Digital societies in Asia Pacific:
Progressing towards digital nations

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Preface

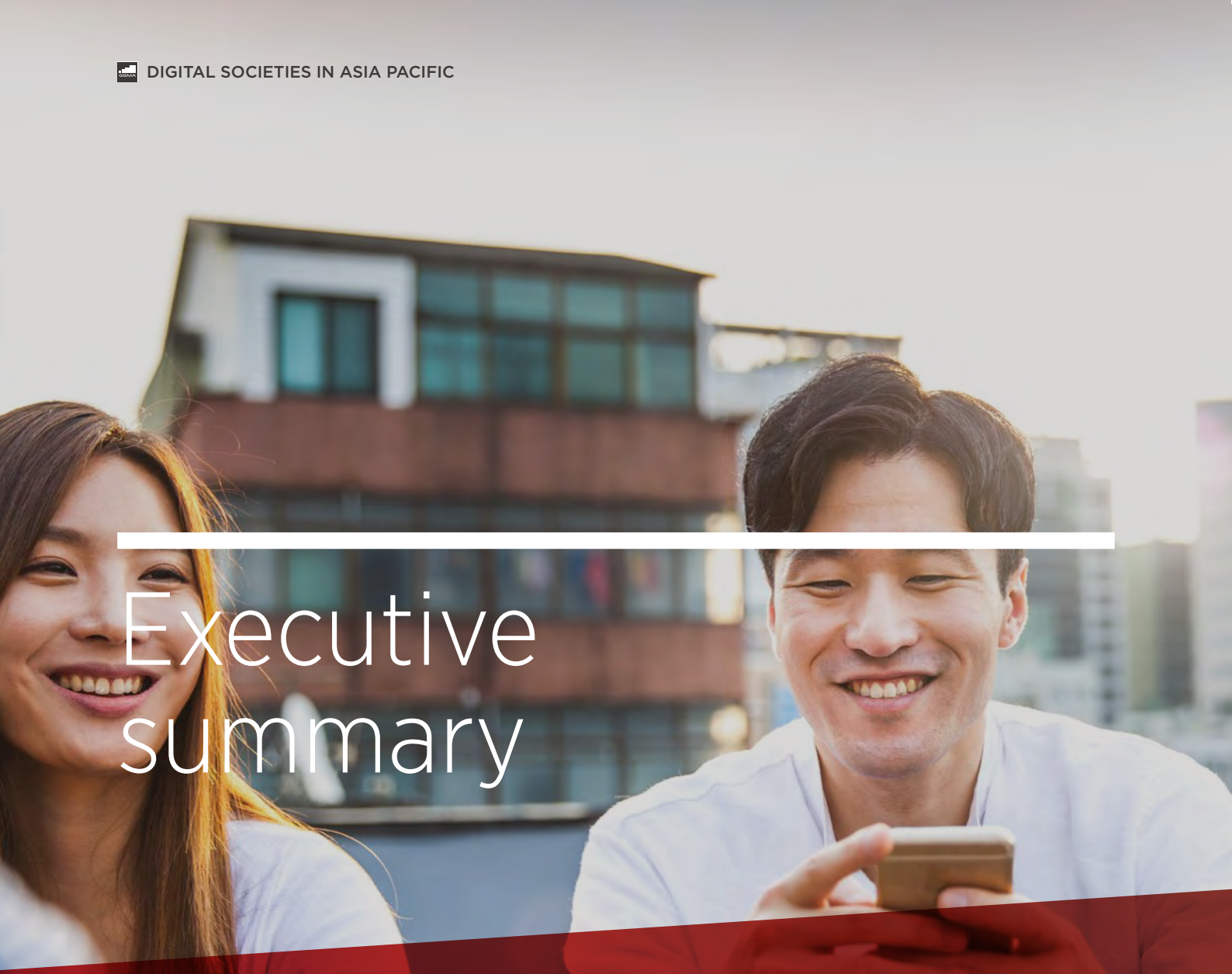
This report is the GSMA's seventh annual Digital Societies report for Asia Pacific.[1] The 2021 edition focussed on how countries in Asia Pacific were accelerating progress on their digital society ambitions through collaboration and a whole-of-government approach (WGA) to implementing digital transformation strategies. The report also chronicled the role connectivity played in the provision of essential services across Asia Pacific during the Covid-19 pandemic.

This year's edition focusses on the concept of 'digital nations', referring to the aspirations of governments across Asia Pacific to integrate digital technologies and services into every sector of the economy. This makes digitalisation the core element of nation building and a means to achieve sustainable and inclusive economic growth.

1 Throughout this report, Asia Pacific is defined as excluding Greater China.

Each edition of the report has evaluated how the target countries in Asia Pacific have progressed on their paths to fully fledged digital societies, measured against five key criteria in the GSMA Intelligence Digital Society Index: connectivity, digital identity, digital citizenship, digital lifestyle and digital commerce. Cambodia and the Philippines have been added to the index this year, bringing the number of focus countries to 13. These are Australia, Bangladesh, Cambodia, India, Indonesia, Japan, Malaysia, Pakistan, Philippines, Singapore, South Korea, Thailand and Vietnam.

Digital technologies and services will continue to play a key role in Asia Pacific, especially as governments look to build more resilient, inclusive and sustainable economies that can withstand future shocks. As focus shifts towards the digitalisation of economic sectors, including micro, small and medium-sized businesses, there is an even greater need for collaboration, underpinned by WGA principles, at local and international levels to secure the benefits and tackle the challenges.



Executive summary

This seventh edition of the GSMA Digital Societies in Asia Pacific report introduces the concept of a 'digital nation', which we see as complementary to the efforts and achievements of Asia Pacific countries on the path to becoming fully fledged digital societies. The term 'digital nation' describes the concerted efforts by governments in Asia Pacific to integrate digital technologies and services into every sector of the economy. This makes digitalisation the core element of nation building and a means to achieve sustainable and inclusive economic growth.

An emphasis on digitalisation is not new; many countries in Asia Pacific have been on this journey for more than a decade. However, the pandemic has served as a catalyst to accelerate progress and underscore the need for a whole-of-government approach (WGA)[2] to digitalisation initiatives, bringing together public and private sector stakeholders across the economy. The pandemic also exposed the gaps in the digital economy in many countries – particularly inequalities in access to and use of digital technologies. At the same time, governments are hard-pressed to accelerate post-pandemic recovery amid a challenging macro-economic environment and ongoing disruptions to global supply chains.

In this context, we have identified four main rationales for the renewed focus on digitalisation, as expressed in aspirations to become digital nations:

- **Resilience –** There is a strong case for building economic structures with greater resilience to shocks, such as that caused by the pandemic.
- **Resources –** Limited, sometimes diminishing, resources mean there is no better time to find ways to operate a productive but efficient economy.
- **Inclusion –** The divide in digital access and use, not just among individuals but also businesses, needs to be closed.
- **Sustainability –** Sustainability and decarbonisation are increasingly viewed as part of a resilient and efficient economy.

In this report, we also identify five key components that will support the realisation of digital nation aspirations:

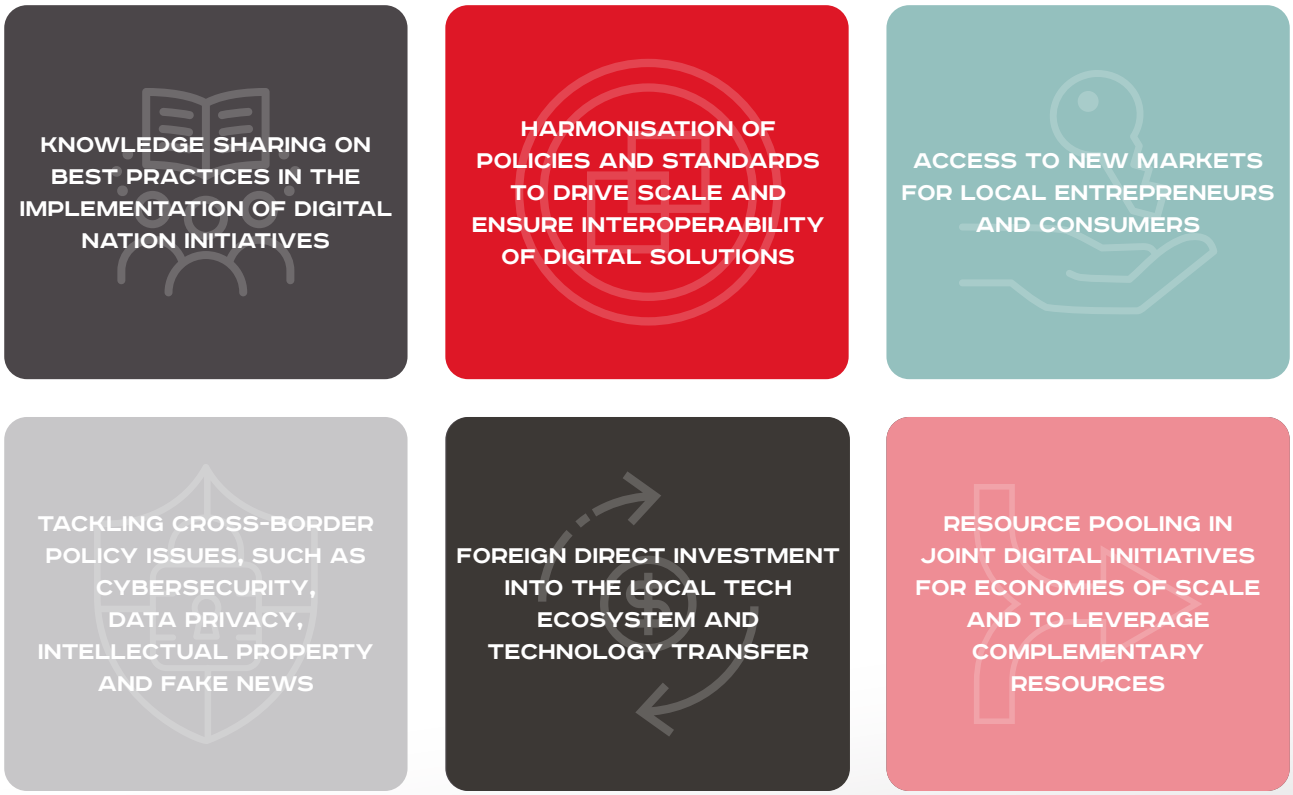
- **Infrastructure –** Digital infrastructure is the backbone of a digital nation, upon which digital services and applications are created, stored, distributed and consumed. The primary digital infrastructure in a digital nation is high-performance telecoms networks, in particular 5G, enabling a range of innovative digitalisation solutions for consumers and businesses.
- **Innovation –** Innovation underpins the creation of new digital products and services, and their application in the digital economy. For countries progressing towards becoming digital nations, the ability to integrate emerging technologies that can enable new solutions and use cases for the economy will be crucial.
- **Data governance –** As the digital economy expands and citizens become more active participants, the risk of misuse of technology increases. As a result, governments need to raise governance standards, with efforts to become more transparent, participatory and accountable.
- **Security –** The increase in digitalisation has led to the unintended consequence of expanding the surface of attacks, which creates more opportunities for cybercriminals. Advanced cybersecurity measures will help people engage in social and business interactions safely across geographies, and enable businesses to deliver value with lower operational costs and to operate in a fully digital environment.
- **People –** The realisation of digital nation ambitions relies heavily on the ability and willingness of people to use digital technologies. This often requires a change in culture and personal behaviour, as well as the right levels of digital literacy and skills to be able to navigate an evolving digital world.

With the rise of the platform economy making it easier for people and businesses to access international markets, digital cooperation at various international levels will be essential to secure the benefits and manage the disruptions on the journey to becoming digital nations. This report identifies a number of key benefits of digital cooperation in the context of efforts to progress towards digital nations (see Figure 1).

2 Advancing digital societies in Asia Pacific: a whole-of-government approach, GSMA, 2020

Figure 1

Key benefits of digital cooperation



Source: GSMA Intelligence

A digital nation cannot exist in isolation. One of the main incentives for increased digitalisation is the promise to help local consumers and businesses to access new markets and forge global linkages, which offer enormous economic opportunities. To unlock this potential, it is imperative governments take a collaborative approach to building the digital economy through bilateral, multilateral, regional and even global digital cooperation.

1 Digitalisation powering post-pandemic recovery in Asia Pacific

Digital technologies and services have been a lifeline during the Covid-19 pandemic and are playing an even more crucial role in efforts to recover and build resilient economies that can withstand current and future shocks. Before the pandemic, countries in Asia were already making progress on their digitalisation journeys, but the realities of the last three years have provided further impetus to integrate digital technologies and services across society, and ultimately become fully fledged digital nations.

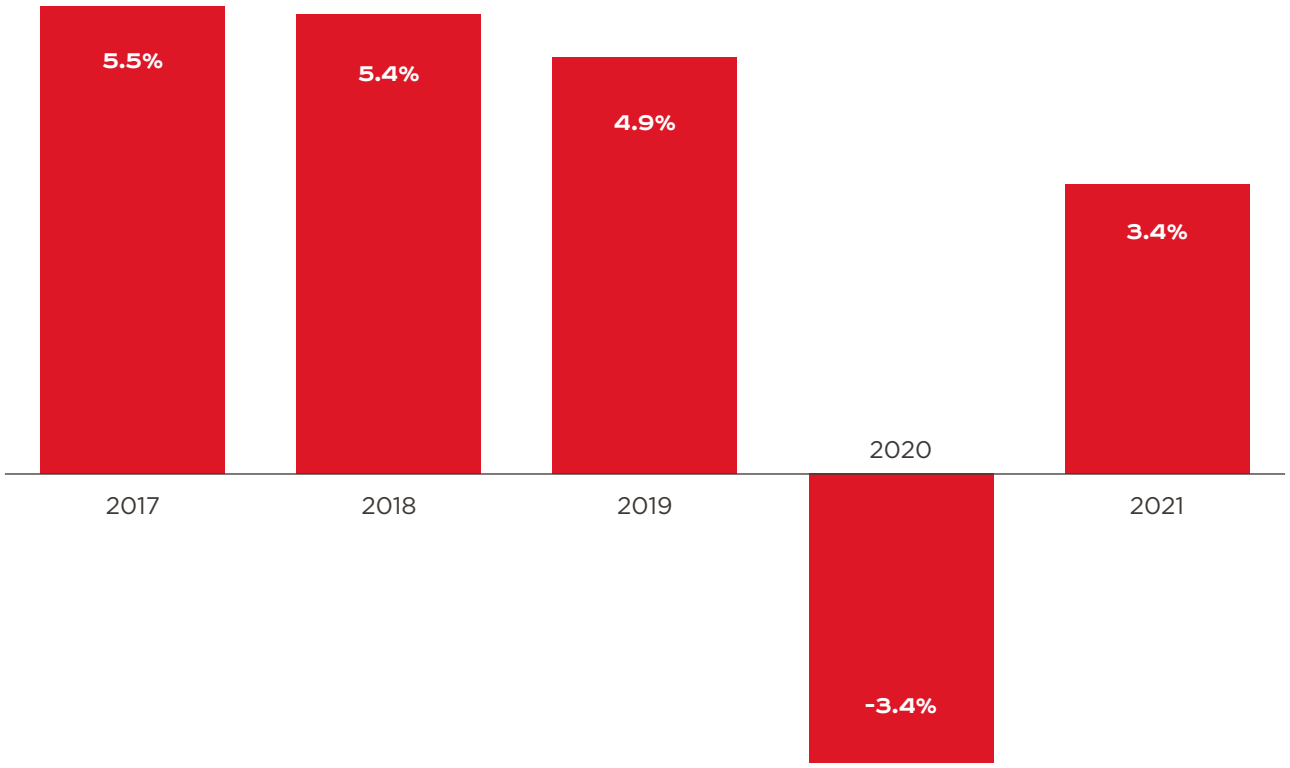
The contribution of digital technologies and services to the pandemic response cannot be overstated. They have been instrumental in supporting governments, businesses and citizens – for example, keeping people and firms connected in order to perform everyday activities, and assisting governments to track the spread of the disease while delivering life-saving information and other services to citizens. In India, the Aarogya Setu app – developed for Covid-19 contact tracing, self-assessment, vaccine booking and status checking – now has more than 215 million active users,[3] while Singapore's TraceTogether app achieved more than 90% adoption within the first year of its release.[4]

The pandemic has left considerable social and economic challenges in its wake, some of which could linger for years. In May 2022, the UN Economic and Social Commission for Asia and the Pacific (ESCAP) estimated the cumulative output loss since the start of the pandemic to be almost $2 trillion, with 85 million people in the region pushed back into extreme poverty.[5] Meanwhile, Asia Pacific is susceptible to the disruptions from the crisis in Ukraine, especially through higher energy and food prices, and weaker tourism and remittances.

