot); an audio or audiovisual recording must be made of the entire meeting, except for meetings held in camera; the electronic traffic data of every attendee must be kept as evidence; minutes must be taken of the meeting; the convening notice (and enclosures) can be distributed via e-mail instead of by standard post, but must in that case be properly archived as evidence by the meeting organizer.**

43 https://platonmartinez.com/articles/2020-interim-rules-on-remote-notarization

44 https://www.privacy.gov.ph/list-of-npc-issuances-related-to-covid-19/

45 *NPC issues 'work from home' guidelines to safeguard personal data*, 15 May 2020, www.privacy.gov.ph/2020/05/npc-issues-work-from-home-guidelines-to-safeguard-personal-data.

46 *NPC PHE Bulletin No. 14: Updated Frequently Asked Questions (FAQs),* 5 June 2020, www.privacy.gov.ph/2020/06/npc-phe-bulletin-no-14-updated-frequently-asked-questions-faqs.

47 https://sso.agc.gov.sg/Act/14-2020

48 Kobkit Thienpreecha, Thailand Eases Restrictions on Electronic Board and Shareholder Meetings, Tilleke & Gibbons, 20 April 2020.

In April 2019 Thailand enabled board and shareholder meetings to hold open or secret ballots with retention of electronic traffic as evidence of processes and outcomes (also see Exhibit 27).

In some cases, legislative changes were required to enable more effective pandemic responses. A good example is, Singapore's pilot of supervised COVID-19 rapid antigen test via teleconsultation. Singapore's Ministry of Health piloted a virtually supervised COVID-19 rapid antigen test to assess its feasibility. The government teamed up with local telehealth startup Doctor Anywhere to offer rapid test supervision via 30-minute video consultations. Doctor Anywhere launched tele-ART, a supervised self-swab test service.

In the consultation, a user must ensure that the contents of the antigen rapid test kit are visible so these can be verified by a supervisor. They must also insert a swab stick to a depth of around 2.5 cm in the nostril. A provider will then send the test result via text and e-mail within four hours.

Examples of additional innovations are provided in Exhibit 28 and Exhibit 29. Singapore's 'Hawkers Go Digital' initiative is a fairly specific but important example of the type of program that is required to shift payment processes into the digital domain. When consumers see a greater penetration of digital payment methods across all type of vendors – even smaller one – they become more confident about moving towards an 'always digital' approach to transactions.

Exhibit 28: Box story: Singapore's digital transformation of traditional hawker centres

Singapore's 'digital road map' was already well-established and defined before COVID-19. However, the pandemic quickened the pace of this digital transformation, as the government looked not only to improve social distancing but also to ensure productivity and resilience for Singaporeans and local businesses in the long term through digital transformation.

One way in which the Singapore government has achieved this is through the 'Hawkers Go Digital' initiative, launched in June 2020. The initiative is targeted at traditional open-air hawker centres (cooked food markets) — one of Singapore's last bastions of cash transactions — to go digital under a unified payments system led by the government. The Hawkers Go Digital programme aimed to reach out to and encourage a total of 18,000 hawker stallholders to adopt the Unified e-Payment Solution by June 2021. Stallholders were encouraged to adopt a contactless payment option by adopting an unique SGQR label at their stall. By using a SGQR, stallholders are able to receive payments through 19 different payment schemes, including DBS PayLah!, GrabPay and Singtel Dash. To help support hawkers, a $3 cash bonus was given for every 10 NETS transactions to all hawkers as well as canteens, coffee shops, food courts and eating houses when they accept NETS payments until 31 July 2021. The government will continue to cover transaction fees (i.e merchant discount rate of 0.5% payable by merchants) until 31 December 2023.[49]

49 https://www.sdo.gov.sg/programmes/hawkers-go-digital/

Exhibit 29: Box story: 'Make in Viet Nam'

Viet Nam's government has leveraged the National Digital Transformation Roadmap 2025 to galvanize support from the private sector in reviving Viet Nam's post-COVID economy. The 'Make in Viet Nam' campaign, officially launched in May 2019 before the pandemic, has been reintroduced in the Roadmap as a way to re-energize the private sector and reaffirm the government's push to turn Viet Nam into an innovation hub, not only a manufacturing hub. The goal is to foster 100,000 tech firms and 10 unicorns (startups valued at over US$1 billion) by 2030.[50]

Vietnam has witnessed significant progress in the development of tech businesses since the 'Make in Vietnam' strategy was implemented. After a year, more than 13,000 digital tech enterprises have been established, up by 28%. Vietnam's digital tech business community currently has over 58,000 companies – a record number, as at first, the project was expected to see only 6,000 enterprises a year at its peak. With the current implementation speed, the set target of 100,000 digital businesses by 2030 can be achieved by 2025.[51]

The COVID pandemic has become a catalyst for the government's innovation ambitions vis-a-vis its 'Make in Vietnam' plan. For example, Vietnam has already rolled out three homegrown tech products to combat the spread of COVID-19 and accommodate changing consumer needs during the pandemic. In April 2020, Vietnam launched its contact tracing app, Bluezone[52], and a virtual health checkup platform. The checkup platform allows medical examinations to be carried out remotely and has further incentivized the government to digitalize Vietnam's health sector, as highlighted in the Roadmap. Riding on this current momentum, in May 2020 the Ministry of Information and Communications launched Zavi[53], Vietnam's first homegrown video-conferencing platform.[54]

Viet Nam's 'Make in Viet Nam' program is aimed at stimulating digital entrepreneurialism. The Vietnamese government's objective is to foster 100,000 tech firms and 10 unicorns with valuations over US $1 billion by 2030. The effort to stimulate national tech sectors is critical in the ASEAN region as growth from other sectors, particularly tourism struggles to recover in the post-COVID period. The need for a renewed focus on the tech sector is discussed further in Section 6 below.

3.3.1 Summary comments on the Role of Digital Technologies

COVID-19 has demonstrated clearly the enormous costs that pandemics can impose on modern society. It also demonstrated the relative unpreparedness of even advanced nations around the world and their relative incapacity to mount rapid and effective responses. Nonetheless, much has been learned. New systems have been developed and digital technologies have demonstrated their indispensability in minimising pandemic human, social and economic harms.

It is also quite clear that threat of future pandemics should now be regarded as a feature of the modern environment. Humans will continue to be exposed to naturally occurring viruses as habitation patterns change. The threat of artificial pathogens can also be expected to increase as biotechnology becomes more advanced and becomes cheaper to access.

50 https://tuoitrenews.vn/news/business/20190509/vietnam-holds-first-national-forum-for-tech-companies/49925.html

51 https://en.nhandan.com.vn/scitech/item/9591102-digital-conversion-and-make-in-vietnam-story.html

52 https://bluezone.ai/

53 https://zavi.me./?lang=vi

54 https://www.asiapacific.ca/publication/vietnam-post-covid-era-realizing-digital-country

Various organisations[55] have argued that, in addition to better policies, better public-health practices, and potentially new institutions, it will also be necessary to deploy networks of sophisticated digital sensing and analysis networks, effectively, virus early warning systems. Highly advanced and efficient track and trace systems will need to be further developed and maintained at the ready. Countries with more advanced digital infrastructure and systems will be better positioned to deploy and benefit from such systems.

These systems will not only require significant technological infrastructure, they will also need very mature approaches to the collection and management of large volumes of personal information, particularly given that, in the face of very serious pandemic threats, participation in these systems will be compulsory.

3.4 Emerging policy priorities for the post-COVID digital economy

The economic disruptions associated with COVID have impacted nations negatively in general but in specific different ways. Economies that were highly dependent on tourism, for example, have suffered significant economic dislocation. The weakening of global trade and supply chains have had serious impacts on many industries while some industries have benefited from the pandemic. It is far from clear to what extent pre-COVID industry structures will reassert themselves and even to what extent permanent and significant changes in the structure of global trade patterns are currently unfolding. In any case, expecting the new normal to return to the old normal may lead to serious policy errors.

Even if many of these disruptions do turn out to be (relatively) short-lived and economies eventually recover, the lost economic growth of the COVID period is 'baked in' to the new growth trajectory (see Section 6). Some economies face, not only the COVID disruption itself, but a shift, for at least the medium term, to lower growth rates and changing trade patterns.

Added to such uncertainties is the future trajectory of COVID itself. The term 'post-COVID' itself may turn out not to be an accurate description of the current period – it may be overly optimistic or shorthand for the period that follows the initial onset of a longer period in which COVID continues to impact the world.

The numerous new stains of COVID, although increasingly contagious, appear to be characterised by less severe symptoms and increasing levels of vaccination help reduce severity further. There are hopes that the disease will eventually become a mild endemic illness with minimal ongoing impacts, but this still remains to be seen.

The economic disruption and uncertainty associated with COVID-19 has led to wider-range and unexpected effects that will impact economies and societies longer term. The disruption of supply chains is rising questions about the benefits of globalisation and many countries are now re-evaluating the merits of 'sovereign capabilities' in the production of key inputs and products. COVID is not solely responsible for this development – raising geo-strategic issues obviously also play a role.

Layered on to these considerations are additional factors associated with geo-strategic development, for example, the objective of several companies to 'de-couple' their economies from China. The role of demography is also emerging as a

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55 See, for example, The Brookings Institution, Breakthrough Technologies for Pandemic Preparedness, Yolanda Botti-Lodovico and Pardis Sabeti, https://www.brookings.edu/wp-content/uploads/2021/12/Chapter-Two_Breakthrough.pdf

driver of economic development trends as counties in the ASEAN region move towards a demographic profile similar to Japan's.

These dynamics are discussed further in Section 6, but the high-level implications for the development of digital policy in ASEAN nations include the need to place a greater emphasis on the role of digital policy in improving efficiency, competitiveness and the economic growth performance of AMS. Appropriate digital policy can contribute to these economic objectives by encouraging digital practices in government and business to improve operational efficiency and competitiveness, encouraging the growth of the tech sector itself for its contribution to economic growth, and improving digital skills of ASEAN citizens. In a period of economic change and uncertainty access to all forms of information regarding emerging opportunities is essential. The digital technologies and practices to achieve integration in global chains should be a high-priority objective of governments and business.

