

South Asia's Digital Economy

**AN OPPORTUNITY TO BUILD
BACK BETTER, DIGITALLY**

Contents

Contents	2
A. Executive Summary	3
B. Introduction	7
Capitalizing on inclusive digital transformation in South Asia to build back better	7
About the Digital Economy Assessments	11
C. The Digital Economy in South Asian Countries: Prospects and Challenges	13
1. Digital Infrastructure	17
2. Digital Public Platforms	29
3. Digital Financial Services	41
4. Digital Businesses	49
5. Digital Skills	56
6. Trust Environment	63
D. Towards a Regional Digital Economy Agenda: Opportunities for South Asia	72
1. Context and Rationale for a Regional Agenda	72
2. Priority Areas: Cross-border Connectivity, Data Infrastructure, Payment Systems	74
E. Conclusion	82
Key themes: Stronger Institutions, Inclusion and Trust	82
Towards a Digital South Asia: National and Regional Recommendations	83
ANNEX	85
Afghanistan	86
Bangladesh	93
Bhutan	101
India	108
Maldives	117
Nepal	123
Pakistan	130
Sri Lanka	136
References	142

A. Executive Summary

Digital technologies are transforming how people, businesses, governments, and markets interact, transact, work, learn, and function. The shift to digital has significant potential to reduce transaction costs, create jobs, enable innovation in products and processes, and expand access to services and markets. South Asian countries have already started to benefit from the digitalization of their economies, societies, and governments. However, in many respects, the full game-changing potential of digitalization in the region remains untapped. South Asian countries could embrace digitization more fundamentally and more strategically, and embark on a journey of green, resilient, and inclusive development (GRID).

Getting the basics right will enable South Asian countries to unlock more of the benefits of digital economy development while mitigating its risks. To start with, people and businesses need access to affordable, fast, and reliable internet. Digital skills, for both basic and advanced users, are a pre-condition for the use, and innovation, of digital technologies. Digital financial services enable commercial transactions and other economic activities to be conducted online. New digital businesses in the region stand ready to tap into the opportunities and transform the economic landscape but require the right enabling environment to flourish. At the same time, given that the proliferation of digital technologies creates an entirely new set of risks, appropriate safeguards are needed to create a safe and secure digital space that is trusted by both people and businesses.

This report provides a **region-wide analysis on the status of the digital economy in South Asia**. It identifies opportunities and challenges for national and regional action to realize the transformational potential of digitalizing economies, societies, and governments. The report synthesizes and builds upon country assessments produced for Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. It follows the World Bank's digital economy assessment framework, covering different dimensions of the digital economy from digital infrastructure and public platforms to digital financial services, skills, and the trust environment. It also discusses the opportunities and benefits of regional integration and collaboration.

First and foremost, enabling access to **high-quality affordable broadband**, and increasing its adoption, will yield substantial social and economic benefits. These benefits include better access to information, education, and training, greater administrative efficiency in public services, and improved economic growth and productivity. There are currently significant gaps in connectivity access and usage within and across South Asian countries. While most countries have closed the gaps in mobile network coverage, fixed broadband coverage remains a challenge. The usage gap (represented by the number of people living within range of a mobile network but not using the Internet) remains the region's biggest challenge, and is driven by gaps in digital literacy, gaps in affordability for the poorest quintiles, and a lack of relevant content and applications. While there is significant diversity across South Asia, countries in the region might consider adopting a twin-track approach as follows: a) implement policies to enhance competition and attract private sector investment for the upgrade and roll out digital infrastructure, especially for fixed fiber networks that connect users over the middle and last miles, and b) invest heavily in demand-side policies and programs to enhance digital skills and increase affordability, especially for the poorest in the region.

Digital public platforms consist of the government's front- and back-end systems and interfaces that facilitate public sector service delivery and operations. Digital identification systems, data sharing and

exchange layers, and digital government service platforms are often the vital ‘rails’ that underpin digital transactions (especially when they are interoperable as ‘digital stacks’), and on top of which public and private sector service providers can build innovative applications and software. Digitalization of governments in South Asia has been progressing steadily with significant political support and bold visions from the highest levels of government. However, Sri Lanka (85th) and India (100th) were the only countries in the region to place in the top 100 of the UN E-Government Development Survey of 2020, meaning there is much more work to be done. Lack of coordination, limited whole-of-government implementation, and insufficient data protection and governance frameworks is undermining progress in this area. Only Bhutan has fully operationalized data sharing and interoperability across government at the national level. Bangladesh, India and Sri Lanka are making some progress in this regard. This should be made a priority for all countries if they are to unlock the full potential of secure data use and re-use for digital government and the digital economy as a whole. One important asset, that could be built on, is the relatively strong identification systems that exist in all countries (except for Nepal’s system, which is currently in a pilot phase). India’s Aadhaar system, for example, which carries some exemplary features such as universal access and data minimization, has accelerated financial inclusion and the shift to digital social protection delivery and government more broadly. Most notably, however, no country has a fully functional digital identification system for people and businesses to carry out trusted and secure transactions online, with both the public and private sectors. Addressing this gap, as well as gender and other disparities in the coverage of existing identification systems, will be vital for realizing the full benefits of these systems.

Digital Financial Services (DFS) include a broad range of financial services accessed and delivered through digital channels, such as payments, credit, savings, remittances, investments, and insurance. The maturity of DFS varies across countries in South Asia. While many common elements exist between countries, so do important differences, and this provides opportunities for bridging gaps in DFS innovation, provision, and adoption. What requires the most attention is the network of financial access points (ATMs, agents, retail merchants, etc.) and gaps in core payment systems and ICT infrastructure, which are less than adequate in many countries in the region. However, gender and cultural norms also play a role in limiting uptake of digital payments, particularly among women. Finally, issues around trust, and digital and financial literacy, are also common. Fintech start-ups have begun to take off across the region, but are hampered by the lack of funding, unfavorable market dynamics, differential policies for different players, insufficient incubator and accelerator programs, and the shortage of a fintech and entrepreneurship talent pool.

The countries covered in this regional review show diverse levels of **digital business** ecosystem maturity. In the region’s largest countries, e-commerce platforms provide significant opportunity for growth, due to large, underserved markets that could rapidly expand operations, and benefit both formal and informal firms. In order to fully tap into these opportunities, however, more attention is needed to create an environment conducive to business, with the removal of remaining bottlenecks. For instance, more institutional capacity is necessary to develop and implement legal and regulatory frameworks to promote innovation and competition. Early-stage and growth financing can improve through government fiscal incentives combined with an enabling regulatory environment. The adoption of digital tools and technology by SMEs can also be facilitated through various mechanisms. Improving opportunities for female entrepreneurs, including through improved access to finance, is particularly needed in the South Asia region. Finally, a robust network of intermediary support organizations and the promotion of linkages with local incubators, hubs, and universities can serve to create a favorable and enabling digital ecosystem.

Digital skills are critical for access to technology-driven development benefits, making them an essential component of the digital economy. Relevant frameworks classify skills into two categories: skills for a digitally competent workforce, such as ICT professionals, and those for digitally literate citizens. Although digital skilling is increasingly recognized as a key foundation of the digital economy, there is a dearth of data on the level of digital skills available in South Asian countries, and most countries in the region currently lack a coordinated and structured digital skills framework. Developing a more structured approach could start with incorporating digital skills in national strategies, followed by the creation of a system, and commensurate capacity, to train a digitally savvy workforce aligned with the requirements of the digital industry. Broad digital skills and training could be fully incorporated into the education system, with schools connected to the internet and equipped with digital technology and devices. Specific training for women, as well as training related to specific use cases, technologies, or advanced IT skills sets, would also be beneficial across the region.

Harnessing the potential of digital transformation requires creating the necessary **trust environment** for people, businesses, and government agencies to use digital technologies. A rights-based approach to data protection, that regulates (or enables and limits) data collection, processing, and use by third parties, is critical. Improving cybersecurity and curtailing cybercrime will also serve to increase trust in cyberspace. The lacunae in safeguards stand out when examining the robustness of key protections in the processing of personal data. No in-scope South Asian country currently subjects the collection or processing of data to a “necessary and proportionate” test to determine if it is justified (although there are some notable exceptions in India). While the current status quo on safeguards is weak, some South Asian countries are making progress on laying down the foundations of a legal framework. A greater focus on, and investment in, cybersecurity is necessary. In most countries, vital operational response such as computer emergency response teams (CERTs) have been formed to help protect the cyberspace and national infrastructure across the region, but more is needed to ensure operational adequacy and efficiency to effectively counter threats.

In South Asia, most reform efforts and investments in the digital space currently take place at the national level with few multi-country initiatives. While **regional integration** dynamics are generally weak in the region, there is added value in coordinating or developing collaborative arrangements between countries on different aspects of the regional agenda. To help maximize the potential of the region to leverage the digital economy, three priority areas stand out in the short- to medium-term, namely connectivity, data flows, and payment systems.

First, in terms of **connectivity**, regional cooperation can help improve access to international capacity and connect currently disadvantaged landlocked countries. Countries with limited cross-border links are on the edge of global connectivity networks, placing them at a significant disadvantage in the market in terms of supply as well as cost (as price-takers for connectivity). Regional efforts can focus on increasing the number of cross-border links with coastal and inland neighbors to interlink with key international connectivity routes. Beyond access to cross-border digital connectivity, access to infrastructure for the storage, analysis, and transmission of data is key to the growth of South Asia’s digital economy. This requires Internet Exchange Points to facilitate domestic data flows, the ability to store data within data centers, and access to cloud computing services that enable users to leverage capabilities, such as machine learning, over vast data sets for greater value creation.

Second, investing in connectivity and data infrastructure would lead to greater benefits when this is combined with an appropriate enabling environment for **cross-border data flows**. Data (both public and private) has the potential to create socio-economic value for all countries in the region when it flows based on common frameworks and standards. At present, while no South Asian country has enacted overarching directives restricting cross-border data flows, restrictions on data localization have been

discussed and introduced in draft bills in India, Pakistan, and Sri Lanka. Restrictions already exist to some extent on the sectoral level. Legal frameworks in other South Asian countries, surveyed as part of the Global Data Regulation Diagnostic, appear largely silent in this regard.

Third, the number of **cross-border payments** (including remittances and trade transactions) are on the rise between countries in South Asia. One of the most important enablers of cross-border payments are the appropriate legal and regulatory frameworks. Though these are largely consistent across the region, some aspects, such as the degree of harmonization of Anti Money Laundering (AML) and Combating the Financing of Terrorism (CFT) procedures and policies related to the participation of foreign financial institutions, need further consideration. In addition to legal and regulatory challenges, the second major barrier to cross-border payments in the region is the compatibility of payment system infrastructures. Countries in the region have all implemented traditional payment systems covering large value (Real-Time Gross Settlement or RTGS) and bulk payments (Automated Clearing House or ACH). They have also established dedicated domestic card payment infrastructures, national switches (except Nepal and Maldives), and Fast Payment Systems (FPS) (except Afghanistan and Bangladesh). However, several countries suffer from an inadequate network of financial access points, such as ATMs, agents, and retail merchants, thereby limiting coverage and hindering uptake.

In sum, the pace of digitization of the economy has been accelerating rapidly across the South Asian region, as more people get online and transformational innovations in public service delivery and business models alter the socio-economic landscape. The shock brought about by the COVID-19 pandemic, together with the increasingly visible consequences of climate change, have exposed the real cost of digital divides. New approaches are needed to position South Asia towards green, resilient, and inclusive development. This report has identified various public policies and measures that could help South Asian countries benefit from accelerated digital development while managing and mitigating the risks. **A significant development potential lies ahead for the region through increased access, use and innovation of digital technologies**, both on the national level and – where possible – through regionally coordinated and collaborative approaches.

B. Introduction

Capitalizing on inclusive digital transformation in South Asia to build back better

Digital technologies are changing how people, businesses, governments, and markets interact, transact, work, learn, and function. The COVID-19 pandemic has—by necessity—accelerated the digital transformation that underpins these shifts, as people, businesses, schools, and governments have had to rapidly adopt digital channels to maintain continuity amid lockdowns, quarantines, and social distancing guidelines. Governments can become more efficient and effective by streamlining their work and making smarter use of their resources, particularly when it comes to vital services such as healthcare, education, and social protection. Before COVID-19, countries in South Asia were already making substantial progress across various aspects of the digital economy. Digitization would also support a longer-term shift towards services-led development in South Asia, building on earlier positive developments.¹ Hence, by adopting appropriate policies and investing strategically, the region now has the opportunity to capitalize on its inclusive digital transformation to build back better.

Going digital has the potential to reduce transaction costs, create jobs, and enable innovation in products and processes, as well as expand access to services and markets. Some 70 percent of new value addition in the global economy over the next decade is expected to derive from digitally enabled platform business models. As discussed in the 2021 World Development Report, data collected for one particular use has the potential to generate economic and social value in use cases beyond those originally anticipated. This data, especially in high volumes, is an essential input to the success of disruptive technologies such as the Internet of Things (IoT), Artificial Intelligence (AI) and machine learning, among others.

South Asian countries are already benefitting from the digitalization of their economies, societies, and governments. Most of the region's inhabitants live in areas covered by 4G mobile broadband networks, forming a large consumer base with access to information, services, and markets. Some countries, like Bhutan and Sri Lanka, have jumped significantly in UN E-Government Development Survey rankings in the last decade. In Bangladesh, digital technologies have been used to empower women through better access to government and financial services. India has become a global information technology services powerhouse and a pioneer of 'digital stacks' that bring together digital payments and identification services, among others, and upon which innovators can build additional services and applications. Digitization can also stimulate innovative country approaches to the delivery of health, education, and social protection, as was seen in many South Asian countries that leveraged digital technologies during the pandemic.²

¹ See <https://www.worldbank.org/en/region/sar/publication/shifting-gears-south-asia-economic-focus-fall-2021>

² See <https://openknowledge.worldbank.org/bitstream/handle/10986/36156/9781464817199.pdf>

Box 1: Development-enhancing Effects of ICT Adoption³

Vast literature exists evidencing the development-enhancing effects of ICT adoption. A new, 2021 summary article by Estefania Vergara-Cobos and Eduardo A. Malásquez offers a fresh, systematic revision of the literature covering the multiple dimensions across agents and channels such as economic transformation and growth (country level), productivity (firm level), welfare and labor (individual level). Overall, it finds that technologies such as the internet, mobile services, and AI have positive spill-over effects such as:

- A 10 percent increase in mobile broadband (MBB) networks adoption (percentage of total connections) causes a 0.14 percent increase in GDP for non-OECD countries.
- A 10 percentage-point increase in adoption of cloud computing services increases a firm's productivity level by 3.5 percent. These productivity gains are more than doubled for high productivity firms in comparison to low productivity firms.
- A 1 percent increase in mobile phone penetration leads to a 0.12 percent increase in human development index in South Asia.

The magnitudes of the effects may vary by country of analysis, year, and technology. Some differentiation is needed depending on the level of development, country situation, type of technology, and other factors.

However, in many respects, the full game-changing potential of digitalization in South Asia remains untapped. In most countries, only about a third of the population subscribes to mobile internet services, except in Maldives (57 percent) and Sri Lanka (50 percent). This is a key barrier for access to the digital economy and digital government services. Moreover, an important gender divide persists, with women owning fewer mobile devices and using the internet less than men. For example, women in Bangladesh are 55 percent less likely to use the internet than men. As many households remain unconnected across the region, 88 per cent of school-age children⁴ (449 million) do not have access to internet at home, and among the poorest 20 percent of the population, that proportion is just 2 percent.⁵

Most countries in the region have a long way to go in implementing comprehensive digital government transformation and building digital public platforms to enhance service delivery and promote private sector innovation. Apart from realizing a whole-of-government approach to digital government and data, there is also an opportunity to shift the mindset from simply digitizing what exists to re-imagining how systems and processes work, enabled by digital technologies. For example, there is a significant difference between making forms available for download from a website but still requiring them to be printed, signed, and submitted in-person or by post with attached certified copies of supporting documents, and allowing people and businesses to carry out a government transaction end-to-end through a website or app, with data supporting the process re-used and pre-filled from existing authoritative databases. Facilitating this are digital public platforms such as identification systems, data sharing and exchange layers, and other common platforms for transactions such as e-signatures, payments, and communications. If the private sector can also build their systems on top of such open platforms (with necessary safeguards against misuse) for when people access their services, this can unlock exciting innovative applications, especially for e-commerce and digital financial services.

Capitalizing on the expansion of digital financial services and e-commerce is often impeded by barriers to innovation and new business models, as well as weak or non-existent fast payment systems, credit, and data infrastructure. Weak consumer protection, low online trust, inadequate data protection and

³ Estefania Vergara-Cobos³ and Eduardo A. Malásquez: Digital Technology Adoption and the Jobs and Economic Transformation Agenda: A Survey

⁴ Between 3 and 17 years old.

⁵ UNICEF, 2020.

insufficient cybersecurity are important constraints. At the heart of many of these challenges lies the lack of coordination among public bodies and with the private sector, as well as antiquated policies, laws and regulations that are not fit-for-purpose in the digital age. These weaknesses were laid bare during the COVID-19 pandemic, when many children were left disconnected from remote learning,⁶ and many small businesses struggled to pivot to e-commerce channels.⁷

Digitalization can also lead to greater risks – such as security breaches, data misuse, vendor and technology lock-in, and social exclusion – which all need to be comprehensively understood and proactively mitigated. Such risks, if not addressed, will serve to undermine the ability of countries to reap the benefits of digitalization, whilst creating a slew of new problems, such as widened digital divides, and reduced public trust and confidence in the digital economy. The starting point for addressing these risks is the establishment of a strong institutional and legal framework that promotes measures for transparency and accountability as well as safeguards against function creep and misuse of systems and data (e.g., data protection). The necessary capabilities to monitor and defend against cybersecurity threats and vulnerabilities, especially for critical infrastructures, need to be developed. Moreover, the rapid shift to digital delivery without maintaining analogue back-ups and alternatives can shut out whole segments of the population (those with limited or no digital access and literacy), while also creating single points of failure when (*not if*) operations are interrupted. Prioritizing technology and vendor neutrality, through, for instance, the adoption of open standards and careful procurement processes, promotes full country ownership of systems and data, and ensures greater flexibility and sustainability. The risks of digitalization can be mitigated, but only if this is done deliberately as an inherent part of the digital transformation process, through proper engagement with beneficiaries, a thorough analysis of threats and vulnerabilities, and adequate back-up and business continuity measures.

As South Asian countries embrace digitization more widely and more strategically, they can embark on a journey to green, resilient, and inclusive development (GRID). With the world facing unprecedented challenges related to climate change, while at the same time coping with a dramatic global health pandemic, digital technologies provide South Asian countries with the opportunity to make a strategic choice, and to switch to a development path that prioritizes digital technologies for lowering carbon footprints, increasing resilience against external shocks, and creating more inclusive development outcomes, while mitigating the risks. Such opportunities can be realized in several different ways, including the following:

- Digital technologies support **green** growth through innovations such as smart and digitally enabled energy grids, transport networks, agricultural practices, and cities built on digital enablers for green development can facilitate a more efficient use of resources through traceability, predictability, and flexibility. Remote sensing technology, and satellite imagery, as well as big data analytics and machine learning can go a long way in helping fight against climate change and boosting the resilience of societies. For South Asia, this includes monitoring the Himalayan ecosystem and its glaciers; about 1.5 billion people benefit from the water of Himalayan rivers, while risks relating to floods during the rainy season, and lower water flow during the dry season, have been exacerbated by retreating glaciers.⁹⁸
- Digitalization is central to creating **resilient** social safety nets and healthcare systems that can respond to sudden shocks. Countries with a mix of good digital identification, digital payment, and

⁶ <https://www.unicef.org/rosa/stories/keeping-all-children-learning-during-pandemic>

⁷ Brucal, Arlan; Grover, Arti; Reyes Ortega, Santiago. 2021. Damaged by the Disaster: The Impact of COVID-19 on Firms in South Asia. Policy Research Working Paper No. 9604. World Bank, Washington, DC.
<https://openknowledge.worldbank.org/handle/10986/35357>; pp. 10-12

data management systems in place were better able to expand existing programs and introduce new cash assistance during the pandemic, especially to cover informal workers who were not part of any existing social assistance and insurance programs. Similarly, governments and businesses that were more digitalized, and countries with better digital infrastructure, showed more resilience to maintain business continuity by shifting systems, transactions, and operations online.

- Digitalization can foster **inclusive** economies by removing physical, cost-based, and other barriers to economic and service opportunities—for both people and businesses. Greater inclusion will benefit women and girls, in particular, who are vastly underrepresented in government offices and traditional business structures. There are important benefits in being able to transact directly with governments and businesses. The opportunities presented by digital financial services and digital entrepreneurship are also manifold, particularly for promoting e-commerce and financial inclusion.

The COVID-19 pandemic has demonstrated the vital role that digital technologies can play in a rapid, resilient and inclusive response to crisis. The World Bank Macro Poverty Outlook⁸ estimates that the ongoing pandemic has led to 78 million new poor⁹ in South Asia. The response to the COVID-19 pandemic fast-tracked the use and growth of digital business platforms, thereby accelerating technology deployment, digitalization, and adoption of new practices in logistics, health, education, agriculture, and e-commerce. Pakistan's government and private sector collaborated in using their foundational identification system, digital payments, and the social registry, to quickly rollout the Ehsaas Emergency Cash program to protect the livelihoods of 12 million families. South Asia could further optimize its use of digital technologies to turn the COVID-19 crisis into an opportunity to address some of the region's most pressing challenges and promote inclusive and services-led growth.

In so doing, the South Asian region could respond quickly to global challenges and trends. By way of example, countries in the region could consider pivoting away from an overt focus on manufacturing export markets, towards the export of business process outsourcing and management services, thereby capitalizing on their comparative advantages. Considering the massive population in South Asia, e-commerce (and especially regional e-commerce) could create opportunities for many small and medium sized enterprises in the region.¹⁰ Furthermore, the growing fields of IoT and big data analytics (and corresponding developments in climate-smart agriculture, smart water management, and smart grids), can help pave the way for a resilient and sustainable recovery in the region.¹¹ In combination, these innovations can help countries explore greener, more resilient and inclusive economic development models, as well as greater economic diversification.

The beginnings of a new era driven by digital development can already be felt across South Asia today, but the first step is for countries to get the basics right, and proactively mitigate risks. People and businesses need access to affordable, fast, and reliable internet. Digital skills are a pre-condition to use digital technologies. Digital financial services are indispensable for economic activity leveraging the cyber space. Entrepreneurs stand ready to develop new businesses and opportunities and transform the economic landscape but require a conducive enabling environment. With a well-thought-out and deliberate approach to digital transformation, strong policy and institutional frameworks, and the necessary investments in markets and ecosystems, South Asian countries have the opportunity to reap

⁸ The World Bank, 2020a

⁹ People living under US\$1.90-a-day.

¹⁰ See, for example, Kathuria, Sanjay; Grover, Arti; Perego, Viviana Maria Eugenia; Mattoo, Aaditya; Banerjee, Pritam. 2020. Unleashing E-Commerce for South Asian Integration. International Development in Focus. Washington, DC: World Bank.

<https://openknowledge.worldbank.org/handle/10986/32718>

¹¹

the benefits of a dynamic digital economy and significantly improve socio-economic outcomes in the region.

About the Digital Economy Assessments

The present report provides a region-wide analysis on the progress of the digital economy in South Asia. It identifies opportunities and challenges for national and regional action to realize the transformational potential of digitalizing economies, societies, and governments. The report synthesizes and builds upon the country assessment reports produced for Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The country reports follow the World Bank's digital economy assessment framework and provide an analytical overview of digital developments in the various countries, from digital infrastructure and public platforms to digital financial services, skills and the trust environment. They also provide insight into new opportunities for regional integration in South Asia.

The regional and country reports are intended to present to governments, businesses, people, and other stakeholders in South Asia how a cohesive approach across the six digital economy pillars will unlock benefits that are much greater than the sum of their parts and will have spillover benefits for the region's 1.8 billion people. The reports also provide insights into a collaborative regional reform agenda. The first part of the report provides a chapeau over the national level work, synthesizing the findings on the national level (across 8 countries). The second part of the report adopts a regional integration perspective and discusses the horizontal enablers that need to be considered to enable the digital economy across the region.

Data collection, analysis and preparation of the country reports took place from spring 2020 to summer 2021, that is, during the global COVID-19 pandemic. Work started with a literature review and benefitted from close collaboration with colleagues in the country offices, as well as the network of local contacts that the team could mobilize to explore different aspects of the country-level analysis. Stakeholder interviews were carried out on the national level, both in form of formal conference calls and through informal background conversations. All collaboration took place in virtual format, including country level workshops.

In line with its two-fold objective, the present report is made up of two main sections:

- **Section B** (which follows) summarizes key trends in digital economy development across the region. Building on the assessments in eight country-specific reports, it discusses the digital opportunities and bottlenecks emerging in South Asian countries, across the main dimensions of the digital economy, namely digital infrastructure, digital public platforms, digital financial services, digital businesses, digital skills, and the trust environment. This section demonstrates that, despite differences in the level of uptake of digital technologies and advancement in infrastructure, countries in the region share a lot of commonalities in terms of digital opportunities, interests, bottlenecks and barriers.
- **Section C** discusses opportunities for regional integration and collaboration. This section, in line with South Asia's regional integration strategy, provides insights into potential regional collaboration and integration that could accelerate digital transformation in the region. It points to the various collaboration opportunities that exist in South Asia across a range of sectors, particularly in education and finance, which could serve to achieve concrete development outcomes. It suggests

that progress could be made by linking the regional digital infrastructure that connects countries to each other. It also underscores the importance of integrated payment systems within the region. Finally, it identifies cross-border data flows as the engine of the digital economy and an important pre-requisite for the digital agenda to take off across the region.

Section D sets out the conclusions of the report; and the executive summaries of all individual country reports are contained in the **Annex**.

C. The Digital Economy in South Asian Countries: Prospects and Challenges

Digital transformation holds great promise for South Asia. Countries in the region recognize the important role that digital technologies play in promoting inclusion, improving public service delivery, creating jobs, and stimulating the economy. Digital agenda strategies are generally centralized, endorsed by the highest levels of government and have gained traction in most countries. Examples include the Digital India Programme (ongoing since 2006), the Digital Pakistan Policy of 2018 and 2021, the 2019 Digital Nepal Framework, and Bhutan's Digital Drukyl initiative (approved in 2019).

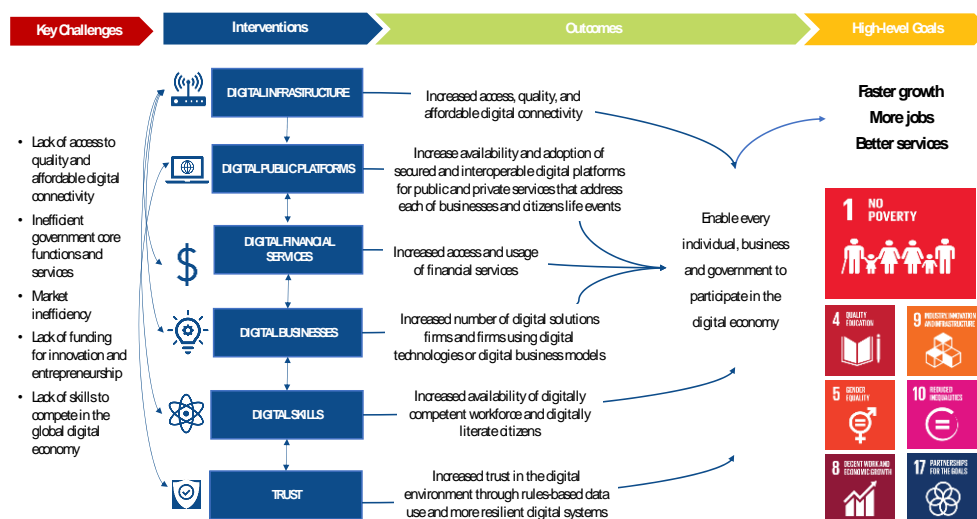
This section discusses six different dimensions of the digital economy in South Asian countries as follows:

- **Digital Infrastructure.** Digital infrastructure paves the way for people, businesses, and governments to get online and link with local and global digital services, thereby connecting them to the global digital economy. Broadly speaking, digital infrastructure consists of connectivity (high-speed internet and related technologies), internet of things (mobile devices, appliances, computers, sensors, geospatial instruments, machine to machine communications, etc.), and data repositories (such as data centers and cloud technology).
- **Digital Public Platforms.** Digital public platforms consist of a government's systems and interfaces that facilitate public sector service delivery and operations. These are developed for the public sector, or as a public good by government, sometimes in partnership with the private sector (or through a hybrid model). When digital public platforms are designed based on a "whole-of-government" and "user-centric" approach, they can significantly improve operational and economic efficiency, boost service quality and innovation, and ensure accountability. They can also increase channels for public engagement and feedback, increase transparency, and reduce opportunities for corruption. Moreover, digital public platforms have the potential to generate important network effects, whereby additional users (and the data they generate) create an exponential increase in value.
- **Digital Financial Services.** Digital financial services (DFS) provide individuals and households with convenient and affordable channels by which to pay, save and borrow. Firms can utilize DFS to transact with their customers and suppliers more easily, build digital credit histories and seek financing. DFS can help governments increase the efficiency and accountability of various payment streams, including the disbursement of social transfers and receipt of tax payments. Digital payments are often the entry point for digital financial services and provide the infrastructure or "rails" through which additional products and use-cases can be developed.
- **Digital Businesses.** The use of digital technologies and associated business models to unlock economic opportunities and enhance private sector competitiveness lies at the heart of any strategy for job creation, increased productivity, higher growth and improved living standards. Digital businesses can be classified into two categories, each with their own distinct characteristics: 1) digital start-ups or early-stage ventures that create new digital solutions or business models as part of their core products or services, and 2) established digital businesses or large platform-based and data-driven firms that have passed the initial start-up stage, and have already acquired suppliers, contractors, and consumers. Digital businesses represent a unique opportunity for South Asian

economies to nurture and scale Micro, Small and Medium Enterprises (MSMEs), promote innovation and entrepreneurship, foster economic integration, integrate lagging populations and regions, increase efficiency, and generate more (and better) jobs.

- **Digital Skills:** Digitally competent workers, with the right digital skills, form the foundations of vibrant digital economies. Digital skills refer to a continuum of skills that can be fostered through formal education and training as well as informal learning. Improving the digital skills for ICT professionals and technical workers, which serve to bolster the development and uptake of digital technologies, requires specialized education and training. On the other hand, digital literacy refers to more general skills/competences required for all citizens and workers that are not in ICT (Information and Communication Technology) occupations. Digitally literate citizens can reap the benefits of a digital society more easily by gaining access to safer and higher-quality information and engaging with the wider community.
- **Trust Environment:** Digital technologies expose societies to risks of data misuse, cybersecurity threats, and cybercrimes. If not addressed, these risks undermine the ability to realize the benefits of digitalization and can create new problems - widening digital divides and reducing public trust and confidence in digital services and transactions. Building an enabling legal and regulatory framework is the first step to reduce these risks and should address: *data protection and privacy* (ensuring personal data handling engenders trust); *consumer protection* (protecting individuals from harm and unfair practices caused by online activities); and *cybersecurity* (ensuring minimal levels of cybercrime and accountability for cybercrimes). These areas are in addition to more thematic digitalization areas of law and regulation such as digital equivalence of documents, digital payments and digital delivery of financial and other products and services. Many of the harms caused by online activities can also happen in real life (e.g., theft, deceptive conduct and fraud). However, there are some unique factors about the online environment that can vastly exacerbate the risks of these and other harms, and which therefore require specific treatment. Effective and resilient institutions are also critical to the effective implementation of the legal and regulatory framework in order to address these risks and build trust.

Figure 1: World Bank Group Digital Economy Framework¹²



¹² World Bank visualization on the Global Digital Economy Framework

- **To fully realize the benefits of a digital economy, South Asian countries should consider adopting a cohesive approach across the pillars discussed above.** Based on the analysis contained in the country reports, as well as the present regional report, the following cross-cutting areas for action emerge as particularly relevant:
 - **Focusing on inclusion:** First and foremost, any digitalization efforts would need to be made for *all*. Efforts and initiatives should bridge, rather than exacerbate, digital divides that already exist in the region. Digitalization needs to serve as a tool for the innovation and expansion of service delivery, particularly in areas such as social protection, healthcare, education, agriculture, and financial services. Broadband access and devices could be made more affordable, and public and private sector services more accessible, especially for women, persons with disabilities, and minorities. South Asian countries should intentionally design their policies and programs in ways that leave no one behind. Countries in the region could also scale up efforts to understand the demand for digital skills, and strengthen their supply, while at the same time equipping SMEs with the right incentives and tools to digitalize.
 - **Strengthening institutions:** Countries in the region could review and rethink the regulations and institutions that could unlock the digital economy. To make it easier for businesses to digitalize, innovate, and invest, countries could consider reducing the regulatory risks facing private and foreign investment in connectivity or e-commerce. To enable a new services economy, rules could be put into place to lower barriers to entry and promote innovation and disruption in stagnant markets. To achieve this, regulatory institutions would likely need to improve capacity, competence, and creativity, and better coordinate government systems and interfaces. Overarching bodies, with clear mandates and the necessary authority to make and enforce policies, standards, and strategies, will be needed to improve the efficiency of digital government programs and deliver enhanced and integrated services to people and businesses. Digital identification, digital payments, and trusted data could be designed coherently as ‘digital stacks’, whereby open interfaces and standards create effective linkages between platforms. Digital stacks could provide the necessary ‘rails’ for the digital economy, by enabling and combining presence-less, cash-less, paper-less, and data-empowered transactions in both the public and private sectors. The use of regulatory sandboxes to test FinTech services and innovations could also be considered.
 - **Building trust:** As South Asia undergoes a digital transformation, governments in the region will benefit from building the necessary legal frameworks with both enablers and safeguards to promote trust in the digital realm. Enablers give legal validity and equivalence for electronic and digital identification, authentication, transactions, signatures, and contracts. Safeguards protect people, businesses, and governments against the risks and misuses of digitalization, such as cyber threats and data breaches. In general, South Asian countries have put into place stronger enablers than safeguards. There is therefore a need to accelerate efforts to develop data protection and cybersecurity frameworks to address this gap, along with appropriate oversight and accountability mechanisms. Apart from preserving the gains of digitalization, safeguards become increasingly important when it comes to digital trade (e.g., data protection adequacy determinations to enable data flows with other regions such as the European Union). Furthermore, greater public-private and regional dialogue through available forums will promote trust among countries and stakeholders, helping to develop densified broadband networks, integrated payments systems, and cross-border data flows.

Box 2: Gender Equality and the Digital Economy in South Asia

Closing gender gaps in access to and use of technology is central to ending extreme poverty and boosting shared prosperity.¹³ From an early stage, ensuring that girls and boys have an equal opportunity to build digital literacy and digital skills is critical for their human capital development. Although comprehensive data are lacking, available data highlight gender gaps in basic digital literacy.¹⁴ For example, in India, 20 percent of women versus 9 percent of men report that they do not know how to access the internet on a mobile device.¹⁵ In Bangladesh, these figures stand at 32 percent for women and 26 percent for men.¹⁶ As women transition to the labor market, digital technologies can serve as a pathway to economic opportunities, particularly through online work that provides added flexibility and moderates mobility constraints. However, to effectively leverage the digital economy, women need intermediate and advanced tech skills. These skills can also help address occupational sex segregation through women's increased participation in male-dominated (and often higher-paying) fields.

Despite the challenges, there are immense opportunities for the South Asia region to leverage technology as an enabler of gender equality—and, in many cases, we already know what works.¹⁷ For example, ensuring that girls and boys have equal opportunities to develop digital skills is key. For girls in particular, hands-on training can help build girls' interest and confidence. Female role models are also critical.¹⁸ To support women's access to digital financial services, design choices that include tailored products and services, increase women's digital financial capability and consider social norms are central to women's economic empowerment.¹⁹ For women entrepreneurs, evidence from other regions demonstrates that socio-emotional training, cash grants, and mobile savings can improve the performance of women-owned firms.²⁰ Incorporating a gender lens and tackling gender gaps across the various pillars of the digital economy are indispensable for building back better digitally in South Asia. Despite the challenges, there are immense opportunities for the South Asia region to leverage technology as an enabler of gender equality—and, in many cases, we already know what works.²¹ For example, ensuring that girls and boys have equal opportunities to develop digital skills is key. For girls in particular, hands-on training can help build girls' interest and confidence. Female role models are also critical.²² To support women's access to digital financial services, design choices that include tailored products and services, increase women's digital financial capability and consider social norms are central to women's economic empowerment.²³ For women

¹³ Klingen et al. 2021 : "Putting women and girls at the center of digital development": <https://blogs.worldbank.org/digital-development/putting-women-and-girls-center-digital-development>

¹⁴ GSMA 2021. *The Mobile Gender Gap Report 2021*. <https://www.gsma.com/r/gender-gap/>

¹⁵ Indicator: Percentage of mobile users who are aware of mobile internet but do not use it, and who identified the following as a main barrier to using mobile internet: GSMA 2021. *The Mobile Gender Gap Report 2021*. <https://www.gsma.com/r/gender-gap/>

¹⁶ Indicator: Percentage of mobile users who are aware of mobile internet but do not use it, and who identified the following as a main barrier to using mobile internet: GSMA 2021. *The Mobile Gender Gap Report 2021*. <https://www.gsma.com/r/gender-gap/>

¹⁷ Klingen et al. 2021 : "Putting women and girls at the center of digital development" : <https://blogs.worldbank.org/digital-development/putting-women-and-girls-center-digital-development>

¹⁸ Hammond, Alicia; Rubiano Matulevich, Eliana; Beegle, Kathleen; Kumaraswamy, Sai Krishna. 2020. *The Equality Equation : Advancing the Participation of Women and Girls in STEM*. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/34317> License: CC BY 3.0 IGO

¹⁹ <https://www.povertyactionlab.org/policy-insight/designing-financial-services-and-social-protection-programs-enhance-womens-economic>

²⁰ World Bank Group. 2019. *Profiting from Parity : Unlocking the Potential of Women's Business in Africa*. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/31421> License: CC BY 3.0 IGO

²¹ Klingen et al. 2021 : "Putting women and girls at the center of digital development" : <https://blogs.worldbank.org/digital-development/putting-women-and-girls-center-digital-development>

²² Hammond, Alicia; Rubiano Matulevich, Eliana; Beegle, Kathleen; Kumaraswamy, Sai Krishna. 2020. *The Equality Equation : Advancing the Participation of Women and Girls in STEM*. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/34317> License: CC BY 3.0 IGO

²³ <https://www.povertyactionlab.org/policy-insight/designing-financial-services-and-social-protection-programs-enhance-womens-economic>

entrepreneurs, evidence from other regions demonstrates that socio-emotional training, cash grants, and mobile savings can improve the performance of women-owned firms.²⁴ Incorporating a gender lens and tackling gender gaps across the various pillars of the digital economy are indispensable for building back better digitally in South Asia.

1. Digital Infrastructure

High-quality broadband access, its widespread use and improved affordability can yield substantial social and economic benefits, including better access to information, education, and training, greater administrative efficiency in public services, and improved economic growth and productivity. Internet connectivity has been shown to be positively correlated with increased labor force participation and household consumption,²⁵ employment mobility,²⁶ new job creation and job growth,²⁷ and re-employment probabilities.²⁸ Internet access also increases economic and social resilience during adverse shocks such as COVID-19 by enabling remote work providing alternative channels to access knowledge, markets, and services.²⁹

However, there are significant gaps in broadband access and use within and across South Asian countries. While most countries have closed mobile network coverage gaps, fixed broadband coverage remains a challenge. There is a significant usage gap (the number of people living in range of a mobile network but not using the Internet), which is driven by gaps in digital literacy, affordability for the poorest quintiles, and the lack of relevant content and applications. Despite the diversity that exists across the region, governments in the region may consider adopting a two-pronged approach to: a) implement public policies to enhance competition and attract private sector investments for the upgrade and rollout of digital infrastructure, especially fixed fiber networks to connect users over the middle and last mile and b) invest in demand-side policies and programs to enhance digital skills and increase affordability, especially for the poorest in the region.

Key Findings

- 1) South Asia has seen remarkable growth in 4G coverage over the last five years, with Afghanistan and Nepal being exceptions.** On average, the region has reduced the share of the population out of

²⁴ World Bank Group. 2019. Profiting from Parity : Unlocking the Potential of Women's Business in Africa. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/31421> License: CC BY 3.0 IGO

²⁵ Bahia, Castells, Cruz, Pedros, Rodriguez Castelan, and Winkler, *The Welfare Effects of Mobile Broadband Internet: Evidence from Nigeria*. (2020)

²⁶ Stevenson, *The Impact of the Internet on Worker Flows* (2006)

²⁷ Bahia, Castells, Cruz, Masaki, Castelan and Sanfelice, *Mobile Broadband Internet, Poverty and Labor Outcomes in Tanzania* (2021)

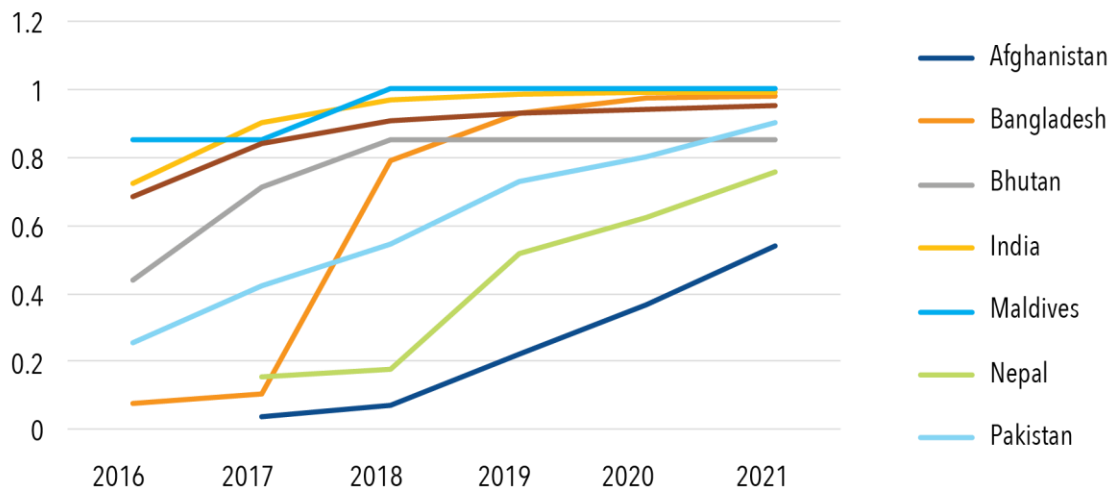
²⁸ Gurtzgen, Nolte, Pohlen and van den Berg, *Does the Internet Help Unemployed Job Seekers Find a Job? Evidence from the Broadband Internet Expansion in Germany* (2018)

Younger and more skilled men benefit the most through higher labor force participation and wage employment, while high-skilled women benefit from transitions from self-employed farm work into non-farm employment.

²⁹ Özden, *Who on Earth Can Work from Home*, World Bank Working Paper (2020)

reach of a mobile network signal to 8 percent, down from 30 percent in 2014. Pakistan and Bangladesh, in particular, have had impressive coverage expansion.

Figure 2: Percentage of population covered by 4G networks, 2016-2021

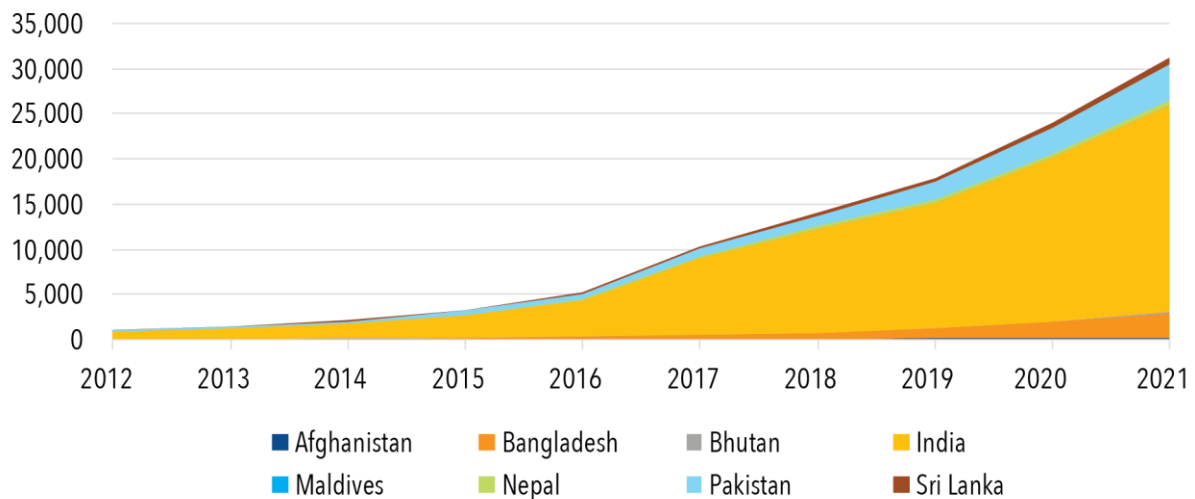


- 2) However, progress on coverage masks the significant challenges that exist in the region in the upstream digital infrastructure supply chain.** Most countries connect to the global Internet via an intercontinental network of submarine cables, and landlocked countries purchase access via their sea-bounded neighbors. Access to this international internet bandwidth via submarine cables (first-mile) has increased steadily over the last decade in South Asia, with the largest increases seen in India, Pakistan, and Bangladesh (see Figure 3). However, while the costs of international bandwidth have decreased over time, landlocked countries still pay exorbitantly high prices for international links with poor resilience. The costs of transit in Afghanistan are over US\$ 10³⁰, compared to the average cost of international transit³¹ in India and Pakistan (US\$4.93 and US\$6.62 respectively). When compared to neighboring Southeast Asian countries such as Malaysia (US\$2.71) and Singapore (US\$0.73), the costs paid by all South Asian countries are higher, despite steady drops in the cost of submarine connectivity in India and Pakistan over the last five years. The high costs paid by landlocked countries are attributable to poor competition among service providers at international borders, and the reluctance of governments and national backbone providers to enter cost-efficient long-term leasing arrangements. This cost is even higher in countries with poor domestic competition. In Afghanistan, for instance, due to the near monopoly of Afghan Telecom in providing international bandwidth to retail providers, costs for bandwidth in the capital Kabul are over five times what it costs at the border. In addition to high costs, the resilience of international links remains a concern. In May 2020, for example, Bhutan's internet was significantly affected by the Amphan cyclone, as both international links to the country passed through the narrow Siliguri corridor from Kolkata. The absence of cable landing stations in the north-east coast of India is particularly challenging for Nepal and Bhutan, as international bandwidth they procure needs to be routed over 2200 km to the border.

³⁰ As of Q2 2020; through interviews with internet service providers

³¹ 10 GigE weighted median cost, Q2 2021

Figure 3: International Internet Bandwidth (Gbps) over Time³²



Within countries, middle mile networks deliver connectivity to proximate locations for further downstream distribution to local communities. Gaps in middle-mile infrastructure (national fiber-optic and microwave backbone networks) were found in all South Asian countries, albeit with significant variances.

Investments in the middle-mile networks, especially wireline networks built with fiber optic cables, are essential to improving end-user internet connections, as their demand for data has increased, requiring higher capacities upstream. Over the last five years, the highest growth in the length of the fixed transmission network took place in Sri Lanka, and the lowest growth in Afghanistan (Figure 4). Across the region, the share of the population living at 10, 25, and 50 km from a transmission link varies: Sri Lanka and Bangladesh have the highest share of population less than 10 km from a transmission link (with their entire population less than 50 km from a transmission link). Despite having the longest network length (in kilometers), India has the highest share of population (more than 82.5%) that are more than 10 kilometers away from a transmission link, highlighting the need for greater investments in the country's middle mile. When existing fixed transmission links are overlaid on a map of population density in India (Figure 5), it is easily observable that areas with lower density (rural communities) are significantly lagging. Outer atolls in Maldives and rural areas of Afghanistan lag the most, with over 30% and 20% of the population living more than 50 km from a fixed transmission link. The absence of good infrastructure sharing practices across South Asian countries is an additional barrier, leading to less frequent and less cost-effective use of existing infrastructure.