Figure 2

As the pandemic recedes, focus shifts from response to recovery

GDP growth of ASEAN countries



Source: International Monetary Fund (IMF)

3 "Now, get health ID via Aarogya Setu", Times of India, February 2022
4 See www.tracetogether.gov.sg
5 The war in Ukraine: impacts, exposure and policy issues in Asia and the Pacific, UNESCAP, 2022

The emphasis on digitalisation is not new in Asia Pacific; many countries have been on this journey for more than a decade. However, the pandemic has served as a catalyst to accelerate progress and underscore the need for a WGA[6] to digitalisation initiatives, bringing together stakeholders from across the public and private sectors. This is evidenced by recent developments in the use of digital technologies and services to power social and economic recovery in the aftermath of the pandemic. Examples include the following:

- In Australia, the Queensland government is implementing its Big Plans for Small Business Strategy, with a focus on helping small businesses adapt to a changing world and pandemic-related shifts in consumer behaviour.[7]
- Indonesia is undertaking a comprehensive programme for the recovery of the tourism sector, which saw 409,000 job losses. The programme includes initiatives to extend 4G networks to 12,548 villages and the development of a digital platform for the Tourism Network Hub.[8]
- To support pandemic recovery, Thailand has set aside THB2.5 billion ($71 million) in the 2022 fiscal year to finance digital development projects across key sectors of the economy, including financial services, healthcare, public services and agriculture.[9]
- The government in Japan is advocating a 'new model of capitalism' to promote economic growth, with digitalisation at the core of the agenda.[10] This is built around three fundamental steps:[11] establishing agile governance, with flexible rules that can quickly adapt to rapidly changing technologies and economic circumstances; establishing one-stop digital services to replace mandatory paperwork or in-person reporting; and establishing a public–private sector partnership for digitalisation, allowing national and local governments to share digital IDs and information with the private sector in real-time.

Digital technologies and services can help provide new growth opportunities for businesses of all sizes across Asia Pacific, contributing significantly to the region's pandemic recovery. The increased focus on digitalisation will continue over the coming years as governments respond to the growing need to improve the wellbeing of citizens and help businesses seize new opportunities. A report by the Asian Development Bank (ADB) estimates that Asia Pacific could reap an economic dividend from digitalisation of more than $1.7 trillion per year, or more than $8.6 trillion over the five years to 2025.[12]

6 Advancing digital societies in Asia Pacific: a whole-of-government approach, GSMA, 2020
7 "New online resources for Queensland small businesses", Queensland Government, May 2022
8 "Jadi Agenda DEWG G20, Sekjen Kominfo: Revitalisasi Pariwisata Lewat Transformasi Digital", kominfo.go.id, June 2022
9 "DE Fund allots B2.5bn for digital development", Bangkok Post, February 2022
10 "Japan's new model of capitalism in an uncertain world", East Asia Forum, February 2022
11 "Japan's digital society rests on Kishida's leadership", East Asia Forum, June 2022
12 Leveraging Digital Technologies Key to Asia's COVID-19 Recovery, ADB, 2021

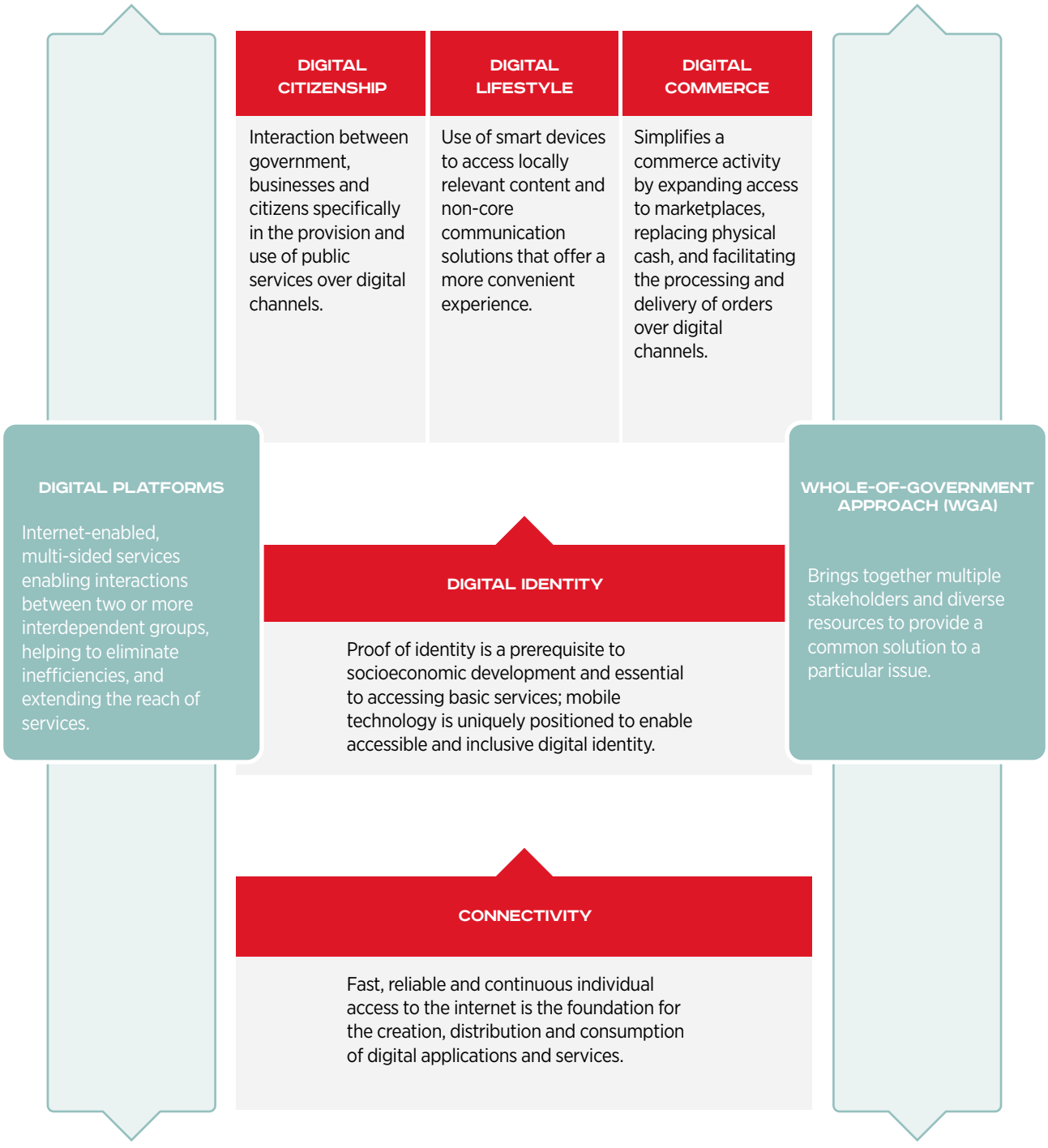
2 Advancing along the digital societies path

Countries in Asia Pacific continue to advance along the path to fully fledged digital societies, as citizens increasingly use a network of intelligently connected devices and interoperable services for daily activities, including work, play and communication. This trend will continue as a 'new normal' world emerges, with digital technologies and services at the centre.

The GSMA has identified five main components of a digital society to serve as a guide for stakeholders and provide a framework to track progress (see Figure 3). Digital platforms are interlaced through the five components, bringing together end users and producers in a digital society to transact with each other. Given that the task of becoming a digital society is multidimensional and involves different actors from the public and private sectors and non-state institutions, a WGA is essential to streamline efforts and realise efficiencies in formulating and implementing digital society initiatives.

Figure 3

Key components of a digital society



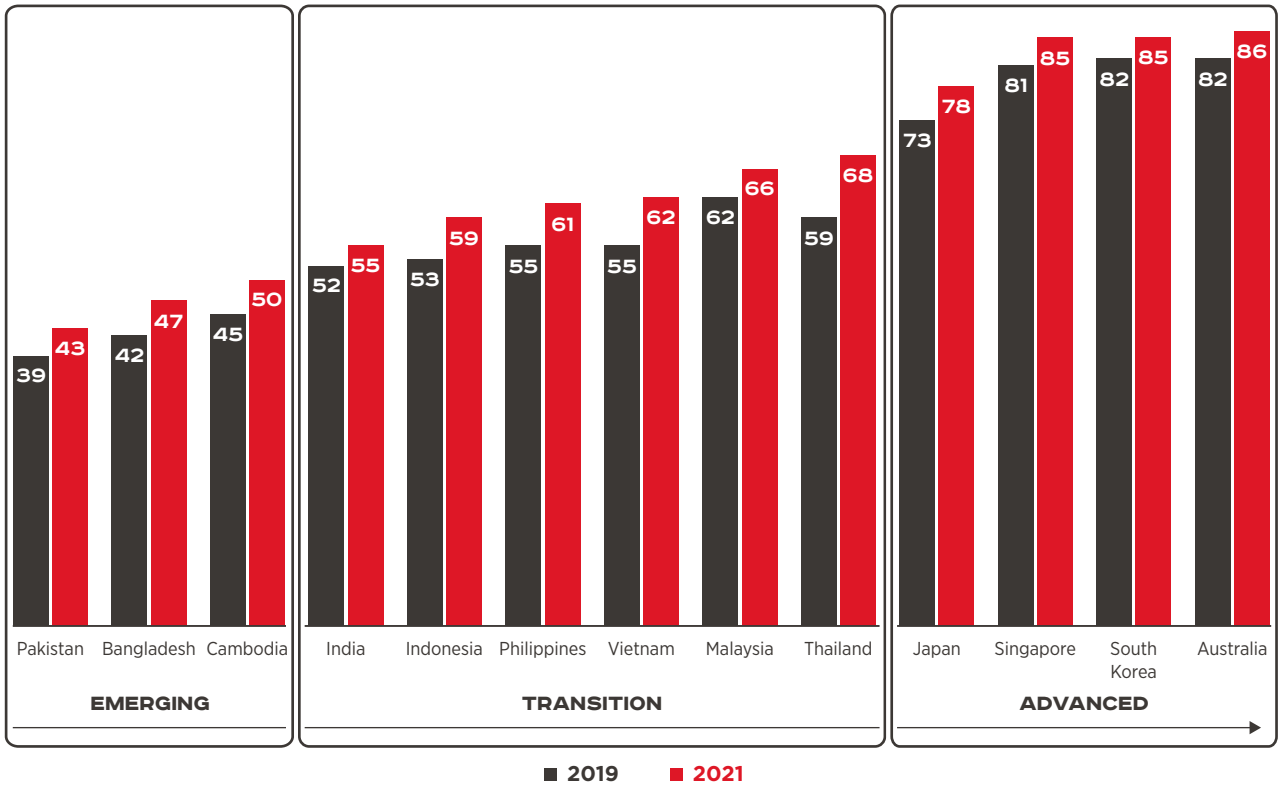
Source: GSMA Intelligence

GSMA Intelligence's Digital Society Index uses the five main components shown in Figure 3 to measure the progress of a country along its path to becoming a fully fledged digital society. Based on the aggregate scores, countries are grouped into three categories: emerging, transition and advanced digital societies.

This year's index includes two new additions – Cambodia and the Philippines. This brings the total number of countries to 13 (as shown in Figure 4). See *Appendix* for the index methodology and the scores for each of the five components.

Figure 4

Continued progress along the path to digital societies in Asia Pacific



Source: GSMA Intelligence

2.1 Connectivity

In any society, the more people there are that can access fast, reliable and affordable internet connectivity on a regular basis, the more governments and businesses can engage with them and deliver services over digital channels. In Asia Pacific, mobile broadband networks are accessible to more people (96% of the population) than any other internet connectivity technology. This is a testament to more than a decade of continuous investment in high-speed networks by operators in the region.

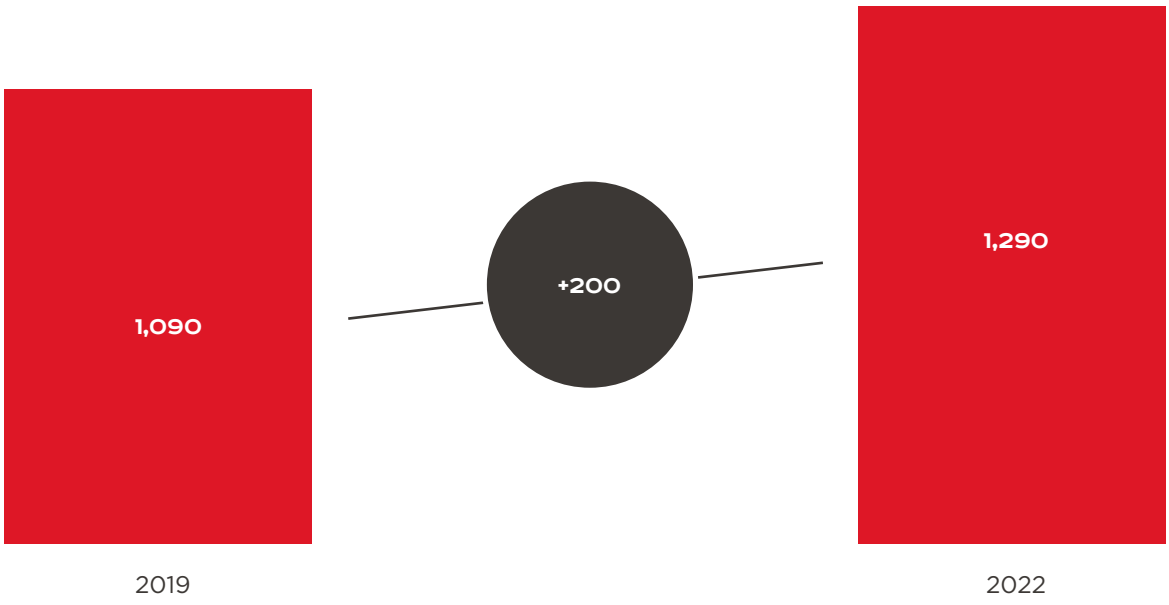
Beyond networks, connectivity is also a function of consumers' ability and willingness to adopt and use internet services. Here, the main underlying factors, notably affordability, are largely outside the control of network operators. To advance along the path to a digital society, governments need to step in to help address the consumer-related barriers to internet adoption and use.

For example, in Singapore, public agencies including the Ministry of Social and Family Development (MSF) and Infocomm Media Development Authority (IMDA) have partnered to launch the Data for All initiative. This seeks to mobilise support from the community to supply around 30,000 children, young adults and elderly members of low-income families, as well as people with disabilities and their caregivers, with mobile data worth more than SGD3 million ($2.1 million).[13]

Figure 5

An additional 200 million people in Asia Pacific have come online through mobile internet since the start of the pandemic

Mobile internet subscribers in Asia Pacific (million)



Source: GSMA Intelligence

13 "Community steps up to help Singaporeans embrace digital to enrich their lives at the inaugural digital for life festival", SG Press Centre, May 2022

2.2 Digital identity

Digital identity refers to a collection of electronically captured and stored identity attributes that uniquely describe a [real] person within a given context and are used for electronic transactions.[14] As more transactions move online with little or no physical interaction, the ability to prove identity in a digital form will become even more pertinent to economic, financial and social inclusion.

