



Building digital societies in Asia



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1 Executive Summary

1. The concept of a digital society centres on the interaction between governments, businesses and citizens via digital technologies, accompanied by social and economic benefits around efficiency and productivity gains, as well as the improved well-being and living standards of citizens. At a more advanced level, citizens living within a digital society are connected to disparate industries, institutions and infrastructures simultaneously over a digital platform, and are able to interact with them in new ways that create value for all the parties involved. This relies on individual access to digital technologies by citizens and businesses, which enhances convenience, flexibility and user engagement, particularly for personalised solutions, compared with shared access in public outlets such as Internet kiosks.

Digital services have the potential to help solve key challenges faced by Asian countries; many countries are struggling to cope with mounting social and economic challenges occasioned by rapid population growth, lack of access to essential services, inefficient utilisation of available resources, increasing pressure on existing infrastructure and services, and huge humanitarian and economic costs from natural disasters. Digitisation enhances access to various services for underserved citizens and creates new growth and expansion opportunities for businesses within a digital society. However, the region's digital society landscape is very diverse, both in the level of connectivity of citizens and in the evolution of digital services. We have grouped countries in the region into three categories of a digital society – advanced, transition and emerging – to reflect the evolution of digital services. Generally, the highly connected countries have a wider range and higher uptake of digital services, underscoring the need for adequate connectivity for a digital society to function effectively.

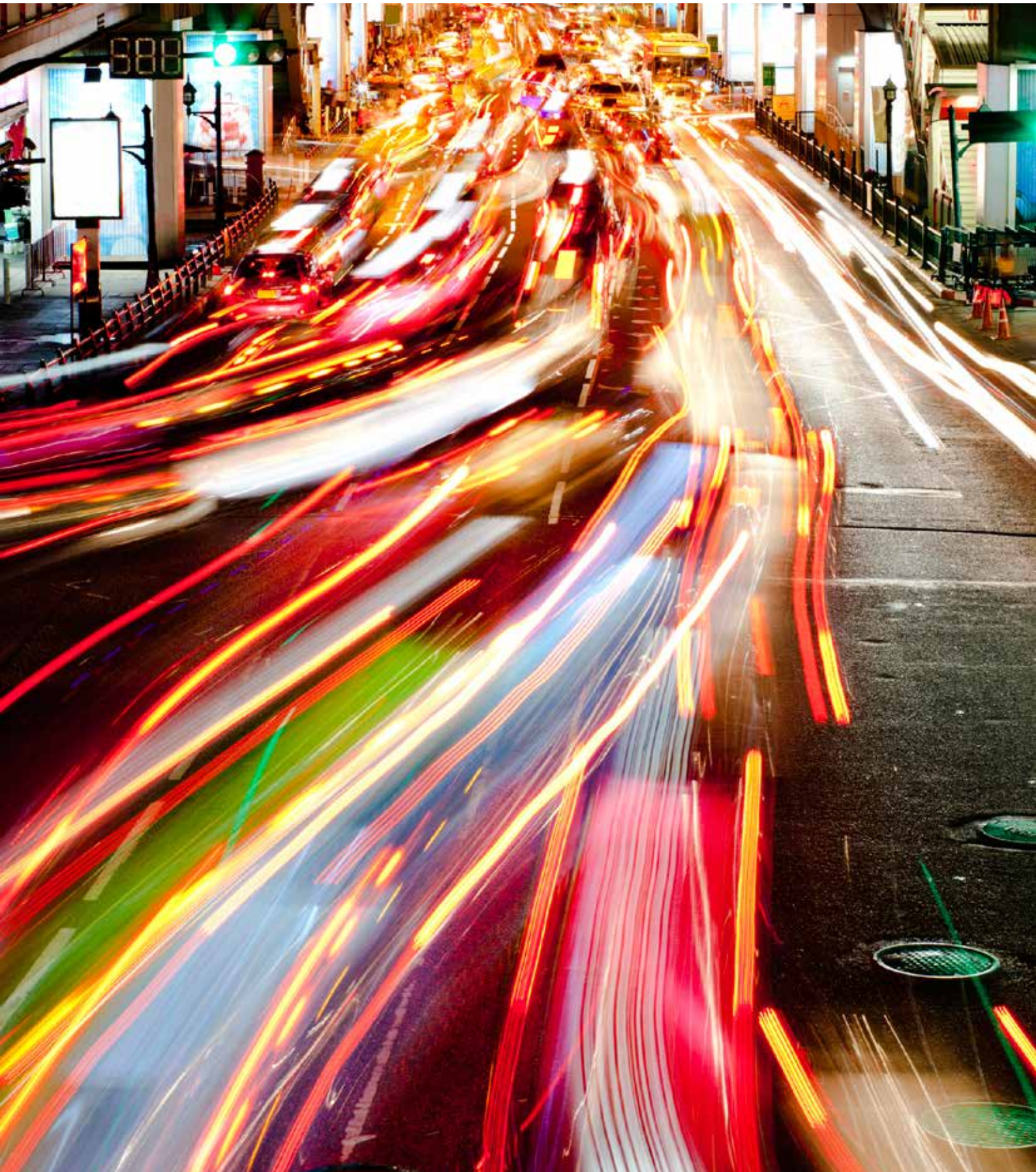
2. Mobile technology is well-suited to deliver the required connectivity and content for a digital society, due to the capability of wireless networks to cover a wide area with greater efficiency and at lower costs than many other technologies. This is particularly true in emerging countries with underdeveloped fixed network infrastructure and low levels of urbanisation. Furthermore, mobile technology has evolved considerably over the last decade with the development of high-speed mobile broadband technologies, and the increasing availability and affordability of high specification devices capable of supporting a variety of feature-rich content and value-added services.

Mobile is increasingly seen as a transformative technology in emerging markets, generating measurable economic, social and cultural value, whether through increased productivity, a rise in employment rates, tighter security, or more efficient and wider-reaching social services. This ultimately leads to improved citizens' wellbeing as public institutions leverage digital platforms and ICT solutions to extend essential services to the grassroots level.

Mobile operators are in a unique position to help enable the implementation of a digital society by exploring opportunities to expand their portfolio to services beyond just the provision of connectivity. By becoming actively involved in areas such as data management, service delivery and customer management, mobile operators can support the development and delivery of digital services, and in turn benefit from an increased number of connections on their network and the potential for additional revenue through value added services.

3. A digital society relies on a number of interdependent enablers to function effectively. These are; i) a critical mass of digitally literate citizens that can access and can afford various services and devices, ii) a variety of relevant content and applications that address local challenges, iii) a robust infrastructure on which digital services can be created, distributed, stored and utilised, and iv) an environment that supports innovation and investment.

Given the importance of connectivity, there is a clear need to make sure that the technology and infrastructure, particularly mobile infrastructure, in a country meets the demands of a digital society. This will be achieved by eliminating barriers to investment around access to spectrum and the imposition of tax. Key stakeholders, including governments and operators, also need to work together on awareness building campaigns for digital services, which should be easy to use and accessible via multiple channels and languages that meet the requirements of local users. The role of the government in establishing a digital society does not stop at creating an enabling environment. It should also include an assertive push for the digitisation of public services, which touch all individuals and businesses within a country and, therefore, can serve as a catalyst for the uptake and usage of digital services by citizens across different demographics and income levels. Using the digital society initiatives and/or economic aspirations of six countries in the region – **Bangladesh, India, Indonesia, Malaysia, Pakistan** and **Thailand** – we highlight the main factors that need to be in place to establish a digital society and the socioeconomic benefits thereof.



2 Context: Lack of inclusion fuels socioeconomic challenges

Governments in Asia have made attempts to tackle social and economic challenges in their countries through increased expenditure on physical infrastructure and services. However, inefficient utilisation of scarce resources, huge amounts of time spent in traffic across major cities in the region, significant gaps in essential services such as education and healthcare, and poor disaster management, often results in considerable productivity losses.

Societies in Asia face a variety of socio-economic challenges that need addressing to engender inclusive growth and sustainable development. Large swathes of the population in some countries in the region, particularly in rural areas, lack access to many essential services, including health, education and financial services. Consequently, there is growing rural-urban migration which puts additional strain on existing urban infrastructure and services such as transportation, utilities and housing, amid limited resources for capacity expansion.

These issues are further compounded by rapid population growth, with the potential for high youth unemployment in the future (the ILO projects youth unemployment in the region to rise to 12% by 2018, from 11.4% in 2014¹), and frequent natural disasters

with attendant economic and humanitarian costs. In 2014, the Asia Pacific region had an estimated population of 3.97 billion, a figure that is expected to rise to nearly 5 billion by 2050² at current growth rates. Six of the ten most populated countries in the world are in Asia (see Figure 1), five of which have more than 40% of the population still living in rural areas prone to natural disasters, such as flooding, and lacking access to essential services. Over half of the world's 226 natural disasters in 2014 occurred in the Asia Pacific region, resulting in economic losses of \$59.6 billion, according to the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)³.

1. Source: ILO: Global Employment Trends 2014

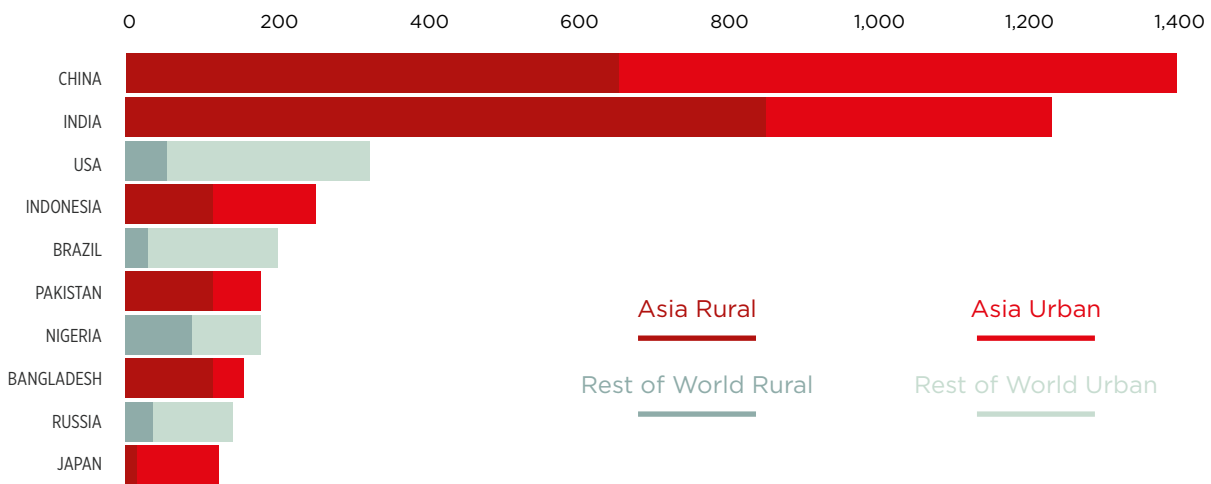
2. Source: World Bank

3. Source: Natural Disasters in Asia and the Pacific: 2014 Year in Review report

Figure 1

Source: GSMA Intelligence

Large rural populations in Asia (Millions)



Governments in the region have stepped up investments in physical infrastructure and services to tackle these issues, but in many cases public spending is not sufficient to meet actual requirements. For example, public spending on education in developing countries in Asia averages 2.9% of gross domestic product (GDP) compared to 5.3% in the advanced economies. The difference is starker for health care: 2.4% in Asia versus 8.1% in advanced economies⁴. Furthermore, continued productivity losses, despite public and private spending on infrastructure and services, as well as the thinning of available resources, strengthens the case for a different approach to managing the socioeconomic challenges in the region.

One practical approach is to leverage advancements in information and communications technology (ICT) and enhanced connectivity among citizens to create solutions that can increase the level of engagement between governments, businesses and citizens, improve service delivery, drive efficiency in resource utilisation, stimulate economic diversification, create new jobs, and increase overall productivity. Generally referred to as a digital society, the digitisation of various services under this approach has the potential to generate substantial social and economic benefits, such as accelerated economic growth and development, better organisational performance for public and private institutions, and improvement in the overall wellbeing of citizens.

In recent years, some governments in Asia have articulated digital society initiatives as part of their medium- to long-term economic development goals. While this is a step in the right direction, the attainment of these goals heavily depends on a set of key enablers, such as unrestricted individual access to high-speed connectivity and relevant solutions to tackle local challenges.

As part of a series of three reports looking at the digital society initiatives of Asian countries and the potential social and economic benefits from the digitisation of various services, this report takes a high level view of developments in six countries in the region – Bangladesh, India, Indonesia, Malaysia, Pakistan and Thailand. Two subsequent reports in the series, published later on this year, will take a deep dive into specific applications within a digital society. The first - Building digital societies in Asia: making transportation smarter - will highlight the opportunities and benefits of the digitisation of transport infrastructure, with a focus on Thailand. The second - Building digital societies in Asia: making commerce smarter - will discuss developments in digital commerce, with a focus on Pakistan.

4. Asian Development Bank (ADB)

3 What is a digital society?

A digital society revolves around the seamless interaction between all aspects of an individual's life via digital technologies. Citizens living within a digital society can access and interact with public and private services, such as utilities, education, health and transportation, anytime and anywhere, leading to increased efficiency and productivity not just for themselves, but for the institutions with which they engage. Personal or household/business connectivity is crucial to achieving a digital society as it increases users' engagement with various services, provides convenience and flexibility of use, and addresses concerns over security and privacy in accessing personalised services.

The advancements in ICT over the last two decades has changed the way people and institutions create, distribute and consume information. The integration of various activities at home, work, education and recreation via digital technologies has the potential to empower citizens with relevant and current information to enable them to maximise their capabilities and enhance their skills, and equip institutions to achieve higher levels of productivity. Governments are taking advantage of this development and emerging business models to increase their engagement with citizens and businesses, creating value for the wider society through improved service delivery and organisational performance.

At a more advanced level, individuals living within a digital society are connected to disparate industries, institutions and infrastructures, such as public services, utilities, education and health institutions, and transportation, simultaneously over a digital platform and are able to interact with them in new ways and more efficiently.

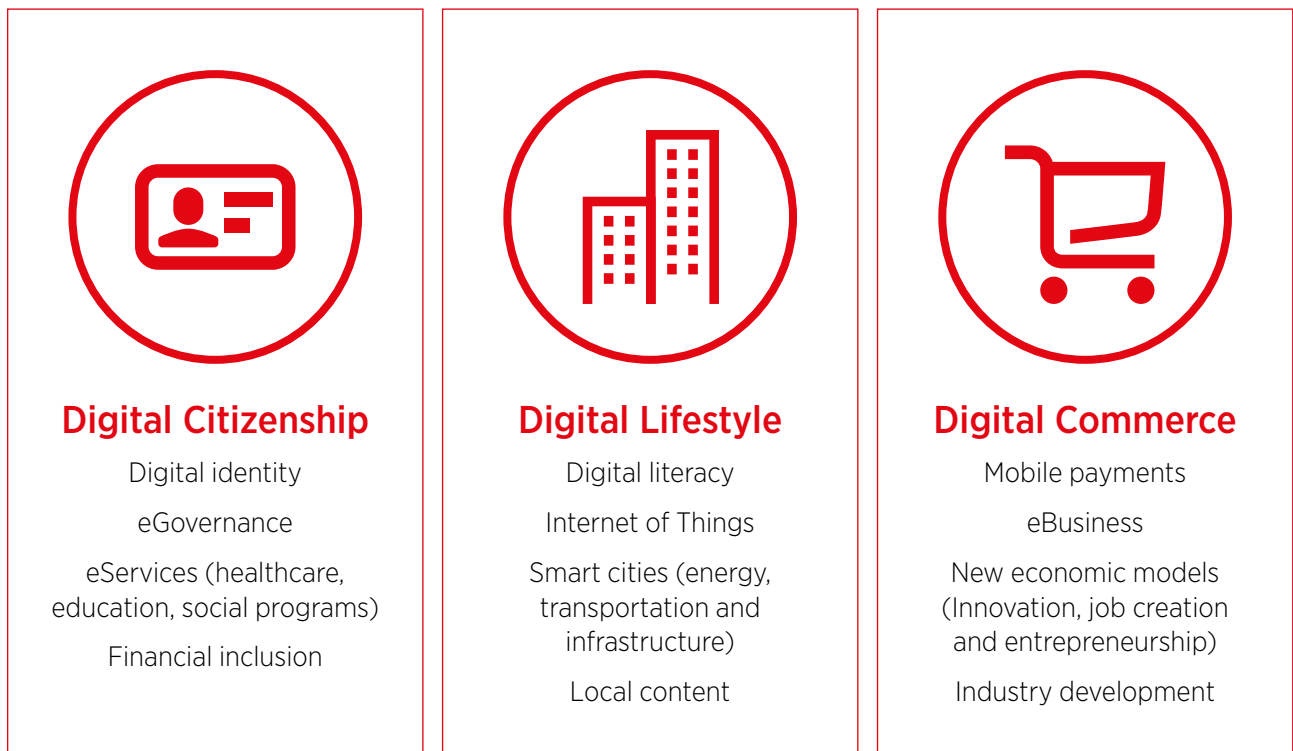
Productivity gains and cost savings are two major benefits of a digital society. These are important outcomes when viewed against the backdrop of increasing demand for various services, partly due to population growth and increasing urbanisation as earlier discussed, and limited resources for capacity expansion. Other benefits relate to the improved wellbeing and living standards of citizens. For example, improved access to healthcare and education through digital solutions leads to higher quality of life for individuals and their families, and fuels a virtuous cycle that positively impacts the economic growth of a country, creates more jobs and reduces poverty.