In addition to these economic objectives, digital technologies represent a powerful tool for social and economic inclusion for populations not yet fully integrated into service provision systems and modern economies.

4 SURVEY: DIGITAL STAKEHOLDERS

4.1 Quantifiable responses

The survey was conducted from early October to early December 2022. A total of 52 response were obtained.

Exhibit 30 show responses to the question: 'In what country do you work?'. The top three responding countries were Malaysia, Thailand and Myanmar. Exhibit 31 shows the role/positions of respondents.

Exhibit 30: In what country do you work?

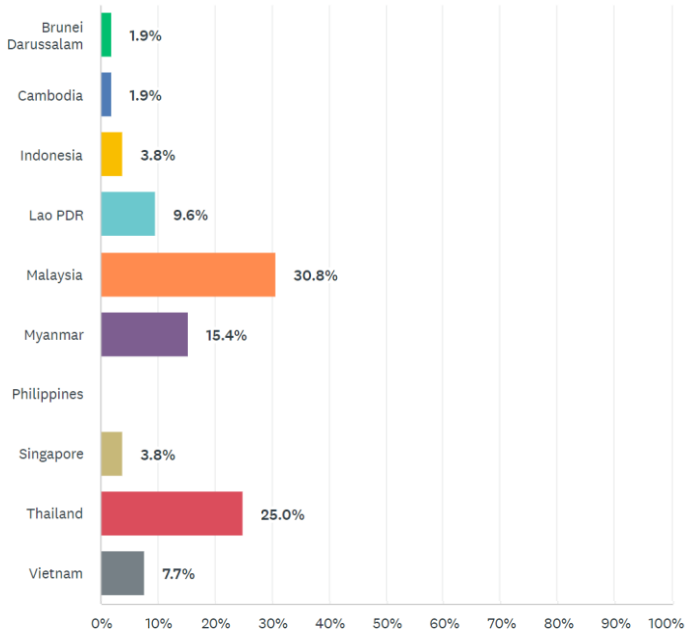


Exhibit 31: What is your role/position?

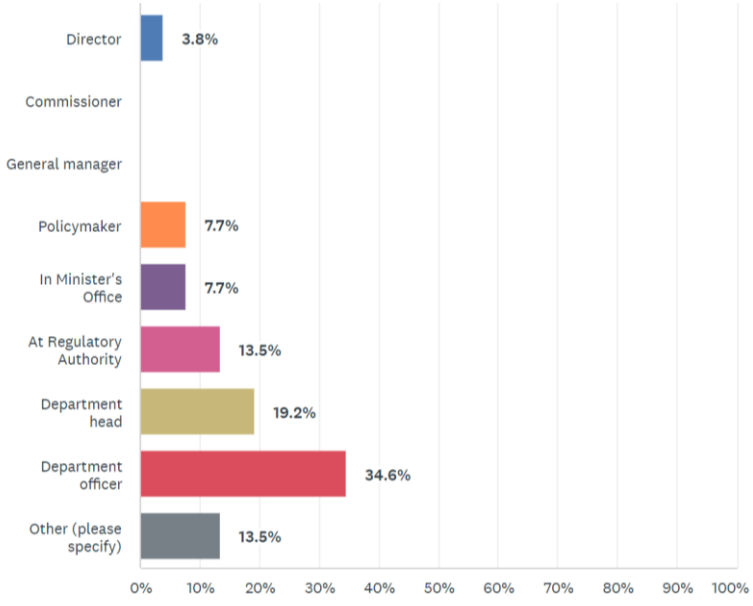


Exhibit 32 shows the types of organisations that respondents work for.

Exhibit 32: For what kind of organisation do you work?

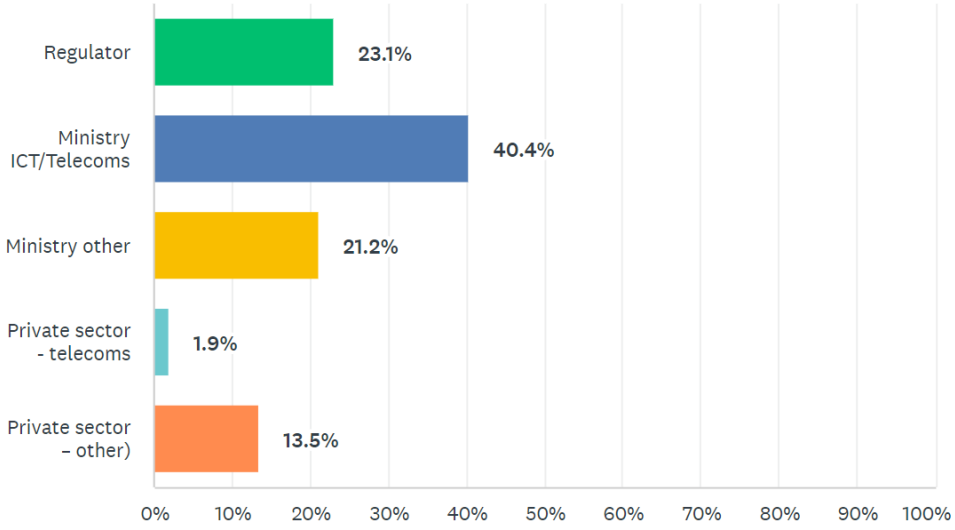


Exhibit 33 shows that respondents believe overwhelmingly that COVID-19 has had overall positive impacts on progress towards digital goals for ASEAN economies with over 86% of respondents saying that COVID-19 had a 'Somewhat positive impact' or 'Overall positive impact on progress' towards digital goals.

This view from survey respondents strongly reinforces other commentary in this report indicating the profound impact that COVID-19 has had on progress towards digital goals in a very short timeframe.

Exhibit 33: COVID-19 has had multiple impacts on ASEAN economies and society. What impact do you think the COVID period has had on general progress towards digital goals overall in your country?

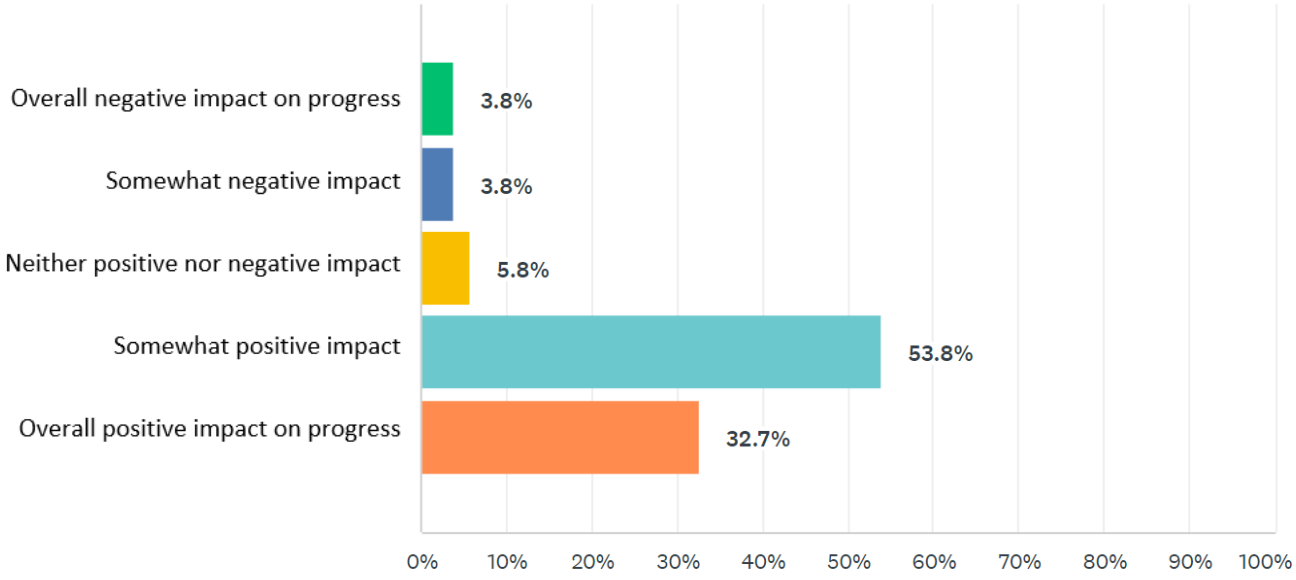
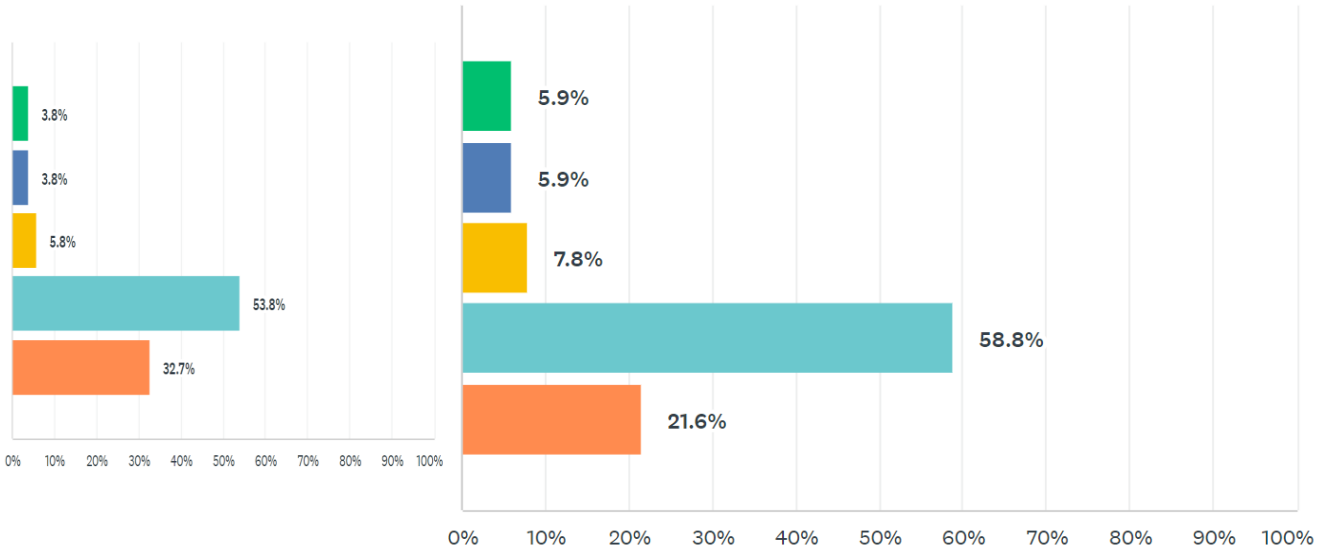


Exhibit 34 shows similar results to the previous question for the impact of COVID-19 on progress towards digital government.