Asia Pacific is home to some of the world's most successful digital identity programmes. For example, India's Aadhar now has more than 1.3 billion registered users (equivalent to 92% of the population), while Singapore's Singpass has 4.5 million users, representing 97% of citizens and permanent residents above the age of 15.[15] In Japan, the 12-digit personal identification number, known as My Number, aims to take the personal information held by various institutions and consolidate it in one place. This allows government services such as social insurance, tax collection and disaster prevention to operate much more quickly and fairly.[16]

Elsewhere in the region, governments are expediting digital identity initiatives and expanding the features and functionality of existing systems. Examples include the following:

- In October 2021, Malaysia disclosed that the implementation of a digital identity system, with a biometric digital ID, had begun and will enable verification of citizens for online services by 2024.[17]
- In February 2022, Pakistan started using contactless biometrics on mobile devices to enroll individuals into its national ID system through the Pak Identity (PAK-ID) mobile application.[18] The digital identity wallet will be linked to Pakistan's biometric SIM registry.[19]
- In February 2022, it was reported that Cambodia plans to start issuing identity documents, such as birth certificates, identity cards and passports, in digital formats to enable citizens to gain access to a broader range of services.[20] The Integrated Population Identification System is part of the government's 10-year national strategic plan on identification.
- In March 2022, it was disclosed that around 50 million Vietnamese, around half the population, have had their biometrics captured for ID authentication as part of the government's efforts to modernise the digital ID system with biometrics technology. The system replaces a paper-based one and will facilitate the processing of social security, tax management and other services.[21]
- In April 2022, the Philippines opened a web-based offline authentication platform for its national digital ID, allowing citizens to perform identity verification for public and private sector services through a smartphone or computer.[22]

Meanwhile, the use of facial recognition technology continues to spread across Asia Pacific, with more countries deploying the solution for a range of use cases. In Indonesia, the government has deployed a solution to identify and classify in real-time people entering and leaving premises of government institutions.[23] Meanwhile, in Japan, a contactless face biometric payment system that works with health masks has been deployed as part of a pilot project in Niigata City.[24]

14 Mobile identity, enabling the digital world, GSMA, 2020
15 Singpass Singapore's National Digital Identity (Factsheet), Smart Nation Singapore, 2022
16 "New ID Card System Creates Solutions for Regional City", JapanGov, March 2021
17 "Govt to introduce Digital ID system that strengthens MyKad security, says Home Ministry", The Star, October 2021
18 "Nadra converting ID cards into digital wallets", Dawn, January 2022
19 "Asaan Mobile Account to bring 50m under banking net: SBP chief", Dawn, December 2021
20 "Cambodia soon to transit into digital identification milestone", Khmer Times, February 2022
21 "Vietnam adopts NEC's biometric ID system, registering 50m", Nikkei Asia, April 2022
22 "Authentication platform launched for Philippine natl ID", The Manilla Times, April 2022
23 "Videonetics' face biometrics selected by Indonesia govt for facility access, surveillance", BiometricUpdate.com, April 2021
24 "Japanese city tests face biometric payment solution that works with health masks", BiometricUpdate.com, February 2022

2.3 Digital citizenship

Governments in Asia Pacific have stepped up their online engagement activities with citizens, helping to increase accountability, information sharing and mutual trust. There is a growing focus on the digitalisation of public service delivery, as governments look to improve the speed and efficiency of service delivery amid competing demands for limited resources. For example, Vietnam has created the legal framework for the authentication of e-contracts, with the potential to save VND30,000–80,000 ($1.3–3.5) on each contract, compared to traditional contracts that incur paper, printing and transfer costs.[25] In India, the government has developed an AI-based portal to engage with elderly citizens and aid the seamless processing, tracking and disbursal of pensions.

E-government in South Korea

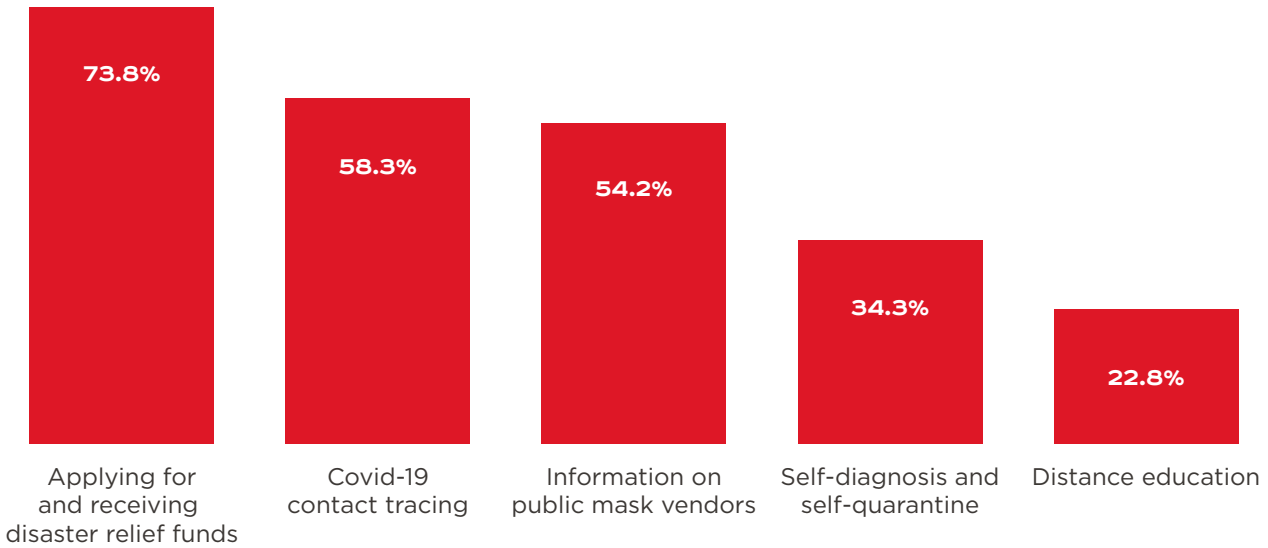
South Korea has the highest score for digital citizenship in the Digital Society Index (see *Appendix*). This reflects a deep commitment and WGA to the implementation of the country's e-government strategy. The pandemic resulted in a sharp increase in the use of e-government services in the country; in 2021, 90% of the population used e-government services, compared to less than 50% a decade earlier.

The government is stepping up investments in its online services to match the increase in demand. In its 2022 budget, the Ministry of the Interior and Safety (MoIS) set aside KRW960 billion ($735 million) for e-government projects, up by more than a third from KRW600 billion in 2020. Meanwhile, the city of Seoul is investing KRW3.9 billion ($3.3 million) in creating Metaverse Seoul – a virtual communication ecosystem for all areas of its municipal administration, including economic, cultural, tourism, educational and civic services. [26]

Figure 6

Citizens in South Korea used e-government platforms for a range of services during the pandemic

Most used e-government services related to Covid-19 in 2020 (percentage of respondents)



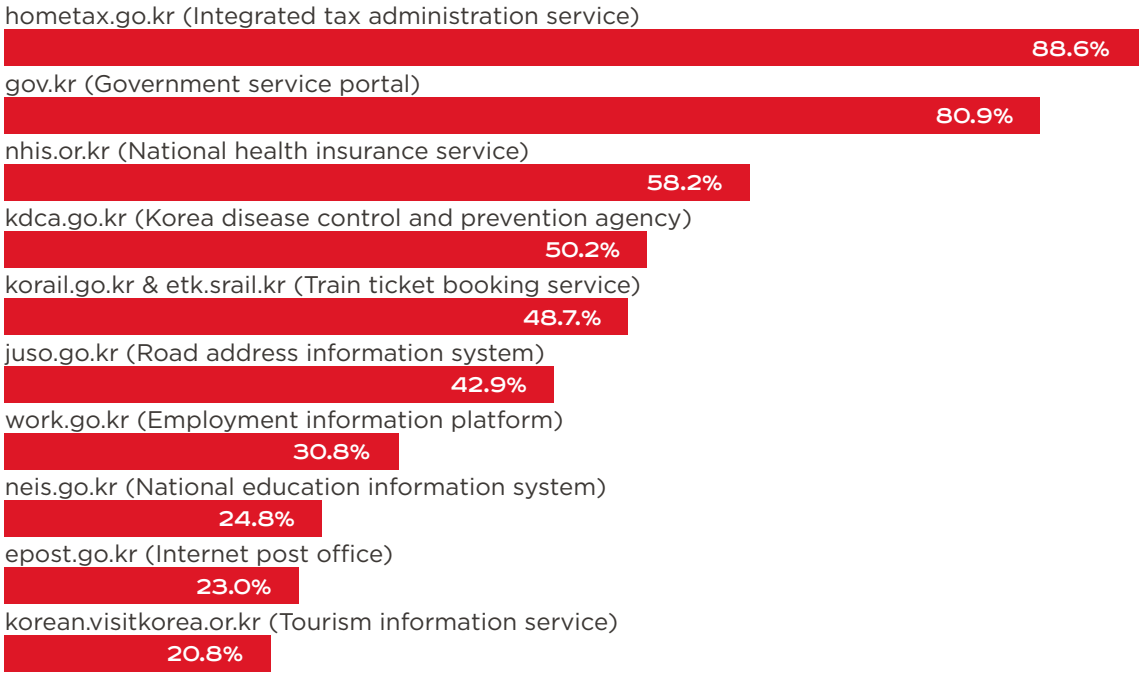
Source: MoIS

25 "MoIT to authenticate e-contracts from June", Vietnam+, June 2022
26 "Seoul Will Invest In Metaverse Communications Platform For City Services", Smart Cities Connect, December 2021

Figure 7

The tax administration service and government service platform are the most popular in South Korea

Most used e-government services in South Korea in 2021, by website (percentage of respondents)

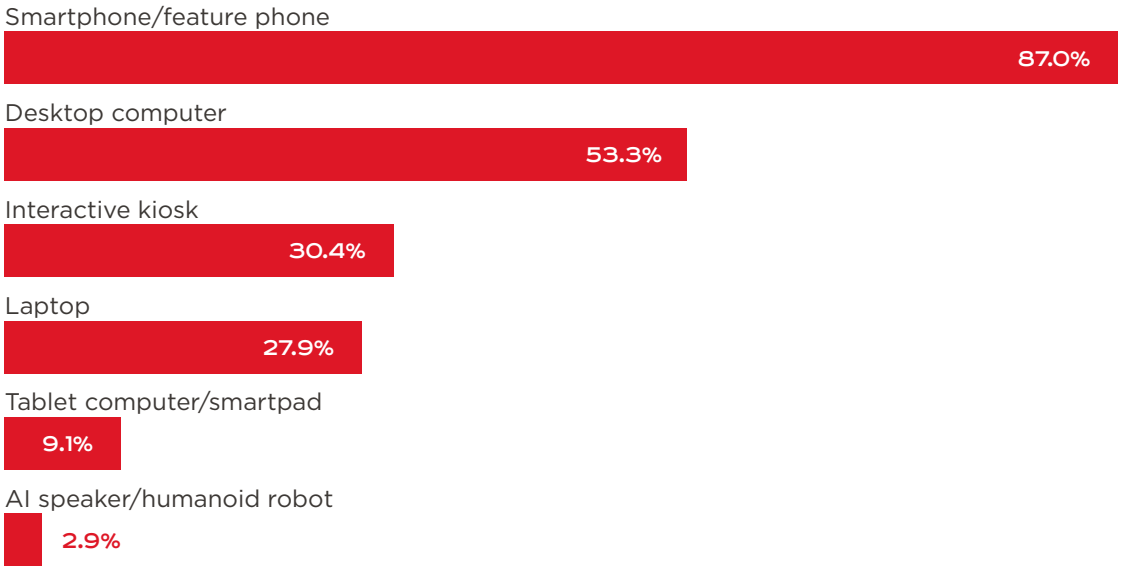


Source: MoIS

Figure 8

Citizens can access e-government services in South Korea via multiple devices; mobile phones are by far the most popular

Devices used to access e-government services in South Korea in 2021 (percentage of respondents)



Source: MoIS

2.4 Digital lifestyle

As digital societies advance, and urbanisation and the growing need to protect the environment affect traditional lifestyles, consumers are increasingly taking a digital-first approach to daily activities. The pandemic accelerated this trend, with lockdowns and social-distancing measures driving the use of digital technologies and services for many activities, including work, learning, shopping, social interactions, healthcare and entertainment. The global scale of the pandemic meant that the shift to digital has benefited from worldwide momentum, especially around the creation of digital content and services, as well as the development of digital platforms to connect users with service providers.

In Asia Pacific, the establishment of smart cities is an important element of digital lifestyle and progress on the path to a digital society. Governments at national and municipal levels increasingly use an array of digital technologies, such as the Internet of Things (IoT) and artificial intelligence, to improve urban life and bring real-time information and interconnected services to people's fingertips.

In Thailand, the idea of using digital technology in smart cities to improve quality of life is part of the 13th National Economic and Social Development Plan. The government has earmarked 15 areas for the implementation of smart city projects.[27] Meanwhile, in Vietnam, 59 of the 63 localities in the country have launched programmes on digital transformation to be rolled out over the next five years, including 41 localities that are also developing smart city services.[28]

27 "Smart city program to use digital technology to improve lives", Thaiger, November 2021
28 "Vietnam News Today (Jun 22): 41 Localities in Vietnam Develop 'Smart Cities'", Vietnam Times, June 2022

2.5 Digital commerce

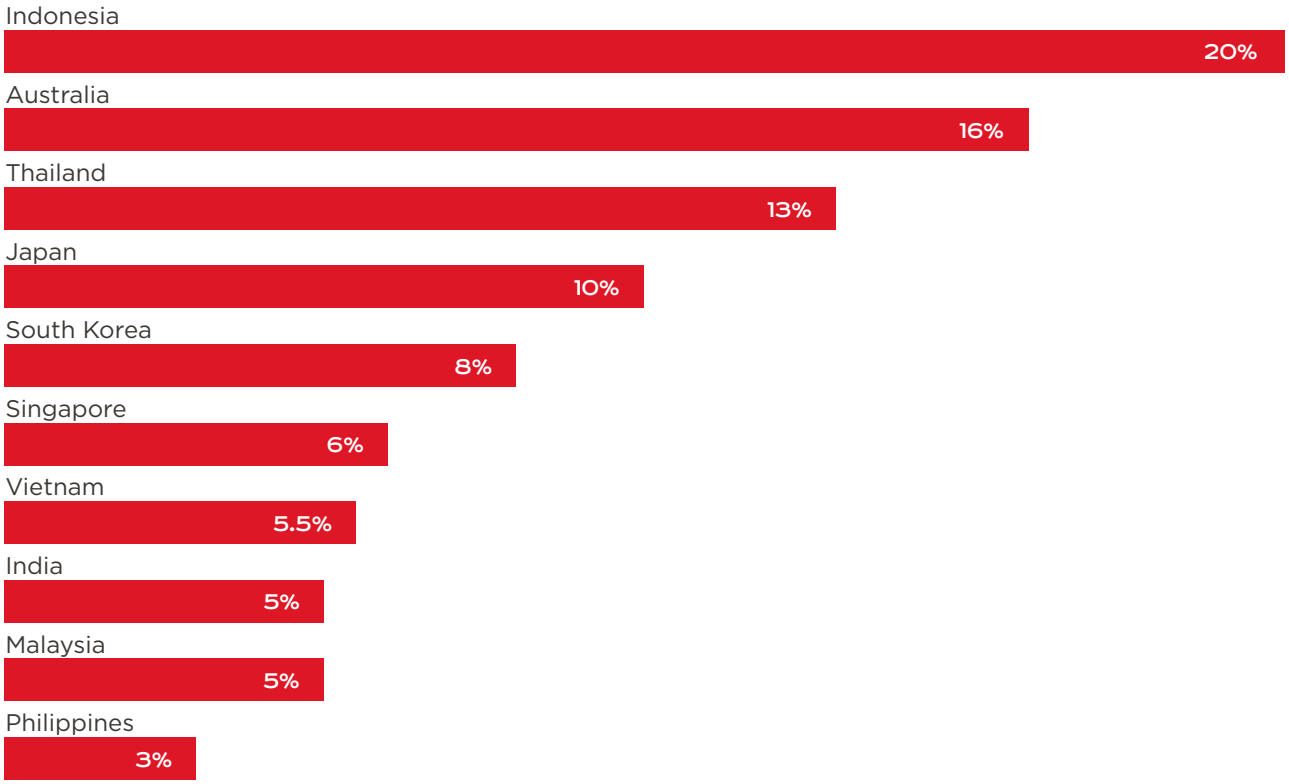
The ability to buy and sell in a safe and reliable manner is an essential part of any functioning society. This is even more crucial in the digital world, where the sensory elements of buying and selling are diminished or at best different. In this regard, progressing along the path to a fully fledged digital society involves putting in place the necessary infrastructure and services to support the advancement of digital commerce, particularly digital payments and logistics.

