DIGITAL DEVELOPMENT PARTNERSHIP

WORLD BANK GROUP

DIGITAL ECONOMY DIAGNOSTIC

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#DE4A
Digital Economy
for Africa Initiative

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About The DE4A Diagnostic Process In ESWATINI

Rapid digital transformation is re-shaping our global economy, permeating virtually every sector and aspect of daily life, changing the way we learn, work, trade, socialize, and access public and private services and information. In 2016, the global digital economy was worth some USD 11.5 trillion, equivalent to 15.5 percent of the world's overall GDP. It is expected to reach 25 percent in less than a decade, quickly outpacing the growth of the overall economy. However, countries like Eswatini are currently capturing only a fraction of this growth potential and need to strategically invest in the foundational elements of their digital economy to keep pace.

The Digital Economy for Africa (DE4A) Initiative forms part of the World Bank Group's support for the African Union's Digital Moonshot for Africa, which aspires to see every African individual, business and government be digitally enabled by 2030. The DE4A Initiative is underpinned by five principles:

1. **Comprehensive:** Taking an ecosystem approach that looks at supply and demand and defies a narrow, siloed approach in defining the digital economy elements and foundations.
2. **Transformative:** Aiming at a very different scale of ambition beyond incremental 'islands' of success.
3. **Inclusive:** Recognizing that the digital economy is for 'everyone, in every place, and at all times' as well as creating equal access to opportunities and dealing with risks of exclusion.
4. **Homegrown:** Supporting solutions anchored in the local context and unleashing the African spirit of enterprise to support more homegrown digital content and solutions.
5. **Collaborative:** Dealing with the digital economy requires a different, more flexible mindset, including collaboration among countries, across sectors as well as between public and private players.
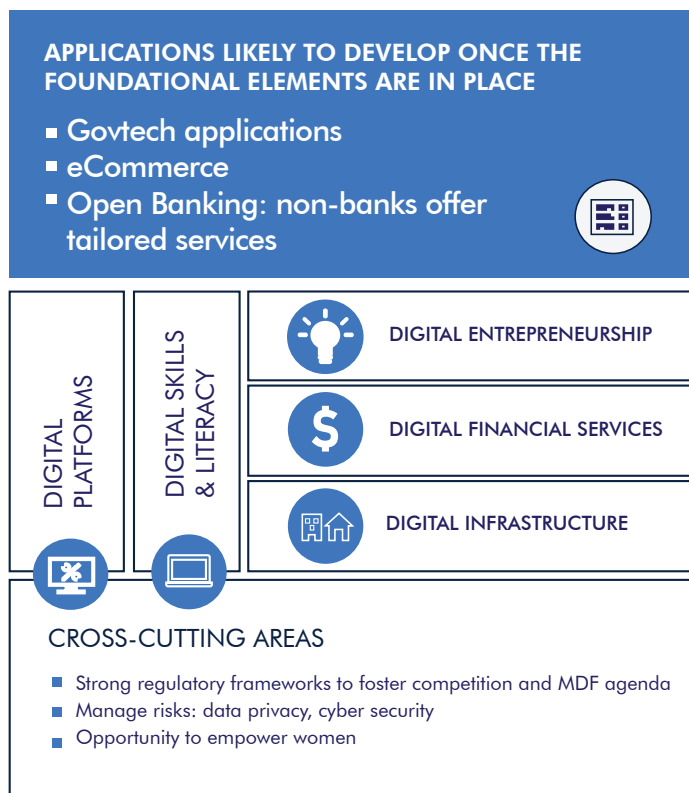
For a successful and inclusive digital economy, African countries need to support the development of the key foundational building blocks of the digital economy. Five foundational elements, which are synergistic, have been identified:

1. **Digital Infrastructure:** Digital infrastructure provides the means for people, businesses, and governments to get online, and link with local and global digital services, thus connecting them to the global digital economy. High-quality and affordable internet connectivity is a critical foundational component of the digital economy.