Exhibit 34: What impact has COVID-19 had on progress towards 'digital government' – digital delivery of government services and use of digital processes within government in your country?



Again, similarly to the previous two questions, respondents believe that COVID-19 had overwhelmingly positive impacts on the adoption of digital processes and service delivery by private sector businesses, SMMEs and larger corporates.

Exhibit 35: What impact has COVID-19 had on the adoption of digital processes and service delivery by private sector businesses, SMMEs and larger corporates, in your country?

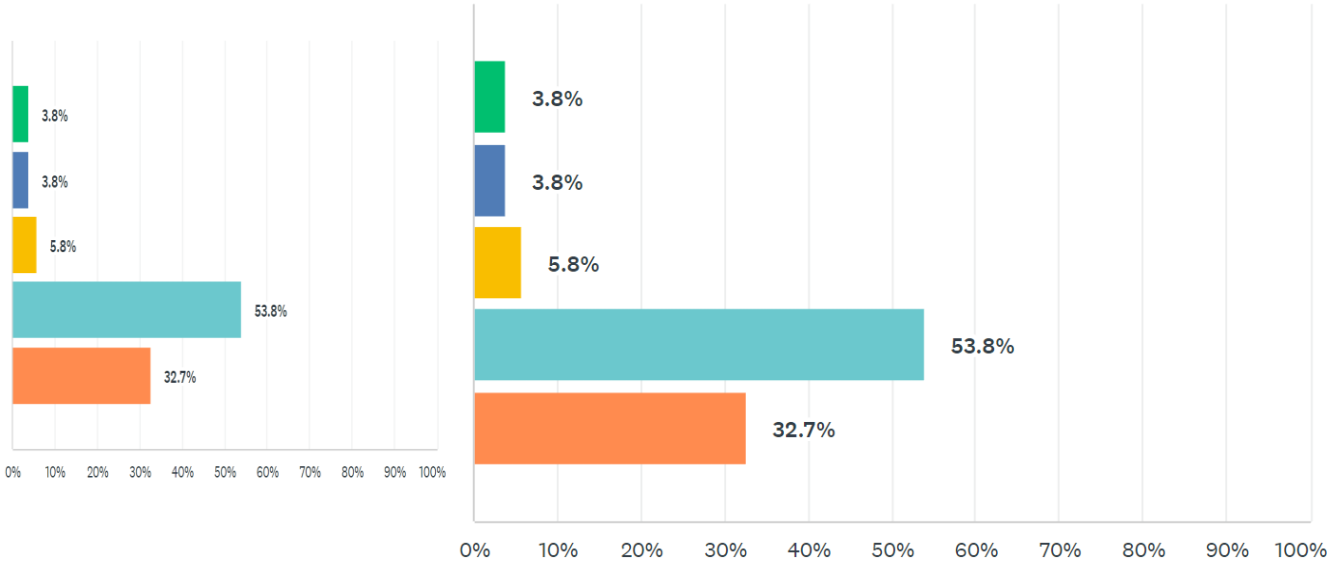
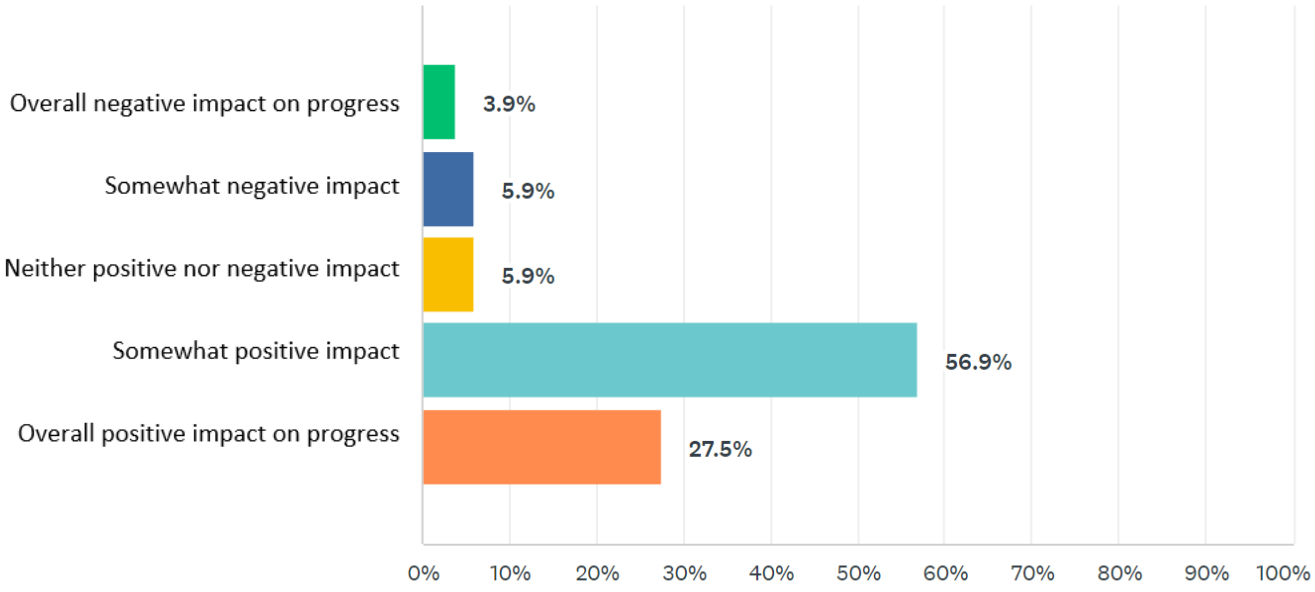


Exhibit 36 shows that respondents believe that private citizens and consumers have also greatly increased digital practices due to COVID-19 with 0ver 84% choosing the options 'Somewhat positive impact' or 'Overall positive impact on progress'.

Exhibit 36: What impact has COVID-19 had on the adoption of digital practices by private citizens and consumers in your country?



Similarly to the previous question, respondents also believe strongly that COVID-19 has caused an increase in digital skills among populations in their countries. This is an important result because poor digital skills are widely viewed as a major impediment to digital practices and reducing the digital divide.

Exhibit 37: Has COVID-19 caused an increase in digital skills among the general population in your country?

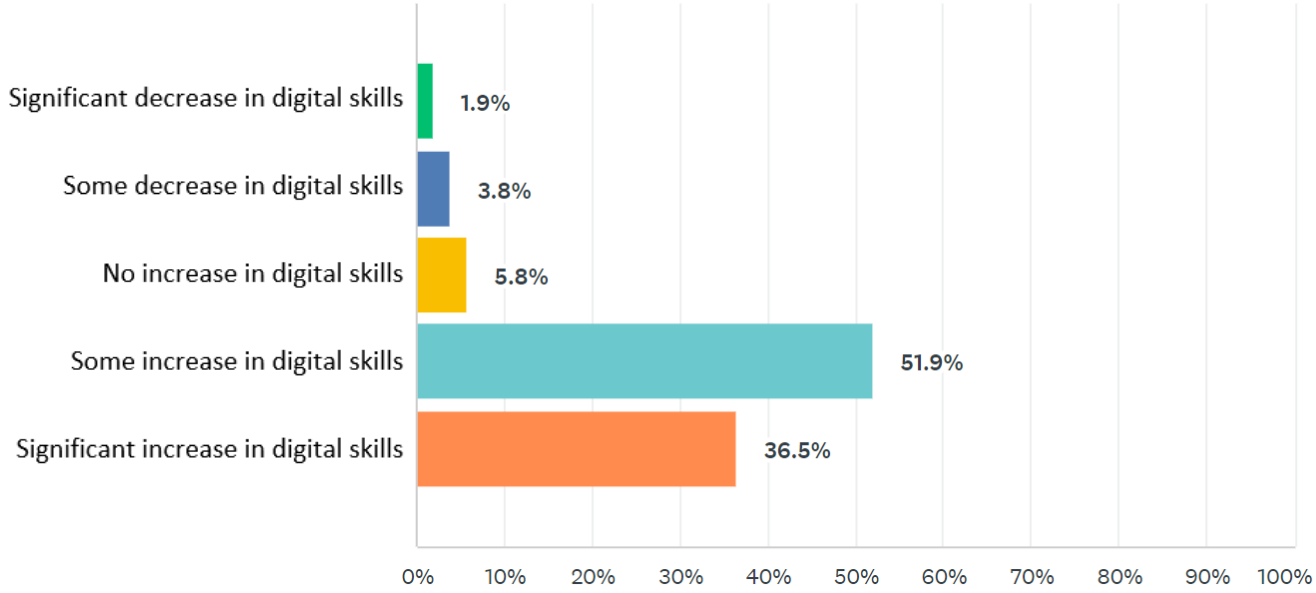


Exhibit 38 shows responses to Question 12 of the survey in which respondents were asked to rank from 1 to 7 a set of 7 digital policy goals for their specific country.

This question was relatively complex and the results shown need to be interpreted carefully. For example, for the digital goal of "Equality of access (access to services and affordability)', 56.9% of respondents rank it as the highest priority goal while 7.8% ranked as the fifth priority for their country.

Overall, respondents ranked 'Equality of access' is the highest priority with 'Digital government' as second-highest and 'Digital adoption by the private sector' as the third highest priority.

Exhibit 38: Consider the 7 digital policy goals. Please rank these from most important in your country to least important (1 to 7) for the pre-COVID period.