Digital payment solutions are a key growth driver for digital commerce, as they facilitate real-time transactions over online channels. Countries across Asia Pacific have recorded strong increases in the volume of digital payment transactions in recent years, largely driven by the impacts of the pandemic. For example, total digital payment transactions in India grew by 33% in FY2021/2022 to 74.2 billion,[29] while Vietnam expects the volume of mobile payment transactions to grow by 50–80% between 2021 and 2025.[30]

Figure 9

Covid-19 catapulted e-commerce in Asia Pacific, but there is still room for growth

E-commerce as a share of total retail in Asia-Pacific, 2021



Source: Statista

29 "India Records 74 billion Digital Payments During FY 2021-22", OpenGov Asia, March 2022
30 "Mobile payment value hoped to surge 80 - 100 percent annually", Vietnam+, January 2022

Government-led initiatives to boost digital commerce

Malaysia: incentivising businesses to go online[31]

The government of Malaysia is keen to grow the local digital commerce ecosystem by helping small businesses get online in the aftermath of the pandemic. As part of the 2021 national budget, the Ministry of Finance introduced the Go eCommerce Onboarding and Shop Malaysia Online initiatives, with an incentive package worth MYR200 million ($45 million) aimed at providing support to Malaysian businesses.

As of October 2021, the campaigns had successfully onboarded more than 500,000 businesses and generated more than 85 million transactions, with a gross merchandise value of more than MYR4.6 billion. The campaigns had also registered 157,566 women entrepreneurs, far surpassing the target to onboard 30,000 in 2021.

Vietnam: developing a digital address system[32]

Besides payments, logistics is another important factor for digital commerce, especially in the trade of physical goods. However, it is often challenged by under-developed or poorly designed legacy addressing systems. In this context, Vietnam has announced a strategy to make the postal industry an essential element of the country's digital commerce infrastructure. The plan is for all households to have digital addresses by 2025 and for all farmer households to function on e-commerce platforms developed by postal companies.

The postal industry consists of a network of around 21,600 points covering communes and 63 provinces and cities, with nearly 800 enterprises operating in the industry. Completing the digital address platform, in line with the national digital map, is an important step in the development of digital commerce in Vietnam.

31 "Go eCommerce Onboarding And Shop Malaysia Online Campaigns Surpass Targets", Business Today, December 2021
32 "VN to develop digital addresses by 2025", MIC Portal, July 2022

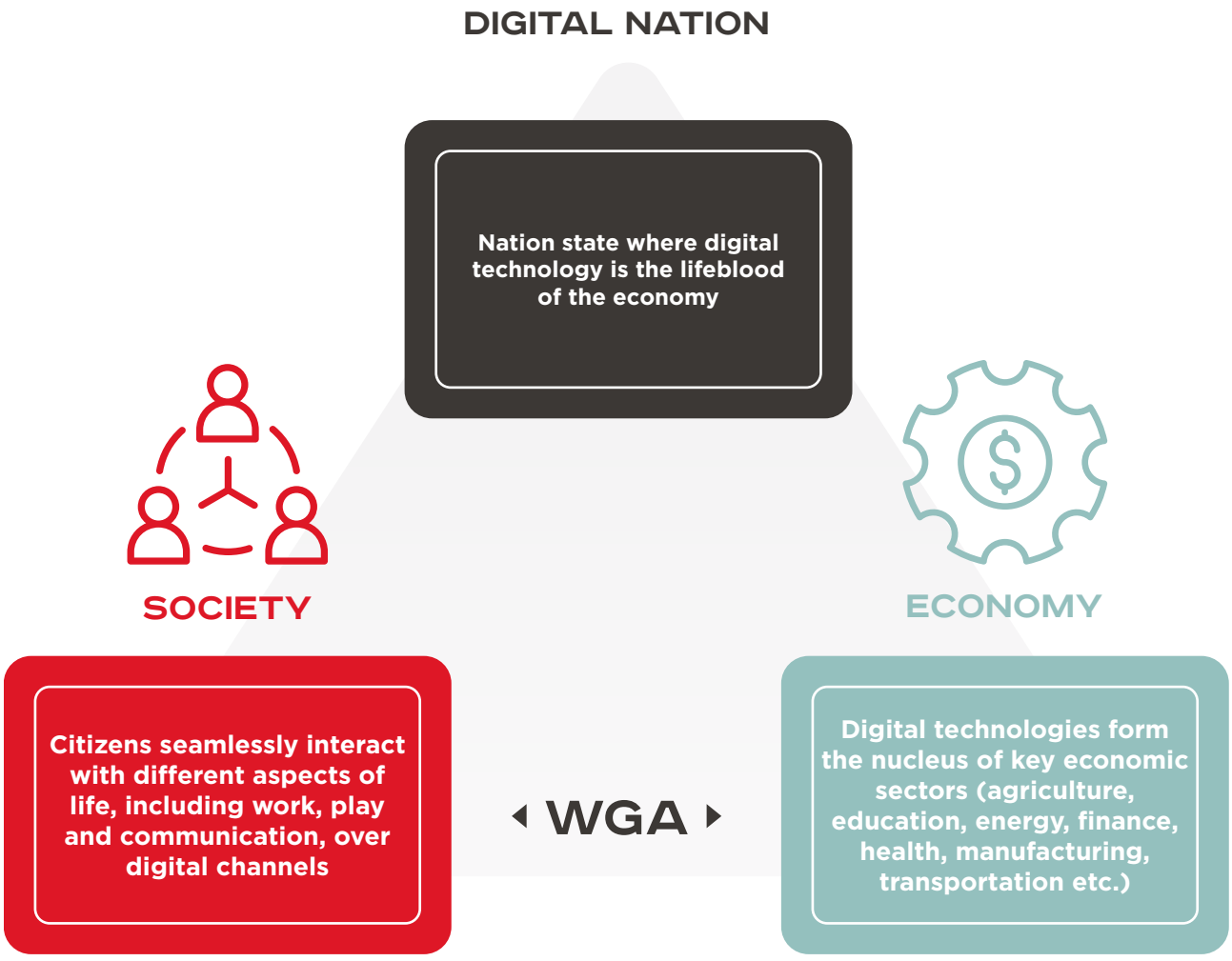
3 Progressing towards digital nations

As the journey to becoming fully fledged digital societies continues, governments across Asia Pacific are making concerted efforts to integrate digital technologies and services into every sector of the economy. This makes digitalisation the core element of nation building and a means to achieve sustainable and inclusive economic growth. This is the hallmark of a 'digital nation'.

The term 'digital nation' has been used in many guises and in various local and global fora, mainly to describe digital transformation within public institutions and a coordinated effort to leverage digital technologies and solutions for economic advancement. Building on these existing perspectives, this report views the concept of a digital nation as complementary to that of a digital society, with a focus on how governments are engaging with industry, through a WGA, to make digital technologies and services the core of their operations.

Figure 10

Towards a digital nation: putting digital technology at the core of economic activities



Source: GSMA Intelligence

3.1 Digital nation ambitions in Asia Pacific

Countries in Asia Pacific have been on the journey to digitalisation for some time. The early part of the last decade saw the launch of several economic masterplans with ambitious digitalisation goals. However, the Covid-19 pandemic has dramatically exposed inadequacies in many plans and highlighted new opportunities that digitalisation can bring to the broader economy.

As a result, several governments have recently outlined enhanced digitalisation aspirations, with a focus on accelerating digitalisation across every sector of the economy and progressing in their journey towards becoming digital nations. We have identified four rationales for this trend:

- **Resilience –** With the collapse of many economic activities and increased vulnerabilities for people and businesses during lockdown, there is a strong case for building economic structures with greater resilience to shocks.
- **Resources –** The economic impact of the pandemic has put additional pressure on already thin resources. For governments, there is no better time to find more efficient ways to operate a productive but efficient economy.
- **Inclusion –** The pandemic exposed the divide in digital access and use, not just among individuals but also among businesses, especially MSMEs, which account for a sizeable share of the economy in most countries.
- **Sustainability –** As countries begin to rebuild sectors of the economy ravaged by the pandemic, there is a growing focus on sustainability and decarbonisation as part of a more resilient and efficient economy.

Below are some examples of renewed digitalisation aspirations of governments in Asia Pacific, in line with the digital nations concept.

Japan's Digital Garden City Nation[33]

Japan's vision for a Digital Garden City Nation was announced in January 2022. It aims to achieve rural-urban digital integration and transformation through four broad initiatives:

- **Building digital infrastructure –** includes targets to achieve 5G coverage for 90% of the population by March 2024; achieve universal fibre coverage of households by 2030; and build more than 12 regional data centres by 2027.
- **Developing and securing human resources with digital skills –** includes a programme to train 450,000 personnel per year, over the period to March 2025, who will be responsible for the promotion of digitalisation in local regions.
- **Implementing digital services to solve rural issues –** includes targets to ensure that almost all farmers in the country practise smart agriculture by 2025, with advanced technologies such as AI, robots and IoT for improved efficiency and productivity in the face of labour shortages due to an aging population. It also includes promoting remote working at around 60% of public organisations to revitalise outlying regions, and the use of digital tools to connect MSMEs with international markets.
- **Initiative to leave no one behind –** involves establishing a human-resource support system to promote and realise a digital society where no one is left behind and everyone can enjoy the benefits of digital technologies regardless of age, gender or location. The system started in April 2022 with more than 10,000 digitalisation supporters nationwide.

33 "Vision for a Digital Garden City Nation: Achieving Rural-Urban Digital Integration and Transformation", Japan Gov, January 2022

Smart Bangladesh[34]

In 2021, the government in Bangladesh launched a 20-year vision to become a smart country with an innovation and knowledge-based economy by 2041. Under the plan, key sectors including utilities, agriculture, water resources and education will be operated digitally through the implementation of smart digital systems. This is expected to drive efficient resource management and prevent wastage.

Bangladesh's digital flagship programme, a2i, will play a key role in the implementation of Vision 2041, building on the success and experience of implementing the now concluded Digital Bangladesh agenda.

Indonesia's Digital Technology Adoption Program 4.0[35]

The Ministry of Communication and Information Technology in Indonesia announced the Digital Technology Adoption Program 4.0 in May 2022, with the aim to reach up to 70,000 MSMEs in Indonesia by 2024. MSMEs account for 97% of jobs in Indonesia. The initiative aims to help MSMEs in the manufacturing sector in 13 priority areas to scale up their digital technology adoption.

The government expects the programme to help MSMEs in the manufacturing sector increase their market access, income and competitiveness, as well as improve the efficiency and effectiveness of their business operations. This would allow them to contribute more to the economy, particularly during the post-pandemic economic recovery. The Ministry of Communication and Information Technology is taking a collaborative approach to implementing the programme, bringing together regional heads, other ministries and institutions, and industry players, including local and global technology companies as well as firms from the telecoms ecosystem.

Malaysia Digital[36]

The government launched Malaysia Digital (MD), an initiative to accelerate growth of the nation's digital economy, in July 2022. MD has three strategic objectives:

- to drive digital adoption among aspiring young entrepreneurs, companies and the Rakyat (people)
- to support local tech companies to become 'Malaysian Champions' and successful international players
- to attract high-value digital investments to maximise the digital economy's contribution to the country.

The MD initiative is being implemented through catalytic programmes, two of which have already been launched: the DE Rantau programme, which aims to establish Malaysia as the preferred digital nomad hub in ASEAN while boosting digital adoption and promoting professional mobility and tourism across the country; and the Digital Trade programme, which aims to accelerate e-commerce and business digital adoption while simplifying cross-border trade, aligned with the National Strategic e-Commerce Roadmap.

34 "Bangladesh's Digital Flagship Program a2i Places Country Closer to Becoming a Developed Nation by 2041", Newsfile, May 2022
35 "Percepat Adopsi Teknologi Digital UMKM, Menkominfo Dorong Kolaborasi di 13 Kawasan Prioritas", Kominfo, May 2022
36 See https://mdec.my/malaysiadigital/

Singapore's Research, Innovation and Enterprise (RIE) 2025 plan[37]

Singapore's RIE plan lays the groundwork for the country's science and technology efforts every five years. In December 2020, RIE2025 was launched with a SGD25 billion ($18 billion) budget to strengthen economic resilience in the wake of the pandemic. RIE2025 is organised across four domains: manufacturing, trade and connectivity; human health and potential; urban solutions and sustainability; and Smart Nation and digital economy.

The Covid-19 pandemic highlighted the benefits of Singapore's Smart Nation initiative, which was launched in 2014. Going further, the Smart Nation and digital economy domain in RIE2025 intends to drive digital adoption and support the development and use of emerging digital technologies to harness new opportunities in the digital economy. This is expected to advance Singapore's Smart Nation ambitions, building on previous RIE investments in the public sector's digital capabilities.

Vietnam's digital nation target for 2030[38]

In June 2020, Vietnam's government approved the National Digital Transformation Programme (NDTP) to move the country towards a new development space centred on the digital economy, digital society, e-government and new market opportunities. The NDTP has set ambitious targets for the digital economy to account for 20% of the nation's GDP by 2025, driven by digital transformation initiatives in health, education, financial services, agriculture and other sectors.

Targets for 2030 are more aspiring. Vietnam wants to be in the group of 30 leading digital nations in the world, with universal fibre and 5G access, more than 100,000 digital technology businesses, and a digital technology workforce of 1.5 million people. The Ministry of Information and Communications is promoting Vietnam's digital transformation process, bringing together digital technology businesses to form a large community to drive the NDTP and the country's socioeconomic development.

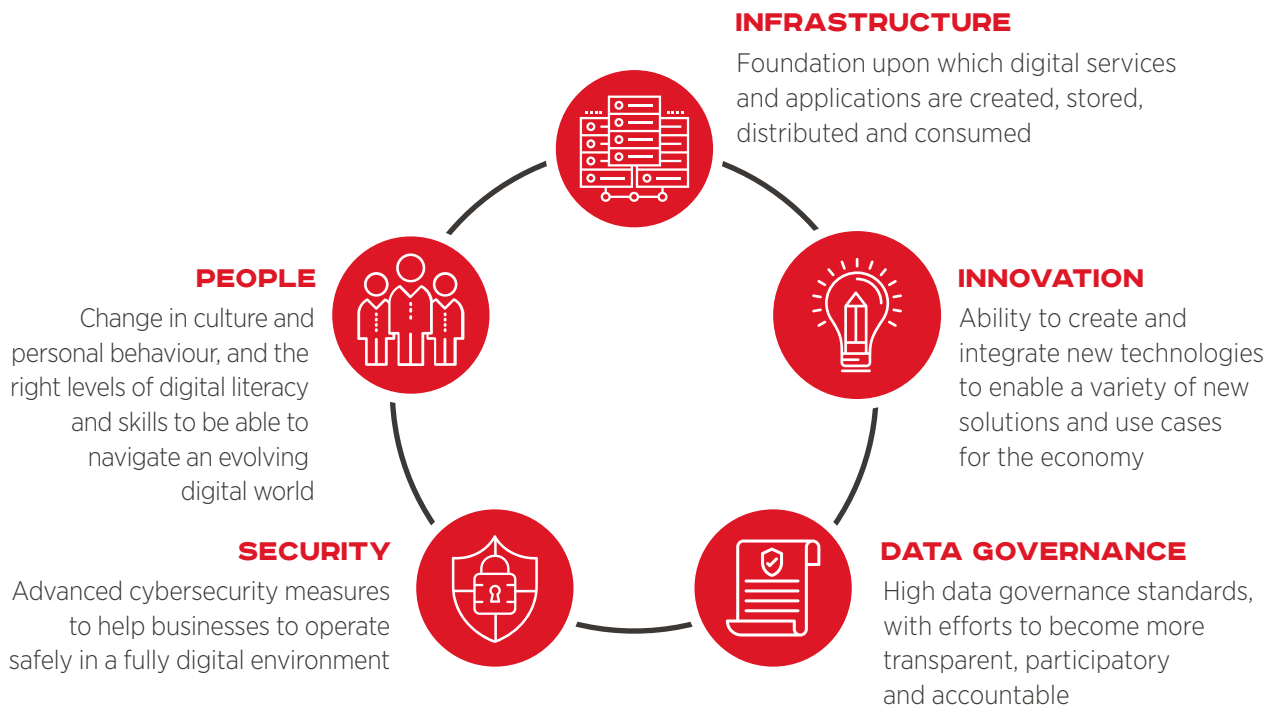
37 See https://www.nrf.gov.sg/rie2025-plan
38 "Vietnam sets the goal to become a digital nation by 2030", ictvietnam.vn, December 2020

3.2 The key components of a digital nation

As shown in Figure 11, five key components need to be in place to support the realisation of digital nation ambitions.