2. **Digital Platforms:** Digital platforms offer products and services, accessible through digital channels, such as mobile devices, computers, and the internet. They facilitate digital exchange and transactions, enabling producers and users to create value by interacting with each other. Governments, for example, operate digital platforms to offer citizen-facing government services and share information. Commercial firms and non-profit foundations also operate digital platforms to offer a growing array of products, services and information.

3. **Digital Financial Services:** Digital financial services enable individuals and businesses to conduct transactions electronically and include services such as digital payments, credit, savings, and insurance. Access to affordable and appropriate digital financial services is critical for the participation of individuals and businesses in the digital economy.

4. **Digital Entrepreneurship:** Digital entrepreneurship and innovation create an ecosystem that helps bring the digital economy to life, by spurring new, growth-oriented ventures, products, and services that leverage technology. By enabling the transformation of existing businesses, digital entrepreneurship contributes to net employment growth and helps to enhance competitiveness and productivity.

5. **Digital Skills**: Economies require a digitally savvy workforce to build robust digital economies, competitive markets and to enable individuals to access digital services and information. Digital skills constitute technology skills, together with business skills for building or running a startup

or enterprise. Greater digital literacy enhances the adoption and use of digital products and services amongst the larger population.

In addition, several cross-cutting themes shape these foundational elements, which determine the ability of creating an enabling institutional and policy environment. A clear strategy and strong leadership are both needed to spearhead the agenda at national level. Equally, the digital economy creates new legal and regulatory challenges, such as protecting consumers and their right to privacy, supporting cybersecurity and data protection, as well as effective taxation and competition, which need to be effectively addressed to ensure that innovative services continue to emerge, and guarantee their safe and affordable access. Moreover, for all citizens to reap the digital dividends associated with the digital economy, it needs to be inclusive to ensure that anyone, regardless of age, gender, income and geography has the ability to access digital tools and services.

Key components of the digital economy ecosystem

APPLICATIONS LIKELY TO DEVELOP ONCE THE FOUNDATIONAL ELEMENTS ARE IN PLACE

- Govtech applications
- eCommerce
- Open Banking: non-banks offer tailored services

DIGITAL PLATFORMS

DIGITAL SKILLS & LITERACY

DIGITAL ENTREPRENEURSHIP

DIGITAL FINANCIAL SERVICES

DIGITAL INFRASTRUCTURE

CROSS-CUTTING AREAS

- Strong regulatory frameworks to foster competition and MDF agenda
- Manage risks: data privacy, cyber security
- Opportunity to empower women

MFD: Maximizing Finance for Development

As part of the DE4A Initiative, ambitious, high-level targets have been established for all five foundational pillars of the digital economy,

DIGITAL INFRASTRUCTURE	DIGITAL SKILLS	DIGITAL PLATFORMS	DIGITAL FINANCIAL SERVICES	DIGITAL ENTREPRENEUR-SHIP
Universal internet network coverage	All 15 year old students with basic digital skills competencies	Doubling of online services index rating for all government	Universal access to digital financial services	Tripling the number of new digitally-enabled businesses created annually
Affordable internet for all at less than 2% of GNI per capita	100 000 graduates in advanced digital skills programs annually	All individuals are able to prove their identity digitally	Africa-wide payments infrastructure platforms in place	Financing for venture capital to reach 25% of GDP
Interim milestone doubling broadband connectivity by 2021		At least 50% of the population regularly uses the internet to access government or commercial services		

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Acknowledgements

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Diagnostic Methodology

Data collection

An **in-country kickoff and fact-finding mission** was undertaken in February 2020, in preparation of this diagnostic. A second mission took place in July 2022 to update and validate findings. In addition to **desk research**, these engagements allowed for broad stakeholder consultation with both the public and private sectors as well as civil society.