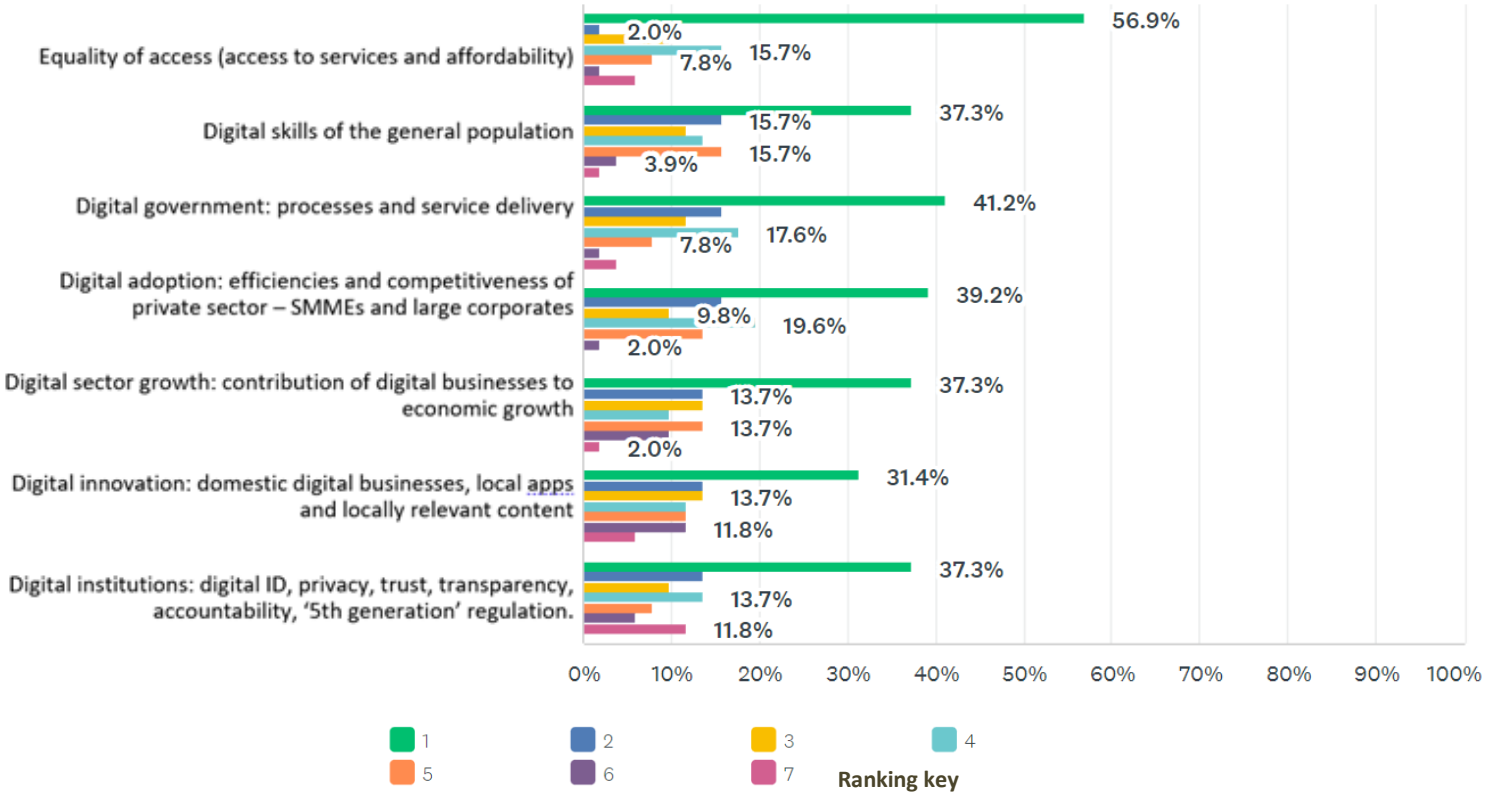
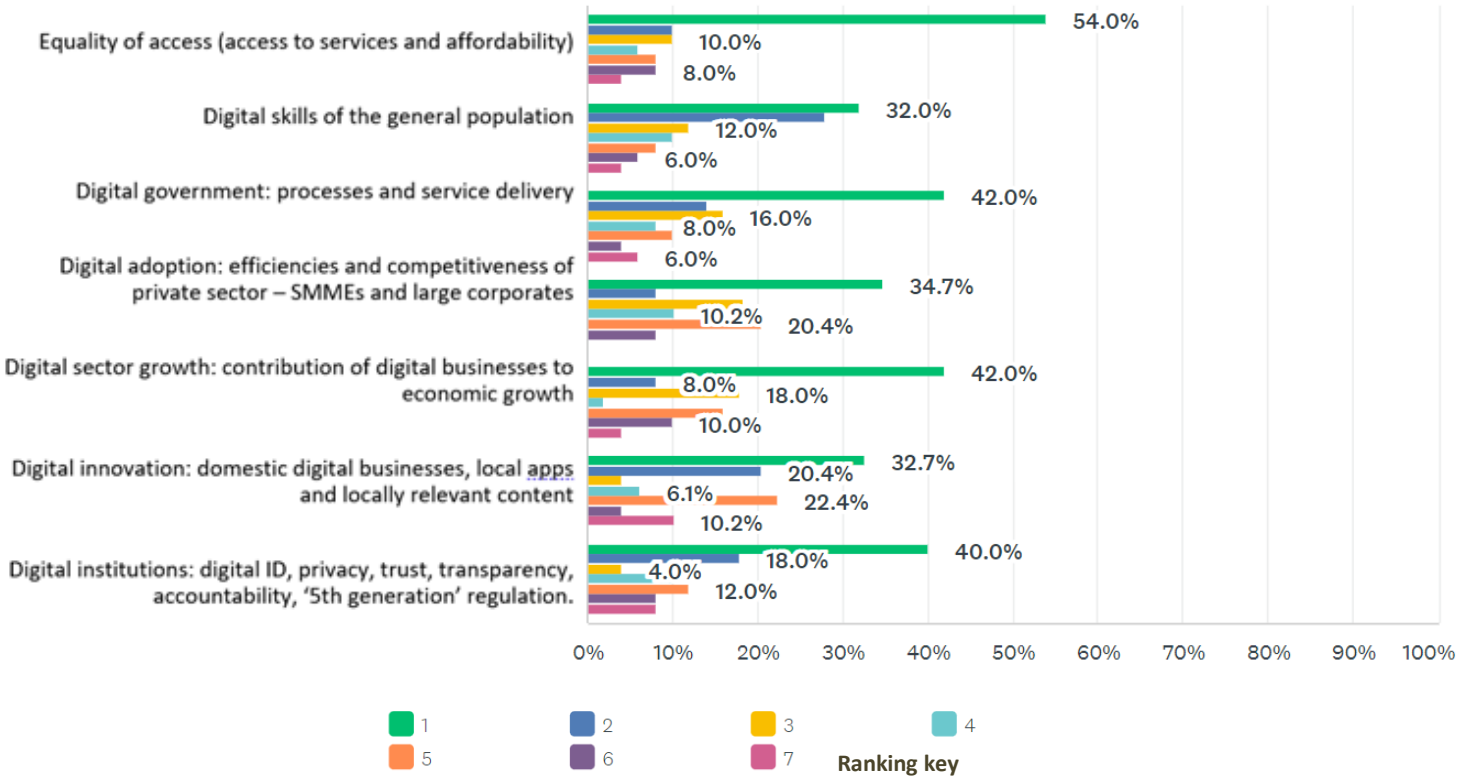


Exhibit 39 show responses to the same question as above but for the post-COVID period. 'Equality of access' remains the most highly rated priority and in almost equal second place are 'Digital government', 'Digital sector growth', and 'Digital institutions.

Exhibit 39: Consider the 7 digital policy goals. Please rank these from most important in your country to least important (1 to 7) for the post-COVID period.



4.2 Survey written responses

Survey Questions 13 and 14 invited respondents to offer comments on two questions on addition policy goals not identified and observations on important positive and negative changes that COVID-19 has 'brought in the digital arena'. The comments below are provided with minimal editing.

Are there other digital policy goals not identified in this list that you believe are important? What are they?

The following responses were received:

- I think the digital policy goal from a human rights and ethics perspective each country.
- awareness raising on cyber security
- Digital infrastructure
- Developing digital finance services to facilitate digital trade and e-commerce Strengthening the digital infrastructure with secure and resilience Increasing the community awareness on the benefit of digital economy and society, in particular for rural areas and remoted areas

- Yes. Digital policy goal not identified in this list that I believe is important is as follows: Digital transformation in healthcare Some hospitals are adopting digital technologies to transform health care delivery and offering telehealth services that make it easier for patients living in rural areas to get treatment, especially during COVID-19. Thailand has established the National 5G Committee to encourage the use of 5G in vertical industries, especially healthcare industry. It has approved the launch of Siriraj 5G Smart Hospital Project. This project is to help transform Siriraj Hospital into a smart hospital using digital technologies based on 5G, Cloud and AI. The project is also an exemplar of digital transformation in healthcare that can inspire other hospitals to adopt digital technologies to provide their services.
- Digital standards and AI Governance
- Government Policy on Service provider and Business provider toward using the digital friendly for the consumer.
- All of these policies are important. In my point of view, the most important policy is Digital Sector Growth, Digital Institutions, Digital Adoption and Digital Skills of the general populations.
- Digital policy in education
- There is still digital divide need to be addressed.

Either broadly speaking or in terms of some specific examples, what are the most important positive and negative changes has COVID brought in the digital arena. (eg, shift to video meetings facilitated by legal changes, online recharge, online banking and financial inclusion, changers in consumer behaviour etc)?

- Digital inclusion
- Regarding positive changes, the pandemic has led to a tremendous surge in e-commerce, mobile payment, and online learning. However, the negative impact of Covid is a digital disruption to those citizens that are digitally challenged.
- The fulfillment of internet network and application access 100% fulfillment of network infrastructure the easiness of getting digital services (health, education, e-commerce, etc.)
- I think of the positive changes COVID-19 has brought to the digital arena because many people prefer online meetings, and online shopping because they are easy to access and quick.
- I think most people familiar new normal situation such as online meeting, banking and shopping because easy to access and reduce times to traveling.
- Shift to video meetings (positive). Online harms (negative).
- Life events in physical society has transferred in the digital society due to covid 19, this is very important positive point, making our life change so much.
- Changers in consumer behavior
- Improving service, Entertainment sector, education
- Online banking consumer behaviour changing online Working/meeting increasing e-commerce growth
- The most important positive changes that COVID-19 brought in the digital arena are as follows: - A shift from offline to online meeting - A switch from offline to online purchase/banking - A transition of business strategy from offline to online e-commerce - Increasing development and implementation of e-government

services. The changes have led to the rise of the digital economy and society. In addition, the increasing number of cybercrimes is one of the negative changes that COVID-19 brought.