Figure 11

Key components of a digital nation



Source: GSMA Intelligence

Infrastructure

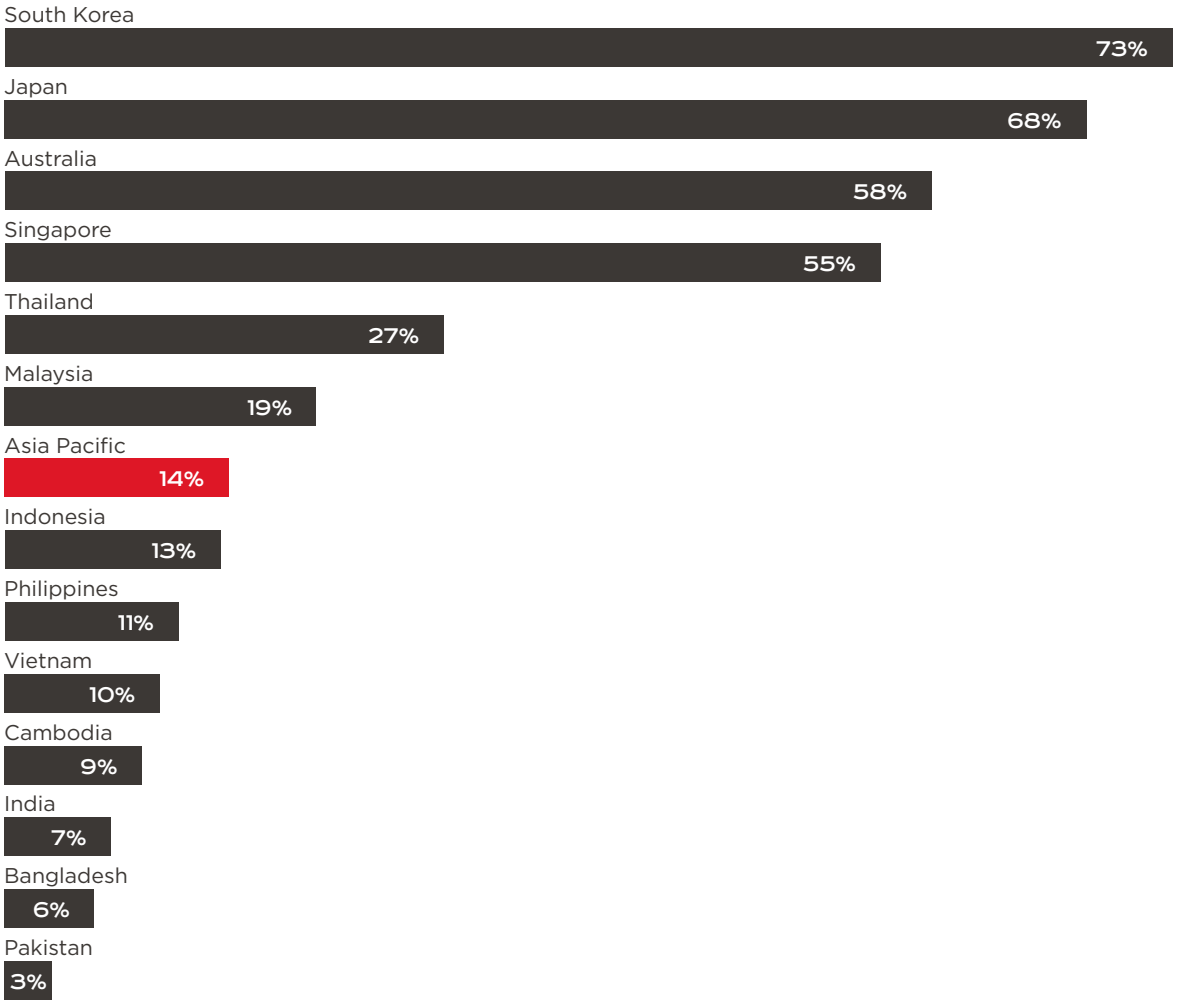
Digital infrastructure is the foundation of a digital nation, upon which digital services and applications are created, stored, distributed and consumed. Key elements of digital infrastructure include mobile and fibre networks, terrestrial and submarine communications cables, data centres, cloud computing, applications and platforms, and API and integration systems. The primary digital infrastructure in a digital nation is high-performance telecoms networks, in particular 5G, enabling a range of innovative digitalisation solutions for consumers and businesses. Governments in Asia Pacific are taking steps to align the development of 5G with their digital nation aspirations.

Fourteen countries across Asia Pacific have now launched commercial 5G services, including six (Australia, Japan, Philippines, South Korea, Singapore and Thailand) that have also launched 5G standalone (SA) services. 5G SA breaks an underlying service connection with LTE and brings a number of enhanced functionalities. The result is an improved ability to support IoT (machine type), network slicing and ultra-reliable, low-latency use cases while delivering a simplified network architecture and the cost optimisation that follows.

Figure 12

5G – a key enabler for digital nation ambitions

5G adoption forecast (percentage of total connections) in Asia Pacific, 2025



Source: GSMA Intelligence

Digital infrastructure now goes beyond 5G, fibre and data centres. It covers areas such as the fitting of streetlights with sensors and wireless transmitters, the installation of electric-vehicle charging stations and security cameras, and (more generally) AI and IoT-enabled infrastructure and services.

This emerging digital infrastructure is set to define future digital nations. In India, the Centre for Development of Telematics (C-DOT) has announced an agreement with Vodafone Idea to facilitate the deployment of IoT solutions and foster interoperability among devices and applications, as government agencies look to leverage the IoT ecosystem for digitalisation projects.[39]

39 "C-DOT and Vodafone Idea Limited sign MoU for cooperation in area of IoT/M2M", pib.gov.in, May 2022

Thailand's 5G policy framework

The Ministry of Digital Economy and Society in Thailand is developing a policy framework and action plan to encourage the development of new 5G products and services, as a way to drive innovation and build a 5G and IoT ecosystem.[40] The framework is expected to help drive investments in 5G infrastructure and advance the digital economy, with an emphasis on accelerating growth in core sectors and target industries.

The government estimates that, by 2035, the incremental value that Thailand will gain from the adoption of 5G in various sectors of the economy could be THB2,319–5,059 trillion ($65–140 billion), reaching equivalent to 10% of Thailand's GDP.[41]

Mobile operators will play a central role in realising Thailand's 5G national plan and are already exploring opportunities to use 5G to improve industrial performance. For example, True and Huawei have deployed a 5G standalone network and mobile edge computing to enable Siriraj Hospital in Bangkok to become a smart hospital. In the manufacturing sector, True has partnered with Mitsubishi and Lertvilai to demonstrate how a 5G network can support production lines.[42] Meanwhile, AIS is using 5G connectivity to enable robots to roam manufacturing plants. The technology is being applied first in an electrode manufacturing plant run by Yawata Electrode in Nakhon Ratchasima.[43]

Supporting the mobile industry to deliver on the required infrastructure for a digital nation

Digital services in Asia Pacific function primarily through mobile technology. As such, the mobile industry has been key in the improvement of digital society enablers. As the transition to digital nations gains momentum, the mobile industry will play an even more crucial role, especially with the deployment of 5G networks and the creation of applications that serve industry verticals. Between 2022 and 2025, mobile operators in Asia Pacific will invest a total of $134 billion in capex, 75% of which will be on the development of 5G networks.[44]

In the coming years, it is critical that governments and policymakers in Asia Pacific ensure the sustainable growth of the mobile industry and its continued ability to invest in high-performance networks and other necessary infrastructure to advance the digital nation. Governments can leverage and reap the benefits of the emerging digital economy through policies and reforms to improve digital infrastructure and connectivity. These steps include the following:

- Providing sufficient internationally harmonised spectrum to ensure the quality of service that consumers and businesses require from mobile networks.
- Putting in place procedures for easier and more efficient and affordable right-of-way (RoW) processes to expand fixed, fibre and tower infrastructure. The recently launched draft policy guidelines addressing the RoW procedures across different states in India to facilitate 5G rollout are a step in the right direction.[45]
- Promoting fair competition and improving ease-of-doing-business processes. Policymakers should strive to create a stable business environment that fosters competition, protects consumers and encourages sustainable investment.
- Exploring financial incentives and the elimination of sector-specific taxes as a means to ease the enormous burden of network development amid rising costs and declining revenues.

40 "Thailand laying down policy framework to promote utilization of 5G technology", Pattaya Mail, June 2022
41 Action Plan for Promoting the Adoption of 5G Technology in Thailand Phase 1, ONDE
42 APAC 5G Case Study – Secure and Responsive Connectivity for Manufacturing and Healthcare by True, GSMA, 2022
43 APAC 5G Case Study – 5G Brings Autonomous Robots to Life by AIS, GSMA, 2022
44 GSMA Intelligence data
45 "DoT Is Making the Life of Indian Telecom Operators Easy With RoW Draft Policy Guidelines", Telecom Talk, April 2022

Innovation

Innovation underpins the creation of new digital products and services, and their application in the digital economy. For countries progressing towards becoming digital nations, the ability to integrate emerging technologies that have the potential to enable new solutions and use cases for the economy will be crucial. In practice, this means creating enabling regulations to foster investment and innovation, as well as facilitating partnerships and testbeds for innovative solutions.

In Australia, the New South Wales government is investing AUD2.4 million ($1.6 million) in a partnership with two universities in Sydney to empower regional councils to use new technology and data-driven solutions to address some of the daily challenges people face.[46] Meanwhile, the government of Queensland has launched a new state-wide innovation hub to deliver support and partnerships in the development of innovative services.[47]

In Singapore, the IMDA partnered with IBM, Samsung and M1 for the country's first 5G Industry 4.0 trial, which developed a 5G-enabled augmented reality (AR) solution in the form of AI-powered smart glasses. These can assist factory operators in assembly and inspection, and can improve training efficiency for new hires by 50%. Also in Singapore, the IMDA is working with industry to drive adoption and commercialisation of 5G solutions by allowing businesses of different sizes to access four open testbeds to develop, adopt and commercialise 5G solutions in areas such as drone deliveries, maritime operations, smart cities and content production.[48]

Innovation is not limited to advanced countries in Asia Pacific. Governments and other stakeholders in emerging and transition countries are also working together to create innovative solutions that address local challenges. In Bangladesh, the government has inaugurated the country's first university campus-based IT business incubator at Chittagong University of Engineering and Technology, as part of building 'Smart Bangladesh'. Among other functions, the incubator will foster research and innovation activities among the faculty and students to create new digital solutions for the local market.[49]

46 "$2.4 million for 'smart spaces' in regions", NSW Government, May 2022
47 "New Far North hub boosts regional science and innovation", Queensland Government, June 2022
48 "All businesses to get access to 5G innovation with four 5G open testbeds", IMDA, October 2021
49 "PM opens country`s 1st campus-based IT business incubator", risingdb.com, July 2022

Singapore develops solutions for port operations[50,51]

Singapore is the world's biggest transshipment hub. Like other major port terminals around the world, it has experienced the impact of huge disruptions to global supply chains as a result of Covid-19 lockdowns. To prepare for future opportunities and adjust to new supply-chain realities, the government is investing SGD20 billion ($14 billion) in a project to automate the port by 2040, doubling the current capacity and introducing new features such as drones and automated guided vehicles (AGVs).

5G is central to the port's automation and remote operation initiatives that will help it maintain a competitive edge. Following a successful pilot by the IMDA and port operator PSA International using 5G to support AGVs and automated cranes, PSA has partnered with mobile operators to deploy 5G networks to scale these solutions. PSA is also considering using 5G in future initiatives such as a smart grid and autonomous delivery and cargo handling operations.

Web 3.0 and the metaverse to drive future innovation

A number of technologies which could be pivotal to the development of the digital economy have emerged in recent years. For example, Web 3.0 – which is seeing the rise of blockchain adoption, non-fungible tokens (NFTs), smart contracts, virtual and augmented reality, and cryptocurrencies – is set to transform how people interact with data and each other online. The decentralisation, encryption and shift from server-client interactions to peer-to-peer interactions that define Web 3.0 come with implications for the digital economy.

At the same time, the concept of the metaverse is gaining momentum. Although still in its early days, elements of the metaverse are already being used to remarkable effect in the digital economy – for example, in terms of collaborating more easily in a hybrid working environment and creating new opportunities to engage with customers. One of the main uses is digital twins, where real objects are represented in the metaverse. With the digitalisation of business and improvements in infrastructure such as IoT, the industrial metaverse is expected to gain traction in the coming years.

50 "All businesses to get access to 5G innovation with four 5G open testbeds", IMDA, October 2021
51 "Singapore's US$14 billion mega-port takes aim at shipping chaos", The Business Times, June 2022

Data governance

Governance broadly refers to how society, organisations and governments are managed and operated. In a digital nation, governance will be a determining factor for citizens' trust and innovation. Trust is the basis for every interaction on a personal, societal and business level across both physical and digital channels. In a digital nation, where digital interactions generate significant amounts of personal and non-personal data, trust is even more important as the remote nature of online transactions makes it harder for the individual to detect fraud.

As the digital economy expands and citizens become more active participants, the risk of misuse of technology increases. Meanwhile, there is growing demand for data science and analytics, which have the power to fundamentally change and reinvent how people live, work and connect with each other, but which also raise concerns around data privacy.

In a digital nation, governments need to raise governance standards, with efforts to become more transparent, participatory and accountable. In recognition of this, some countries in Asia Pacific have recently announced governance policies and guidelines around the implementation of digitalisation initiatives. Examples include the following:

- In May 2022, India's Ministry of Electronics and Information Technology issued a draft National Data Governance Framework to mobilise citizen non-personal data for use by public and private entities, in a bid to improve services. The draft policy seeks to address the methods and rules to ensure that non-personal, anonymised data from both government and private entities is safely accessible by the research and innovation ecosystem.[52]
- Data governance is a potential area of collaboration between Indonesia and Singapore as part of the Information and Communications Joint Committee (ICJC) on digital co-operation between the two countries. The ICJC provides an opportunity to foster a closer working relationship in bilateral digital cooperation, for the benefit of citizens and businesses, and to accelerate post-pandemic recovery.
- The Philippines Department of Information and Communications Technology (DICT) has strengthened its Public Key Infrastructure (PKI), which enables users of public networks such as the internet to securely exchange private data, to build trust in the government and ensure secure and reliable online transactions.
- Thailand's Personal Data Protection Act (PDPA), the country's first-ever law on personal data protection, came into effect on 1 June 2022. The law defines the responsibility enterprises have regarding the collection and processing of personal data.

AI will be a key feature of future digital nations, with applications across a range of public and private sector services. For example, security cameras, chatbots, traffic management systems, self-driving cars and smart city applications will rely heavily on AI-based solutions. However, with the increasing use of AI comes growing concerns around security, AI malfunctioning, lack of empathy and pervasive bias. Meanwhile, a growing number of businesses, particularly MSMEs, want to develop and deploy AI applications, often with a limited understanding of technical, business and ethical issues around the technology.