The range of services in a digital society fall within three broad, interrelated pillars, shown in Figure 2.

Figure 2

Source: GSMA Intelligence

The three pillars of a digital society





DIGITAL CITIZENSHIP

Digital citizenship increases the interaction between a government and its citizens by facilitating the efficient delivery of public services and timely dissemination of

relevant information. A first step in digital citizenship is digital identity. This gives a government accurate data on its citizens and forms the foundation for the provision of personalised digital services throughout the lifetime of an individual, from birth registration and healthcare services during childhood, through education, employment and tax services during school and working age, and pensions and social benefits in retirement. It also creates new financial inclusion opportunities for citizens who otherwise would struggle to access various essential services due to a lack of a reliable identification and banking infrastructure.

For governments, digital citizenship creates an opportunity to broaden the revenue base – a critical need in many developing countries –

by bringing previously undocumented citizens and informal businesses into the tax net and also by increasing trust in public services administration among citizens through improved transparency, accountability and communication of government activities and expenditure. Digital citizenship also increases citizens’ participation in governance through solutions that allow them to express their opinions about various public and private services. For example, the Malaysian government uses a mobile app to receive complaints from citizens against unreasonable prices by traders, as part of its efforts to track traders who overcharge their customers.

Many countries have found ways to measure the economic benefits of digital citizenship services. In the UK, the government estimates that the savings in direct government expenditure from its digital strategy, also known as Digital-by-Default, could reach £1.7 billion per annum. The government is also on track to achieve £1.2 billion savings for the period 2010-15 across departments converting to digital transactions⁵.

USE CASE: ESTONIA

OVERVIEW

The government of Estonia has implemented the most comprehensive digital citizenship initiative to date. Over the last 15 years, the e-Estonia initiative has successfully digitised key government services and citizens’ civic duties. From e-elections, e-taxes, e-police to e-healthcare, e-identity and e-school, Estonians have largely become digital citizens. The ‘X-Road’ data exchange infrastructure launched by Estonia’s Information System Authority links all the country’s decentralized public and private databases, and is one of the key elements behind the country’s digital society initiative. The other key element is the chip-enabled ‘eID’ card – the nationally standardized system of online authentication and digital signing. With near universal mobile adoption, eID is augmented by Mobile-ID, negating the need for carrying smart card readers. With this infrastructure in place, e-Estonia delivers a vast range of government services to all stakeholders, including citizens and businesses.

IMPACT

The e-Estonia initiative has resulted in four marked impacts: 1) unprecedented levels of transparency and accessibility in government; 2) safe, convenient and flexible exchange of private, public and corporate data; 3) healthier, better educated population with easy access to social services; 4) a prosperous environment for business and entrepreneurship. Presently, more than 90% of the 1.3 million Estonians have E-ID cards. Apart from authentication (m-ID), other examples of mobile e-government services increasingly used by citizens in Estonia are paying parking charges (m-Parking), and purchasing tickets on public transport without cash (m-Ticket). Further, 94% of tax returns were filed via the e-Tax Board in 2011 while a quarter of the votes in the 2011 parliamentary elections were cast over the Internet. Estonia plans to have 10 million total users (including citizens and foreigners) of the e-Estonia platform by 2025.

5. Source: Digital Efficiency Report, Cabinet Office, November 2012



DIGITAL LIFESTYLE

The concept of the Internet of Things (IoT) is central to the establishment of a digital lifestyle. This is demonstrated by the integration and interconnection of multiple

devices with disparate services and infrastructure over digital networks, and the ability of individuals and institutions to interact with them remotely and simultaneously. A combination of growing wealth and digital literacy often drives demand for new technology-enabled solutions by consumers to suit their changing lifestyle. These solutions, which are accessible over digital platforms, enables them to interact with an array of devices and services, from home appliances and utility meters to in-vehicle navigation and freight tracking.

IoT has taken off in many developed countries, where multiple industries have been interconnected to drive efficiency in the production, distribution,

storage and consumption processes, and is also gaining momentum in many developing countries, driven by increasing digital literacy and localised content and solutions. This has the potential to bring substantial social and economic benefits to governments, citizens, and businesses through the creation of new jobs, increase in productivity and competitiveness, and more efficient use of scarce resources.

Smart cities rely on the concept of IoT, and are developed either as purpose-built projects or as existing cities whose infrastructure and services have been retrofitted with technology to make them smarter. South Korea's \$35 billion Songdo smart city project, built on 600 hectares of land and equipped with integrated infrastructure, is an example of a purpose-built project, while the Dubai smart city project, which integrates key service areas such as transportation, security, infrastructure, utilities, education, health and recreation, typifies the transformation of an existing city into a smart one.

USE CASE: SEOUL, SOUTH KOREA

OVERVIEW

Seoul is the capital of South Korea and the country's largest city with population of 10 million people. In June 2011, the city's authorities launched 'Smart Seoul 2015', a smart city initiative to incorporate ICT in the city's development strategies. Supported by advanced ICT infrastructure, including free Wi-Fi in public places and mobile data networks, the city administration and other institutions developed a wide range of digital services, including;

- **Smart Work Centres** – system that enables government employees to work from 10 offices close to their homes
- **Community Mapping** – open governance model for increased citizen participation in the administration of the city
- **Smart Metering** – efficiency improvement initiative to reduce the city's total energy use by 10%
- **U-Seoul Safety Service** – a project that integrates location-based services and CCTV technologies with communications networks to notify authorities and family members of emergencies involving children, the disabled, the elderly, and those suffering from Alzheimer's disease.

IMPACT

Mobile technology is a key part of Smart Seoul. Through the m.Seoul apps, government agencies provide the city's residents with 62 unique services accessible on more than 10 types of mobile devices. m.Seoul apps also support location-based services pinpointing nearby public offices, restrooms, hospitals, supermarkets and bus stations. Other services include live real-estate listings, daily job-search updates, and notifications of free cultural events. The average number of m.Seoul users increased from under 50,000 per month in 2007 to more than six million per month in 2014, according to the Seoul Metropolitan Government, supporting Seoul's top 10 ranking among global cities in a variety of indices, including e-Governance, labour productivity and city competitiveness.



DIGITAL COMMERCE

Digital commerce simplifies financial transactions between individuals and organisations. In developed countries, digital commerce is primarily used as an alternative channel

to perform various financial transactions, such as paying taxes and bills, purchasing goods and services, and accessing existing bank accounts. In many developing countries, where access to traditional forms of banking services is limited, the focus is more on financial inclusion, with mobile-based digital commerce giving some citizens their only access to formal financial services. In both developed and developing countries, digital commerce has created new economic models and reshaped business processes across many industries, including financial services, entertainment, retail and public services.

Small and medium-sized enterprises (SMEs) are key beneficiaries of digital commerce, which significantly increases their reach and potential

customer base. In a digital society, businesses utilise online platforms to showcase and promote their products, and customers use the same medium to search, purchase and track the delivery of products. Digital commerce also plays a key role in the delivery of digital citizenship and digital lifestyle services, enabling governments, businesses and citizens to close financial transactions in a secure and efficient manner.

Globally, mobile technology is playing an increasingly important role in digital commerce, with most countries seeing a faster growth in online transactions via tablets and smartphones, compared to desktops. The deployment of mobile money solutions (there were more than 255 mobile money services across 89 countries in 2014⁶) is helping to drive this growth, particularly in developing countries. In the transport industry, mobile-based technologies, such as NFC (near field communication), now allows travellers to store electronic versions of their tickets on their mobile devices. This saves time, lowers sales and distribution costs, and eases congestion at departure points.

USE CASE: KENYA

OVERVIEW

Kenya's biggest mobile operator Safaricom launched its M-PESA mobile money service in 2007, taking advantage of the increasing uptake of mobile services and low banking penetration in the country to offer a solution that extends financial services to large swathes of the population without access to traditional financial institutions. Over the years, M-PESA has evolved from a basic person-to-person remittance service to a digital commerce suite, facilitating a wide range of digital transactions between public institutions, private businesses and individuals. In 2015, Safaricom launched M-PESA debit cards and point of sale terminals to enable users to pay for government services and taxes, in line with the government's plan to use digital technologies to improve efficiency and curb corruption. The Kenyan government expects financial transactions between public institutions and citizens, including tax, bills, fines, and business registration payments, to be done electronically in the next few years.

IMPACT

Safaricom is not the only mobile money service provider in Kenya. Competition from other service providers is helping to drive growth and make the service more accessible and available for consumers. In 2014 the total value of mobile money transactions in Kenya reached KES2.372 trillion (\$24.7 billion) across 86 million transactions⁷. Although online transfers and credit/debit card payment are on the rise in the country, the mobile money platform will play a major role in the digital commerce space given its potential to reach more consumers compared to other solutions.

Safaricom saw strong growth in person-to-business (64%) and business-to-business (83%) transactions in the six months to September 2014, compared to 20% for person-to-person transactions, highlighting the potential of mobile-based digital commerce.

6. Source: State of the Industry: Mobile Financial Services for the Unbanked, GSMA, 2014
7. Source: Central Bank of Kenya

3.1 Digital societies in Asia: A diverse landscape

Asia is arguably the most diverse region in the world in terms of economic and ICT development. The region is home to some of the world's biggest economies and most connected countries. In contrast, it also contains a number of countries with very low connectivity levels and relatively small economies.

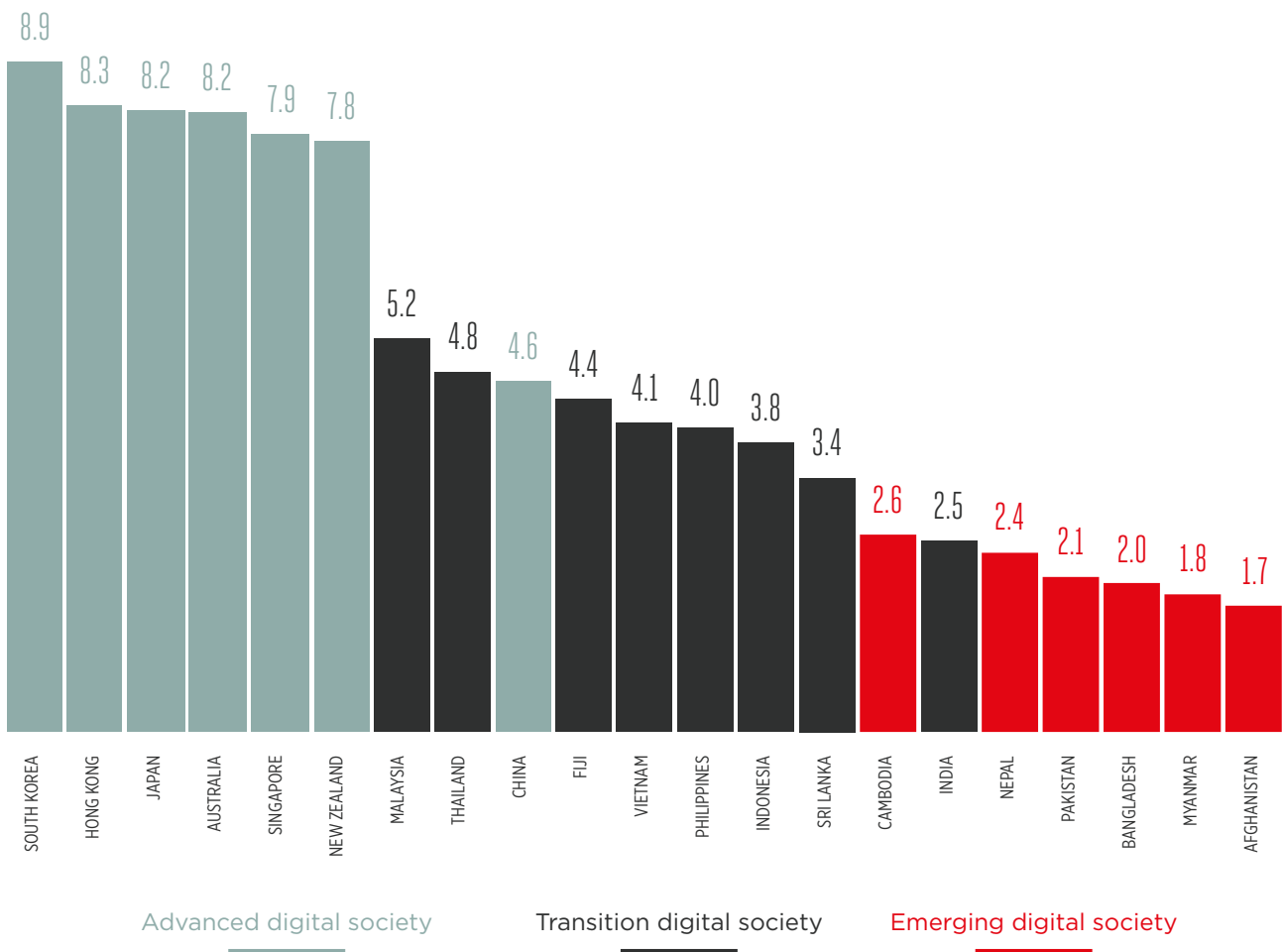
The 2014 ITU ICT Development Index (IDI) reflects the regional diversity among Asian countries in terms of connectivity. Six countries in the region – South Korea, Hong Kong, Japan, Australia, Singapore and New Zealand – are ranked among the top 20 most connected countries globally, while India, Pakistan, Bangladesh and Myanmar are among the countries from the region that fall into the least connected countries (LCC) category (see Figure 3).

Figure 3

Source: ITU, GSMA Intelligence

ICT development index

(Asia Pacific, 2013)



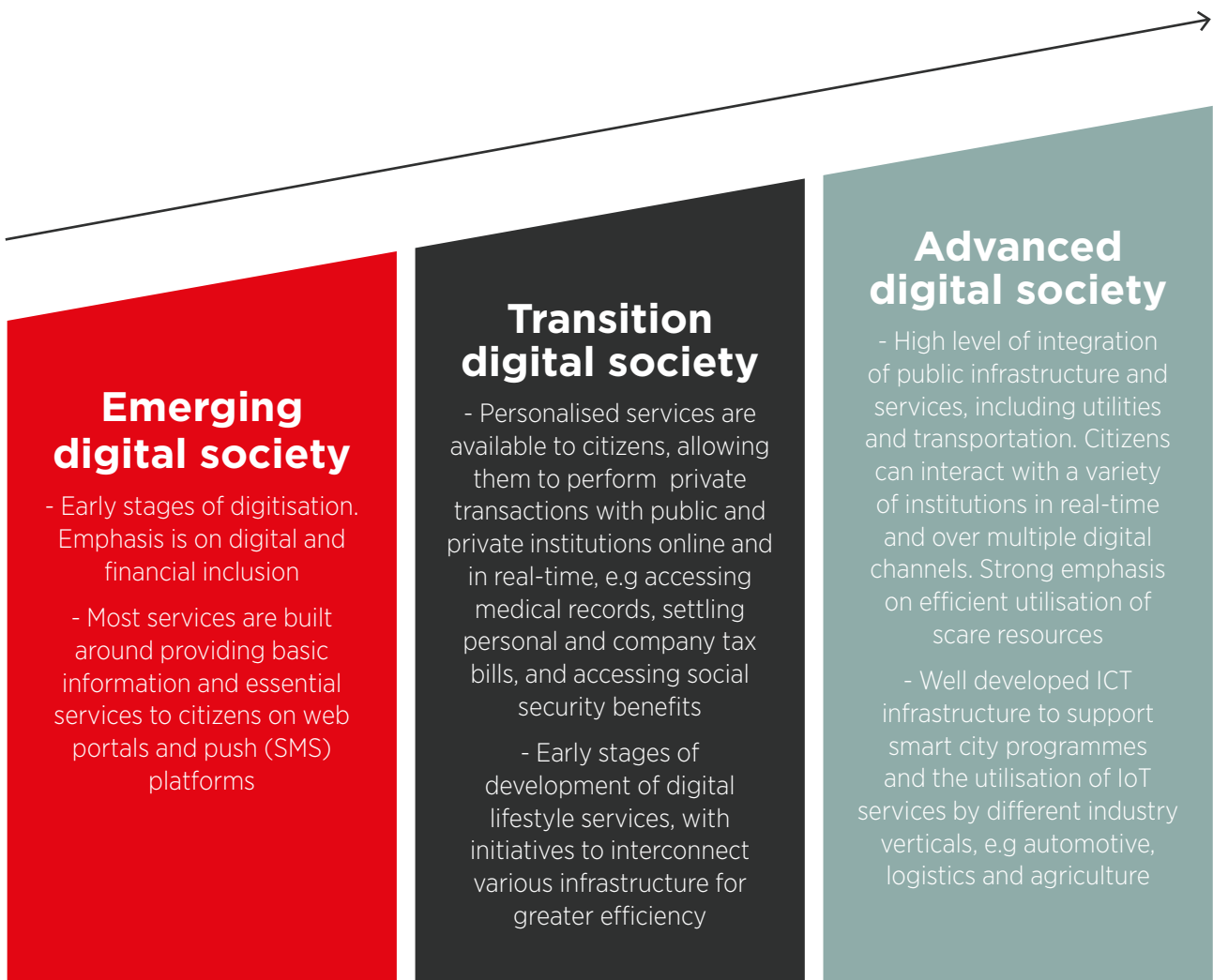
As a digital society is a function of connectivity and income levels, it is not surprising that the most connected and wealthiest countries in the region also have the most developed digital society services in place. For the purpose of this report, we have divided the countries in the Asia region into three broad categories - advanced digital society, transition digital society, and emerging digital society - based on the evolution of digital society services (see Figure 4).