³² Authors' calculations using data from Telegeography (as of Q2 2021)

Figure 4: Fixed Transmission Networks: Length and Growth (2015-2020)³³

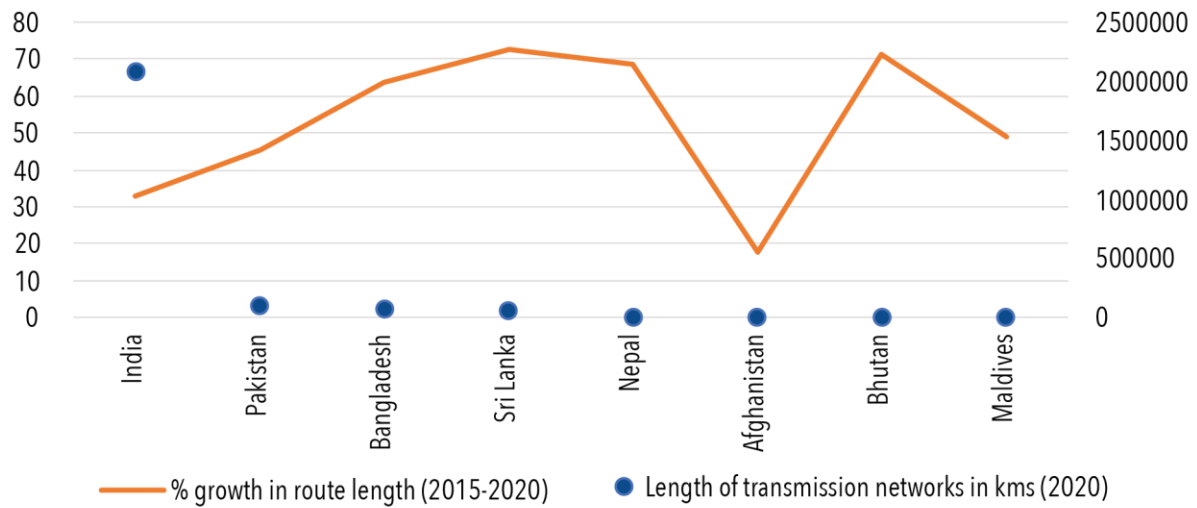
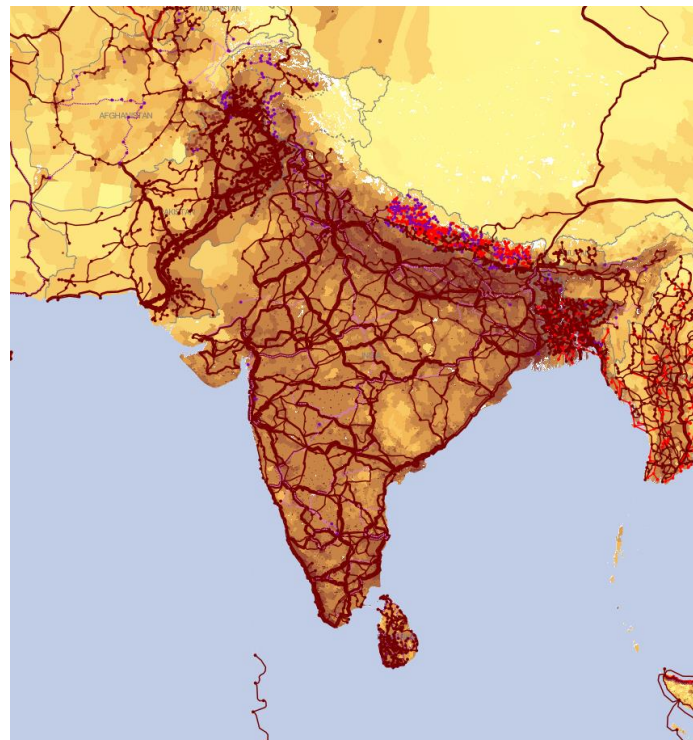


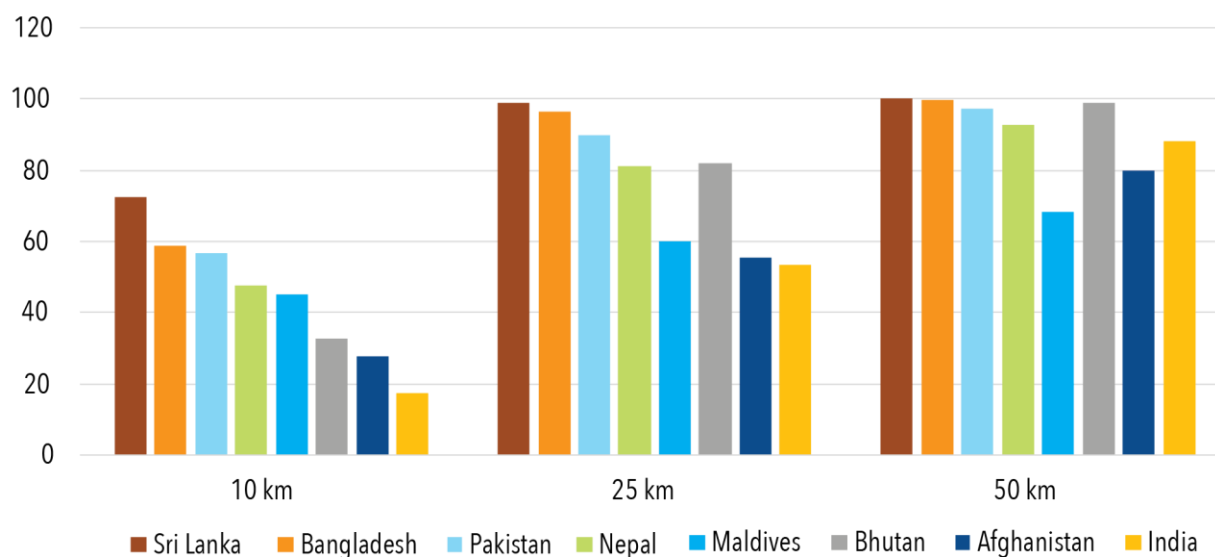
Figure 5: Transmission Links Overlaid on a Map of Population Density, South Asia³⁴



³³ Authors' calculations using ITU World Transmission Maps

³⁴ ITU World Transmission Maps

Figure 6: Share of Population less than 10, 25 and 50 km from a Transmission Network³⁵



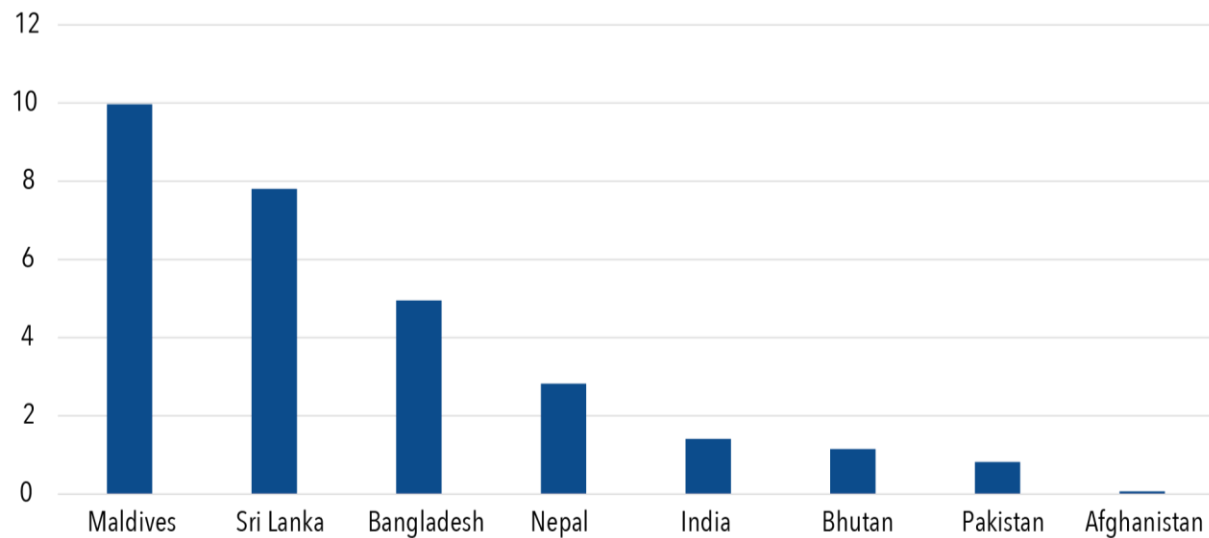
Access to high quality and affordable last mile connectivity (for end-users) is highly uneven within and across South Asian countries.

Fixed broadband (critical for stable, high-capacity data transactions such as online education, video streaming, and enterprise use) is particularly limited, and where available, of poor quality. Closing the fixed broadband coverage gap in South Asian countries will be vital to the region's development. Research estimates that 660 MB of data per user per month is needed to carry out basic online activities such as learning, online shopping, and accessing public services, health services, and news. When the list of online activities is expanded to include access to social media and video streaming, the estimated minimum amount of data needed is around 6 GB per month per user³⁶. Beyond supporting the increased volume of data transactions, last-mile fixed broadband networks also support stable, high-quality connections with greater speeds, enhancing the overall end-user experience. South Asian countries have a long way to go in this regard: while the island nation of Maldives leads with 10 percent fixed broadband subscriptions, all other countries have single digit subscription rates (Figure 7). Quality is of equal concern, with Afghanistan scoring the poorest in terms of fixed network quality (ranked last in Ookla's Speedtest Global Internet Index with an average fixed broadband download speed of 1.7 Mbps). Afghanistan is followed by Pakistan and Bhutan, both of whom have median speeds less than 10 Mbps over their fixed networks.

³⁵ Authors' calculations using ITU World Transmission Maps

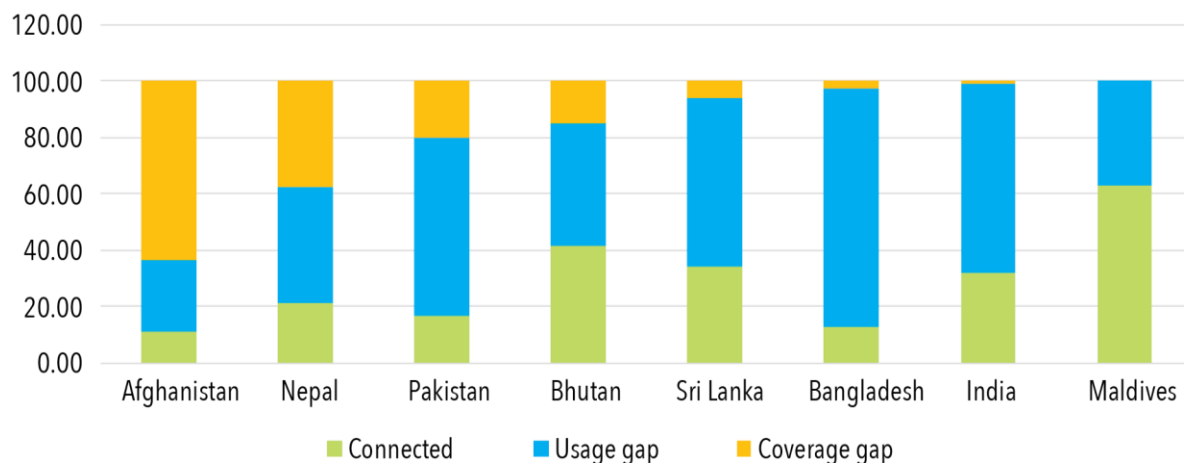
³⁶ Chen, 2021

Figure 7: Fixed Broadband Subscriptions per 100 Inhabitants, 2019³⁷



- 3) Importantly, a significant usage gap persists in the South Asia region. Compared to other regions in the world, the region has the highest percentage (61%) of people living within the range of a telecommunications network, but not using the Internet. This has remained unchanged since 2017.**

Figure 8: Coverage Gaps and Usage Gaps by Country, South Asia³⁸



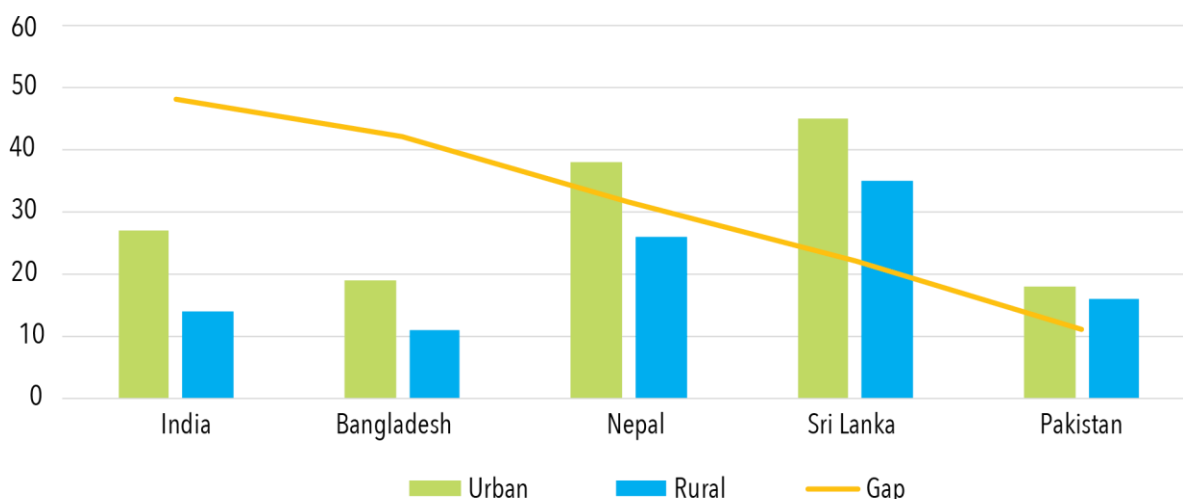
The large usage gap is driven by low adoption across the most populous countries in the region — Bangladesh, India, and Pakistan (Figure 8) — as well as limited adoption by low-income groups and women. Reducing gaps in coverage requires not only network investments but also enabling regulatory policies relating to spectrum allocation and management. Reducing gaps in usage, on the other hand, require a deeper enquiry into the drivers of poor internet adoption across different demographics. For example, whilst the mobile ownership gap in the region has dropped from 26 to 19 percent, and the mobile internet usage gap from 67 to 36 percent, South Asia continues to have the widest mobile

³⁷ ITU World Telecommunications Indicators Database 2020

³⁸ Own calculations using ITU and GSMA data

gender gaps globally. Women in the region are 36 percent less likely to use mobile internet than men, and early research during the COVID-19 pandemic suggests that these gaps have been widening.³⁹ Nationally representative After Access Surveys also show significant rural-urban gaps, with India and Bangladesh showing the widest gaps among those countries surveyed (Figure 9).

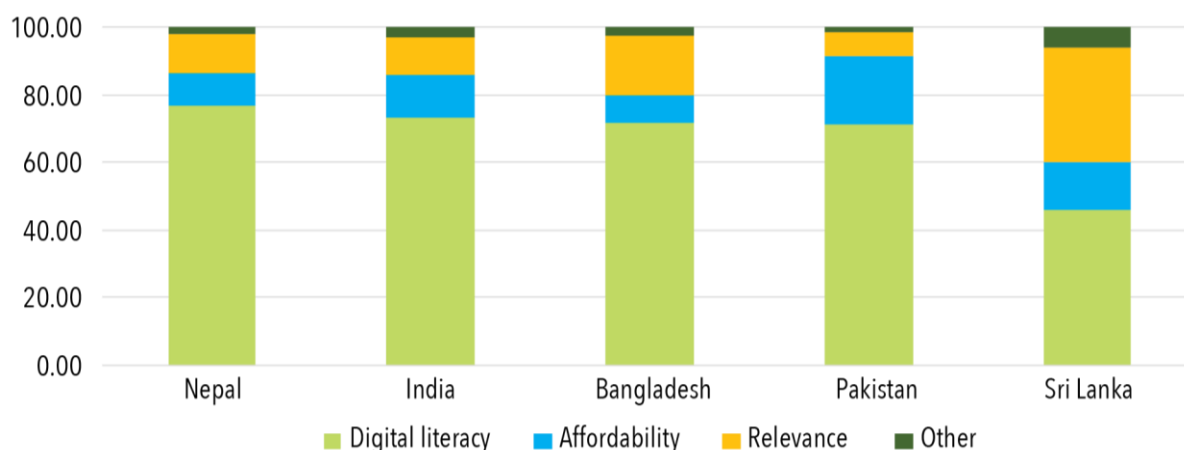
Figure 9: Rural-Urban Gaps in Internet Use⁴⁰



4) There are three primary reasons for the usage gap in South Asia: digital literacy, affordability, and relevance.

Digital literacy was identified as the main barrier to usage in nationally representative surveys across Nepal, India, Bangladesh, Pakistan, and Sri Lanka. The second most important barrier overall is affordability. The only exception is Sri Lanka, where relevance (such as the lack of availability of local language content, native apps) played a more central role than affordability.

Figure 10: Reasons for not using the Internet⁴¹



³⁹ Mobile Gender Gap Report 2021, GSMA.

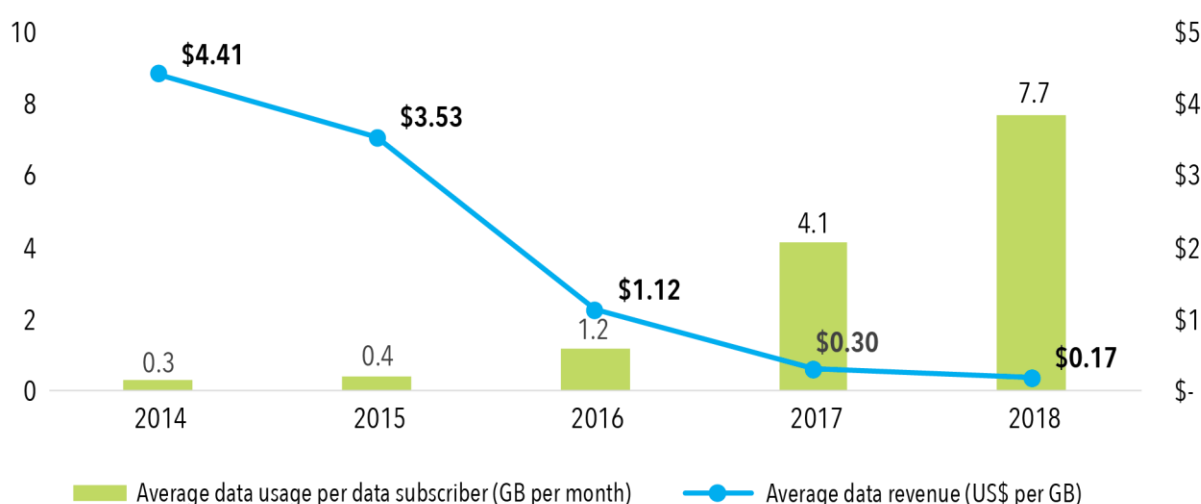
⁴⁰ After Access Surveys (2017-18)

⁴¹ After Access Surveys 2017-18

Affordability is a nuanced, multi-dimensional problem in South Asia, but one that must be addressed if the region is to reap the benefits of a digital economy.

Greater affordability is positively correlated to higher Internet usage. The demand for data for the purpose of work, learning, health, and entertainment, particularly during the COVID-19 pandemic, has increased to an estimated 6 GB per user per month. This rise in demand, along with the continuing development of more and more data-hungry content and applications, will have implications on end-user data spending. Unless data affordability is successfully promoted, the affordability gap will further exacerbate existing digital divides.

Figure 11: Data Use vs. Data Costs, India (2014-2018)⁴²



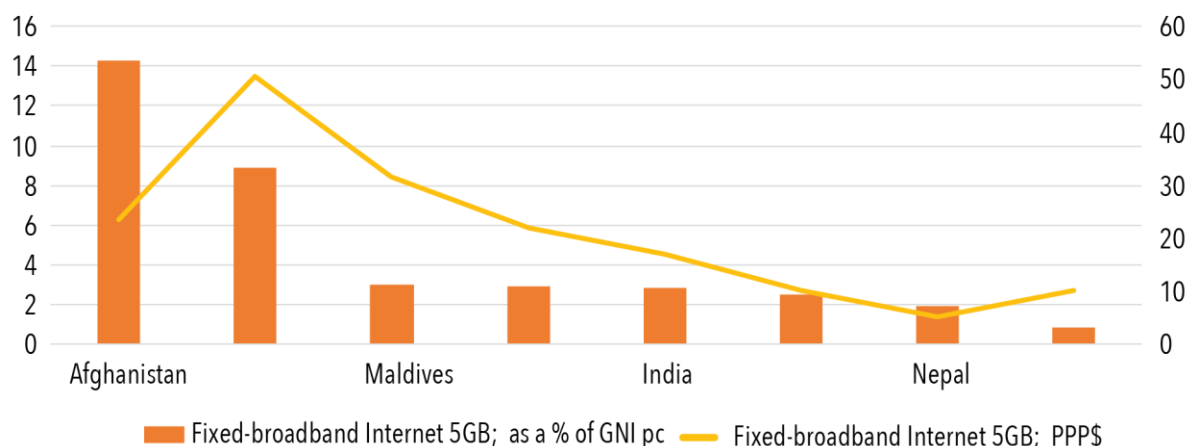
Currently, fixed broadband packages are unaffordable for most end users in South Asia.

The UN Broadband Commission recommends a threshold of 2% average GNI per capita for 5GB of fixed broadband data. Sri Lanka and Nepal are the only countries in the South Asia region that provide fixed broadband at, or below, this recommended threshold; even in those cases, higher speed connectivity—at speeds considered as entry-level in other parts of the world—is typically unaffordable.⁴³ Across all South Asian countries, the cost of a 5GB broadband package is unaffordable for the bottom 40% of the population, with the average cost particularly high in Afghanistan and Pakistan (Figure 12).

⁴² Authors' Calculations using Data from the World Development Report 2021

⁴³ For example, a 30 Mbps fixed broadband connection in Sri Lanka could cost LKR 10450 (about US\$50); this is equal to 15 percent of GNI per capita on an annualized basis. European Union member states define 30 Mbps as basic broadband, with current targets to deliver 100 Mbps to all households across that region. See <https://digital-strategy.ec.europa.eu/en/library/connectivity-european-gigabit-society-brochure>

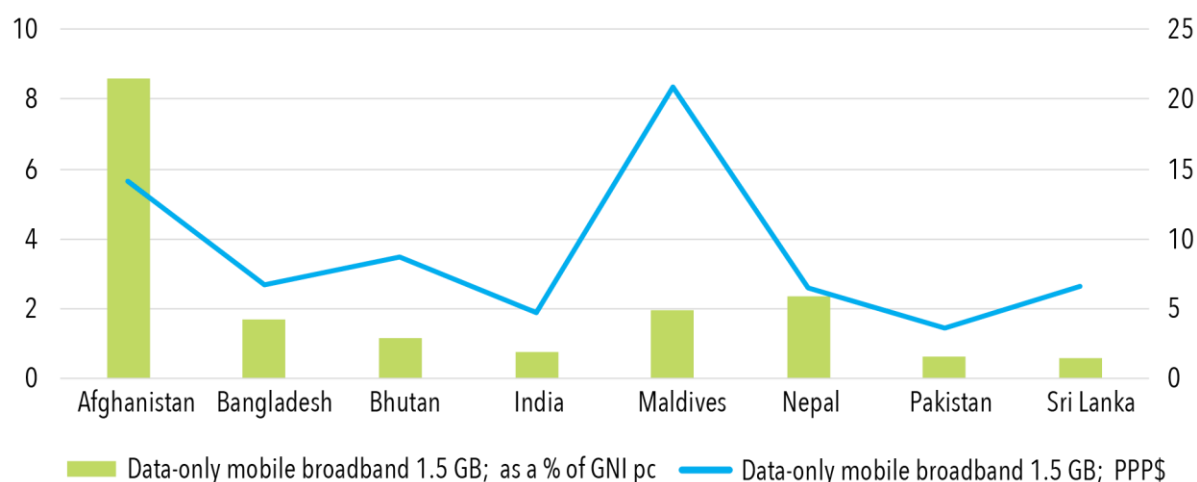
Figure 22: Cost of 5GB Fixed Broadband in South Asia (PPP\$ and % of GNI per capita)⁴⁴



The price of 1.5 GB of mobile broadband data in the region is relatively more affordable than fixed broadband, at an average of 2.2% of monthly GNI per capita.

While the average cost of mobile broadband in the region is close to the UN Broadband Commission benchmark of 2% of GNI per capita, it hides some critical differences: whilst the per capita use of mobile broadband may be increasing, costs have almost doubled in landlocked countries such as Afghanistan and Nepal.

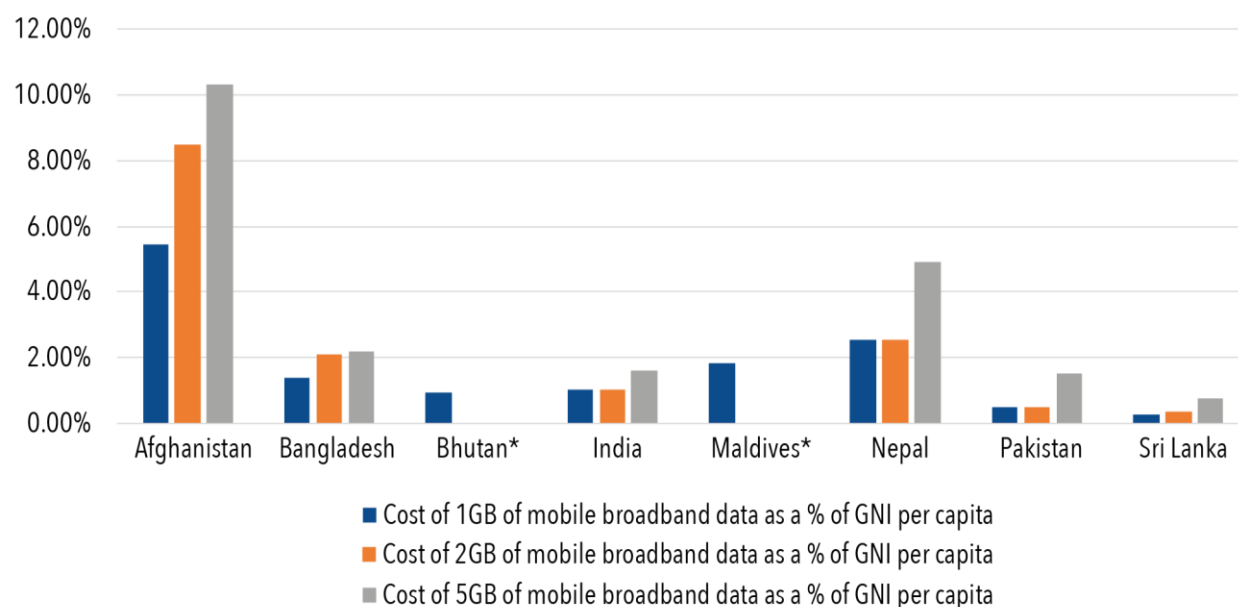
Figure 33: Average cost of data-only Mobile Broadband (1.5 GB) as a % of GNI per capita (2019)⁴⁵



⁴⁴ ITU World Telecommunications Indicators Database 2020

⁴⁵ ITU World Telecommunications Indicators Database 2020

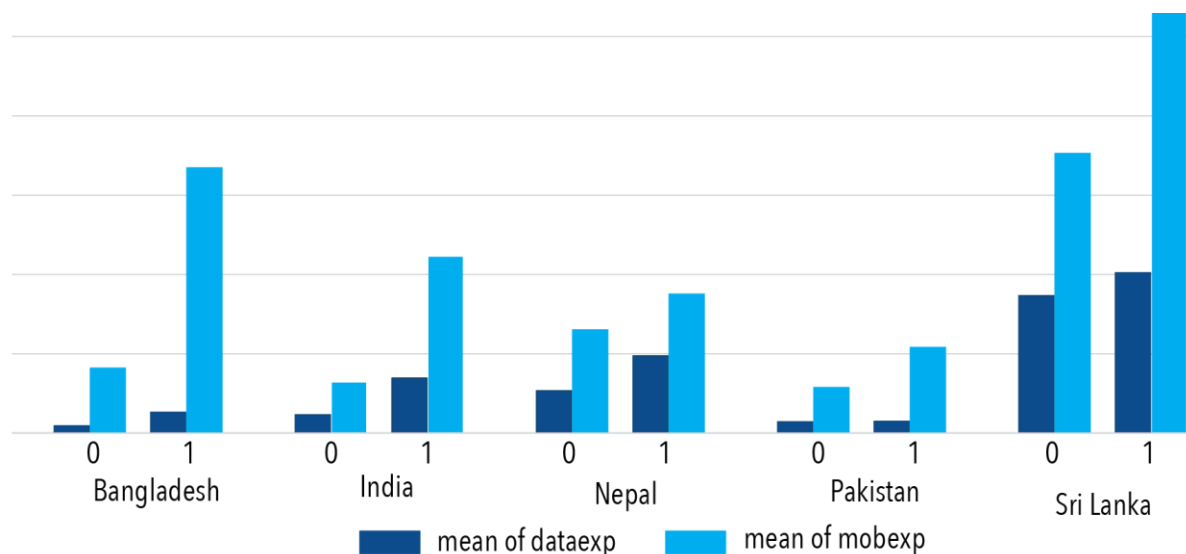
Figure 44: Cost of Data (1GB, 2GB, 5GB Packages) in South Asia (2020)⁴⁶



The poor are of course the most affected by these high prices. Nationally representative surveys in South Asia conducted in 2017-18 show significant differences between the expenditure on mobile phone data by the bottom 40% of income distribution and others.

For example, in Bangladesh, for the bottom 40%, the cheapest 30-day data package (with at least 660MB) costs about 2.6% GNI per capita and the cheapest 30-day data package (with at least 6GB) costs about 5.6% of GNI per capita. Both these rates are higher than the 2% threshold defined by the A4AI.

Figure 55: Expenditure on Mobile Phone Voice and Data Expenditures, between the Bottom 40% and Others⁴⁷



⁴⁶ A4AI and ITU, 2020

⁴⁷ After Access Surveys 2017-18

Device affordability is yet another challenge for the South Asia region.

The costs of devices vary across countries in the region, with Maldives having the highest costs, followed by Pakistan and India. Low-cost smartphones make a range of activities possible—including access to video learning, telemedicine, and ecommerce—in a way that basic phones cannot. Nationally representative surveys show that the proportion of smartphone and feature phone users is especially low in India and Pakistan where the cost of smartphones is higher, compared to Bangladesh and Sri Lanka, where the cost of a smartphone as a percentage of average GNI per capita is comparatively lower. These higher prices are often due to taxes and duties imposed on these devices, which are sometimes perceived as luxuries. Local manufacturing capacity is emerging in some countries, which could help alleviate this challenge, but might need improved regional approaches to ensure that all of South Asia can benefit from such developments.⁴⁸

Figure 66: Smartphone Price as a % of GNI per Capita⁴⁹

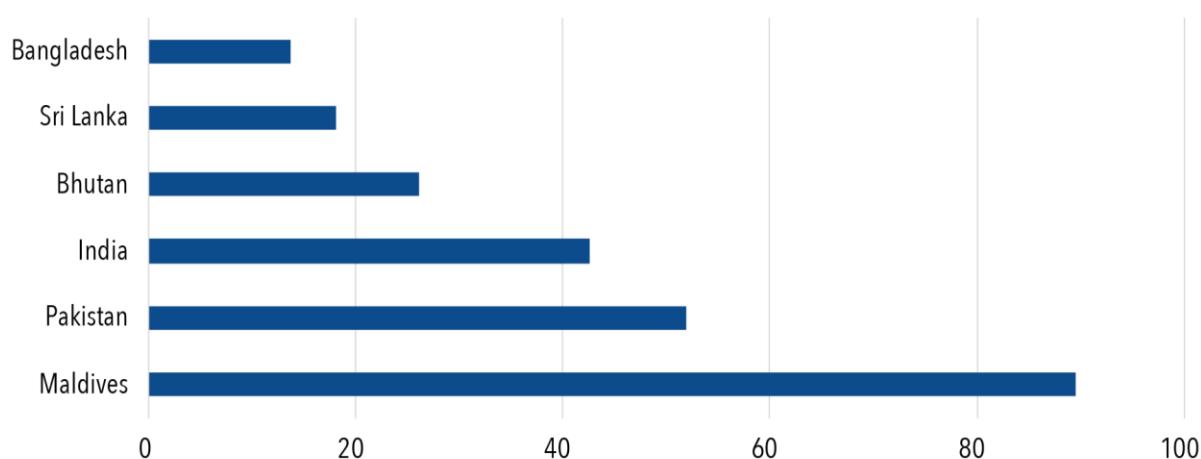
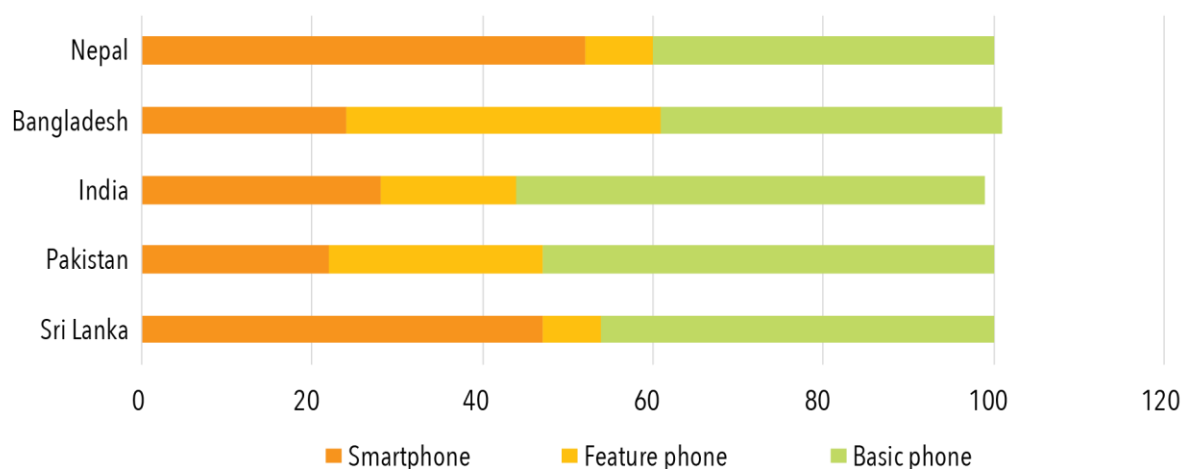


Figure 77: Proportion of Smartphone, Feature Phone, and Basic Phone Users in select South Asian countries⁵⁰



⁴⁸ <https://www.canalys.com/insights/The-driving-forces-behind-the-high-growth-South-Asian-smartphone-markets>

⁴⁹ A4AI Smartphone Affordability Database 2021

⁵⁰ After Access (2017-18)

If South Asia is to capitalize on the benefits of the digital economy, these gaps in affordability would need to figure prominently in policy and regulatory debates and actions.

Research suggests that individuals are 5% less likely to use the mobile internet if the average cost per 1 GB of mobile data is more than 2% of an individual's monthly income. Further, individuals are 4% less likely to adopt the mobile internet if the average cost of an internet-enabled phone (smartphone or feature phone) is more than an individual's monthly income.

Recommendations

- **Ensure adequate and cost-efficient international redundancy for landlocked countries.** This is critical in the context of increased risk of natural disasters and socio-political instability in neighboring regions. Access to private sector owned and operated terrestrial fiber links, as well as an open and fair access regime for international gateways, is equally important. Currently, South Asian landlocked economies are dependent on costly but low-capacity international links with low redundancy. For greater resilience, governments could diversify access to international fiber optic connections and liberalize access to international gateways by curbing monopolistic pricing (such as what exists in Afghanistan). In the short run, existing regional and sub-regional bodies could also provide platforms for dialogue and coordination to improve international connectivity in the short run. This will also help increase the use of international and domestic internet bandwidth by neighboring countries like Pakistan, India, and Bangladesh.
- **Bridge critical gaps in the middle and last mile by promoting investments in these segments, rolling out new networks, and upgrading older infrastructure to be energy-efficient and climate-responsive.** Those investments that have been concentrated primarily in urban areas and towns (in Pakistan, Bangladesh, Nepal, and parts of India), could be extended to reach lower-tier cities and districts. The rollout of fiber, rather than existing microwave connections, could be prioritized where feasible, with a view to securing high bandwidth and throughput between locations. Even in countries with high last-mile coverage, unconnected communities are often marginalized along other dimensions of exclusion (scheduled tribes, minorities, and the poor) and thus, closing remaining such critical gaps remains a priority.
- **Facilitate cross-sectoral, passive, and active infrastructure sharing for greater cost efficiency in infrastructure deployment, through appropriate policies, regulations and enforcement.** The potential for infrastructure sharing is still untapped across the South Asia region. To remedy this, governments may consider developing and actively enforcing policies for greater sharing of mobile network towers (for example in Afghanistan, Nepal, Bangladesh, and Sri Lanka), as well as the sharing of utility poles, dark fiber owned by utilities, ducts on highways, and metro area networks. Governments could adopt policies to ensure open access to the backbone network. They could require all major infrastructure programs (such as roads, railways, pipelines, and energy distribution) to provide for a fiber link, in line with “dig once” policies. Moreover, harmonizing rights-of-way regulations could enable operators to deploy infrastructure without having to navigate needlessly protracted government processes.
- **Address the usage gap by increasing affordability through innovative pricing, lower sector-specific costs, and partnerships for device affordability.** Usage gaps do not only stem from low purchasing power for devices and data, but also from the lack of digital skills and awareness. The specific

measures that could be taken to improve affordability vary across South Asian countries. However, generally speaking, the review, removal, or reduction of sector-specific taxes would greatly improve affordability and access, and stimulate demand. Sector-specific taxes include taxes on voice and data, import duties (Afghanistan), and retail taxes on digital devices up to specific thresholds (India, Maldives). Programs for device and service affordability should be targeted and sustainable. A focus on the last two quintiles of the income distribution would be particularly impactful. Device access for the poor through poverty alleviation programs in other regions suggest positive effects of device distribution, especially for women and female-headed households.⁵¹

- **Ensure the effective utilization of Universal Service and Access Funds to boost adoption. These are presently deployed in a non-transparent manner with varying success across the region.** Improving transparency of universal service funds to ensure that the funds collected are spent on connectivity projects in a timely manner would be a step in the right direction. This can be achieved through the effective tracking and monitoring of the Funds. Data on fund contributions, disbursements, and projects under design and implementation could also be made publicly available in an open data format, with disaggregation by gender and other factors (e.g., age, location, income). Governments can also use funds more effectively to provide public access spaces, public Wi-Fi spots or zones, subsidized devices for households, as well as digital skills training.
- **Enhance the public-private dialogue to identify how existing legal and regulatory frameworks can be updated to reflect recent innovations in technology and business models and respond to the emerging global and regional opportunities of the digital economy.** Pockets of isolated excellence in regulatory reform and innovative financing exist across several key reform areas in South Asia. Greater regulatory coordination and stakeholder engagement can serve to identify policy levers to rapidly bridge both market and access gaps, and foster digital inclusion across the region.

2. Digital Public Platforms

Digital public platforms consist of the government's front- and back-end systems and the interfaces that facilitate public sector service delivery and operations. Digital identification systems, data sharing and exchange layers, and digital government service platforms are the vital 'rails' that underpin digital transactions and connections for people, businesses and governments. Public and private sector service providers can build their applications and software on top of common or shared public platforms ('soft' infrastructure), thereby enabling economies of scale, agility, integration and interoperability for the delivery of increasingly responsive and sophisticated services. When rolling out social assistance or cash transfer programs, for instance, a government agency could do this more quickly and easily by building their registration process on top of a digital identification system (to verify the applicants) and their eligibility determination process on a data exchange layer (to cross-check relevant databases for inclusion and exclusion criteria). When COVID-19 hit, countries that had whole-of-government digital public platforms in place (such as Singapore and South Korea), were in a much better position to rapidly roll out expanded social protection programs and maintain continuity of services through digital and online channels.

Well-designed and well-implemented digital public platforms can make government and private sector services and operations more inclusive, accessible, efficient, and effective, positioning

⁵¹ Mid-line evaluation, World Bank's GEWEL Project in Zambia (2020).

governments as enablers for thriving digital economies and societies. Key to achieving these outcomes are strong analogue foundations such as clear institutional arrangements and whole-of-government approaches (to coordinate policies, resources, and initiatives), comprehensive legal frameworks and enforcement (to provide certainty, accountability, transparency, promote trust and other safeguards), application of human-centered design and stakeholder engagement (to ensure inclusion and responsiveness), and strong data governance (to promote the interoperability, portability conditions and security that allows the use, re-use and protection of data). Crucially, digital public platforms should not be seen simply as digitizing existing manual and paper-based systems, processes, and information (i.e., the traditional ‘e-government’ paradigm), but instead as an opportunity to re-imagine how services and operations function (i.e., the ‘digital transformation’ paradigm). In other words, digital public platforms are just as much about business systems and processes as technological systems and processes. Furthermore, digital public platforms are an opportunity to unleash the benefits of using and re-using information while also safeguarding against misuse, as envisioned in the recommendations of the 2021 World Data Report on Data for Better Lives (in particular the ‘new social contract for data’).

Designing digital public platform ecosystems as ‘stacks’ characterized by open standards, open interfaces, data interoperability and complementary functionalities can unlock exponential value for people, businesses, and governments. Stacks are a common concept in software development and consist of a set of components working together seamlessly to execute an application. The concept can also be relevant to data flows. Thus, applying stacks to digital public platforms means that digital platforms (including those in the private sector) can be built on top of each other easily, providing the benefits of economies of scale and creating opportunities for innovation. The ‘India Stack’ is a world-leading example of this concept in action, with application programming interfaces (API) enabling government agencies and businesses to consume digital identification, digital payments, electronic signatures, and personal data empowerment services—and the combination thereof—to build presence-less, cashless, paperless, and consent-based transactions. The process for opening a bank account, for instance, was reduced from days to minutes as a result. The Singapore National Digital Identity (NDI) stack is another good example, with APIs allowing anyone to build applications based on trusted data, identity, access, and services.

Figure 88: India Stack

		WHAT IS IT?	WHAT IS IN IT?	WHO IS THE OWNER?
INDIA STACK	Consent layer	A modern privacy data sharing framework	Open personal data store	Reserve Bank of India
	Cashless layer	An electronic interoperable payment network	IMPS, AEPS, APB, UPI	National Payments Corporation of India
	Paperless layer	Easily store and retrieve information digitally	Aadhaar e-KYC, e-Sign, Digital Locker	Department of Electronics and Information Technology
	Presence-less layer	Unique digital biometric identity with open API access	Aadhaar card, Mobile Aadhaar	Unique Identification Authority of India

Key Findings

1) Foundational identification systems in South Asia can provide a platform for the digital economy through the creation of ‘digital stacks’— but gaps in inclusion and trust remain important challenges in the region.

Identification systems can facilitate and improve access and delivery of services across both the public and private sectors. Enabling online transactions with the same levels of trust and security as face-to-face interactions can unlock enormous opportunities for digital government, digital services and innovation as a whole. However, it is vital that the design and implementation of identification systems are in line with international good practices, in particular with respect to fostering inclusion and trust (see Box 3 below).

Box 3: Best Practices for Digital Identification Systems⁵²

Identification systems can enable and boost service digitalization, innovation and expansion. However, they can be difficult to implement because they inherently interface with a range of political, social, legal, and cultural dimensions. Moreover, if not well-designed, identification systems can increase risks related to data protection and socio-economic exclusion. To help countries to navigate these opportunities and risks, thirty international, regional, private sector, and academic organizations have endorsed the ten *Principles on Identification for Sustainable Development* as a guiding framework across three dimensions of inclusion, design, and governance.

Pillar 1: Inclusion

1. Ensure universal access for individuals, free from discrimination.
2. Remove barriers to access and use.

Pillar 2: Design

3. Establish a trusted—unique, secure, and accurate—identity.
4. Create a responsive and interoperable platform.
5. Use open standards and prevent vendor and technology lock-in.
6. Protect privacy and agency through system design.
7. Plan for financial and operational sustainability.

Pillar 3: Governance

8. Protect personal data, maintain cyber security, and safeguard people’s rights through a comprehensive legal and regulatory framework.
9. Establish clear institutional mandates and accountability
10. Enforce legal and trust frameworks through independent oversight and adjudication of grievances.

South Asian countries have made significant progress introducing foundational identification systems and, in some cases, strengthening accessibility, design, and governance, in line with the ten *Principles on Identification for Sustainable Development*, as mentioned above. India, Pakistan and Sri Lanka stand out for having re-positioned their identification systems from systems intended merely for card registration and distribution, to key components and foundations of broader ‘stacks’ for service delivery and data empowerment for individuals. This re-positioning was likely supported by the institutional arrangements in these countries. In India, the entity responsible for identification sits under the Ministry of ICT (Unique Identification Authority of India or UIDAI) and in Pakistan, it is semi-autonomous (Pakistan’s National Database and Registration Authority or NADRA). In Sri Lanka, a new identification system is being developed by the Information and Communication Technology Agency (ICTA). While other

⁵² www.idprinciples.org/

foundational identification systems in South Asia have had some success, they have not been strategically repositioned in this manner.

India's Aadhaar system is noteworthy in terms of scale and the use of pioneering features such as the minimal number of demographic data fields collected, separation of legal status from unique identification, reduced emphasis on a physical card for authentication, and a registration approach that relies on an ecosystem of authorized agencies and registrars. In 2017, 97% of Indian residents aged 15 and over had an Aadhaar number, which is a significant feat considering that the system was only launched in 2010. Aadhaar is also part of the JAM trinity including Jan Dhan bank accounts and mobile phones as well as direct benefit transfer schemes. As such, Aadhaar contributed to a massive increase in financial inclusion across the country, from 35% in 2011 to 80% in 2017, with the most significant gains among women and people living in remote areas.

Aadhaar has served as a core enabler for digital public platforms: it was the springboard for several other successful Digital India initiatives such as the India Stack and individual layers including UPI, eSign, DigiLocker, data protection and empowerment architecture (DEPA), as well as more recently, the CoWIN platform to support India's COVID-19 vaccination delivery and certification program. Furthermore, it has scaled innovative privacy-by-design features such as tokenization through the concept of a Virtual ID. A virtual ID is a temporary, revocable 16-digit random number, mapped to the Aadhaar number, that can be used whenever Aadhaar-based authentication or e-KYC services are carried out, with a view to minimizing potential privacy risks associated with the disclosure of the original number. However, Aadhaar has already been operational for a number of years without an enabling legislative framework and, as a result, has been subject to constitutional challenges. The courts ultimately upheld the system but the case provided the impetus for several positive legal and regulatory reforms.

Pakistan and Sri Lanka have also made concerted efforts to increase the accessibility of foundational identification systems for vulnerable populations, with the intention to promote broader inclusion for digital public platforms. Pakistan's National Database and Registration Authority (NADRA) has made important outreach efforts to close coverage gaps and promote inclusion, and introduced innovative practices, such as all-female registration centers. As a result, although gender gaps still persist (Table 1), coverage of the national identity card reached 86.5% as of 2017, a significant accomplishment considering the country's geographic and security challenges. The coverage of Sri Lanka's national ID system (managed by the Department for Registration of Persons) is also high, with over 93% of the population having a national ID card. Once again, however, a significant gender divide remains (see Table 1). In 2003, Sri Lanka reformed its nationality law to provide nationality and identification to 90,000 Hill Country Tamils, thereby resolving their statelessness.

Both Pakistan and Sri Lanka are developing innovative solutions in this regard. NADRA launched several innovative projects in 2021 such as a smartphone app with self-biometric enrollment and a shift to decentralized identity wallets. Spearheaded by ICTA, Sri Lanka's Unique Digital Identity (SL-UDI) program is a new digital authentication layer that will exist on top of the existing national ID system, and will be designed as the foundation for the national data exchange (NDX) and the broader 'stack' that ICTA is envisioning.

Bangladesh's national ID system, which emerged from a voter registration system (originally supported by UNDP and then by the World Bank between 2011-2018) now covers 89% of adults. However, the system has not been as effectively used for service delivery and digital transactions as was the case in India and Pakistan.

Bhutan has a well-established national ID system managed by the Ministry of Home Affairs and has begun piloting a digital identification system for online transactions, implemented by the Department of

Information Technology and Telecom. For its part, Afghanistan has been simultaneously expanding coverage of its existing paper-based foundational identification system and is rapidly rolling out a digitalized equivalent (2020-21). Nepal launched a pilot for a new foundational identification system in 2015, with the initial target of enrolling 100,000 people. However, the project has struggled to scale up since then, and this has constrained improvements in social protection and government service delivery.

Table 1: Foundational ID System Coverage and Digital Capabilities in South Asia⁵³

Country	ID coverage (adults)			Digitized ID database	Digital identity verification / authentication against the ID system or ID card for service providers	Digital ID system for online transactions and services
	Total	Women	Men			
Afghanistan	71.40%	48.40%	94.20%	Yes	No	No
Bangladesh	88.70%	87.80%	89.50%	Yes	Yes	No
Bhutan	<i>No Index data⁵⁴</i>			Yes	No	Partially (SSO)
India	96.80%	96.70%	96.80%	Yes	Yes	Partially
Maldives	<i>No Index data⁵⁵</i>			Yes	Yes	Partially (SSO)
Nepal	<i>No data / NID in pilot stage⁵⁶</i>			Pilot	Pilot	No
Pakistan	86.50%	77.50%	95.10%	Yes	Yes	No
Sri Lanka	93.50%	91.60%	95.80%	Yes	No	No

A number of key challenges remain across the region, particularly in terms of gender gaps. There is also significantly lower coverage of youth in Bangladesh, Pakistan and to a lesser extent in Sri Lanka. These disparities need to be addressed through the identification and removal of supply-side issues, e.g., by bringing registration opportunities closer to people and streamlining the administrative process for enrollment. Demand-side initiatives are also critical, such as providing information about the importance of obtaining an ID and creating appropriate incentives for registration. Flexibility and choice in identification requirements when it comes to accessing basic services should also be retained. Access to basic services should not exclusively require a specific form of identification (such as a national identity card or number), as this would create barriers to access and further exacerbate existing divides. In countries where ID systems and civil registration systems are distinct (Bangladesh, India, Pakistan, and Sri Lanka), fostering interoperability between both systems will be crucial to ensuring access to identification and accurate, trusted records from birth to death.

Currently, only Bangladesh, India, and Pakistan offer identity verification services to third parties for face-to-face transactions. Other countries in the region depend on manual inspection of physical cards to verify identity, which is an inefficient process and increases the risk of fraud. Automated demographic, biometric, cryptographic, or one-time password verification for higher risk transactions

⁵³ 2017 ID4D-Findex Survey; 2018 ID4D Global Dataset, 2021 World Development Report; original research

⁵⁴ UNICEF data on under-5 birth registration rate indicates 100% coverage for Bhutan as of 2010. Although an imperfect proxy, this suggest that foundational ID coverage among adults is also likely to be high.

⁵⁵ UNICEF data on under-5 birth registration rate indicates 99% coverage for Maldives as of 2016-7. Although an imperfect proxy, this suggest that foundational ID coverage among adults is also likely to be high.

⁵⁶ Estimates by the Forum for Women, Law & Development from 2015 suggest that the coverage of citizenship certificates, which are commonly used for identification purposes, was about 77% as of 2014, with a projected decline to 74% by 2021. See: <https://fwld.org/wp-content/uploads/2016/06/Acquisition-of-Citizenship-Certificate-in-Nepal-Estimation-and-Projection.pdf>

(such as bank account opening, government-to-person payments, passport, and license applications) can provide added assurance and facilitates process automation.

Finally, no country in South Asia has a fully functional digital identification system that enables people to prove their identity for trusted and secure online transactions across both public and private sector services. A fully functional system could be used to facilitate electronic signatures, as well as digital service access across borders, just as the eIDAS regulation does within the European Union. Current systems in South Asia are predominately designed for face-to-face transactions. Bhutan and Maldives have introduced digital identification in the form of single sign-on solutions, exclusively for accessing government services. However, this restricts any broader benefits, such as remote and online bank account openings, loan applications, and secure remote onboarding for private sector jobs and service delivery platforms. India's Aadhaar supports some online use cases through SMS-based One Time Passwords, for instance, but this does not provide the highest levels of assurance according to international standards (e.g., through cryptographic security and binding of digital identity with the natural person). Pakistan (NADRA) and Sri Lanka (ICTA) are also currently in the discovery phase of creating digital identification solutions for online transactions. With increasing smartphone ownership, there is a significant opportunity to develop digital identification systems to accelerate digital transformation. This could include adopting digital public platforms in the form of digital authentication apps (similar to a number of European and East Asian countries), implementing non-centralized models such as identity federations (where there is an ecosystem of regulated third party digital identification providers) and introducing decentralized identity wallets.

2) There is an important gap in data policies and interoperability in most countries in the region

The responsible and effective use and re-use of data managed by government, especially personal data, is essential for digital public platforms, as well as for most aspects of the digital economy. This does not only apply to public sector services and operations. Government databases are often the main authoritative source for certain kinds of information, such as those related to basic identity attributes and licenses, and these databases thus play a critical role in the delivery of private sector services. Getting data governance and interoperability right, particularly the legal and regulatory environment for data protection, is a pre-requisite for any kind of personal data empowerment framework, which would allow data subjects to consent to the sharing and re-use of their data in a safe and dynamic way. Institutions also need to be established and empowered to monitor and enforce data protection rules effectively.

Data governance frameworks comprise policies and rules that define, among other things, what data may be collected, for what purpose, who may control or process what data, how data is stored and secured, and who may access data, under what conditions and for what purpose. Interoperability refers to the ability of information to be exchanged, and commonly understood, by different systems. It is facilitated by standards and infrastructure such as APIs, webservices, and service buses. Data governance and interoperability frameworks are intrinsically linked and could even be developed and implemented in combination. These frameworks are extremely difficult to retroactively implement, however, as data controllers may be reluctant to change standards, 'open', update or share their data. An additional challenge for countries with federal structures, such as India and Pakistan, is the coordination and coherence between central and state/provincial levels of government. Only Bhutan seems to have operationalized its data governance and interoperability framework, through its Government Enterprise Architecture (GEA) launched in 2012. Bhutan's smaller size and less complex government structure may have contributed to its success on this front.

Bangladesh and India have developed and begun implementing e-Government Interoperability Frameworks and government data standards, with India being more advanced in this area. India has shown stronger progress at the sectoral level, rather than the whole-of-government level, with the data protection and empowerment architecture layer of the India Stack currently focused on portability and consent-based data sharing in the financial sector. Furthermore, India is strengthening data governance and interoperability in the health sector through the new Health ID launched in 2021 by the Ayushman Bharat Digital Mission. In Sri Lanka, ICTA is working on a national data exchange (NDX) that would draw on aspects of X-Road (a data exchange platform developed by Estonia, which is effectively a distributed service bus) and the data protection and empowerment architecture pioneered in the India Stack.