The following **stakeholders were consulted** as part of the country assessment: Ministry of Information, Communications, and Technology, Ministry of Finance, Ministry of Economic and Development Planning, Ministry of Home Affairs, Office of the Prime Minister – e-Government Unit, Ministry of Public Service, Ministry of Health, Ministry of Education, Ministry of Tinkhundla, Eswatini Communications Commission, Eswatini Posts and Telecommunications Corporation, Eswatini Revenue Authority, Eswatini Public Procurement Agency, the Royal Science & Technology Innovation Park, Mbabane Hub, and the Central Bank of Eswatini.

Analysis presented also draws on **regional and global benchmarking**, based on standardized indicators that form part of the DE4A diagnostic methodology. The analysis also draws on government statistics and data shared by the private sector.

Limitations and data gaps

Given the nascent state of Eswatini's digital ecosystem, there is a paucity of reliable data across the board in relation to the digital economy. The report thus draws heavily on data shared by stakeholders consulted and international benchmarking data, when available. The Covid-19 pandemic also rendered difficult data gathering and interactions with counterparts during report preparation and consolidation.

List of Acronyms

ADSL	Asymmetric Digital Subscriber Line
AML	Anti-Money Laundering
API	Application Program Interface
ASIT	Advanced School of Information Technology
ASYCUDA	Automated System for Customs Data
ATM	Automated Teller Machine
AU	African Union
B2B	Business-to-Business
B2C	Business-to-Consumer
BDS	Business Development Services
CBE	Central Bank of Eswatini
CFI	Centre for Financial Inclusion
CFT	Combating the Financing of Terrorism
CICO	Cash in Cash out
CMIS	Client Management Information System
CSC	Civil Service Commission
DE4A	Digital Economy for Africa Initiative
DFS	Digital Financial Services
DSL	Digital Subscriber Line
ECOT	Eswatini College of Technology
EEC	Eswatini Electricity Company
EFT	Electronic Funds Transfer
e-GP	Electronic Procurement System
EIC	Eswatini Infrastructure Corporation
EIPA	Eswatini Investment Promotion Agency
EPTC	Eswatini Swaziland Posts and Telecommunications
ESCCOM	Eswatini Communications Commission
ESPPRA	Eswatini Public Procurement Regulatory Agency
FSP	Financial Service Providers
FSRA	Financial Services Regulatory Authority
G2B	Government-to-Business
GDP	Gross Domestic Product
GEN	Global Entrepreneurship Network
GNI	Gross National Income
GoE	Government of the Kingdom of Eswatini
GSMA	Global System for Mobile Communications Association
HRMIS	Human Resource Management Information System
ICT	Information and Communication Technology
ID	Identification
IMF	International Monetary Fund
IMS	Information Management System
IP	Intellectual Property
IP	Internet Protocol
IPR	Internet Property Rights
ISO	International Organization for Standardization
ISOC	Internet Society
ISP	Internet Service Provider
ITU	International Telecommunication Union
IXP	Internet Exchange Point

JAE	Junior Achievement Eswatini
JVA	Joint Venture Agreement
KYC	Know-Your-Customer
LEAP	Limkokwing Enterprise Acceleration Platform
MCIT	Ministry of Commerce, Industry, & Trade
MDA	Ministries, Departments and Agencies
MICT	Ministry of Information, Communication and Technology
MMSP	Mobile Money Service Providers
MNO	Mobile Network Operators
MoET	Ministry of Education and Training
MOTC	Ministry of Transport and Communications
MOU	Memorandum of Understanding
MP	Member of Parliament
MSMEs	Micro-, Small-, and Medium-Enterprises
NCSS	National Clearing and Settlement Systems
NDP	National Development Plan
NGN	Next Generation Network
NICI	National Information and Communication Infrastructure
NPR	National Population Register
NPS	National Payment System
NREN	National Research and Education Network
OPM	Office of the Prime Minister
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PIN	Personal Identification Number
POS	Point of Sale
PPP	Purchasing Power Parity
REN	Research and Education Network
RSTP	Royal Science & Technology Innovation Park
RTGS	Real-time Gross Settlement
SACCO	Savings and Credit Cooperative Organization
SADC	Southern African Development Community
SEDCO	Small Enterprise Development Company
SIDS	Small Island Developing States
SITA	South African State Information Technology Agency
SMEs	Small and Medium Enterprises
SOE	State Owned Enterprise
SRA	Eswatini Revenue Authority
SSA	Sub-Saharan Africa
STEM	Science, Technology, Engineering and Mathematics
TVET	Technical Vocational Education and Training
UASF	Universal Access and Service Fund
UNDP	United Nations Development Programme
USD	United States Dollars
VOCTIM	Gwamile Vocational and Commercial Training Institute
WBG	World Bank Group
WEF	World Economic Forum
WIPO	World Intellectual Property Organization
YERF	Youth Enterprise Revolving Fund