The advanced digital society countries have highly developed and integrated digital platforms in place for digital citizenship, digital lifestyle and digital commerce services. Here, the emphasis is on improving efficiency in the utilisation of scarce resources. For example, countries in this category are investing heavily in IoT solutions, such as smart meters, to manage the distribution and consumption of utilities amid rising domestic and business demand. For this reason, we classify China as an advanced digital society, ahead of Malaysia and Thailand, due its efforts in developing high-level IoT and smart city solutions (see Figure 5).

Figure 4

Source: ITU, GSMA Intelligence

Digital society evolution



In contrast, most services in countries that fall into the emerging digital society category centre on digital citizenship and, to a lesser extent, digital commerce, with the primary goal of increasing citizens' engagement with the government and driving digital and financial inclusion. For these countries, the provision of essential services, such as healthcare, education and financial services, which are otherwise not easily accessible due to a lack of infrastructure, poor logistics and lack of affordability, is top priority.

The transition digital society countries sit between the emerging digital society countries and the advanced digital society countries. The key difference between transition and emerging digital society countries is the personalisation of services in the former, which leads to higher levels of engagement between individuals and institutions. For example, in a transition digital society citizens can access private medical records or settle tax bills online, in addition to obtaining basic healthcare or tax information from government portals. Despite recording a slightly higher score in the IDI than India, we have classified Cambodia as an emerging digital society country mainly because personalised services are yet to take off in that country. Although the provision of essential services is still an important part of the digital society initiatives in transition countries, there is a greater focus on efficiency savings from the delivery of services over digital platforms.

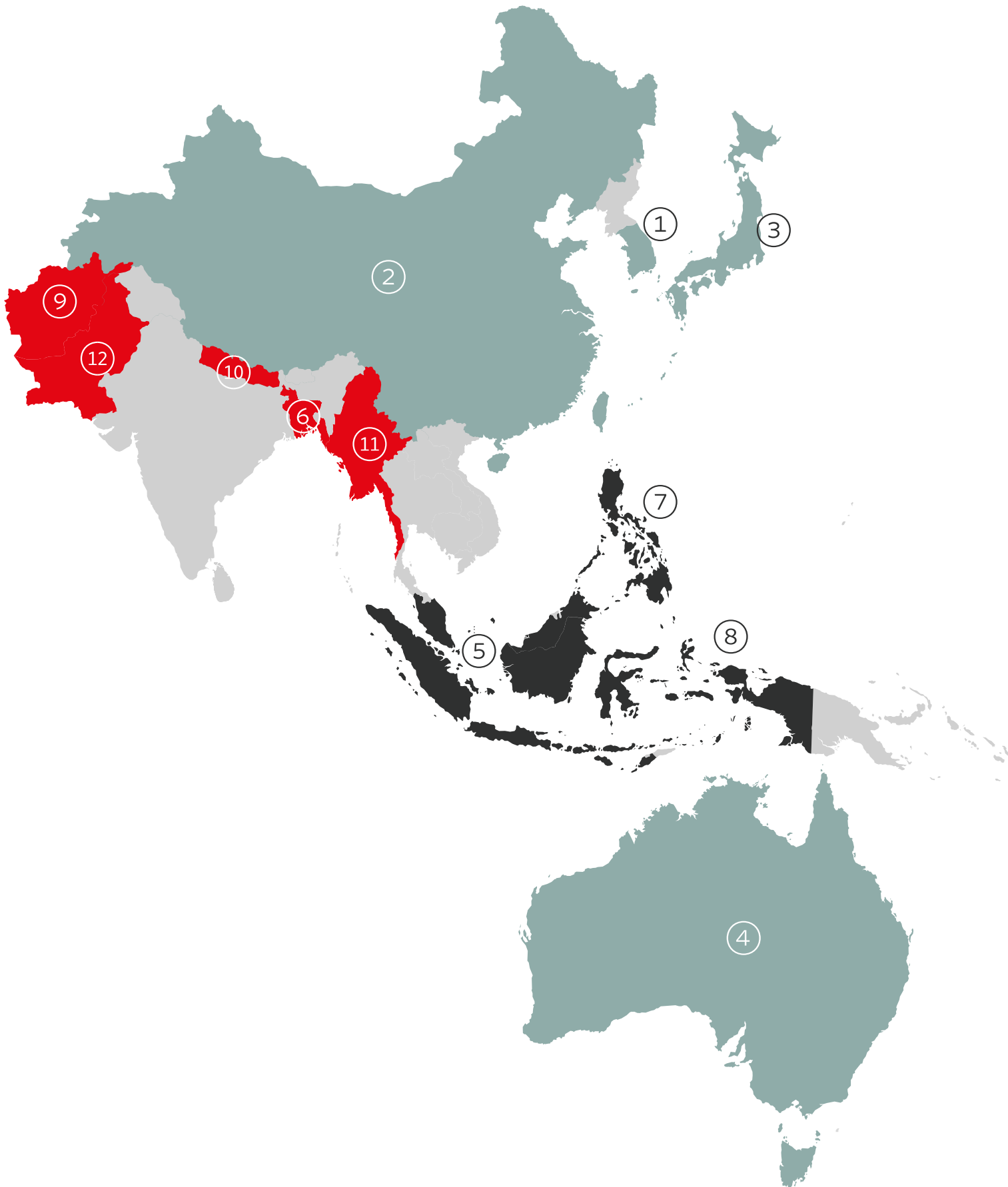
Some transition digital society countries have taken steps to build next generation ICT infrastructure and invest in large-scale digital lifestyle solutions. India plans to transform around 100 existing cities into smart cities. In April 2015, the Cabinet approved the initiative and a five-year budget of INR48 billion (\$7.6 billion). As part of the project, each selected city will get INR1 billion (\$158 million) every year for five years from the central government, while state and local governments will be required to match these resources by at least 50%. Smart cities will be selected based on their ability to improve quality of life and provide a sustainable environment by using technology. In Malaysia, the government has tasked the state utility Tenaga Nasional Bhd (TNB) to deploy smart grid systems as part of plans to advance the goal of greater energy security across Malaysia as demand for power grows. Examples of digital services launched in countries that fall under the categories of a digital society in Asia are highlighted in Figure 5.

Figure 5

Sample digital society projects in Asia

ADVANCED DIGITAL SOCIETY	TRANSITION DIGITAL SOCIETY	EMERGING DIGITAL SOCIETY
<p>01. South Korea plans to build a nationwide smart grid system to reduce its emissions by monitoring energy use more carefully. The grid could lower the country's greenhouse gas emissions by 40 million tonnes annually while reducing overall energy use by 3% and lowering the peak load for electric power by about 6% when completed in 2030</p>	<p>05. Malaysia built a government lab to analyse data from different agencies and find ways of using the data to improve public services. The lab is part of a wider national Big Data Analytics Innovation Network. Another project with the Dept. of Irrigation and Drainage looks at data from sensors and feedback from the public on social media on flooding and irrigation-related issues</p>	<p>09. The Afghanistan government, in partnership with mobile operator Roshan, has implemented a mobile money service that enables money transfer over the operator's network to remote parts of the country. Some of the essential services available on the platform are electricity bill payment by citizens and salary payment to members of the security forces</p>
<p>02. China plans to install more than 60 million smart electricity meters, designed with free SMS alerts and load management systems, for early detection of overloading problems and cutting the risk of equipment failure at peak periods. China will also install smart water meters as part of a \$294 billion investment to help manage its water resources</p>	<p>06. The Asian Development Bank (ADB) is supporting a solution that will help government officials in the Philippines, and also in Bangladesh to use digital tools to prepare and respond to natural disasters. The solution uses OpenStreetMap and smartphone apps to collect information for pre-disaster planning, evacuations and timely delivery of relief</p>	<p>10. Nepal is digitising the citizen certificates issued by the District Administration Offices (DAO) to help maintain and update information on citizen certificates. The project would computerise the data of citizenship certificates from all 75 DAOs, five Regional Administration Offices (RAOs), and two Area Administration Offices</p>
<p>03. Japan expects the country's utilities to install smart meters in all households by March 2025 to encourage customers to save power by monitoring their usage in real time. Japan's 10 major utilities have kicked off widespread smart meter rollouts and expect 78 million units to be in place for residential and low-use customers by the government's deadline</p>	<p>07. Philippines plans to make 144 cities smarter by building out ICT infrastructure to connect systems, and share and analyse data for real-time responses to various scenarios. Cauayan, one of the planned smart cities, has been equipped with an e-government system, a computerised police clearance process and a city ID system</p>	<p>11. With support from the World Bank, Myanmar is building a national portal to provide citizens, businesses and visitors with a single online window for government information and services. Users will also be able to provide suggestions and feedback about poor service delivery or incidents of corruption, and transact services over a safe digital platform</p>
<p>04. New South Wales state in Australia is providing customers with real-time data on the waiting time at its service centres. The data is updated every few minutes and is available for 30 service centres. The information can be accessed through a mobile app and web site, allowing citizens to see how long they'll have to wait before deciding whether to visit a service centre.</p>	<p>08. Residents of Jakarta in Indonesia can now report flooding directly to the city's disaster management agency through a mobile app and view updates from others on their smartphones. People can share updates on rainfall, river level and flooding, attach photos to their reports, share their reports on Twitter and Facebook, and receive early warnings from the city's disaster information system</p>	<p>12. Pakistan used digital technologies to tackle an outbreak of dengue in 2013. The government deployed smartphones to workers to enable them upload and geo-tag photos on the go. Data was transmitted in real-time to a centralised server and the work of more than 25 departments could be viewed on a consolidated dashboard. A total of 407,000 activities were reported over the portal.</p>

Source: GSMA Intelligence



Digitisation can unlock huge social and economic benefits for Asian countries and help governments in the region to tackle some of the challenges they face. Some governments have articulated national aspirational plans around economic growth and development, job and wealth creation, and citizens' wellbeing, all of which could benefit from the digitisation of services and increased connectivity of citizens. For example, countries with large populations and a civil service struggling to meet the growing demand for various public services could see a significant improvement in service delivery, greater accountability among workers, and a more efficient use of resources from the digitisation of government services.

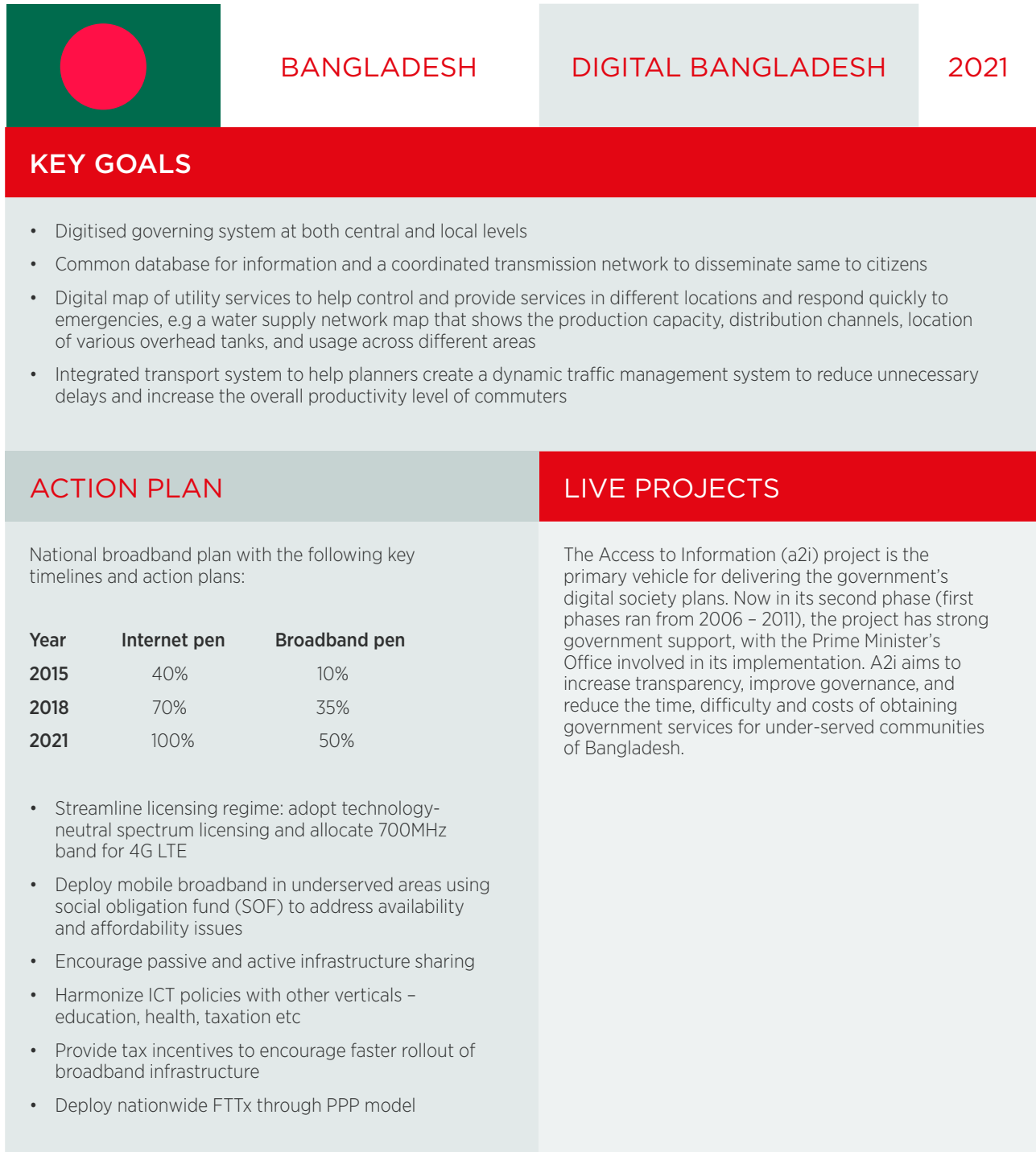
Using developments in six (four transition and two emerging digital society) countries in the region, we take a closer look at various digitisation and national aspiration plans, the potential social and economic benefits thereof, and the key enablers that need to be in place for a digital society. The focus countries are Bangladesh, India, Indonesia, Malaysia, Pakistan and Thailand. We selected these on the basis of ongoing or planned digital society and/or national aspirational plans they intend to implement over the next decade. These countries also demonstrate the application of various digital services at various stages of ICT and economic development, from digital inclusion and eServices in Bangladesh and Pakistan, to smart city projects in Malaysia and Thailand.

The key elements of the plans in the six countries are summarised below. Digital citizenship and digital commerce are high on the agenda for all six focus countries, underlining the intention of governments in the region to find efficient ways of improving service delivery and increasing their engagement with citizens.