Maldives and Pakistan do not currently have data governance and interoperability frameworks or infrastructure. Afghanistan and Nepal have developed e-Government Interoperability Frameworks, but these have not yet been implemented.

Across the region, there are important gaps in data governance when it comes to legal and regulatory frameworks as well as institutions responsible for setting rules for data processing and ensuring sufficient oversight. Data protection, cybersecurity, e-transactions and associated frameworks are still emerging in South Asia. Often, they are not backed up by institutions that are empowered and competent to enforce them.

An important use case for data interoperability and governance is to make better use of data for social protection targeting. One anomaly in the region is that although some countries have strong foundational identification systems and large social protection programs, none have a dynamic social registry at the national level. There are, however, examples of information systems that support individual or multiple social protection programs, as well as static social registries (such as Pakistan's National Economic and Social Registry). Social registries are information systems that support outreach, intake, registration, and determination of potential eligibility for one or more social programs. Being dynamic and up to date in real time, or at least periodically, is important for achieving adaptive social protection and being able to respond effectively and efficiently to crises, e.g., quickly identifying informal workers affected by the COVID-19 pandemic. It is important to note that there does not always need to be a single registry database—a federation of multiple registries that can communicate easily (often called a virtual social registry) could also be used, such as what exists in Chile and Turkey.

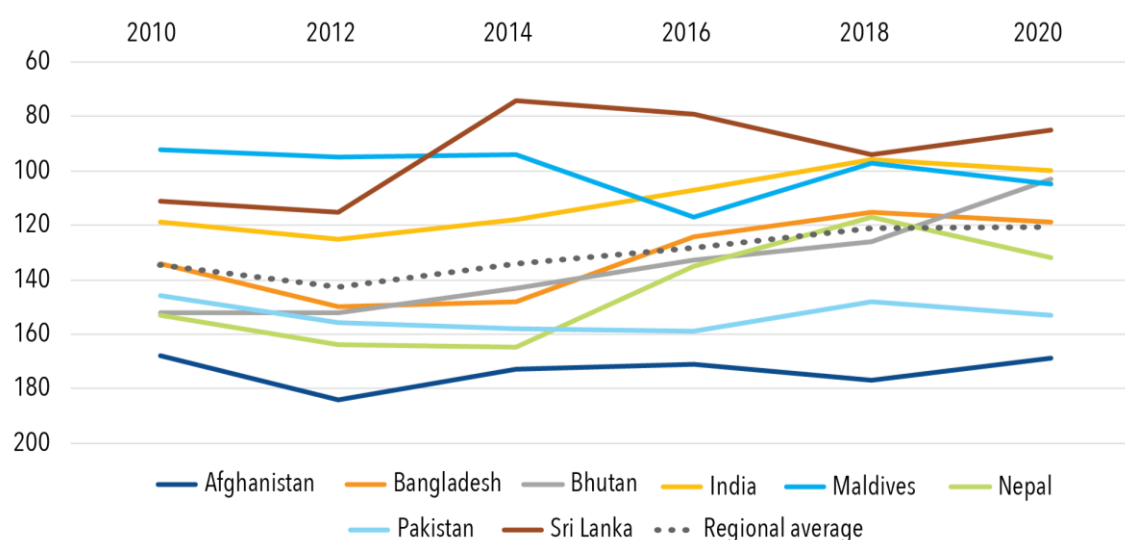
3) The overall digitalization of government services has progressed steadily, with Sri Lanka and India performing the best and Bhutan making the most significant improvements relative to other countries. However, inclusion and accessibility remain a challenge.

Given that digital public platforms are intended to support government service delivery more broadly, the overall digitalization of governments can be used as a relatively good proxy indicator for quality and performance of digital public platforms. Although there is no perfect indicator or set of indicators to measure the progress and effective implementation of digital public platforms specifically, the UN E-Government Survey⁵⁷ offers a helpful point of reference and comparison. The average ranking of South Asian countries in this regard has steadily increased between 2010 and 2020 (Figure 19). However, according to the 2020 Survey, only Sri Lanka (85th) and India (100th) ranked in the top 100 countries for e-government development. Bhutan had the most significant improvement in the last decade, jumping 49 places between 2010 and 2020, followed by Sri Lanka (26 places) and Nepal (21 places). Maldives has seen the biggest decrease in rankings during the same period, falling 13 places (and from the top 100) to

⁵⁷ The E-Government Development Index based on the UN E-Government Survey measures: i) the scope and quality of online services quantified as the Online Service Index (OSI); (ii) the status of the development of telecommunication infrastructure or the Telecommunication Infrastructure Index (TII); and (iii) the inherent human capital or the Human Capital Index (HCI).

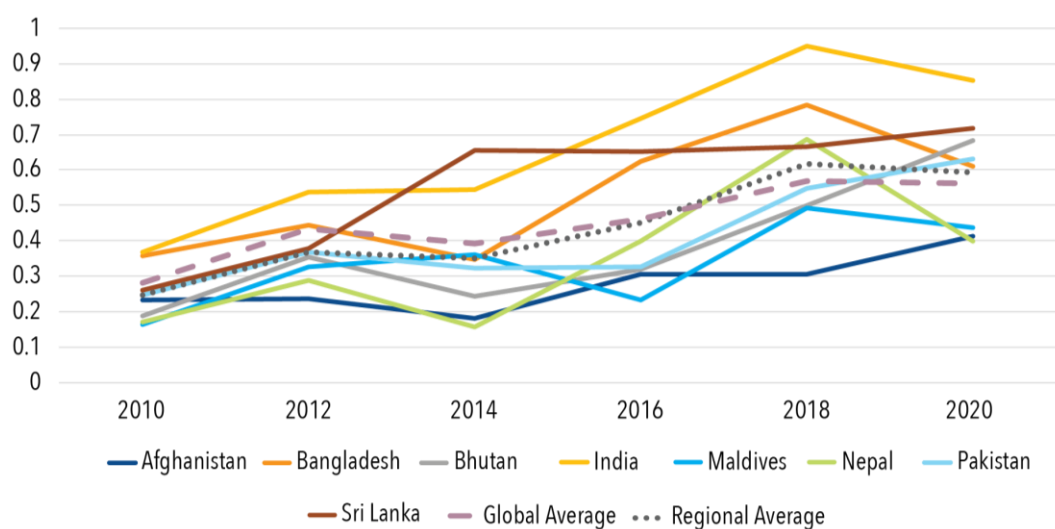
103 in 2020. Pakistan also saw a decrease in its ranking by 7 places to 153 and Afghanistan has barely moved (168 in 2010 to 169 in 2020).

Figure 19: UN E-Government Development Index Rankings for South Asian countries, 2010–2020⁵⁸



From the digital public platforms perspective, the Online Service Index (OSI)—one of the three main components of the UN E-government Survey—is likely the most relevant. The evolution of the OSI for South Asia between 2010-2020 shows good progress for all countries (Figure 20). India stands out but Bangladesh, Bhutan, Pakistan, and Sri Lanka have also shown significant improvement. Notably, the regional average score surpassed the global average score for the first time in 2018 and stayed there in 2020. This indicates that South Asian countries are taking advantage of increasing digital access to build digital public platforms that offer online transactional and informational services.

Figure 20: UN E-Government Online Services Index Scores for South Asian countries, 2010–2020



⁵⁸ Ibid

However, the UN e-government survey focuses on the supply-side (i.e., the existence of platforms and services) rather than on demand-side accessibility and usage. Across all country reports, access was highlighted as a key challenge for both government-to-person and government-to-business digital public platforms. The barriers identified include reliability and affordability of broadband internet access, affordability of devices, and digital literacy (of people, entrepreneurs and employees). Barriers for accessing and using identification (foundational ID or other digital identification systems) are prevalent, particularly for members of vulnerable groups. Gender gaps in accessing and using digital public platforms have also been observed in some countries.

When large groups of people are excluded from accessing and using digital public platforms, their development impact remains unrealized. With greater inclusion comes greater accountability, improved communication, control over data, new opportunities for entrepreneurship, better and faster service delivery, and so on. In parallel, there is an important demand-side challenge to be noted: without people and businesses ready to embrace digital transactions, there is limited incentive for governments to invest in the platforms enabling them. The COVID-19 pandemic has underscored the challenges and opportunities that have been lost due to such digital divides. Even as platforms for online learning and telemedicine were scaled up, millions of children and adults in the region were still unable to take full advantage of them.

One notable good practice has been the establishment of physical service centers where people—especially those without internet access and digital skills—are able to access digital services with assistance. For example, India had 360,873 common service centers at the end of the 2019-2020 financial year. Bangladesh brings digital government services to its people through its nearly 6,000 Union Digital Centers (UDCs) and 64 District e-Service Centers (DESC), which serve as one stop shops for such services. UDCs have significantly reduced and optimized service processing times in Bangladesh: for example, obtaining a birth registration, which previously took seven to eight days, can now be done in at a UDC in less than eight hours. Similarly, death registration certificates can now be obtained within 5 hours instead of nearly two days.

4) Strong political recognition, policies and legal enablers exist in the region—but limited coordination, whole-of-government implementation, and data protection frameworks undermine progress.

All South Asian countries have policies and/or strategies promoting the development of digital public platforms across government. Digital Bangladesh (2008), Digital India (2015), Digital Druknyul (2019) in Bhutan, and Digital Pakistan (2019) are excellent examples of high-profile initiatives with head of government leadership that include the digitalization of government services, not just to improve service delivery to people and businesses, but also as enablers for the digital economy. Sri Lanka, too, has laid out a strong vision for its government's digital transformation (Vision 2024), but it remains anchored within a specific agency rather than being a whole-of-government approach. Maldives has included digital public platforms across its development strategies but has not yet developed a comprehensive standalone strategy. Afghanistan has multiple overlapping strategies (e.g., Digital Foundation Strategy for Afghanistan 2019-2021, Digital Afghanistan Strategy 2020-2025, and Afghanistan Digital Economy Strategic Plan 2019-2023).

There has been some progress in enacting legal frameworks, such as for electronic transactions, and in establishing relevant agencies and mandates. Legal frameworks provide certainty and confidence that digital and online transactions have the necessary legal equivalence to physical and manual processes. Only Maldives has not yet enacted an electronic transaction law, but has a draft in advanced stages.

The situation in the region in terms of ‘safeguarding’ personal data is still of concern. While some countries have legal frameworks that cover data protection and privacy issues in specific sectoral contexts, only Bhutan and Nepal currently have an omnibus personal data protection law. India, Maldives, Pakistan and Sri Lanka have bills at various stages of the legislative process. The absence of general data protection laws and data protection authorities with the mandate to enforce these laws leads to considerable uncertainty as well as legal and operational risks with respect to collecting, processing, sharing, using, and re-using personal data, which are all core functions of public digital platforms.

Figure 91: Electronic Transactions and Data Protection laws in South Asian Countries

Country	Digital Public Platforms Vision Document	Electronic Transactions law	Personal Data Protection law
Afghanistan	Several ¹⁵⁹	Electronic Transactions and Electronic Signatures Act, 2020	-
Bangladesh	Digital Bangladesh (2008)	Information and Communication Technology Act, 2006	-
Bhutan	Digital Drukyl (2019) and e-Governance Master Plan (2014)	Bhutan Information Communications and Media Act, 2018	Bhutan Information Communications and Media Act, 2018
India	Digital India (2015)	Information Technology Act, 2000	Draft bill
Maldives	National Strategic Action Plans	Draft bill	Draft bill
Nepal	-	Electronic Transactions Act, 2008	Privacy Act, 2018
Pakistan	Digital Pakistan (2019)	Electronic Transactions Ordinance, 2002	Draft bill
Sri Lanka	Vision 2024 for ICTA (2020)	Electronic Transactions Act, No 19 of 2006	Draft bill

A ‘whole-of-government’ approach to digital public platforms and digital transformation more broadly—characterized by coordination in common standards and infrastructure—is being realized in Bhutan, India, Maldives, and Sri Lanka. These also happen to be the countries with the highest rankings in the 2020 UN E-Government Survey. A common theme across these four countries is that there is an agency (or in the case of India, a body) with a clear mandate for policymaking and coordination, including enforcement, namely Bhutan’s Department of Information Technology and Telecom (DITT), India’s Digital India management structure, Maldives’ National Centre for Information Technology (NCIT), and Sri Lanka’s Information and Communication Technology Agency (ICTA). In principle, such a body does not necessarily need to be at the apex of government. Bhutan’s DITT and Maldives’ NCIT are attached to Ministries, while Sri Lanka’s ICTA is housed in the Ministry of Technology. Digital India’s management structure is headed by the Prime Minister while coordination and implementation are supported by the

Ministry of Electronic and Information Technology (MeitY). The institutional arrangements in the other countries are not as clear. In Pakistan, for example, while the Pakistan Computer Bureau (PCB) and Electronic Government Directorate (EGD) were merged to form the National Information Technology Board (NITB) under the Ministry of Information Technology and Telecommunications (MoIT), the NITB only has limited enforcement power.

Although reporting to the head of government directly is helpful for inter-agency coordination, what is even more important is the clarity of roles and responsibilities of key stakeholders. In some countries, for instance, central digital government organizations or bodies have decision-making power over budgets and procurements, especially to enforce standards and adoption of common infrastructure. In others, coordination related to digital public platforms is a big challenge, including in Afghanistan (which had an apex body in the National ICT Council of Afghanistan chaired by the President) as well as in Bangladesh and Pakistan (which do not have central coordination organizations or bodies). In Bangladesh and Pakistan, there is considerable duplication of software and hardware investments. This does not need to be the case, especially given the existence of common infrastructure such as national data centers.

Recommendations

- **Support whole-of-government approaches to digital government through institutional and regulatory reforms and the development of relevant technical capacity in the civil service.** Clarifying institutional arrangements means defining actors responsible for policy, strategy, planning, funding, procurement, delivery, and operations. Ideally, a single body or organization should be responsible for as many of these functions as possible. The more power they have, the more effective they can be. In some cases, difficult decisions may need to be taken, including consolidation of agencies and mandates. India and Sri Lanka offer good practice examples in this regard, including by having bodies and organizations with the authority and capacity to develop and enforce common policies, platforms and standards, and by establishing clear roles and responsibilities among actors. It will also be important to develop the skills and capabilities of civil servants so that they are able to conceptualize, design, manage, and operate digital public platforms. This may include centralizing some implementation functions into a digital government organization. Sri Lanka's ICTA, for instance, develops software on behalf of line ministries. Beyond the South Asia region, there are useful digital government institutional models in Australia, Brazil, UK and Singapore, that could be adapted to the region.
- **Prioritize data protection and cybersecurity to boost trust in digital government services.** Bhutan and Nepal have already enacted data protection laws, whereas India, Maldives, Pakistan, and Sri Lanka are at advanced stages of introducing general personal data protection laws. It is crucial to accelerate these processes and ensure that they align with relevant good practices. It is also important to adopt a 'privacy-by-design' approach for digital public platforms from the get-go, to reduce the risk of data breaches and misuse. This techno-legal approach will help provide the necessary safeguards, certainty, and accountability around the collection and use of personal data.
- **Strengthen data governance and interoperability frameworks to support better service delivery and realize the full value of using and re-using data.** With strong data protection frameworks in place, countries can move to designing and implementing whole-of-government data governance and interoperability frameworks, accompanied by enforcement of relevant standards. As part of these efforts, countries may consider the suitability of federated and decentralized protocols for data sharing and verification, such as the Verifiable Credentials standard. This will support use cases

such as integrated service delivery, social protection targeting, and digitalized healthcare and education. It will also incentivize the private sector to develop innovative services based on government-managed (and trusted) data.

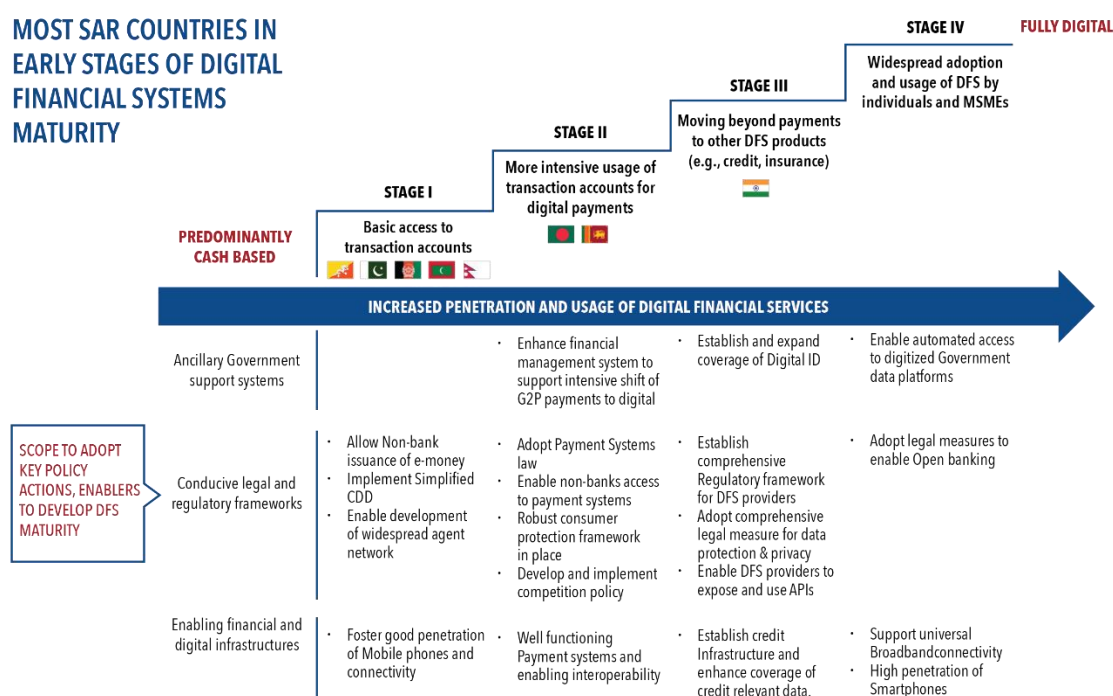
- **Strengthen digital identification, digital payments, and data platforms—and design them as ‘digital stacks’ to enable strategic linkages between them.** Countries in the region could use their identification systems as a basis for their own digital stacks to unlock presence-less, cashless, paperless, and consent-based transactions. Such stacks would use not only a whole-of-government but a whole-of-country approach. The India Stack and Singapore NDI Stack offer useful examples. Existing foundational identification systems would either need to be improved or used as a basis upon which to build additional services, so that digital identification credentials can be issued, with higher levels of assurance, for trusted remote online transactions with both the public and private sectors. Current gaps in the access and use of identification systems should also be addressed.
- **Support high impact and catalytic use cases, such as healthcare, education, jobs, and financial services.** With limited resources, countries in the region could consider prioritizing efforts towards developing digital public platforms that will reach the maximum number of beneficiaries and have the maximum developmental benefits. With people being the greatest asset of South Asian countries, developing digital public platforms that build, protect, deploy, utilize, and empower human capital is the most logical priority.⁶⁰ An example of such a use case is dynamic social registries, a basic infrastructure for the delivery of social protection, which could accelerate poverty alleviation by enabling better targeting of social assistance and insurance. Thus far, no country in the region has dynamic social registries at the national level. Similarly, deepening access to financial services will also equip people and businesses with the ability to participate more meaningfully in the digital economy. An initial focus on a smaller set of priority and high impact use cases could create a demonstration effect across all sectors.
- **Close digital divides and empower women and girls by being deliberate about inclusion and human centered design.** Digital public platforms are an excellent opportunity for South Asian countries to make progress in closing gender and other divides by equalizing access to government services. For women and girls, digital platforms provide greater agency and opportunities for economic empowerment, such as skilling and employment, property purchase and transfer, business applications, social assistance, and social insurance. Deliberate efforts are needed to prioritize those services that are especially beneficial for women and girls. A greater focus on human-centered design is also required, whereby digital public platforms are developed with empathy for the people they are being designed for, including an understanding of their specific problems and needs, and how/if a proposed solution would address these needs. This ‘bottom up’ approach contrasts with traditional ‘top down’ approaches that dominate digital public platforms in South Asia today. Instilling a culture of human-centered design will ultimately lead to digital public platforms and services that are more inclusive and responsive to the needs of people and businesses, and have greater positive impact.

⁶⁰ World Bank, 2021. *The Converging Technology Revolution and Human Capital: Potential Implications for South Asia*. Available at: <https://openknowledge.worldbank.org/bitstream/handle/10986/36156/9781464817199.pdf>

3. Digital Financial Services

Digital Financial Services (DFS) refer to a broad range of financial services such as payments, credit, savings, remittances, investments, and insurance, accessed and delivered through digital channels. They involve new operating models and a wide range of actors in the financial services value chain. DFS increase the speed, transparency, security, cost and availability of more tailored financial services that can serve the poor at scale. Although innovations in technology and business models have resulted in the rise of DFS, a well-functioning DFS ecosystem requires the following elements: (i) conducive legal and regulatory frameworks, (ii) enabling financial and digital infrastructure (payment systems, credit infrastructure, and digital connectivity infrastructure), and (iii) ancillary government support systems (data platforms, digital ID, and financial management platforms).

Figure 102: DFS Maturity in SAR Countries



(Adapted from Figure 3, “Digital Financial Services”, World Bank Group, April 2020)

Key Findings

As depicted in Figure 22, the maturity of DFS varies across countries in South Asia. While many common elements exist between countries, so do important differences, and this provides timely opportunities for bridging gaps in DFS innovation, provision, and adoption.

- 1) Bolstered by recent reforms and investments across South Asian countries, DFS is showing early promise in bridging the financial inclusion gap and motivating hundreds of millions to formally participate in the financial system.**

South Asia accounts for over 20 percent of all unbanked adults in the world. Nevertheless, there is notable improvement in key DFS metrics in the region. For example, in Pakistan, mobile money has grown fourfold since 2015, driven by the high penetration of mobile services (84 percent), high coverage of the national identification system, and identity authentication systems available at the retail level. In Maldives, concerted efforts have been made by the Maldives Monetary Authority (MMA) to digitalize financial services and expand financial inclusion, and as a result, mobile money penetration has shown a marked increase since the onset of COVID-19. Still, critical gaps in growth and scale persist due to a several factors, including the number of financial access points, payment infrastructure, and gender norms. These are discussed further below.

Table 2: Select DFS Indicators in South Asian Countries (Global Findex)

(All figures in % of adult population)	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
Financial institution account	15%	41%	34%	80%	NA	45%	18%	74%
Used the internet to pay bills or to buy something online in the past year	1%	4%	1%	4%	NA	2%	8%	6%
Sent or received domestic remittances: through a mobile phone	0%	19%	0%	1%	NA	1%	5%	0%
Sent or received domestic remittances: through a money transfer service	2%	0%	3%	1%	NA	5%	1%	2%
Used a debit or credit card to make a purchase in the past year	NA	NA	10%	12%	NA	NA	NA	17%
Used a mobile phone or the internet to access an account	1%	22%		5%	NA	4%	8%	8%
Made or received digital payments in the past year	11%	34%	17%	29%	NA	16%	18%	47%
Mobile money account	1%	21%	NA	2%	NA	NA	7%	2%

2) The network of financial access points (ATMs, agents, retail merchants, etc.) is less than adequate in many countries in the region.

In this regard, greater private sector investment will depend on agent fees and commissions, agent capacity, and government incentives to expand to underserved areas where the business case is less strong. There is significant room to facilitate mobile money account ownership, for example in Afghanistan, both in terms of the process (streamlining KYC requirements and account activation) and the costs. This needs a robust network of cash-in and cash-out points. In 2019, for instance, there were 3.3 registered mobile money agent outlets per 1,000 km² in Afghanistan, compared with 567.1 in Pakistan. Mobile money providers still charge registration fees at account opening and/or maintenance fees that are relatively high compared with informal and cash-based solutions such as hawalas. 3G infrastructure is absent outside major urban centers in Pakistan and this contributes to a lower penetration of access points. In Bhutan, difficult terrain makes it challenging for financial service providers to offer services to remote populations in a cost-efficient and sustainable manner, and as such, DFS (especially through microfinance institutions) becomes even more critical. In Pakistan, more

than 40 percent of accounts are currently inactive, and branchless banking is concentrated in two telco-owned banks (JazzCash and Easypaisa). Further, Pakistan has one of the least accessible banking networks in the South Asia region. Banking infrastructure has developed at a slow pace in the country, with ATMs increasing at around 12 percent per annum and POS machines at just 4 percent. Agent onboarding procedures for branchless banking networks also remain cumbersome. The Nepal Rastra Bank has been gradually creating financial access points through bank branches but has not been able to cover all local government levels due to Nepal's difficult terrain and high operating costs. The distribution of ATMs and POS has increased over the years, but concentrated deployment and sub-optimal usage have led to inadequate coverage and higher operational costs.

3) Countries in the region are actively addressing gaps in core payment systems and ICT infrastructure.

Countries in the region have implemented traditional payment systems covering large value and bulk payments (RTGS and ACH respectively), established dedicated domestic card payment infrastructures or national switches (except Nepal and Maldives), and set up fast payment systems (except Afghanistan and Bangladesh). Payments, credit infrastructure and interoperability are improving in the region but there are substantial variations across countries. In Afghanistan, a wide range of low-cost digital payment options (e.g., AfPay domestic card scheme or QR-code standards) have been developed. Adoption of digital payments by Afghan youth is slow and below the national average. Most digital platforms do not offer e-payment solutions due to lack of demand from customers based on limited trust, awareness, digital and financial literacy levels. For e-commerce payments, commercial payment gateways available on the market are expensive and inefficient, imposing high fixed costs and transaction fees. However, these have been integrated with international payment processors to incentivize Afghan diaspora to export to their host countries and to purchase within the country (for family or friends). In Bangladesh, the country's robust payment infrastructure supports different modes of digital payments; but full interoperability between bank accounts, mobile wallets, and other payment instruments is yet to be implemented. Acceptance of digital payments, especially among SMEs, needs to be better promoted in the country. The credit infrastructure is evolving but needs to be further strengthened through digital technologies, in order to implement alternate creditworthiness and scoring processes and provide need-based credit products and services. Bhutan has a robust payment infrastructure which supports different modes of digital payments and provides interoperability between banks. The COVID-19 pandemic boosted digital payments, as they became more widely accepted, and saw the growth of transaction values and volumes of various contactless payment services (such as QR codes and digital wallets). In Maldives, the MMA is in the process of implementing a fast payment system that will enable real-time, 24x7 transfers and payments amongst and between bank and mobile money accounts. In Nepal, contactless payment services, like QR code payments, were increasingly used during the pandemic. A national QR initiative was launched in October 2020, but most QR set-ups are closed loop and not interoperable.

4) Gender and cultural norms are leading to a low uptake of digital payments among women.

Generally speaking, this gender gap is common across the region. Policies to change cultural norms are therefore essential (e.g., expanding the female agent network). In Afghanistan, access to formal financial services is much lower for women (7 percent in 2017) than men (23 percent). The NFIS (National Financial Inclusion Strategy) aims to increase the number of women owning a transaction account in the country to 12 percent by 2024. In Bangladesh, where the financial inclusion gap is one of the widest globally (at 29 percent in 2017), adoption of digital financial instruments remains low among women despite an increase in mobile phone ownership. This is driven by various factors, including lower ID

coverage and digital literacy, less confidence in using mobiles, limited knowledge of English, patriarchal household dynamics, and the fact that nearly 99 percent of digital finance agents in Bangladesh are men. In Nepal, only 3 percent of women have used the internet or a mobile phone to access bank accounts, while only 13 percent have made or received digital payments. In Sri Lanka, access to mobile money accounts is evident among young adults, but low digital skills, awareness, and trust remains a hurdle. In Maldives, innovative DFS products, many developed by banks, have played a noteworthy role in circumventing geographic barriers. However, there are limited DFS products tailored for specific audiences like women entrepreneurs. In Pakistan, there is evidence of greater adoption of national IDs by women after G2P social safety net payments were associated with their national ID. A similar approach could be taken with respect to mobile wallets. Concurrently with such initiatives, it is important to accelerate financial literacy programs for the target population.

5) To a large extent, issues related to trust and financial/digital literacy are common across countries in the region, and are widening the gap between access and use.

Cash is generally preferred to card or mobile money, and cash-on-delivery across South Asia remains dominant. This increases the gap between DFS access and DFS usage. In Afghanistan, even after the onset of COVID-19, the uptake of digital payments was constrained by the predominance of cash-on-delivery. In Bangladesh, which has a large unbanked population, account usage and penetration of digital financial products and services is low, with distribution skewed towards urban areas. This situation is exacerbated by low levels of digital financial literacy and a lack of trust in formal and digital financial services. In Pakistan, which is primarily a cash-based economy, digital payments account for just 0.2 percent of total transactions (compared to 1.5 percent to 7 percent in peer countries), and most digital transactions are bank transfers or Over the Counter (OTC) payments. Cash-in-circulation represents 17 percent of GDP in Pakistan compared to 12 percent in India and 5 percent in developed countries. The dominance of biometrically-authenticated agent-facilitated non-account-based transactions have hampered the growth of account-based transactions.

6) Further improvements in the institutional, legal, and regulatory framework for consumer protection, including data protection and cybersecurity, will be vital to creating a resilient and trusted environment that enables digital payments and the digital economy as a whole.

Recently, and in recognition of the role of non-banks in DFS, there have been some positive developments in the regulatory framework for digital payments across the region. India, Maldives, Nepal, Pakistan, and Sri Lanka now have separate payment system statutes. Afghanistan and Bhutan have also issued relevant regulations under their central bank statutes. Bangladesh is in the process of enacting a National Payment Systems Act to address some critical gaps.⁶¹ However, the Global Financial Inclusion and Consumer Protection (FICP) Survey shows that the South Asia region has the lowest prevalence of stand-alone units within financial sector authorities that are dedicated to financial consumer protection. There are also several loopholes in the legal mandate for financial consumer protection in the region: the regulatory framework is not well-adapted for new and enhanced risks arising from DFS and there are weaknesses in market conduct supervision and dispute resolution mechanisms. The degree of harmonization of AML/CFT (Anti-Money Laundering and Combatting the Financing of Terrorism) procedures, policies related to foreign participation in financial infrastructure, and cross-border aspects pertaining to data protection and privacy also need further refinement. In Afghanistan, consumer protection policies do not currently cover online transactions, a key challenge to the growth of e-commerce. Regulatory provisions to establish trust in the e-commerce and e-payments

⁶¹ Legal certainty around operational aspects such as netting, collateral protection, irrevocability and settlement finality.

ecosystems could be strengthened in the country. In Maldives, there is the risk of data and information misuse due to underdeveloped consumer protection and cyber security legislations. In Sri Lanka, consumer protection is currently inadequate, and the wider adoption in digital services, such as online and mobile banking, have led to increased risks of fraud, data privacy violations, and security breaches. This comes with related service unavailability and poor customer recourse mechanisms. The recent establishment in Sri Lanka of the Financial Consumer Relations Department of the Central Bank, and the expected enactment of the Data Protection Bill, will address some of these concerns. It is important to note that the onset of the COVID-19 pandemic saw a surge in unregulated online lenders targeting struggling borrowers, including those with low credit scores, who were unable to provide authenticated documentation and became saddled with huge debt repayments.

7) The level of innovation in the DFS space varies across countries in the region, with India—a global leader in the space—being an outlier.

In terms of government payments, all governments in the region have increased their usage of digital payments, although the degree of adoption varies. The process began with the digitization of civil service salary payments across the whole region (except for Afghanistan, where this has not yet been completed), followed by the broader push to modernize all government-to-person (G2P) payments, including pensions and social safety net benefits. With respect to the latter, India's Direct Benefit Transfer (DBT) program has been particularly successful, with almost three billion transactions processed per year. This success was driven by the integration of domestic payment infrastructures, which provided recipients with a meaningful choice of payment service providers. Subsidies were also offered to the financial sector that encouraged, rather than crowded-out, private investment. Other countries in the region have followed suit, although the digitization of their G2P payments is progressing in a more piecemeal fashion. In Bangladesh, for example, recipients of various social safety benefits can receive payments in their mobile wallets. To facilitate this, mobile financial service (MFS) providers have integrated their systems, to a limited extent, with the Bangladesh Automated Clearinghouse (BACH). In many cases, the COVID-19 crisis motivated governments to experiment with digital payments delivery. The Ehsaas Emergency Cash Program in Pakistan employed the branchless (agent) banking networks of two partner banks to disburse cash assistance to poor families. Due to legal and logistical constraints, however, recipients were not provided with full-fledged transaction accounts, but rather with "Limited Mandate Accounts" (LMA) with restricted functionality. Similar challenges were observed elsewhere in the region. Even where recipients were provided with fully functional financial accounts, the lack of acceptance of digital payments among merchants, lack of trust in the system, limited cash-out facilities, and low levels of financial literacy all resulted in upholding the dominance of cash and slowing down digitalization. In India, beneficiaries of the PMGKY program were not always aware that payments had been delivered into their accounts.⁶² More recently, governments across the region have embarked on the digitization of other payment streams, such as P2G or person-to-government (e.g. taxes, tolls or utility bills) and B2G or business-to-government. Bangladesh, for example, launched ekPay (a centralized billing portal for public sector entities), while India developed the National Common Mobility Card (a specification for an interoperable tap-and-go card for public transportation). However, such initiatives are relatively new, and many government payments streams across the region still rely on manual processes with a cumbersome user experience.

⁶² Alan Gelb, Anurodh Giri, Anit Mukherjee, Kritika Shukla, Mitul Thapliyal and Brian Webster. 2021. "Social Assistance and Information in the Initial Phase of the COVID-19 Crisis: Lessons from a Household Survey in India." CGD Policy Paper 217. Washington, DC: Center for Global Development. <https://www.cgdev.org/publication/socialassistance-and-information-initial-phase-covid-19-crisis-lessons-household-survey>

8) Some regulators in the South Asia region are establishing innovation facilitators to ensure new digital products and services find their way to market.

In Bangladesh, for example, where mobile financial services are already very successful, the Regulatory FinTech Facilitation Office (RTFO) is a central bank-based one-stop-shop for fintechs and other financial innovators, where dedicated staff assist with license applications and other regulatory enquiries. In Bhutan, the Royal Monetary Authority (RMA) launched the FinTechBhutan initiative to support innovations that will improve the quality, efficiency, and accessibility of financial services. Under the Bhutanese initiative, a regulatory sandbox has been established to develop innovative products and services, such as digital lending and digital KYC. In Pakistan, the availability of digital microlending or micro-saving products is very limited, but the State Bank of Pakistan is developing an innovation office to promote innovative solutions among entrepreneurs. In Sri Lanka, where digital wallets are gaining popularity, the Central Bank is exploring a regulatory sandbox for fintech innovation, open banking, and e-KYC initiatives. It is also expected to introduce Supervisory Technology (SupTech) and Regulatory Technology (RegTech) solutions that utilize AI. In India, the Reserve Bank Innovation Hub (RBIH) has been established, together with a regulatory sandbox, in August 2019, with the following themes: (i) spur innovation in digital payments and help the unserved and underserved population access payment services⁶³, (ii) cross-border payments, (iii) MSME lending, and (iv) prevention and mitigation of financial fraud.

9) Fintech start-ups are beginning to take off in the region but are hampered by lack of funding, unfavorable market dynamics, differential policies for different players, insufficient incubator and accelerator programs, and the shortage of a fintech and entrepreneurship talent pool.

India is a notable exception in this regard, as it is home to the third largest start-up movement globally, propelled by rapid technology growth and innovation. The Startup India and Digital India campaigns have created a large support network for around 57,000+ start-ups in the country, through 520 incubators, 850 co-working space providers, and 59 accelerators that currently provide business programs, coaching, mentorship, and workspaces. By way of contrast, Afghanistan's fintech startup ecosystem (of VCs, incubators, and accelerators) is almost non-existent. In Nepal, there are approximately 56 fintech start-ups providing products and services related to internet or mobile banking, digital wallets, agent-banking, bill payments, remittances, crowdfunding platforms and loan lifecycle management. In Bhutan, incubators and accelerator programs such as Startup Center and iHub have been established to boost fintech startups. In the Maldives, an accelerator program 'NIRU' was introduced in 2018 but there are currently no incubator programs, and angel investor networks are poor. Most fintech startups are therefore boot strapped. There is also no market leverage for the establishment of a sandbox. Though there is evidence of growing activity in the fintech startup space in Pakistan, incubators see very few entrepreneurs in financial services because of the perceived regulatory complexity and lack of collaboration platforms where fintechs and incumbents can work together. There are more than 40 prominent fintechs in the country, including both licensed and unlicensed players. In Sri Lanka, existing regulations oblige fintechs to partner with financial institutions to offer products, services, and solutions. HatchX, Sri Lanka's first Fintech accelerator, recently supported seven fintech startups. In Bangladesh, as of 2021, there were 112 fintech startups.

⁶³ https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=48550

Figure 113: Number of Technology Hubs⁶⁴

Digital Entrepreneurship Ecosystem					
Indicator	Pakistan	India	Nepal	Sri Lanka	Bangladesh
Number of technology hubs	35	>250	12	15	15

Recommendations

Despite an increase in entrepreneurial activities in the field, important gaps in financial access still persist. This is due not only to gaps in connectivity but to social and cultural norms, particularly with respect to women's financial empowerment. Moreover, many people do not have the financial/digital literacy or awareness of DFS to use them with any confidence. Others might simply not have the incentive to shift away from a dependence on cash or traditional financial services. As a result, while DFS might promote inclusion, there are barriers to use by those who might benefit the most: people who are poorer, older, or live in remote areas of South Asia.

More could be done to improve trust in DFS, by addressing the continuing use of traditional systems as the need for data protection and cybersecurity. An important set of constraints arise from inadequate regulatory frameworks and institutional capacities that might hold back innovation or ability to manage risks in various financial services markets. As countries aim to balance innovation with risk management, updates to legal and regulatory frameworks are needed, together with institutional capacity development and coordination between the public-private sectors, incumbents and innovators. Furthermore, efforts to boost interoperability will pay off in terms of increasing competition among service providers and business models, and expanding access.

The subsequent recommendations are aimed at mitigating the challenges arising from this analysis, and cover ancillary government support systems, conducive legal and regulatory frameworks, and enabling financial and digital infrastructures.⁶⁵

- **Encourage adoption of digital payments wherever feasible and address coverage of recipients who lack access.** A consistent and long-term approach could be adopted by governments to encourage the private sector to freely develop the digital ecosystem in multiple areas, riding on the back of the digitization of G2P programs. Payment delivery processes could be integrated across government programs and ministries. IDs, social registries, financial management and payment systems would best be integrated into provide common platforms. All contract payments above certain thresholds—whether G2B or B2B—could gradually be shifted to a digital mode. For example, India might consider expanding their Direct Benefit Transfer (DBT) program to remaining state-level benefit programs. The government could also continue to evaluate the economic model for DBT incentives, with the view to expand the choice of providers available for recipients and aiming subsidies where most needed. Bangladesh, Bhutan, Nepal, Maldives, and Pakistan may consider enacting similar policies, leveraging the full range of providers and interoperable payments infrastructures to facilitate digital, account-based payments with a view to advancing financial inclusion through government payments. Any subsidy or incentive arrangements for payment service providers should be negotiated on a whole-of-government basis including (where applicable) subnational authorities. With respect to implementation, all South Asian countries could consider

⁶⁴ Invest2innovate

⁶⁵ Refer Figure 4, “Digital Financial Services”, World Bank Group, April 2020.

developing centralized portals or gateways for government collections (as already planned in Bangladesh through the ekPay portal), to improve user experience, strengthen security, and negotiate better contract terms with payment service providers or card networks. In addition, they may consider establishing a dedicated platform, or working group, to exchange regional experiences and best practices for digitization of government payments.

- **Address gaps in financial infrastructure and modernize credit reporting systems to integrate alternative data and establish a roadmap for developing the payments and data exchange components of the digital stack.** Measures could include accelerating the implementation of fast payment systems in Bangladesh and integrating financial infrastructures with government and business payments in Pakistan. In Nepal, Bhutan, Sri Lanka, and Maldives, digital capabilities could be improved. Standardized QR codes could also be adopted all South Asian countries, following the examples of India and Pakistan. The digital capabilities of existing credit reporting systems need to integrate alternative data and MSME data. As the government data platforms develop further, the focus should be to move towards a data exchange platform that financial institutions can access, based on the consent of the respective data subject.
- **Foster trust and promote literacy (digital and financial) by strengthening the institutional and regulatory environment.** Authorities in South Asia could strengthen the institutional, legal, regulatory, and supervisory processes to ensure robust cyber security, data privacy and protection, and consumer protection, which in turn will help build broad-based trust in DFS. For example, legal and regulatory frameworks should be adapted to address new and heightened risks arising from DFS, such as those related to outsourcing, cloud computing, use of alternative data, algorithmic scoring, use of digital channels, and gaps in the regulatory perimeter. With respect to implementation, literacy initiatives should convey targeted messages (highlighting the many benefits of DFS and the risk mitigation measures taken) to be impactful and leverage existing government programs for widespread adoption at scale. Special attention should be given to underserved populations such as women, senior citizens, youth, rural and displaced populations.
- **Proactively adopt regulations and establish innovation facilitators to expand the DFS market, encourage new entrants and develop *avant-garde* business models.** Governments and regulators should consider a proactive review of existing legal and regulatory frameworks and address gaps and ambiguities that discourage market entry and the development of new business models. Bangladesh, Bhutan, and Pakistan have recently launched initiatives in this direction that they should consider expanding. There are, however, no such initiatives in Sri Lanka, Nepal, Maldives, or Afghanistan. On the implementation front, except for India (which is an outlier), all South Asian countries would benefit from more innovation facilitators such as incubators, accelerators, angel investor networks, and (at the minimum) innovation hubs. The use of alternative data, e-KYC, cloud services, API-based data exchange and platform-based models are particularly relevant in the South Asian context. Countries that already have innovation office and sandbox regulatory approaches could channel the insights gleaned from them to inform review and updates of regulatory frameworks.
- **Support policies and implementation reforms that facilitate cross-border payment services, through Payment Services Providers (PSPs).** In the South Asian context, for example, this could mean State Bank of India's operations in Bangladesh could facilitate acceptance of RuPay cards issued in India, under a partnership with State Bank of India. Another example could be for Sonali Bank operations in India and PayTM to accept Bangladeshi bKash in India under their respective acquiring licenses in the country.

4. Digital Businesses

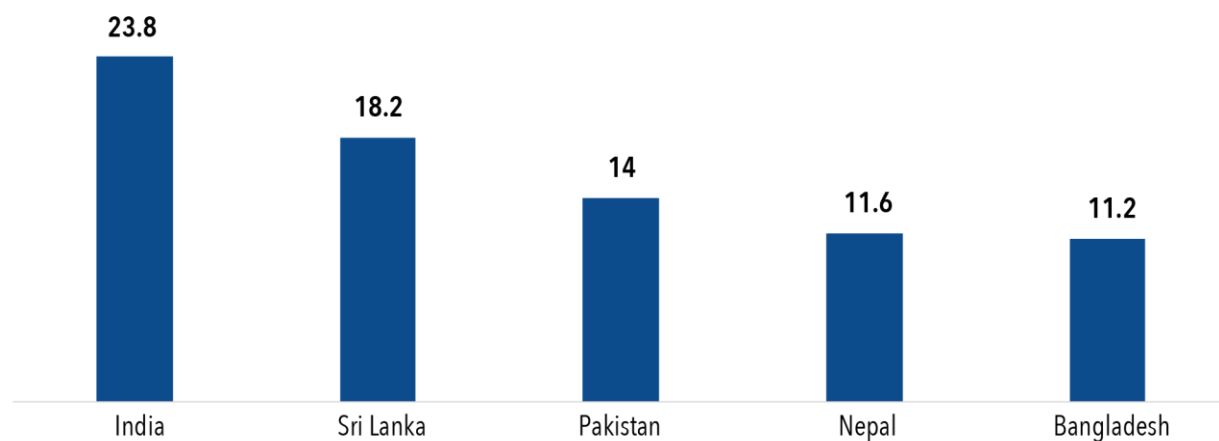
Digital businesses can be classified, according to their level of maturity, into digital startups, on the one hand, and established digital businesses, on the other. *Digital start-ups* are early-stage ventures that create new digital solutions or business models as part of their core products or services, and *established digital businesses* are platform-based and data-driven firms that have passed the initial start-up stage. The growth and sustainability of digital businesses require a well-functioning entrepreneurship ecosystem and venture capital financing. As ecosystems mature, the policy focus needs to shift towards the creation of a contestable market where all new digital businesses have a fair chance to enter, compete and scale. Digital entrepreneurship⁶⁶ is best supported by a well-developed ecosystem of private sector led incubators and accelerators that naturally connect to mentorship and capital networks, innovative debt and equity financial mechanisms, entrepreneur, university and industry networks, international business linkages, as well as enabling regulatory and legal policy.

Key Findings

1) The digital business ecosystems in South Asian countries show diverse levels of maturity.

The Digital Entrepreneurship Index ranks the relative strengths of digital entrepreneurship ecosystems across the sub-indices of Digital Infrastructure Governance, Digital User Citizenship, Digital Multi-sided Platforms, and Digital Technology Entrepreneurship. Bangladesh and Nepal are at the bottom of the list of South Asian countries in the Index, while India and Sri Lanka have the most developed digital entrepreneurship ecosystems in the region (Figure 24). India's digital economy is set to reach a value of US\$800 billion by 2030.⁶⁷ In contrast, Afghanistan's ecosystem is in a very early stage, with only a handful of small digital start-ups operating in the country.

Figure 124: Digital Entrepreneurship Index (2019) Scores for South Asian Countries (0-100)⁶⁸



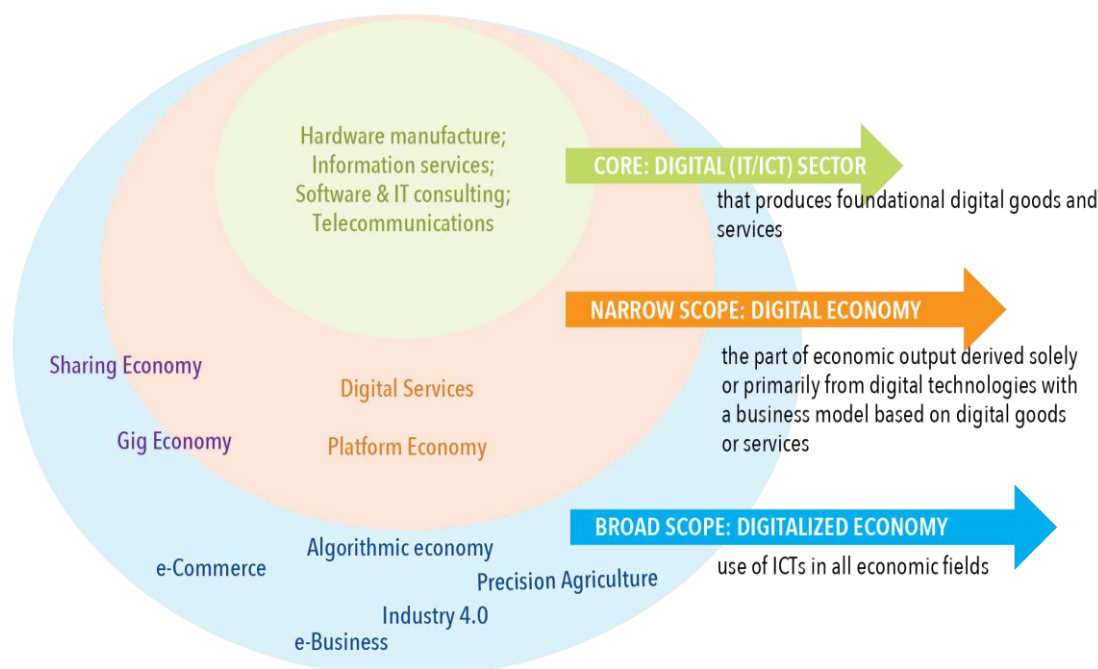
⁶⁷ E-commerce in India: Industry Overview, Market Size & Growth | IBEF

⁶⁸ Measuring digital entrepreneurship ecosystems: The Digital Entrepreneurship Index - <https://thegedi.org/wp-content/uploads/2020/04/Digital-Entrepreneurship-Index-report-v0.pdf>

2) The level of dynamism of digital businesses depends in part on the performance of the remaining digital economy pillars, that is digital infrastructure, digital financial services, digital skills, and digital platforms.

In other words, in order to develop and grow, digital businesses require quality digital connectivity, accessible financial services (supported in particular by venture capital (VC) and private equity (PE) funds), a skilled workforce, and responsive e-government systems. They also need robust legal and regulatory frameworks in areas such as e-transactions and taxation, data privacy and consumer protection, supplier protection, e-signatures and e-documentation, intellectual property protection, cybercrime, and competition policy. To support the growth and proliferation of digital businesses, governments could consider having a basic enabling regulatory environment in place, while keeping in mind that distortions may arise, requiring review, as the adoption of digital businesses increases.

Figure 135: The Digital Economy⁶⁹



3) E-commerce platforms in the region's largest countries have taken advantage of large, underserved markets to rapidly expand their operations.

In India, the e-retail market is expected to grow at a rate of 25 to 30 percent per year over the next five years, reaching a value of US\$120-140 billion by FY26.⁷⁰ Digital businesses play a key role in closing service access gaps among underserved populations, as they can offer innovative solutions to pressing development problems. Examples in the region include successful business in India such as Byjus (a multinational educational technology company), BharatPE (a fintech startup catering to small merchants and store owners), and Blackbuck (a logistics platform improving the efficiency of goods transport).

⁶⁹ Bukht and Heeks (2017)

⁷⁰ Bain & Company in association with Flipkart (2021). 'How India Shops Online 2021'.

Box 4: Digital Platforms and Competition

Digital businesses can spur innovation, generate new products, reduce transaction costs, and enhance market intermediation, but they can also bring new challenges for policymakers seeking to protect consumer welfare. Due to network effects, economies of scale and scope, multisided markets, nominally-free products, and the high value of proprietary data on consumer behavior, markets dominated by digital businesses – particularly digital platforms – tend towards a decreasing level of competition (“winner-takes-most”) and therefore, over the long-term, potentially threaten welfare of consumers and suppliers who connect to these businesses. To mitigate this risk, policymakers are developing new approaches to competition policy. Considerations include:

- Multisided markets and the value of control over data complicate the definition of markets as well as the assessment of market shares, market power, and the impacts of anti-competitive behavior. As a result, it is important for policymakers to actively monitor market concentrations and firm practices, as well as to consider *ex-ante* pro-competitive policies to counter market-distorting conglomeration, rather than relying solely on *ex-post* competition policies.
- Mergers between digital firms can harm consumer welfare through the centralization of control over data and intellectual property, rather than by affecting traditional measures of market share. Traditional thresholds for merger review by competition authorities may not be relevant for digital firms given that such firms typically do not have sufficient tangible assets or revenues.
- While the potential for mergers and acquisitions provides startups with incentives to innovate, competition authorities must be alert to the potential for “killer” or “zombie” acquisitions (whereby a firm acquires a smaller potential competitor and discontinues its innovations) and vertical mergers to inhibit competition and harm consumer welfare. To balance the protection of incentives for innovation with the protection of competition in digital markets where firms hold fewer tangible assets, competition authorities may make increased use of behavioral remedies based on a thorough understanding of new business models.