Executive Brief

Rapid digital transformation has been re-shaping the global economy, changing fundamental patterns of social and economic activity, with a further acceleration during the global Covid-19 pandemic due to the increased recognition of the potential of digital transformation for building resilience in economies. The potential is huge. For example, digital transformation in the agricultural sector, which is the main source of income and livelihood for more than 70 percent of the Swazi, would significantly increase productivity gains and reduce poverty in rural areas. This diagnostic provides an assessment and recommendations on five pillars that are foundational to the development of a vibrant digital economy in Eswatini: digital infrastructure, digital platforms, digital financial services, digital skills and digital entrepreneurship.

Adoption of broadband services remains low in Eswatini. Mobile broadband is the predominant way for the Swazis to access the internet, with 90 percent of the population covered by mobile broadband networks (3G plus). However, the country is characterized by a wide mobile internet usage gap (i.e., those who live within range of a broadband network but do not use internet services). In 2021, it was estimated that the mobile broadband penetration was only 35 percent, when calculated with unique subscribers. The usage gap is attributable to the lack of affordability of both fixed and mobile internet services. Unaffordable internet has also negatively impacted the rollout and usage of e-Government and e-Commerce services, as well as entrepreneurial growth, within Eswatini.

Digital infrastructure in Eswatini is underdeveloped due to lack of competition in the broadband sector, as the incumbent operator, the Eswatini Posts and Telecommunications Corporation (EPTC), has a partial monopoly and exclusivity of first mile (international connectivity) and middle mile (national backbone) connectivity. As part of its Covid-19 Recovery Plan 2020, the Government of Eswatini (GoE) has renewed its commitment to complete the unbundling of EPTC as part of an effort towards liberalization of the ICT industry. The successful unbundling of EPTC would be an important first step in introducing further market competition in the sector and spurring private investment. Together with the introduction of key regulatory safeguards, the unbundling of EPTC will be a key step in improving access and affordability of broadband services in Eswatini. However, given EPTC's recent operating and financial performance and the increasing competition within Eswatini's telecommunications market, unbundling alone may be insufficient to ensure that EPTC's businesses are sustainable and that Eswatini obtains the infrastructure and low-cost internet services it needs to fully realize digital economy and e-Government opportunities. This is because substantial investment and technical resources and expertise are required to deploy and upgrade wholesale networks.

There is a significant opportunity to strengthen compliance, efficiency and transparency in government and improve the experience of and benefits to public and private sector digital platform users in Eswatini. Currently, Eswatini is in a feedback cycle wherein (1) user experience is sub-optimal, and platform benefits are unclear; (2) demand for platforms and incentives for investing in them is low; thus, (3) performance remains poor. Public sector platforms have limited availability and functionality, do not securely share essential data between themselves to streamline user experience (e.g., using the ID system to facilitate permissioned data sharing across government services), and are not built on secure and reliable infrastructure. Similarly, critical digital private platforms, such as e-commerce marketplaces and digital financial services, remain underdeveloped and underutilized. The government would need to urgently prioritize investments in public sector platforms and the incubation of private sector platforms, as well as establish clear leadership, support and accountability structures to fully reap their benefits.