- 1. The shift to video meetings online to reduce movement and meet up with people helps to curb the spread of covid-19. This also save on the cost of travelling and logistics. 2. More cashless services is being used or offered in businesses for consumer, even in the smaller towns. 3. More online purchases as some businesses have move to online selling, and have close off physical business. More delivery services is being done, some being taken up as part time job to help meet the needs among the consumers. 4. The needs of online learning / videos for primary school kids (between 7-12) as according to education syllabus as resources are slightly lesser as compared to other age groups.
- Online recharge, Online banking and Financial inclusion
- The COVID-19 pandemic has caused emotional suffering from the loss of lives and create digital divide (in access, use, and quality of use among rich and poor, as well as for city and urban people and older people). Although the pandemic situation has shown many negativities, on the other hand, it also has several positive impacts on reorganizing society, politics, and the economy as a whole. The rapid digital transformation growth has led to many discoveries and innovations in all affected individual, private and public sectors in national, regional, and global contexts. Most of these would be medical, environmental, industry, and socio-cultural related. According to our observation, below are the three main positive changes in the digital arena. 1. Individual – easy access in daily use of mobile banking in e-transactions, digital ID, digital driver's license, etc. 2. Business Sectors [start-ups or B2B companies] – increasing revenue growth and adopting digitization initiatives. 3. Public Sectors/Government Agency – realizing how important of digital transformation, for instance, Thailand has announced e-Meeting and e-Procurement regulation to support both business and public sectors during COVID-19. Therefore, Thailand is facing a great challenges in collecting and managing data utilization to create policy and implement digital law enforcement to prevent digital threats and protect consumer rights.
- The business/consumer has accept digital online as a new concept in economy. As shifting to new digital economy need the continuous learning process to the consumer
- Speed catalyst for digital transformation.
- Positive : fast, efficient, easier to excess and convenient Negative : some services impose higher charge than normal, safety or security of data, expose to scammers for monitoring purposes
- Positive (savings in time, cost & resources): 1. Video meetings 2. Video learning & education 3. Online shopping Negative: 1. Exit of businesses not ready with digital changes 2. Lacking the necessary physical experience on certain businesses and decision makings
- Digital banking has now become the agenda of Financial Institutions
- Pandemic has accelerated digitalisation and emphasised the need to the population on being digital literate.
- Shift of mindset in adoption of digital solution to ease data management
- Positive changes - the adoption of mobile health app, as a requirement for all public. More and more innovative online services and delivery. Accessibility of

online devices for students. Negative changes - sustainability of digital solution post-covid, where consumer behavior transitioning back to being non-digital.

- Shift to video meetings facilitated by policies online recharge online banking and financial inclusion changers in consumer behaviour online learning online consultation
- The vast improvement in digital technology and the adoption of the cybersecurity requirement and awareness
- Positive: digital adoption across business sector and digital skill has been greatly improve during pandemic user behaviour and consumer behavior has changes. negative: economic impact due to covid and it take awhile to recover,
- Positive impacts are the shift to video meetings that is more productive and time efficient, as well as the hike of e-commerce
- Digital skills has been developed both in public organizations, private business and society community
- Online has growth.

5 COVID-19 POLICY PRIORITIES FOR ASEAN

5.1 The post-COVID world and ASEAN Economic Development Opportunities

There are two potential risks associated with thinking about economic and social development from the perspective the 'post-COVID' era. The first is that it is far from clear that COVID is, indeed, in the past. China, for example, in mid- to late-2022, is still very much in the throes of dealing with its own pandemic phase. Further, it is not yet clear that new mutations of the virus might not plunge the world back into a series of lockdowns and disruptions. Even without return of emergency pandemic conditions, the world is much more alert to pandemic threats in general. Even if new pandemic threats do not appear in the near future, a range of precautions associated with potential pandemics may inhibit activities such as tourism, travel and trade.

The second reason that a focus on the 'post-COVID' perspective may be misleading is that viewing the current global economic landscape through a 'COVID lens' may distract planners and policymakers from other significant, perhaps more important, dynamics that are currently at play.

Identifying big drivers of economic change is important but difficult. There are two reasons why. One is that 'we are always looking in the rear-view mirror'. This statement refers to the fact that data is always about the past. At any point in time, economic analysists try to identify the current value and future trajectory of many variables on the basis of the most recent data but this always involves old data and inescapable speculation. In this sense, all efforts to understand current economic dynamics and opportunities are exercises in uncertain forecasting.

The second challenge is that, even if very recent data is available and high levels of analytical expertise are brought to bear, it is still very difficult to identify critical turning points. Classic cases are turning points in stock markets or in real estate markets. Author, Michael Lewis, in his book *The Big Short: Inside the Doomsday Machine* described the very few people who were able to 'think outside the box' about the US housing market in the period leading up to the 2007-08 Global Financial Crisis. Although the returns to picking the turning point of these markets were potentially enormous, almost no one was able to achieve this successfully.

The context of ASEAN nations in 2022 there are several 'big picture' trends that are of critical relevance to economic development strategy and policy. These tends may be at critical turning points (or near them) at this time and these tends should be incorporated into current economic development policy thinking. These trends are interrelated to such an extent that describing them as distinct is somewhat misleading, but nonetheless they can be identified as the following:

- **Digital development** will continue to play a significant and growing role in economic development (IR 4.0, AI, IoT etc). This trend is locked in with many new and powerful technological innovation currently maturing.
- **Digital systems and skills** will play an increasing role in global trade enablement (supply chains, logistics etc) in a period where these trade patterns are likely to be changing quickly.

- **The post-COVID search for new sources of economic growth** where existing industry structures are changing quickly and unpredictably and new sources of economic growth are needed to replace faltering old ones.
- **Decoupling of trade and economic inter-dependence** of democratic nations from autocratic ones and geo-strategic tensions due to influences such are the Russian-Ukrainian War and China's increasing regional assertiveness.
- **De-globalisation** is a current theme which, to some extent reflects the specific focus on economic decoupling from autocratic nations but is a tend not limited to this influence. It also reflects a response to the general disruption of supply chains caused by COVID plus the realisation that critical products, particularly a range of pharmaceuticals, should not entirely be sourced from overseas. This has led to an emphasis on developing to 'on-shoring' and 'sovereign capability' in a set of critical industries including semi-conductors and pharmaceuticals. Where various countries (primarily the USA and EU) settle in the trade-off between self-reliance and participating in international trade is impossible to predict. Countries will continue to trade, however, and this means new opportunities for ASEAN nations. The significant effort being dedicated to the formation of various trade agreements is evidence of this opportunity with the Regional Comprehensive Economic Partnership (RCEP) being of obvious significance to ASEAN;
- **Climate change and the associated policy responses**, is another global driver of economic change, is both of which will likely drive significant changes in industrial structure. The influence of climate change policy, coupled with the current global disruption of oil and gas markets (due, in part, to the Russian Ukrainian war), will create changes in energy prices which will likely continue into at least into the medium-term.
- **Demographic dynamics:** ASEAN AMS have widely different demographic structures and these strongly influence labour force dynamics and many other important economic variables.

Some appreciation of the scale of economic opportunity for AMS and the highly dynamic nature of trade activity can be derived from Exhibit 40. The US 'big three' trade partners – Canada, Mexico and China – are provided for comparison, as is India.

Exhibit 40: US Exports and Imports, Year-to-date (July 2022) US$ million and percentage change ASEAN and selected other countries

Country	US Exports 2022	% change	US Imports 2022	% change
Canada	206,006	17.8	260,676	31.4
Mexico	187,953	19.4	261,871	19.9
China	83,931	0.8	318,406	18.5
India	27,304	23.8	51,716	30.4
Singapore	26,291	29.9	18,367	6.9
Malaysia	10,480	20.9	31,916	-1.6
Thailand	9,390	27.0	33,529	26.5
Viet Nam	6,912	4.0	74,551	33.0
Indonesia	5,902	36.0	20,209	41.2
Philippines	5,237	7.7	9454	25.2
Cambodia	306	30.0	7,078	64.7
Myanmar	142	-43.6	85	9.8
Lao PDR	30	63.3	109	23.7

Source: US International Trade Administration https://www.trade.gov/data-visualization/us-goods-trade-global-partners

Although trade levels in any given year can be somewhat volatile, and although some of the absolute levels of trade are relatively small compared with the US's big trading partners, some of the growth rates in exports to the US from AMS are particularly impressive, for example: Cambodia 64.7%, Indonesia 41.2%, Vietnam 33%, Thailand 26.5% and Lao PDR 23.7%. Growth rates in this range will quickly result in highly substantial levels of trade which represent a significant and sustainable avenue for economic development.

Of particular relevance to consideration of trade opportunities is RCEP. RCEP is a free trade agreement (FTA) between ASEAN – and its AMS and Australia, China, Japan, New Zealand and Republic of Korea. RCEP came into force on 1 January 2022[56] and encompasses a market of 2.2 billion people, or almost 30% of the world's population, with a combined GDP of US$ 26.2 trillion or about 30% of global GDP. This grouping also accounts for nearly 28% of global trade (based on 2019 figures) making it the world's largest free trade arrangement. RCEP is yet another factor that points to the criticality of the current moment in terms of opportunities for trade-led economic growth.

In general, the demographic structure of many ASEAN nations creates economic opportunities. Exhibit 41 and Exhibit 42 show fertility rates and demographic structure for ASEAN and selected other countries. Many AMS still have fertility rates above replacement levels (ie above 2.1). Even at fertility rates slightly below replacement, many countries have a demographic structure that means there workforces will continue to expand for some time. It should be noted that China's fertility rate is already well below replacement and some demographers suggest that it may be as low as 1.15 currently[57]. This means that China's workforce is probably currently shrinking, and will continue to do so at an accelerating rate, which will open up further opportunities for ASEAN economies.