Across South Asia, the competition authorities of India and Pakistan have the highest levels of capacity relative to other authorities in the region. The Competition Commission of Pakistan (CCP) announced in April 2020 that it was developing rules and regulations for digital platforms in order to protect data transactions and personal data (<https://profit.pakistantoday.com.pk/2020/04/22/ccp-to-prepare-rules-for-online-businesses/>). To date, the Competition Commission of India (CCI) is alone in the region in finalizing digital antitrust cases. The \$20 million fine levied by CCI in 2018 in Google for abusing its position of dominance by advantaging its flight unit in search engine results is among the highest imposed by a middle-income country. The CCI has also pursued abuse of dominance cases against MakeMyTrip, an Indian online travel company; Flipkart, an Indian e-commerce company later acquired by Walmart; Ola Cabs, an Indian ridesharing company; Uber; and Matriomy.com. The building of capacity of competition authorities across South Asia – as well as encouraging harmonization and coordination between authorities – should be a priority given the increased importance of digital markets in the post-COVID era.

India was also among the first middle income countries to have its competition authority publish a market study on competition in the e-commerce sector. The CCI found that e-commerce platforms had several pro-competitive effects (such as increasing price transparency), but they also encouraged platforms to put in place more competition safeguards including transparency in their search rankings and review mechanisms, clear data policies, and fair terms and conditions for their merchants. India has also begun imposing some ex-ante regulations on e-commerce platforms. For example, new e-commerce rules that prohibit foreign firms from selling their own products on their platforms are intended to protect domestic retailers against risks of exclusion. However, the fact that these regulations target only foreign firms and are not predicated on the firm holding a dominant position may mean that such regulations could create an unlevel playing field and go beyond what is needed to prevent adverse outcomes. This underlines the need to ensure that ex ante regulations to boost competition in digital markets should be based on a case-by-case economic analysis and should be designed to avoid stifling firm incentives to invest and innovate.

4) Both formal and informal firms in South Asia have benefited from the presence of e-commerce platforms.

A recent World Bank survey of South Asian firms selling on e-commerce platforms Chaldal and Daraz showed that the primary reason for joining the platforms was to access more customers. Most of the sellers reported a business expansion after joining the platforms.⁷¹ The benefits go beyond an increase in sales: firms also reported the adoption of new or improved business practices and technologies, better access to finance, and greater work-life balance. The survey also found that firms that had been using e-commerce platforms for longer periods of time experienced greater positive outcomes. South Asian firms connected to e-commerce platforms vary widely in terms of size, degree of formalization, and other characteristics, but they tend to be owned and managed by more educated and younger individuals than the average firm.⁷² Informal firms reported an increased incentive to register their business. This highlights the potential of the digital economy to shift formalization incentives and to positively affect informal firms, more specifically through four main benefits: good management practices, greater access to markets, reduced capital inputs, and lower matching and verification costs.⁷³

5) Disparities in the maturity of digital business ecosystems are partly explained by the quality of government support initiatives and the robustness of a country's networks of intermediary support organizations.

The government has an important role in supporting the development of digital business ecosystems through facilitating entrepreneurship and engaging the private sector while making sure not to appear to be picking winners. Creating an enabling environment by removing obstacles to growth such as anti-competitive regulations in key industries, taxation on small firms, inefficient “red tape,” difficulty of firms to transact with global markets while attracting and encouraging local domiciling of investment capital are key. The exemplary growth of India's start-up ecosystem is largely due to the success of formative technology businesses that created positive spillover across the economy, skilled human capital in key sectors of the economy, and a conducive environment for digital businesses and equity investment. Notably, the country has the 3rd largest number of incubators and accelerators in the world with over 520 active tech incubators and 59 accelerators, 42 percent of which have been set up in just the last five years. Importantly, many of these programs are connected to global industry leaders such as Microsoft, Google, and Tata; industry associations such as Nasscom; and top universities such as the Indian Institutes of Technology, whose graduates are digital economy leaders. Even government-linked incubators and accelerators bring a private sector partnership. For instance, accelerators such as Start-up Oasis are supported by the Government of India but are managed and run by IIM Ahmedabad's CIIE.CO program. In Sri Lanka, the government has developed technology clusters in Galle, Kandy, Nuwara Eliya and Kurunegala, incorporating universities, technology institutes, and private companies.⁷⁴ Bangladesh is providing seed and growth stage funding through Startup Bangladesh as well as supporting investment in critical digital infrastructure such as data centers. In recent years, Pakistan's universities, city governments, and the government's information and communication technology (ICT) fund have expanded support network for start-ups. As of 2021, Pakistan had 16 incubators and four accelerators providing business programs, coaches, mentors, and co-working spaces. However, the

⁷¹ Bussolo, Maurizio; Golla, Anne; Kotia, Ananya; Lee, Jean N.; Narasimhan, Prema; Sharma, Siddharth. 2021. *How Selling Online is Affecting Informal Firms in South Asia*. World Bank. Forthcoming.

⁷² Ibid.

⁷³ Ibid

⁷⁴ <https://www.icta.lk/industry-development/>

business-enabling environment and investment fund regulations in Pakistan continues to create obstacles in the growth of digital businesses.

6) While digital businesses and the adoption of digital technologies could promote gender inclusion by opening markets and job opportunities to women, there is still an important gender participation gap in the digital economy.

The extent of female participation in the digital ecosystem as digital business entrepreneurs, digital platform sellers, or as employees of digital businesses, remains limited. Only about 13 percent of enterprises in India, for example, are owned by women.⁷⁵ In Bangladesh, labor force participation amongst women remains low, with dismal representation in digital and ICT sectors. In fact, women comprise only 16 percent of the total ICT workforce in the country.⁷⁶ In Nepal, the number of new female business owners, and new sole female proprietors doubled from 2014 to 2018, but primarily in non-digital sectors.⁷⁷ Increased investment in digital skilling, and ecosystem support services, targeted towards women will unlock greater business creation and growth. Examples include mentorship and coaching, access to relevant networks, incentives, and accelerator-led investment in women-owned businesses.

7) There is a need for greater coordination between policymakers, regulators, and private sector actors to create a conducive regulatory and policy framework for digital business development and investment.

In Nepal, passing the e-commerce bill and providing a consistent set of rules, will provide greater certainty for digital businesses. In Pakistan, the government has taken important steps to create an enabling environment for digital businesses, but investment is being held back by a lack of consumer protection mechanisms, inadequate enforcement of intellectual property rights, inconsistent tax regimes, and absence of investor protections. In the Maldives, the 2020 Consumer Protection Act and the Electronic Transaction Bill (debated in Parliament in mid-2021) represent important steps towards completing a robust framework, but key areas remain to be legislated, most notably personal data protection. In Bhutan, the absence of policies to address payment systems, data privacy, and consumer protection creates an environment fraught with risks for new ventures. In Sri Lanka, a weak competition regime is having an impact on both digital and non-digital businesses. In particular, the Consumer Affairs Authority (CAA) has failed to provide for the regulation of mergers and monopolies, leaving a significant gap in the legislation governing anti-competitive practices. In addition, several key pieces of legislation, such as the Personal Data Protection Bill and Cybersecurity Bill are only in a draft stage (as of April 2021), creating significant uncertainty for businesses. In some cases, the lack of sectoral regulations tailored to digital businesses is a problem. For instance, online pharmacies, who are required to register with the National Medical Regulatory Authority (NMRA), noted that the regulator did not have a licensing/regulatory process in place for them at the time of their inception.

8) Digital businesses face many of the hurdles common to all entrepreneurs in the region, especially with respect to access to finance.

This is due to the regulatory hurdles that exist for the type of local capital formation best suited to digital businesses and startups. With the exception of India—which has seen a surge in Private Equity (PE) and Venture Capital (VC) funding for new enterprises over the last decade—access to early-stage

⁷⁵ Bain & Company and Google (2019). Powering the Economy with Her. Women Entrepreneurship in India.

⁷⁶ Survey on ICT Job Market in Bangladesh, Daffodil International University, 2019

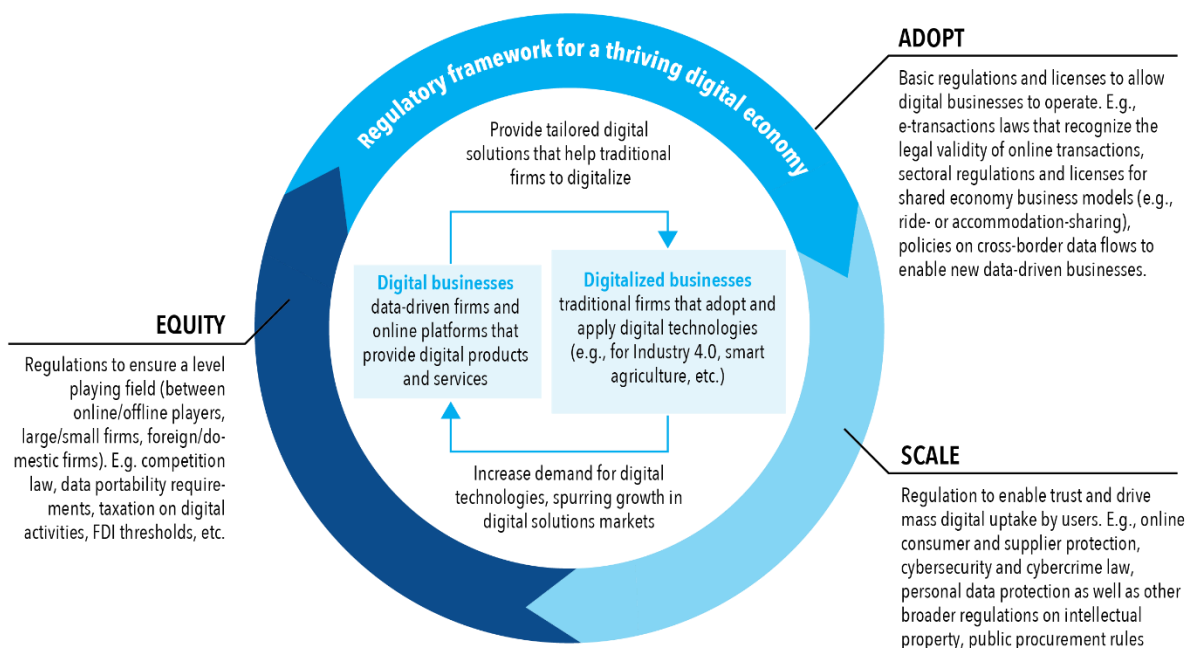
⁷⁷ Doing Business Dataset, World Bank, Accessed on August 4th, 2020

financing in the region is a challenge. There is a lack of understanding of digital among local financial institutions and private investors, exacerbating the gap that already exists in MSME and trade finance for local entrepreneurs. For instance, in Nepal, under the Foreign Investment and Technology Transfer Act (FITTA), VC/PE firms are restricted in how they can enter the market, the types of instruments they can use, and the amount of funds they can deploy. In Pakistan, access to finance for emerging businesses is difficult, as both VC/PE availability and formal sources of finance are constrained. In Sri Lanka, according to the Council of Startups, less than US\$2 million in VC funding was invested in the market in 2020, amounting to just 0.002 percent of GDP (200 times lower than the corresponding ratio in India).

Recommendations

- **Build institutional capacity for the development and implementation of legal and regulatory frameworks to promote innovation and competition.** The growth of the digital economy requires an assessment of guidelines, laws and regulations as they relate to, *inter alia*, business formation and dissolution, access to capital (in the form of working capital, trade finance, and business loans through digital channels), foreign direct investment flows (as risk capital in the form of equity investment, contestability with traditional business models, and cross-border dynamism in the movement of goods, data, capital and people. The adoption of a three-tiered framework can help policy makers prioritize legislation and regulations and adapt them to the level of maturity of the digital ecosystem (Figure 26). In particular, countries at early stages of digital ecosystem development could benefit from enacting e-transaction laws to ensure the basic legal legitimacy of online transactions (such as electronic contracts and digital signatures), enable cross-border data flows, and facilitate registration for digital businesses (including sectoral permits and licenses). After setting up basic e-transactions regulations, governments in the region could then consider enacting regulations that help businesses scale, such as improving local capital formation for early-stage, venture, and growth capital. Importantly, they could foster trust in digital commerce through the enactment consumer and supplier protection, cybersecurity, data protection, and intellectual property legislation. The adoption of market-efficient investment structuring policies, together with the clarification of laws relating to bankruptcy, taxation, and repatriation of funds, can serve to crowd-in capital. In any market, but especially in more mature ones, regulators should consider adequate competition policy and advocacy measures that could guarantee fair competition between online and offline players, large and small firms, and foreign and local firms. They could also support integration into increasingly digital regional trade, commerce, and value chains through regional interoperability for digital payments and services, trusted data sharing and digital ID and authentication. A comprehensive mapping of digital market regulations in each country would help identify roadmaps for the implementation of international good practices along each of the areas recommended above (Fig. X).

Figure 146: Framework to identify gaps in the regulatory framework for the digital economy⁷⁸



- **Accelerate the growth of early-stage and growth financing through government fiscal incentives, in addition to the creation of an enabling regulatory environment.** Governments may consider structuring supportive tax regimes to incentivize early-stage capital providers, such as angel investors (including those of the diaspora) and seed, venture, and growth funds. Government fiscal incentives could be used to encourage healthy and growth-oriented capital flows into the country, rather than capital inflows that engage in hostile market consolidation and stifle competition. The government could explore options in consultation with the private sector, such as innovative financing methods (e.g., peer-to-peer platforms), the use of government funds through risk-sharing facilities and other matching initiatives to enable capital to reach scale.
- **Facilitate adoption of digital tools and technology by SMEs.** The COVID-19 pandemic has accelerated the digitization of MSMEs across South Asia. This has increased opportunities for technology enabled FinTechs, SaaS, communications, commerce, and logistics companies, while connecting MSMEs in new and inclusive ways to financial services, suppliers, and customers. Efficiency gains have also been made through the digitization of activities like bookkeeping and order management. To achieve informed, empowered and equitable digitalization, governments could further support this trend by providing relevant incentives such as training and funding of MSMEs, and particularly women owned MSMEs. A key target of these incentives could be digital solution providers, so that they may design fit-for-purpose solutions for local MSMEs.
- **Improve opportunities for female entrepreneurs, including through improved access to finance.** To increase the number of women entrepreneurs having access to finance and increase the rate of lending to women-owned SMEs, performance-based incentives for financial institutions (in collaboration with private investors) could be considered. Financial institutions may use their own

⁷⁸ Source: Digital Markets & New Business Models: Database and Regulations (P172856).

balance sheets to finance the growth of a particular woman-led portfolio. These performance incentives can also be provided in risk-sharing facilities. In addition, specific programs to improve the gender imbalance could be considered, e.g. coaching and mentoring programs for women entrepreneurs on access to markets and networks, targeted skills, personal initiative training, investment-readiness training, and business model support.

- **Facilitate and support the development of a robust network of private sector intermediary support organizations, incubators and accelerators and promote linkages to employers, investors, trade associations, and universities.** It is important to develop approaches that adapt best practices and building networks from successful entrepreneurial hubs in large cities to secondary and tertiary cities. The government should seek to facilitate the development of business and entrepreneurial networks at the local, national and international level by focusing on providing assistance to link firms to customers, suppliers and other key stakeholders.

5. Digital Skills

Digital skills are critical for access to technology-driven development benefits and are an essential component of the digital economy. Digital skills can be defined as an individual's capacity to access, manage, understand, integrate, communicate, evaluate, and create information safely and appropriately. Although in South Asia no context-specific digital skills or competencies framework has yet been developed, different digital competence frameworks such as the EU's Digital Competencies framework 2.1 (DigComp2.1) and the EU e-Competency Framework 3.0 (e-CF 3.0) can provide guidance and be adapted to country-specific contexts. Generally speaking, relevant frameworks classify skills into

Box 5: Digital Skills Pyramid

Digital skills exist on a spectrum from basic to advanced levels of complexity (based on various frameworks from the World Bank Group (WBG), United Nations Educational, Scientific and Cultural Organization (UNESCO) and European Union (EU)):

Basic Digital Skills (Information and Communication Technologies (ICT) user) refer to basic functional skills that enable a safe use of digital devices and online and software applications (including word processing, spreadsheets, Internet searches, etc.) and are widely considered a critical component of a new set of literacy skills in the digital era (jointly with traditional reading, writing, and numeracy skills);

Intermediate and advanced Digital Skills (ICT practitioner) refer to more sophisticated digital skills of ICT professionals (ability to design, develop, and maintain digital tools, carrying out tasks such as web design, programming, coding, and managing ICT systems);

Electronic Business (e-business) skills (or electronic leadership (e-leadership) skills), defined as a mix of more complex digital and entrepreneurial skills (including abilities to apply, create, and invent new business models, products, and services using digital technologies).

Thus, digital competencies represent an individual's ability to use his or her knowledge, skills (know-how) and attitudes (life skills) in relation to the three spheres of technological, social and cognitive competencies in order to use new or existing ICTs to:

- (a) analyze, select, and critically evaluate digital information;
- (b) solve problems;
- (c) develop a collaborative knowledge base while engaging in organizational practices.

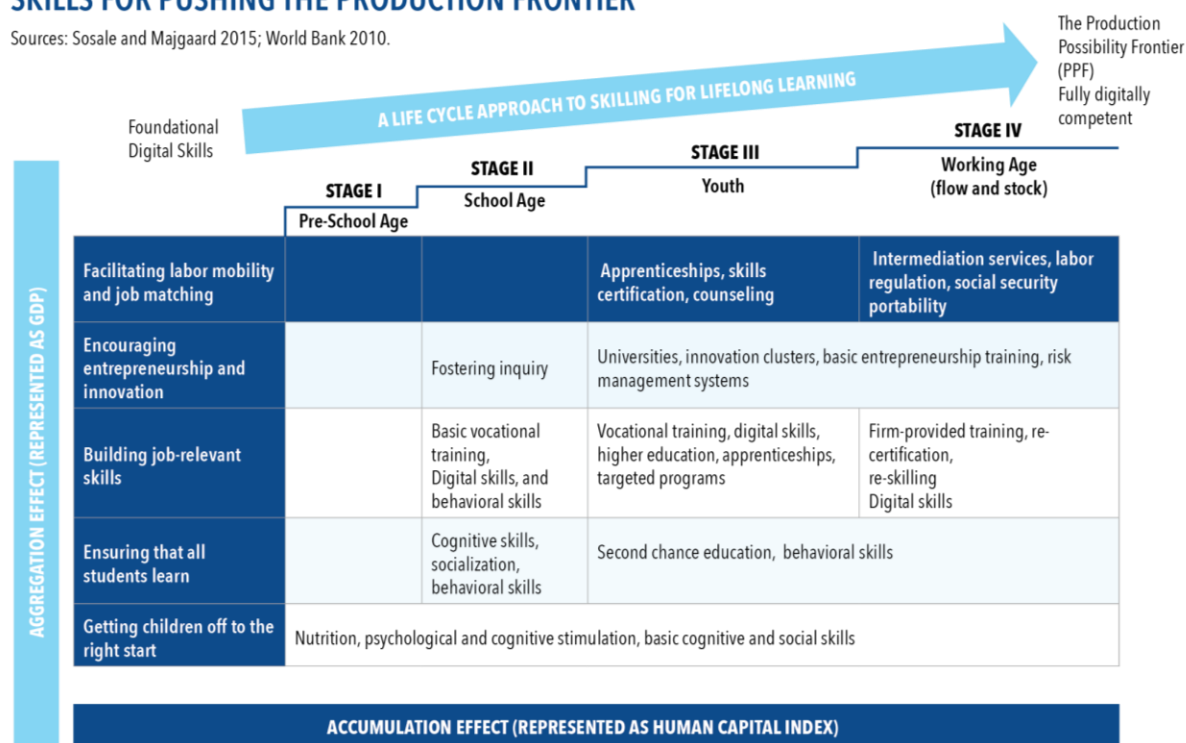
two categories: skills for a digitally competent workforce, such as ICT professionals, and skills for digitally literate citizens.

In a post-COVID-19 economy, a people-centered approach is needed to support a green, resilient and inclusive recovery. In this context, timely action is required to reimagine service delivery across all sectors of the economy and for all segments of society, particularly women and vulnerable populations. Skilling, upskilling, reskilling, and lifelong learning will foster adaptability, facilitate resilience, and fetch dividends for countries. A proposed framework for skilling is provided in Figure 27, in which the Accumulation-Aggregation Model applies the principles of a dynamic calculus that factors in the following elements: (a) the intertemporal accumulation of skills, (b) the layered nature of skills acquisition, (c) a life-cycle approach to skilling, and (d) moving the production possibility frontier (PPF) over time.

Figure 157: A Life Cycle Approach to Skilling for Lifelong Learning

ACCUMULATION-AGGREGATION MODEL DIGITAL SKILLS FOR PUSHING THE PRODUCTION FRONTIER

Sources: Sosale and Majgaard 2015; World Bank 2010.



A 2021 World Bank South Asia Regional Report⁷⁹ analyzes trends in the region and the imperative for digital skills, offering a comprehensive agenda to exploit the opportunities offered by converging technologies while minimizing

⁷⁹ Bashir, Sajitha; Dahlman, Carl J.; Kanehira, Naoto; Tilmes, Klaus. 2021c. The Converging Technology Revolution and Human Capital: Potential and Implications for South Asia. South Asia Development Forum. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/36156> License: CC BY 3.0 IGO.

the risks to vulnerable populations. The proposed strategies in the Report lend credence for building public sector capacity and promoting data and technology governance frameworks in a rapidly evolving technology landscape. The Report offers recommendations on how the South Asia Region can capitalize on converging technologies to accelerate its development of human capital, promote adaptability and resilience to future shocks.

Box 6: Capitalizing on Converging Technologies to Accelerate Human Capital Development in SAR

Research notes that the convergence of technological breakthroughs spanning biotechnology, nanotechnology, information technology, and cognitive science is driven by artificial intelligence, data flows, computing power, and connectivity. The convergence of different groups of technologies is unleashing technological advances at an unprecedented speed. These advances in technology can be used to improve access to and the quality-of-service delivery, prepare the workforce for technological changes in the workplace, encourage innovation for human development, and empower marginalized segments of the population. Framing the relationship between human development and technology, the findings of the Report address the nexus between nurturing, utilizing, empowering and investing for recovery and resilience in the midst of the COVID-19 pandemic.

The Report espouses an enhanced framework of the World Bank's Human Capital Project and the analysis of the South Asia Human Capital Plan developed by the World Bank's South Asia Region unit. The Plan identifies three drivers that limit human capital outcomes: the poor quality and effectiveness of services, inequality of opportunities, and the increasing vulnerability of South Asian countries to a spectrum of shocks and risks. To understand the relationship between human capital and technology in general and converging technologies in particular, the Report outlines among others, some key components that could be adopted to assess the needs for digital skills in the digital economy for South Asia (DE4SA): (1) analyses of digitization and the services-led economy, the technology landscape in South Asia for service delivery in the human development sectors, the deployment of converging technologies in employment and innovation, and the safeguards and protections for the use of converging technologies in relation to human capital development; (2) a systematic examination of the technology infrastructure, applications, and digital skills required in South Asia; and (3) exploring viable alternative futures for human capital outcomes in the region, taking into account broad technology metatrends and the critical uncertainties expected to influence outcomes. The low levels of human capital in the South Asia Region brings some risks and opportunities for the digital economy.

Key Findings

- 1) Harnessing the power of digitalization and digital skills offer new avenues to promote service delivery and benefit from new services. Skilling, upskilling, reskilling, and facilitating lifelong learning will foster adaptability, facilitate resilience, and gain dividends for a country.**

Post-COVID-19 recovery necessitates reimagining service delivery across all sectors in the economy and for all segments of society especially for the vulnerable and for women. Due attention should be given to making programs work better for the vulnerable, especially women. The low uptake of digital payments among women is due in part to gender and cultural norms. Women face specific challenges in accessing digital payments, mainly arising from difficulties they face in accessing quality education and training, entering the labor market, and staying employed. These aspects are often overlooked or insufficiently addressed in development projects. Areas that could be further explored include operational features, economic constraints, and strategies that focus on information, aspirations, and norms.

- 2) Although digital skilling is increasingly recognized as a key foundation of the digital economy, there is a dearth of data on the level of digital skills available in South Asian countries.**

There are few shared competencies between different government entities in charge of the agenda. However, there is little clarity on interventions and possible improvements in digital skills levels over time and across various strata of populations (e.g., white, grey, and blue color workers) to foster inclusive, green, and resilient development. Factors at play include variations in country size, level of human capital development, digital readiness, as well as overall digital awareness, accessibility, and skill levels.

3) The development of digital skills frameworks, digital skilling for schools and initiatives to address training quality are all underway in most South Asian countries, but there is a wide range, and most countries in the region still lack a coordinated and structured digital skills framework.

A structured skills framework requires assessments (of skill types, demand, and supply), feasibility studies, and analytically rigorous economic and financial analyses. Currently, there are virtually no digital skills assessments or demand assessments completed in South Asian countries, and response programs are fragmented. While some discussion of these matters has been noted in government circles, in most countries, there is no clarity on the type of digital skills that are needed, who needs them, what exactly is required and for whom. The discussion generally seems to take place at the two ends of the spectrum: very high-end ICT skills, or very basic rudimentary skills, such as how to use a mobile phone.

In some countries, including Afghanistan and Bangladesh, no comprehensive national digital skills policy / strategy / framework could be identified, and there does not seem to be any clear institutional anchoring of the digital skills agenda. In Nepal and Sri Lanka, digital skills are a high priority and a range of skills initiatives and programs exist. Still, a more structured framework to strategically build domestic digital skills and capabilities is needed. In Bhutan, digital skills have just become front and center in the country's new development vision. In Pakistan, the Digital Pakistan Policy 2018 recognizes the importance of digital skills among the ICT workforce as well as digital literacy among citizens. Many activities are ongoing in this regard, but the agenda remains fragmented between national and state levels, and there is a lack of clarity on resource implications. In India, the 2015 National Policy on Skill Development and Entrepreneurship (NPSDE) mentions ICT enablement as one of the core enablers to achieve the vision of Skill India. The policy underscores the use of modern technology and tools to make skilling accessible and aspirational amongst the masses. Several large-scale programs are driving the transition to digital skills.

4) Digital skills build on key foundations of literacy and numeracy.

The biggest challenges for digital skills in all South Asian countries are low levels of literacy in the region and poor performance in human capital indicators, combined with capacity and gender gaps. The human capacity gap is the main reason for the drastically low broadband usage gap in the region (at 64 percent). For instance, in Afghanistan, only about 6 percent of citizens can use a computer, and only about 9.4 percent are social media platform users. In Bangladesh, only about 8 percent of the population uses computers or similar devices, and only a quarter of them can perform tasks on basic office software (e.g., spreadsheet, presentations). The situation is similar in Pakistan, with about 8 percent of individuals (10 years and older) reporting the use of computer / laptop / tablet in the last three months. In India, the National Family Health Survey (NFHS-5) indicates that only 42.6 percent of women have ever used the internet (compared to 62.2 percent of men). It also reports a strong rural-urban divide: only 56.8 percent of urban women, and an even lower 33.9 percent of rural women, report using the internet, compared to 73.8 percent and 55.6 percent of men, respectively.

In light of these challenges, especially those relating to literacy, usage gaps need to be addressed holistically, with local support programs and multi-modal approaches, e.g., integrated ways to access

broadband, relevant content for synchronous/asynchronous access, digital skills training through blended learning such as augmented reality/virtual reality (AR/VR), adaptable learning and other modes. Other examples of initiatives that can promote digital skills include public service delivery centers, Wi-Fi-supported schools, local trainings, green-for-clean access using solar/point-to-point access, development of relevant content, and knowledge support for farmers and communities. Relational content that links visuals with text could also help promote adult literacy.

5) To make the digital economy inclusive in South Asia, mass digital upskilling of the population would be needed.

Based on a review of current government strategies, there are no clear plans for digital upskilling in the region. Countries have formulated visions of becoming “smart nations”, as in the case of Sri Lanka, or have introduced digital competencies from a broad perspective without clear-cut targets. From an infrastructure perspective, in some countries, challenges begin at the school level, where broadband and digital devices are lacking. In other countries (that have some level of coverage), curricula could be updated to introduce the practical aspects of digital literacy at the basic education level. Curricula and teaching methods across South Asia tend to be theoretical, outdated and not aligned with the requirements of a digital economy. India’s school education ecosystem is large, diverse, and complex with 250 million students and 9 million teachers, in more than 1.5 million schools spread over 60 educational boards. In 2019-20, around 38.5 percent of Indian schools had computers, and of this percentage, around 22 percent had internet access. In Afghanistan, only about 40 percent of public schools own at least one computer. And of these, only 5 percent are connected to the internet. In Bangladesh, where 82.2 percent of schools have computer facilities and 72.98 percent of schools have an internet connection, updates to existing curricula are sorely needed. In Bhutan, ICT infrastructure to access the internet and computers is low for primary schools (45.5 percent) compared to secondary schools (96.6 percent). In the Maldives, all primary and secondary schools had electricity and internet connectivity by the end of 2014, but the country is yet to establish a National Research and Education Network (NREN). In Nepal, only about 6 percent of primary schools and 24 percent of secondary schools have access to basic electricity, and only 1 percent of primary schools and 3 percent of secondary schools have internet connectivity. In Pakistan, 44 percent of government high schools and 38 percent of private high schools have computer labs in rural areas (with internet connectivity at 33 percent and 35 percent respectively), while in urban areas, the proportion is 85 percent and 80 percent respectively. In Sri Lanka, computer facilities in schools are limited and vary across districts. In 2017, only 55 percent of government schools had computer facilities.

6) Many countries in South Asia have realized the potential of their emerging digital and IT firms and aim to support such firms through increased training of technical experts in fields such as computer science or electrical engineering.

However, the quality of training and technical expertise remains low in many countries. To increase the level of flow and stock of highly skilled professionals, and foster resilience, a focus is needed on tertiary level training institutions, and partnerships with the private sector and international universities. This will create synergies, heighten awareness, deepen understanding, create expertise, and provide new directions for digital skills development. Job readiness skills and credentials are important elements for under-represented youth. The private sector is finding new ways to help under-represented youth become job ready and build careers in the digital industry. It is well-known that the role of the private sector in employment is crucial. The COVID-19 pandemic has required training institutions to pivot and operate remotely. In Pakistan, good opportunities exist to leverage the IT sector as a field for economic growth and job creation. However, IT firms consider the shortage in appropriate skills as an important

obstacle for their businesses. Prevailing course offerings and curricula at universities and schools of higher education struggle to fill the demand at the required levels. In Nepal, around 12 percent of university graduates have completed STEM education programs. Of these, only 7,500 students are graduating annually from engineering and ICT-related courses, including about 3,000 ICT-only graduates. In Bhutan, only around 1 percent of employed persons are engaged in the information and communication technology (ICT) sector. Almost half (41 percent) of the private firms in Bhutan consider the non-availability of a skilled workforce as an important barrier to their operations. The country's potential role as host to data centers and cloud infrastructure would benefit from a wider pool of technical experts.

As a powerful means to include more people in the digital economy, as both users and producers, improving digital skills has a significant positive spillover effect on the overall development of the digital economy. However, there is also the risk of market failure in terms of private sector (firm) investments in digital skills. Broader digital literacy can help reduce gaps in the adoption and use of digital technologies. However, the region's approach in this regard remains unstructured and uncoordinated, with limited data available on both demand and supply. This can negatively affect the inclusion targets, particularly of specific social groups such as women, persons with disabilities, or social minorities, in terms of their ability to access and use digital services. Improving coordination between government programs and the private sector (including links between education and employment, and awareness-raising initiatives) will likely increase the ability of more people to access and use various digital services.

7) Generalized knowledge, specialized knowledge, and specific skills will be necessary to carry out climate and disaster risk screening.

The basis for resilience consists of the right knowledge, the ability to adapt to situations and adopt new ways of doing things, and the capacity to innovate in the face of crises, e.g., COVID-19 pandemic and natural disasters. Climate change assessments are becoming increasingly digitized, whether these are climate and disaster risk screening, climate co-benefits tracking, greenhouse gas accounting, and/or calculations of the shadow price of carbon. Similarly, payment systems and ICT infrastructure can best yield fruit if the flow and stock of digitally savvy professionals and citizens are prioritized.

Recommendations

Digital skills can be better developed through a deeper integration of digital technologies in society. In this regard, the education sector is a natural and leading promoter of skills transformation. In a well-developed digital economy, there will be significant demand for skilled workers, which can be met through training programs for advanced digital skills. Since most countries in the South Asia Region have some form of policy or strategy for digital access, standardized e-Learning platforms could help them create a foundation for customizing, adapting, and facilitating skilling based on specific country circumstances. Measures to boost the availability of digital skills will need to be combined with a broader improvement in digital infrastructure (including connectivity to homes and educational institutions) and in data infrastructure to support learning and teaching. The hybrid modes of work that were taken up across the world during the COVID-19 pandemic served to demonstrate the power of technology-based connectivity and infrastructure. However, they also highlighted the need for access to quality learning and skills, and the perils of non-inclusion. It is time to harness the convergence of human capital and technology and capitalize on the production potential in the South Asia region, to generate aggregative economic growth. Some specific recommendations for digital skills development, in the short and medium term, are set out below.

- **Explicitly incorporate digital skills in national strategies.** The elaboration of Digital Skills Development Plans (DSDPs) can promote good practices at central (federal) and decentralized levels. They can help countries develop national level strategies and action plans, facilitate the assessment of the digital skills landscape, develop dedicated programs to build understanding of digital skills, and create mechanisms for the evaluation of skills.
- **Develop the necessary capacity, and create an efficient system, to train a digitally savvy workforce that is aligned with the requirements of the digital industry.** This includes the development of a skills framework that builds in continuous training in relevant digital skills for all professionals, as well as placement strategies and programs. A useful starting point would be to conduct a comprehensive digital skills assessment to understand both the supply of digital skills (available human capacity), and the demand in priority sectors of the economy. To bridge the skills gaps identified by such assessments, the participation of the private sector, both established companies and startups, will be indispensable. Carrying out skills assessments periodically through partnerships between the public sector, the private sector and academia, will help maintain a dynamic approach to digital skills development. At the same time, training efforts could be scaled up to help people adapt to the changing nature of work, and groom digital leaders who might establish or pilot disruptive technology start-ups. Investments in the establishment of training centers and Industrial Training Institutes to provide higher-level IT skills training could also be considered. Incentives in the form of ratings on parameters that signal the quality of training centers and accreditation could facilitate target allocations and rebates.
- **Ensure the rapid and dynamic adaptation of the workforce in response to fast-changing expectations and working methods within the IT and digital industry.** Broad digital skills and training should be incorporated into the education system. This will require a focus on ensuring skills access and quality for all, improving the digital skills and readiness of trainers/trainers/tutors, and investing in much-needed digital infrastructure. Examples include the creation of eLearning Platforms (for blended learning, skilling, upskilling, and reskilling), the scale-up of existing courses with digital skills modules (e.g. existing government MOOCs or Massive Open Online Courses), the development of local language and gender-neutral digital content, the availability of appropriately-priced devices for parents, students, academics, and administrators, and the establishment of standardized competencies across digital learning domains. In order to facilitate intra-national, intra-regional, and international labor competitiveness, a system of smartcards (or Digital Skill Passports) could also be considered as evidence of internationally acceptable digital skills. Finally, mandating digital skills training or certification as a key employment criterion (or value add) would serve to encourage both skilling and re-skilling.
- **Establish trainers' academies to foster the use of digital resources for trainers in skills training across all sectors.** This approach is in line with ILO Research from 2020 in establishing a relationship between the availability of initial and continual digital education for teachers, and the capacity of the TVET (Technical and Vocational Education and Training) systems for innovation.⁸⁰ In this context, it is worth considering a 360-degree industry involvement in the TVET ecosystem, starting from course selection and content curation, to Training-of-trainers (ToT) programs and candidate employment. Furthermore, developing dedicated ToT programs for higher-level job roles could help create a corpus of master trainers.
- **Make available refresher courses for trainers, including domain skilling components with close linkages to industry. This could be followed by possible on-the-job training with industry. A**

⁸⁰ The Digitization of TVET and Skills Systems, 2020 (ILO).

dedicated academy for trainers and assessors in digital skill domains can be developed around existing training institutions. Digital technology can be taught to help trainers better plan for teaching and learning, improve assessments, and provide better feedback to students.

- **Incorporate special learning modules to enhance the work readiness of women in the IT fields.** Digitalization affords the opportunity to introduce gender-neutrality in the technology and digital industry. At the same time, hiring women managers would help level the filtration process. Fostering equality in education, skilling, visibility, pay, and promotion helps to curb bias. Such measures would also improve the chances of female candidates to thrive in the IT industry and in new areas of self-employment (e.g., through home-based work). In order to achieve this, TVET programs should include modules to prepare women for the world of work, and include topics such as negotiating with employers/peers/seniors, voicing their opinions, collaborating with confidence, and managing and leading teams.
- **Harness technology to green the globe.** The use of renewable resources such as solar and wind technologies have demonstrated the need for digitally driven analysts, monitors, assessors, and managers. These new jobs will require a new workforce to marshal innovation, well trained in digital options and digital modelling.

6. Trust Environment

This section discusses the importance of creating a trust environment which could enable users to interact and transact in a digitally safe manner. While legal and regulatory framework is the backbone of such a trust environment, there are other areas which bolt into the trust framework – e.g., digital equivalence (i.e., legal recognizance of documents, signatures and transactions submitted digitally), and transactional security of payments facilitated or executed through digital financial services. While data flows increase access to data and encourage the growth of digital economy, harnessing the potential of digital transformation requires the creation of an environment where users can trust the digital platforms they rely on, and trust their counterparties, while sharing their personal data and information and conducting transactions.

Creating a trust environment revolves around understanding a number of expectations from users. For example, they may ask the following questions when deciding whether or not to participate in a digital economy:

- **Knowledge:** Where do I find good quality information about engaging with the digital economy?
- **Service providers/data collectors:** Are my digital service providers and data collectors (and their respective service providers) trustworthy?
- **Security risks:** Can I trust that my transactions or data transfers will be safe and not subject to inappropriate use, fraud or other crimes?
- **Efficiency and reliability:** Will I be able to access what I need, when I need it? What is the likelihood of delay or interruption?
- **Remedy:** What happens if something goes wrong? Is there any recourse reasonably accessible to me? Can I trust the adjudicating organizations if I have a complaint about what I purchased or accessed, how it was delivered and the use of my data?

It is also important to recognize the importance of context. The precise regulatory architecture for the digital economy is—and naturally will continue to be—different for each country, and as a result the laws and regulations created to enable a trust environment must be appropriate to the specific country context. At the same time, to achieve many of the benefits canvassed in this report, a degree of harmonization and interoperability is crucial. Striking this balance can be achieved by:

- Mapping the specific opportunities and risks in a country and evaluating their impacts on the community.
- Implementing a base line of core legal and regulatory requirements and practical initiatives that can support multiple areas. Data protection is a good example of this, as are areas that already have strong transnational alignment such as anti-money laundering and cyber security.
- Prioritizing the more specific rules for particular aspects of the digital economy based on the opportunity and risk assessment. This requires policymakers and regulators to have a realistic view on what risks are intolerable now or which opportunities will be lost without action, with other areas on a roadmap to be subsequently addressed.
- Taking a risk-based, iterative and scaling approach as the digital economy evolves. This involves a dynamic and regular evaluation of emerging risks, thereby building a strong book of digital economy principles over time, which can specifically address emerging risks in each local market and operating environment.

As the World Development Report 2021 notes, effectively leveraging data for societal transformation requires countries to forge a new model of data usage and safeguarding—that is ensuring equitable access to data, and at the same time, fostering trust by safeguarding users against data misuse.⁸¹ As such, a trusted data ecosystem requires: (i) responsible data sharing; (ii) accountability-based personal data regimes; and (iii) additional controls when data is shared across geographies, entities and sectors. However, creating a trust environment for the digital economy goes beyond data protection; improving cybersecurity and curtailing cybercrimes also serves to increase trust in the digital economy and digital transactions. Building a trust environment establishes legal and regulatory frameworks which aim to protect users from harm and risks involved when engaging in online activities on digital platforms. This section discusses:

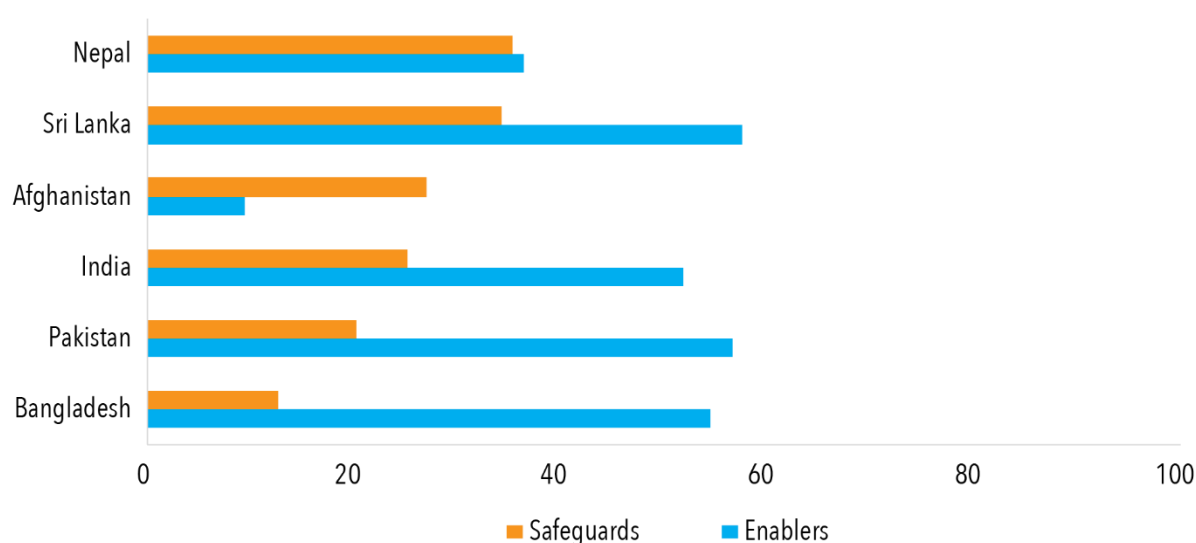
- the findings on the current situations of critical safeguards in the South Asia region; and
- recommendations and discussions on emerging regulatory trends.

Key Findings

- 1) Lack of data safeguards, while enabling data flows.** Countries in South Asia are at different stages in their development of a trust environment, but they often lack data protection measures at a sufficiently high level as against emerging global best practices. Also, the majority of the countries allow and facilitate data sharing and data use without establishing safeguards for data transactions. While all countries fell short of the global average safeguards score (58), Bangladesh, Pakistan, India and Sri Lanka outperformed the global average enablers score (48). Afghanistan performed the worst of all countries surveyed from South Asia, with the lowest score on both safeguards and enablers of data transactions.

⁸¹ <https://www.worldbank.org/en/publication/wdr2021>

Figure 28: Overview of Countries' Safeguards and Enablers, GDRD 2021⁸²



- 1) The lacunae in safeguards stand out due to the lack of protections with respect to the processing of personal data.** None of the in-scope countries currently subjects the collection or processing of data to a “necessary and proportionate” test to determine if it is justified. Only India, through its 2011 IT Rules, requires that the collection and use of personal data be proportionate, relevant, adequate, and necessary in relation to the purpose for which it was collected, and requires that data not be kept longer than necessary after processing.

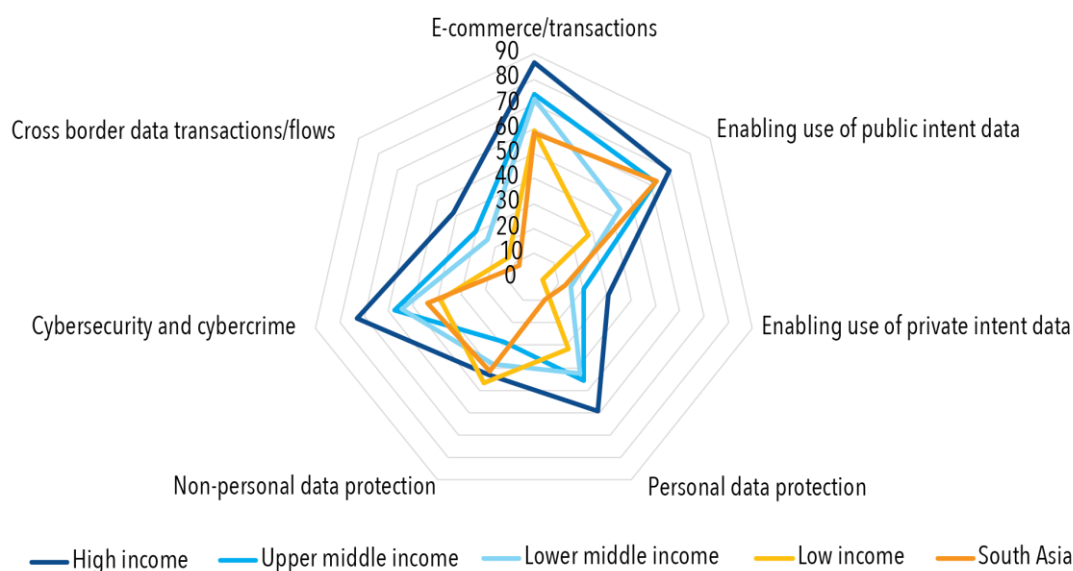
Table 3: Limitations on personal data collection and processing in South Asian countries

Country	Does the relevant law/regulation provide exceptions to limitations on the collection or processing of data by government?	Are these exceptions subject to a “necessary and proportionate” test to determine whether the exception is legitimately applied?	Does any law or regulation require that the collection and use of personal data be made for a stated purpose (or similar standard)?	Does any law or regulation require that the collection and use of personal data be proportionate, relevant, adequate, and limited to what is necessary in relation to the purpose for which it is processed (or similar standard)?	Does any law or regulation require that personal data not be kept longer than is necessary for the purposes for which it is processed (or similar standard)?
Afghanistan	No	No	Yes	No	No
Bangladesh	No	No	No	No	No
India	No	No	Yes	Yes	Yes
Nepal	Yes	No	Yes	No	No
Pakistan	No	No	No	No	No
Sri Lanka	No	No	No	No	No

⁸² Global Data Regulation Survey 2020

- 2) **While the current status quo on safeguards is weak, some South Asian countries are making progress on laying down the foundations of a legal framework.** Of the countries studied as part of the Global Data Regulation Survey, only Nepal had a general-purpose law on the books pertaining to personal data. In addition, research has found that Bhutan, too, has a law in the books on the protection of personal data. Sri Lanka, Bangladesh, and India all have draft data protection and privacy bills that are in various stages of consideration by their respective legislatures. Further, India, Afghanistan, Bangladesh, and Pakistan have sector-specific laws that have some clauses pertaining to the collection and processing of personal data.
- 3) **As a region, South Asia performs well in its efforts to enable the use of public-intent data, scoring on par with upper-middle income countries.** All South Asian countries in the data regulation survey have a Right to Information Act, and all but Afghanistan have an Open Data Policy. In addition, India, Bangladesh, and Sri Lanka have adopted an open licensing regime to facilitate the sharing of public intent data. In India, although there is no mandatory open banking regime, policy measures to encourage data sharing have been introduced. These include safeguards such as the creation of “account aggregators” to ensure that individuals consent to the use of their financial data and that data are not used beyond the agreed terms.

Figure 29: Average scores on different data governance dimensions by income group/region⁸³



- 4) **The region could do more to improve its enabling environment to support cross-border data flows.** The region remains deeply fragmented in terms of cross border digital trade and performs worse along that dimension than the average low-income country. India has restrictions on cross border dataflows and requires that all data relating to the payments system be localized whilst adopting an adequacy approach towards cross-border transfers of other types of personal data. All other surveyed countries had no legal or regulatory framework in place in relation to cross-border data flows. The Data Protection Bill currently under consideration in Pakistan would impose a series

⁸³ The Global Data Regulation Survey 2020

of data localization requirements and enact additional restrictions on the cross-border transfer of data.

- 5) **South Asian countries perform well in terms of having measures to prevent cybercrime in their legal framework.** India and Pakistan have these measures articulated through a single law (the IT Act and Rules and Prevention of Electronic Crimes Act, respectively). Nepal and Sri Lanka have followed a somewhat fragmented approach and have multiple laws containing chapters relevant to cybercrime. While the robustness of the legal framework can be heartening, little data exists about the total number of adjudicated court cases or decisions that have been passed regarding these cybercrime measures, making it hard to validate their effectiveness.
- 6) **South Asian countries perform well in terms of having measures to prevent cybercrime in their legal framework.** India and Pakistan have these measures articulated through a single law (the IT Act and Rules and Prevention of Electronic Crimes Act, respectively). Nepal⁸⁴ and Sri Lanka⁸⁵ have followed a somewhat fragmented approach and have multiple laws containing chapters relevant to cybercrime. While the legal framework is robust, little data exists about the total number of adjudicated court cases or decisions that have been passed regarding these cybercrime measures, making it hard to validate the effectiveness of the legal framework.
- 7) **Two South Asian countries perform poorly in terms of adopting and enforcing cybersecurity protections.** According to the Global Cybersecurity Index 2020, the performance of the South Asian countries varies. In particular, Maldives and Afghanistan were the worst performers in the region, while other countries lie on a wide spectrum, as demonstrated in the table below.⁸⁶

Country	Rank in the Global Cybersecurity Index 2020 (among 182 participant jurisdictions)
Maldives	177
Afghanistan	171
Bhutan	134
Nepal	94
Sri Lanka	83
Pakistan	79
Bangladesh	53
India	10

⁸⁴ https://www.coe.int/en/web/octopus/country-wiki-ap/-/asset_publisher/CmDb7M4RGb4Z/content/nepal/pop_up?_101_INSTANCE_CmDb7M4RGb4Z_viewMode=print&_101_INSTANCE_CmDb7M4RGb4Z_languageId=en_GB

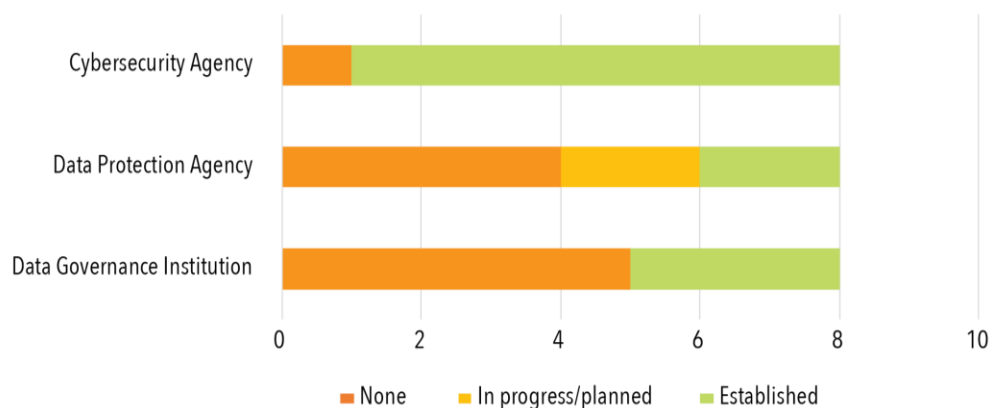
⁸⁵ https://www.coe.int/en/web/octopus/country-wiki-ap/-/asset_publisher/CmDb7M4RGb4Z/content/sri-lanka?_101_INSTANCE_CmDb7M4RGb4Z_viewMode=view/

⁸⁶ https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2021-PDF-E.pdf

While seven of the eight countries have a cybersecurity agency, research conducted at the country level showed wide gaps in the capacity of these agencies to detect, warn, and respond to cyberthreats. Even in countries with cybersecurity agencies, these agencies are nascent in and lack basic technical human resources (Afghanistan and Pakistan).