Eswatini's collaborative efforts in modernizing the payments landscape have resulted in a solid financial infrastructure on which innovative digital financial services can be anchored. While 3 in 4 adults already use mobile money, opportunities exist to boost the level of digital financial services to even more impressive levels. The Digital Financial Services (DFS) ecosystem is still evolving, with existing initiatives narrowly focused on the payments segment and largely driven by mobile money. Ensuring full interoperability between banks and non-banks, as well as between mobile money services, would be an essential prerequisite for advancing further adoption, affordability, and innovation in DFS.

Digital skills development is significantly constrained, with limited educational curricula and quality training programs. This is further hindered by the lack of digital infrastructure in educational institutions and the high costs of internet connectivity, both of which pose a significant barrier to online and remote learning, particularly for higher education. There is an urgent need for the Government to establish comprehensive policies and implementation plans for digital skills development, both to ensure its population becomes fully digitally literate and to nurture a digitally competent workforce. This should be complemented by plans to develop the necessary digital infrastructure in educational institutions.

Digital entrepreneurship in Eswatini significantly lags due to the lack of a pipeline of investible ventures, integrated and impactful support programs, early-stage financing, and a weak enabling environment for digital entrepreneurship and private investments. The current public and private sector initiatives are largely uncoordinated and small-scale, with limited impact in terms of reach and job creation. Nonetheless, the GoE is committed to supporting digital entrepreneurship through the Royal Science and Technology Park (RSTP), which houses the country's only digital incubator and hosts the Africa e-Trade Group for Southern Africa, the African Union's (AU) initiative to grow the digital single market in the region. The weakness of the entrepreneurship and innovation ecosystem reflects various challenges affecting the digital economy, such as limited access to and affordability of digital connectivity, the disconnect between supply and demand of digital skills, and the limited adoption and use of digital platforms and DFS products.

Executive Summary

This report provides an assessment of the various pillars of Eswatini's digital economy, as part of the World Bank Group (WBG)'s Digital Economy for Africa (DE4A) initiative. Prepared to support the implementation of the Digital Transformation Strategy for Africa, approved by the African Union in February 2020, the WBG DE4A Initiative aims to help drive Africa's digital transformation and sets out a bold vision to ensure that every African individual, business and government is digitally enabled by 2030. The initiative leverages an integrated and foundation-based diagnostic framework to examine the development of the digital economy across Africa. Based on this framework, this assessment provides a comprehensive overview of the five DE4A foundational elements in Eswatini: digital infrastructure, digital platforms, digital financial services, digital skills and digital entrepreneurship. The analysis presented in this report is based on desk research and several fact-finding missions by various WBG digital economy experts, that allowed for broad stakeholder interaction with the GoE, the private sector and other key stakeholders. This report seeks to support various government institutions and stakeholders to take stock of the current state of the digital economy and provide recommendations for further development.

The digital economy offers Eswatini a range of opportunities for economic development and leapfrogging. Digital technologies are expanding access to global markets, changing business models, fostering innovation, and delivering enormous productivity gains. For example, digital transformation in the agricultural sector, which is the main source of income and livelihood for more than 70 percent of Swazi, has the potential to increase productivity gains and thus reduce poverty in rural areas. Similarly, digitalization of the health sector will better equip Eswatini to respond against a global pandemic, such as Covid-19, for example by facilitating online vaccine registration.

As such, Eswatini could benefit from a digital revolution that has the potential to drive sustained and inclusive economic growth and provide much-needed jobs to its youthful workforce. The accelerating pace of technology diffusion could also provide an opportunity to unlock new channels for access to quality public and private services. The public sector plays an important dual role in this new environment, both as a user of digital technologies in delivering key products and services and as a regulator of the functions and activities associated with the digital economy. Therefore, Eswatini needs to adopt the necessary policy and regulatory reforms, including adopting the right institutional arrangements, to realize the benefits associated with digital transformation.