The ASEAN Digital Masterplan 2025[53] includes commitments to best-practice guidance on AI governance and ethics. Consequently, many ASEAN member states have established or are developing national AI strategies and governance frameworks.

52 National Data Governance Framework Policy, meity.gov.in, 2022
53 ASEAN Digital Masterplan 2025, asean.org, 2021

Figure 13

ASEAN countries outline AI governance frameworks

Source: GSMA Intelligence, public announcements

Singapore's AI Verify

At the World Economic Forum meeting in May 2022, Singapore announced the launch of AI Verify – the world's first AI governance testing framework and toolkit, providing a means for companies to measure and demonstrate how safe and reliable their AI products and services are. This follows its launch of the Model AI Governance Framework in 2019, as part of the National AI Strategy. AI Verify seeks to promote transparency in the use of AI between companies and their stakeholders through self-conducted technical tests and process checks.

The AI Verify testing framework, which was developed by the IMDA and the Personal Data Protection Commission, addresses five major areas of concern (pillars) and 11 AI principles:

AI ethics pillars

- Transparency on the use of AI and AI systems
- Understanding how an AI model reaches a decision
- Ensuring safety and resilience of AI systems
- Ensuring fairness and no unintended discrimination by AI
- Ensuring proper management and oversight of AI systems

AI ethics principles

- Transparency
- Explainability
- Repeatability or reproducibility
- Safety
- Security
- Robustness
- Fairness
- Data governance
- Accountability
- Human agency and oversight
- Inclusive growth, and societal and environmental well-being

Security

The increase in digitalisation has led to the unintended consequence of expanding the potential surface for attacks, which creates more opportunities for cybercriminals. The shift to remote and hybrid working environments has resulted in a significant increase in internet activity, often in a less secure setting, making it harder to monitor and restrict fraudulent activities.

A 2022 survey of 387 risk and fraud executives in Malaysia, Philippines, Singapore and Thailand found the cost of fraud rose 10–16% across Asia Pacific from 2019 pre-pandemic levels.[54] The top contributor to fraud losses for businesses remains the inability to identify synthetic identities and verify and authenticate identities using attributes such as phone numbers, email addresses, behavioral analysis and devices.

The above scenarios and growing consumer concerns around corporate data practices highlight the importance of trust in the transition to digital nations. Digital trust and ID services, as well as advanced cybersecurity measures, will be crucial features in digital nations, helping people to engage in social and business interactions safely across geographies, while enabling business to deliver value with lower operational costs and to operate in a fully digital environment. Several recent developments highlight the commitment of governments in Asia Pacific to establish and maintain digital trust:

- Australia's national science agency, CSIRO, is helping to tackle the growing threat of cyberattacks by providing free research and development support to businesses working in the cybersecurity sector.[55]
- The Pakistan Telecommunication Authority (PTA) has announced the formulation of the Cyber Security Framework (CSF) to improve digital security. The framework is based on the Critical Telecom Data and Infrastructure Security Regulation (CTDISR) of PTA and defines the obligation for auditors and PTA licensees.[56]
- The Inter-Ministry Committee on Scams (IMCS) of Singapore has initiated two new programmes to protect e-commerce marketplaces from fraudulent activity. These are the E-commerce Marketplace Transaction Safety Ratings (TSR) and the Revised Technical Reference 76 on Guidelines for Electronic Commerce Transactions (TR 76). The TSR provides consumers with information regarding the transactional security of various e-commerce marketplaces based on the range of anti-scam methods in place, while TR 76, as the national standard for e-commerce transactions, has been updated to incorporate additional anti-scam rules for e-retailers and e-commerce platforms in order to provide enhanced safety for customers online.

People

People are at the heart of a digital nation, primarily as users of digital technology and services, but also as the 'brains' behind the implementation of digitalisation initiatives. Realising digital nation aspirations will rely heavily on the ability and willingness of people to use digital technologies. This often requires a change in culture and personal behaviour, as well as the right levels of digital literacy and skills to be able to navigate an evolving digital world.

The Covid-19 pandemic highlighted the digital divide that already exists – a divide that will likely be exacerbated if unaddressed, given the heightened pace of digitalisation across society and as society moves to more advanced technologies, such as Web 3.0 and the metaverse.

Governments in Asia Pacific have accelerated efforts to hone the digital skills of citizens, particularly vulnerable population groups such as women, people with disabilities and the elderly. For example, Australia's Be Connected initiative uses a community-centred approach to assist individuals aged 50 years and above who have little or no experience with technology to learn basic digital skills. This includes using a device, being safe online, sending emails, using social media, shopping and banking online, and accessing e-government services.[57]

54 2022 True Cost of Fraud APAC Study, LexisNexis, 2022
55 "CSIRO's offer to SMEs working in cyber security", CSIRO, June 2022
56 "Digital security framework formulated", The Express Tribune, July 2022
57 Be Connected – improving digital literacy for older Australians, dss.gov.au, 2022

With support from Singapore's Digital for Life Fund, administered by the IMDA, the Singapore Institute of Technology and Guide Dogs Singapore are developing effective digital training and a learning resource toolkit for individuals with visual impairment.[58] Meanwhile, in India, the government's AI-based language translation platform, Bhashini, is designed to ensure citizens and MSMEs can access digital government services and information in their native language.[59]

There is also a need to strengthen digital talent across Asia Pacific as a means to sustain innovation and the expansion of the digital economy, especially among MSMEs, which account for the vast majority of the labour force. To realise digital nation aspirations, governments need to step in to build digital skills among MSMEs. In Indonesia, the government launched the Digital Entrepreneurship Academy (DEA) and the Digital Talent Scholarship (DTS) programme in 2021 to digitalise MSMEs and boost the digital economy. Data from the Ministry of Communication and Information Technology shows that more than 63,000 entrepreneurs had been trained by the DEA by the end of 2021, with another 40,000 due to be trained in 2022 in areas such as online business strategy and cybersecurity for MSMEs.[60]

Meanwhile, to prepare for jobs of the future, the Council for Indian School Certificate Examinations (CISCE) and the Indian Institute of Technology of Delhi plan to jointly design a curriculum for schools that includes robotics, AI, machine learning and data science. The curriculum is for grades 9 to 12 in schools affiliated with the CISCE board.[61] The government has also launched the AI for India campaign, in collaboration with AWS, to offer training, provide internships, allocate projects, and certify and employ 2.5 million citizens.[62]

DigiSkills.pk in Pakistan

In Pakistan, women face many challenges, especially in rural areas where schools can be far away and transport links unavailable. Parents often do not feel safe sending their daughters to school, for security reasons. This has the potential to widen an already significant digital gender gap in the country.

In 2018, DigiSkills.pk was launched by Ignite, under the Ministry of IT & Telecom, to equip existing and new freelancers with the knowledge, skills, tools and techniques necessary to seize the opportunities available internationally in online job marketplaces and locally.

The key objectives of DigiSkills.pk have been to increase the number of individuals working as freelancers in the country, the number of hours worked per freelancer, earnings per hour or per project for freelancers, level of financial inclusion, and number of experts with specialised skills. As of June 2022, more than 2.7 million enrolments had been achieved in 13 cohorts. Of these, 714,403 (26%) were female.

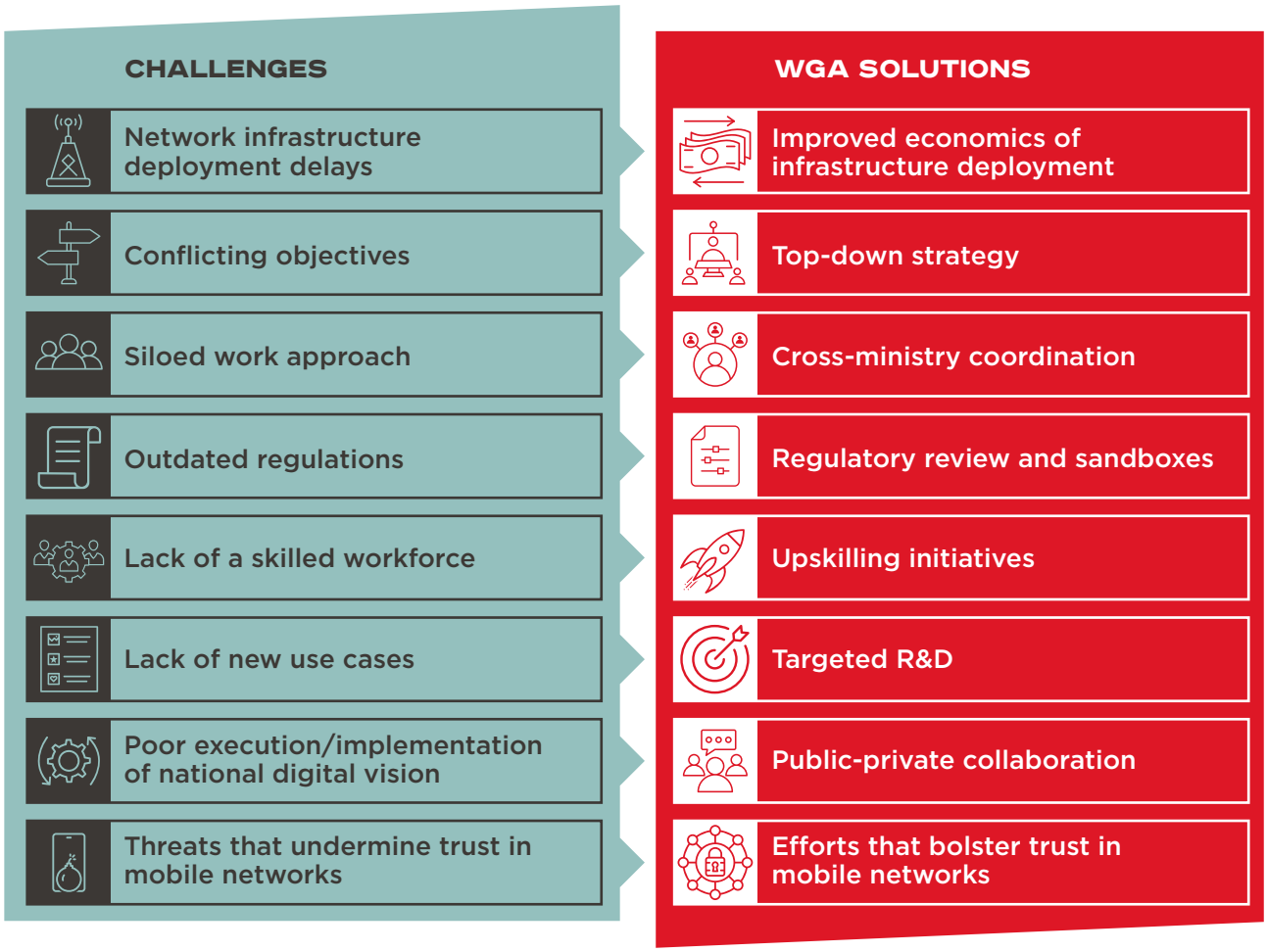
58 "Closing the digital divide for persons with visual impairment", IMDA, May 2022
59 "MeitY holds Brainstorming with Researchers & Startups to shape strategy for Digital India BHASHINI - India's AI led language translation platform", pib.gov.in, May 2022
60 "SMEs Digital Ecosystem to Intensify in Indonesia", OpenGov Asia, July 2022
61 "IIT Delhi and CISCE join together for courses on robotics and AI for classes from IX to XII", INDIAai, May 2022
62 "Minister of Education Dharmendra Pradhan launches 'AI for India' campaign", INDIAai, June 2022

3.3 Accelerating progress through WGA

A whole-of-government approach (WGA) brings together multiple stakeholders and diverse resources to provide a common solution to a particular issue. How quickly countries progress on the path to fully fledged digital societies will be a function of the level of collaboration across government, the private sector and other non-state institutions to accelerate progress in each of the five components of a digital nation. In recognition of this, governments in Asia Pacific are increasingly leveraging the key principles of WGA to deliver on their digital nation ambitions (see Advancing digital societies in Asia Pacific: a whole-of-government approach for more detail).

Figure 14

Using WGA to tackle key challenges around digital society initiatives



Source: GSMA

Examples of WGA-based digitalisation efforts in Asia Pacific

- India's Department of Telecommunications has launched the 5G Vertical Engagement and Partnership Programme (VEPP) to foster strong collaborative partnerships for the development of 5G use cases among ecosystem stakeholders and to address vertical industry needs. This involves an inter-ministerial committee that includes representatives from the ministries for electronics and information technology, science, agriculture, health, urban affairs, education, power, mines, commerce, ports, railways, heavy industries, road transport and tourism. In partnership with ministries, state government departments and start-up hubs, VEPP will facilitate the necessary approvals and regulatory clearances to enable use-case prototyping, pilots and demos at user or industry premises.[63]
- Indonesia has announced its intention to take a collaborative approach, underpinned by WGA principles, to the development of the metaverse in the country. To this end, the Ministry of Communication and Informatics is collaborating with local metaverse technology company WIR Group to create 'metaverse Indonesia', bringing together public and private institutions from key sectors in Indonesia. WIR Group has signed MoUs for cross-sector collaboration with several partners, including Bank Rakyat Indonesia and Bank Negara Indonesia from the financial sector, and partnership agreements with entities including Jakarta Fashion Week (JFW), retailer Alfamart, FMCG company Kalbe Nutritionals, independent music label Sun Eater, and property developers Vasanta and Triniti Land.
- Malaysia has established the Malaysia Digital Coordinating Committee (MD-CC) to coordinate more efficient and effective governance and operation of Malaysia Digital. The MD-CC, which is under the jurisdiction of the Ministry of Communications and Multimedia Malaysia, is based on a WGA, with an emphasis on the involvement of industry players, stakeholders and the community in the implementation of national policies.
- Singapore's TechSkills Accelerator (TeSA) aims to build and develop a skilled ICT workforce for the Singapore economy, and enhance employability outcomes for individuals. In November 2020, the 5G Academy was formed as part of the TeSA initiative to equip citizens with 5G skills. The 5G Academy brings together a broad group of stakeholders, including the IMDA, SkillsFuture Singapore, Workforce Singapore, Singapore Polytechnic, National University of Singapore and mobile operators, to aggregate hiring and training requirements from the 5G ecosystem. By November 2021, the TeSA initiative had equipped more than 3,000 Singaporeans with 5G skills.[64]
- Vietnam's Alliance of Public-Private Partnerships for Smart City Development has been established to foster greater collaboration from the private sector in the formation and development of smart cities. The alliance will connect corporations, businesses, policymakers, leaders and urban developers to exchange ideas and resources between the public and private sectors, with the aim of developing a smart urban system across the country.[65]

63 "Department of Telecommunications invites Expression of Interest for 5G Vertical Engagement and Partnership Program (VEPP) initiative", pib.gov.in, April 2022
64 "More than 3,000 Singaporeans equipped with in-demand 5G skills through TechSkills Accelerator Initiative", IMDA, November 2021
65 "iForum for Smart City to foster smart city development in Vietnam", Hanoi Times, November 2021