- 8) **Beyond laws and regulations, institutions with key data governance functions are lacking in most countries in South Asia, and where they do exist, their capacity remains poor.** As Figure 30 shows, more than half of the countries in the region lack a data governance institution. Where they exist (like in India, Bangladesh, Nepal), these institutions are subsumed under another government ministry, department, or agency. Even in contexts where a data protection authority exists, such as in the case of Bhutan’s Infocomm and Media Authority, it is only a partly independent body with limited authority, and therefore ill-equipped to deal with the complexities of data flows in the digital economy.

Figure 30: Prevalence of Key Data Governance Institutions in South Asia



Recommendations

- **All South Asian countries could work towards adopting and effectively enforcing a robust legal and regulatory framework, developed according to rule of law principles, in an inclusive multi-stakeholder manner and fit-for-purpose for the digital economy.** The table below covers the best practices and emerging practices which seeks to create a trust environment, at the same time, maintaining a proportionate and balanced business environment to facilitate data flows.

Key aim	Best practice	Emerging areas of practice
Legal protection and scope of protection	<ul style="list-style-type: none"> Legal definition of “personal data” – broadly defining the concept of “personal data” that includes data that could be used, on its own or in conjunction with other data to identify a person directly or indirectly. Data controllers and processors –applying obligations to those who control and handle personal data. 	<ul style="list-style-type: none"> Data portability – a right that allows data subjects to request their data be transferred from one data controller to another in certain circumstances, thereby providing data subjects greater access to and control over their data to improve their ability to compare and switch between products and services. Some extraterritorial application – protection is expanded by having laws

	<ul style="list-style-type: none"> • General principles – robust data protection regimes generally cover: <ul style="list-style-type: none"> ○ Lawful and transparent collection and processing –personal data is only permitted to be collected and processed for lawful, specified, explicit and legitimate purposes that are transparently communicated to the data subject. ○ Use – personal data is not permitted to be used, transferred and or shared in a manner that is incompatible with the original collection unless with the consent of the data subject. ○ Data minimisation – only the minimum amount of personal data required to achieve a specified purpose is permitted to be collected and used for that purpose. ○ Accountability – data users are required to demonstrate compliance with laws through extensive record keeping. ○ Accuracy – data controllers are obliged to ensure data is accurate and up to date. ○ Limited retention – data is permitted to be retained only for as long as is necessary to achieve its purpose. • Security – data is required to be kept securely and protected from unauthorised or unlawful access or use. This overlaps with the regulation of cybersecurity. 	that apply to all corporations conducting business with residents / citizens of the jurisdiction, regardless of where the corporation resides. This ensures full protection and encourages citizens to carry out cross-border transactions, trusting that their data will be protected.
Controls by individuals <i>Giving data subjects controls over their personal data</i>	<ul style="list-style-type: none"> • Controls - giving data subjects the power to know how their data is being used, by whom and why and, as against private enterprises at least, to have a choice over those matters. • Consent – implementing consents for vulnerable groups (particularly minors). • Rights in relation to direct marketing – laws may require special forms of consent for direct marketing communications. 	<ul style="list-style-type: none"> • Right to be forgotten—allowing data subjects to request data controllers erase data about them, cease further use of that data and prevent third party access to it. • Consent – avoiding “consent fatigue” by adopting opt-in regime where a consent is informed and given freely (that is, there is a choice element, express and not implied by action or omission and subject to a right to withdraw the consent).
Sensitive data and vulnerable groups <i>Providing a higher level of protection for sensitive data sets and vulnerable groups</i>	Sensitive personal data – imposing prohibitions, stricter rules or consent mechanism in processing sensitive data in recognition that it requires a higher level of protection. Some common examples of sensitive data are: race, religious or philosophical beliefs, political affiliations, social welfare needs, health and sexual orientation etc.	
Safeguarding against harms	Preventing harm - Preventing personal data being used in a way that causes harm to the data subjects – e.g., by preventing identity theft, unwanted marketing and bias profiling	Automated decision-making – introducing rules to ensure protection from potential harms caused by artificial intelligence. Some of the principles are as follows: <ul style="list-style-type: none"> • Fairness and ethics – protecting against harm that can arise from bias and profiling; • governance and accountability – requiring institutions to proactively and

		<p>holistically manage and monitor the use of artificial intelligence;</p> <ul style="list-style-type: none"> • transparency – setting a minimum standard to disclose the application of artificial intelligence in services and/or products; and • resilience – protecting against cyberattacks and third party risks through continuity requirements and contingency planning.
<p>Proportionate and balanced exemptions</p> <p><i>Achieving the right balance between individual data privacy rights and:</i></p> <ul style="list-style-type: none"> • <i>the rights of the government to surveil its citizens; and</i> • <i>corporate interests in the use of data</i> 	<p>Exemptions – personal data is permitted to be collected, accessed and used without the data subject’s knowledge or consent in certain circumstances such as protecting the data subject or others from harm, for scientific or statistical purposes and for the detection and prevention of crime.</p>	
Enforcement	<ul style="list-style-type: none"> • Independent regulator with appropriate powers to enforce the framework—a government body is responsible for driving data privacy best practice, consumer education, supervising collection and use of personal data and bringing enforcement action where breaches arise. • Rights of redress—data subjects have a right to redress including a right to complain to a government enforcement agency. 	

➤ **To encourage the use of digital economy, all South Asian countries could implement legal and regulatory framework which seeks to eliminate cybercrimes.** In particular, cybercrime laws seek to:

- **prevent cyber-enabled crimes.** Crimes that take place online or are substantially facilitated with tools such as online messaging systems – e.g., data theft, fraud and money laundering.
- **prevent cyber-dependent crimes.** Crimes that can only be committed using computers, computer networks or other forms of communications technology – e.g., hacking, viruses, ransomware, theft of property.
- **prevent virtual world crimes.** Crimes that only occur in the virtual world – e.g., violent crimes where the victims are physically unharmed but psychologically harmed due to the extent of real-time interaction and deep immersion into virtual environments.
- **better enable attribution of criminality** to identify the real-world person behind an online identity. This requires addressing jurisdictional issues such appropriate forum and cross-border cooperation.

The table below covers the best practices for cybercrime laws.

Theme	Best practice
Substantive law	<ul style="list-style-type: none"> • Criminalization of acts.

	<ul style="list-style-type: none"> Imposing criminal liability on corporate entities for aiding, abetting and attempting cybercrimes.
Procedural law	Powers of investigation, prosecution, compulsion, production, collection, interception and preservation of content data, traffic data or stored data, and computer systems.
Electronic evidence	<ul style="list-style-type: none"> Protecting electronic data from manipulation or tampering. Ensuring rules on the collection, use and admissibility of electronic evidence. Ensuring power to request multinational service providers for information or evidence. Establishing operating procedures that allow for the identification, collection and analysis of electronic evidence in a manner that maintains the chain of custody and can withstand trial.
Safeguards	Complimenting criminal laws with safeguards regarding data protection and consumer protection.
Appropriate criminalization	Creating new and emerging types of offences or alternative options (e.g., administrative measures or civil sanctions). ⁸⁷
Independent regulator with appropriate powers to enforce the framework	Establishing a dedicated government institution for preventing and combatting cybercrime, specialized law enforcement, prosecution and court structures and personnel, resources, capabilities and technology training for cybercrime.
Active and informal cooperation	<p>Public-private partnerships – facilitating information and expertise sharing and intelligence analysis</p> <p>Cross-border cooperation</p> <ul style="list-style-type: none"> Establishing formal and informal mechanisms of international cooperation, knowledge exchange, centralized information and coordination hubs for cross-border enforcement operations against cybercrimes Establish cooperation framework which contributes to a 24/7 network for points of contact for urgent assistance

⁸⁷ <https://www.combattingcybercrime.org/>

D. Towards a Regional Digital Economy Agenda: Opportunities for South Asia

1. Context and Rationale for a Regional Agenda

Regional strategies for digital economy development have already emerged in Europe, East Africa, and South East Asia, as countries around the world recognize the effectiveness of regional efforts over purely domestic initiatives. Multilateral and regional coordination have taken over from 'race to the bottom' approaches to digital economy regulations, in light of the risks of regulatory arbitrage and those of an increasingly borderless digital world.

The digital economy, through its scale and network effects can enable greater access to inputs and markets, improve the exchange of knowledge, capital, and innovation, and help countries achieve national socio-economic development goals. Economies of scale create dynamics through which all economies can benefit, through larger markets, higher trade volumes, and more data. There are benefits to coordination in the digital era that could otherwise be lost without regional or global approaches. After all, the success of the internet itself is the outcome of voluntary global adoption of IP-based technologies and other networking protocols and standards.

One of the biggest challenges for the South Asia region is limited trust among stakeholders to jointly pursue a wider digital economy agenda across the region. Thus far, the success of multilateral coordination and regional institutions in achieving desired socio-economic outcomes has largely been

Box 7: Current Regional Cooperation and Coordination Efforts in South Asia

Regional cooperation and coordination efforts in South Asia regularly take place through sub-regional groupings and initiatives, often involving Bangladesh-Bhutan-Nepal-India (BBIN); Afghanistan-Pakistan-Central Asia; or India-Maldives-Sri Lanka. In addition, initiatives in other sector than digital technologies, or covering wider economic cooperation programs, exist and can be built on.

SAARC: The South Asian Association for Regional Cooperation (SAARC) was founded in 1985. It seeks to promote the welfare of South Asian citizens and improve economic, social and cultural development, among other objectives.⁵⁹ Under the SAARC framework, the Member States signed the South Asian Free Trade Agreement (SAFTA), which came into force in 2006 and substituted the previous SAARC Preferential Trading Arrangement.⁶⁰ However, intra-regional import and export did not change significantly between 2006 and 2017.⁶¹

SASEC: The South Asia Subregional Economic Cooperation (SASEC) program is project-based cooperation in transport, trade facilitation, energy, and economic corridor development.

BIMSTEC: The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) has been established to improve cooperation between some South and South-East Asian countries. Yet, despite the existence of the various institutional frameworks and coordination mechanisms, the results of such collaboration fall short of their potential.

Sub-regional block BBIN: The sub-regional block of Bangladesh, Bhutan, India, and Nepal (BBIN) collaborate on the development of Multi-Modal Connectivity between the countries.

muted. This is partly due to the absence of regional institutions that could adopt a digital agenda as a core part of their activities. The geographic scale of the region, domestic socio-economic challenges, and

conflicts are among the many reasons that have contributed to the lack of broad-based coordination and cooperation frameworks.

While it may not be feasible to develop a regional approach covering all eight countries of the region, it may be useful to draw upon existing institutions to promote dialogue, consensus, and decision-making. Most South Asian countries are members of global trade groupings or participate in overlapping or extended regional groups. There is certainly some appetite for regional cooperation in the region, as evidenced through initiatives such as SAARC, SASEC and BIMSTEC (see Box 7). These can be used to align incentives and build momentum for coordination. South Asian countries have much to gain from building on the relative success of these initiatives and working together for the establishment of common frameworks, to unlock the full value of the digital economy.

By adopting a multilateral or regional approach to digital economy development, countries can access a wider pool of inputs for the benefit of their domestic digital economies, which in turn fuels the growth of a regional digital economy. Benefits include:

- **Intra-regional trade** is currently underdeveloped in South Asia, despite its large population density and potential for trade flows: the gap between actual and potential intra-regional trade was estimated at US\$44 billion in 2015, up from US\$7 billion in 2001.³¹ The region only trades 5% of its total trade volume within the region, as compared to 22% in Sub-Saharan Africa, and 50% in East Asia and the Pacific. A more robust regional digital economy can address some roadblocks to intraregional trade and foreign direct investment in the region. For example, greater digital integration of systems in key areas such as customs and trade facilitation (including cross-border logistics) will lower non-tariff barriers to intra-regional trade. Digitization of customs and trade systems at borders will significantly facilitate cross-border trade by reducing cost and shortening clearance and transit times. The increased scale, scope, and speed of trade can be particularly beneficial for SMEs looking to expand their markets by targeting customers in neighboring countries
- New opportunities for **interregional e-commerce** can create markets and facilitate the increased movement of human resources for business, trade, labor, and tourism, which can have cascading effects on remittance transfers between countries. Coordination and interoperability between country payment systems will create a frictionless experience for such remittances, further driving economic growth and welfare gains. Facilitated cross-border financial flows will provide firms in South Asia the opportunity to expand markets, building on existing cultural and regional ties. Border markets, such as those between Bangladesh and India and Myanmar and India have been successful, particularly for MSMEs. Additionally, small online sellers have identified cross-border logistics, customs clearance for low-value shipments, and lack of clarity on customs rules for such shipments, as the top three challenges to cross-border e-commerce. Regional coordination in this regard would significantly lower the cost and complexity of doing business, facilitate market expansion, and fuel MSME growth.
- In the finance sector, **digital financial services (DFS)** hold great potential for financial inclusion, social inclusion, and poverty reduction, as well as socio-economic development more generally. They make international transfers cheaper and more accessible, of particular importance in a region where personal remittances account for almost 4 percent of the regional GDP (2019).⁴⁴ However, the development of DFS will require appropriate legal and regulatory frameworks to ensure that data is protected, and fraud is minimized. In this context, South Asian countries can work collaboratively to further boost what has become a world hub for FinTech enterprises (with India being home to 7 unicorn start-ups in the space). The region stands to benefit

considerably from a coordinated regional approach to growth and inclusive development through the promotion of DFS.

- **Education** is a sector that could particularly benefit from increased regional integration. The digital education (or EdTech) industry in the region is experiencing enormous growth, driven mainly by private sector innovations and applications, such as examination apps, digital course content, and tutoring platforms. In the early phases of the COVID-19 pandemic, South Asian countries witnessed some of the strictest lockdown measures worldwide, with almost 368 million children and 41 million students affected by school and university closures.³⁵ Although digital technologies helped some students learn, many were left further behind. Regional collaboration on digital education would facilitate knowledge exchange and the replicability of successful EdTech solutions. Countries could share existing digital tools and relevant digital content for school-level learning, but also collaborate on literacy and skills initiatives. Developing mutual recognition schemes for university certifications would also facilitate workforce mobility between countries, reduce hiring costs, and foster a broader labor market. National research and development efforts facilitated by regional broadband connectivity networks could also benefit from the greater opportunities for collaboration made possible by foundational digital infrastructure.

2. Priority Areas: Cross-border Connectivity, Data Infrastructure, Payment Systems

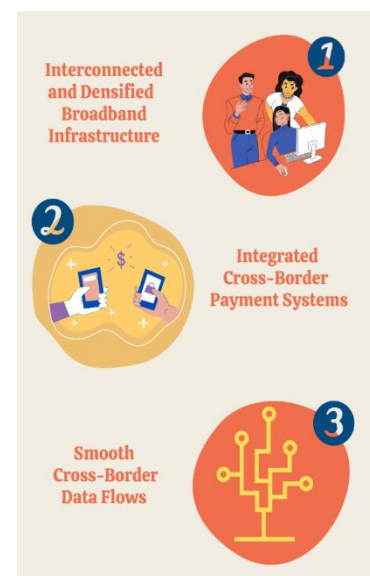
To build a thriving regional digital economy and reap its benefits, South Asian countries could consider greater regional coordination in the following three priority areas: i) cross-border connectivity and data infrastructure, ii) an enabling environment for cross-border data flows, and iii) integrated cross-border payment systems. Reliable connectivity, together with seamless and secure flow of data and payments are foundational ‘infrastructure’ and ‘rails’ to unlock cross-border transactions and other sector transformations such as e-commerce, fintech, healthcare, education, social insurance.

1) Cross-border Connectivity and Data Infrastructure

Countries connect to the global internet via submarine cable systems and, in the case of land-locked countries, cross-border terrestrial links.

The number of landed submarine cables in South Asia has steadily increased in the last decade and is projected to continue to increase at over 30 percent CAGR between 2020-2027. However, as noted in Section B, landlocked countries in the region—Afghanistan, Nepal, and Bhutan—pay higher prices, have lower bandwidth capacity, and experience poorer service quality.

Regional cooperation can help improve access to international capacity and connect currently disadvantaged landlocked countries. Countries with limited cross-border links are on the edge of global connectivity networks, and at a significant disadvantage in the market in terms of both supply and cost

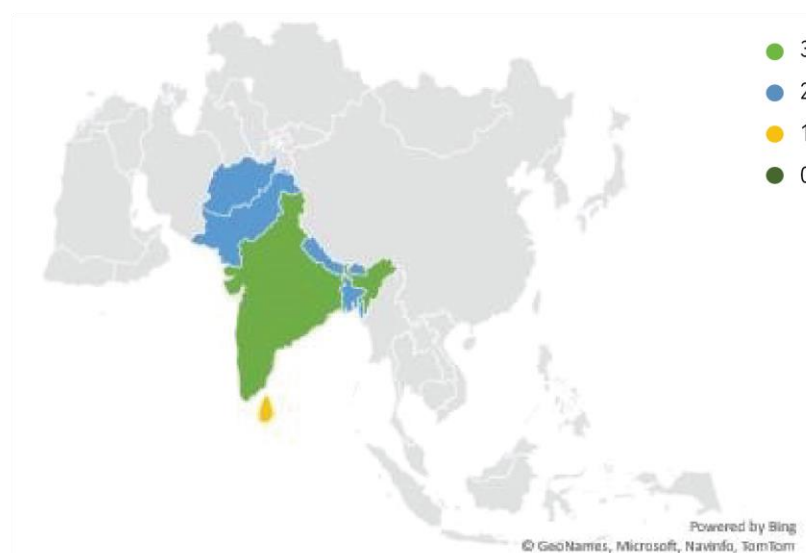


(as price-takers for connectivity). For example, Afghanistan relies on terrestrial connectivity mainly through Pakistan, while Nepal and Bhutan are connected via a limited number of cross-border links to India. This negatively affects the affordability, resilience, and quality of services downstream, a phenomenon exacerbated in Afghanistan by the lack of competitive pricing and regulations in the national backbone, and resulting in much higher end-user prices.

Regional efforts can focus on increasing the number of cross-border links with coastal and inland neighbors to interlink with key international connectivity routes. For example, Bhutan's efforts to diversify its access to international connectivity via Bangladesh, in addition to its existing arrangements with India, are designed to reduce distance to the nearest cable landing station and improve resilience. At present, Nepal and Bhutan connect to cross-border links in India, which transports international connectivity from the cable landing stations in Tuticorin and Chennai on India's east coast, nearly 2200 miles away from the borders of Nepal and Bhutan. Improving the capacity and quality of key fixed network transmission routes within India that transport this bandwidth, in addition to expanding access to international connectivity via Bangladesh, can prove to be regionally beneficial—enhancing within-country capacity in India, and improving access to greater international capacity for Nepal and Bhutan.

In addition to cross-border digital connectivity, access to infrastructure for the storage, analysis, and transmission of data is key to the growth of South Asia's digital economy. This requires Internet Exchange Points to facilitate domestic data flows, the ability to store data within data centers, and access to cloud computing services that enable users to leverage capabilities such as machine learning over vast data sets for value creation. Data infrastructure remains highly uneven across countries in the region, with India having access to 112 colocation facilities and 24 cloud on-ramps, while Sri Lanka has neither. Maldives performs most poorly on access to data infrastructure, despite having nearly 100 percent coverage of 4G networks, as it does not have access to local data centers or a local cloud services market, showing great potential for improvement of such infrastructure to support the creation and reuse of data for economic development.

Figure 161: Data Infrastructure Maturity (0-3) in South Asia⁸⁸



⁸⁸ Authors' calculations using data collected for the World Development Report 2021

Countries in the region can benefit from being proactive in investing in carrier-neutral colocation data centers, internet exchange points, and access to cloud services providers via cloud on-ramps. For instance, Bhutan, owing to its location, cooler weather, and access to cheap, renewable sources of energy, is particularly well-positioned to develop a robust data center market. Other landlocked countries can also do more to enhance their local data center markets (Nepal) and improve the functioning of Internet Exchange Points (Afghanistan). Despite access to excellent submarine cable connectivity, data infrastructure in Sri Lanka and Maldives is still under-developed, and so there is significant scope for private sector investments in future. Larger markets, such as India and Pakistan, can also leverage their existing data infrastructure to regionally aggregate demand. This could in turn incentivize large global content providers to co-locate their content in regional hubs, with benefits in terms of faster, more reliable access for end-users. Given the importance of network effects and economies of scale in the digital economy, a regional approach to data infrastructure, with the right enabling environment (as described in the next section), can help stimulate greater cross-border data flows, benefiting both big and small economies in the region.

2) An Enabling Environment for Cross-border Data Flows

Investing in connectivity and data infrastructure can lead to greater benefits when combined with an appropriate enabling environment for cross-border data flows. Data (both public and private) has the potential to create socio-economic value for all countries in the region when it flows based on common frameworks and standards. Advanced technologies such as artificial intelligence and machine learning increasingly use cloud computing and rely on the ease of cross-border data flows. Cross-border data flows can also facilitate greater choice of competitive online services for end users and enable economically efficient choices to store and process data for businesses. Regulation of these cross-border data flows lies at the heart of ongoing discussions of international trade governance, owing to its knock-on effects on digital trade. A legal and regulatory framework that upholds privacy, security, and consumer protection is critical to supporting digital transactions, especially across borders.

Requirements to localize data and limit data transfer can directly affect countries' economic competitiveness. The high cost of investing in the infrastructure to localize data can disincentivize foreign investments and prevent local technology startups to thrive. For instance, regulations on the cross-border transfer and use of data can impose substantial costs on micro, small, and medium enterprises (MSMEs), stymieing their growth. Research suggests that data localization requirements and restrictions on cross-border data flows, including for outward transfers, adversely affect the set-up and operation of firms' global production networks⁸⁹.

At present, while no South Asian country has enacted overarching directives restricting cross-border data flows, restrictions on data localization have been discussed and introduced in draft bills in India, Pakistan, and Sri Lanka. On average, South Asian countries rank lower than average low-income countries in terms of the enabling environment for cross-border data flows, as noted in Section B. In India, several restrictions on data localization have now been enacted through sectoral policies and rules in banking, insurance, and health care. However, while these legal restrictions exist, the institutions to enable harmonized processing of decisions and regulatory enforcement on data flows is absent (Table

⁸⁹ "Daza Jaller, Lillyana; Gaillard, Simon; Molinuevo, Martín. 2020. The Regulation of Digital Trade: Key Policies and International Trends. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/33164> License: CC BY 3.0 IGO."

4). Legal frameworks in other South Asian countries surveyed, as part of the Global Data Regulation Diagnostic, are largely silent on this point.

Table 4: Legal and Institutional Environment for Cross-Border Data Flows in South Asia

Country	Do any laws, regulations or policies require personal data to be stored within the country?	Do any laws, regulations or policies restrict the transfer of personal data outside the country?	Is there a "One Stop Shop" Agency" (e.g. Data Protection Agency) to harmonize processing of decisions and regulatory enforcement?
Afghanistan	No	No	No
Bangladesh	No	No	No
India	Yes	Yes	No
Nepal	No	No	No
Pakistan	No	No	No
Sri Lanka	No	No	No

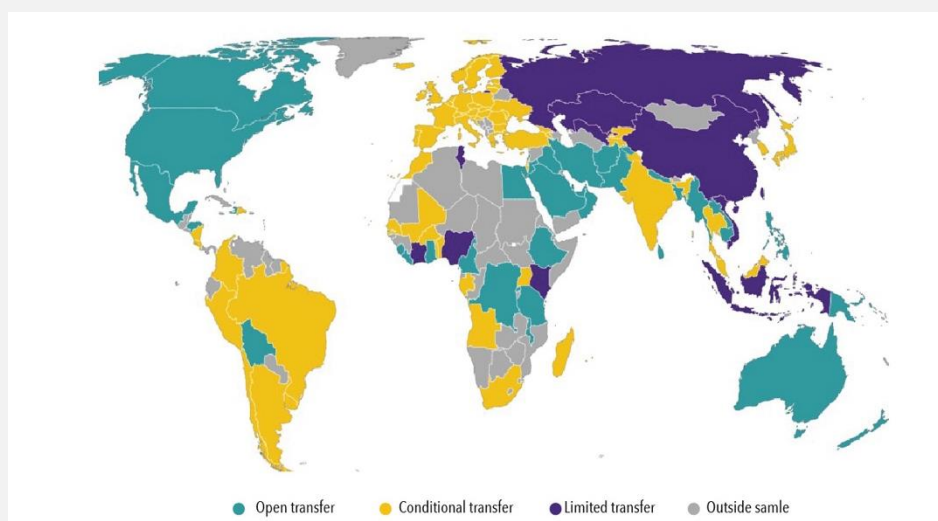
Furthermore, the growth of digital platforms in the region can benefit from facilitated cross-border data flows. As discussed above, the larger markets in South Asia—India, Pakistan, and Bangladesh—already have flourishing digital businesses. A legal and regulatory framework facilitating cross-border data flows can enable these platforms to reach the regional market, capitalizing on the commonalities in end-user preferences for goods and services. For smaller markets in the region, this will lead to fair, interoperable, predictable, and trustworthy digital trade, and in larger markets, competition and user-choice will also be improved. In addition, newer data-driven business can flourish, easing processes in the flow of goods within the region. For instance, freight tracking on sub-regional transport corridors can benefit from the use of data-driven approaches. IoT-based digital platforms can be better leveraged for intra-regional trade with a common and well-articulated approach to data sharing across South Asian countries, reducing border delays and easing customs procedures.

In the medium-term, there is an opportunity to facilitate mutual recognition of digital IDs to allow people and businesses to do transactions and access services across borders. This includes the ability to exercise consent and control over data, such as a person giving permission for their financial service provider to share data with another. The European Union regulation on electronic identification and trust services for electronic transactions in the European Single Market (eIDAS), which came into force in 2014, offers a useful example of how such governance and technical arrangements can be designed. Such an effort in South Asia would depend on identifying compelling use cases, which are more likely to emerge as data and payment flows are unlocked in the region.

An enabling environment for cross-border data flows can benefit from regional coordination. Early evidence from South Asia suggests greater need for such coordination, given the proliferation of inward-looking data policies and localization requirements in draft legislation in the region. The World Development Report 2021 recommends the promotion of international standards for cross-border data sharing and digital transactions, including technical standards for data protection and to ensure interoperability and alignment with global trade rules on data flows. In South America, where several countries have chosen to harmonize their frameworks for data governance in alignment with the European General Data Protection Regulation (GDPR), the region is better placed to capitalize on the economic benefits of cross-border data flows. This has included efforts on the regulation of online consumer protection, electronic payments, and intermediary liability rules. While political economy

constraints differ across the region, both public and private sectors in South Asian countries can benefit from common standards, coordinated approaches, and evidence-based policies on the regulation of data flows. This can help the region unlock its vast potential for electronic commerce and digital trade, promoting the region's economic transformation.

Box 8: Examples of Regional Regulation on Cross Border Data Flows and Payments Integration



Cross-border data flows have become an integral part of the global economy. Made possible by digital innovation over the last years, including broadband networks, datacenters, and cloud infrastructure, cross-border data flows allow for digital businesses to carry out their activities and offer their services across different countries.

Research undertaken for the World Development Report 2021 has mapped current approaches around the world, categorizing regulations for cross-border data exchange as (i) open transfer; (ii) conditional transfer; and (iii) limited transfer.⁹⁰

The regulation of cross border data flows is an area of important international debate and rapid evolution of new, national, regional, and international standards. Rules anchored at the World Trade Organization (WTO) provide for regimes on trade in services and work is underway to better capture the cross-border exchange of data. Currently, most innovation is captured in preferential trade agreement between regional blocks or groups of trading partners. In the European Union, a deeply integrated region, has developed a comprehensive framework on the use of personal data under its General Data Protection Regulation (GDPR), which has since 2016 become a reference point for discussions on data regulation in many parts of the world. In East Asia, an ASEAN Framework on Digital Data Governance is under development to create harmonized standards for data management and cross border data flows within ASEAN.

Cross-border interlinking of payment systems could be via: (i) single access point and direct link models or (ii) spokes and linkages of a hub and spoke model. In a centralized network arrangement, participants from multiple jurisdictions may be brought together onto a centralized system where they have accounts at a common shared

⁹⁰ <https://wdr2021.worldbank.org/stories/crossing-borders/>

payment system. Alternatively, they may rely on their respective domestic infrastructures for connectivity, whereby the operators of the domestic infrastructures would hold accounts at a “hub entity” under a hub and spoke arrangement. Two examples of multilateral platforms are provided below.

SADC-RTGS: SADC-RTGS (formerly known as SIRESS) is a regional cross-border RTGS system in the Southern African Development Community (SADC) region.⁹¹ The SADC-RTGS payment platform went live on 22 July 2013 with high-value payments. It is an automated interbank settlement system operated by the South African Reserve Bank (SARB), as appointed by the SADC participating member central banks. Participants include central banks and financial institutions that are authorized by the central bank in their country of origin to participate in that country's settlement system. The ownership matters and decision-making processes of SADC-RTGS fall under the governance structures of the Committee of Central Bank Governors (CCBG). SADC-RTGS is a single-currency payment system that settles in the South African rand (ZAR). There are considerations to include additional currencies on the system in the near future. SADC-RTGS's legal arrangements are set out in multilateral agreements aimed at providing legal certainty in the absence of an appropriate SADC-wide legal and regulatory framework for payment, clearing and settlement systems.

Buna: Buna Payment System (Buna) is a regional payment infrastructure with participants from the 22 Arab Monetary Fund (AMF) states. Buna is a fully owned subsidiary of the Arab Monetary Fund (AMF). The platform became fully operational in December 2020. The project's motivation is rooted in the challenges faced by banks to complete cross-border payments in the Arab region. Buna is a multi-currency settlement system in four Arab currencies⁹² as well as USD and EUR. Buna allows participants to connect directly or through central banks.

3) Integrated Cross-Border Payment Systems

The number of cross-border payments (including remittances and trade transactions) are on the rise between South Asian countries. The regional integration of payment systems can generate welfare gains and benefits such as (a) reliable and cost-efficient payments (b) better dispute management and faster resolution of complaints with more standardized rules and regulations, and (c) faster processing of transactions and settlements (due to the avoidance of time zone differences resulting from settlement of transactions in books of correspondent banks USA or Europe).

Most countries in the South Asia region, apart from Nepal and Maldives, have functioning domestic payment card infrastructure. These systems have been leveraged to establish bilateral linkages between countries for seamless cross-border payments. However, no dedicated regional payments arrangement currently exists. Bilateral agreements include those between India and Nepal and between India and Bhutan. As a result of such arrangements, since 2008, there is a one-way remittance scheme from India to Nepal using the Reserve Bank of India's National Electronic Fund Transfer (NEFT) system (the scheme's upper limit was raised in August 2021). In addition, the Bhutan Financial Switch (BFS) and India's National Financial Switch (NFS) were also interlinked in 2019. This means that Indian travelers can seamlessly use their domestic RuPay-branded cards at ATMs and point-of-sale (POS) terminals in Bhutan, and similarly, Bhutanese travelers can make use of ATMs and PoS terminals in India.⁹³

⁹¹ In 1992, Member States signed the SADC Treaty committing the regional group to work together in order to: achieve development and economic growth, alleviate poverty, enhance the standard and quality of life of the people of Southern Africa, and support the socially disadvantaged through regional integration. SADC membership comprises 16 countries namely, Angola, Botswana, Comoros, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Tanzania, Zambia and Zimbabwe.

⁹² Jordanian Dinar, Egyptian Pound, UAE Dirham and Saudi Riyal. Other Arab currencies would be added in the future subject to meeting criteria for settlement currencies.

⁹³ <https://www.rma.org.bt/RMA%20Publication/DPSS/Q2,%202021%20Report.pdf>

One of the most important enablers of cross-border payments are legal and regulatory frameworks.⁹⁴

Though these are largely consistent across the region, the following aspects may require further consideration: a) the degree of harmonization of Anti Money Laundering (AML) and Combating the Financing of Terrorism (CFT) procedures, b) policies related to foreign financial institution's participation in financial infrastructure, and c) cross-border issues pertaining to data protection and privacy.

In addition to legal and regulatory challenges, the second major barrier to cross-border payments in the region is the compatibility of payment system infrastructures. Countries in the region have all implemented traditional payment systems covering large value (Real-Time Gross Settlement or RTGS) and bulk payments (Automated Clearing House or ACH). They have also established dedicated domestic card payment infrastructures, national switches (except Nepal and Maldives), and Fast Payment Systems (FPS) (except Afghanistan and Bangladesh). Still, several countries suffer from an inadequate network of financial access points, such as ATMs, agents, retail merchants and so on.

For the regional integration and cross-border provision of payment systems, the following models could be considered: (i) a partnership model, (ii) a bilateral integration model, (iii) a multilateral arrangement, using the existing financial infrastructure of a particular country, or through the interlinking of existing country-level infrastructures, and (iv) establishment of a new common infrastructure across the region. The use of existing infrastructure has the advantage being easier to implement and more cost-effective. New infrastructure would have the advantage of being seen as a collective regional effort and could provide more flexibility in responding to the specificities of the regional context. A robust cost-benefit analysis would be required to identify the most adequate model. A practical way forward might be to expand existing cross-border bilateral models, while in parallel pursuing multilateral arrangements.

These models could be based on traditional approaches or entirely new approaches using innovative, disruptive digital technologies such as Stablecoins, Central Bank Digital Currency (CBDC), and/or Distributed Ledger Technologies (DLT). However, global discussions on these technologies are still at a nascent stage and much remains unclear.

Box 9 below sets out examples of existing country-level payment systems infrastructure that could be leveraged for facilitating cross-border payments.

Box 9: Existing Payment Systems Infrastructure that could be leveraged to facilitate Cross-Border Payments

⁹⁴ The legal provisions for payment system cover (i) recognition of electronic payment, (ii) irrevocability, (iii) recognizing bilateral and multilateral netting, (iv) settlement finality, (vi) collateral protection, (vii) powers to adopt international standards and best practices, (viii) powers to enter into MOU with foreign regulators/ authorities, (ix) cross-border cooperation for oversight (including information sharing, if required), etc.

RTGS (Real-Time Gross Settlement): The RTGS system in operation in Bangladesh, India, and Nepal has a multi-currency option. These systems support the settlement of foreign exchange transactions. As such, they could be utilized for the settlement of payment transactions between these countries. Additionally, the Indian system could support both Bhutan and Nepal, as their currencies are pegged to the Indian rupee.

FPS (Fast Payment Systems): Linking Fast Payment Systems for cross border payments is an option that could be explored in the region. A good example is India's BHIM (Bharat Interface for Money), whose UPI (United Payment Interface) has gone live in Singapore, demonstrating the use of UPI for making payments internationally. The connectIPS system in Nepal also has functionalities similar to UPI. In Bhutan, the Bhutan Immediate Payment Service (BIPS) and Payment Gateway (PG) could also be used to facilitate cross-border payments. Linking FPS for cross border payments, using the Project Nexus framework proposed by the Innovation Hub of the Bank of International Settlements (BIS) could also be considered.

Online Payment Gateways: Online payment gateways in the region facilitate the repatriation of remittances against small value service exports in non-physical form, e.g., data entry/data process, off-shore IT services, or business process outsourcing. Regulators in the regions could establish a collaborative dialogue with online gateway providers to examine how services between countries may be provided at low cost.

Connectivity between domestic settlement networks: Most countries in South Asia have already established national switches for the domestic clearing and settlement of all payment card transactions. This domestic arrangement could be leveraged to enable cross-border payments through card transactions between countries in the region, without impacting existing arrangements for domestic transactions. The settlement for such cross-border transactions could be managed by identified commercial banks, with risk mitigation measures put into place by the respective regulators.

E. Conclusion

The pace of digitization in the South Asian region has been accelerating rapidly, as connectivity improves, more people get online, and transformational innovations in public service delivery and business models alter the socio-economic landscape. The shock imposed by the COVID-19 pandemic, together with the increasingly visible consequences of climate change, have exposed the real cost of digital divides. New approaches to development are sorely needed.

Compared to past crises, countries today are in a better position to tackle the formidable challenges they confront through the use of digital technologies. Digitalization has gained a prominent role in the daily lives of people in the region, and its impact on society will only grow in the coming years. This report has identified important public policy reforms that would enable South Asian countries to benefit from accelerated digital development while at the same time ensuring risk mitigation.

Key themes: Stronger Institutions, Inclusion and Trust

A carefully considered combination of public policies that boost inclusion, overcome constraints in institutional capacity, competence, and coordination, and improve confidence and trust in the digital economy, will help South Asian countries realize the benefits of the gathering digital revolution.

Getting the basics right will enable South Asian countries to unlock more of the benefits of digital economy development while mitigating its risks. To start with, people and businesses need access to affordable, fast, and reliable internet. Digital skills, for both basic and advanced users, are a pre-condition for the use, and innovation, of digital technologies. In addition, digital financial services are indispensable for economic activity to successfully leverage the benefits of the cyberspace. New digital businesses in the region stand ready to tap into the opportunities and transform the economic landscape but require the right enabling environment to flourish. At the same time, given that the proliferation of digital technologies creates an entirely new set of risks, appropriate safeguards are needed to create a safe and secure digital space that is trusted by both people and businesses.

By **enhancing inclusion**, countries can ensure that digitalization benefits accrue to all and that no one is left behind. **Strengthening institutions and regulations** will unlock the gains of digital economy while mitigating the risks that could emerge. Finally, providing legal validity and equivalence for electronic/digital identification, authentication, transactions, signatures, and contracts while ensuring safeguards for people, businesses, and governments against the risks and misuse of digitalization will serve to **increase trust in the digital economy**, and encourage further uptake and innovation. Moreover, greater public-private and regional dialogue, through available forums, will also promote collaboration and trust among countries and relevant stakeholders. This is essential to the development of the densified broadband networks, integrated payments systems, and cross-border data flows, necessary for a thriving regional economy.

Towards a Digital South Asia: National and Regional Recommendations

To truly realize the benefits of a digital economy, South Asian countries need to take a cohesive and deliberate approach across all six pillars of the digital economy, namely (1) digital infrastructure, (2) digital public platforms, (3) digital financial Services, (4) digital businesses, (5) digital skills, and (6) trust environment. The main recommendations emerging from the present regional synthesis, and the various country-level analyses, are set out below.

Pillar	Key Recommendations
Infrastructure	<ul style="list-style-type: none"> • Ensure adequate and cost-efficient international redundancy for landlocked countries. • Bridge critical gaps in the middle-mile and last-mile by improving investments in the backbone, both by upgrading older infrastructure to be energy-efficient and climate-responsive, and by rolling out new networks. • Facilitate cross-sectoral, passive, and active infrastructure sharing for greater cost efficiency in infrastructure deployment through relevant policies, regulations, and active enforcement. • Increase adoption, and address the usage gap, by promoting service affordability through innovative pricing and lower sector-specific costs, and device affordability through strategic partnerships. • Boost adoption through the effective utilization of Universal Service and Access Funds, which are presently deployed in a non-transparent manner and with varying success across countries in the region. • Enhance public-private dialogue to identify how existing legal and regulatory frameworks can be updated to reflect recent innovations in technology and business models and respond to the emerging global and regional opportunities of the digital economy. • Accelerate efforts to drive demand for the adoption and use of broadband services.
Public platforms	<ul style="list-style-type: none"> • Support whole-of-government approaches to digital government through institutional and regulatory reforms and the development of relevant technical capacity in the civil service. • Promote data protection and cybersecurity to improve trust in digital government services. • Strengthen data governance and interoperability frameworks to support better service delivery and tap into the full value of data use and re-use. • Strengthen digital identification, digital payments, and data platforms—and design them as ‘digital stacks’ that enable cross-linkages. • Support high impact and catalytic use cases, such as healthcare, education, jobs, and financial services. • Bridge digital divides and empower women and girls, in particular, by being deliberate about inclusion and human-centered design.
Financial services	<ul style="list-style-type: none"> • Encourage adoption of digital payments by governments wherever feasible and widen coverage of recipients who lack access to financial services. • Address gaps in financial infrastructure and modernize credit reporting systems to integrate alternative data and establish a clear roadmap for developing the payments and data exchange components of the digital stack. • Foster trust and financial/digital literacy through strengthened institutional and regulatory environments. • Establish innovation facilitators that enable the development of new business models, promote the participation of new market entrants, and expand the DFS market. • Proactively adopt regulations that encourage innovative and <i>avant-garde</i> business models.
Businesses	<ul style="list-style-type: none"> • Build adequate institutional capacity for the development and implementation of legal and regulatory frameworks to promote innovation and competition. • Accelerate the growth of early-stage and growth financing through government fiscal incentives, and an enabling regulatory environment. • Facilitate the adoption of digital tools and technology by SMEs. • Improve opportunities for female entrepreneurs, including through improved access to finance. • Support the development of a robust network of intermediary support organizations and promote linkages with local incubators, hubs, and universities.

Pillar	Key Recommendations
Skills	<ul style="list-style-type: none"> • Incorporate the digital skills agenda in national strategies. • Develop the necessary capacity, and create an efficient system, to train a digitally savvy workforce that is aligned with the requirements of the digital industry. • Respond to rapidly changing expectations and working methods within the IT and digital industry through a rapid and dynamic adaptation of the workforce. • Establish trainers' academies to encourage trainers to use digital resources in skills training across all sectors. • Promote the availability of refresher courses for trainers, including a domain skilling component with close linkages to industry, followed by possible on-the-job training within industry. • Incorporate special learning modules to enhance the work readiness of women in the IT fields. • Harness technology to green the globe.
Trust environment	<ul style="list-style-type: none"> • Adopt and effectively enforce a robust legal and regulatory framework, developed according to rule of law principles, in an inclusive multi-stakeholder manner and fit-for-purpose for the digital economy. • Invest in independent, well-resourced, and competent institutions to enforce the legal and regulatory frameworks that safeguard the data rights and interests of all stakeholders.

The broad findings above are complemented by country-specific recommendations—fit to each country's *status quo* and specific circumstances—to unlock digital opportunities while mitigating the risks of an increasingly digital economy. The Annex that follows provides additional, country-specific analyses and policy options for countries to consider as they seek to translate these themes and ideas into specific policies and initiatives.

From a regional perspective, the realization of a more integrated digital network between and within countries is an important first step towards reaching inclusive access and meaningful connectivity. An integrated regional network can help overcome the inherent challenges of landlocked and island states in the region. Such integration would reduce data prices, improve affordability, and increase overall access to the internet. At the same time, the establishment of shared legal and regulatory frameworks that allow agile data flows would create appropriate foundations for a flourishing digital regional ecosystem. Furthermore, systems and processes for the adoption and use of digital financial services would boost cross-border economic exchange.

With these strategies in place, countries in the region will be in a strong position to build back better after the current crisis, particularly through a mix of public investments and private capital mobilization. By optimizing the use of digital technologies, building on the strengths of the private sector, and leveraging the growing capacities and ideas of its people, the South Asia region can truly realize the benefits a green, resilient, and inclusive digital economy.

ANNEX

Executive Summaries of Country Assessment Reports

Afghanistan

In the face of considerable challenges and crises, Afghanistan has made important progress over the last decades in building the key foundations of its digital economy. In 2002, there was just one telephone for every 540 people, with almost no sign of the internet. Today, Afghanistan has 62 national and international internet service providers with nearly 5.23 million subscriptions. The government has put into place several strategic ICT programs, including the e-Government program, with a view to improving transparency and efficiency, and enabling the delivery of key public services. The introduction in 2013 of 3G mobile broadband services, and in 2017 of 4G rollouts, are slowly increasing overall broadband Internet penetration in the country.

The Afghanistan government considers the development of the digital economy as an important part of longer-term economic development. The Ministry of Communication and IT (MCIT) is the primary government body responsible for the IT industry and the supervision and oversight of digital planning. Its Vision 2022 seeks to grow the ICT sector as a whole by improving ICT usage in the country, expanding telecommunications/IT infrastructure and services, and ensuring universal ICT access for all citizens.⁹⁵ Despite the sector's rapid development, high-speed Internet remains costly for both individuals and small businesses. Afghanistan has a Digital Adoption Score of 0.43 and sits among the lowest-ranked countries (169th out of 193) in the United Nations global eGovernment Development Index or eGDI. It is clear that much remains to be done to complete the foundations of the country's digital economy.

Afghanistan would need to address some cross-cutting bottlenecks that are hindering the development of its digital economy. In particular, the government should take action to (i) *ensure that the digital economy is inclusive of* (and accessible to) all people regardless of age, gender, socio-demographic status, and geography, (ii) *build a trusted digital ecosystem* through regulatory frameworks for data protection, privacy protection and cybersecurity, (iii) *enable coordinated institutional strategies* to define forward-looking achievable targets across agencies and levels of government in order to maximize the impact of efforts to digitize public services, and (iv) *improve the capacity of government, individuals, and businesses to benefit from the digital economy* through digital literacy and skills development, capacity-building for public officials, and a coordinated effort to integrate digital tools across the economy.

Key Findings

Digital Infrastructure

Afghanistan's digital connectivity has improved significantly over the past decade, with mobile penetration reaching above 90 percent by mid-2020. The private sector has taken a leading role in building mobile networks. The introduction in 2013 of 3G mobile and in 2017 of 4G mobile is slowly increasing overall broadband internet penetration in the country. However, gaps remain in terms of the deployment of next generation broadband networks. Only 0.4 percent of the country's population is covered by 4G/LTE, and while 3G population coverage has reportedly increased to 90 percent, uptake remains low. Close to 70 percent of the population, mostly in rural areas, still use legacy 2G networks. Fixed broadband subscriptions are also limited: regional benchmarking of fixed broadband household penetration shows that household penetration stood at 0.4 percent in mid-2019, which is low compared to peers in the region and peers in the same GDP per capita decile. Difficult terrain and sparsely populated areas, coupled with security issues, have restricted the geographic reach of connectivity in

⁹⁵ ICT Policy (2019-2023): MCIT, Afghanistan Government

more remote areas. Security is a critical issue and affects day-to-day operations: in 2020 alone, nearly 1200 mobile towers were damaged in security-related incidents. Security problems also delay or hinder the deployment of new telecommunications infrastructure. High costs associated with regulatory barriers and limited competitive pressure contribute to high prices and lower adoption. For example, an entry-level mobile broadband package is equivalent to about 7.1% of GNI per capita, far greater than the 2 percent threshold for affordability recommended by the Broadband Commission (of the International Telecommunication Union and UNESCO). The retail price of fixed line internet services is equivalent to US\$26 (per Mbps, per month), and therefore unaffordable for the average citizen. In addition, high costs for spectrum, import duties, fines, permits, as well as other types of fees and taxes specific to the sector pose significant challenges to sector development. The quality of broadband services is also poor: mobile broadband speeds in Afghanistan are less than half the global average. This is primarily due to the limited amount of currently allocated radio spectrum and the significant delays in the allocation of additional spectrum. Moreover, even though the wireless market in Afghanistan is somewhat competitive, the state-owned Afghan Telecom is not appropriately positioned as a wholesale provider to other operators, and infrastructure sharing is not actively encouraged. Such actions would be in line with the government's open access policy (OAP) approved in October 2016. Nonetheless, investments to date have been limited. Finally, as a landlocked country, Afghanistan's international connectivity is generally slower and costlier than its regional peers, although some neighboring countries have reported higher wholesale IP transit rates.

Significant challenges remain for Afghanistan in its efforts to create an enabling environment for private sector investment. A few high-priority measures could help accelerate digital connectivity development, mobilize private capital and increase competitive pressure on the market to deliver better outcomes. First of all, non-discriminatory access to, and transparent pricing for, infrastructure owned by the incumbent Afghan Telecom would position it as a wholesale provider to other operators. Second, implementing infrastructure sharing would accelerate broadband development in rural areas, by limiting duplication of infrastructure and redirecting resources to underserved communities. Third, improving the management of Quality of Service (QoS) and radio spectrum would enhance affordability and service quality. Fourth, rapidly deploying resources from the Telecommunication Development Fund (TDF) would accelerate infrastructure development in underserved areas and fund programs to build demand-side capacity for greater uptake. Finally, the government should consider how it might reduce the impact of taxes and duties on telecommunication equipment, adopt more efficient procedures for their import, and promote the affordability of broadband-enabled devices.

Digital Public Platforms

Afghanistan should consider leveraging the wider use of digital technology in public service delivery to strengthen its fight against corruption and improve the effectiveness of citizen services. The country scores 0.56 (on a scale of 0 to 1) in the World Bank's 2016 Digital Adoption index (Government cluster), which is at the lower end of the scale compared with other countries in the South Asian region. It also lags all other South Asian countries in the 2020 United Nations e-Government Development Index (EGDI), ranking 169th out of 193 countries.

One of the key challenges in the implementation of e-governance in Afghanistan remains the connectivity gap. The lack of connectivity limits the extent to which people and businesses can engage with the government and use its services. Still, there has been some progress. The Government is using digital technology to simplify administrative procedures and to reduce the exposure to corruption. Systems that have been recently computerized include the following: human resources information system (in all ministries), employee attendance system, revenue collection system, tax payment system, banking affairs, most public office correspondence, and electronic passport distribution. At the national

level, several new initiatives are underway to accelerate the digitization of essential governmental services and operations.

The Digital Foundation Strategy for Afghanistan (2019-2021) sets out a vision for building the country's key digital foundations. The Digital Afghanistan Strategy (2020-2025) and the Afghanistan Digital Economy Strategic Plan (2019-2023) recognize the importance of digital transformation and e-government and were launched to support the economic, social and governance needs of the country. Some of the basic elements for public service delivery have already been created but require more comprehensive implementation. The government has established a national data center housed at the Ministry of Information and Communication Technologies (MCIT), as well as data centers for the healthcare sector and for environmental data collection. The e-Government Interoperability Framework (e-GIF) was prepared by MCIT to promote the interoperability of government systems. This should now have been fully implemented. Similarly, plans are in place to expand the use of a critical identification system for the population; at present, Afghanistan has the second highest percentage of population without an ID in South Asia, with a third of its population unregistered. The introduction of e-Tazkera, a digital identification system, has long been planned, but the timeline for rollout is still unclear. And despite considerable progress over the years, essential digital services such as shared data repositories (for instance for land or property) are not in place. Though well-intentioned and proactive in its efforts, the government seems to have adopted a piecemeal approach, launching many fragmented (and often peripheral) projects with uncertain outcome and value.

Low literacy levels and the limited capacity of average Afghani citizens to adopt and use digital channels poses another challenge to the development of the digital economy. Gender gaps are stark, with many women lacking access to digital devices and services, including basic identification. There is no structure for the effective coordination and sharing of data among different organizations and the legal and regulatory environment for data protection is weak, with provisions for online privacy contained only in the cyber-crime code. This undermines overall public trust in digital transactions. The situation is further exacerbated by the absence of clear institutional leadership. Multiple agencies are involved in the digital agenda (e.g., the communications ministry, statistical agency, and telecommunications regulatory agency), often with unclear mandates. Afghanistan ranks 126 of 175 countries in the ITU's Global Cybersecurity Index (2018), suggesting significant room for improvement.