As governments worldwide sought ways to respond to the economic and social consequences of the Covid-19 pandemic, the need for seamless and reliable digital services had never been more important. In Eswatini, the pandemic led to a sharp decline in economic growth at a time when the country had already been facing deep economic and social challenges. The pandemic, and the social distancing measures instituted to curb the crisis have brought to the forefront the importance of digital technologies, which provide the tools to facilitate human interaction and business continuity without physical interaction.

Laying the foundations for the digital economy in Eswatini will continue to be an effective response to curb the impact of major crises, such as health or climate shocks, by allowing the preservation of livelihoods and the continuity of businesses, core government functions and service delivery. Furthermore, a robust digital economy and digital transformation in various sectors will be key for increasing Eswatini's economic resilience and facilitating its recovery from future shocks. For example, access to affordable and reliable internet has been the lifeblood of Eswatini's economy during the pandemic. In addition, ensuring the continuity of government services and core government functions through digital technologies has been essential to safeguarding the welfare of the Swazi population. This is all the more so as the country's reliance on digital technologies will grow in the "new normal," which encompasses remote working and digital government. Similarly, supporting the development of digital infrastructure and connectivity for education institutions is critical to ensure the continuity of learning in case of school closures. Finally, powering digital financial services and online payments are one way to ensure the continuous operation of businesses and commercial activities.

The Government of the Kingdom of Eswatini is cognizant of the importance of digital transformation. The Information Communications Technology (ICT) sector has been recognized as a driver for economic growth and sustainable development and, consequently, is highlighted as a national priority in Eswatini's National Development Plan (NDP) 2019-2022. Following the outbreak of Covid-19, the GoE has also identified the ICT sector as one of the critical enablers for the fulfillment of its Post Covid-19 Recovery Plan. However, this has not yet translated into ICT sector reforms and investments. Key priorities and investments identified in the recovery plan include unbundling EPTC, leveraging the Royal Science and Technology Park (RSTP), creating a single center of excellence for the government, developing the country's internet exchange point (IXP), and establishing a national payment gateway. Overall, little progress has been made so far on these fronts, as will be further described below.

Diagnostic findings show that the potential of the digital economy in Eswatini has not yet been fully realized. A coordinated and holistic approach will be needed to build an inclusive digital economy, as each of the foundations play an important role in their own right, but also depend upon and reinforce the others. For example, improved digital connectivity can only have a transformational impact on economic opportunity and inclusive growth when combined with improved digital skills and literacy, access to digital payments and other financial services, and support to digital entrepreneurs. The government's ability to develop digital platforms and leverage technology for improved efficiency and service delivery is key to enable the interlinkages between the pillars and create synergetic effects. The combined effect of these improvements is larger than their sum.

Below is a summary of key findings across the five foundational pillars of the digital economy in Eswatini.

Digital Infrastructure

Mobile broadband has been the predominant way in which people and businesses in Eswatini use internet services, but overall penetration rates remain low. In 2021, the mobile broadband penetration rate was estimated at only 35 percent (unique subscribers). This is particularly low when considering that around 90 percent of the population are covered by mobile broadband networks (at least 3G). The high usage gap (i.e., those who live within range of a broadband network but do not use internet services) is largely explained by the lack of affordability of both fixed and mobile internet services. This lack of affordability is in turn due to incomplete market liberalization and lack of competition, combined with the lack of access to submarine cables, as Eswatini is a land-locked country. Unaffordable internet has also negatively impacted the rollout and usage of e-Government and e-Commerce services, as well as entrepreneurial growth, within Eswatini.