Exhibit 41: Fertility Rates: ASEAN and selected other countries

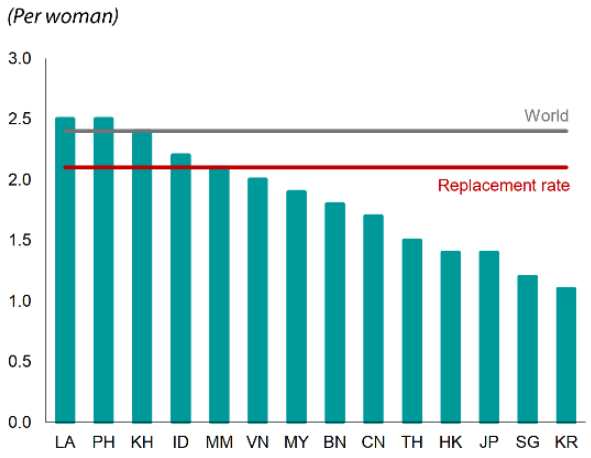
Country	Fertility rate 2022 United Nations Births per woman
WORLD	2.4
REPLACEMENT	2.1
China	1.7
India	2.1
Lao PDR	2.5
Philippines	2.4
Cambodia	2.4
Indonesia	2.2
Myanmar	2.1
Viet Nam	2.0
Malaysia	1.9
Thailand	1.5
Singapore	1.2

56 RCEP entered into force on 1 January 2022, for ten countries, Australia, New Zealand, Brunei Darussalam, Cambodia, China, Japan, Laos, Singapore, Thailand and Viet Nam. While it RCEP entered into force for the Republic of Korea on 1 February 2022 and for Malaysia on 18 March 2022.

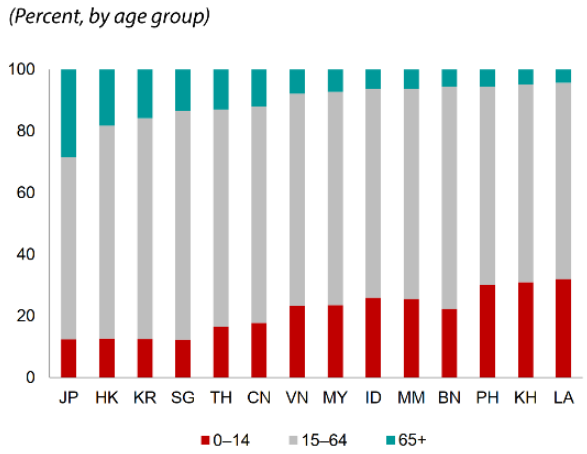
57 See, for example, https://news.cgtn.com/news/2022-01-19/What-s-behind-China-s-population-entering-the-zero-growth-zone--16WsLx7M89y/index.html

Source: Fertility rate 2022 United Nations Population Fund https://en.wikipedia.org/wiki/List_of_sovereign_states_and_dependencies_by_total_fertility_rate

Exhibit 42: Fertility Rates and Demographic Structure: ASEAN+3 and selected other countries



Source: United Nations Population Fund.
Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = the Philippines; SG = Singapore; TH = Thailand; and VN = Vietnam.



Sources: World Bank, World Development Indicators; and AMRO staff calculations.
Note: BN = Brunei; CN = China; HK = Hong Kong; ID = Indonesia; JP = Japan; KH = Cambodia; KR = Korea; LA = Lao PDR; MM = Myanmar; MY = Malaysia; PH = the Philippines; SG = Singapore; TH = Thailand; and VN = Vietnam.

Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

As nations develop economically, their fertility rates tend to fall. Countries with relatively young populations have the potential to benefit from a 'demographic bonus'. The demographic bonus arises because as large numbers of young people reach working age the national workforce expands and average productivity per person increases. This enables the country to not only grow its GDP but also critically its GDP per capita. The success with which a country exploits its demographic bonus will have a very large impact on its capacity to grow and ultimately, to avoid what is called 'middle income trap'. Once a country has moved through its period of demographic bonus, if it has not reached a high level of GDP per capita, its prospects for doing so in the future are significantly diminished. Given that ASEAN nations have passed or are approaching the replacement fertility rates, there is a strong element of urgency concerning the formation of ambitious development policy at this point in time.

Taken together, this set of trends represents enormous economic opportunity for ASEAN. The scope of this report is digital policy priorities but fully realising current economic opportunities requires policy coordination on a much greater scale than just digital policy.

Nonetheless, digital policy has a critical role to play in harnessing these economic opportunities. A high degree of digital development under pin the efficiency of the private sector and the quality and cost of government services. Digital development will impact the growth of local tech sectors across ASEAN. Foreign capital inflows and integration into global supply chains will depend on high levels of digital development. And of course, such young populations are 'born digital' being familiar with smartphones, other devices and connectivity from an early age.

5.2 Post-COVID Digital Policy Priorities

Given the largely negative economic impacts of COVID-19 and the shifting landscape of economic opportunity in the post-COVID world, what should be ASEAN's digital policy drivers and priorities in the decades ahead? In considering this question, it is useful to review the common digital policy drivers derived from the AMS digital plans:

1. Equality of access: includes infrastructure/coverage, service quality
2. Digital skills (creating 'digital citizens')
3. Improving accessibility, quality and cost effectiveness of government services via digital processes and delivery
4. Digital adoption by business as a growth driver via greater innovation, productivity and competitiveness
5. The digital economy sector itself as national growth driver
6. Local digital entrepreneurialism and innovation, locally produced services and content
7. Digital institutions: digital ID, privacy, trust, transparency, accountability, facilitating 'fifth generation' regulation, best practice communications legislation.

Considering these digital policy priorities through the lens of current economic opportunities and trends and responses from digital policy stakeholders to the survey, point to the following set of contemporary digital policy objectives:

1. Develop new digitally driven sources of efficiency, competitiveness, and economic growth and development

In one sense the importance of economic growth and development remains a high priority in the post-COVID period just as it was pre-Covid. What is different is that industry structures have changed and are in a state of flux, international trade patterns are shifting and the general level of uncertainty has increased. Digital development policies can form part of a more extensive set of growth policies. Importantly, any approach to economic development must necessarily include key elements of 'digital enablement'. These elements include:

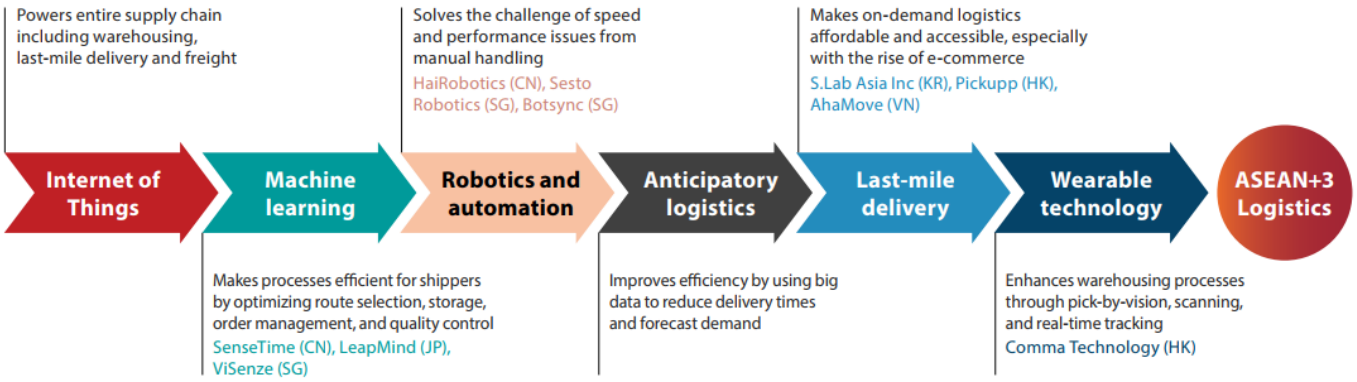
- **Continued development and deepening of communications networks and services** by encouraging and facilitating infrastructure investment and by managing and allocating spectrum on an efficient and sustainable basis. This will drive the economic development benefits arising from better communication systems. This requires not only better access networks in rural areas and cities, but also fit-for-purpose backhaul and international connectivity via submarine cables and cross-border land links.
- **Encouraging the growth of the local tech sector** supported by domestic and foreign investment driving the tech sector to become a significant contributor to national economic growth. Digital entrepreneurism has enormous potential to create value in ASEAN economies and is already doing so with GRAB, Sea Limited, Tokopedia, Bukalapak and others[58]. The top four most valuable publicly traded companies in the USA are tech companies (Apple, Microsoft, Alphabet and Amazon). It is important to

[58] See, for example, https://finfan.vn/News/here-s-the-full-list-of-southeast-asia-s-23-unicorns-2461 or https://ycpsolidiance.com/article/unicorn-companies-indonesia-2022

recognize that, while these international tech giants will likely dominate their niches in the medium and even long-term, there is nonetheless enormous scope for ASEAN nations to develop local tech companies based on the distinctive market opportunities in the region. This is particularly so given the large populations of several ASEAN countries and their relatively rapid economic development.

- **Encouraging adoption of digital processes and delivery** within all tiers of business from large corporates to SMEs. This improves productivity and competitiveness, increases market reach and facilitates remote working when necessary. These benefits are the drivers of a range of technology development areas characterised by Industrial Revolution 4.0, AI, machine learning, big data, Internet of things etc.
- **Accelerate adoption of digital processes and digital service delivery by Governments** with the objective of improving efficiency, and service reach and quality. These goals are dependent upon the goal of digital economic and social inclusion: digital government services cannot be fully realized if connectivity is unavailable or unaffordable.
- **Developing 'entry level' digital skills to build scale and viability of digital services.** Higher levels of digital inclusion increase the viability of both private and government digital services. This encourages governments to adopt digital processes and increases the success of digital entrepreneurs.
- **Develop digital systems and skills for supply chain participation.** Integration of domestic businesses within global supply chains is impossible without a high level of integration of digital information and digital process systems. ASEAN governments should welcome business integration with businesses in export markets and should encourage investment in digital systems and digital skills development. The recent passing into force of RCEP create obvious incentive and momentum to accelerate this process.

Exhibit 43: Logistics and Technology in ASEAN



Source: AMRO staff, adapted from StartUs Insights.
Note: CN = China; HK = Hong Kong; JP = Japan; KR = Korea; SG = Singapore; and VN = Vietnam.