Figure 6

Source: GSMA Intelligence

Overview of government initiatives for a digital society





KEY GOALS

- Digital India aims to provide lifelong unique and authenticable digital identity for all citizens, which would enable them access a wide range online services within a safe environment. The integration of the services of various government departments under the initiative would also allow citizens access services in real-time and over multiple channels
- The 3 main focus areas of the initiative are;
 - Digital infrastructure
 - eGovernance and eService delivery
 - Digital empowerment

ACTION PLAN

Digital India is based on 9 pillars:

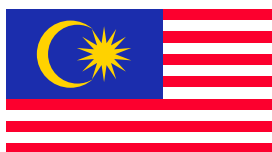
1. Broadband highways
 - a. Broadband access in 250,000 Gram Panchayats, reaching 600 million rural dwellers by 2016
 - b. Communication infrastructure in new urban developments
 - c. Nationwide coverage of information infrastructure by 2017
2. Universal access to mobile connectivity
 - a. Mobile services to reach 42,300 unconnected villages by 2018
3. Public Internet access programme
 - a. Community service centres (CSCs) in 250,000 villages by 2017
 - b. Convert 150,000 post offices into service centres by 2016
4. eGovernance: digitisation of government services
 - a. Use ICT to re-engineer government services and transactions
 - b. Digitise public databases and automate workflows
 - c. Establish feedback loop to address persistent problems
5. eKranti: digitisation of service delivery
 - a. digitise service delivery across key sectors, including education, agriculture, healthcare, security, judiciary and financial services
6. Information for all
 - a. Open data platform and 2-way communication between citizens and government, using social media and web-based platforms
7. Electronics manufacturing
 - a. Net zero imports of electronics, including mobile devices and smart energy meters, by 2020
8. Job creation
 - a. Train people to run viable businesses delivering IT services
9. Early harvest programmes
 - a. Digitise mass messaging to elected officials and government employees and government greetings, and implement biometric access to all central government

LIVE PROJECT

The government has launched numerous projects for its digital society goals; from basic digital and financial inclusion initiatives to more ambitious smart city plans. Two notable digitisation projects are the Aadhaar digital inclusion project, and the MyGov and eBiz integrated portals. The Aadhaar project authenticates the identity of citizens through a unique identification number. More than 750 million identification numbers have been created so far, while more than 100 million bank accounts have been linked to Aadhaar ID numbers, enabling the government to electronically transfer social aids to beneficiaries' bank accounts, cutting down wastage in social security schemes. Aadhaar is accepted as a valid form of ID by state agencies.

The government has also launched the MyGov portal, which enhances citizens' engagement with the government, and the eBiz portal, which integrates 11 services from 6 ministries required to start a business. The digitisation of key government services is designed to reduce the time and cost required to perform public service transactions, such as registering a company names and receiving a tax identification number.

	INDONESIA	INDONESIA BROADBAND PLAN	2019
KEY GOALS			
<p>The broadband plan aims to accelerate Indonesia's transition into a digital society by focusing on the following services:</p> <ul style="list-style-type: none"> • eGovernance • eHealth • eEducation • eLogistics • eProcurement 			
ACTION PLAN		LIVE PROJECTS	
<p>The Indonesia broadband plan aims to achieve the following targets by 2019;</p> <ul style="list-style-type: none"> • Provide mobile data access to the entire urban population at speeds of at least 1Mbps • Provide mobile access to 52% of rural households at speeds of at least 1 Mbps • Provide fixed access in urban areas to 71% of households, covering 30% of the population, at speeds of 20 Mbps • In rural areas, access to fixed broadband to reach 49% of households, or 6% of the population, at speeds of at least 10 Mbps 		<p>The government expects smart city standards to be in place by the end of 2015. The cities of Jakarta, Yogyakarta, Banyuwangi and Bandung have implemented smart city projects, while Lombok and Kutai Kartanegara plan to launch theirs soon. According to the government, the city with the best implementation will be selected as a benchmark to determine the standards and harmonise future developments. Jakarta plans to invest IDR30 billion (\$2.4 million) on its smart city project in 2015, 60% of which will be spent on building an operations centre that will help monitor and respond to complaints from citizens. Residents of the city are already using an app called Qlue to report complaints on traffic accidents, crime, natural disasters and sanitation by submitting location-tagged photos.</p>	



MALAYSIA

DIGITAL MALAYSIA

2020

KEY GOALS

To move Malaysia towards a developed digital economy by 2020 by creating an ecosystem that promotes the pervasive use digital technology in all aspects of the economy. The main focus areas of this initiative are;

- eEconomy
- ePublic services
- eCommunity
- eLearning
- eSovereignty

ACTION PLAN

The Digital Malaysia Roadmap recommends 3 interventions to bridge existing gaps and accelerate growth. These are;

1. Usage: improve access to affordable, reliable and high capacity digital infrastructure, including broadband, applications content and devices
2. Adoption: overcome various barriers to adoption by increasing skills, cost and knowledge thresholds
3. Access: improve access to affordable, broadband, applications content and devices

LIVE PROJECTS

Malaysia's Economic Transformation Programme (ETP) defines Communications, Content and Infrastructure (CCI) as a National Key Economic Area (NKEA). Through various Entry Point Projects (EPPs), the Malaysian government aims to 'migrate all public-facing government services online with the goal of 'zero face-to-face' interactions by 2020'⁸. In line with this plan, the government announced a new project in October 2014, to further extend the benefits of the 'digital economy' to the Bottom 40% of the income pyramid (B40) and to deepen the economic impact of niche segments. The project leverages digital platforms to help poor people in the B40 community earn new income through crowdsourcing. The crowdsourcing project is one of 8 projects lined up under the Digital Malaysia plan to create 160,000 high value jobs, contribute 17% to GNI and generate additional RM7,000 (\$1,940) of digital income per annum for around 350,000 citizens.

8. Economic Transformation Programme Annual Report 2014, Performance Management and Delivery Unit, Malaysia, 2014



PAKISTAN

VISION 2025

2025

KEY GOALS

One of the objectives of Pakistan's Vision 2025 is to develop a knowledge-based economy. This will ensure that Pakistan's cities are digitally connected, with free flow of information laying the foundations for the country's cities to be smart and creative. To achieve this, the ICT working group within the Vision 2025 plan have been charged to focus on;

- eGovernance
- eCommerce
- eServices (including education, health and enforcement of Intellectual Property Rights)

ACTION PLAN

To achieve the digital society objectives, the ICT working group within the Vision 2025 plan have proposed the following action plans;

- Establish a national broadband infrastructure
- Establish national telecentres and central databases
- Create 5 to 6 highly connected cities, building on a common digital services platform

LIVE PROJECTS

Although Pakistan is yet to articulate a digital society roadmap, the country's Vision 2025 plan would significantly benefit from digitisation. The rapid uptake of mobile broadband services in Pakistan following the launch of commercial 3G services supports this view as it creates new opportunities for the government to accelerate the implementation of key aspects of the plan by leveraging the connectivity and rich media capabilities of 3G/4G network infrastructure.

		THAILAND DIGITAL ECONOMY	2020
	THAILAND		
KEY GOALS			
<p>Thailand’s digital economy strategy emphasises the development and application of ICT in five strategic areas;</p> <ul style="list-style-type: none"> • eGovernance • eIndustry • eCommerce • eEducation • eSociety <p>The strategy aims to enhance the economy and quality of life of the citizens and lead Thailand towards a knowledge-based economy and society.</p>			
ACTION PLAN		LIVE PROJECTS	
<p>The government has proposed the following themes to drive its digital economy initiative;</p> <ul style="list-style-type: none"> • Hard infrastructure: cooperate with the private sector to provide suitable ICT infrastructure to support a digital economy, such as high-capacity broadband, data centres, and digital gateways. This includes the government’s target for all citizens, irrespective of location, to have access to a minimum 30Mbps broadband service by the end of 2017 • Soft infrastructure: boost confidence in online transactions by providing verification systems to identify individuals online and cybersecurity to safeguard e-commerce activities • Service infrastructure: create a platform to support private businesses and individual • Promotion and innovation: develop the digital skills of entrepreneurs to improve their efficiency • Society and knowledge: provide universal access to online channels, ensuring everyone can access the Internet at an affordable price 		<p>In 2015, the Thai government announced 8 draft bills to guide the implementation of its digital economy goals, namely:</p> <ol style="list-style-type: none"> 1. Information and Communication Technology Ministry Reform Bill, 2. Digital Economy Bill, 3. NBTC Bill 4. Electronic Transactions Bill, 5. Electronic Transactions Development Agency Establishment Bill, 6. Personal Data Protection Bill, 7. new Computer Crime Bill and 8. National Cyber Security Bill. <p>The bills are subject to the approval of the National Legislative Assembly (NLA), and have been designed to address issues that may arise in the establishment of a digital society in the country, from connectivity to online security and data privacy.</p>	



4

The role of mobile in a digital society

Mobile technology is well-suited to deliver the required connectivity and content for a digital society. This is based on the capability of wireless networks to cover a wide area with greater efficiency than many other technologies, particularly in emerging countries with underdeveloped fixed network infrastructure and low levels of urbanisation. Furthermore, mobile technology has evolved considerably over the last decade with the development of high-speed mobile broadband technologies, and the increasing availability and affordability of high specification devices capable of supporting a variety of feature-rich content and value-added services.

4.1 Mobile is the primary technology of connectivity

MOBILE IS GROWING RAPIDLY

Mobile has scaled dramatically in Asia, with the region one of fastest growing globally in recent years (see Figure 7). Unique subscribers⁹ and connections¹⁰ have grown much faster than the global average, and the region has seen rapid uptake of mobile broadband, driven by the ongoing technology shift

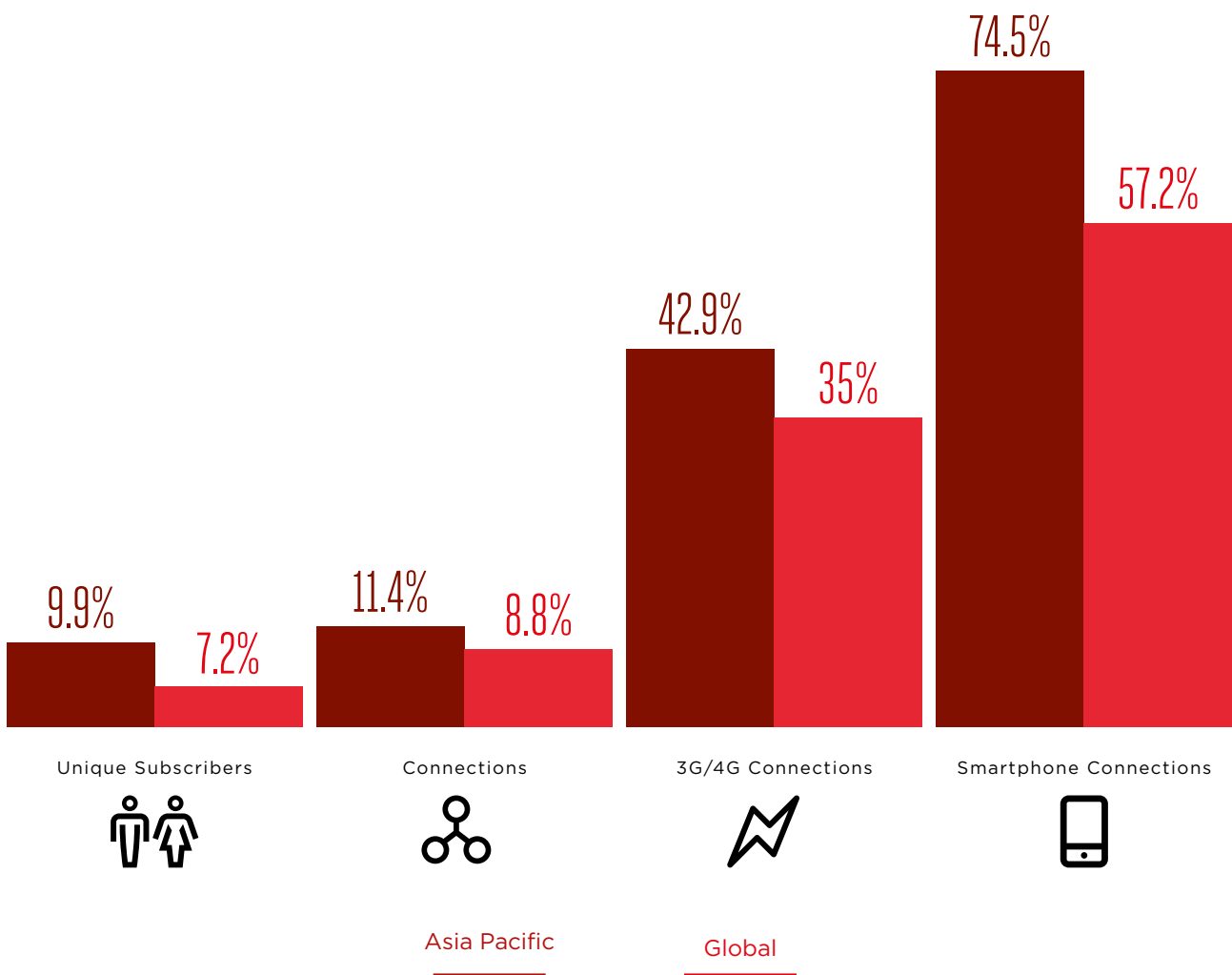
to 3G and, more recently, 4G networks – particularly in the more developed markets – and the increasing demand for data services. This shift towards faster network speeds, alongside a decline in prices, has driven the uptake of smartphones in the region, with smartphone connections growing much faster than the global average in the last five years.

Figure 7

Source: GSMA Intelligence

Asia Pacific versus global annual growth

(CAGR 2009-2014)



9. Unique users who have subscribed to mobile services at the end of the period, excluding M2M. Subscribers differ from connections such that a unique user can have multiple connections.
 10. Unique SIM cards (or phone numbers, where SIM cards are not used) that have been registered on the mobile network at the end of the period. Connections differ from subscribers such that a unique subscriber can have multiple connections.

MOBILE ALLOWS MORE PEOPLE TO BE CONNECTED THAN ANY OTHER TECHNOLOGY

Mobile networks are increasingly ubiquitous across Asia, especially in the more developed markets. Continued investment by the mobile operators means that coverage levels have also increased markedly in developing countries, with 2G coverage in most markets now generally over the 90% level. In parallel, fixed penetration across the region is very low due to the limited reach of fixed infrastructure – on average across the region, only 8% of the

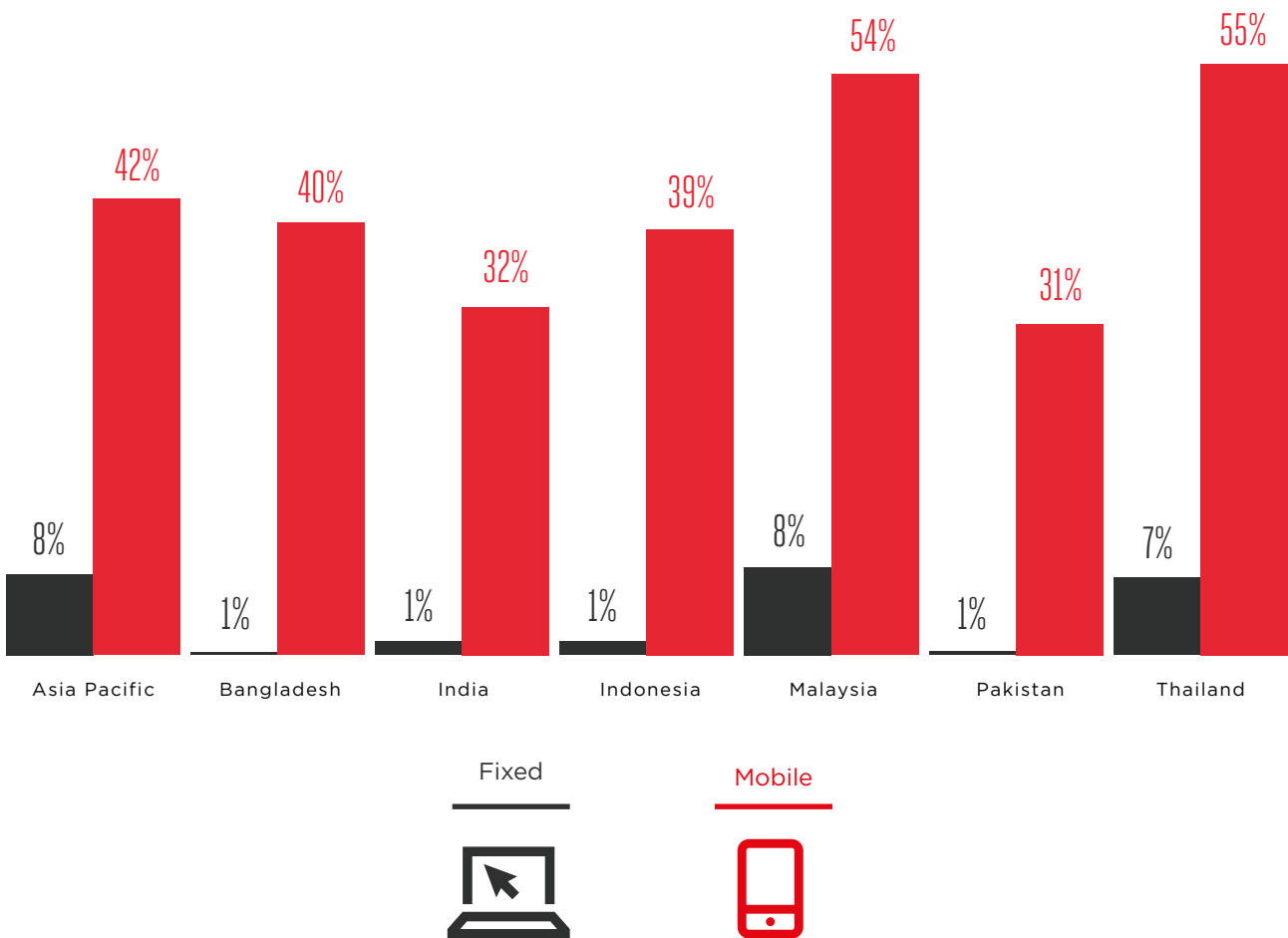
population has a fixed connection, compared to 42% that subscribes to a mobile service (see Figure 8). In some of the focus markets such as Bangladesh, India, Indonesia and Pakistan, fixed penetration is as low as 1%, while close to a third of the population are mobile subscribers. This means that mobile technology is well-suited to extend connectivity and improve service delivery to rural areas, reducing the digital divide, and can act as the enabler for innovative services where other technologies and delivery modes fall short.