There are three key measures that could be taken to boost digital government and service delivery. First, a Digital ID program could be set up as an autonomous, self-governed entity with a foundational role to improve public and private service delivery more broadly. This ID program could be designed to link with a variety of different services, such as financial services, healthcare, and voting access. Throughout, a clear focus on gender and social inclusion, including protecting privacy and data security, should be maintained. Second, the government could pursue its digital transformation agenda in a more integrated and coordinated manner. In order to achieve this, the government would require a single enterprise/service architecture, which would prioritize and consolidate service delivery from multiple citizen-facing applications. This common shared infrastructure would concentrate on service availability and ensure disaster recovery back-up. In parallel, leadership for the digital agenda, as well as the various institutional roles, need to be clarified. Third, trust in digital services could be fostered through better cybersecurity for digital public platforms and better data protection mechanisms, including the establishment of an effective Data Protection Authority (DPA). Given the country's low literacy and limited internet adoption rates, together with the risk of further exclusion through digital transformation, e-government services should be backed by physical facilitation mechanisms that work in conjunction with, not in parallel to, digital service delivery.

Digital Financial Services

The central bank, Da Afghanistan Bank (DAB), considers financial inclusion as a key strategic pillar and has enabled digital financial services to support this outcome. Mobile money was introduced in Afghanistan in 2008. Regulations for money services providers and payment system operators were introduced in 2016, formalizing the role of mobile money companies as Electronic Money Institutions (EMI) and encouraging the market entry of non-banking players. The four largest mobile operators acquired EMI licenses by setting up separate independent entities. The DAB's first National Financial Inclusion Strategy (NFIS) for Afghanistan (2020–2024), launched in September 2019, aims to expand and diversify access points, enhance access to formal financial services for both men and women, empower consumers, and increase access to finance for Micro-, Small and Medium-Sized Enterprises (MSMEs) and the agriculture sector. The strategy is also intended to promote access to Digital Financial Services (DFS). Afghanistan is working towards bringing about increased efficiency in the financial system through the establishment of a consolidated payment system (Afghan Payment System) and the transition towards a DFS-based civil servant salary payment system. 97 percent of the police force have now been registered in the system and more than 73 percent of the government's total 800,000 military and civilian employees receive their salaries electronically. Innovation is also happening in the fintech space, for instance through the launch of online payment solutions. Even though these developments hold promise, basic infrastructure is still missing and there is limited support for digital transactions. Afghanistan's ATM network has less than 500 ATMs across the country and only some 2,000 credit cards were in circulation in 2018. Awareness of, and trust in, the formal financial system is limited; at the same time, the informal "hawala" system still operates on an honor basis. A mere 15 percent of adults in Afghanistan had transaction accounts with financial institutions in 2017 (for storing value or for payment) and only 0.3 percent of adults used mobile phones to access these accounts. Further, the agent network for mobile money faces liquidity problems. Other obstacles to the adoption of DFS include limited digital access, security concerns, religious and cultural beliefs, and low rates of financial literacy. Moreover, Afghanistan operates in an overall weak cybersecurity environment, with no cybersecurity framework for the banking sector, and an incredibly nascent Government Cyber Emergency Response Team (CERT) that is both understaffed and weakly prepared to address cyberthreats.

A number of high-priority measures could be taken to boost the use of digital financial services. Financial literacy and inclusion programs could be put into place to educate people on DFS, including women and poorer households. Efforts towards promoting government-to-citizen payments should be expanded to a wider range of products such as microlending or micro-saving products. This could include favoring digital wallets over agent-dependent OTC (over the counter) transactions, in order to encourage consumers to spend cash digitally. Regulatory sandbox initiatives to promote innovation and regulatory compliance could boost local fintech innovation and support the development of disruptive ideas in areas such as digital remittances, peer-to-peer lending, and retail payments. In addition, interoperability initiatives and efforts could target both digital and analogue channels—in other words, agent-level interoperability could be used to promote branchless banking.

Digital Businesses

With limited digital access and adoption, Afghanistan lags in many of the key measures of business digitization and digital innovation. Even so, there is a small and active community of digital innovators in the country. Enhancing digitalization efforts can help increase the quantity and quality of jobs, especially given that the labor force participation rate was 54.2 per cent and the employment-to-population ratio was 49.5 per cent (in 20xx). These rates are significantly lower for women, and strategies are sorely needed to ensure that more women enter the workforce with the necessary skills to participate. On the business side, the emergence of networking platforms for digital businesses is a positive development as

they can act as important breeding grounds for new ideas, collaborative discussions and private sector activity. Incubators have been supported mainly through development partner projects, which to a limited extent, have included financing. Venture capital activity is currently very low in the country, due mainly to perceptions of high-risk. A significant number of Afghan IT graduates who studied outside the country (mainly in India and European countries) have since returned home. These individuals could be the future of the country's ICT sector, but only if the right conditions for entrepreneurship and absorption into the labor force are in place. There is much demand for IT services among larger firms; in Kabul, most medium and large companies already use IT for advertising, accounting, and HR management. Indeed, Kabul hosts the vast majority of the 600 or so IT firms active in Afghanistan, with other pockets of activity in Herat and Mazar-i-Sharif. There are still many challenges for the industry to overcome if it is to reach its full potential, such as low productivity, difficult business environment, skills and higher input costs (e.g., price of imported equipment, energy, and cost of capital). Incubation and sector collaboration and advocacy efforts are still nascent. Security issues, unreliable connectivity and power, and the lack of advanced ICT labor skills remain the biggest impediments to the development of a self-sustaining digital ecosystem.

Whilst the foundational elements of a digital economy exist in Afghanistan, the government could do more to promote the development of nascent digital businesses. First, the government should establish clear guidelines on technology procurement on an open-access, competitive, and non-discriminatory basis, in order to address the current standstill on ICT contract outsourcing to the private sector. Second, the government should address the current delays for business license renewals by linking renewals to tax returns. Third, the government should undertake a regulatory review of the private equity and venture capital ecosystem and consider incentives to attract private sector investments for start-ups. Finally, the government should continue to improve credit-related infrastructure to ease SME access to financing. It should also continue its efforts to nurture start-up communities by convening all key stakeholders (start-ups, mentors, trainers, investors) in a cohesive environment to promote growth and innovation.

Digital Skills

Digital skills have generally been classified into two main types: broader digital literacy skills for a digitally empowered population, and more advanced skills for a digitally ready workforce. Afghanistan lags the region in both cases, with low levels of digital literacy among its population and a rather small, albeit growing, digital workforce. There are very few reliable statistics about broad digital literacy in the country, even as the government is looking to build skills as part of its digital agenda. For example, the Digital Foundation strategy for Afghanistan seeks to build capacity and digital literacy to "create an employment-ready workforce by bringing together a research driven culture to create a knowledge sharing economy." The policy also seeks to empower civil servants through digital literacy, improve digital literacy among the general population, leverage e-learning opportunities to narrow the digital skills gap, and promote digital innovation through research and development. Given the limited access to digital tools and services, it is vital to build the necessary infrastructure, promote access to it and create relevant content. The readiness of teachers to train students must also be made an important priority. Indeed, considering that an additional 10 million or so children have had their normal schooling interrupted due to the COVID-19 pandemic, there is an opportunity to use educational technology to reverse the negative impact on educational levels. In the context of limited infrastructure, widespread poverty, weak security, and social attitudes towards the education of girls, e-learning can provide better and more flexible access to education for excluded populations such as young wives, working children, displaced peoples. The current legislative framework for education does not recognize online, remote, or distantly-earned degrees, certifications and diplomas, even though e-learning is now being blended

with more traditional learning modes. For example, during COVID-19, the Ministry of Higher Education made digitized educational content available to students through the Higher Education Learning Management System (HELMS), hosted through Amazon Web Services. In addition, the Government has been developing educational content in collaboration with six leading universities on the global ed-tech platform EdX, known as AfghanX. AfghanX is supported by the Central e-Learning committee of the Ministry of Higher Education, which provides academic and administration support to higher education institutions. To facilitate and foster digital learning, the legislative framework could benefit from some improvements, including additional control and quality considerations, drawing upon the best practices of peer countries. An important goal in this regard should be the development of a transparent set of standards to measure the quality of education being delivered, regardless of the type of institution or the location of learning (e-learning vs. traditional). However, achieving consensus on what those standards should be is no easy task. Another important aspect of the legislative framework should be to create mechanisms for software and technology companies, curriculum development ventures, and EdTech, to work with government to develop and deliver online programs over different platforms. Furthermore, ensuring the availability of skilled workers will serve to expand the ICT sector and its ICT-enabled businesses. Currently, the telecommunications sector is the major employer of ICT-skilled workers, employing nearly directly or indirectly 300,000 employees in telecom infrastructure, telecommunication, and mobile banking. A study by the World Bank (supported by the *ICT Sector Development Project*) estimates that the demand for ICT professionals in the country was around 350,000 in 2015, a figure that has only increased over time.

In general, digital skills can be further developed through a better integration of digital technologies in society and daily life. In this respect, the education sector could act as an important catalyst for this transformation. A digital economy will also create demand for skilled workers, which can be met through training programs for advanced digital skills. High-priority areas for government should therefore include the creation of e-learning platforms and capacities to enhance education access and quality, teacher training, development of locally relevant content, and improved school infrastructure. In parallel, focused training programs to improve the skills and employability of recent graduates—from universities and from TVET institutions—should help close the gap in the supply of trained and digitally ready workers, which will in turn support innovation and the development of digital businesses in the country.

Policy Recommendations

Based on the analysis above, the following table sets out several high priority policy recommendations for the development of the digital economy in Afghanistan.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Implement (planned) transparent pricing and non-discriminatory access to Afghan Telecom's infrastructure, positioning it as a wholesale provider to other operators Implement cross-sector infrastructure sharing, especially for energy infrastructure Define standards for quality of service (QoS) and collaborative methods with network operators for QoS measurement and maintenance 	<ul style="list-style-type: none"> Develop a long-term plan for radio spectrum allocation and management Consider reducing the impact of taxes and duties on telecommunication equipment to promote affordability of broadband-enabled devices Increase the competitive allocation of Telecommunication Development Fund (TDF) resources to accelerate infrastructure development in underserved areas

Pillar	Short-term	Medium- to long-term
Platforms	<ul style="list-style-type: none"> Organize the digital transformation effort through a single enterprise/service architecture, and a common shared infrastructure Complement digital services with front-end physical facilitation mechanisms to bridge digital divides 	<ul style="list-style-type: none"> Expand the Digital ID program with a foundational role to improve public and private service delivery, including a focus on gender and social inclusion
Financial services	<ul style="list-style-type: none"> Roll out financial literacy and inclusion programs to educate and motivate users, including women and poor households Promote digital wallets to encourage consumers to spend cash digitally Boost interoperability through a combination of digital and analogue efforts, e.g., agent-level interoperability for the promotion of branchless banking 	<ul style="list-style-type: none"> Consider regulatory sandboxes to promote innovation and regulatory compliance Expand efforts on G2P to a wider range of products such as microlending or micro-saving
Businesses	<ul style="list-style-type: none"> Design enabling policies that nurture digital businesses Boost domestic e-commerce through accelerating the development of the Digital Addressing System and strengthening consumer protection in the digital environment 	<ul style="list-style-type: none"> Nurture start-up communities and incentivize private sector investments in start-ups
Skills	<ul style="list-style-type: none"> Launch 'Bridging programs' to boost the employability of graduates 	<ul style="list-style-type: none"> Integrate digital tools into the education system, prioritize teacher training and the creation of relevant content
Trust	<ul style="list-style-type: none"> Strengthen data protection laws 	<ul style="list-style-type: none"> Establish a Data Protection Authority (DPA), and enhance the cybersecurity of digital public platforms

Bangladesh

The government of Bangladesh is currently working towards transforming the country into a digitally developed nation. The Digital Bangladesh Vision, adopted in 2008, aims to promote a growing IT industry, a digital government, human resource development, and connected citizens. These goals were defined by the election manifesto. The government has implemented a large number of projects relating to digital technologies and a number of these are already underway. The 2009 National ICT policy was developed in line with the country's goal to achieve middle-income status by 2021 and developed status by 2041. Digital Bangladesh has been supported by several initiatives, including the Leveraging Information and Communications Technology (LICT) project, the Access to Information (a2i) project, and many other government and multi-donor funded programs. Furthermore, in adopting a whole-of-government and whole-of-society approach to digitization, Bangladesh recently launched its 'Post-COVID-19 National ICT Roadmap FY 2021-2025' aiming for widespread digitalization. The five-year plan outlines actions to be taken in areas such as ICT and emerging technologies, healthcare, literacy, financial services, start-ups and entrepreneurship. The roadmap is the eighth of its kind and highlights the role of the digital economy in accelerating economic growth. A revised National ICT Policy is currently in preparation and is intended to focus on the following areas: digital government, digital security, social equity, universal access to education, research and innovation, skills development and employment generation. The policy aims to strengthen domestic capacity to cope with the changes brought about by emerging technologies.

The first phase of the digital revolution in Bangladesh has yielded commendable results, but there is still much more to be done. According to the World Bank Digital Adoption Index, Bangladesh has improved its ranking from 132nd in 2014 to 125th in 2016, out of 183 countries. This reflects a wider adoption of technology by citizens, businesses, and government. However, Bangladesh lags other countries in South Asia (except for Nepal and Afghanistan) in embracing digital technologies more fully. There are several bright spots indicating the potential for further advances. First, mobile telephone penetration was at 101.5% in 2019. Second, according to the Oxford Internet Institute (OII), Bangladesh has become the second largest country in the world supplying online labor; there are around 650,000 registered freelancers in the country, making USD 100 million annually (according to the government's ICT Division). The BASIS report notes that Bangladesh has earned about USD 800 million by exporting ICT products and services to over 50 countries in 2017. The business process outsourcing (BPO) industry in Bangladesh currently employs 40,000 employees and is expanding rapidly due to the increase in the number of offerings in Robotics Process Automation (RPA), big data analytics, Internet of Things (IoT), and 3D imaging, among others.

Nonetheless, Bangladesh will need to take steps to address some cross-cutting bottlenecks hampering the development of its digital economy. Recommended actions include the following: (i) *ensure that the digital economy is inclusive for all*, through access to tools and services, regardless of age, gender, socio-demographic status, and geography, (ii) *develop institutional strategies and coordination* that define ambitious yet achievable targets across the different arms of government in order to optimize the digitalization of public services; (iii) *develop digital capacities* to ensure that leaders and citizens have the basic digital vision, championship, skills and literacy, needed for digital innovation and entrepreneurship to thrive across the economy, whilst mitigating associated risks; and (iv) *build a stronger trust ecosystem* through the establishment and implementation of appropriate cybersecurity, data protection and privacy regulatory frameworks across government and the private sector.

Key Findings

Digital Infrastructure

There is good nationwide coverage of mobile services in Bangladesh. The Bangladesh Telecommunication Regulation Commission (BTRC) estimates that mobile internet penetration (subscriptions) is more than 50 percent, and overall Internet usage is 57.2 percent. On the other hand, fixed broadband penetration has remained low, dropping from 6.3 percent in 2018 to 4.9 percent in 2019. With a view to increasing both broadband access and uptake, the National Telecommunication Policy was adopted in 2018. Currently, the government's Access to Information (a2i) program is preparing a new national broadband roadmap and strategy to make affordable internet a reality for all. One of the major objectives will be to strengthen each element of the broadband value chain. International connectivity in Bangladesh is supported by two submarine cables, with a third expected shortly. In addition, regional projects like the South Asia Sub-regional Economic Cooperation (SASEC) Program are expected to further enhance international connectivity. There is now greater competition in this area as reflected by the drop in bandwidth price from BDT 28,000 to BDT 625 per Mbps over a span of five years. The cost of internet in Bangladesh could be reduced further by focusing on the middle mile. At present, services between cities and in metropolitan areas are provided by two private sector operators. Competitive pressures in the market can be increased through the entry of new operators and the use of alternative infrastructures, e.g., existing fiber optic capacity embedded in railway and power transmission lines. The introduction of 4G (LTE), operator demand for 5G, together with higher fixed broadband usage by people and businesses across the country, is rapidly increasing the need for nationwide backhaul transmission capacity, which the middle mile is not yet equipped to deliver. It is also important to address last mile connectivity in commercially nonviable areas. Priority should be given to connectivity for hospitals, clinics, schools, and local government offices, particularly in light of the country's ongoing response to COVID-19. Continued investments are needed in digital infrastructure and platforms to enable key developments such as IoT and AI-as-a-service, with which academia, entrepreneurs, and businesses can pilot new products and services. It is encouraging that the government plans to provide national 5G coverage by 2026. However, the regulatory approach towards mobile operators could be taken keeping in mind the digital dividend. In order to steer Bangladesh's digital connectivity efforts into the future, a better understanding of 5G technology and architecture is required, together with an understanding of key challenges and global best practice. Finally, it will be critical for Bangladesh to boost its efforts to increase the proportion of women participating in the digital economy. The gender gap in the country is stark, with women being 55 percent less likely to use the internet than men. This is due in part to the lack of gender-friendly public access points, but also more generally to the existence of pervasive cultural barriers.

Potential areas of focus for Bangladesh to boost access and use of digital connectivity include the following: (i) issuance of legislative, regulatory, and licensing guidelines for 5G and related spectrum management issues, (ii) optimization of infrastructure sharing —especially in the middle-mile segment— to increase the availability and use of fiber optic cable infrastructure, (iii) improvement of the consultative process to define a legal and regulatory framework to boost investor confidence, (iv) collection of gender-disaggregated data to analyze the digital uptake and usage patterns of women, and (v) simplification and unification of the licensing regime, in order to introduce real competition in the middle mile, reduce barriers to market entry and promote service innovation. Underpinning these reforms is a need for transparent engagement and consultations between the policymaker, the regulator (BTRC), and telecommunications services providers. This is vital to the development of an enabling environment that incentivizes investment and promotes service innovation.

Digital Public Platforms

Bangladesh has made good strides of late in the development of digital public platforms. For its digital agenda to become reality, however, the government will benefit from substantially improved coordination across its various arms through a whole-of-government approach. 'Digital Bangladesh', launched in 2009, was the first big agenda of its kind in the region adopting a bold holistic approach for the transition to a digital economy, society, and government. In line with this, there have been some notable successes such as the establishment of 5,000 Union Digital Centers (UDCs) across the country, making digital services more accessible. Many hundreds of services have also been simplified, particularly through the efforts of the Access to Information (a2i) programme. While these deserve credit, government investments in technology have typically been siloed and duplicative. Various plans and frameworks have been developed over time and the Bangladesh Computer Council has built some common infrastructure, such as a national data centre, e-GOV Computer Incident Response Team (CIRT), and national enterprise architecture (with support from the World Bank's Leveraging ICT project). However, adoption by government agencies still needs to be mainstreamed across all agencies. Over the last decade, Bangladesh improved its ranking in the United Nations eGovernment Development Index (EGDI) from 134th in 2010 to 119th in 2020 out of 193 countries, but there is still room for improvement.

Bangladesh's national identification system has a relatively high rate of coverage: 88.7% of persons aged 18 and above have a national ID according to the 2017 ID4D-Findex survey. Deliberate efforts to close the gender gap in registration have paid off, with 87.8% of adult women having a national identity card compared to 89.5% of men. The system does not yet cover non-nationals (such as refugees) nor anyone younger than 18. It is also not linked to the civil registration system for births, deaths and other vital events, which, despite recent improvements, remains underdeveloped. A case in point is that only 37% of children under five have a birth certificate. Since its modernization in 2016, the national identification system has been linked to a large number of services, including biometric verification for SIM registration and bank account openings. However, it has not yet led to the same kind of service innovation and transformation as what has been witnessed in India and Pakistan. One structural challenge may be that the system is housed at the Electoral Commission - as such it may be difficult to view it as anything more than a database, let alone a service delivery platform in its own right. For instance, Bhutan, India, Maldives, Pakistan and Sri Lanka have dedicated agencies for managing foundational identification systems. It may have been in full awareness of these shortcomings that the ICT Division developed the *Porichoy* platform. *Porichoy* can be used by government agencies and businesses to integrate identity verification into their processes, drawing on the national identification system and other databases. The platform is fairly new and results are yet to be seen. The use of electronic signatures in Bangladesh is limited, but the Controller of Certificate Authorities, which operates a national public key infrastructure, has already licensed six Certificate Authorities.

Data sharing and interoperability across government has been weak but the Bangladesh National Digital Architecture (BNDA) launched in 2019 is a key effort to improve this. It has not yet been adopted and implemented. With common standards for data and the national enterprise architecture bus to facilitate communication between government information systems, the technological enabling environment is largely in place for better data sharing and interoperability. However, government agencies will need to make their data available. Of equal importance is cybersecurity and data protection. The CIRT will go a long way to help address security challenges, but capacity needs to be built across government agencies and civil employees. Bangladesh joins Afghanistan as the only two countries in SAR without an omnibus data protection law in place or even a bill at advanced stage. Without any clear and generally-applicable

legal enablers and safeguards, there is significant uncertainty with respect to the collection and use of data in Bangladesh.

The health, education, and social protection sectors would greatly benefit from smarter use and re-use of data. The Bangladesh Bureau of Statistics' (BBS) National Household Database (NHD) is an important support for government agencies as they assess the needs of citizens seeking access to government benefits. Data-sharing agreements with social protection agencies are also in place to help them identify beneficiaries for their respective programs. At the same time, BBS has recently announced plans to introduce a biometric-based National Population Register that could overlap with both the national identification system and NHD. This duplication highlights the need for coordination across government.

There is significant potential for digital public platforms to take government service delivery and operations to the next level, but this will require a number of reforms and policy actions. First, institutional arrangements and mandates need to be revised in order to foster a genuine whole-of-government approach with a more effective use of scarce resources. A clear and dedicated apex body or agency should be established at the highest levels of government, to set and enforce policy. Policy implementation can be decentralized at the agency level. One of the priorities of such a body should be to ensure that the BNDA is fit-for-purpose and adequately enforced. Second, Bangladesh should continue to focus on inclusion and ensure that the transition to digital government services does not leave anyone behind e.g., by building on efforts such as Union Digital Centers. Third, the national identification system needs to be repositioned as a service delivery platform at the heart of a wider identification ecosystem (requiring coordination between the national identification system, civil registration, and other initiatives such as the National Household Database and National Population Registry). Fourth, if the government is to prioritize safeguards and legal certainty for the collection, sharing, use, and re-use of personal data, it should urgently enact a general data protection law.

Digital Financial Services

At present, only 35% of Bangladesh adults are digitally included, through a registered mobile money account and/or a bank or NBFIs account offering digital access. Nearly half of Bangladesh adults reported never having made a digital payment or transfer. The share of adults with a mobile money account has risen significantly from 3% in 2014 to 28% in 2019. Mobile money transfers were the most popular digital financial service (DFS) activity in 2019: 78% of adults who had used a digital payment or transfer used a mobile money transfer. Bill pay was the second most prevalent digital financial activity, mainly among bank users. Beyond these applications, however, DFS is limited. Not many citizens hold digital accounts and interaction among banks, financial institutions, and digital financial services platforms is largely inadequate. This hinders the availability of digital public services and, in times of crisis, prevents under-served citizens from availing themselves of vital government support. There are certain challenges that need to be addressed in order for Bangladesh to reap the benefits of financial inclusion. The usage of ICT and other digital tools in the country remains low, and this affects the uptake of DFS. 50% of the population has account access but the population with debit cards is only at 11.2%. Banked citizens prefer bank tellers over ATMs to withdraw funds: only 7.5% of the banked population uses ATMs as the main mode of withdrawal compared with 78% using bank tellers. Gender inclusion is also problematic, mainly due to the significant mobile gender gap. Bangladesh's financial inclusion gender gap grew from 9 percent in 2014 to 29 percent in 2017, making it one of the widest gender gaps in the world. Only 10 percent of women in the country have a mobile money account compared to 32 percent of men. Bangladesh has adopted FinTech solutions and innovations to address the needs of its large unbanked population. These are gaining momentum have boosted levels of financial inclusion in the country. In 2018, 50 percent of the population had access to formal financial services, an increase of 57 percent since 2013. The government is also hoping to leverage FinTech to expand digital financial

inclusion. A good example is the establishment of the Digital Financial Services (DFS) Lab, a joint initiative by Bangladesh Bank and a2i working towards creating citizen-centered product and service innovations to facilitate rural e-commerce and increase financial literacy. Clearly, the national regulatory framework needs to respond to the dynamics of a rapidly evolving FinTech landscape. In light of this, a Regulatory FinTech Facilitation Office (RFFO) was established in October 2019. RFFO assists interested parties with their applications to launch pilot projects and provide regulatory assistance. The pandemic, too, has led to an increase in internet banking: banking service providers reported more usage of their digital apps during the crisis. One of the reasons behind this surge may be that salary payments were increasingly being done online.

Greater innovation and adoption of DFS in Bangladesh is achievable but needs a multi-level approach. To begin with, broader issues such as affordable access to broadband and availability of local-language content will need to be addressed. Second, given that only 29% of people in Bangladesh were considered to be financially literate in 2018, efforts will be needed to improve financial literacy together with a focus on basic digital literacy. Promoting the engagement of women with these services will be critical to ensure inclusion. In addition, poor awareness of grievance and redress mechanisms means that users are apprehensive when using mobile or digital financial services unaided, for fear of losing their money. The use of digital financial services in social safety net programs could improve awareness and increase adoption. After being deployed as pilots, such programs could then be scaled up based on lessons learnt. Third, a comprehensive regulatory framework will need to be developed to set security standards for the electronic payment system and to promote system interoperability. Finally, Bangladesh will need to take steps to enhance the cybersecurity of financial systems to foster trust in these services.

Digital Businesses

The digital start-up ecosystem in Bangladesh has had a late start compared to its regional peers. Growth is supported by various business-friendly regulations along with multiple start-up ecosystem enablers like co-working spaces, community events, local and global incubator/accelerator programs as well as active interest from government and development partners. For example, government policies and projects from ICT ministries support the local start-up ecosystem, for instance through the establishment of more than 28 Hi-Tech Parks for technology companies. The government has also initiated the Start-up Bangladesh Fund with a view to catalyzing investments. The results so far are promising - there are 683 tech start-ups in Dhaka alone. However, programs to support venture capital firms and private equity in digital technology are lacking. In 2018, Bangladeshi start-ups raised around US\$27 million while those in Thailand and Vietnam raised US\$50 million and US\$246 million respectively in the first quarter of 2019. In addition, Bangladesh performs poorly in terms of VC availability compared to South Asian peers (like India, Pakistan, Nepal and Bhutan), ranking 112th out of 141 economies. Still, exports of digital goods and services are on the rise and the country's ICT sector has seen strong growth overall during the past decade. At present, there are over 4,500 IT/software companies functioning in Bangladesh with a market value of over US\$400 million. In the fiscal year 2016-17, the ICT sector registered export earnings worth US\$0.8 billion from the global market and US\$1.54 billion from the domestic market—equivalent to a one percent contribution to GDP. Even so, Bangladesh ICT sector exports have been erratic, falling by 22% from 2017 to 2018, contributing 17.60% in 2016 and 13.59% in 2017 to the total service exports of the country. Digitization of firms is limited but on a growth trajectory. E-commerce in Bangladesh has increased, with the country ranking just behind India according to the 2019 B2C E-commerce Index and ahead of its other South Asian counterparts (Nepal, Bhutan, and Sri Lanka). Use of digital technologies by traditional firms, however, remains limited. Reasons for this include low levels of digital literacy, lack of internet access, and high costs. Larger firms are using digital technology more actively for basic

business purposes, like communication with customers—nonetheless, more advanced use of digital technologies and services remain limited. Low penetration of digital technologies is symptomatic of the overall lack of innovation capacity among Bangladeshi firms. The country's innovation capacity scores lower than most comparable economies according to the 2019 Global Innovation Index. Barriers to digital innovation include the shortage of qualified developers and software engineers, limited access to modern technology and equipment and limited collaboration with public research and education institutions.

A number of measures could be taken to stimulate innovation and accelerate the digitization of businesses in Bangladesh. Promoting research and innovation, enabling linkages between academia and the private sector, and investing in digital skills are important first steps. The growth of digital firms is also hindered by a difficult business environment, lack of early-stage and late-stage financing, and limited market opportunities outside of Dhaka and Chattogram. The infrastructure and support system for innovation are rapidly expanding, but they remain concentrated in a few big cities. The government could also develop policies to stimulate investment in the digital industry, including through venture capital. Transparent and competitive processes are required, as is the simplification of bureaucratic practices. Specific attention should be paid to female entrepreneurship through specialized initiatives and services, e.g., increased focus on financial inclusion and access to finance through special training programs for female entrepreneurs. To further support digital start-ups and investors, effective regulations should be put into place to protect intellectual property rights and detect, prevent, and punish cybercrime.

Digital Skills

The number of IT professionals currently employed in Bangladesh is approximately 0.22 million. Demand for human capital is expected to double by 2025. There is a lack of highly skilled information technology specialists, with supply at a mere 40 percent of the projected demand. Similarly, only about 50% of current demand can be fulfilled by the current supply of graphic designers and mid-level project and product management professionals. In this post-COVID pandemic period, the expectation is that new jobs in sectors like pharmaceuticals, health services, agro-food, creative media, ICT and e-commerce will emerge with the acceleration in digitization across the economy. In Bangladesh, there are over 1,500 firms engaged in software development and IT services. Due to increased demand, these organizations need to recruit additional IT consultants, app developers, backend developers, front end developers and technical support engineers. Many companies are investing in improving their processes and pushing towards the digitalization as many transitions to teleworking environments. This could generate over 10,000 additional jobs in IT and related industries. Developing advanced skills in the workforce will be critical to maintaining this growth momentum. Bangladesh has adopted several initiatives across multiple sectors with a view to developing a talent pool that is skilled, equipped, and digital-ready. The education system produces over 0.5 million university graduates every year. It has introduced various dedicated training programs to train graduates to deliver value on a global scale. Over 65,000 IT and ITES professionals were trained in 2018. According to the Oxford Internet Institute, Bangladesh has the second largest pool of online workers in the world. To strengthen digital skills further, the country established specialized labs in all of its 130 universities and is currently investing in Frontier Technology Centers of Excellence with global tech partners like IBM. Bangladesh is also training professionals on emerging technologies like big data, blockchain, IoT, artificial intelligence and data analytics. The government is strengthening digital skills based on the foundations laid out in its Digital Bangladesh policy. However, digital skills may not reach target levels unless a holistic approach to human capital and workers is taken, ranging from childhood nutrition to adult education.

Skills development could thus be intensified to continually re-skill, and up-skill the digital competencies of Bangladesh’s workforce. Harnessing digital technologies will not be successful without a strong pool of digital talent. To capitalize on Bangladesh’s demographic dividend, the skills mismatch needs to be addressed through reforming the curriculum with a focus on digital skills and reducing the digital divide of the rural population (where most of the youth population lives). Skills development could be pursued through a skills framework approach with continuous training and placement efforts in relevant digital economy skills for all professionals. At the same time, it is important to scale training efforts to groom digital leaders competent to lead in disruptive technology start-ups, and to help employees adapt to the changing nature of work. In addition, broader digital skills and training should be incorporated into general education. This will require better digital infrastructure for education, digital skills and readiness training for teachers, and development of local language content. Finally, education and training programs have been slow to establish successful collaborations with industry. Industry collaboration in skills development will be vital to ensure that students are provided with relevant quality experience and training that keeps up with the latest technologies being used in industry. Broader digital literacy will continue to be critical given the country’s high dependence on low-skilled labor and remittances. This is particularly the case as the digital disruption of traditional sectors and occupations will cause labor-intensive export-led manufacturing to be less feasible, with the potential of limiting further job growth.

Policy Recommendations

Based on the analysis above, the following Table sets out several high priority policy recommendations for the development of the digital economy in Bangladesh.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Allow the entry of alternative providers across sectors through infrastructure sharing—especially in the middle-mile segment— in order to increase availability and use of fiber optic cable infrastructure Enhance the consultative process for defining of the legal and regulatory framework to boost investor confidence Simplify and unify the licensing regime, and unleash real competition in the middle-mile by reducing barriers to market entry and promoting service innovation 	<ul style="list-style-type: none"> Develop legislative, regulatory, and licensing guidelines for 5G and related spectrum management Develop mechanisms to close last-mile connectivity gaps in commercially nonviable areas, with priority given to hospitals/clinics, schools, local government offices, etc. Collect gender-disaggregated data to analyze the uptake and usage patterns among women and develop responsive digital inclusion programs
Platforms	<ul style="list-style-type: none"> Permit greater use of, and secure access to, the national ID database and integrate it with other governmental applications and systems Fully adopt a ‘Whole of Government’ (WOG) approach, including through the development of WOG platforms for use across public sector agencies 	<ul style="list-style-type: none"> Build the institutional capacity of government offices, on the one hand, and people, on the other, to develop and use digital platforms
Financial services	<ul style="list-style-type: none"> Support financial literacy programs with a focus on digital awareness and increasing the engagement of women Develop the regulatory framework to set security standards for the electronic payment system and to promote interoperability of systems 	<ul style="list-style-type: none"> Support the development of user-friendly products, content and applications in the local language Introduce DFS for social safety net programs

Pillar	Short-term	Medium- to long-term
Businesses	<ul style="list-style-type: none"> Stimulate investment in start-ups and fast-growing SMEs by engaging with local and regional venture capital and private equity firms and identifying barriers to entry (or scale-up) Broaden the reach and availability of digital skills training, and innovation-support facilities and services 	<ul style="list-style-type: none"> Improve integration into the regional economy, mobility of capital, and ease of investment. Support female entrepreneurship through a focus on skills development and access to finance Ensure a level playing field as more firms focused on ed-tech, health-tech, ag-tech enter the market
Skills	<ul style="list-style-type: none"> Conduct a comprehensive digital skills assessment by bridging the skills gap and bringing together private sector (companies and start-ups), academia and the public sector (policy-makers) to identify specific digital skills gaps and how these gaps might be addressed Address skills mismatch by reforming the curriculum with a focus on employment-oriented digital skills Establish collaboration with industry for the skills development system to provide students with quality and relevant learning experience Support broader digital literacy programs for people and workers across the economy Develop the underlying infrastructure of the education system, improving digital skills and readiness of teachers, and fostering local language content Prepare a dedicated digital skills competency framework or standard—a key infrastructure need given the increase in digital skill requirements during COVID-19 	<ul style="list-style-type: none"> Develop a skills framework approach with continuous training, apprentice and placement efforts in key technology skills for improving human capital and the workforce. Scale-up the training of digital leaders
Trust	<ul style="list-style-type: none"> Develop a consent framework with emphasis on privacy and protection of personal data Boost the cybersecurity of financial systems Build awareness about grievance redressal mechanisms for digital transactions 	<ul style="list-style-type: none"> Address data privacy, data protection and cybersecurity concerns through an enhanced legal and regulatory framework and its appropriate enforcement Develop effective regulations for the prevention, detection, and punishment of cybercrimes and for the protection of intellectual property rights that in turn will serve to promote digital start-ups and incentivize investors

Bhutan

Bhutan is currently well-placed to leverage its digital economy for both economic growth and social inclusion. Internet and mobile penetration levels stand at 90 and 98 percent, respectively. Most Bhutanese comfortably use social media platforms and messaging apps. The government established an online portal for services as it seeks to promote digital government and innovation. To support the business needs of ICT and knowledge-based start-ups, the Thimphu Tech Park was opened in 2012. While digital adoption and usage in Bhutan have increased over time (as indicated by the World Bank's Digital Adoption Index), Bhutan lags far behind Bangladesh, India and Pakistan in embracing digital technologies. There is still a long way to go to ensure an inclusive and productive digital economy. Optimizing e-government services, boosting public sector connectivity and online service delivery, and fostering digital literacy, are some of the elements that could accelerate Bhutan's digital transformation.

The Government of Bhutan is keen on developing its digital economy. The government has embarked on a program of initiatives, known collectively as Digital Drukyl, aiming to harness the power of ICT to transform Bhutan into a smart and inclusive society. The program includes the creation of integrated end-to-end online citizen services, integrated online business licensing schemes and single online customs-trade approvals. The program aims to provide all schools with usable connectivity, and to empower teachers to use digital content for learning outcomes in digital schools across the country. Digital Drukyl also intends to create a digital identity system, as well as improve the quality of healthcare through an electronic patient information system for hospitals. These programs will create some of the foundations of a digital economy in Bhutan. However, more can be done to accelerate the process of "building back better" after the COVID-19 pandemic, including preparing the country for future shocks.

Bhutan needs to address some important cross-cutting bottlenecks to develop its digital economy further. In this context, the government could consider taking the following steps: (i) *ensuring that the digital economy is inclusive* for all regardless of age, gender, and socio-demographic status, (ii) *building a trusted digital ecosystem*, with a population that has basic digital literacy skills to take advantage of digital services and a regulatory framework to protect data and privacy with adequate cybersecurity measures, (iii) *developing the necessary institutional framework* to implement efforts and initiatives to digitize public services, and (iv) *increasing the digital capabilities* of people, businesses, and the public sector to take full advantage of the digital transformation.

Key Findings

Digital Infrastructure

Bhutan has made major strides in connectivity and access and some 90 percent of its population now has access to the internet. Fiber optic cables link all 20 districts and 201 gewogs (supra-municipal) administrations. The government has adopted the Bhutan Telecommunications and Broadband Policy, with a view to improving public services (health and education), promoting local content development and access, and enhancing global integration. Its aim is for 80 percent of the country's residents to have access to entry-level broadband services (beyond the basic internet services currently available). For areas that are not economically viable, support from universal service funds will be considered.

Bhutan's regulator has also laid out a roadmap for 5G, with deployments expected to begin in 2022, promising to encourage innovation in the market. To this end, it has granted permits for operators to conduct 5G trials in the 2600MHz, 3.5GHz and 26GHz bands without incurring license or spectrum fees.

The regulator has also made spectrum in the 3.5GHz band available for the commercial launch of 5G services in early 2022. Despite such developments, household and business connectivity remains limited. Most households have basic mobile and internet coverage but fixed broadband connections are enjoyed by a mere 2 percent of the population. With a near duopoly in the internet services market and a heavy reliance on Indian telecommunications operators for international connectivity, Bhutan faces some competitive and market structure constraints in the development of affordable and high-speed internet services, leading to low average speeds (only 4 percent users in the country experience internet speeds above 10 Mbps). Connecting Bhutan to a third international Internet link via Bangladesh would increase capacity, reliability, and competition. This has been identified as a priority in Bhutan's 12th Five-Year Plan (2018-2023) and discussions are underway with officials in both Bangladesh and India to make this happen. Connecting rural areas has also proved to be a challenge. In this context, the Universal Service Fund (USF) could be used to close infrastructure gaps as well as connect schools and health centers. Given the country's challenging terrain and small market size, it will be critical to increase co-ordination between infrastructure providers, notably through infrastructure sharing and national roaming agreements. Investments should also be made efficiently. Low adoption has been compounded by related challenges such as a low literacy rates, limited digital public service delivery, and high broadband service costs. An entry-level broadband package is about a quarter of per capita income at the international poverty line. There is also a continued need for robust gender-disaggregated data, and a rigorous analysis of the ground-level situation, to validate assumptions and enable evidence-based decision making.

Bhutan's digital infrastructure development can be accelerated with a mix of policy measures and targeted investment programs that could mobilize private capital. A critical first step will be to implement various regulatory measures to boost competition especially in the international connectivity segment of the broadband value chain and reduce the costs of rolling out broadband networks.⁹⁶ The latter would also facilitate last-mile fiber optic deployment using existing and planned fiber networks, high speed Fixed Wireless Access (FWA), and satellite technology in a sustainable way, for maximum reach quality. Third, regulatory mechanisms should be established to monitor the quality of service, including spectrum monitoring for the avoidance interference. To ensure that digital growth in Bhutan does not leave women behind, concerted efforts should be made to enhance digital literacy and create service and content designs that promote inclusiveness for individuals with lower literacy levels. Finally, Bhutan should define and implement targeted universal service programs to close access gaps for connectivity, particularly in commercially unviable areas.

Digital Public Platforms

Bhutan has made good progress on digital public platforms, jumping from 152th in the 2010 UN e-Government Development Survey rankings to 103rd in 2020. This has been achieved through a well-organized approach and clear leadership for the digitalization of government under the Department of Information Technology and Telecom. The 2012 Government Enterprise Architecture (GEA) and 2014 E-Government Masterplan have been effective frameworks for rolling out digital public platforms and shared infrastructure initiatives such as the Government Data Hub (GDH) for data sharing (which has surpassed its targets in terms of the number of systems integrated) and the Government Data Center.

⁹⁶ This includes addressing legal bottlenecks for infrastructure sharing by implementing national guidelines for obtaining approvals, having a one-stop approval process, mapping of telecommunications-ready infrastructure, and development of in-building telecommunications standards. Competition regulations should be developed further to promote sharing of infrastructure, ensure sustainable tariffs, and be applicable to the telecoms sector and to the mobile operators regardless of being private or State-owned.

Notwithstanding these results, a large number of government services are not yet fully digitalized and often require some manual or physical step in the process, e.g., payment services. Demand for digital services from the public is also relatively weak, likely owing to the lower level of digital skills. The limited amount of resources poses yet another challenge, particularly at the local level. For example, Bhutan has 200 Gewog Community information centers (CICs); however, these centers are unable to deliver public services effectively due to a lack of equipment, the limited number of trained operators, and service glitches. Another example is the national identification system which, although well-established with good coverage, is in need of modernization if it is to become a platform for delivering key services such as identity verification.

The Digital Drukylu initiative and e-Government Policy of 2019 set out ambitious agendas to take digital public platforms to the next level. To successfully build on these foundations, Bhutan should seize on a number of important opportunities. First, it should focus on the implementation of Digital Drukylu and in particular on the full digitalization and integration of services through process re-engineering. It should also introduce a digital identification system that would allow secure identity verification for both in-person and online transactions. Second, in order to create opportunities for e-commerce and innovation in digital government services, the government should consider developing a 'digital stack' that would enable the new digital identity system to interface with future digital payments and data ecosystems. Finally, to sustain the progress made, and increase the creation, adoption and usage of digital public platforms, Bhutan should invest further in the ICT capabilities of civil servants and the digital skills of the population.

Digital Financial Services

There is tremendous scope for using digital financial services (DFS) to close gaps in access and inclusion in Bhutan. Only 41 percent of Bhutanese adults use banking services. The usage is higher among urban adults (66 percent) than among rural adults (30 percent). Almost half of all adult males (49 percent) use banking services compared to 45 percent of adult females. 63 percent of the rural adult population are financially excluded, with 94 percent of the rural population engaged in informal financial services and private money lending practices. In rural areas, 81 percent of banked adults require more than one hour to reach their bank, whereas in urban areas 35 percent require more than an hour. Current financial products and services cater to the general population and may not serve the unique needs of rural customers. 36 percent of the adult Bhutanese population remains unbanked or financially excluded in terms of savings account ownership. There are some common barriers and challenges for DFS adoption. Demand-side barriers can arise for various reasons, such as irregular income, lack of employment, low literacy levels and financial capability. Supply-side barriers stem from a lack of digital technology in the delivery of financial services, combined with the long distances to financial access points (especially given Bhutan's tough, mountainous terrain). A major challenge for accelerating financial inclusion is accessibility to formal services and the lack of appropriate financial products and services in terms of access, infrastructure, and affordability. Traditional collateral-based financial products and services typically have strict KYC requirements, hindering access, suitability, and inclusiveness. Other important challenges relate to the lack of financial literacy particularly in remote areas. Women in Bhutan have lower levels of economic participation in the Bhutanese economy and thus, lower incomes. Indeed, according to a 2013 World Bank survey, women in Bhutan prefer to save at home; they find it difficult to make small, regular deposits given the disproportionate travel effort involved, especially in remote areas. In this regard, digital and mobile finance becomes increasingly important as it reduces the physical operational costs and enables providers to service last-mile and low-income customers.

There are a number of actions that should be taken in Bhutan to boost the adoption of DFS. In addition to improving connectivity and the trust ecosystem (security of transactions and protection of personal

data), these fall into four main areas. First, the government should promote of DFS services through the digitization of government payments via GIFT (e.g., salary, payments, tax, fines, and so on). It should also establish customer protections guideline and dispute redressal mechanisms specifically related to electronic commerce and online payments. Second, financial services should be integrated with e-services more generally. For example, banking systems could be integrated with civil registration ID databases in real time to simplify and facilitate electronic customer identification and onboarding. E-commerce transactions could be facilitated through the acceptance of international card payments over payment gateways. Third, the government should facilitate the interoperability of systems and services e.g., interoperable QR code payments and relevant upgrades of IT systems in government agencies. Currently, for instance, the DRC (Department of Revenue and Customs) cannot automate online tax payments and collections using the existing RMA Payment Gateway. Finally, the government could consider prioritizing training and education, so that people have the necessary digital financial knowledge and skills to adopt DFS. A special effort should be made to promote the inclusion of women and women entrepreneurs.

Digital Businesses

Low penetration of advanced technology is symptomatic of the overall lack of innovation capacity among Bhutanese firms. According to the World Bank Bhutan Development Report 2019,⁹⁷ ICT contributes to only 3.5% of the country's labor force and 3.7% of its GDP. Bhutan ranked 105th out of 139 economies in the 2016 WEF Global Information Technology Report, and 117th among 175 countries in the 2016 ICT development index. So while Bhutan has made significant progress in the ICT sector over the last few years, growth has been slow in comparison to the rest of the world. This is evident with the decline in Bhutan's ranking on the ICT Development Index. ICT infrastructure needs to be strengthened to attract investments from budding sectors. As noted by the Annual Education Statistics, internet and electricity connectivity in public primary schools is inadequate and basic computer education is limited. There is also a low level of innovation and expenditure on research and development (R&D) activities; only 7.3 percent of Bhutanese firms spend on R&D, lower than firms in Nepal, Bangladesh, India, Pakistan and Afghanistan. Other barriers to digital innovation include the shortage of qualified developers and engineers, limited access to modern technology and equipment, and limited collaboration with public research and education institutions. That being said, as a late starter in the technology space, Bhutan could capitalize on its lack of legacy systems, access to cost-effective technologies, and relatively manageable amounts of data.

Bhutan has already been able to attract a handful of foreign ICT companies, especially in the Thimphu Tech Park, and there has been a certain level of domestic and public investment. The Thimphu Tech Park provides an influx of skills and knowledge for start-ups, but has not yet reached its potential to meet the demands of citizens and businesses. The absence of digital ecosystem policies, on matters ranging from payment systems and data privacy to complaint and redress mechanisms, limits sector growth and keeps investors at bay. Foreign direct investment (FDI) is restricted by a tightly controlled system and inadequate policies related to industrial licensing, trade, work and finance. The shortage of skilled labor impedes entrepreneurship and innovation in the digital sectors. Furthermore, as per the World Bank Enterprise Survey, 23 percent of firms surveyed consider access to finance as a key bottleneck to growth and sustainability. Women face even greater barriers in digital entrepreneurship due to lower enrolment levels in tertiary-level STEM education. 2019 data from the Department of Higher Education reveals that female students comprised only 28 percent of engineering graduates and 42 percent of ICT graduates in the country. The regulatory framework governing firm registration is also comparatively

⁹⁷ <http://documents1.worldbank.org/curated/en/259671548449315325/pdf/134060-WP-PUBLIC-25-1-2019-13-34-54-BDRJanuary.pdf>

complex; for example, limited liability companies (LLCs) are required to register with the Registrar of Companies.

Given its nascent digital business ecosystem, Bhutan should focus on creating an enabling environment for digital businesses to grow. Creating a consultative process for businesses to engage with the government to develop appropriate regulatory frameworks will be an important first step. In this way, regulations can be developed to promote innovation, improve overall standards and quality, and foster firm competitiveness. Clear and transparent regulations will reduce the legal uncertainty currently felt by many entrepreneurs, lower the cost of doing business, and simplify the establishment and operation of privately-owned small businesses. This will stimulate MSME sector growth in Bhutan. Other areas of focus should include the revision of licensing and incorporation procedures, the provision of training on taxation and accounting standards, and the harmonization of government databases to increase tax compliance and reduce regulatory burdens. The promotion of digital financial services, improvements in connectivity, and the availability of skilled workforce will also support digital innovation.

Digital Skills

Based on the research conducted by the ITU/IMPACT expert, it seems that there is a relatively small pool of highly skilled ICT personnel in Bhutan. In general, the private sector lacks sufficient technical and managerial skills to stimulate ICT business innovation and growth. The development of skills, in particular digital skills, has been a challenge in Bhutan for three main reasons. First, Bhutan has a low gross tertiary enrollment rate compared to its neighboring countries. Second, there are both skills shortages and a skills mismatch. For instance, only 366 of about 3000 graduates in 2019 had an engineering degree. Private sector employers report that workers lack the necessary skills in ICT, teamwork, leadership, and problem-solving. There is also a gap in advanced digital skills. It would seem that the country has placed a greater emphasis on improving basic digital literacy and ICT education, with much less focus on policies and initiatives to promote high-end or advanced digital skills, including in TVET (Technical and Vocational Education and Training); the country only produces some 100 IT graduates per year. With respect to the empowerment of women, although overall female enrolment rates in education have been increasing, there continues to be low female uptake of STEM subjects. It has been recognized that there is also a strong need for training IT/network experts in the field of cybersecurity. Cybersecurity awareness and literacy across society is fairly low, inadequate to compete with, or complement, the international cybersecurity ecosystem. There is currently no national level awareness campaign, with the exception of some ad-hoc initiatives seeking to raise cybersecurity awareness among the general population. Cybersecurity education in Bhutan is limited to seminars, workshops and regional conferences. Adequate cybersecurity courses/subjects are not offered at national universities. Not surprisingly, there is a lack of trained and qualified personnel that could implement counter measures and respond effectively in the event of a critical cyber incident. As of 2018, Bhutan was ranked 125th out of 175 countries in the ITU's Global Cybersecurity Index, alongside Fiji and Afghanistan. The government has now begun developing a national cybersecurity strategy, and has created a cyber incident response team. However, it is vital for human capacity in this space to be developed, together with the adoption of relevant measures across businesses and governments.

Measures to boost the availability of digital skills in Bhutan will need to be underpinned with broader improvements in digital infrastructure, including connectivity to homes and educational institutions to better support both learning and teaching. Engagement with the local and international private sectors will be necessary to identify and close gaps between those skills developed in the education system and those in demand by the private sector. Programs to increase overall female enrolment rates in STEM subjects are sorely needed, but so too are broader public campaigns aimed at families and communities.

Finally, the government should put into place a standardized system for recognizing, evaluating, and establishing equivalency between the various types of educational qualifications.