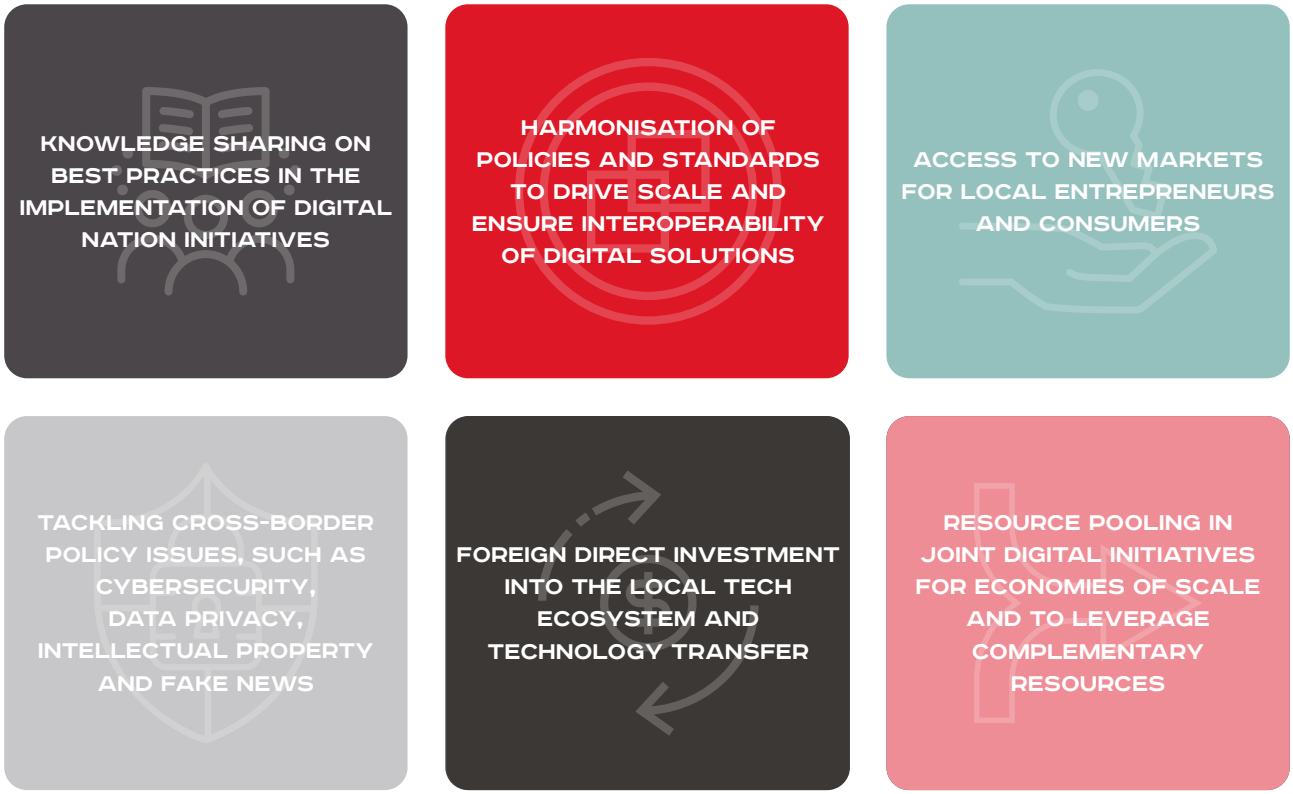
4 Collaborating to build digital nations

The rise of the platform economy has made it easier for people and businesses to access international markets. As digitalisation increases and more businesses go online, the volume of cross-border interactions and transactions will grow further, providing opportunities and challenges, almost in equal measure, for governments, people and businesses. In this context, digital cooperation at various international levels will be essential to secure the benefits and manage the disruptions on the journey to becoming digital nations.

Figure 15 shows six key benefits of digital cooperation.

Figure 15

Key benefits of digital cooperation



Source: GSMA Intelligence

In Asia Pacific, ASEAN has played a key role in creating cohesive digitalisation frameworks and agreements. These include the Master Plan on ASEAN Connectivity 2025,[66] the ASEAN Digital Masterplan 2025,[67] the ASEAN Agreement on E-commerce,[68] and the ASEAN Leaders' Statement on Advancing Digital Transformation in ASEAN.[69] In the wake of the Covid-19 pandemic, the Go Digital ASEAN initiative was introduced to sharpen the digital skills of more than 200,000 people from rural regions and underserved communities in 10 participating countries – including women-led MSMEs, underemployed youth, ethnic minorities, and people with disabilities – to create a more inclusive ASEAN region.[70]

Regional collaboration through these frameworks and initiatives is essential to achieve the benefits of digital cooperation. This is particularly crucial in Asia Pacific, given the diverse digital landscape and the opportunity for knowledge sharing, access to new markets and technology transfer to accelerate progress in emerging and transition digital society countries in the region.

In addition to regional-level efforts, there is a growing trend towards bilateral and multilateral digital economy partnerships among Asia Pacific countries and, in some cases, with countries in other regions. Figure 16 maps certain partnerships to the benefits of digital cooperation. Many of the partnerships are designed to deliver multiple benefits.

66 Master Plan on ASEAN Connectivity 2025, asean.org, 2021
67 ASEAN Digital Masterplan 2025, asean.org, 2021
68 ASEAN Agreement on Electronic Commerce, asean.org, 2021
69 ASEAN Leaders' Statement on Advancing Digital Transformation in ASEAN, asean.org, 2021
70 Go Digital ASEAN, asiafoundation.org

Figure 16

Examples of digital cooperation partnerships in Asia Pacific (January to July 2022)

Knowledge sharing	Singapore and China have signed an agreement to share ideas in the digital economy by collaborating on investments and digital trade, and sharing best practices on digital economy rules and policies.[71] Singapore and Japan have signed an agreement on digital government transformation, and intend to share information and experiences in areas such as AI, cloud services, cloud identity and the pandemic.[72]
Standards harmonisation	Singapore and Malaysia have agreed to start discussions on a framework for cooperation in their digital and green economies. This involves promoting more interoperability and cooperation on initiatives to decarbonise their industries and enable local companies and employees to take advantage of opportunities in the green economy.[73]
Access to new markets	India and the UAE have signed an MoU to work together on strengthening the supply-chain resilience of industries and expand access to each other's markets through mutual cooperation in the areas of sustainable energy, AI, industry-enabling technologies and healthcare. India–UAE bilateral trade grew from $180 million in the 1970s to $60 billion in 2020, making the UAE India's third biggest trading partner after China and the US.[74]
Tackling cross-border issues	Thailand and Vietnam have agreed to ramp up cooperation in fake news management to establish a safe and healthy online environment.[75] Singapore has finalised a digital trade agreement with the UK to develop safe and secure cross-border e-payments, adopting internationally accepted standards and promoting interoperability between e-payment systems.[76] The Joint Committee Meeting (JCM) on Information and Communications Co-operation between Singapore and Malaysia is discussing issues relating to enabling trusted data flows between the two countries, and better connecting their innovation and technology ecosystems to support businesses and start-ups.
Investment and tech transfer	The Philippines Department of Science and Technology (DOST) and the Royal Melbourne Institute of Technology (RMIT) in Australia have agreed to work together on digital health programmes.[77] Vietnam and Australia have discussed partnership opportunities on technology transfer and cooperating on programmes to help strengthen bilateral relations and reinforce trade and investment partnerships between the two countries.[78]
Resource pooling	Philippines and South Korea have agreed to collaborate on a series of R&D projects starting in 2022, with a particular focus on smart vertical farming, otherwise known as indoor farming.[79] India and Japan have signed an agreement to grow the digital economy through joint digital transformation projects in areas such as IoT and AI, and to enhance cooperation in fields such as 5G, open RAN, telecoms network security, submarine cable systems, massive MIMO, connected cars, quantum communications, and 6G innovation.[80] The Indo-German Science and Technology Centre (IGSTC) plans to set up a joint AI initiative for start-ups, research and applications in healthcare and sustainability.[81]

Source: GSMA Intelligence

71 "Singapore and China enhance bilateral cooperation in green economy and digital economy", MTI Singapore, June 2022
72 "GovTech partners the Digital Agency of Japan to push Digital Government Transformation", GovTech Singapore, June 2022
73 "Singapore and Malaysia agree to deepen cooperation in digital economy and green economy" MTI Singapore, June 2022
74 "Cabinet approves Memorandum of Understanding between India and United Arab Emirates (UAE) on Cooperation in the field of Industries and Advanced Technologies", pib.gov.in, June 2022
75 "Vietnam, Thailand enhance cooperation in digital economy, transformation", Vietnam+, May 2022
76 UK-Singapore Digital Economy Agreement, mti.gov.sg
77 "PH, Aussie institute to collab on digital health programs", Philippine News Agency, April 2022
78 "Vietnam, Australia bolster partnership in technology, trade", Nhandan, June 2022
79 "PH, Korea R&D collab to start this June", Philippine News Agency, May 2022
80 "7th Japan-India ICT Joint Working Group meeting held under India-Japan ICT Comprehensive Cooperation Framework", pib.gov.in, May 2022
81 "India and Germany agree to work together on AI startups, research and application", INDIAai, May 2022

Call to action

Digital technologies play a crucial role in the recovery from Covid-19, building on the support provided in the response phase of the pandemic. Beyond recovery from the pandemic, governments across Asia Pacific have outlined plans to build more resilient, inclusive and sustainable economies, underpinned by widespread digitalisation of economic sectors. This ambition to become 'digital nations' is complementary to ongoing digital society efforts.

Collaboration between governments and industry through a WGA, as well as digital cooperation at international levels, is necessary to accelerate progress in the journey towards digital nation building. A digital nation cannot exist in isolation. One of the main incentives for increased digitalisation is the promise to help local consumers and businesses access new markets and forge global linkages, which offer enormous economic opportunities. To unlock this potential, it is imperative governments take a collaborative approach to building the digital economy through bilateral, multilateral, regional and even global digital cooperation.

Appendix

A1 Digital Society Index methodology

Metrics

The GSMA Intelligence Digital Society Index uses the five main components of a digital society – connectivity, digital identity, digital citizenship, digital lifestyle and digital commerce – to show the progress of a country along its path to becoming a fully fledged digital society. The metrics of the Digital Society Index rely on 49 indicators across the five main components. Each component consists of the following dimensions, number of indicators and corresponding weighting of indicators:

1. **Connectivity:**
   - **a** Mobile infrastructure – 4 indicators (25% weighting)
   - **b** Network performance – 3 indicators (25% weighting)
   - **c** Spectrum – 4 indicators (25% weighting)
   - **d** Other enabling infrastructure – 4 indicators (25% weighting)
2. **Digital identity:**
   - **a** Availability and usage of identity and digital identity – 4 indicators
3. **Digital citizenship:**
   - **a** Provision of public services through digital channels – 4 indicators
4. **Digital lifestyle:**
   - **a** Access and use of smart devices – 4 indicators (30% weighting)
   - **b** Solutions beyond core communications in consumer IoT – 5 indicators (20% weighting)
   - **c** Solutions beyond core communications in enterprise IoT – 7 indicators (20% weighting)
   - **d** Locally relevant content online – 5 indicators (30% weighting)
5. **Digital commerce:**
   - **a** Financial inclusion – 1 indicator (45% weighting)
   - **b** Transactions – 3 indicators (45% weighting)
   - **c** Digital trade – 1 indicator (10% weighting)

Connectivity is measured across four dimensions:

1. **Mobile infrastructure:** 2G, 3G, 4G and 5G network coverage.
2. **Network performance:** Average mobile upload/download speeds and latency.
3. **Spectrum:** : Digital dividend from the release of 700 MHz spectrum for mobile use, and the amount of sub-1 GHz, 1–3 GHz and above-3 GHz spectrum used for mobile services per operator.
4. **Other enabling infrastructure:** Access to electricity, international bandwidth per internet user, the number of secure[82] internet servers per capita and internet exchange points per 10 million people.

82 Secured by publicly trusted TLS/SSL certificates

Digital identity is measured across one dimension:

1. **Availability and usage of identity and digital identity:** Assessed on whether there is a national identity system in the country and the number of people registered. This dimension also considers whether a country's citizens use their digital identities, if available, to access online services, and whether the country has a framework for data protection and/or data privacy.

Digital citizenship is measured across one dimension:

1. **The provision of public services through digital channels:** The availability and quality of online and e-government services, as well as the extent to which citizens use them.

Digital lifestyle is measured across four dimensions:

1. **Access and use of smart devices:** The rate of smartphone adoption, the share of licensed cellular IoT connections as a percentage of total connections, the cost of entry-level internet-enabled handsets and the gender gap ratio for mobile phone ownership.
2. **Solutions beyond core communications in consumer IoT:** IoT connections per capita (or per vehicle/household where relevant) in the following categories: consumer electronics (smart TV, home entertainment, personal entertainment and set-top box); smart home (home appliances, home infrastructure, home security and energy monitoring); wearables (fitness trackers and smart watches); smart vehicles (connected cars, connected bikes and insurance telematics); and other (drones, robots and trackers for children, the elderly and pets).
3. **Solutions beyond core communications in enterprise IoT:** IoT connections per capita in the following categories: smart city (public transport, surveillance, electric vehicle charging, street lighting, parking and waste management); smart utilities (energy, water and gas smart metering, and smart grids); smart retail (points of sale, digital signage, vending machines and ATMs); smart inventory (inventory tracking, monitoring and diagnostics and warehouse management); smart buildings (heating and air conditioning, security, lighting, hot desks and office equipment); health (remote monitoring of medical devices and emergency vehicle infrastructure); and other (fleet management and applications in agriculture, oil, mining and construction).
4. **Locally relevant content online:** The proportion of the population who are active users of social media, the use of internet for entertainment purposes, the number of apps developed per internet user, the number of apps available in the first language of a country and the proportion of the country's population with accessible apps in their first language.

Digital commerce is measured across three dimensions:

1. **Financial inclusion:** The percentage of mobile subscribers that use mobile financial services (mobile banking and/or mobile money).
2. **Transactions:** The preparedness of an economy to support online shopping, the share of adults that have ordered or purchased goods online and the performance of national logistics networks.
3. **Digital trade:** This dimension analyses legislation on the acceptance of digital signatures in index countries.

Building the index

The process for building the index consisted of determining the relevant data for the five components, identifying the 49 indicators, normalising the data, addressing missing data and calculating the composite of the measures. For all the indicators, the index used the latest data available at the time of research and took the values for each indicator from the same year.

The creation of the index required a complete dataset, so the imputing of variables used a 'hot-deck' method of imputation to imply a value for a country by taking the value of a similar country.

The indicators had different units and scales, so the index normalised any indicator that did not use a 100-point scale to make the indicator values comparable and to construct aggregate scores for each country. For indicator values that required normalisation, the process set minimum and maximum values to transform the indicators into indices between 0 and 100 using the following formula:

Normalised value = ((actual value – minimum value) / (maximum value – minimum value)) × 100

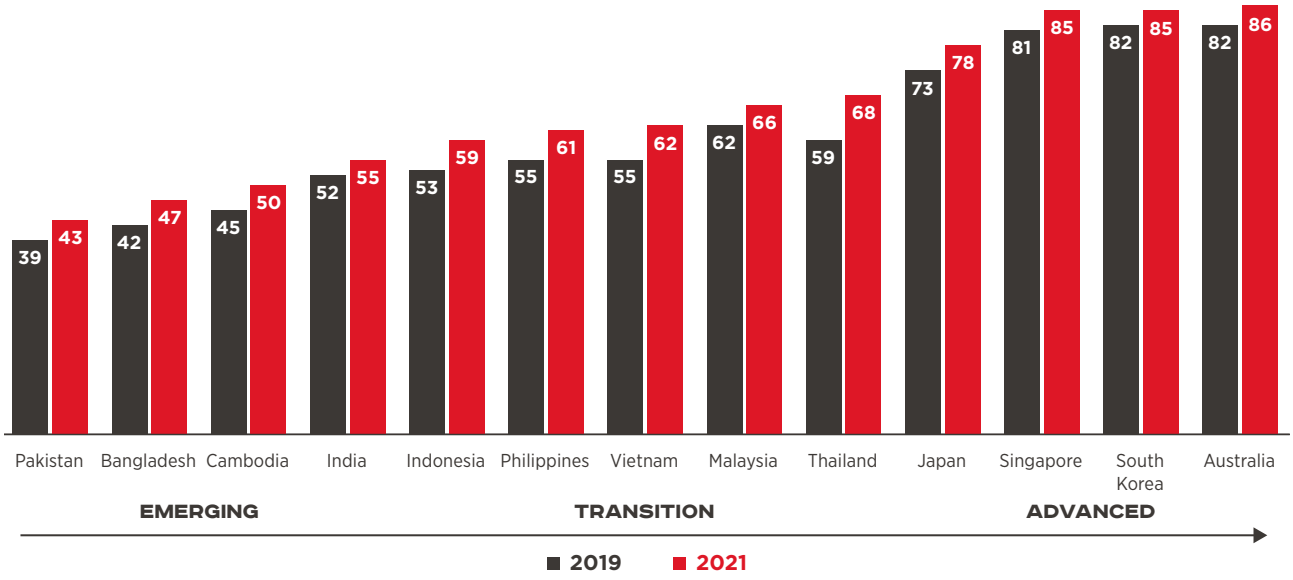
After normalisation of the necessary values, the index became a composite of the five components on a 100-point scale, according to the weights in the indicators above, with 1 representing the worst situation and 100 the best. This normalisation allows comparison of the countries' scores for each category. To calculate the overall score, the index used the sum of the indicators within each component while taking into consideration each indicator's weighting.