Figure 8

Source: ITU, GSMA Intelligence

Fixed versus mobile penetration

(2013)



SMARTPHONES ARE BECOMING MORE POPULAR AND AFFORDABLE

Despite mobile networks covering the vast majority of the population throughout the region, subscriber penetration is still relatively low (as low as 31% and 32% in Pakistan and India respectively). The main reason for this is device affordability, with many people simply not being able to afford a mobile device. Cheaper devices are key in connecting as many people as possible, and affordable smartphones in particular are vital in providing them with the best services and user experience.

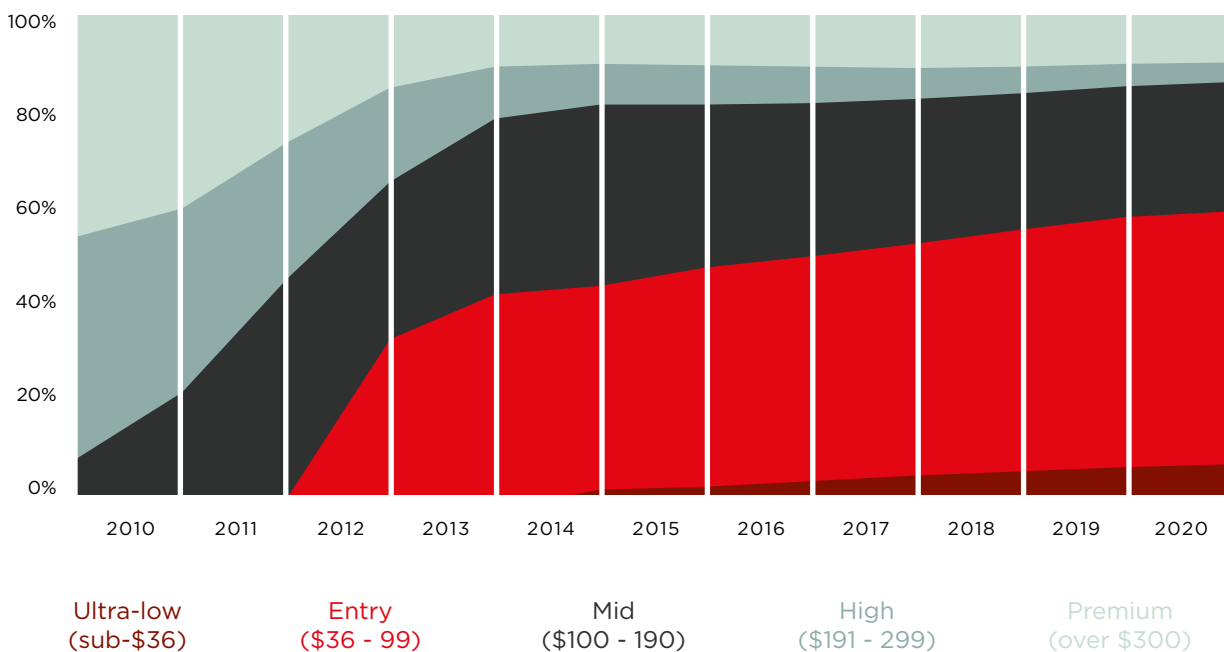
Both the mobile operators and players in the broader mobile ecosystem (such as handset manufacturers) are contributing to making mobile services more affordable. The average price of a smartphone across the region dropped to just over \$200 in 2014, down from \$329 in 2008¹¹. However, this is still out of reach for the vast majority of

the population in developing countries, and there is an ever increasing need for more affordable smartphones. 'Entry' tier smartphones costing less than \$100 have become a reality in recent years, and now account for over 40% of total smartphone sales in some markets such as India (see Figure 9). In addition, the 'ultra-low' tier is slowly gaining traction, driven by devices like the Cherry Mobile Ace in the Philippines, which costs just \$23. The emergence of this 'ultra-low' tier will make a small but growing contribution in improving smartphone affordability, and sub-\$100 smartphones are expected to reach 50% of total smartphone sales in India in the next two to three years. Ultra-low end smartphones are of particular relevance in emerging markets, where the handset subsidy model (which reduces the upfront cost of ownership for customers) that has been prevalent in many developed markets has seen very limited application (see [Mobile platform wars](#)), and are a key factor in bringing mobile services to lower income segments.

Figure 9

Source: Strategy Analytics

India smartphone sales by wholesale price tier



11. Source: Strategy Analytics

As they become more affordable, smartphone connections are expected to overtake feature phone connections in Asia by the end of 2016. Likewise, all the focus markets will see a switch to smartphones being the dominant form of device by 2020, apart for Malaysia, where smartphone connections already overtook feature phone connections in 2014 (see Figure 10).

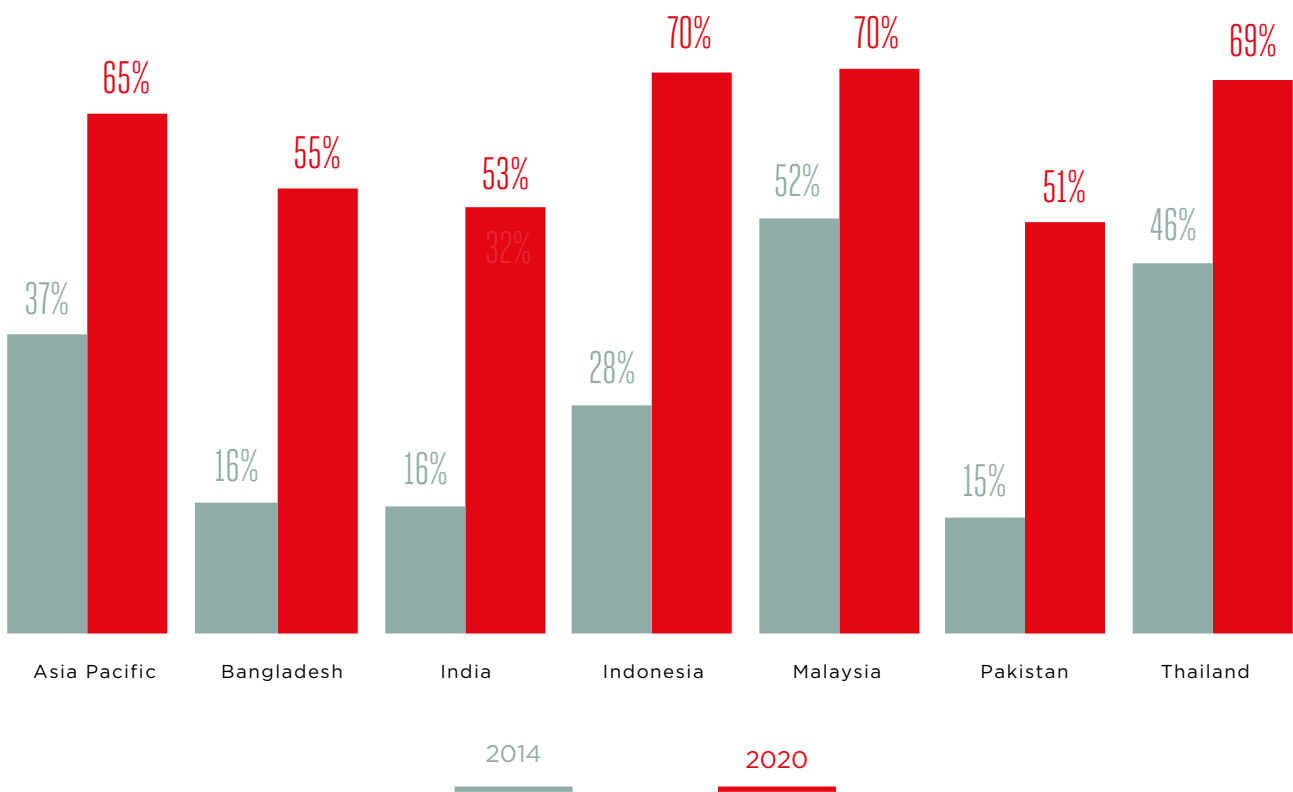
It should be noted, however, that as feature phones will still account for a large part of the market, they will play a key role in a digital society

in the near future. In emerging digital societies (as described in Chapter 3.1) for example, SMS (short messaging service) or IVR (interactive voice response)-based services will be very important in getting information to people who do not own a smartphone or who are not served by a mobile broadband network. Digital services should therefore not exclusively cater for smartphone owners, and should include services accessible for the not insignificant proportion of the population who will still use feature phones.

Figure 10

Source: GSMA Intelligence

Smartphone adoption



This declining cost of ownership of mobile devices allows more and more people to become connected and access the services they want and need, and offers service providers a cost-effective means of reaching the maximum amount of consumers possible. Coupled with the growing adoption of smartphones, mobile devices are increasingly being used for services other than traditional talk and

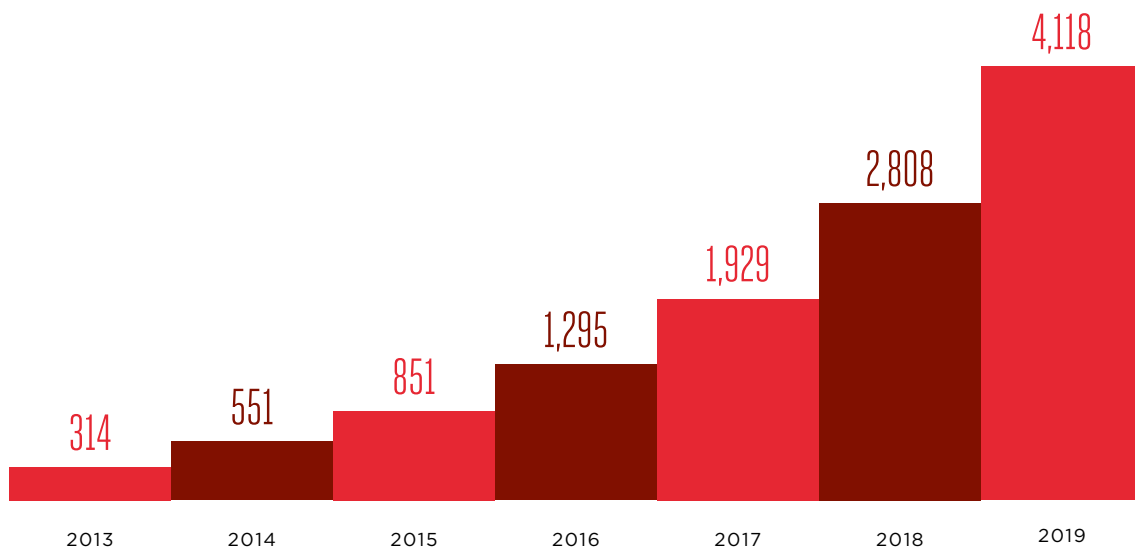
text, such as browsing the Internet and accessing other value added services (VAS). This has led to a significant increase in data traffic throughout the Asia Pacific region over the last few years, which is expected to accelerate as people use VAS more and more, with each subscriber, on average, using over 4 GB of mobile data per month by 2019, up from only 500 MB in 2014 (see Figure 11).

Figure 11

Source: Cisco, GSMA Intelligence

Asia Pacific mobile data traffic per subscriber

(MB per subscriber per month)



More and more people throughout Asia are therefore becoming connected to the internet via mobile, and are using their mobile devices more and more for services other than voice and text. This growth in connectivity and engagement brings with it many socioeconomic benefits that increase the effectiveness of a digital society, and improve the wellbeing of its citizens.



4.2 Mobile can bring many socioeconomic benefits to a digital society

The adoption and utilisation of digital technologies on a large scale in a given society often generates measurable economic, social and cultural value, whether through increased productivity, a rise in employment rates, tighter security, or more efficient and wider-reaching social services. This is true for both developed and developing countries, albeit it with different priorities depending on the stage of economic and ICT development; the primary focus of digital programs in developed countries is greater efficiency in resource utilisation, while in most emerging markets the primary focus is to increase citizen participation and access to public services. This ultimately leads to improved citizens' wellbeing as public institutions leverage digital platforms and ICT solutions to extend essential services to the grassroots level.

Figure 12

Source: GSMA Intelligence

Some of the socioeconomic benefits of mobile



MOBILE DIRECTLY AND INDIRECTLY IMPACTS PRODUCTIVITY AND EMPLOYMENT

The economic contribution of the mobile sector in value added terms in 2014 represented 4.7% of Asia Pacific's total GDP. There are four key elements to this impact: the direct contribution of mobile operators; the direct contribution of the mobile ecosystem; the indirect impact on the broader economy; and the increase in productivity brought about by the use of mobile technologies (see Figure 13).

The direct contribution from mobile network operators in 2014 was of \$286 billion in value added (1.2% of Asia Pacific's GDP). The rest of the mobile ecosystem, which in our definition includes infrastructure service providers, retailers and distributors of mobile products and services, handset manufacturers and mobile content providers, generated a total value added of around \$110 billion (approximately 0.5% of GDP).

Further to the direct economic impact, the economic activity of the mobile industry in Asia has a multiplier effect on the rest of the economy, beyond the mobile ecosystem, as operators and the ecosystem purchase inputs and services from their providers in the supply chain, generating sales and value added in other sectors and industries. This effect means that other parts of the economy also benefit from the activity generated by the mobile ecosystem. It is estimated that this resulted in the generation of value added in the region of around \$80 billion in 2014 (0.3% of GDP).

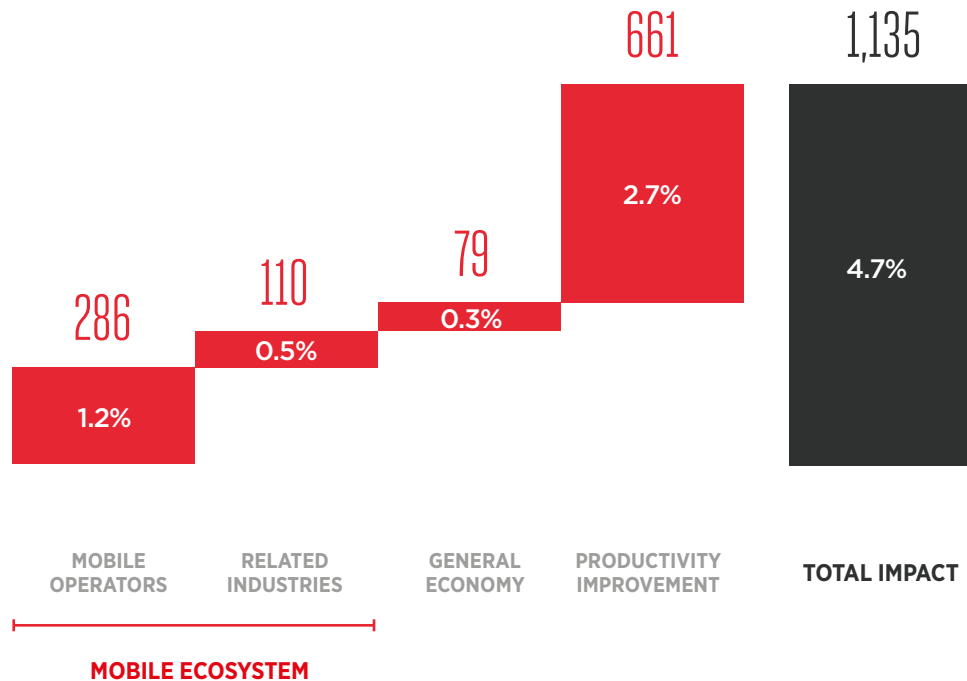
Finally, and in addition to the direct and indirect contribution to GDP by mobile network operators and the mobile ecosystem, an estimated 2.7% of Asia Pacific's 2014 GDP reflects the increased productivity brought about by the widespread use of mobile technology in other sectors of the economy. Mobile technology has already facilitated productivity improvements in the region for many workers and businesses, and these are estimated to have generated a \$661 billion contribution to GDP in 2014. Overall, in 2014 the mobile industry made a contribution of over \$1.1 trillion in value added, or 4.7% of the region's total GDP.