Source: ASEAN+3 REGIONAL ECONOMIC OUTLOOK 2022 ASEAN+3, Growth Strategy in the Pandemic's Wake, ASEAN+3 Macroeconomic Research Office (AMRO), February 2022.

2. Advance economic and social inclusion of more remote and under-serviced ASEAN populations
   - **Digital deepening: improve infrastructure, spectrum allocation and coverage**. In rural and remote areas access to connectivity should be to at

least 4G, and preferably 5G, services most likely in the sub-1 GHz spectrum band to enable wide coverage at the most efficient investment cost.[59] This contrasts with ASEAN urban areas where means very high speed and high capacity bandwidth is required using spectrum at much higher frequencies, including 2.6 GHz and 3.5 GHz bands.

- **Improving economic and social inclusion will promote economic growth** and development via a larger and better informed workforce. Economic development will typically encounter labour supply roadblocks unless all citizens have access to information about market and employment opportunities. Availability of market information is critical to increasing participation in markets in rural and remote areas.
- **Ensure services and access devices are affordable.** Beyond making services and connectivity accessible, governments must also ensure that access devices and services are affordable for low income groups. This can be achieved through a range of policies that include facilitating investment, encouraging competition, encouraging access to infrastructure through smart and targeted infrastructure sharing rules, innovative funding models for uneconomic/high cost areas.
- **Encourage adoption of core digital applications such as digital banking and payments, and online purchasing.** The adoption of basic digital services such as banking and payments which have an obvious value proposition is typically the gateway to adoption of more sophisticated services. Government initiatives and policy innovations can be instrumental in creating significant uptake of such services.[60] Has highlighted by HSBC "Southeast Asia is experiencing a wave of digitisation. The region added 400 million new Internet users in the first year of the global pandemic, and 70% of the ASEAN population is now online. The Covid-19 crisis also triggered a broad expansion of e-commerce and demand for transfers and contactless payments that hasn't faded even as the pandemic wanes."[61]
- **Government digital delivery of services and benefits** provides strong motivation for more widespread digital adoption and promote digital skills. Governments can package digital skills training with delivery of government services to accelerate general digital adoption.

3. Develop Digital Institutions:
   - **Developing digital institutions** creates trust and encourages widespread adoption of digital practices and services. Digital institutions encompass laws, policies, practices and systems that enable digital business and government processes to operate in a trusted and transparent manner.
   - **Protection of private personal information** is a central requirement and enabler for the development of digital institutions. For both business and governments management of personal information must be based on clearly defined principles and process, transparency and responsibility,

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59 Part of the challenge is that ASEAN has generally been very slow to secure the digital dividend in the 700 MHz band, given delays in transitioning from analogue to digital TV. Indonesia's switchover has been delayed until Q1/Q2 2023 and Cambodia is yet to commence. In the Philippines and Myanmar, while the 700 MHz band is available for IMT purposes, analogue TV is still used in the VHF spectrum. Unlike Europe and North America, no ASEAN market has secured the second digital divide in the 600 MHz. Only Viet Nam has timed it at 2029.

60 https://www2.deloitte.com/sg/en/pages/risk/articles/digital-banks-in-asia-pacific.html

61 https://www.business.hsbc.com.au/en-au/insights/innovation-and-transformation/open-for-business-southeast-asias-digital-payments-revolution

accountability. This requires strong cybersecurity laws and regulations, skillsets and systems.

- **Development of digital identity systems** that protect personal information by design from the ground up enormously enable a wide range of digital services. Significant steps have been taken in a number of AMS to offer digital identity to their citizens. Having a good digital identity is the key for all e-commerce actors to achieve an inclusive digital economy that benefits all people.[62] Such systems should also be consistent with the ASEAN Digital Integration Framework[63]
- **'Fifth generation' collaborative regulation:** Fifth generation collaborative regulation is a concept promoted by the International Telecommunication Union (ITU). It emphasises the changing role of sector regulation from early 'telecoms regulation' to the broader more interconnected role for regulation. This has been driven by technological convergence wherein "ICTs have moved far beyond the realm of simple 'communications' to become the crucial foundation for every economic sector and a sine qua non of business performance and national growth."[64]

4. Work with other nations and international public health organizations to develop digital tools for pandemic preparedness
   - **Pandemic preparedness requires regional and global cooperation.** In April 2020, the Special ASEAN Summit on COVID-19 endorsed the establishment of the COVID-19 Response Fund aimed at financing the purchase of necessary medical equipment. But higher levels of cooperation and preparedness are necessary.[65]
   - **High levels of people movement within ASEAN requires deep cooperation for pandemic management.** On 14 May 2022 new protocols relating to public health emergencies, preparedness, and response, were developed "Strengthening Regional Initiatives in ASEAN on COVID-19 Response and other Public Health Emergencies" project.
   - **Digital technologies will be indispensable tools in future pandemic responses.** For example, the ASEAN Protocol for Cross-Border Contact Tracing and Rapid Outbreak Investigation, and the ASEAN Health Protocol for Pandemic Preventive Measures in Public Places aim to provide an effective communication mechanism among relevant border authorities in AMS with quality information to prevent and mitigate transmission of COVID-19 and other similar infectious diseases in the future.

These digital policy responses to economic drivers of change are summarised and illustrated in Exhibit 44. In the next section, differences between regional, and digital policy priorities and the priorities of the digital groupings discussed in Section 2 are considered in more detail.

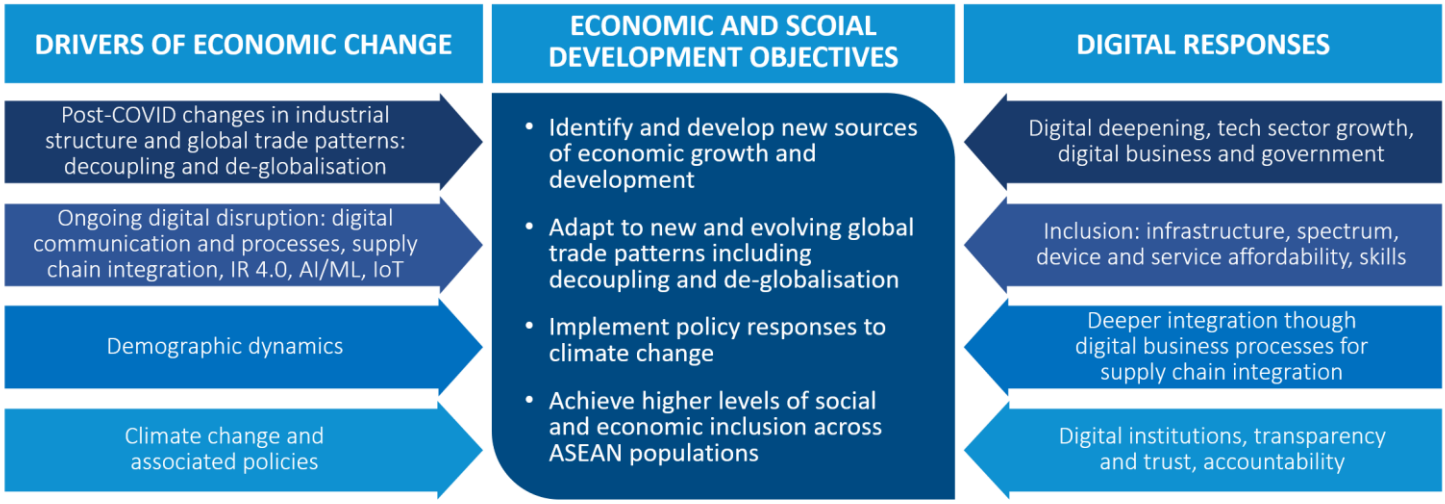
62 https://gjia.georgetown.edu/2022/07/20/e-commerce-digital-identity-and-inclusive-digital-economy-in-southeast-asia/

63 https://asean.org/wp-content/uploads/2020/12/Adopted-ASEAN-Digital-Integration-Framework.pdf

64 ITU, https://www.itu.int/hub/2020/05/why-we-need-5th-generation-ict-regulation/

65 COVID-19 AND ASEAN COOPERATION: THE STATE OF PLAY AND WAYS FORWARD, Wednesday, October 7, 2020, Kaewkamol Karen Pitakdumrongkit, AsiaGlobal Online Journal, https://www.asiaglobalonline.hku.hk/covid-19-and-asean-cooperation-state-play-and-ways-forward

Exhibit 44: Drivers of economic change and digital policy responses



Source: Windsor Place Consulting Pty Ltd

5.3 National and Regional Digital Policy Priorities

The difference between AMS in terms of their natural grouping in terms of digital development, that were identified in Section 2 mean that each AMS or group of AMS, will have different digital priorities although there are common priorities for all ASEAN nations. In this section the priorities common to ASEAN and the priorities of the three groupings are discussed.

5.3.1 Common Digital Goals

There are some digital policy goals that are common for all ASEAN jurisdictions.

5.3.1.1 The Primacy of Spectrum in ASEAN's Digital Future

Intelligent and efficient use of mobile (IMT) spectrum is central to advancing digital development and for maximizing the contribution of digital development to economic development. It is not unreasonable to say that there is almost no foreseeable scenario in which ASEAN could allocate too much spectrum to IMT use.

Except for backhaul and national/international communications links, wireless communications access is the future especially in ASEAN which does not have deep legacy landline infrastructure and in many cases requires service provisioning over an archipelago. Therefore spectrum has never been a more precious national resource.

Governments need to be very well informed and make pragmatic clear-eyed decisions about the inevitable trade-offs that must be made when making spectrum allocations. In particular, governments must avoid 'false economies' which will ultimately work against future economic growth and development. It is tempting for governments to view unallocated spectrum primarily as a source of government revenues. In the majority of cases, this perspective will be counter-productive. If governments attempt to maximise revenue by charging high prices for spectrum, they are likely to impose unsustainable costs on communications carriers who will therefore not have the resources to undertake sufficient investment in infrastructure and new technologies. In addition, operators that are burdened with excessive cost structures are more likely to be driven towards consolidation with other operators thereby diminishing overall sector competition which almost inevitably will result in

poorer outcomes for consumers. In this context, reduced sector competition and/or the mandating of monopolies in fixed or mobile service provision should be avoided.