Policy Recommendations

Based on the analysis above, the following table sets out several high priority policy recommendations for the development of the digital economy in Bhutan.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Reduce the costs of rolling out broadband networks (particularly last mile fiber optic networks), through cross-sector infrastructure sharing or Fixed Wireless Access (FWA) technologies Set up a third international gateway to improve the affordability and reliability of internet connectivity 	<ul style="list-style-type: none"> Set up mechanisms to monitor spectrum and quality of service Define targeted universal service programs to close access gaps, including gaps in USF funding Add missing optical fiber loops to improve overall network reliability
Platforms	<ul style="list-style-type: none"> Implement a national foundational digital identification system, which is integrated with both public and private service providers Develop the shared systems and platforms that could form the backbone of service delivery in the country, operating in a secure, unified, and interoperable manner 	<ul style="list-style-type: none"> Re-engineer processes and services and boost the capabilities of public organizations to take advantage of the digital opportunity for service delivery, including through digital financial services Explore the possibility of private sector investment in cloud computing data centers, and in so doing, consider the availability of low cost green hydro power and favorable climatic conditions
Financial services	<ul style="list-style-type: none"> Digitize government payments through GIFT (e.g., salary, payments, tax, fines, etc.) Enable e-commerce transactions through the acceptance of international card payments via payment gateways Increase the interoperability of systems and services 	<ul style="list-style-type: none"> Integrate financial services with e-services, including integrating banking systems with civil registration ID databases Educate people on digital financial services (knowledge and skills), with a special focus on ensuring the inclusion of women and women entrepreneurs
Businesses	<ul style="list-style-type: none"> Create a conducive environment for digital businesses to grow through the use of a consultative process for businesses to engage with government in the development of regulatory frameworks Revise licensing and incorporation procedures, provide training on taxation and accounting standards, and harmonize government databases to increase tax compliance and reduce regulatory burdens 	<ul style="list-style-type: none"> Promote digital financial services, improvements in connectivity, and availability of a skilled workforce, in order to support digital innovation
Skills	<ul style="list-style-type: none"> Improve engagement with the local and international private sector to identify and close gaps between the skills imparted by the education system and those in demand by the private sector Develop systems to recognize and standardize diverse types of qualifications 	<ul style="list-style-type: none"> Adopt measures to broadly improve digital infrastructure, including connectivity to homes and educational institutions, and improve the data infrastructure that supports learning and teaching Launch broad-based initiatives to promote high-end and advanced digital skills in education as well as the TVET sector, including programs to increase overall female enrolment rates in STEM subjects

Pillar	Short-term	Medium- to long-term
Trust	<ul style="list-style-type: none"> Establish customer protection guidelines and dispute redressal mechanisms specifically targeting electronic commerce and online payments Develop a robust personal data protection law 	<ul style="list-style-type: none"> Continue improvements in connectivity and the trust ecosystem—ensuring secure transactions with appropriate protection of personal data—to boost use of financial services, and online government services Increase knowledge and awareness among individuals, businesses, and the public sector on cybersecurity risks and response measures

India

Digital technologies are reshaping our global economy, permeating every sector and aspect of daily life. Its impact can be seen in how we learn and work, our social and economic interactions, and how people, businesses, and governments access and provide information, services, and markets. In 2016, the global digital economy was worth approximately US\$11.5 trillion; this was equivalent to 15.5 percent of global GDP. It is expected to increase to 25 percent in less than a decade, outpacing the overall economy's growth. The COVID-19 pandemic and its related restrictions on mobility and social interactions have underscored how digital technologies can support learning, business and trade, government operations continuity, and citizen service delivery. Strategic use of digital technologies, especially for emerging countries like India, can not only expedite the economic recovery post the pandemic, but also make the economy more resilient and buoyant in the longer term.

India's growing digital profile

The digital ecosystem in India has grown significantly over the last few years. Internet users in the country have grown 260 percent to 833 million in June 2021, from 319 million in June 2015⁹⁸. Easy and affordable access to internet covering the majority of the population, coupled with concerted initiatives of the government and private sector has led to improved digital service delivery in the country.

More than 4,000 e-government services across the country witness about 270 million e-transactions every day⁹⁹. With the success of Aadhar (digital platform for unique citizen identities) and UPI (Unified Payments Interface for real time money transfers), there is an increased thrust by the government to invest in sectoral platforms, strengthening G2C, G2B and G2G interactions. Several such platforms viz. Cowin (for COVID Vaccinations), Ayushman Bharat (healthcare), DIKSHA (for education and teacher training), GSTN (Tax), GeM (public procurement), UMANG (e-Gov services), etc. have already been implemented successfully and several other digital public platforms are being planned.

Private enterprises and start-ups have also brought in new and innovative digital solutions which are now part of everyday economic activities in the country. For instance, India's e-Commerce sector is already sized at USD 46 billion in 2020 and is expected to grow to USD 111 billion by 2025. India has been a dominant player in the global IT—ITeS sector with revenues of USD 191 billion in 2019-20, accounting for ~ 55% of the global service sourcing market¹⁰⁰. India has the third highest numbers of unicorns, 72, behind only US and China¹⁰¹, and provides a fertile ground for many more digital startups.

Digital economy opportunities for India

The GoI published a report in 2019 highlighting the potential for economic value addition of USD 1 Trillion through concerted digital interventions across sectors and recently chalked out a 1,000-day plan to realize this potential¹⁰². The initiative focusses on bringing coherence into digital governance, simplify rules and regulations for technology led innovation, and focus on building India's high-tech prowess. New age technologies like AI, Cyber Security, Super Computing, Semiconductor designing, Blockchain, and Quantum Computing have been identified as focus areas by the government.

⁹⁸ TRAI Performance Indicator Reports for quarter ending June 2015 and June 2021; EY analysis

⁹⁹ <https://etaal.gov.in/etaal2/auth/centralchart.aspx> - based on data for September 2021

¹⁰⁰ <https://timesofindia.indiatimes.com/readersblog/youth2020/how-the-it-industry-is-shaping-the-future-of-india-36519/>

¹⁰¹ <https://www.ventureintelligence.com/Indian-Unicorn-Tracker.php> as of 10th November 2021; https://www.business-standard.com/article/companies/india-added-three-unicorns-per-month-in-2021-hurun-report-121090200848_1.html

¹⁰² <https://economictimes.indiatimes.com/tech/information-tech/meity-has-a-1000-day-plan-for-a-1-trillion-digital-economy/articleshow/86469206.cms>

India's mature IT sector as well as its large youth population base provides India a great opportunity to address important cross-cutting themes to accelerate its digital economy. These include (a) improving *socio-economic inclusion* through digital means and addressing concerns around affordability, digital literacy and awareness to ensure equitable access to opportunities for all; (b) *bridging implementation divides* across sectors and levels of government, reducing the gaps in digitization across states, in key sectors such as education and healthcare and by leveraging the private sector to a greater extent, as well as building on the India Stack platform to further intensify the adoption and usage of digital financial services; and (c) updating policy and regulatory frameworks and institutional capacity to *enable investment and promote innovation* and to *strengthen the trust environment*.

Key findings

Digital Infrastructure

With more than 1.2 billion telecom subscribers and more than 830 million internet subscribers¹⁰³, India hosts the second largest telecom market in the world. Between June 2015 and June 2021, the number of internet users per 100 population has grown 2.4 times from 25.3 to 61 (interestingly, growth in rural internet usage has been higher than in the urban areas, as user per 100 population in rural areas grew almost 2.9 times from 13 to 38 during this period). This growth has been fueled by mobile based services, whilst India's fixed broadband penetration remains behind its peers. As of 2020, fixed broadband subscriptions per 100 people was at 1.61 percent, lagging several lower-middle-income countries (e.g., Indonesia at 3.9, Kyrgyz Rep. at 4.2, Bangladesh at 5.8, and Vietnam at 17.2). Only a third of the telecom towers have an optical fiber backhaul, which considerably limits the capacity to meet growing bandwidth needs of the consumers and will impact India's ability to leverage next generation high bandwidth services like 5G. The National Broadband Mission seeks internet accessibility and overcoming low fixed broadband adoption by addressing high infrastructure deployment cost, lack of tower fiberization, dominance of mobile connectivity, and lack of access to broadband networks, especially in rural areas. However, implementation delays in the execution of large initiatives (such as the BharatNet national fiber optic backbone) and low utilization of the universal service fund (about half of available funds disbursed) have also delayed improvements.

A litigation-prone legal and regulatory framework has remained a key concern of the industry players, hindering investments to strengthen the underlying digital infrastructure. High spectrum auction reserve prices, high levies and taxes and complex approval processes have further constrained the development of the sector. The institutional framework for telecommunications can also be streamlined; various agencies have responsibilities over related regulatory functions and programs. Whilst the government has from time to time notified various policies to address the challenges of the sector—viz. the National Digital Communications Policy 2018, the National Broadband Mission, and other such initiatives—on ground implementation of these policy recommendations have remained muted.

India can boost access to affordable, inclusive, and secure broadband networks and services through a mix of measures, including: (1) acceleration of major digital infrastructure projects such as optical fibre connectivity to all villages and telecom towers; (2) simplification and improved coordination of rights-of-way and infrastructure sharing across levels of government; (3) defining a policy framework that streamlines institutional responsibilities, aiming to maximize private investment and competition; and (4) design and implementation of innovative universal service

¹⁰³ TRAI Performance Indicator Report for quarter ending June 2021

programs to bridge access, affordability, and adoption gaps—with a focus on lower-income and rural users—drawing on international good practices and local innovation.

Digital Public Platforms

The Government has been focusing over the past decades on building India's digital ecosystem—a concept known as the “India Stack”—to enable presence-less, paperless, cashless, and data-driven service delivery by linking these and other platforms through open standards and open interfaces. These initiatives have contributed to India improving in various global indicators and position itself as a leader in digital public platforms among developing countries and within South Asia. These public platforms have also helped immensely in mitigating the adverse impact of COVID by ensuring continued public service delivery and seamless implementation of social welfare schemes.

Digital public platforms have also helped the government increase efficiency across its processes, resulting in significant monetary gains. For instance, Direct Benefits Transfer, which enabled direct transfer of benefits across multiple schemes through digital means and addressed leakages in the systems by leveraging Aadhaar, have resulted in cumulative savings of INR 1,780 billion to the public exchequer up to March 2020¹⁰⁴. Similarly, public procurement through GeM has enabled savings of INR 100 billion over the last five years¹⁰⁵.

With the intention of maximizing potential benefits and optimizing investment, the government aims to create more digital public platforms addressing specific concerns of each of the sectors, implementing a converged digitization across various central government ministries/ departments, states, and local government bodies. This shall address existing challenges like duplication and ad-hoc implementations; subdued adoption of government interoperability frameworks; limited process re-engineering leading to digitization of inefficient manual processes; existence of multiple legacy systems; and limited collaboration across various government agencies. In addition, it may enable effective and responsible use and re-use of data, which at present remains a key challenge, with the absence of a comprehensive data protection framework to provide safeguards and guardrails.

India's digital public platforms and the resulting service delivery can be strengthened through: (1) being intentional about universal inclusion and accessibility of digital public platforms, especially for the most vulnerable sections of society, and imbibe human centered design, local language support and use emerging technologies as key principles; (2) building on the India Stack as a foundation for use cases and services across all sectors and at both central and state-levels; and (3) promoting greater trust and secure data sharing by developing a comprehensive data protection and data exchange layer, including operationalization of the Data Empowerment and Protection Architecture (DEPA) layer of the India Stack, as well as using techno-legal interventions to enable fully online digital government transactions, learning from digital government world leaders such as Australia, Denmark, Estonia, South Korea, and Singapore.

Digital Financial Services

India has a dynamic and fast-paced environment and is emerging as a hotbed of innovation for digital financial services at a large scale. The COVID-19 pandemic further fast-tracked digital transformation of the payment's ecosystem in India. Overall, the total digital transactions volume in the financial

¹⁰⁴ <https://dbtbharat.gov.in/estimatedgain>

¹⁰⁵ <https://www.thehindu.com/business/centre-saved-10-in-cost-via-gem-purchase/article35825831.ece>

year 2020-2021 stood at 43.71 billion transactions (worth more than a quadrillion Indian rupee) as opposed to 34.12 billion in 2019-20. The National Payments Corporation of India (NPCI), founded as an initiative by the Reserve Bank of India and the Indian Banks' Association, provides the crucial infrastructure for several payment systems. Among those are the highly used Unified Payments Interface (UPI), supported by over 261 banks, with monthly transactions crossing 4 billion by volume in October 2021¹⁰⁶, the card scheme RuPay and the recently launched voucher based digital payment system- e-Rupi.

The Government has striven to ensure basic banking for all through initiatives such as the Jan Dhan Yojana (JDY), opening millions of new “zero-balance” bank accounts and implementing direct benefit transfers to such accounts. The Government currently channels 433 schemes from across 56 ministries with more than 75 million JDY accounts receiving such transfers. Even so, 190 million people remain unbanked and do not have bank accounts nor participate in any formal financial institution.

In parallel, India's FinTech ecosystem has seen tremendous growth over the last few years, making it one of the largest and fastest-growing FinTech markets. India has produced 16 FinTech start-ups as of June 2021, which rapidly reached billion-dollar valuations. FinTechs are providing digital solutions, channels and easier onboarding processes remotely through new forms of KYC, such as Aadhaar-enabled KYC using biometrics, One-Time-Password (OTP) delivered to the Aadhaar-registered mobile numbers, and Video KYC across the sector including payments, banking, insurance, credit, stock and mutual fund trading and pensions, thereby further expanding the reach of digital financial services.

India's digital lending market has grown tremendously in the past few years to serve the large financing gap across retail and MSME. According to Experian data¹⁰⁷, India's retail digital lending space reached more than \$150 billion in size by 2020, and it is projected to reach \$350 billion by 2023. FinTech players are working towards developing AI and big data based alternate credit models to enable lending to more marginalized customers. In addition to that, Buy-now Pay Later is emerging as the fastest-growing e-commerce digital payment method in India and is estimated to capture 9% of the total e-commerce share market by 2024¹⁰⁸. In line with open-banking principles and data privacy and robust consent driven frameworks, the Account Aggregator model is set to enable lower lending-costs based on aggregation of borrower-controlled data. The Open Credit Enablement Network (OCEN), along with the Account Aggregator model are set to democratize credit. The RBI has initiated a digital platform- TReDS, to facilitate MSMEs by financing their trade receivables.

Yet, India lacks the infrastructure to make the transition to a “less-cash” society. Amongst the barriers to greater penetration of digital financial services, the foremost is the low level of digital and financial literacy, which characterizes a large portion of the low-income population. Other challenges include lack of acceptance infrastructure by vendors and businesses especially in rural areas. Innovation might be held back by the existence of several regulators / quasi-regulatory bodies governing different segments of the financial sector, with their own policy and guidelines. With a boost, DFS can play a significant role in promoting the “National Strategy for Financial Inclusion for India 2019-2024 (NSFI)” that serves as a guide to financial inclusion initiatives in India. Apart from inclusion, another issue that will need additional attention is cybersecurity. India has seen cyberattacks on its financial sector, which has created substantial business disruptions leading to reputational damage and financial instability.

¹⁰⁶ <https://www.npci.org.in/what-we-do/upi/product-statistics>

¹⁰⁷ <https://static.investindia.gov.in/2021-06/Experian-Invest%20>

¹⁰⁸ [Home | Global Payments Report 2021](#)

India can support more inclusive, secure, and innovative DFS through a range of measures, including: (1) increasing digital and financial literacy through awareness campaigns targeting semi-organized / organized collectives and local-self-government organizations; (2) expanding the acceptance and prevalence of digital payments, including through the introduction of low-cost payment solutions built on the current payments stack and leveraging open protocols to expand ecosystems; and (3) simplifying multi-regulator interfaces for DFS and FinTech innovations through a single-window approach.

Digital Businesses

Digital businesses in India can be divided into two categories, each with its own distinct characteristics: (a) digital start-ups and (b) established digital businesses. The growth and sustainability of digital start-ups rely on a widespread yet closely knit entrepreneurship ecosystem and venture capital financing, which enables the entrepreneurs to turn ideas into viable new businesses and scale fast. As of November 2021, there were more than 58,726¹⁰⁹ Government-registered start-ups in India across various sectors and 72 unicorns¹¹⁰.

India's start-up ecosystem has benefited from a confluence of factors: increasing entrepreneurial activity given a ready pool of talent with advanced education and notable experience in working at successful digital start-ups in India and abroad, several incubator and accelerator programs led by investors and the private sector, and the increasing attention of global investors. For instance, Accel launched Accel Atoms to provide non-dilutive capital and 1:1 mentoring in order to extend incubation support. At the same time, India's entrepreneurs are still constrained by factors that have underpinned the persisting digital divide in the country: a shortage of skills, poor infrastructure, and low internet adoption limiting their reach within the country.

However, many start-ups register abroad to avoid complex regulations in the country or to benefit from market access; Indian digital businesses have so far been unable to target global markets and remain focused on Indian and South Asian markets, barring the exceptions of the IT or ITES industry, which largely caters to global banking and financial firms. As of today, less than 10 percent of Indian MSMEs have access to digital marketplaces or e-commerce platforms pointing towards a significant potential for these businesses to increase their customer base through online platforms. Uncertainties around policy and regulations for e-commerce, taxi-aggregators, FinTech, and other sectors create a difficult environment for both domestic and foreign digital businesses.

Another factor limiting the growth of digital businesses in India is the lack of trust between market actors. Digital businesses and transactions require a level of trust enabled by a transparent regulatory environment regarding contract enforceability, reliable legal recourse in case of fraud, e-transactions, e-signatures, taxation, among other. Additionally, India has not defined a national regulatory authority for personal data protection, which limits the trust between individuals and businesses regarding the use of personal data. Relatedly, cybersecurity remains a concern with the increasing digitization of sectors while capacity for securing systems, data, and networks remain limited. These enabling factors remain weak in the country. Finally, gender imbalances within the venture capital and private equity space act as a key inhibitor for women-led technology start-ups in India and perpetuates the digital gender gap. According to IFC research, women comprise only 7 percent of senior investment

¹⁰⁹ <https://www.startupindia.gov.in/>

¹¹⁰ <https://www.ventureintelligence.com/Indian-Unicorn-Tracker.php>

professionals across private equity and venture capital in South Asia, of which 95 percent are from India.³

India could capitalize on its visible position globally to accelerate its digital businesses while also supporting a broader-based digitization of established businesses. It could consider measures such as: (1) improving public-private dialogue on regulatory changes for digital entrepreneurs and businesses to streamline processes across states and promote trust within the ecosystem; (2) incentivising digitization in small and medium businesses through targeted programs; (3) defining and implementing programs to create a conducive, gender-sensitive environment for women entrepreneurs; (4) creating an institutional mechanism to support Indian entrepreneurs and business to operate across global intellectual property regimes; and (5) accelerating data protection and cybersecurity policies, empowering institutions to build trust in the digital economy.

Digital Skills

India is making progress in digital transformation across all sectors, which is expected to boost the demand for digital skills in the country. However, available comparators are not very encouraging. India ranked 59th on 'Digital/Technological Skills' out of the 64 countries in IMD World Digital Competitiveness Ranking, 2021. The Network Readiness Index (NRI) assesses how countries are ready to leverage information technologies to be future-ready. NRI ranked India 56th on ICT Skills.

India's future demand for skills will likely grow from 1.2-1.3 million in 2020 to 3.5-3.7 million in 2024. About 77 percent of the CEOs in a CEO Survey by NASSCOM in 2019 mentioned a lack of digital capabilities and skills among the top three risks that can hinder the IT-ITES industry's growth. NASSCOM estimates that more than 70 percent of the talent available in IT services across the globe comes from India. Hence, a significant revamp of the present digital skill supply scenario is needed to meet future demand. There is evidence indicating that there is a gap between education and employment, while also pointing to gender and location divides.

Whilst the government provides skill training and recognition to about 10 million individuals annually, this covers less than 2 percent of India's working-age population and appears inadequate in scale to meet anticipated demand. From the lens of gender inclusion, at the undergraduate level, only 32 percent of graduates in engineering and technology subjects are females. At the workplace, women comprise only one-third of the IT-ITES sector, with a heavy bias towards entry-level jobs.

The government has sought to enhance school and TVET education to include digital skills with a range of programs, for example, to promote the connectivity of schools and to boost adoption of online learning. Besides, about 30 central ministries, state departments, public or private institutions impart short-term skilling, but there is a lack of synergy and convergence in these efforts and often weak links between industry needs and training programs. Further, COVID-led disruption of physical learning has created an opportunity to expedite digital adoption. In the short to medium term, this can be fostered by creating a unified, digital skilling platform for learners and creating a capacity to train the workforce in intermediate and high-level IT skills.

To boost the digital skills base broadly while increasing the talent pool available for the digital industries, India could: (1) coordinate or even unify the various platforms and programs to create a one-stop digital learning point accessible for learners of all age; (2) create the capacity to train the workforce in intermediate and advanced IT skills in line with market demand; and (3) invest in training-of-trainers to enhance their digital skills.

Trust Environment

With data becoming borderless and freely accessible, India is facing challenges of data privacy management and weak data regulation. While the right to privacy is a fundamental right under Article 21 of the Constitution of India, the Personal Data Protection Bill, which would be India's first law on personal data protection, is still under discussion in the parliament. Moreover, in the absence of a national regulatory authority for personal data protection, Adjudicating Officers provisioned by the IT Act currently evaluate cyber incidents. However, when it comes to data protection, the execution of this mechanism on the ground has been inadequate.

In recent times, due to a surge in digital interactions, India experienced an increase in the number of cyber-attacks. Lack of cyber awareness and gap in cyber skill-building programs along with public responsiveness are the key contributing factors.

To combat this risk of cyber-attacks, it is required for India to be ahead of the curve: (1) put in place robust governance systems with the help of established centers such as the Defence Cyber Agency, the Indian Cybercrime Coordination Centre, and the Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre), which are already making efforts towards India being more cyber secure. (2) Promote the Cyber Surakshit Bharat Program to spread awareness about cybercrime and strengthen cyber capacity. It is the first public-private partnership (PPP) of its kind and expected to take advantage of the IT industry's cybersecurity expertise.

Opportunities to Empower Women

The digital gender divide, broadly defined as the gender gap in the access, use, and ownership of digital technologies, is prevalent across developed and developing economies. However, the disparity between men and women is not limited to merely access to ICT resources. The digital gender divide extends to digital skills, representation of women in ICT jobs and careers, the share of women-owned businesses in the technology sphere, adolescents pursuing education in STEM fields, women's participation, and uptake of digital governance, and more. Even as India takes strides towards a digital society, internet access remains inequitable in the country. NFHS 5 (Fifth National Family and Health Survey) data shows that only 42.6 percent of women have ever used the internet compared to 62.16 percent of men. Examining the barriers shows that lack of technical know-how to access the internet and reading or writing challenges emerge as top detriments to women's access to and usage of the internet. While India has closed gender gaps at the primary and secondary school levels, the absence of gender-disaggregated data to analyze the uptake of science and mathematics at the secondary level is a challenge. At the tertiary level, stark differences arise in technology and engineering.¹¹¹

Nearly 78 percent of women in India are now financially included via a digitally enabled account, bringing the gender gap to only four percentage points¹¹². However, only 27 percent of women used digital payments or transfers compared to 35 percent of men in 2018¹¹³. Financial autonomy and digital literacy have emerged as the main factors impeding women from using digital financial services in the country. Data also shows that female entrepreneurial activity is on the decline in India, and participation remains limited to non-digital sectors.

Similarly, the Aadhaar program has been instrumental in bringing a large section of historically excluded groups, including women, under the coverage of a national identity system. Further, while there is scope

¹¹¹ MHRD (2019), AISHE 2018-19

¹¹² Wave 6 Report: Sixth Annual FII Tracker Survey, Intermedia & BMGF, May 2019

¹¹³ Wave 6 Report: Sixth Annual FII Tracker Survey, Intermedia & BMGF, May 2019

for greater inclusion of women through gender-friendly service delivery, certain initiatives such as *Mahila e-haat*, *Mobile Academy*, *She-Box* have demonstrated the potential for good practices for overall service delivery.

Women's exacerbated vulnerabilities stemming from the rising threat of online gender-based violence is an emerging area of concern. As per NCRB data, the number of cybercrimes against women in 2020 amounted to 10,405¹¹⁴, significantly increasing from 8,379 reported in 2019¹¹⁵. To empower the women of digital India: (1) There is a need to collect sex-disaggregated data of the beneficiaries and establish gender-specific targets. (2) There is a need for a robust legal and policy framework that evolves in tandem with the changes in the nature and level of threat that women face online (3) Provide an impetus to the concerted efforts to enhance the female entrepreneurial ecosystem, especially in the technology space, by way of supportive policy and enabling regulations, such as the National Policy on Skill Development and Entrepreneurship 2015.

Policy recommendations

Based on the analysis, the report suggests the following high-priority policy recommendations for developing the digital economy in India.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Accelerate major digital infrastructure backbone projects such as BharatNet to enhance optical fibre connectivity across rural areas and fiberisation of telecom towers Simplify and improve coordination of rights-of-way and infrastructure sharing across levels of government 	<ul style="list-style-type: none"> Define a policy framework to minimize regional differences, enabling equal and timely 5G access to the consumers, through maximization of private investment and competition Design and implement innovative universal service programs to bridge access, affordability, and adoption gaps—with a focus on lower-income and rural users—drawing on international good practices and local innovation
Public Platforms	<ul style="list-style-type: none"> Be intentional about universal inclusion and accessibility of digital public platforms Build on the India Stack as a foundation for use cases and services across all sectors 	<ul style="list-style-type: none"> Promote greater trust and secure data sharing by developing a comprehensive data protection and data exchange platform and techno-legal interventions to enable fully online digital government transactions
Financial services	<ul style="list-style-type: none"> Expand the acceptance and prevalence of digital payments, including through the introduction of low-cost payment solutions built on the current payments stack and leveraging open protocols to expand ecosystems 	<ul style="list-style-type: none"> Increase digital and financial literacy through awareness campaigns targeting semi-organized / organized collectives and local-self-government organizations Simplify multi-regulator interfaces for DFS and FinTech innovations through a single-window approach
Businesses	<ul style="list-style-type: none"> Improve public-private dialogue on regulatory changes for digital entrepreneurs and businesses to streamline processes across states and promote trust within the ecosystem 	<ul style="list-style-type: none"> Create an institutional mechanism to support Indian entrepreneurs and business to operate across global Intellectual Property regimes Define and implement programs to create a conducive, gender-sensitive environment for women in the field in partnership with industry and civil-society Enable digitization in small and medium businesses through targeted programs

¹¹⁴ [CII 2020 Volume 2.pdf \(ncrb.gov.in\)](#)

¹¹⁵ [CII 2019 Volume 2.pdf \(ncrb.gov.in\)](#)

Pillar	Short-term	Medium- to long-term
Skills	<ul style="list-style-type: none"> • Create the capacity to train the workforce in intermediate and advanced IT skills in line with market demand • Invest in training-of-trainers to enhance their digital skills 	<ul style="list-style-type: none"> • Coordinate or even unify the various platforms and programs to create a one-stop-learning point accessible for learners of all age
Trust	<ul style="list-style-type: none"> • Accelerate policy incentives and/or create platforms for improved financial data sharing in a secure and protected manner 	<ul style="list-style-type: none"> • Accelerate data protection and cybersecurity policies and regulations as they apply to businesses, and establish relevant institutions to build trust in the digital economy
Gender	<ul style="list-style-type: none"> • There is a need for increased focus on and investment in public education and digital literacy programs that enhance women and girls' mobile digital literacy and confidence. • Collaboration with the private sector and international development community to support digital literacy training are also likely to lead to women's greater uptake of digital technologies. 	<ul style="list-style-type: none"> • It is crucial to provide a preventive approach to a robust legal and policy framework that explicitly identifies online gender-based violence and its detrimental impact, including harassment that does not specifically have a sexual nature. Such recognition will likely allow for greater sensitization within the institutional response framework, thereby making it a more conducive environment for women.

Implementation Approach

A tiered governance and administrative structure to ensure coherence and collaboration across all ministries/ departments of the Central government, various State governments and local governing bodies is a key imperative to fast-track India's digital economy goals. Therefore, the following governance structure is proposed:

- **Digital Economy Council:** The apex body under the Chairmanship of Prime Minister of India. Key central ministries (represented by their ministers) including Ministry of Finance (Dept. of Economic Affairs), Ministry of Electronics and IT, Ministry of Communications, Ministry of Skill Development and Entrepreneurship, Ministry of Commerce and Industry, NITI Aayog and other pertinent ministries as may be deemed necessary
- **Empowered Group of Secretaries:** Headed by the Cabinet Secretary and represented by Secretaries from the above ministries and other secretaries to be co-opted based on the relevance of the initiatives as may be planned. Eminent industry leaders may be invited as necessary for their inputs
- **Nodal Institution for Monitoring:** Responsible for monitoring and enabling Digital Economy initiatives. May be created as an entity under Cabinet Secretariat or under the aegis of NITI Aayog, and shall coordinate with the key stakeholders—Ministries, States and Industry
- A 'Digital Economy Fund' may be created and institutionalized, which may be utilized for undertaking specific programs designed for expediting the digital economy goals of India.

Maldives

The government of Maldives is looking towards digital transformation as an important enabler of broader economic growth and social development. The 2019-2023 Strategic Action Plan (SAP) outlines five policy priorities for the country's digital transformation: (1) modernize the governance mechanism of the ICT sector to prepare for a digital economy, (2) establish digital infrastructure, platforms and ecosystems capable of providing ICT solutions that are more efficient, secure and consistent, (3) modernize government services through digitalization for data-driven policy making and efficient delivery of information and services, (4) encourage digital innovation and create a conducive environment for businesses to thrive in a digital economy, and (5) develop a digital-ready workforce and build human capacity in the ICT industry. These themes cover much of the foundations for a digital economy and would set the country up for broad-based digital development. In the wake of the COVID-19 pandemic, the updated SAP also recognizes ICT as a key enabler for decentralizing government, achieving economic diversification and building resilience against future disasters.

The first phase of the digital revolution in Maldives has yielded commendable results, but there is still more work to be done. Over 60 percent of the population now uses the Internet, more and more businesses are adopting digital technologies, and the deployment and use of digital government services is on the rise. This is a remarkable improvement from 2006 when only a tenth of the population used the Internet. The COVID-19 pandemic accelerated digitalization as people, businesses and government agencies had to switch to online tools and platforms. The Maldives can benefit from the wider sustained use of digital technologies as it seeks to decentralize its economy, extend access to public services in the outer atolls, and diversify its economy. At present, there are still large gaps in digital technology adoption across groups, based on location and level of education. For instance, while 83 percent of households in the capital Malé have access to fixed broadband services, only 51 percent of households in the atolls have access. Fixed broadband connections in Malé are twice as fast as those in the atolls. Similarly, while many larger businesses have digitized, only a few small and medium-sized enterprises have adopted digital technologies. There is also ample room for improvement in the adoption of e-government services.

Maldives needs to address some cross-cutting bottlenecks to further develop its digital economy. In particular, the government should consider taking action to (i) *ensure that the digital economy is inclusive* for all, regardless of age, geography, gender, and socio-demographic status, through proper access to digital tools and services, (ii) *put into place a coordinated institutional strategy* for digitizing public services across agencies and levels of government and (iii) *develop digital capacities*, not only basic digital literacy, but also digital innovation and entrepreneurship skills, so that businesses and individuals alike can reap the benefits of the digital economy while mitigating its risks.

Key Findings

Digital Infrastructure

Maldives is ahead of other countries in the South Asian region when it comes to digital connectivity. In 2019, 63 percent of the population, and 60 percent of households, used the Internet. Still, large adoption and usage gaps persist across groups, depending on location and level of education. Preliminary estimates from the 2019 Household Income and Expenditure Survey (HIES) indicate that 83 percent of households in Malé have access to fixed broadband services, compared to 51 percent of

households in the atolls. Moreover, Internet users in Malé enjoy average download speeds (for fixed broadband connections) that are twice as fast as those in the atolls. The uptake of fixed broadband services is relatively low for the country's income level and lower than the average for upper-middle income countries. The high price of services is likely a major deterrent: the price of a monthly subscription for an entry-level fixed broadband plan is about 3.1 percent of per capita income. At the nationally defined poverty line (MVR 74), the cost of an entry level mobile broadband is about a fifth of average monthly income and a similar fixed broadband connection costs a third of that income. Prices are especially high relative to the quality of services that users receive; in January 2021, the average download speed in Maldives was 24.5 megabits per second (Mbit/s), slower than both Bangladesh (33.5 Mbit/s) and India (54.7 Mbit/s). By contrast, advanced economies are actively rolling out ultrafast broadband Internet at speeds over 100 Mbit/s. It would seem that high-quality Internet services are still out of reach for many Maldivians.

Geography is in part to blame for challenges relating to affordability. The Maldives is a small island state and as such, is a price-taker for international connectivity. These high prices in the upstream market segment naturally influence downstream retail prices. In addition, the distribution of the population across the atolls means that some locations are not commercially viable for high-capacity network connectivity, leading to higher unit prices and weakening the base for advanced digital services. For instance, less than 10 of the larger islands are connected with fiber optic cable networks. Even though these islands are home to a majority of the country's population, gaps in infrastructure hinder the quality of connectivity in outer islands that are already at risk of falling behind in access to markets, information, or services. Moreover, gaps in the enabling regulatory environment compound the challenges related to geography. Maldives has a duopoly of service providers and a nascent regulatory framework that is only partially developed. For example, the competition policy framework is not yet fully defined. This does little to encourage service providers to innovate, invest, or roll out inclusive services.

Further investment in digital infrastructure is needed to ensure equitable access to affordable, secure and reliable high-speed Internet services. The government plays an important role in creating an enabling environment that facilitates such investments and stimulates competition. To this end, the government should prepare and adopt a national broadband strategy in a consultative manner, elaborating on the themes contained in the Strategic Action Plan and defining specific targets and action plans to realize affordable and universal broadband access. The Action Plan should (i) define policy reforms and regulatory measures to foster competitive pressure with the aim of improving the affordability, coverage and quality of services, (ii) build the capacity of the regulatory authority to define and enforce regulations on competition and resource management (e.g., radio spectrum), and (iii) define competitively neutral approaches to mobilize private capital to connect the outer islands, and boost the overall availability of fixed broadband services.

Digital Platforms

The government has established several digital public platforms to improve access to services for citizens and residents, including an online identity management solution, a business portal, a job center portal, and other government services. The government plans to expand the digital identity infrastructure to enable digital signatures in the public and private sectors. The COVID-19 pandemic required the deployment of various information management systems as well as an online education portal. The experience has been mixed and gaps were observed, for instance in healthcare worker and

teacher preparedness.¹¹⁶ The pandemic has laid bare the need to increase access to health services (for instance via telemedicine services) and to improve the use of data and digital tools in disaster management. For these efforts to be effective, digital systems and data should be made interoperable across key ministries and agencies involved in disaster risk management, as well as across national government and local councils. To this end, the government plans to build a universal technology stack and establish regional data centers in the North and the South. However, international benchmarking suggests that there is ample room for growth in the adoption of e-government services in Maldives: the UN E-Government Development Index 2020 ranks Maldives 105th among 193 countries on e-government development, behind several South Asian countries (e.g. India, Bhutan).

Three broad weaknesses have been identified. First, the legal and regulatory frameworks to promote digital government and e-commerce are underdeveloped. For example, there is no legislation in place for electronic transactions, privacy, data protection, or cybercrime. This creates significant vulnerabilities to cyber-attacks. Second, leadership of the digital government agenda is unclear, with multiple actors involved. Core infrastructures and shared services are also missing. The government of the Maldives should consider a shift towards a ‘whole-of-government’ approach involving all relevant stakeholders. The aim should be to decentralize the provision of key public services and government functions, while ensuring interoperability and system integration. Third, there seems to be a lack of ICT skills among public sector staff, which may be having an impact on the usage and adoption of existing ICT solutions in government. This may also result in the public sector not being digitally ready, and ultimately delay the rollout of digital government platforms.

Developing the foundations of a digital economy will require improving public and private platforms in the country. The government of Maldives should consider taking the following actions: (i) defining clear responsibilities and mandates for various government agencies, preferably with an integrated, institutional governance framework for digital transformation, (ii) defining a digital government policy that outlines a clear roadmap for the government’s digital transformation efforts, (iii) strengthening the legal and regulatory framework for public service delivery and private platforms and (iv) creating core infrastructures (e.g., national government cloud), services (e.g., a single and universal identification), and skills for public service delivery.

Digital Financial Services

Digital financial Services (DFS) have grown rapidly in the Maldives in recent years, with many private service providers—including banks and telecommunications companies—introducing electronic payments and mobile money services. According to the 2018 World Bank Findex Survey, a quarter of adults in Maldives have a mobile money account and 68 percent of adults reported making or receiving digital payments. This is higher than in other South Asian economies. The use of digital payments in the country is on par with China and Malaysia. Mobile payment service providers now have over 700 agents and merchants in more than half of all inhabited islands, including in over 70 islands that do not have commercial bank branches or ATMs. Public services have also embraced digital payments for the collection of various fees and charges. Given Maldives’ widely dispersed population, it is difficult to physically provide financial services to all residents and DFS has therefore gone a long way in improving financial inclusion in the country. However, some important gaps and challenges persist. The national payments system does not currently support instant digital payments or money transfers between different entities. Key systems such as the Real Time Gross Settlement System (RTGS) and Automated Clearing House (ACH) system are not fully integrated with the internal core banking system of all

¹¹⁶ Moosa S, Ibrahim A, Usman SK. Social sector experience during the COVID-19 pandemic's lockdown in the Maldives. Maldives: The Maldives National University, 2021.

participating banks, limiting the number of real-time transactions. Many transactions still need to be done in person, which is inadvisable during a global pandemic. The country also lacks interoperability at various points in the financial value chain, for instance at points of sale or ATMs. The absence of integrated and real-time payment settlements is a major bottleneck in the development of e-commerce, fintech and other online services solutions. As a result, most e-commerce activities have thus far been limited to cash-on-delivery mode, rather than electronic payments. The absence of a local card payment switch also results in transactions being sent offshore for processing, at increased cost.

Efforts are underway to implement a nationwide instant payments system, sometime in late 2021. Maldives does not have a Cyber-Emergency Response Team (CERT) or a sectoral institution governing the country's financial sector. This makes it difficult to identify sector-specific threats and for market players to share knowledge, experience and know-how. The absence of national cybercrime legislation also means that cybercrime within the financial service sector cannot be easily prosecuted. Maldives was ranked last (175th) with a score of 0.004 in the 2018 Global Cybersecurity Index.¹¹⁷ This is lower than South Asian countries such as India (47th), Bangladesh (78th), Sri Lanka (84th), Pakistan (94th), Nepal (109th), Bhutan (125th) and Afghanistan (126th). Therefore, building trust in the country's financial ecosystem seems to be an uphill battle. Furthermore, an important gender gap can be observed in account access and use of financial services. Barriers to women's account ownership include the prevalence of cash, opening balance requirements, and the fact that, traditionally, only one member of a family has an account.

Three high-priority measures to promote DFS could help the Maldives accelerate its transition to a digital economy. First, the government should develop a digital finance infrastructure for interoperable payments and transactions, including for real time transactions/settlements and card payments. Second, a higher level of trust in electronic transactions should be encouraged through better cybersecurity measures for financial systems and greater awareness among businesses and individuals. Finally, the government should test measures to increase financial inclusion and close gender gaps, such as digitizing G2P payments and expanding access to ATMs, especially in the outer islands.

Digital Businesses

Maldives performs relatively well when it comes to the digitization of firms. In the 2016 World Bank's Digital Adoption Index (DAI) for businesses, it scored higher than other countries in South Asia as well as other upper-middle-income small-island developing states (such as Fiji and the Dominican Republic). However, smaller businesses have not digitalized as rapidly. Indeed, the relatively low number of fixed broadband subscriptions suggests that most micro, small and medium enterprises (MSMEs) do not use technologies such as virtual private networks, data hosting and cloud-based services, as they require good quality fixed broadband. Low adoption of digital financial services also suggests that businesses might conduct relatively few transactions online. While there is anecdotal evidence of digitization during the COVID-19 pandemic, overall the digitization of businesses in the country is limited. This could stifle innovation and hinder resilience to future shocks. Larger or well-established businesses, such as those in the tourism and hospitality industries, tend to have international links (e.g., through joint ventures) and are likely to use automation and digital technologies for sales, booking, and enterprise resource planning. By contrast, locally owned and operated guesthouses are less connected, due to poor Internet connectivity (especially in the outer islands), low digital awareness, underdeveloped digital capabilities and skills, as well as weaknesses in the trust environment.

¹¹⁷ It should be noted that this low rank is likely due to Maldives' non-participation in the survey process. However, that might also indicate a lack of awareness or coordination within the public sector on this topic.

More can be done to boost the role of digital industries and start-ups in the economy, particularly for the purposes of job creation. For example, the ICT sector in the Maldives employs just 1.8 percent of all workers and of those, only 22 percent are women - a lower proportion than in other sectors of the economy. Furthermore, most of these firms are relatively small and provide small-scale IT services. Growth is restricted as most larger businesses (in fields such as tourism or banking) in-source their technology services. The ICT sector thus contributes to a very small share of the economy, accounting for 3.4 percent of GDP, compared to 5.8 percent in Mauritius, for example. While it would be challenging for Maldives to compete with more established countries such as India and Sri Lanka in exporting ICT services, more widespread adoption of digital technologies by businesses across the economy would increase the domestic demand for ICT activities. A supporting ecosystem for digital innovation and entrepreneurship is also required. Currently, there are very few support facilities for start-ups (e.g., incubators,) and those that exist do not appear to be sustainable. Access to finance for start-ups is also inadequate and digital skills are underdeveloped.

Maldives can do more to build and develop its digital businesses. The government should support the digitization of small businesses (especially in sectors such as tourism) while at the same time building a start-up ecosystem to promote digital innovation. In this regard, it will be critical to improve broadband connectivity and roll out robust digital finance infrastructure. In addition, implementing legislation to secure electronic transactions, protect data and privacy, and boost cybersecurity will help create a more secure environment for digital transactions, thus improving transparency and confidence in the use of data and digital technologies. The government should also engage with academia and the private sector to identify specific actions that could be taken to boost digital innovation and entrepreneurship. Focused governmental intervention should also aim to promote the creation and growth of firms in non-traditional sectors and increase the level of digitization across the economy.

Digital Skills

The limited availability of relevant data makes it difficult to provide a comprehensive assessment of the level of digital literacy and skills in the Maldives. In the case of firms, half of MSMEs interviewed during a COVID-19 rapid assessment (UNDP and Ministry of Economic Development Maldives, 2020) did not have a single digitally-literate employee. However, no data is available on basic digital literacy in the population, nor on the overall digital skills level of students (e.g., as measured by the proportion of youth that have engaged in computer-based activities in the last three months). There is also no gender-disaggregated data. Measuring these indicators on a regular basis would help Maldives track its progress towards digital readiness. Collecting this data in a transparent manner would also enhance evidence-based policymaking in this area.

The government recognizes the need to build the digital literacy of the population together with advanced digital skills for a future-ready workforce. Digital skills have been included in the official curriculum starting from Grade 1 and all public schools have access to the Internet. Several higher education institutions also offer degrees in technology-related fields. The erstwhile Ministry of Communications, Science and Technology (MoCST) (under the Ministry of Environment, Climate Change and Technology since May 2021) ran a e-Citizen program for the purpose of building digital literacy skills. Still, important gaps remain. Only around 5 percent of tertiary graduates pursue science, technology, engineering, and mathematics (STEM) programs. Weak foundational skills, and low achievement in mathematics, may discourage youth from pursuing studies and careers in ICT-related fields and STEM jobs (which tend to require a higher level of ICT skills). In addition, while digital skills were included in the National Skills Qualifications Framework, the latter lacks a broader digital skills framework which could identify the skills necessary to citizens at large for accessing and using everyday services.

Fostering digital literacy among all Maldivians is critical to ensuring that everyone can take advantage of new technologies in an increasingly digital world. Developing more advanced digital skills would ‘futureproof’ the local workforce, enabling them to leverage new opportunities created by the digital economy. For the government to achieve these objectives, a multipronged approach is required including (i) the collection of better data on the level of digital literacy and skills, (ii) continued support and scale up of basic digital literacy and upskilling programs, and (iii) investment in market-driven digital economy skills that respond to rapidly evolving demands (e.g. cybersecurity). Finally, it is vital to equip the public and private sectors with the necessary tools to tackle cybersecurity threats, particularly given the increase in such incidents since the onset of the COVID-19 pandemic.

Policy Recommendations

Based on the analysis above, the following table sets out several high priority policy recommendations for the development of the digital economy in Maldives.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Complete the development of the policy and regulatory framework aligned with international good practices Implement <i>ex ante</i> competition and cross-sector infrastructure- sharing regulations to increase competitive pressure at various points of the broadband value chain, with a view to improving the affordability, coverage, and quality of services 	<ul style="list-style-type: none"> Build the capacity of the regulatory authority to define and enforce regulations including for resource management (e.g., radio spectrum) and for cross-sector infrastructure sharing, in order to encourage investments and competition Define transparent and competitive approaches to mobilize private capital to connect the outer islands and boost availability of fixed broadband services
Platforms	<ul style="list-style-type: none"> Define clear responsibilities and mandates for various government agencies Define a Digital Government policy that outlines a roadmap for the government’s digital transformation efforts Engage with stakeholders across public and private sectors, as well as civil society, to create an integrated institutional governance framework for digital government 	<ul style="list-style-type: none"> Strengthen the legal and regulatory framework to facilitate public service delivery and the operation of private platforms Set up core infrastructures (e.g., a national government cloud), as well as shared services and platforms (e.g., a single and universal identification system) Invest in skills for public service delivery
Financial services	<ul style="list-style-type: none"> Develop an infrastructure for interoperable payments and transactions, including for real-time transactions and settlements, and facilitate card payments Improve the cybersecurity of financial systems 	<ul style="list-style-type: none"> Test measures (such as digitizing G2P payments and expanding access to ATMs especially in the outer islands) to increase financial inclusion and close gender gaps
Businesses	<ul style="list-style-type: none"> Address underlying challenges for digital businesses, including those related to broadband connectivity and digital finance infrastructure 	<ul style="list-style-type: none"> Engage with academia and the private sector to identify steps to boost digital innovation and entrepreneurship
Skills	<ul style="list-style-type: none"> Collect better data on the level of digital literacy and skills Continue to support and scale up basic digital literacy and upskilling programs 	<ul style="list-style-type: none"> Invest in market-driven digital economy skills that respond to rapidly evolving demands (e.g. cybersecurity)
Trust	<ul style="list-style-type: none"> Define and implement legislation to secure electronic transactions, protect data and privacy, and boost cybersecurity Equip the public and private sectors to cope with cybersecurity threats 	<ul style="list-style-type: none"> Increase awareness of businesses and individuals to ensure a higher level of trust in electronic transactions

Nepal

Nepal has identified the digital economy as a key driver of growth and social inclusion in the country.

Households and businesses have reasonable access to basic connectivity—a good starting point for digital inclusion. However, gaps in access to affordable broadband remain. Some efforts towards digitization have taken hold, but Nepal still lags in adoption and use of digital services by business and government. The UN e-government development index ranks Nepal at 132 of 193 countries. Digital transactions using mobile banking, internet banking, and digital wallets all increased during the COVID-19 pandemic, suggesting a greater potential for digital financial services. Gaps in access to affordable broadband have limited the ability of many people and businesses to use digital technologies to respond to the COVID-19 pandemic, thereby negatively affecting digital inclusion. For example, UNICEF has found that two-thirds of Nepal's schoolchildren were unable to access remote learning during school closures. There is also scope for improvement in the promotion of digital innovation, the use of digital tools by business, the development of a digital start-up ecosystem, and the delivery of public and private services. Only a few Nepalese firms began using, or increased the use of, digital platforms during the pandemic (19 percent compared with 28 percent in Sri Lanka, 45 percent in Pakistan, 46 percent in Vietnam and 38 percent in Cambodia). Nepal could also take steps to improve the trust ecosystem (it currently ranks 94th among 181 countries in the 2020 Global Cybersecurity Index), notably by strengthening personal data and consumer protection.

The Government of Nepal is keen to develop its digital economy and reap the associated benefits.

Nepal's vision for digital development is outlined in the Digital Nepal Framework (DNF), a comprehensive digital development strategy adopted by the Government in 2019, which covers the various foundations and sector use cases. The DNF aims to digitize eight sectors (e.g., health, education, agriculture) through 80 different initiatives. The planning commission has identified the DNF as a game-changer program, and the government has sought implementation assistance from The World Bank. The private sector and civil society also recognize the need for inclusive digital development. There is interest from the private sector to play a more-strategic role, building on investments in digital connectivity, digital financial services, and e-commerce platforms.

Nepal will need to address some cross-cutting bottlenecks if it is to develop its digital economy

further. The government should consider the following actions: (i) *boost digital inclusion*—ensuring that all individuals and businesses have access to affordable, high-speed connectivity and secure digital services—which is currently held back by gaps in coverage and affordability of high-speed connectivity, (ii) *expand service delivery*, to broaden the use of digital public and private services — this is currently hampered by gaps in digital government infrastructure (e.g., limited data center capacity), poor coordination among public agencies, institutional capacity constraints, limited funding for digitization of public services, limited human resources to support digitization efforts in the public and private sectors, missing foundational elements (e.g., a foundational ID, digital signatures) and low digitization of transactions due to missing digital financial infrastructure elements (notably, a national switch to make digital payment systems interoperable), and (iii) *promote digital innovation* by embedding digital technologies in products/ services/processes, building digital, higher-level skills and management expertise among SMEs, and addressing gaps in the trust ecosystem.

Key Findings

Digital Connectivity

Nepal has done well in terms of ensuring access to basic connectivity; estimates suggest that about 75 percent of Nepal's population uses the internet. There are about 18 million mobile internet and broadband subscriptions (equivalent to about two-thirds of the population) and around 7 million fixed broadband subscriptions. However, access to fixed line networks and higher-speed connectivity is limited outside urban areas, and mobile networks remain the primary means of connectivity in Nepal. All 77 districts of the country now have some level of basic internet connectivity. Despite this recent progress, broadband usage in Nepal remains underdeveloped with limited coverage outside large cities. Prices are unaffordable for many and coverage and reliability of services is poor, leading to persistent gaps in adoption and use of services. An entry-level mobile broadband package is about 2.75 percent of GNI per capita, which is higher than the 2 percent threshold for affordability. The cost for a fixed-broadband basket with monthly data usage of (a minimum of) 5 GB stands at 2.30 percent of GNI per capita, which is also beyond the affordability threshold of 2 percent. In addition, handset prices remain expensive, with Nepal ranked 115th out of 134 countries in terms of device affordability. The high price of devices (especially smartphones), high customs tariffs, and user reluctance to adopt smartphones due to lack of digital literacy, contributes to these digital access gaps. The development of the broadband market in Nepal is also curtailed by the fact that there is limited competitive pressure on the market to drive investment and innovation. Nepal has six national mobile network operators. However, the lion's share of the market (94.5 percent) is held by just two operators, effectively creating a duopoly. And while Nepal has around 40 Internet Service Providers (ISPs) providing internet and network services, these are primarily focused on urban areas. This is due to the potential of better returns in urban areas, but also to persistent barriers to market entry. For instance, the limited infrastructure sharing and coordination between telecom network providers and other linear infrastructure providers (e.g., energy and transport) does not encourage new players to enter the market. Moreover, there are various regulatory and policy barriers, including an outdated legislative framework, weak enforcement of laws and regulations, and complex licensing schemes. Various taxes, fees, and duties also increase the costs of service provision and the price for services: there are fees for renewal of mobile licenses paid by service providers and taxes on phone calls. Nepal's national backbone network and supporting infrastructure has expanded but gaps persist with some major projects remaining incomplete. The limited reach of middle mile fiber networks affects quality and affordability of services, especially internet services. Finally, as a landlocked country, Nepal faces some additional costs in connecting to global telecommunications networks; prices of wholesale data services are much higher than in neighboring countries.

The government of Nepal could boost access to affordable digital connectivity by taking the following measures: (1) increasing competitive pressure on the market, through the enforcement of regulations and licensing conditions on all networks including rollout obligations, and infrastructure sharing (among networks and across sectors), (2) updating the telecommunications legislative framework to align with international good practice and to respond to emerging technology and business trends, (3) implementing measures to support digital inclusion, such as programs that de-risk private investments in less commercially-viable and high-cost areas (e.g., mountainous areas), rationalizing taxes and fees to reduce the burdens on lower-income consumers, and improving access to devices for rural and low-income households and individuals, and (4) accelerating the deployment of infrastructure and supporting ongoing rural telecommunications development programs.