Figure 13

Source: GSMA Intelligence

Total (direct and indirect) contribution to Asia Pacific GDP

(2014, \$ billions)



The mobile ecosystem also makes an important contribution to employment across the region. In 2014 mobile operators and the ecosystem provided direct employment to approximately 6.5 million people in the region. The largest employment contribution came from the content, applications and services sector, with approximately 2.4 million jobs (although it has to be noted that a number of jobs in this sector were part-time or on a self-employment basis). Large numbers of jobs were also directly supported by distributors and retailers, with 1.8 million jobs, and by mobile network operators, with 1.7 million jobs. There were also a very significant –although smaller – number of jobs supported in the infrastructure and handset manufacturing sectors.

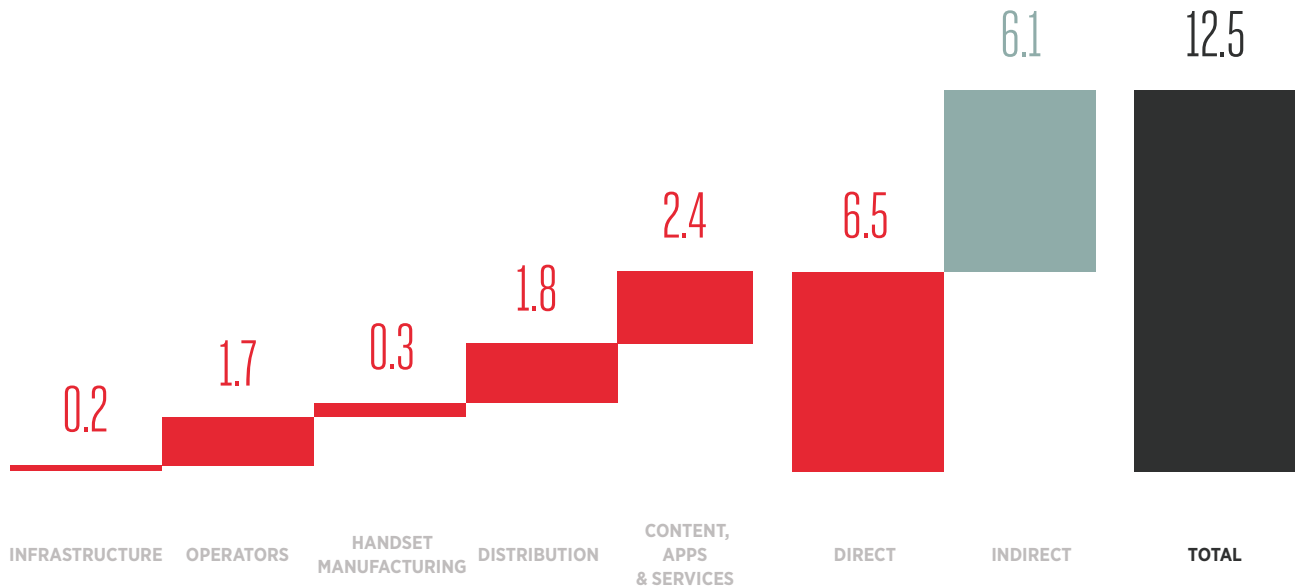
Additional jobs were also indirectly supported as the industry’s economic activity generated demand and jobs in other sectors, in particular in the direct supply chain of the mobile ecosystem. In 2014 over 6 million jobs were indirectly supported, bringing the total impact (both direct and indirect) of the mobile industry in the region to approximately 12.5 million in 2014 (see Figure 14).

Figure 14

Source: GSMA Intelligence

Asia Pacific employment impacts

(2014, millions)



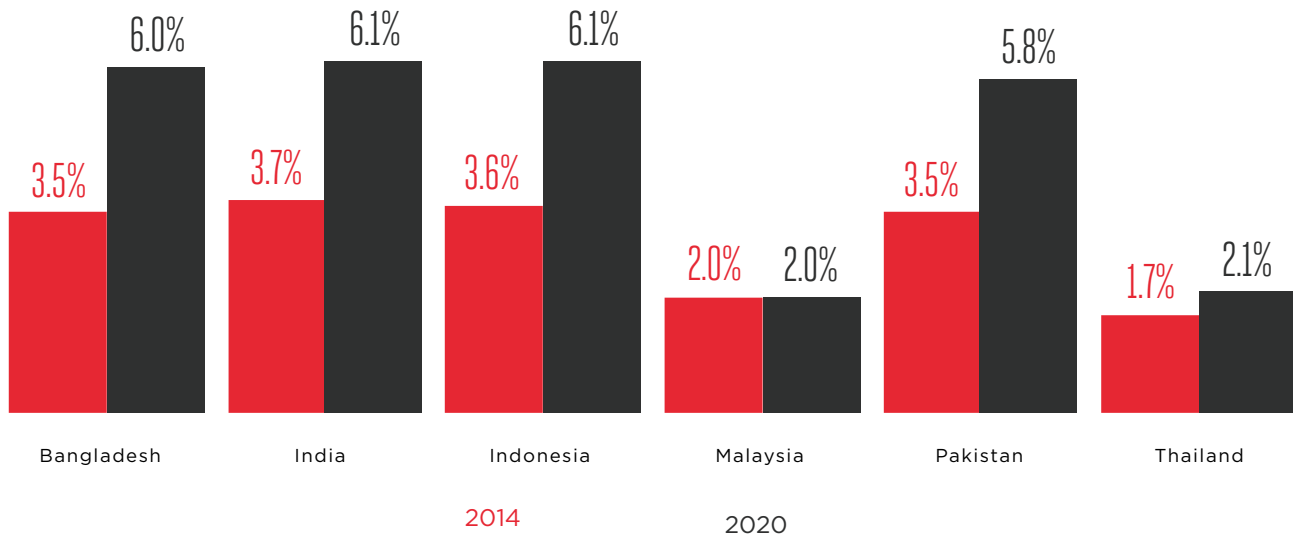
Over the next few years, growth in mobile penetration and usage of mobile services in the focus markets will lead to an increase in productivity, which will have an impact of as much as 6% on GDP by 2020, depending on the current maturity of the mobile industry (see Figure 15). In emerging digital society countries such as Bangladesh and Pakistan, there is still huge room for growth in mobile Internet users, and the impact from a large number of people simply being connected for the first time will be transformative from a productivity and efficiency point of view.

In transition digital society countries, such as Malaysia and Thailand, growth will come about from the implementation of more advanced services. Mobile penetration is already relatively high in these markets (over 50%), so simply increasing connectivity/penetration will not bring about the same productivity benefits – around 2% of GDP compared to around 6% in the emerging digital societies. These countries are therefore looking into more advanced services such as smart cities and IoT in order to maintain the momentum of growth in their mobile economies. It should be noted that in these markets, while the percentage figure does not show much growth, the actual productivity gains in financial terms are notable, highlighting that the impact of mobile on productivity will continue to grow over the period at a similar rate as growth in the rest of the economy.

Figure 15

Source: GSMA Intelligence

Productivity improvement impact on GDP



MOBILE BRINGS UNIQUE SECURITY BENEFITS.

The combination of ubiquitous coverage, faster networks, and more affordable devices has created a critical mass of consumers with which the governments and other institutions can engage. A digital society is reliant on the two-way interaction between individuals and governments, involving the transmission of potentially confidential information. As such, the method of delivery needs to be secure in order to hold the trust of the users, and also to prevent fraud.

In the last few years there have been several high profile global security breaches that have highlighted potential serious flaws in the way personal information and data is currently protected online. eBay accounted in March last year that its database containing encrypted passwords and other non-financial data had been hacked¹², and in April 2014, the Heartbleed bug was disclosed, rendering approximately 17% (around half a million) of the Internet's secure web servers certified by trusted authorities vulnerable to the attack¹³, allowing theft of private keys and passwords.

Along with the fact that a typical consumer has around 26 different online user names but only five different passwords¹⁴, serious questions are being asked about the suitability of the current password model for online safety and privacy.

The very definition of a digital society involves the transmission of highly personal information. Thus for a digital society to function effectively, individuals need to be confident in the security of the system, which will increasingly be lacking if the current username and password model is followed. Mobile authentication is gaining popularity, whereby using the inherent security of a device that is always with customers, the mobile phone, secure and convenient access to digital services can be unlocked. Additionally, the personal nature of mobile makes it ideally suited to digital solutions, as the device is always on, in close personal possession, and contains a lot of personal information on a consumer's daily life. Mobile technology therefore strikes a unique balance between connectivity, portability, security and personalisation, making it the perfect platform for the basis of a digital society.

12. Source: http://www.ebayinc.com/in_the_news/story/ebay-inc-ask-ebay-users-change-passwords

13. Source: <http://news.netcraft.com/archives/2014/04/08/half-a-million-widely-trusted-websites-vulnerable-to-heartbleed-bug.html>

14. Source: Experian, 17 July 2012

Social benefits

In addition to the benefits outlined above, mobile is increasingly seen as a transformative technology in the wider social and environmental issues of emerging markets, putting relevant, impactful services into the hands of underserved people in areas such as health, agriculture, finance, education, utilities and disaster management.



Health: Mobile health applications facilitate rapid diagnosis of critical conditions, improve access to specialised treatment, and act as a platform for remote monitoring and disease prevention. In India for example, Bharti Airtel supplies healthcare information to large segments of the population. Bharti Airtel's mHealth SMS alert packs make health information readily available to the large segments of the population that lack Internet access, and subscribers to the service get instant access to expert medical advice. Services are targeted at low-income populations, but the more recent Medibank service is targeted towards middle and upper-income consumers in rural areas where access to healthcare is poor.



Food security: mAgri services improve accessibility to ICT services for rural communities and enhances competitiveness of local farmers by gaining information on pricing and providing connections between buyers and sellers. In more advanced applications, mobile-based systems can be used to monitor irrigation and other equipment, increasing efficiency and saving on wastage. Again in India, Nano Ganesh¹⁵ is a mobile-based remote control system for agricultural water pumps, which allows control of the pumps remotely, checks the availability of power supply, checks the on/off status of the water pump, and, in some advanced modems, provides alerts in the case of cable or pump theft. The estimated benefits per end user of the Nano Ganesh system are 1,000 litres of water, one litre of petrol and at least three hours of time saved per day.



Financial inclusion: Mobile payments make it easier for consumers to execute payments, bridging urban/rural divides and offering a platform for further innovation (e.g. contactless payment solutions) and contributing to a vibrant economy. With a population of 180 million and only 15% bank penetration in 2008, Pakistan presented an attractive market opportunity for mobile money. In 2009, Telenor launched Easypaisa, a mobile money service that in 2015 serves more than 15 million active customers with wallets and over the counter services through 65,000 EasyPaisa shops. In 2014, Easy Paisa reported that it moved value equal to 2% of Pakistan's GDP through the EasyPaisa Platform.¹⁶

15. <http://www.nanoganesh.com/>
 16. <http://www.easypaisa.com.pk/>



Education: E-learning is becoming an important pillar in building knowledge-based societies and opening up education to everyone. It increases educational opportunities, acts as a platform for skill-building and promotes development in rural and remote areas. mEducation solutions already allow thousands of students in China, Bangladesh, South Korea and Indonesia to access course content through SMS and audio lessons. A mLearning student saves around 87% in training costs versus a traditional classroom, mainly due to the elimination of the cost and inconvenience of travelling to attend courses. In Indonesia, a new initiative for schools aims to replace physical textbooks, which are expensive and difficult to obtain and distribute, with tablets and ebooks¹⁷.



Utilities: Smart electronic systems are making big steps in increasing efficiency of energy consumption, and the shift towards cloud computing may deliver significant gains in energy efficiency. At least three Pakistani utilities have started deploying smart meters in order to cut electricity distribution losses and modernize billing operations. In March 2015, the Islamabad Electric Supply Company (IESCO) said it will start a three-year smart meter rollout by the middle of the year in a bid to improve accurate customer billing. IESCO's 23 million customers, including 18 million residential customers, will be able to use their mobile phones to lodge complaints about overbilling or load-shedding and also send out meter readings. Multan Electric Power Company and Peshawar Electric Supply Company are also looking to deploy GPRS-enabled smart meters to residential, agricultural, small industrial and public sector consumers, building on the opportunities created by enhanced connectivity. According to a PWC report, reducing power theft and increasing usage efficiency via mobile-enabled smart meters could save enough electricity in India to power more than 10 million homes¹⁸.



Disaster management: The role of mobile in both preparedness and response to disasters such as earthquakes and floods is key, facilitating coordinated response mechanisms with the capability to reach the majority of the population. One of the most important factors in delivering relief to the affected people is communication, and mobile operators regularly work in collaboration with the government and other humanitarian organisations to provide coordinated, impactful solutions to recovery. For example, Telenor Pakistan has introduced an SMS-based early warning system aimed at mitigating the impact of disasters and extending timely relief to the victims¹⁹. Unlike traditional SMS services, which require broadcast messages to be delivered to every subscriber on a carrier's network, this system can target a particular region or even a neighbourhood to which text messages can be sent. The text messages elicit a response from mobile phone users in need of aid, giving them an effective voice on how assistance should be delivered.

17. <https://www.techinasia.com/indonesia-education-textbooks-ebooks-esabak/>

18. Source: Realising the Benefits of Mobile IoT Solutions, PWC, March 2015

19. Source: <http://propakistani.pk/2014/08/29/telenor-pakistan-inaugurates-gps-based-disaster-warning-sms-system/>

4.3 The role of the mobile operator

AREAS OF OPPORTUNITY

Implementation of a digital society provides an important opportunity for mobile operators to develop and deploy additional products and services. Mobile operators stand to benefit from an increased number of connections on their network, offering the potential for additional revenue through value added services. Additionally, if smart city initiatives are deployed (smart transportation or smart meters for example) and machine-to-machine (M2M²⁰) services begin to gain traction, mobile operators could benefit, due to the longer device lifecycles, from the prospect of reducing churn and increasing customer stickiness, if for instance M2M services are bundled with a voice/data offering.

There are four areas necessary to the implementation of a digital society where mobile operators can play a role: connectivity, data management, service delivery, and customer management.



Connectivity refers to connecting elements of city infrastructure and individuals' handsets to central servers and databases. Connectivity is, of course, a mobile operator's core business, and when it comes to digital services (VAS and/or M2M), the majority of operators in developing markets have, to date, been almost exclusively involved in this area. Additionally, new technologies that are central to the establishment of a digital society, such as M2M, largely run on mobile networks. However, connectivity is a relatively small proportion of the overall revenue opportunity in digital services (see Service delivery below). Mobile operators should therefore think about expanding their portfolio to services beyond just the provision of connectivity, into areas such as data management, service delivery and customer management.

20. M2M technology connects machines, devices and appliances together wirelessly via a variety of communications channels to deliver services with limited direct human intervention, transforming them into intelligent assets that open up a range of possibilities for digital services.



Data management involves aggregating and analysing data from multiple sources to produce new insights. Operators have the capability to aggregate and analyse real-time data and information captured by digital applications, which could be used by municipalities to make informed decisions and generate insights for future services. “Big data” analytics is set to become a key part of digital services in the future, and operators are evaluating how this can impact their business. Mobile operators can leverage data flowing over their network and deliver it, along with any resulting analyses and insights, to governments or other agencies running digital services. In addition, operators have experience in handling large volumes of sensitive data securely, and could act as the trusted partners for both the government and end-users in the analysis and protection of information.