The consequences of inadequate, inefficient or unsustainable IMT spectrum allocation will be lost opportunities for economic development which will be of permanent consequence for ASEAN economies. Communications policy generally, and spectrum policy more specifically, need to be resolutely focused on communications industry competition and delivering innovation and quality of services for end users. This is how the contribution of communications to economic growth can be maximized. The upcoming debate at the WRC-23 on the future of the 6 GHz band is a case in point. Given the challenge of refarming C-Band spectrum for IMT given extensive use of the band by satellite in ASEAN, securing at least the upper 6 GHz for IMT/5G purposes in critical to the region's spectrum future and economic growth post 2025. Likewise, retaining the 28 GHz for satellite services including for use by earth stations in motion (ESIMs) is also in the interest of ASEAN and AMS.

5.3.1.2 The Importance and Increasing Achievability of Inclusion

It is increasingly possible to eliminate or at least greatly reduce the digital divide. Technologies such as 5G in the sub-1 GHz range will greatly enable access to high quality communications and data services at moderate infrastructure capital costs in rural and remote regions.

At the same time enabling technologies are arriving, the returns to ubiquitous access are rising. Once all or near all citizens have access to communications and data services it becomes possible to deliver a range of services on a digital basis without disadvantaging a particular social group. This leads to economies of scale and costs savings in service delivery. Examples in the travel sector include new electronic customs declarations in Indonesia,[66] Singapore's new Arrival Card with health declaration[67] and Viet Nam's eVisa portal. [68]

It is emphasized that access does not just mean access to connectivity. It also requires affordable access devices and digital skills. Governments need to plan holistically to ensure effective access. The need to develop digital skills varies significantly across ASEAN. Digital skill levels remain very low in Philippines, Thailand, and Viet Nam comparing to the need but even in Singapore, which has 100 percent 4G network coverage, 'Individuals with basic skills' is at 53% (see Exhibit 5). Initially at least, skills development needs to focus on developing the digital skills necessary to access digitally delivered government services and digital commercial offerings. The closer any country can get to universal digital skills sufficient access services, the sooner scales achieved in this kind of service delivery, the greater the investment in such services that can be justified, and the sooner quality and efficiency benefits in service delivery can be realised.

In addition to the development of these skills for digital access, it is also critical to develop higher level skills in order to create a workforce that can facilitate a growing and increasingly sophisticated digital economy.

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66 https://bcngurahrai.beacukai.go.id/ecd/?h=beranda

67 https://www.ica.gov.sg/enter-transit-depart/entering-singapore/sg-arrival-card

68 https://evisa.xuatnhapcanh.gov.vn/trang-chu-ttdt

5.3.1.3 Building the tech sector and digital entrepreneurialism

It is possible for all ASEAN nations at any level of digital and economic development to increase the rate of growth of the domestic tech sectors and promote digital entrepreneurialism. In the United States, the growth of the tech sector has driven value creation there the past two decades. Obviously, the USA represents a globally unique combination of capital, exceptional universities, and a strong entrepreneurial spirit. Nonetheless, if policy settings are right and appropriate incentives are created, local entrepreneurs will identify digital opportunities that will create value and contribute to economic growth and development.

The 'Make in Viet Nam' campaign, officially launched in May 2019 before the pandemic, is an example of a proactive policy in this area (see Exhibit 29). The goal is to foster 100,000 tech firms and 10 unicorns (startups valued at over US$1 billion) by 2030. In Indonesia, KOMINFO's Digital Talent Scholarship has been training fresh grads and professionals since 2018 while their #1000StartupDigital program, for instance, connects startups to mentors, investors and game developers through a series of workshops, bootcamps, and networking sessions.[69] E-commerce platforms Lazada and Shopee have also provided financial aid and training to help small businesses move online during the pandemic.

An important element of the promotion of a pro-growth tech sector should be attracting foreign tech sector investment. Venture capital markets have become significantly more international over the past decade. VC capital from the USA in particular provides critical access to talent and markets which might otherwise be very difficult to reach.

5.3.2 Advanced Digital Development Nation Goals

In terms of networks the task of digitally advanced AMS is 'network deepening' which includes not only high-frequency 4G and 5G deployments supported by very high speed high-capacity backhaul but also cloud computing, high speed computing and other systems being located in the region.

5.3.3 Intermediate Digital Development Nation Goals

In the AMS that are at an intermediate level of digital development, networks need to be both deep and made more geographically extensive. These countries generally have high to very high levels of 4G coverage of the quality of this coverage, including moving to 5G where possible, needs to be improved further.

In cities and in suburban areas, capacity – preferable optical fibre - needs to be planned , deployed and operated for access and for wireless backhaul.

5.3.4 Emerging Digital Development Nation Goals

Cambodia and Lao PDR, and to some extent Myanmar, face multiple challenges in increasing their levels of digital development.

Lao PDR should continue to prioritise increasing the geographic coverage of its 4G/5G network. Both Lao PDR and Cambodia need to find ways to make handsets and services more affordable for their less advantaged groups who are mostly (but not exclusively) in remote and regional areas.

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69 https://govinsider.asia/transformation/exclusive-inside-indonesias-vision-for-an-inclusive-digital-recovery-johnny-plate-kominfo/

As noted above, the development of the skills necessary to access digital services is critical across ASEAN but, in particular, it is critical in the relatively less digitally developed AMS. Critical to that is making relevant and useful content available in local languages and scripts which can be widely understood. This is even more challenging for smaller ASEAN markets.

6 RECOMMENDATIONS

The following recommendations are aimed at maximising the capacity of AMS to respond with appropriate digital policies to the economic challenges and opportunities in the post-COVID period.

1. **Allocate more IMT spectrum intelligently and sustainably and as soon as possible**
   - Spectrum is the lifeblood of ASEAN digital development. As wireless technologies evolve and improve – 5G and beyond to 6G in 2030 – the economic returns to efficient, sustainable spectrum allocation rise.
   - The future of extending ASEAN connectivity is wireless. Making spectrum for access available and allocated, such as 5G in sub-1 GHz band, is a key priority for bringing all ASEAN citizens into the digital economy irrespective of their location and circumstance.
   - Providing spectrum on a sustainable basis means ensuring that prices are not so high that they financially disable the smaller operators in national marketplaces. Small and new operators typically provide the competitive pressures that drive innovation and better customer outcomes. Lower spectrum prices are an investment by national governments in industry competitiveness and dynamism.
   - As technology generations move from 3G and 4G to 5G and 6G (expected in 2030), larger contiguous spectrum blocks for each operator are needed to achieve effect spectrum utilization. This means renewed efforts from spectrum agencies to refarm and manage ever larger spectrum blocks for future allocations.
2. **Balance increasing spectrum allocations with encouraging infrastructure investment**
   - Deepen local access networks in high-value, high-density urban environments which characterize the situation in many AMS.
   - Extend geographic reach of access network in rural and regional area and aim for ubiquitous access and inclusion. Critical to that is to support infrastructure and spectrum sharing in rural and remote areas of ASEAN which are uneconomic to serve with multiple providers and/or are high cost
   - Facilitate the deployment of 5G networks that support Fixed Wireless Access (FWA) as a competition/complement to the region's under-developed fixed network infrastructure
   - Ensure that spectrum prices are not so high that they discourage infrastructure investment
   - Ensure that access networks are supported with appropriate backhaul and international connectivity
   - Build in headroom and resilience so that networks can cope with unexpected high levels of demand especially for disasters and more variable climatic conditions arising from climate change.
3. **Seek, promote and invest in investment for access**
   - Support access through spectrum availability and with infrastructure rollout requirements where possible

- Where these measures do not provide access, explorer direct subsidization and innovative local scale access solutions even if they are relatively low capacity (some access is much better than none).

4. **Drive regulatory innovation**
   - The quality of sector regulation drives industry competitiveness, innovation and customer service. Given the rapid technological and market development of the telecommunications sector, regulatory approaches need to be constantly updated and adapted. Fifth generation collaborative regulation is a concept promoted by the ITU. It emphasises the changing role of sector regulation from early 'telecoms regulation' to the broader more interconnected role for regulation. The fifth-generation regulatory framework provides a model for ASEAN regulators.
   - Telcoms sector disaggregation from vertically integrated incumbents to MNOs, service providers, transmission providers, towercos, and neutral hosts requires regulatory responses in order to maintain effectiveness.
   - Universal service innovation is required to accelerate digital inclusion and reduce the digital divide even where there such disaggregation is taking place.
5. **Develop digital institutions**
   - Confidence and trust in digital institutions is critical for universal adoption of government digital services. ASEAN governments are alert to the need for effective privacy laws and practices across ASEAN but government practices need to adopt high standards of transparency and accountability.
   - Ensure that there are well-regarded and secure digital ID platforms with interconnectivity across ASEAN
   - Cyber security is also a necessary focus in order to secure digital businesses and digital government services to deliver reliability and attract investment.
6. **Develop digital skills at all levels**
   - Develop 'entry level' digital skills to enable adoption of core digital services – digital banking and payments, online commerce and use of government digital services.
7. **Support growth of local tech sectors**
   - Local tech sector companies in ASEAN face significant opportunities and have already demonstrated that they can grow rapidly on the basis of serving domestic and/or regional markets notwithstanding the global dominance of US tech giants in their particular market niches. There are already more than one dozen ASEAN tech 'unicorns' - tech companies that have reached a valuation of over US$1 billion.

Windsor Place Consulting Pty Ltd (WPC) is internationally recognised as an outstanding provider of advice to the information industries. The firm, established in 2000, works extensively in telecommunications, media, and information technology, both in the development of commercial strategies for the private sector and the formulation of national policy and legislative settings for public sector clients. WPC's team members have a long association with these industries, having been actively involved through various stages of market liberalisation, from the introduction of competition in Australia in the 1990's to the drafting and implementation of modern convergence legislation in a range of countries especially in Asia, Africa and the Pacific.

WPC has undertaken projects in each and every ASEAN Member States over the past 20 years including engagements for Governments, regulators, licensed operators, investors and international organisations such as the International Telecommunications Union (ITU), the World Bank, Asia-Pacific Telecommunity (APT) on range of issues including legislation, spectrum, broadband policy, interconnection, tariff regulation and training.

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