Digital Public Platforms

The digital delivery of public services has been improving in Nepal over the past decade, with the Government playing an active role in designing and implementing services. However, the quality of online services needs significant improvement. The majority of digital government platforms are informational and offer limited interactional and transactional services. Nepal is among the five least-developed countries in e-governance, far behind most South Asian countries on the e-Government Development Index (EGDI) of 2020. The lack of quality online services results in low adoption of e-governance and low public participation in e-decision making, as reflected in the e-participation index.

Key elements of the foundations for digital public platforms are still missing. Even though Nepal took its first step towards creating a National ID in 2011, the conventional paper-based Citizen Certificate continues to serve as the National ID. The proposed new digitalized National ID is only in its pilot phase. This effects of this gap are being felt intensely across the country. After the April 2015 earthquake, rescue and relief efforts were severely hampered due to the absence of identification and the lack of a functional database of households with socio-economic information. Moreover, data protection and cybersecurity issues need to be addressed through an appropriate and enabling legal framework. Nepal has adopted digital signatures, but while various initiatives have been taken to promote the usage and adoption of digital signatures, it is yet to be widely adopted, owing mainly to limited infrastructure. Yet another challenge is that public services and systems are not currently interoperable. The Government Enterprise Architecture (GEA) was defined in 2011 but has yet to be implemented. Only a handful of government departments or public agencies host data in the Government's data center (GIDC) rather than in their own small server environments. The government has formulated its Nepal e-Government Interoperability Framework (NeGIF), but there is little awareness of the framework, and therefore, implementation has been limited.

There are several constraints to the development of digital public platforms in Nepal. First, departments work in silos and thus the approach to digitalization has been largely fragmented. Second, a lack of proper planning, implementation, and monitoring has led to project overruns, delays, and slow utilization of allocated funds. Third, individual government bodies develop their own independent applications and platforms, leading to issues of data quality, security, and redundancies. Finally, Nepal's policy and regulatory frameworks are undergoing only gradual updates; a major policy focus on faster implementation and adoption of e-governance seems to be lacking.

Public service delivery in Nepal could be enhanced through the following measures: (1) strengthening the legal and regulatory framework for digital development across all three tiers of the government for a deeper and wider outreach of digital government initiatives, (2) prioritizing the rollout of the national ID system in line with international good practice, universal coverage and inclusion (e.g., addressing gender barriers), advancing data protection, and supporting high impact use cases such as service delivery in healthcare, education, and social protection, (3) building secure and interoperable digital government platforms, encouraging a data sharing culture across government, and building government capacity to deliver solutions (e.g., a social registry for targeted social assistance), and (4) boosting cybersecurity readiness across the government and private sector.

Digital Financial Services

There is an important opportunity to scale up Digital Financial Services (DFS) in Nepal. The distribution of financial products and services is highly uneven and skewed in the country, with a high concentration in urban areas and low concentration in rural areas. The mountainous and hilly terrain makes it challenging for brick-and-mortar financial services deployments, mainly because of low population density, poor connectivity, infrastructure-related challenges, and the high operating costs of financial institutions that use traditional products and channels. DFS can thus play a major role in implementing the Nepal Financial Inclusion Roadmap that serves as a guide to financial inclusion initiatives in the

country. Coverage, adoption, and usage of digital banking instruments are also low but have witnessed some growth in the last three years, indicating untapped potential. There are 7.6 million debit cards and 169 thousand credit cards in circulation, approximately 11.7 million mobile banking users, and 1.05 million internet banking users. In the last three years, the number of mobile banking users has quintupled. The COVID-19 crisis has revealed a willingness to embrace DFS. Digital transaction volumes have risen manifold, along with a surge in the number of users across mobile financial services. Nepali businesses have started promoting online payment gateways and providing exclusive offers on digital payments. However, several challenges remain. At present, more than half of Nepal's adult population does not have a bank account, and a fifth are completely financially excluded (not using either formal or informal financial services). There is also a significant gender gap across Nepal in account coverage and use: 58 percent of women, and 50 percent of men, are unbanked. This is due not only to insufficient funds, but also to the lack of trust and confidence on the part of customers, coupled with inadequate financial and digital literacy. The latter is exacerbated by difficulties in access and gaps in coverage in remote and rural areas. In addition, the lack of know-your-customer (KYC) documents and largely complex processes make customer onboarding cumbersome. In order to enhance the use of alternate last mile delivery channels, the central bank (Nepal Rastra Bank or NRB) has been gradually moving away from a bank-only to a branchless banking (BLB) approach. In addition, NRB is also supporting the development of the retail payment infrastructure of Nepal, building trust and enabling people to switch from paying cash to paying electronically. To promote innovation and strengthen digital payments, 38 non-bank institutions have been licensed by the NRB to operate as Payment Service Operators (PSOs) and Payment Service Provider (PSPs). Contactless payment services, like QR code payments, have seen wider adoption during the pandemic. Nepal is still in the process of developing a National Payment Switch, which would make payment systems interoperable. It should be noted that banks and financial institutions have been paying a hefty price for digital transactions through international payment gateways. Digital transaction limits imposed to manage the risks of money-laundering have also been an obstacle to digital payment adoption in Nepal. In this context, plans are underway to develop an international payment gateway within the country. Nepal does not yet have a Regulatory Sandbox, which would be a critical mechanism for encouraging innovation in DFS while facilitating compliance with, or flagging the need for, a change in regulations. As digital data becomes integral to transactions, stakeholders have expressed concerns about personal data protection as well as the weak cybersecurity of financial service providers, whose numbers are on the rise.

Nepal could boost adoption and use of DFS through a combination of measures, including the following: (1) accelerating the development of core digital financial services infrastructure, such as the national payment switch and international payment gateway, (2) boosting digital financial access and literacy, e.g., through awareness campaigns to educate and build trust, and nationwide programs aimed at providing a formal banking account to the financially excluded, and (3) strengthening cybersecurity and personal data protection policy and regulations (with implementation in the financial sector a priority).

Digital Businesses

Digital businesses are a key pillar of Nepal's digital economy and hold great potential for economic growth, employment, wealth creation, and improved living standards. As of August 2019, there were more than 350 active start-ups in Nepal across different sectors, such as software as a service (SaaS), online travel, health, education, real estate technology, e-commerce, and so on. There are also a number of established digital businesses, like homegrown firm F1Soft, a fintech company providing transaction services to banks and financial institutions. Other examples include local subsidiaries of foreign-owned firms such as LogPoint, a cybersecurity company with a development center in Kathmandu. Nepal scores lower than India, Pakistan, Sri Lanka, and marginally higher than Bangladesh,

in the Digital Entrepreneurship Index. Digital businesses have only recently begun emerging in the country, with many new technology start-ups focusing on areas like education, fintech, and e-commerce. However, the growth of digital start-ups is expected to accelerate in the next five years. Nepal's e-commerce sector is valued at close to US\$30 million and is experiencing a growth of more than 40 percent per year. Even so, e-commerce is still nascent, with limited retail infrastructure to support digitization, and few digital payment options. There are also several barriers to the entrance of large multi-national digital firms in the country, including the lack of a large digitally skilled workforce, difficulty in establishing operations, issues relating to remittances and international payments. A good example is Airbnb, which made its online vacation marketplace available in Nepal, only to face significant challenges in transferring rental income to its local hosts through international transactions.

Nepal has around 35 incubators and accelerators programs along with approximately 15 co-working spaces and nine Venture Capital and Seed Funds. However, given the lack of venture capital firms in the country and an insignificant angel ecosystem, Nepal's entrepreneurs and start-ups still face significant difficulties in accessing risk capital. The availability of venture capital and private equity funds is limited due to restrictions on foreign sources of funds, but also because exit options have not been made easy (including IPOs). Moreover, there is no specific legal and regulatory framework in place and institutional capital capacity is limited. A policy framework for supporting digital businesses and start-ups across sectors is sorely needed, including frameworks for data privacy and foreign investments, which could attract investors. Without a legal framework for Alternate Investment Funds (AIF), PE and VC funds have to operate in quasi-corporate structures with complicated shareholding and governance structures. Put together, these factors hinder the establishment and growth of digital start-ups, despite the country's proximity to two of the largest consumer markets in the world. Greater coordination between regulators and government departments is also needed.

To build, support and grow its digital businesses, the government of Nepal could take the following actions: (1) create an inter-governmental (cross-sectoral) working group to develop policies and regulations in support of digital businesses, notably with the aim of developing a single window approach, (2) usher in regulatory and fiscal reforms related to local capital formation that encourage investment from global and regional early-stage equity capital providers, (3) improve access to early-stage financing through passive government support for Seed Funds, VCs, and PE, including for example, through a fund of funds (FoF) or investment matching program to anchor and catalyze domestic and foreign flows into the market, (4) develop a supportive tax regime to incentivize VCs whilst putting into place consumer safeguards and rules for investor protection, and (5) Facilitate the adoption of digital tools and technologies for medium-sized enterprises through skills development, access to finance, and advisory support.

Digital Skills

Despite the fact that internet penetration rates are on the rise, the uptake of essential digital services is low in Nepal, due primarily to inadequate digital literacy. There is currently little systematic data on the demand for digital skills in the country, but available indicators point to a low level of digital skills in the population. In the absence of reliable estimates, select employment and labor market indicators in the ICT sector have been considered. Nepal ranked 105th (out of 141 countries) in the Global Competitiveness Index (GCI) for 'digital skills among active population' with a score of 44.5, compared to the score of the best-performing country of 80.5. The Nepal Labour Force Survey 2017-2018 estimated that only 0.9 percent of employed Nepalese work in the information and communications industry. The emerging ICT sector remains a crucial driver for a digitally competent workforce. Nepal's IT and IT-enabled BPO services are its fastest-growing service exports, similar to the situation in neighboring India and Bangladesh. The Investment Board reports that there are approximately 500 IT companies in Nepal,

some of which have more than 300 employees. With the development of appropriate digital skills in the population, Nepal could position itself as a sizable talent pool in the global digital economy. Government initiatives highlight significant interest in digital skills development across the economy. For example, under the new national curriculum (which is expected to be fully rolled out within 5 years of its adoption), ICT will be introduced as a core Science and Technology subject as early as the sixth grade. However, the lack of quality learning at the primary level is the basis for the poor foundational digital literacy at the school level. Inadequate digital infrastructure and human resources further hinder digital skilling. As per the 2021 Education Sector Analysis (forthcoming), only 34.7% of public schools have electricity, 28.3% have computer facilities and 12.4% use computers in learning activities. There are important differences in the levels and quality of infrastructure between rural and urban areas (mainly Kathmandu). In line with the 'Digital Nepal' agenda, training teachers to teach digital skills will be critical. Teachers at public schools and universities have inadequate technical, content, and pedagogical support, combined with poor IT awareness. Indeed, the advent of COVID-19 has accentuated the drawbacks of the school system and made education less accessible, leading to an increase in the number of out-of-school children. UNESCO (2020) estimates that, due to COVID-19, nearly 8.7 million students in Nepal have experienced school or university closures. A significant share of these students are likely to be adversely affected; it is estimated that a mere 13 percent of schools are offering online classes (due primarily to limited infrastructure). As mentioned above, teachers often lack the necessary skills to conduct online courses and this has further exacerbated the problem. Only one percent of public-school teachers are estimated to be running online classes.

Nepal can continue to improve skill levels of its existing workforce while investing in its future workforce. The government should consider taking the following actions to boost digital skills in the country: (1) organize skilling initiatives at different levels of the education system (from school to adult continuing education), (2) introduce digital literacy at an early age in schools, deliver necessary training for teachers and ensure a minimum level of digital infrastructure access in schools, (3) create a Digital Skills Development Fund to drive market-relevant digital skilling.

Policy Recommendations

Based on the above analysis, the following table sets out several high priority policy recommendations for the development of the digital economy in Nepal.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> • Increase competitive pressure on the market, through the enforcement of regulations and licensing conditions for all networks (including rollout obligations), and through infrastructure sharing (among networks and across sectors) • Update the telecommunications legislative framework to align with international good practice and respond to emerging technology and business trends • Accelerate the deployment of infrastructure with the support of ongoing rural telecommunications development programs 	<ul style="list-style-type: none"> • Implement measures to support digital inclusion such as programs that de-risk private investments in less-commercially-viable and high-cost (e.g., mountainous) areas, rationalizing taxes and fees to reduce the burdens on lower-income consumers in particular, and improving access to devices for rural and low-income households and individuals

Pillar	Short-term	Medium- to long-term
Platforms	<ul style="list-style-type: none"> Prioritize rollout of the national ID system in line with international good practices, notably universal coverage and inclusion (including the removal of all gender barriers), whilst ensuring data protection, and supporting high impact use cases (e.g., strengthening the delivery of services such as healthcare, education, and social protection) 	<ul style="list-style-type: none"> Strengthen the legal and regulatory framework for digital development across all three tiers of the government for a deeper and wider outreach of digital government initiatives Build secure and interoperable digital government platforms, encourage a data-sharing culture across government, whilst building government capacity to deliver solutions (such as a social registry to enhance targeting of social assistance)
Financial services	<ul style="list-style-type: none"> Accelerate the development of core digital financial services infrastructure, such as the national payment switch and international payment gateway 	<ul style="list-style-type: none"> Boost digital financial access and literacy, including through awareness campaigns to educate and build trust Implement a nationwide program to provide formal banking accounts to the financially excluded population
Businesses	<ul style="list-style-type: none"> Create an inter-governmental working group to develop policies and regulations to support digital businesses (given their often cross-sector nature) with the aim of developing a single window approach 	<ul style="list-style-type: none"> Adopt regulatory and fiscal reforms related to local capital formation that encourage investment from global and regional early-stage equity capital providers Improve access to early-stage financing through passive government support for seed funds, VCs, and PE, e.g., capitalizing a fund of funds (FoF) or investment-matching program to anchor and catalyze domestic and foreign flows into the market Develop a supportive tax regime to incentivize VCs, while ensuring consumer protection safeguards and investor protection rules Facilitate adoption of digital tools and technologies for medium-sized enterprises through skills development, access to finance, and advisory support
Skills	<ul style="list-style-type: none"> Introduce digital literacy at an early age in schools, while also ensuring the necessary training of teachers and a minimum digital infrastructure for the required outcomes 	<ul style="list-style-type: none"> Organize skilling initiatives at different levels of the education system (from school to adult continuing education) Create a Digital Skills Development Fund to drive market-relevant digital skilling
Trust	<ul style="list-style-type: none"> Strengthen cybersecurity and personal data protection policies, regulations, and implementation, with the financial sector as a priority 	<ul style="list-style-type: none"> Boost cybersecurity readiness across the government and the private sector (and across various sectors, including healthcare, education, utilities, and financial services)

Pakistan

The government of Pakistan is strengthening its digital economy which it views as an enabler of both social inclusion and economic growth. The Digital Pakistan Policy of 2018, and associated ‘Digital Pakistan’ program, announced by the Prime Minister’s Office in 2019, is a high-level framework to improve access to the internet, digitize the government and public services, build digital skills, and promote innovation and entrepreneurship. Two provinces have also defined digital policies with similar themes.¹¹⁸ Looking to the future, Pakistan will need to further bolster each of the five digital economy foundations of infrastructure, platforms, financial services, businesses, and skills, to achieve its goals. The country will also have to tackle its legal and regulatory frameworks, as well as the cross-cutting themes of trust, cybersecurity, inclusion and women’s empowerment. Establishing the foundations of a digital economy will support a resilient recovery, ensure that benefits of digitization are available to all, and mitigate the associated risks.

A strong digital economy would help Pakistan boost innovation and productivity, create employment opportunities for youth, and generally “build back better” following the COVID-19 crisis. Improved broadband connectivity and access will give more people opportunities to learn and find jobs, and more firms opportunities to integrate with the regional and global economy. Building on some of its existing foundations, such as a robust identification system and digitization of public and financial services, Pakistan could overcome spatial and demographic disparities while also improving governance and expanding access to service delivery. Legal reforms will improve the business climate and create incentives for firms to tap into digital opportunities to grow and innovate, which in turn will boost productivity and create new jobs.

For Pakistan to fully reap the benefits and opportunities of a digital economy, a number of cross-cutting bottlenecks need to be addressed. To do so, the government should consider the following actions: (i) *ensure that the digital economy is inclusive* for all Pakistanis regardless of age, gender, socio-demographic status, and geography, in terms of having access to digital tools and services; (ii) *build a trusted digital ecosystem*, notably by ensuring that the population has basic digital literacy to take advantage of digital services and by developing a regulatory framework to protect data and privacy, with adequate cybersecurity measures; and (iii) *foster institutional strategy and coordination*, across agencies and levels of government, to define ambitious yet practicable targets in order to maximize the impact of efforts to digitize public services.

Key Findings

Digital Infrastructure

While Pakistan’s digital infrastructure has seen impressive growth, the country is lagging other developing countries in terms of internet quality and adoption. Pakistan is a mobile-first market, with digital services being accessed primarily through mobile connectivity. About 44 percent of people use the internet, but fixed broadband penetration remains around 1 percent—lower than most South Asian countries—while mobile broadband penetration is reported at 43 percent. There is also evidence of an internet-use divide between male and female populations (21 percent vs. 12 percent); rural and urban populations (28 vs 10 percent); and education levels (67 percent of graduate-level vs 8 percent of primary-level), which serve as a proxy for other socio-economic indicators

¹¹⁸ See Khyber Pakhtunkhwa Digital policy 2018-2023 and Punjab IT policy 2018.

Although Pakistan has some of the lowest mobile data rates in the world, fixed broadband prices are significantly above the affordability threshold. This, along with the high cost of internet-enabled devices (due in part to taxes), continues to be the biggest impediment to the digital economy, combined with low general and digital literacy. The quality and speed of connectivity is also poor, with Pakistan ranking 112th of out 145 countries in mobile connectivity speeds, and 159th out of 175 countries in fixed connectivity speeds. Quality remains suboptimal due to the limited deployment of high capacity (fiber optic cable) networks at the national level and in downstream segments. For example, more than half of Union Councils (the smallest administrative unit in Pakistan) do not seem to be connected to fiber. Network deployment in the last mile (access) networks is also uneven across the country: multiple players are deploying fiber in parallel in select areas of Tier 1 cities, while there is almost no deployment in Tier 2/3 cities. There is limited sharing of infrastructure across market segments, which restricts international connectivity, leads to high costs for network rollout, and creates barriers to entry for new and small network operators. Innovation in wireless broadband is also being held back. Pakistan has one of the lowest levels worldwide of total spectrum allocations for wireless broadband services. License renewal disputes have also arisen, creating regulatory uncertainties that affect the overall investment climate.

Pakistan should re-define bold targets for digital connectivity with a view to creating a solid foundation for a vibrant and inclusive digital economy. As part of its efforts to ensure widespread access to high-quality and affordable broadband, the government should consider the following four high-priority reforms: (1) a more effective regulatory approach to broadband cost reduction, including easing access to rights of way and promoting infrastructure sharing, (2) improved management of the radio spectrum, essential for better wireless connectivity, (3) reduced tax rates on telecommunication services as well as import duties on smartphones and telecommunication network elements, and (4) increased coordination among different government departments for the purpose of identifying opportunities to boost competitive pressure in the market. In parallel, the government should identify mechanisms to overcome gaps in network deployment and digital adoption due to financial barriers. It should also consider using the resources of the universal service fund to address these specific market failures.

Digital Public Platforms

Digital public platforms in Pakistan are currently weak, with the country ranking 153rd in the UN e-Government Development Index, 2nd last in the South Asian Region (ahead of Afghanistan but 19 spots behind Nepal). There is little harmonization between agencies and systems at the federal-level, between federal and provincial governments, and between provincial governments. Very few services are fully digitalized, meaning that manual or physical intervention is required at some step in the process. Barriers for accessing digital government services, especially connectivity, remain a significant challenge, especially for poor and remote communities, women and girls. Data sharing and interoperability across government has been very limited. Resources at both federal and provincial levels are spread too thin, with too many peripheral projects of uncertain value.

Nevertheless, there is growing political will and momentum towards positive change. The Digital Pakistan program has injected urgency, leadership, and purpose into efforts to digitalize government services. Importantly, Pakistan already has a relatively strong foundational identification system and the National Database and Registration Authority (NADRA) has ambitious plans to take the system to the next level, e.g., through the development of a decentralized digital identity wallet. The government was also able to successfully use digital technologies as part of the health and social protection response to COVID-19.

These assets can serve as a launching pad for Pakistan to develop digital public platforms in ways that are integrated and inclusive, and promote the transparency and efficiency of government. This would

then enable the public and private sectors to innovate and build relevant services on top. In order to realize this opportunity, Pakistan could set up an apex body or organization that would develop and enforce policy and coordination for digital public platforms. Ideally, this body should sit at the highest levels of the federal government, and could also be replicated at the provincial-level. Second, the Digital Pakistan vision should be translated into detailed plans and frameworks, especially coherent federal and provincial enterprise architectures and e-government interoperability frameworks. Third, the identification ecosystem needs to be reformed to make it financially sustainable without charging fees to citizens and service providers. Provincial civil registries should be strengthened and linked with NADRA, which currently issues child registration certificates that are duplicative of birth certificates. Fourth, priority should be given to enacting the country's personal data protection law, after aligning it with international best practices, and building the necessary institutional capacity for its effective supervision and enforcement. Fifth, a high profile 'Pakistan stack', or government-wide digital integration layer, should be launched to integrate identification, payments, and personal data. Finally, all of these efforts should be designed with inclusion as a core philosophy to ensure that no one in the country will be left behind.

Digital Financial Services

The majority of Pakistanis lack access to any banking services including formal credit options; three in four Pakistani adults (75 per cent) are financially excluded. The divide is even more stark when viewed from a gender angle: men are more likely to have a bank account compared to women. On the financial inclusion front, Pakistan has underperformed comparable countries in the region (the South Asian average is 68.4 percent) and other lower middle-income countries (whose average is 56.1 percent). The sector also faces certain inherent operating environment obstacles such as the informality of the economy, low financial literacy, and a gender gap in economic participation.

Not surprisingly, digital financial services are also underdeveloped. Digital payments only account for 0.2% of Pakistan's ~100 billion transactions, whereas the share of digital transactions in peer countries ranges from 1.5% to 7%. Merchant acceptance of electronic payments is not widespread (less than 5%), and e-commerce is skewed towards Cash-on-Delivery (CoD). In addition, there is a near absence of other digital financial products such as insurance, savings, investments and credit.

A key opportunity point for the proliferation of DFS in Pakistan is the high penetration of mobile services (84%), high coverage of the national ID, and the biometric verification services available at the retail level. Financial institutions (providers of digital payment services) have difficulty connecting to each other due to a lack of a centralized infrastructure. The lack of a Unified Payments Interface (UPI) and high transaction costs for payments discourage the widespread adoption of digital payments.

There is evidence of emerging interest in the FinTech start-up space. However, incubators see very few DFS entrepreneurs due to the perceived regulatory complexity and lack of collaboration platforms for FinTechs and incumbents. Finally, poor user experience and lack of sufficient data protection and authentication mechanisms further curtail adoption.

Digital financial services can be accelerated through a mix of regulatory measures and investments. The government should consider taking regulatory measures for the interoperability of payments, financial consumer protection, as well as transaction security, which could support a cross-cutting trust ecosystem. Other measures to consider include the creation of an innovative credit registry (such as one based on utility bill payments for instance) that can support the development of digital micro-lending. The creation of a dynamic regulatory regime for FinTechs (such as a sandbox) could help respond to a fast changing DFS landscape. The Government might also consider expanding the National Financial

Literacy Program and accelerating the digitization of government payments, as ways to increase the adoption of digital financial services.

Digital Businesses

There are encouraging trends for Pakistan's digital economy in some areas of private sector development. IT and ITeS services are one of the fastest growing sectors in Pakistan today. More than 7,000 IT companies are contributing about USD 2.6 billion to the economy. IT and ITeS exports have increased to USD 1.44 billion in FY20. E-commerce in Pakistan is also rapidly expanding and is now a PKR 230 billion market annually, dominated by multi-retailer platforms. Around 720 start-ups have been established since 2010, 67 % of which are still active.

While there has been growth, it has been from a low starting point and the country's IT sector exports still underperform compared to regional competitors such as India, Sri Lanka, or Bangladesh. Most of Pakistan's exports are made up of low value-added software services, or services such as call centers in the BPO segment. 75% of start-ups target only the local market. The government of Pakistan has taken steps to improve the enabling environment for digital businesses and entrepreneurs including the creation of a support network for start-ups, 16 incubators and 4 accelerators providing business programs, coaching, mentorship, and co-working spaces. The government has also built 14 software technology parks, providing purpose-built technology facilities on government-owned lands.

The enabling environment for digital businesses can improve further, notably through improved access to finance (including the development of a digital credit scoring registry, and better access to VC funding). More regulatory reforms are needed to boost digital businesses in the country, with a focus on intellectual property rights enforcement, inconsistent tax regimes and high import duties on IT products. Joining the WTO's IT Agreement (ITA) would also be helpful for the abolishment of certain import tariffs. More innovation in cloud services and infrastructure is also needed. In this context, it is important to establish effective cloud policies and enabling regulations that protect data, support infrastructure development, and do not restrict the cross-border flow of data. To strengthen Pakistan's position in e-commerce, consumer protection in online marketplaces would need to be strengthened. The absence of mechanisms to return faulty products, and re-export to foreign marketplaces, represents a key bottleneck, together with the absence of international payment service providers on the market (such as PayPal). Recent work by the government on a National Single Window for e-commerce transactions may help improve the situation. Additionally, the registration of Pakistani sellers with Amazon has recently started and is now expanding.

Digital Skills

Pakistan has a poor adult literacy rate (60%) and the world's second-highest number of children not attending school (equivalent to 44% of the age group population). The World Economic Forum's Global Competitiveness Index (GCI) for 2019 ranks Pakistan 132 of 140 economies in terms of skills, behind all other South Asian countries measured. The lack of basic skills amongst citizens is impeding digital adoption and hindering the development of the digital economy. Only 8% of the population uses computers or computerized devices. Half of these computer users can only perform basic functions such as sending emails, and just a quarter can perform tasks using basic office software such as spreadsheets or presentations.

Significant disparities exist in basic digital literacy, be it across rural-urban, provincial, income and gender. As the low level of education and skills in the country is a key bottleneck for economic development, recent progress in growing a domestic IT sector is widely considered to be a significant opportunity for Pakistan. The emerging, export-centric, 'virtual freelancing' opportunity is one that Pakistan is keen to seize. Fueled by improvements in scientific and technical education, the expansion of

high-speed broadband access and the country's young population (under-35s generated 77% of the revenue in 2019), the services of Pakistani freelancers have become attractive in both domestic and international markets.

Fostering the development of skills in support of the digital economy will require a two-pronged approach. First, the government should make basic digital skills training widely available in order to enhance the inclusion of Pakistan's illiterate or untrained population. Second, the government should establish concrete programs to support the country's emerging IT sector. These can include on-the-job training for various IT skills as well as more advanced software development skills, programming, and web applications. The government should also consider additional measures to support its digital economy, such as the provision of workspaces, faster internet at reasonable costs, and reliable electricity.

Policy Recommendations

Based on the above analysis, the following sets out several high priority policy recommendations for the development of the digital economy in Pakistan.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Define new and bold targets for digital connectivity, in line with global digital leaders, broken down into federal and provincial targets Define regulations to implement broadband cost reduction, including easing access to rights of way, and promoting infrastructure sharing Increase coordination among different government departments to identify opportunities to boost competitive pressure in the market 	<ul style="list-style-type: none"> Mobilize private investments for the fixed broadband backbone to benefit 2nd and 3rd tier cities Clarify policies and regulations for radio spectrum, including for 5G services, in order to ensure long-term investor confidence Rationalize taxation on telecommunication services
Platforms	<ul style="list-style-type: none"> Consolidate government systems into a common shared infrastructure (digital integration layer) with high availability and disaster recovery back-up (G-cloud) Improve interoperability of public platforms and services, including through the development of shared infrastructure (such as data centers) to support sector applications in health, education, and transport, and consider a "digital twin" approach emanating from a single enterprise architecture Use Pakistan's ID program to support a wider range of digital services 	<ul style="list-style-type: none"> Develop a higher degree of collaboration and coordination between federal and provincial governments Adopt an open data initiative
Financial services	<ul style="list-style-type: none"> Take regulatory measures to ensure the interoperability of payments, with a view to strengthening financial consumer protection, and developing a secure transaction framework Establish an innovative credit registry (such as one based on utility bills payments, etc.) that can help in the development of digital micro-lending Create a dynamic regulatory regime (such as a sandbox) for FinTechs to respond to the regulatory requirements of a fast-changing DFS landscape 	<ul style="list-style-type: none"> Expand national financial literacy programs, focusing on women and social minorities Accelerate the digitization of government payments

Pillar	Short-term	Medium- to long-term
Businesses	<ul style="list-style-type: none"> • Implement reforms on intellectual property rights enforcement, as well as rationalize tax regimes and high import duties on various IT products • Strengthen consumer protection and dispute resolution mechanisms for online marketplaces, and integrate an international payments platform 	<ul style="list-style-type: none"> • Enable better access for start-ups to private sector finance (including the development of a digital credit scoring registry, and better access to VC funding)
Skills	<ul style="list-style-type: none"> • Support a private sector led demand assessment of digital skills at all levels to inform higher education and training design • Increase basic digital skills training programs for illiterate or untrained populations • Launch concrete support programs for the emerging IT sector 	<ul style="list-style-type: none"> • Increase the use of technology in education
Trust	<ul style="list-style-type: none"> • Finalize and enact the Personal Data Protection Bill as a milestone in data protection, after alignment with international best practices • Operationalize the national level CERT and ensure an effective handling of cyber incidents 	<ul style="list-style-type: none"> • Define a comprehensive mechanism for the identification of Critical Infrastructure • Enhance cybersecurity skills supply through formal and informal education channels • Expand international partnerships, adopt internationally recognized standards (such as the Budapest Convention on Cybercrime), and seek bilateral agreements to facilitate knowledge exchange and upgrading

Sri Lanka

By enhancing the foundations of its digital economy, Sri Lanka could achieve its ambition of becoming a ‘technology-based society’ and bring about “a technological revolution across all sectors.”¹¹⁹ The President’s Manifesto seeks to develop national digital connectivity infrastructure, digitize education and public service delivery, build digital skills, and promote innovation and entrepreneurship. To achieve this, the government should adopt a strategic approach covering the five key foundations of infrastructure, public platforms, financial services, businesses, and skills. To ensure that everyone can reap the benefits of the digital economy, cross-cutting aspects such as the trust environment, appropriate legal and regulatory frameworks, and opportunities to empower women will also have to be addressed. By focusing on these key foundations, the government will be in a position to support a resilient recovery while mitigating associated risks.

Sri Lanka can leverage its digital economy to address spatial disparities, reduce barriers to trade, and close gaps in service delivery. Digital advances can help the country “build back better” after a crisis. Expanding broadband connectivity can improve inclusion of marginalized groups in the rural parts of the country where pockets of extreme poverty persist. Digital entrepreneurship offers growth opportunities for Sri Lanka’s large domestic, traditional MSME sector and could help MSMEs link into export value chains beyond the shores of Sri Lanka. Finally, embracing digital technologies can help reform the country’s sizeable public sector (which is mainly using traditional and legacy operating methods) towards better service offerings for citizens and businesses, with less bureaucracy and red tape. As the global economy recovers from the COVID-19 pandemic, these foundations will support innovation and new modes of service delivery by both businesses and government, while boosting the capacity for people to access markets and safety nets in the event of future shocks.

To develop its digital economy further, Sri Lanka needs to address some important cross-cutting bottlenecks. In this context, the government should consider the following high-priority actions: (i) *ensuring that the digital economy is inclusive* for all (through access to digital tools and services), regardless of age, gender, socio-demographic status, and geography; (ii) *countering the effects of market concentration* through appropriate regulation in the areas of digital infrastructure, digital financial services (DFS), and competition policy; (iii) *building a trusted digital ecosystem*, through a regulatory framework for data protection and privacy coupled with appropriate cybersecurity measures, but also by ensuring that the population has basic levels of digital literacy to take advantage of the digital services on offer; and (iv) *ensuring institutional coordination* to maximize the impact of efforts to digitize public services and promote digital businesses.

Key Findings

Digital Infrastructure

Widespread access to affordable and high-quality broadband services lies at the heart of a successful digital economy. Without it, access to online learning, e-commerce, and public services are restricted. In Sri Lanka, Internet use amongst people aged 5-69 stood at 30.3 percent in the first half of 2019; this is lower than many countries with similar levels of GNI per capita. Moreover, internet use was uneven across geographies and demographic groups. Individuals in urban areas were 23 percent more likely to be internet users than their rural counterparts in 2018. Similarly, important gender gaps exist: men were 34 percent more likely to be internet users than women. The adoption of broadband, be it fixed or

¹¹⁹ President of Sri Lanka, Manifesto: Vistas of Prosperity and Splendour, 2019

mobile, is also limited. Only 28 percent of the population has 4G mobile broadband connectivity (compared with 98 percent in Thailand, 36 percent in Vietnam, and 51 percent in India). Only a third of households have fixed broadband connections, compared with half in Thailand and almost two-thirds in Vietnam. And even though prices seem affordable when viewed in global terms, average mobile broadband services remain unaffordable for the bottom 60 percent of the population, at more than 2 percent of GNI per capita. There also limitations regarding the speed and quality of connections. Sri Lanka ranked 121st out of 141 countries in mobile broadband speed, and 107th out of 175 in fixed broadband speeds (in February 2021). With an average fixed broadband speed of 29 Mbps, only a small share of households would be able to access a mix of learning, telework, and public services online during this and future pandemics.

The poor market outcomes in terms of digital infrastructure is likely due to the limited competitive pressure on the market. Most market segments are dominated by the two largest service providers, with some programs being implemented by the incumbent Sri Lanka Telecom without any competition at all. The government should therefore reform the telecommunications regulatory framework as follows: (1) identify areas of weak competition in the value chain and define appropriate *ex ante* competition regulation measures, (2) implement measures to reduce the costs of broadband network deployment including through infrastructure sharing, and (3) allocate limited resources, such as the radio spectrum, in a competitive manner that also supports innovation and affordable service provision. For those areas, and for those populations, where market failures could result in persistent underinvestment in broadband networks or limited adoption due to financial barriers, the government should evaluate options to subsidize access and adoption through strategic and targeted public investments.

Digital Public Platforms

Sri Lanka leads the South Asian region in terms of digital public platforms and has an ambitious forward-looking agenda benefiting from strong leadership and clear institutional arrangements. Notably, the Information and Communications Technology Agency (ICTA), which was established in 2003 and has had its mandate strengthened in recent years, plays a key role in coordinating activities in policy development and implementation. The ICTA has created shared infrastructure, such as the Lanka Government Cloud and Lanka Government Network, which connects 800 government offices. Sri Lanka tops the region on the UN E-Government Development Index (in 85th place) and is the only South Asian country in the top 100 globally.

Nonetheless, there are some significant structural challenges to be overcome if the country is to realize fully digitalized government services. A culture of openness among government agencies is lacking, as is the will to drastically change systems and business processes, with many transactions still requiring physical documents and intervention. Sustained investments in technology are therefore limited, with a number of digital government projects being terminated midway through implementation. The lack of internet use among the public is also a key constraint. Even among those who use the internet, there is limited trust in, and demand for, online government services: in 2019, only a third of adult internet users made use of online government services such as obtaining information or performing transactions. Sri Lanka's foundational identification system is well-established and covered 93.5% of adults in 2017. However, the system does not offer authentication services nor is it fully connected with the civil registry. Furthermore, there are small disparities in coverage among women and youth.

The ICTA is spearheading two exciting projects as part of its philosophy to embrace the 'digital stack'. First, the Sri Lanka Unique Digital Identity (SL-UDI) program intends to be an authentication and minimal data layer built on top of the existing foundational identification system, enabling public and private sector service providers to easily integrate. The ICTA also plans to link SL-UDI with payment systems,

similar to how Aadhaar is being used as a financial address in the India Stack. The SL-UDI will be built on the Modular Open Source Identity Platform (MOSIP) kernel. Second, the National Data Exchange (NDX) plans to enable secure and trusted personal data sharing, drawing on international experiences such as Estonia's X-Tee/X-Road and India's Data Empowerment and Protection Architecture, as well as emerging decentralized approaches. Linking the SL-UDI and NDX will enable people to consent to their data being shared, providing them with more agency over their personal data.

The most important priority for Sri Lanka will be to sustain the current momentum and ensure that the ICTA is sufficiently resourced to spearhead the development of digital public platforms and the digitalization of government services and operations. With the SL-UDI and NDX foundations in place and designed as a digital stack, there are important opportunities to develop a dynamic social registry and support other priority use cases such as financial services, healthcare, and education. To accelerate progress, government officials and agencies should be incentivized to streamline and fully digitalize their processes, including becoming paperless. With the enhanced use and re-use of personal data, the government should enact the personal data protection law as soon as possible and establish a credible supervisory regime to promote trust in digital government services. Finally, demand for digital government services should be stimulated by improving internet access and digital skills among the population, especially vulnerable groups.

Digital Financial Services

Sri Lanka's formal banking and insurance sector is well established, with an underlying infrastructure that is fairly digitized. A relatively large share of the population has a financial account: 73.6 percent of all adults, and 73.4 percent of female adults, have access to a financial account. In addition, 70.6 percent of adults in the bottom 40 percent of income have access to financial accounts and 72.8 percent of rural resident adults have access. The payments infrastructure has digitized to a large extent, with the central bank taking an active role in the process. However, usage of bank accounts and more advanced financial products remains limited. There are also considerable segments of the population that are either unbanked or underbanked. The uptake of Digital Financial Services (DFS) has been slow, due primarily to a limited reliance on traditional banking institutions. As most digital financial services are currently offered through traditional banks, uptake is weak, as is the adoption of other non-digital financial products (other than regular bank accounts). For example, between 2014 and 2017, the share of adults making or receiving a digital payment, within any particular year, doubled to 47.2 percent. Cash has long been the most popular payment mode for retail payments; in 2019, only 6 percent of adults used the internet to pay bills or to make a purchase. A move to digital transactions could support COVID-19 limitations on physical interactions, and would help the country prepare for future crises. Although a handful of new start-ups have emerged over the last few years, and solutions have been launched by some leading banks, the local FinTech space is nascent. One bottleneck may be that FinTech companies face the same level of regulations and restrictions as established financial institutions, making entry into the market difficult. These include, for instance, restrictions in accepting deposits, restrictions on payment of interest by e-money providers, mandatory physical signature verification, and no paper delivery.

The government could promote the development of digital financial services in Sri Lanka by taking the following measures: (1) adopting an agile approach to regulating innovative financial services, for example, taking a 'wait and see' approach, expanding the use of regulatory sandboxes to test FinTech innovations, or easing market entry barriers for smaller financial service providers while still ensuring financial integrity and stability, (2) promoting competition and financial inclusion through a level-playing field for digital financial services in terms of access to data, technologies, and infrastructures, and (3) reforming legal and regulatory frameworks to increase the trust of individuals in digital financial services

through improved protection against fraud, data leaks, security breaches, service unavailability, and poor customer recourse mechanisms. The latter is of course an integral part of the cross-cutting requirements of a trusted digital ecosystem.

Digital Businesses

Sri Lanka could do more to digitize its micro-small-and-medium sized enterprises (MSMEs) and promote its start-ups.¹²⁰ The start-up ecosystem in the country is nascent and was valued at US\$117 million in 2019. 350 start-ups were registered on the Startup SL platform, an industry-led attempt to create a centralized information hub for start-ups. Several incubators and accelerators have been set up with the help of development partners. Yet the country performs poorly in terms of start-up support when compared with aspirational peers such as Malaysia, India, and Thailand. Access to finance continues to be challenge: 70 percent of start-ups that responded to the 2019 SLASSCOM Sri Lanka Startup Survey indicated that they had either self-funded their venture or relied on funds from family. Gaps in the legislation also play a role in holding back entrepreneurship. For example, unlike countries such as India, Malaysia, and Singapore, Sri Lanka does not have a Limited Liability Partnership Act; as such, investors are compelled to become shareholders with less flexibility in the management of partnerships, thereby discouraging investment. By adopting digitally-enabled business models, Sri Lanka's MSME sector could tap more easily into opportunities for rapid growth and business development beyond its shores. The National Policy Framework for SME Development (from the Ministry of Industry and Commerce) underscores the role technology can play in driving innovation, productivity, and service quality. Sri Lanka's performance on the World Economic Forum's Executive Opinion suggests that ICTs are fairly well integrated in business. However, ICT usage by smaller businesses is low. Only 40 percent of SMEs used the internet for business in 2018, despite research showing that those SMEs using ICTs record 2.8 times more revenue and twice the profit of SMEs that are not ICT-enabled. The pandemic might have shocked some businesses into rapid digitization, as evidence from global surveys suggest. Nonetheless, the usual mix of constraints, such as limited digital skills among workers, low capacity to absorb technology into production or distribution, gaps in access to technology and finance, and limited use of the internet (for e-commerce), is likely to keep digital adoption by MSMEs low. MSMEs should be able take advantage of e-commerce, both domestically and internationally. Given increased market concentration, local players have been calling upon the government to create a level-playing field with international firms.

The government could take the following measures to support digital start-ups and the digitization of businesses: (1) simplify administrative procedures and mechanisms for incubation and the scale up of start-ups, (2) promote stronger business ties between Sri Lankan MSMEs and the private sector from outside the region, through the use of e-commerce platforms and partnerships across the region, (3) improve the broader business environment through legal and regulatory reforms, including the creation of a level-playing field between domestic and international firms, and (4) implement a program to boost digitization of SMEs through better access to technology, finance, and skills.

Digital Skills

The government has recognized the important role that digital skills play in achieving the country's digitalization targets. The development of advanced digital skills is crucial for the workforce in the digital industries, but also for businesses to compete more generally in the global value chains of the digital economy. The Export Development Board has identified IT and business process management as one of

¹²⁰ Digital start-ups refer to early-stage ventures that create new digital solutions or business models as part of their core products or services. The growth and sustainability of these digital start-ups require a well-functioning entrepreneurship ecosystem and venture capital financing to turn ideas to viable new businesses and scale fast.

the top 6 strategically important industries in Sri Lanka. The ICT workforce in the country was 124,873 strong in 201 and the government has pledged to increase this number to 200,000 by 2022. In 2018, the ICT workforce consisted primarily of graduates, with 74 percent having a bachelor's degree at minimum. The demand for these advanced skills remains strong. SLASSCOM, Sri Lanka's export-oriented ICT industry body, estimates that the annual demand for graduates in 2020 was 21,000, compared to a market supply of 9,000 (representing a demand/supply gap of 12,000). The supply of skills is limited in part due to a small pipeline of students: 11,166 undergraduates were enrolled in computer science courses in universities and higher education institutions in 2018. In addition, there is also significant brain drain from the country.¹²¹ As digitization spreads across the economy, basic digital skills are becoming increasingly important for workers in all sectors. It is important that individuals are able use digital technologies productively. But existing data on digital skills points to low levels of basic digital literacy amongst the population, which could deter usage of digital technologies and expose people to digital risks such as cyberthreats or misinformation. The national Computer Literacy Survey indicates that the average level of digital literacy stands at 46 percent, higher amongst men (49%) than women (42%).¹²² Opportunities to improve digital skills remain few and far between: the 2017 school census suggested that 45 percent of schools in the country had no access to computers and many instructors are still not digitally capable.

Absent or weak digital skills constitute a major bottleneck for the development of the digital economy in Sri Lanka. A digitally-competent workforce would boost the transformation of the country's economy, as would a digitally-literate population able to use digital technologies, beyond mere social exchange, to interact with government, access information, and learn. With the pandemic expected to increase both digitization and automation, Sri Lanka's workers would be better equipped for a resilient recovery with the necessary digital skills. In this context, the government should establish a strong digital skills development program with two main objectives: (1) to fill the gaps in basic digital literacy to advance the broad uptake of digital technologies across the population and (2) to develop specialized workforce-training programs with the private sector that strengthen foundational skills (e.g. analytical skills, communication) while also training people with in-demand technical skills. Specific attention should be given to skills development for women and their placement in high-productivity jobs in digital industries.

Policy Recommendations

Based on the analysis above, the following table sets out several high priority policy recommendations for the development of the digital economy in Sri Lanka.

Pillar	Short-term	Medium- to long-term
Infrastructure	<ul style="list-style-type: none"> Define appropriate <i>ex ante</i> competition regulation measures Implement measures to reduce the costs of broadband network deployment Allocate limited resources (e.g., radio spectrum) in a competitive manner that supports innovation and affordable service provision 	<ul style="list-style-type: none"> Evaluate options to subsidize access and adoption through strategic and targeted public investments
Platforms	<ul style="list-style-type: none"> Complete the development of foundational platforms needed for integrated services Accelerate reforms of the management of government data and systems to promote interoperability and data sharing 	<ul style="list-style-type: none"> Accelerate the ongoing implementation of a "whole of government" approach to digitization

¹²¹ <http://www.ft.lk/columns/Educated-youth-leaving-the-shores-of-Sri-Lanka-Is-it-brain-drain-or-brain-gain/4-678025>

¹²² Digital literacy (defined as the ability 'use a computer, laptop, tablet or smartphone on his/her own')

Pillar	Short-term	Medium- to long-term
Financial services	<ul style="list-style-type: none"> Promote competition and financial inclusion through a level-playing field for digital financial services in terms of access to data, technologies, and infrastructures 	<ul style="list-style-type: none"> Adopt an agile approach to regulating innovative financial services Adopt reforms to increase the trust of individuals in digital financial services through improved protection against fraud, data leaks, security breaches, service unavailability, and poor customer recourse mechanisms
Businesses	<ul style="list-style-type: none"> Simplify administrative procedures, including those for incubation and scale up of start-ups 	<ul style="list-style-type: none"> Promote stronger business ties between Sri Lankan MSMEs and the private sector from outside of the region Improve the broader business environment through legal and regulatory updates Boost digitization of SMEs through access to technology, finance, and skills
Skills	<ul style="list-style-type: none"> Design and implement, together with the private sector, specialized workforce training programs that strengthen foundational skills (e.g. analytical skills, communication) but also in-demand technical skills 	<ul style="list-style-type: none"> Invest in filling the gaps in basic digital literacy to increase the uptake of digital technologies more widely across the population
Trust	<ul style="list-style-type: none"> Update and strengthen key legal instruments relating to cybersecurity and personal data protection, in order to boost trust in government services and in private transactions 	<ul style="list-style-type: none"> Develop the capacity and skills of public sector employees and institutions to adopt digital technologies, whilst ensuring cybersecurity and personal data protection

References

- Anderson, B. J., & O'Connor, A. C. (2020). Economic impact of 2Africa. RTI International.
- Asian Development Bank, "Projected Impacts of Climate Change", 2010
- Asia-Pacific Economic Cooperation (APEC), "APEC Privacy Framework", 2017.
- ATAF, "Domestic Resource Mobilization (Digital Services Taxation in Africa)", 2020.
- Azam et al., "Review of the status and mass changes of Himalayan-Karakoram glaciers", Cambridge University Press, 2018.
- Bauer, Matthias, Michal Krol, Hosuk Lee-Makiyama, and Bert Verschelde. "THE COSTS OF DATA LOCALISATION: FRIENDLY FIRE ON ECONOMIC RECOVERY", ECIPE Occasional Paper, 2014.
- Bronza, B., "AUSTRIAN TRADE TOWARDS THE OTTOMAN EMPIRE AND ASIA DURING THE 18th CENTURY", ISTRAŽIVANJA Journal of Historical Researches, 2016.
- BRICS Competition Innovation Law & Policy Centre, "Digital Era Competition BRICS Report", 2019
- Brynjolfsson E., Collis A. How should we measure the digital economy? Harv. Bus. Rev. 2019;97(6):140–146
- Brynjolfsson, Erik, Lorin M. Hitt, and Heekyung Hellen Kim. 2011. "Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance?" SSRN Scholarly Paper ID 1819486, Social Science Research Network, Rochester, NY. doi.org/10.2139/ssrn.1819486. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), 2018.
- Ferracane, M., and E. Van der Marel, "Do data policy restrictions inhibit trade in services?", 2019
- Gately, D., "Sharing the Gains from Regional Cooperation: A Game Theoretic Application to Planning Investment in Electric Power", Department of Economics Research Report, Western University, 1972.
- Gomber P., Kauffman R.J., Parker C., Weber B.W. "On the fintech revolution: interpreting the forces of innovation, disruption and transformation in financial services", 2018.
- Hasnat et al., "Major Environmental Issues and Problems of South Asia, Particularly Bangladesh", Handbook of Environmental Materials Management (pp.1-40), 2018.
- Mackay, A., "Climate change 2007: Impacts, adaptation and vulnerability". Contribution of Working Group II to the fourth assessment report of the Intergovernmental Panel on Climate Change. J. Environ. Qual. 2008, 37, 2407.
- Meltzer, P., and P. Lovelock, "REGULATING FOR A DIGITAL ECONOMY UNDERSTANDING THE IMPORTANCE OF CROSS-BORDER DATA FLOWS IN ASIA", Global Economy and Development Brookings Working Paper, 2018
- Schneider, C., "The Political Economy of Regional Integration", Annual Review of Political Science Vol. 20:229-248, 2017.
- Soni et al., "Investigation of potential source regions of atmospheric Black Carbon in the data deficit region of the western Himalayas and its foothills", Atmospheric Pollution Research Volume 10, Issue 6, November 2019, Pages 1832-1842.

The World Bank, "A SINGLE DIGITAL MARKET FOR EAST AFRICA", 2018a.

The World Bank, "A Glass Half Full: The Promise of Regional Trade in South Asia", 2018b.

The World Bank, "The Digital Economy in Southeast Asia : Strengthening the Foundations for Future Growth", 2019.

The World Bank, "Building Back Better: Pursuing a Greener, More Inclusive, and Resilient Recovery", 2020a.

The World Bank, "Macro Poverty Outlook", 2020b.

The World Bank, ""DEEP TRADE AGREEMENTS (DTAs): Data, Tools and Analysis." About Dataset and Reference Paper. 2020c.

The World Bank, "Approach to South Asia Regional Integration, Cooperation and Engagement (SA RICE)", 2020d.

The World Bank, "Digital Financial Services", 2020e.

The World Bank, "World Development Report: Data for Better Lives", 2021a.

The World Bank, "Education Technology in South Asia. Recent Trends, Future Prospects and Issues". Background note as part of the World Bank study on "Technology for Accelerating Human Capital Outcomes in South Asia", 2021b.

The World Bank, "Technology to Accelerate Human Capital Outcomes in South Asia", 2021b.

WHO South-East Asia Journal of Public Health, "Harnessing the potential of digital health in the WHO South-East Asia Region: sustaining what works, accelerating scale-up and innovating frontier technologies", 2019.

UNCTAD, Digital Economy Report, 2019.

UNICEF, "How many children and young people have internet access at home?", 2020.

United States-Mexico-Canada Agreement (USMCA), 2019.

Vamvakidis, A., The World Bank Economic Review, Volume 12, Issue 2, May 1998, Pages 251–270, <https://doi.org/10.1093/wber/12.2.251>

World Bank Group. 2016. World Development Report 2016 : Digital Dividends. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/23347> License: CC BY 3.0 IGO

World Bank. 2021. Global Economic Prospects, January 2021. Washington, DC: World Bank. doi: 10.1596/978-1-4648-1612-3. License: Creative Commons Attribution CC BY 3.0 IGO.