Service delivery includes service enablement (enabling things to “talk” to each other), system integration, and provision of the service (delivering real-time information to people and machines that will enable them to adapt and respond to events in the city). Once the data has been aggregated and analysed (during the data management component – see above), it can form the basis of a digital service and be distributed to end-users. An example of this is the various health, education, and other social services as described in Chapter 4.2. Mobile operators are ideally suited to meet this need due to their coverage, and through leveraging of their existing customer base.

Depending on the application, this component offers a significant revenue opportunity for mobile operators: in an M2M transportation application for example, Machina Research estimates that by 2020, services (excluding connectivity) will account for 77% (\$20.6 billion) of the global revenue opportunity for mobile operators, up from just under 60% (\$2.9 billion) in 2014, with revenue through connectivity and devices making up the rest (see Building digital societies in Asia: Making transportation smarter).



Customer management includes mobile operators supporting digital services with customer support and billing operations, such as call centres and web portals, as well as promoting them through messages to their existing subscriber base. Mobile operators can make use of their extensive customer care and support operations for digital applications, and could also expand their relationship with their customers and increase brand awareness. Additionally, mobile operators can leverage their experience in marketing, branding and outreach to promote the adoption of digital services.

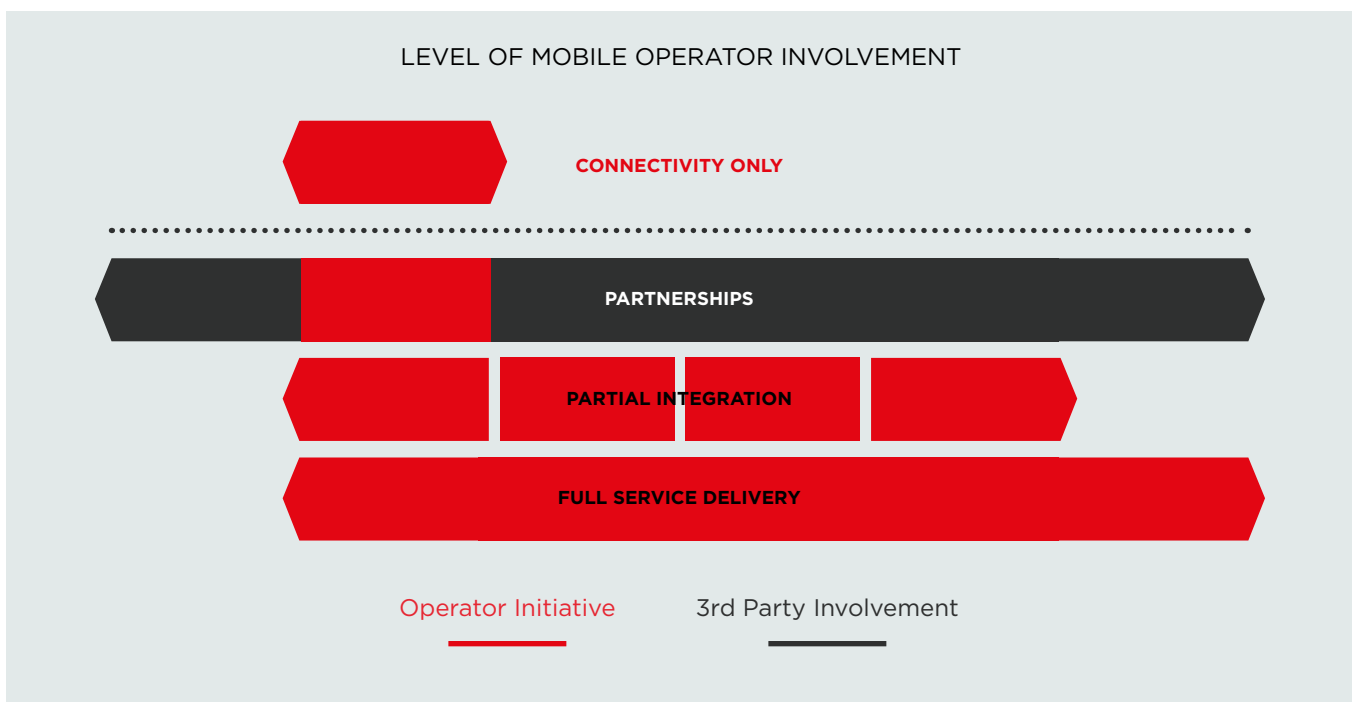
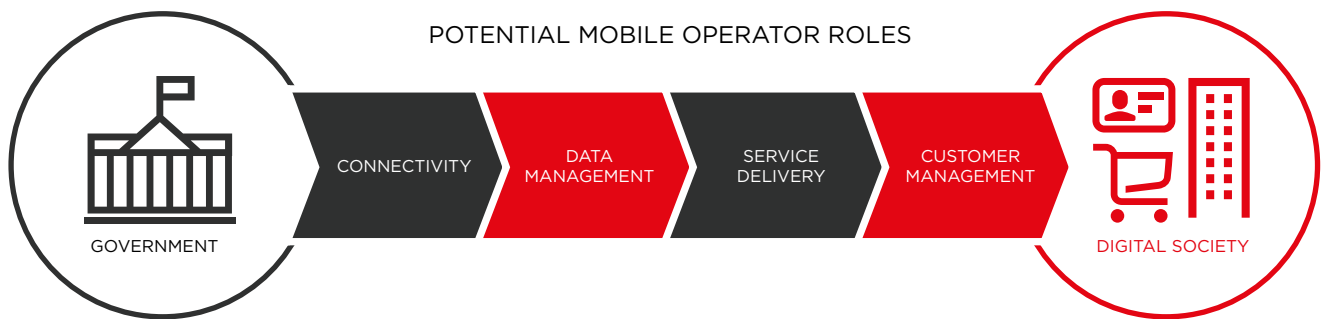
LEVEL OF MOBILE OPERATOR INVOLVEMENT

Aside from connectivity, we believe there are three additional levels of involvement that mobile operators can undertake, keeping in mind the potential roles outlined above, to help the development of a digital society, whilst capturing a greater share of revenue for themselves (see Figure 16):

Figure 16

Source: GSMA Intelligence

Potential mobile operator roles in a digital society





Mobile operators can strike **partnerships** with other ecosystem players, including governments, solution providers, system integrators, application developers and service providers, to subsidise/reduce costs of service rollout, or share the initial investment into an E2E platform. This could also include partnering with start-ups and entrepreneurs to assist in the development and deployment of innovative digital solutions. Striking partnerships can simplify the route to market for mobile operators and start-ups, and can reduce the costs necessary to develop a solution from scratch. Moreover, partnerships can aid in the standardisation of digital services, reducing integration issues and costs of deployments, and help de-fragment the ecosystem.

As an evolution of a partnership strategy, mobile operators can look to be involved in one or more areas of the delivery (data management, service delivery or customer management, as described above) without explicitly providing a full end-to-end solution, thus providing **partial integration**.

Finally, mobile operators can look to provide **full service delivery** by taking control of all four components themselves and deliver an E2E digital service. Developing an E2E service in-house brings increased efficiency through economies of scale, and gives the mobile operator total control over the development, deployment, maintenance and marketing of a digital solution. Additionally, by going E2E, large regional or global operators can leverage their purchasing power with suppliers, and spread investment costs over a larger potential addressable audience of consumers and businesses, helping lower the cost barrier. Further, mobile operators could expand their existing customer relationships to include additional services bundled together with voice, text and data subscriptions, potentially creating an “all-in-one” E2E service. This would simplify finances for the end users (bringing everything together under one bill), and could result in more connections and reduced churn for the mobile operators. However, depending on the digital maturity of the country and/or the nature of the service, going E2E may require a diversification of a mobile operator’s business, as well as significant investment in knowledge and staff. Thus, this route is likely to be out of reach for all but the largest mobile operators.

5 Enabling a digital society

There are certain factors that need to be in place for a digital society to function effectively, and for the potential benefits to fully materialise. For example, people living in a digital society should be able to access required services through online platforms with round-the-clock availability. In practice, this relies on multiple factors around content and connectivity, with broadband access that is widely available and affordable to all citizens, including people in urban and rural areas, and the existence of locally-relevant applications and solutions for generic, personalised and integrated solutions.

Within Asia, there are regional organisations, such as the Association of Southeast Asian Nations (ASEAN), the Asia-Pacific Telecommunity (APT), and the Asia-Pacific Economic Cooperation (APEC), that seek to harmonise policies and frameworks for the establishment of a digital society - each of the six focus countries in this report belong to at least one of the regional organisations. In many cases, these policies have similar objectives, the implementation of which has the potential to create an optimal environment for multi-national companies to invest in the required infrastructure and services for a digital society. Some of the common objectives contained in the policies of these organisations include universal access to broadband connectivity, promote a secure and trusted online environment, develop content and applications, and strengthen cooperation and convergence of services.

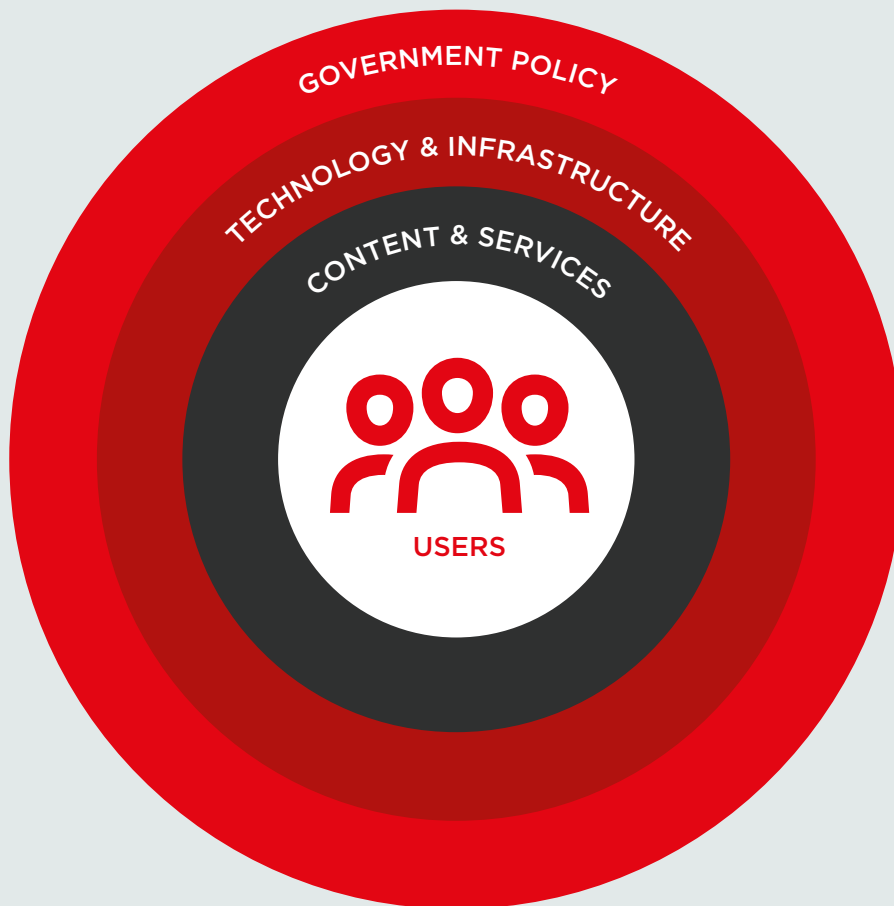
These policies and frameworks fall into four broad categories - users, content and services, technology and infrastructure, and government policy - which we call the key enablers of a digital society (see Figure 17). The four enablers are interdependent and each of them must be present for a digital society to advance and achieve its full potential. For example, there must be a critical mass of digitally literate citizens who can afford and access digital services. Furthermore, available content must appeal to local needs and be easy to use in order to generate interest among citizens, while appropriate technology and infrastructure is vital to connecting citizens to various digital solutions. Finally, the government is largely responsible for creating the necessary policies and a conducive environment for innovation and investment to thrive.

Overleaf, we look at the four enablers of a digital society in more detail.

Figure 17

Source: GSMA Intelligence

Enablers of a digital society



USERS

For a digital society to function effectively, individuals (across income levels, age groups and locations) must be digitally literate and, along with businesses, be able to access and afford the required connectivity for digital services. The emphasis here is on personal or household/business connectivity, as opposed to shared access in public outlets such as Internet kiosks or office buildings. Personal connectivity increases users' engagement with digital services, partly due to convenience and flexibility of use, and also because it addresses concerns over security and privacy in accessing personalised services, such as individual tax or medical records.

Barriers to overcome

Access and affordability: Generally, consumers with higher disposable incomes are more likely to use digital services due to the costs associated with devices, connectivity and, in some cases, content. This partly explains the higher uptake of digital services in countries with wealthier citizens. As the majority of digital services are best delivered as rich content, the relatively high cost of smartphones for many consumers is a notable barrier to the adoption of digital services.

Security and privacy: Data integrity and trust play a major role in generating and sustaining user interest in digital services considering that digitisation increases the vulnerability of individuals and institutions to online attacks. Citizens' concern over the protection of their privacy and unauthorised access to their online activity could make them less inclined to engage with digital services. In Vietnam, the automation of government services to reduce the time and cost of service delivery met an initial resistance from citizens who wanted to continue with traditional systems of face-to-face and personal interaction with public officials.

Awareness and usability: Citizens need to be aware of and able to use the array of services available to them in a digital society. Consumer ignorance/apathy or, in extreme cases, outright scepticism towards digital services is most acute in developing countries. A GSMA survey on local content in Asia showed that a considerable proportion of Internet users in India only accessed social networking sites and sent picture messages, mainly because they were unaware of other relevant online content, including government services. In developing countries in particular, illiteracy is most prominent across rural areas and marginalised groups, such as the poor and youth, and causes a major challenge in accessing Internet content which is predominately text based. Combined with an overall lack of awareness about the Internet and its potential uses and benefits, this creates a significant barrier for the uptake of digital services, even where access and affordability issues have been addressed.

Potential solutions

Mobile tax reform: Tax is major component of the cost of connectivity to end-users. For example, tax as a proportion of mobile ownership is approximately 18% in Bangladesh and more than 30% in Pakistan, compared to a global average of less than 12%. Especially adverse are sales taxes on SIM cards, mobile services, and handsets. Although Bangladesh has implemented some reforms in recent years – reduced SIM card sales tax from BDT 800 (\$10) to BDT 600 (\$7.7) in 2011 and again to BDT 300 (\$3.9) in 2013 – a GSMA study found that removing the tax has the potential to increase the number of mobile connections by 3.7 million, including 1.6 million 3G/4G connections. Although the rapid economic growth in many developing countries will drive demand for digital services, the reduction of the cost of connectivity, particularly for the most vulnerable users, through a broad-based tax approach will support the uptake and usage of these services.

Online protection: Dynamic cyber-security laws should be put in place and accompanied by adequate enforcement to safeguard consumers and protect their personal privacy. This will engender consumer confidence in digital services. Apart from individuals, many major industries are susceptible to inadequate online security, privacy controls, personal information protection and digital identification. These include public services, financial services and the wider eCommerce industry. Some countries have taken steps to mitigate this risk and ensure consumer buy-in. For example, Singapore's Smart Nation platform has been designed to process secured and anonymised data to protect citizens' privacy.

Meanwhile, mobile operators already enjoy a high level of trust from their customers and can take advantage of new solutions, such as the GSMA-backed authentication solution Mobile Connect, to play a more central role in the delivery of digital services. Mobile connect enables customers to create and manage a universal identity that will securely authenticate them and allow them to safely access mobile and digital services such as e-commerce, banking, health and digital entertainment, as well as e-government portals, via their mobile phones.

Digital literacy: Building awareness of the Internet will require efforts of multiple stakeholders, starting with the initiators of various digital services – public and private organisations – who need to make concerted efforts with respect to the delivery of awareness building campaigns and literacy training programmes. For example, mobile operators can leverage existing distribution channels to provide training to rural communities as well as use basic technologies, such as SMS or IVR, to deliver tutorials to a wider subscriber base. Governments also have a major role to play, both in creating awareness on digital services and in training citizens to use available applications. This can be achieved by devoting sufficient resources to extend a supportive learning environment to rural areas and deploying services that will attract strong user interest, especially in the areas of financial inclusion, digital identity, eEducation, eHealth and welfare services.

CONTENT AND SERVICES

Availability of relevant content and services is essential for the successful implementation of a digital society. It is all well and good for people to be connected, but a digital society will not function if they have nothing to do once they are online.

A set of well-defined and locally-relevant applications and services are essential to generating user interest in digital services. Also important is the provision of personalised services, as well as the interconnection of services and disparate infrastructures and agencies into centralised digital platforms that are accessible through multiple devices and in real-time.