The data for the index came from a variety of sources, including the World Bank, United Nations, World Economic Forum, Economist Intelligence Unit, We are Social, Organisation Internationale des Constructeurs d'Automobiles (OICA), Tarifica, Appfigures and GSMA Intelligence. The majority of the datasets consist of factual data such as rates of smartphone adoption; some data sources rely on more subjective inputs, such as from the UN E-Government Index, which assesses different aspects of e-government services.

A2 Digital Society Index scores, 2019–2021

Figure A1

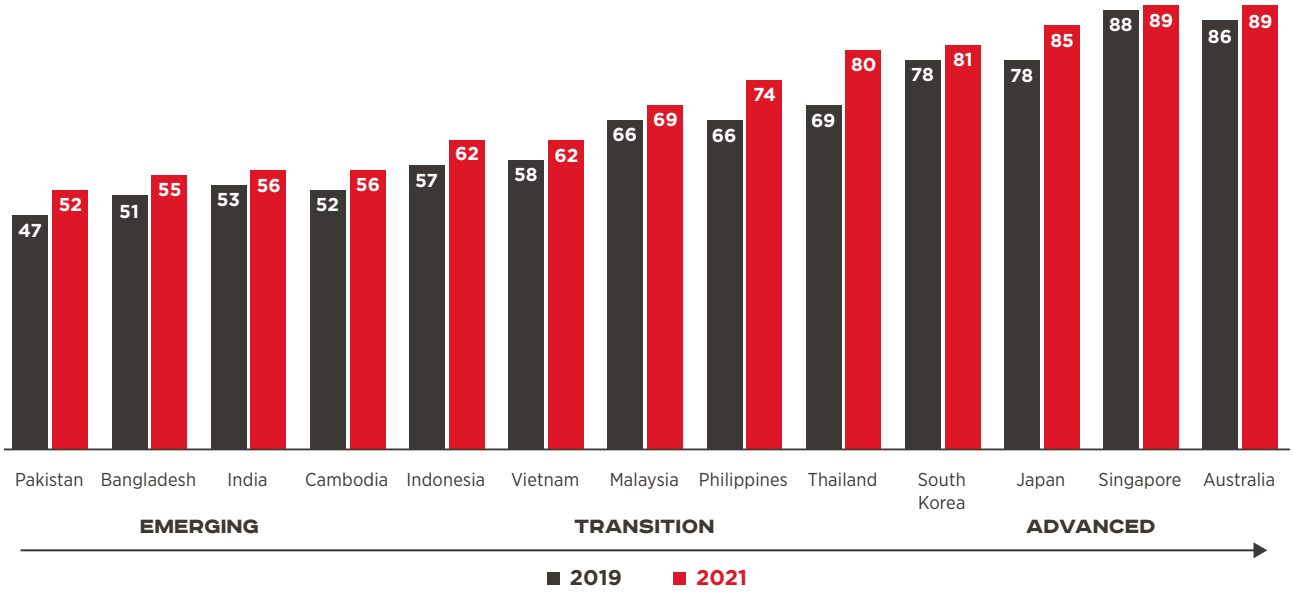
Digital society scores



Source: GSMA Intelligence

Figure A2

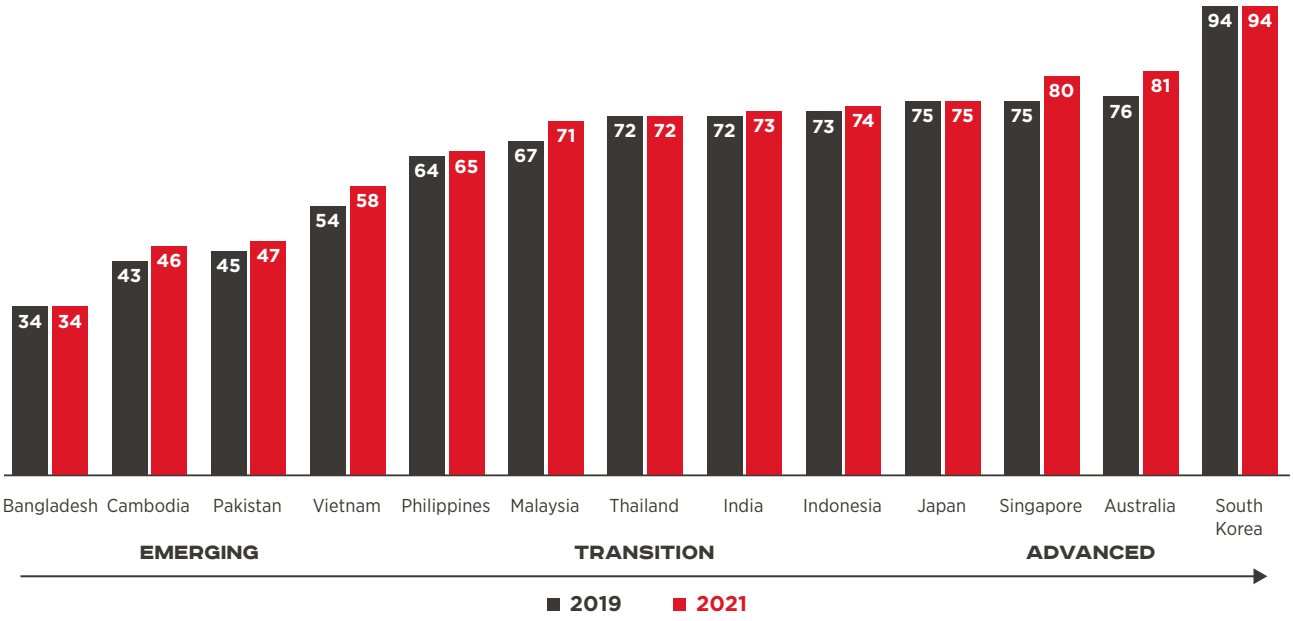
Connectivity scores



Source: GSMA Intelligence

Figure A3

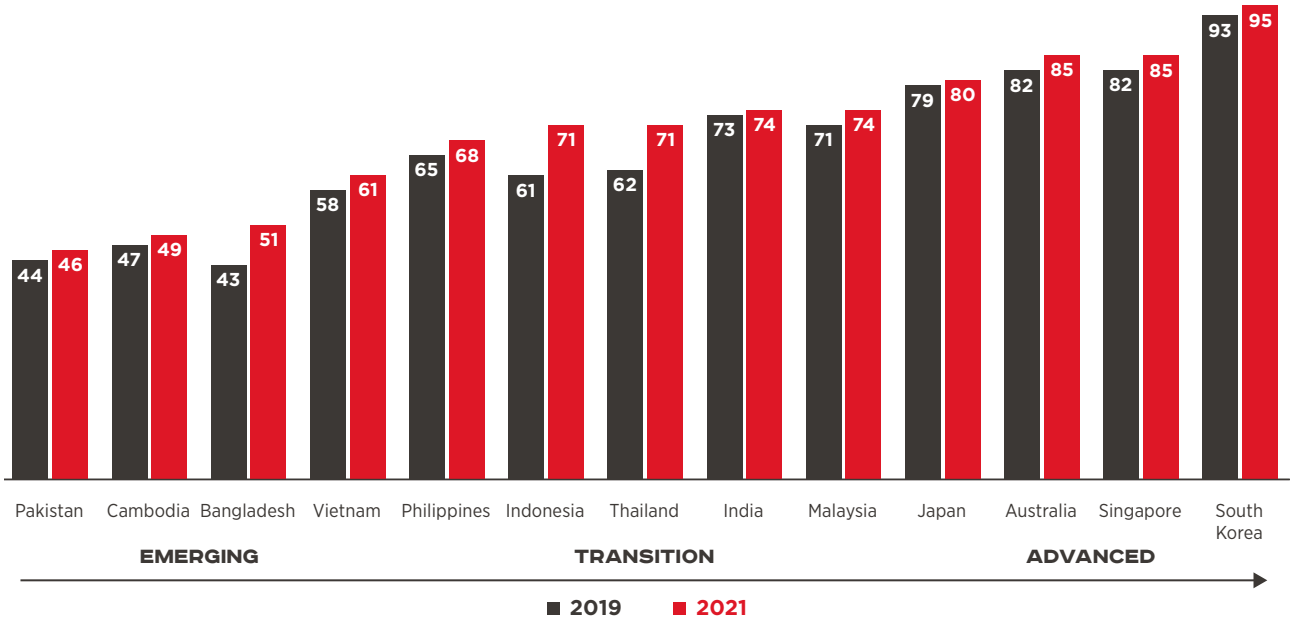
Digital identity scores



Source: GSMA Intelligence

Figure A4

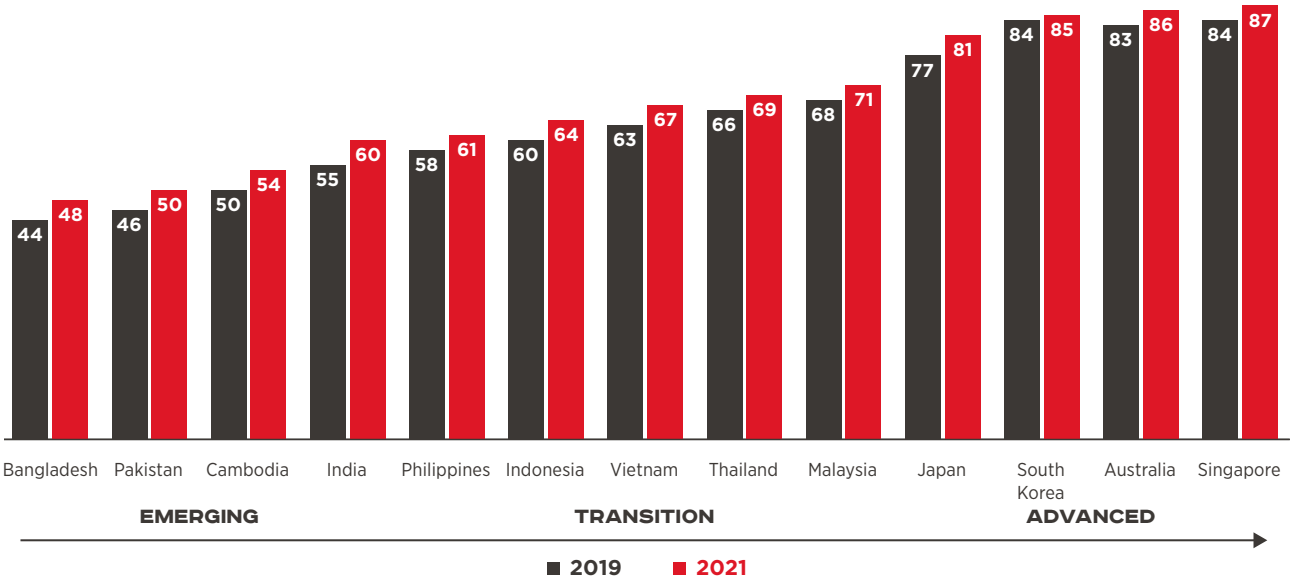
Digital citizenship scores



Source: GSMA Intelligence

Figure A5

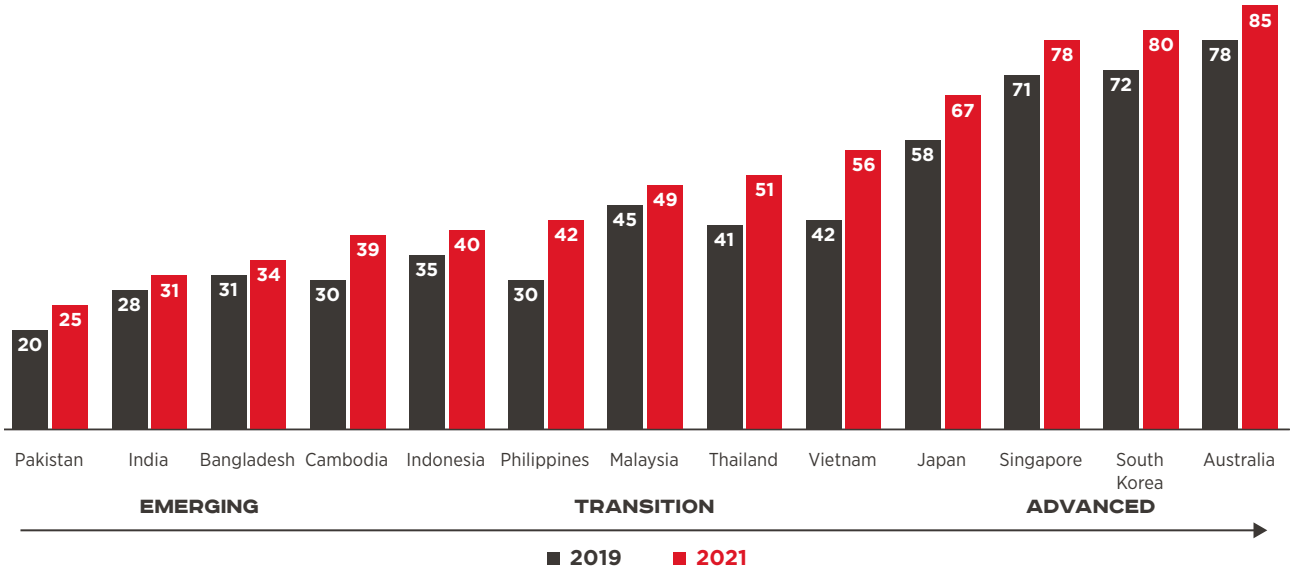
Digital lifestyle scores



Source: GSMA Intelligence

Figure A6

Digital commerce scores



Source: GSMA Intelligence

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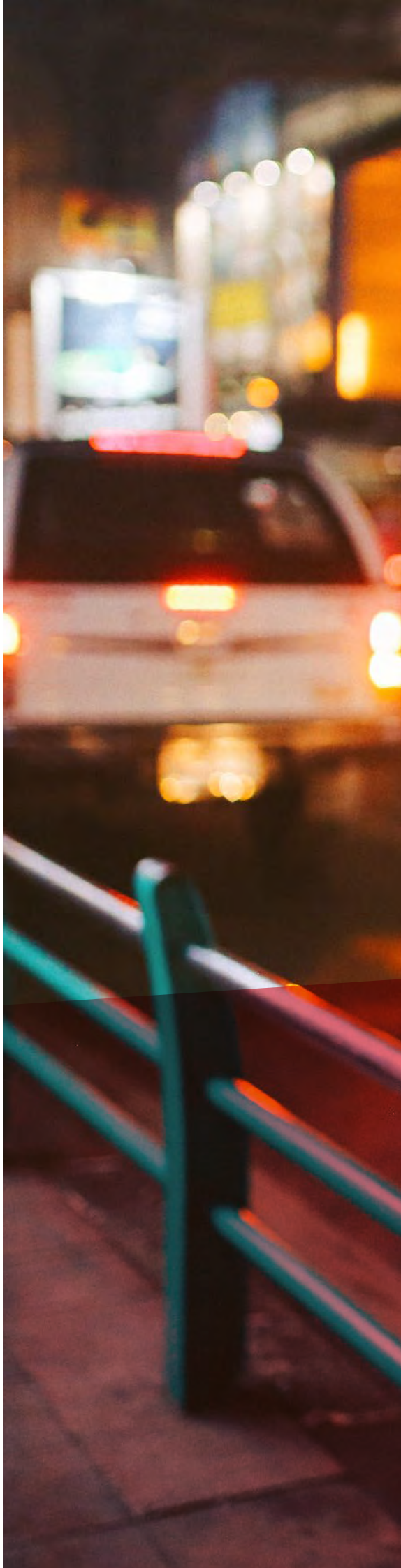

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