There is an opportunity for the mobile industry to engage, collaborate, and partner with governments, developers and entrepreneurs to build a thriving content ecosystem, ensuring the services exist on which a successful digital society can be based.

Barriers to overcome

Language: 55% of global websites use English as the primary language, whereas only 5% of the global population (335 million) speak English as their first language. Chinese on the other hand (including all dialects) is the first language of over 1.1 billion people (17% of the global population), yet only 3% of websites are written in Chinese. This trend continues in many non-English speaking countries throughout the developing world, where very little Internet content exists in languages such as Arabic, Hindi and Bengali, limiting its usefulness.

Device compatibility: At present, the majority of global content is largely focussed on data-heavy websites or smartphone apps. However, smartphone penetration and mobile broadband coverage is still low in the developing world, thereby reducing accessibility of the content.

Meeting local needs: Generic content will not be as useful as specific and targeted content, but knowing exactly what users want can be difficult. Having local developers create the solutions is one way of ensuring local needs are met, but in many markets across the region, there is a shortage of developers who often struggle with a limited skill-set and insufficient resources.

Potential solutions

Innovation fostering: Mobile operators are becoming increasingly involved in finding and encouraging local developers, helping them overcome challenges such as limited skill-sets and low resources. Through accelerator programs, start-up competitions, innovation scouting and venture capital investment, mobile operators are helping to lower the barriers of entry by partnering with these developers to push local content.

Accessibility: Developers, meanwhile, should focus on creating content that will be accessible to the most people possible. Smartphones will play an important role in the developing world due to the growth they will foster, but the opportunity for the simplest feature phone can be just as great as for the most advanced smartphone. Content that is more feature phone centric, or that is outside the mobile data channel, will therefore play a big part in the uptake of local content. Content developers can use SMS, USSD (unstructured supplementary service data) and IVR solutions to target low-end device owners.

E-government services: these are emerging as a major source of local content and services in Asia, as well as globally, providing access to relevant services such as health, education, financial services, agricultural information and voting in a convenient, timely, and transparent way.

TECHNOLOGY AND INFRASTRUCTURE

Implementation of a digital society necessitates connectivity. In emerging markets, where fixed infrastructure is poor, this connectivity will primarily be provided by mobile technology. Mobile networks therefore need to have as close to ubiquitous coverage as possible, and be able to support the digital services. Amongst the focus markets, only Malaysia and Thailand – the transition digital societies – have a majority (over 50%) of the population connected to digital services (see Figure 18). By contrast, in Pakistan, less than a third of the population is a mobile subscriber, and of those, only 10% subscribe to higher speed mobile broadband (3G and 4G) services. Aside from the challenges outlined under Users above, and considering the very high proportion of rural dwellers in these countries, there is a clear need to make sure the mobile infrastructure in these countries meets the demands of a digital society.

Figure 18

Source: GSMA Intelligence. Note: % rural is a 2013 estimate

The ‘digitally connected’

(Q1, 2015)

	Population (m)	% rural	Unique subscriber penetration	MBB % of unique subscribers
Bangladesh	160	71%	42%	10%
India	1,279	68%	37%	16%
Indonesia	255	48%	42%	35%
Malaysia	31	36%	54%	57%
Pakistan	187	63%	32%	13%
Thailand	67	65%	56%	71%

Figure 19

Source: GSMA Intelligence

Spectrum allocations and Digital Dividend band status for focus markets

	% connections (Q1 2015)		LTE frequency (MHz)	Overall spectrum allocation		Digital Dividend (DD) status
	3G	4G / LTE		< 1 GHz	> 1 GHz	
Bangladesh	7%	NA	LTE not launched	31%	69%	DD allocated to mobile and regionally harmonised band plan announced – not yet licensed to mobile operators
India	12%	0.1%	2300	29%	71%	DD allocated to mobile and regionally harmonised band plan announced – not yet licensed to mobile operators
Indonesia	35%	0.4%	900/2300	24%	76%	DD allocated to mobile and regionally harmonised band plan announced – not yet licensed to mobile operators
Malaysia	51%	4.5%	850/1800 /2600	17%	83%	DD allocated to mobile and regionally harmonised band plan announced – not yet licensed to mobile operators
Pakistan	10%	0.1%	1800	30%	70%	DD allocated to mobile and regionally harmonised band plan announced – not yet licensed to mobile operators
Thailand	91%	2.3%	2100	25%	75%	DD not allocated to mobile broadband

Barriers to overcome

Coverage and capacity: Just over 70% of the region's population is covered by a mobile broadband (3G and/or 4G) signal. However, this is very much concentrated in urban areas, leaving a significant number of people in rural areas without access to the Internet. 2G will continue to be the main technology used in emerging markets in the region over the coming years, but whilst basic voice and text services can be handled over 2G, the use of digital services and access to the mobile Internet necessitates further rollout of 3G and 4G equipment. Operators can run these services using 2G/GPRS, but speeds are slower and will deteriorate further as usage increases, so in order to provide a quality of service users will grow to expect, a higher level of 3G and 4G population coverage needs to be achieved.

Cost of maintenance and power: The economic case for a mobile operator to expand networks into rural areas is challenging because of the cost of maintaining and powering cell towers in remote, off-grid locations, in combination with the lower revenues expected from the thinly spread, low income populations.

Potential solutions

Capital investment by mobile operators: Mobile operators in Asia have made significant capital investments of over \$430 billion in the last 6 years, focussing on both improving network coverage and facilitating the growth in people connecting to the mobile Internet. Capital expenditure is expected to continue to increase, with investments of around \$730 billion expected between 2014 and 2020 to meet demand both in terms of new mobile users, and from existing ones migrating to higher-speed packages.

Public subsidies: The government can award public funds directly to mobile operators, where aids are allocated on the basis of a public tender. In low demand areas, the expected rollout costs exceed the expected margin that would be generated from offering services in the area. As a result, the area will remain uncovered in the absence of public funding. The government could provide funding to bridge the gap between costs and margins such that the area becomes viable to cover. In addition, universal service funds (USFs) remain an option, but limitations from their structure and governance have largely limited success so far – a GSMA survey of 64 USFs in 2012 revealed that more than \$11 billion was tied up between them and not yet spent on any rollout projects (see [Closing the network 'coverage gaps' in Asia](#)).

More low frequency spectrum: The majority of spectrum assigned to operators in Asia region since 2010 has been in higher frequency 'capacity' bands (above 1 GHz), which are not ideal for providing 4G coverage into rural areas. These higher frequencies are typically used in priority by mobile operators to cover urban and suburban areas where data traffic is dense, and substantial network capacity is required. However, based on their propagation characteristics, lower frequencies (below 1 GHz) provide extended coverage at lower cost, as fewer base stations are required to achieve greater geographic coverage, making these 'coverage' bands ideal for use in rural areas.

In the focus markets, less than a third of available spectrum is in this lower frequency range, and only Indonesia and Malaysia have launched 4G networks at frequencies below 1 GHz (900 MHz and 850 MHz respectively, see Figure 19). This highlights a need for more spectrum to be allocated in coverage bands to trigger wider adoption of mobile broadband services. The 700 MHz Digital Dividend (DD) band is key for expanding mobile broadband into the rural regions, carrying substantial socioeconomic benefits while enabling operators to reduce capital and network costs, thereby accelerating rollout and lowering prices for end users. In all of these markets except for Thailand (where the DD band has not been allocated to mobile), the DD band has been allocated to mobile and the regionally harmonised APT700MHz band plan adopted. However, it is yet to be licensed to mobile operators. Making more low frequency spectrum available for mobile operators to purchase is key to improving rural coverage, but, as with capital expenditure, it is crucial that mobile operators see the potential return for their investment.

Infrastructure sharing: This allows mobile operators to jointly use masts, buildings and even antennas to help reduce the cost of extending network coverage, particularly into remote or geographically challenging areas, by avoiding unnecessary duplication of infrastructure. It also has the potential to strengthen competition and reduce the carbon footprint of mobile networks, while reducing costs for operators.



GOVERNMENT POLICY

The government has a major role to play in realising the digital society. The starting point is creating a conducive environment for innovation and investment in services and infrastructure to thrive. This should be complemented by an assertive push for the development of digital services by public institutions, and the integration of disparate services over a common platform to stimulate usage by citizens and businesses. Public services touch all individuals and businesses within a country, and the digitisation of these services can serve as a catalyst for the uptake and usage of digital services by citizens across different demographics and income levels. For example, the digitisation of citizens' records around birth registration, income and business tax, and social benefits in any country would attract interest from the majority of the population.

Barriers to overcome

Unclear strategy: Private sector investors across different industries, including telecoms, infrastructure, and financial services, are key players in any digital society, but are likely to hold back investments in new technologies and services if there is significant uncertainty over government policy direction in relation to digitisation. For example, lack of clarity over spectrum allocation and usage could stall much needed investments into expanding mobile broadband networks, and opacity around the provision and regulation of digital services, such as eHealth and mobile financial services, could also hamper the development of relevant content and applications.

Short-term focus: There is a tendency for governments to propose policies around digitisation and the build-out of ICT infrastructure with a short-term focus. This is due to variety of reasons, including cost constraints, the urge to solve specific challenges immediately, and the lack of capacity and skills to articulate a holistic strategy. Given the fast pace of technological change, these policies soon become obsolete and, in many cases, constrain the development of other digital society enablers, notably infrastructure and content.

Fragmented approach: The existence of multiple and mutually exclusive digital platforms and policies can deter a government's digitisation effort in 2 ways; first, by stretching government resources through unnecessary duplicity and secondly, by presenting a complicated framework to other stakeholders, including businesses and citizens. Fragmentation often arises from poor planning of the government's digital strategy and/or failure to harmonise the activities of different government agencies under a single digital strategy.

Potential solutions

Initiate and support digitisation of public services: A good place to start is the formulation of national broadband plan to achieve universal access and affordability of broadband connectivity (by end-2014, some 140 countries globally had developed a national broadband plan, including 33 in the Asia Pacific region). This should be complemented by a clear digitisation strategy, outlining the key timelines and targets as well as the roles of different stakeholders within the digital ecosystem. India's digital society initiative demonstrates this point by outlining the key focus areas and pillars, administrative oversight, and anticipated costs and challenges.

In the formulation of a digital strategy, public policy makers need to take a long-term view of infrastructure and services to ensure that they are fit-for-purpose over time. For example, while it is reasonable for governments in emerging digital society countries to prioritise basic digital citizenship services to solve immediate challenges around lack of access to financial, education or health services, it is also important for them to create policies that are robust enough to accommodate high level digital lifestyle services, such as smart infrastructure, in the future with very little modification. Governments can achieve this by incorporating the views of key stakeholders in a transparent policy formulation process and ensuring that individuals with adequate industry knowledge lead the administrative oversight of their initiative.

Create an investor-friendly environment: An investor-friendly environment will encourage the continued build out of high-speed, high-bandwidth networks to support a digital society, as well as the development of necessary skills to create appropriate applications. Mobile operators are among the biggest investors in many markets, and an investor-friendly environment around key issues, such as taxation, independence of telecoms regulator and service liberalisation, will likely incentivise them to invest in capital-intensive network rollout projects necessary to support a digital society. Generally, a fair tax system encourages service providers to invest in capital-intensive infrastructures, which, in turn, generates economic benefits for the society from the improved connectivity of citizens, while the existence of an independent regulator enhances transparency and boosts investor-confidence. In terms of service liberalisation, governments need to support mobile operators to develop and deliver various digital content and services, such as mobile money. Using their existing assets and infrastructure, including existing customer relations and experience of distributing digital content, mobile operators are in a good position to create and deliver various digital society services.

Governments also need to create a suitable environment for third-party content and service providers to thrive. Countries with well-structured incubation programmes for digital start-ups have seen the development of new solutions in support of their digital society initiatives. For example, Singapore, which is ranked as one of the best places for start-ups in Asia and around the world, has seen the rapid development new content and applications addressing various needs within the local society and beyond. Governments also have to role to play in facilitating knowledge transfer from more advanced countries. In Asia, Japan is supporting Malaysia's digital society plan while Singapore and South Korea are doing same with Indonesia.

Facilitate interconnection of services: Governments should aim to harmonise policies on digitisation and facilitate the interconnection of the services of disparate agencies under a common digital platform. The UK government's move to transfer all government agencies to a single domain, Gov.uk, demonstrates the benefits of this action. In December 2014, the Government Digital Service (GDS) completed the process of moving 312 agencies and government organisations over to the common domain. This resulted in the closure of 685 website domains and subdomains, the synchronisation of information available to citizens leading to a significant drop in call centre complaints, and clearer access to required services for citizens through a single domain with a consistent interface.

Considering the cost implications and huge resources required for the harmonisation of multiple policies and interconnection of disparate services at a later date (it took the GDS 15 months to shift the websites over, publishing more than 150,000 pages on Gov.uk and introducing 1.8 million redirects from the relic websites to the new pages), governments should aim to design policies and services with an integrated view from the onset.

For every society aspiring to leverage digital technologies for social and economic benefits, the digital society enablers described above need to be distilled into specific governance and regulatory action plans based on prevailing local factors. Using the six focus countries we reference in this report as an example, there are key steps each of them would need to put in place, in line with the four digital society enablers, to support the implementation of their respective digitisation and national aspirational plans. Some of these steps are unique to some countries, such as ensuring the independence of the telecoms regulator and a transparent and consultative regulatory process in Thailand, and the articulation of a robust digitisation plan in Pakistan. Others are more general, for example the revision of adverse consumer and operator tax regimes, efficient utilisation of universal service funds (USFs), and fair allocation of spectrum resources to encourage investments. Figure 20 maps some notable steps for each of the six focus countries in this report.

Figure 20

Source: GSMA Intelligence

Action plan for the six focus countries

Bangladesh	<ul style="list-style-type: none"> • Resolve tax disputes and rationalize sector specific taxes • Revise and finalise national telecoms policy and Digital Bangladesh roadmap • Create incentives and predictability for mobile operators to invest in spectrum, such as technology neutrality and a future spectrum release plan • Promote a transparent and level playing field for mobile financial services promoting financial inclusion • Ensure a level playing field framework for mobile operators and new licensees for infrastructure sharing
India	<ul style="list-style-type: none"> • Implement National Telecom Policy 2012 • Allocate spectrum for public and civil sector usage • Promote best practice regulation and efficient use of USFs • Review sector specific taxes to increase affordability of mobile internet
Indonesia	<ul style="list-style-type: none"> • Accelerate the digital switch-over • Create a level playing field across banks and non-banks for the distribution of mobile money • Finalise spectrum roadmap • Resist imposition of mobile handset taxes • Increase efficiency in utilisation of USFs
Malaysia	<ul style="list-style-type: none"> • Create a more market based approach to ensure universal coverage of mobile • Use market based spectrum allocation and pricing, as well as clarified renewal procedures, to promote investor confidence
Pakistan	<ul style="list-style-type: none"> • Rationalise sector specific taxation of consumers and operators and harmonize taxes across federal and state level • Release the revised national telecom policy and implement the necessary changes to relevant laws and regulations in consultation with industry • Develop long-term spectrum roadmap • Provide incentives to promote rural connectivity
Thailand	<ul style="list-style-type: none"> • Ensure independence of the regulator • Harmonise telecoms licenses • Develop fair, transparent and consultative auction and regulatory processes • Ensure wider legal and regulatory frameworks for digital economy currently being revised are in line with international best practice to maintain investor confidence • Continue transition from concessionary system to a liberalized licensing regime

As discussed throughout this report, digitisation offers a credible approach to tackling the major social and economic issues faced by Asian countries. Governments in the region must therefore utilise platforms with the best potential to create and deliver digital solutions that improve public services, generate value for citizens and businesses, and drive overall economic growth and development. Mobile technology is well suited to support the attainment of digital society goals in Asia; it puts relevant, impactful services into the hands of underserved people in areas such as health, agriculture, finance, education, utilities and disaster management, while the ubiquity of mobile networks and the capacity of 3G/4G networks to deliver rich content makes it a convenient medium for citizens to access, create, distribute, and store a variety of services, as well as interact with connected infrastructure on the go. Furthermore, it facilitates personal and household/business connectivity across income groups, demographics and locations – a crucial factor in the uptake of digital services.

Accordingly, it is vital that the mobile infrastructure in a country meets the demands of a digital society. This will be achieved by eliminating barriers to investment around access to spectrum and the imposition of tax. Furthermore, policies that encourage content creation and enable awareness campaigns for various digital services need to be in place, and governments play a central role in the formulation and implementation of the necessary frameworks that support these objectives. In addition to creating an investor-friendly environment, governments must also push for the digitisation of public services, which touch all individuals and businesses within a country, in order to stimulate the implementation and development of a successful digital society.

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