Digital infrastructure in Eswatini is underdeveloped, mainly due to the lack of competition in the broadband sector. This is because the incumbent operator, EPTC, has partial exclusivity in the first mile (international connectivity, although other players have begun to bypass EPTC and procure their own internet capacity) and middle mile (national backbone) of the broadband value chain. While the unbundling of EPTC to separate its wholesale and retail functions was initiated as early as 2013, no effective progress has been made so far. The GoE has renewed its commitment to the unbundling of EPTC and included it as one of the enablers for liberalizing the ICT industry in its Covid-19 Recovery Plan, published in 2020. Unbundling EPTC will be an important first step in fostering a more competitive broadband market and developing incentives for private sector investment in underserved areas, as well as advancing the GoE's efforts to lower broadband prices. Successful unbundling and improved affordability will be only be realized by the introduction of regulatory safeguards and oversight measures, such as wholesale price control, nondiscriminatory access to wholesale networks and clear market definitions of the broadband value chain. Even after the unbundling of EPTC, however, the GoE should consider an array of options to pursue further liberalization and privatization and effectively increase private investment and market competition. In particular, given EPTC's recent operating and financial performance and the increasing competitiveness of Eswatini's telecommunications market, unbundling alone may be insufficient to ensure that EPTC's businesses are sustainable or that Eswatini obtains the low-cost internet services needed to fully realize digital economy and e-Government opportunities. This is because substantial investment and technical resources and expertise are required to deploy and upgrade wholesale network.

Investments are also needed to improve digital infrastructure. The country needs massive investments to modernize backbone infrastructure, which still includes a significant share of copper cables, as well as cross border bandwidth and capacity. For mobile broadband, there is room to further increasing access to high-speed, good quality internet services by expanding 4G/LTE networks to the remaining lagging regions of the country. While this will be mainly driven by private investment, the GoE must work to ensure the expansion of mobile networks in rural and remote areas in order to narrow the digital divide. In addition, special emphasis needs to be placed on increasing the demand for broadband services through targeted interventions and thus increase digital inclusion. This could include demand-side subsidies for handsets and tablets and low- or zero-interest loans for devices, as well as large scale digital awareness and literacy campaigns.

Digital Platforms

Public Digital Platforms: There is a significant opportunity to strengthen compliance, efficiency and transparency in the public sector by improving public sector platforms in Eswatini. The assessment found that Eswatini needs to upgrade or re-implement major public administration systems, such as Financial Management Systems, Payroll, e-Procurement, Revenue Systems, and Human Resources Mechanisms to improve government effectiveness and accountability. In the absence of a whole-of-government approach to e-Government, several digital government platforms have been developed to fulfill specific functions for the relevant Ministries, Departments and Agencies (MDAs) involved. However, these do not take into account the full set of business processes and end uses, nor have they enabled connectivity with other public sector platforms. Furthermore, government infrastructure is not sufficiently robust to support the desired system upgrades. For example, Eswatini has an integrated civil registration and national identification (ID) system based on the National Population Register (NPR), although the absence of necessary legal and regulatory frameworks and technical capacity has been a constraint to deploying a modernized ID system at scale.

There is also an opportunity to improve the experience of and benefits to public and private sector digital platform users in Eswatini. Currently there is an incomplete feedback cycle wherein user experience is sub-optimal and the benefits of using platforms remain unclear, leading to reduced demand for platforms and insufficient incentives to further invest in them. Public sector platforms are limited in availability and functionality, do not securely share essential data across platforms to streamline user experience (e.g., using ID to facilitate permissioned data sharing across government services), and are not built on a secure and reliable infrastructure.

Commercial Digital Platforms: Critical private digital platforms, such as e-commerce marketplaces and digital financial services, remain underdeveloped and thus underused in Eswatini. Many Micro, Small and Medium Enterprises (MSMEs) may lack the awareness and knowledge of how to use such platforms. In addition to removing the regulatory roadblocks that impede the availability of infrastructure and affordable connectivity, the government should also promote the use of private digital platforms, such as e-commerce platforms, by leveraging its hosting role of the Africa e-Trade Group in partnership with the African Union (AU) and the recently launched continental e-commerce platform, **Sokokuu,** as well as through the development of an e-commerce strategy.

Underlying these challenges is the lack of commitment to implementing legal and policy reforms for the digital economy and a low level of investment in building and utilizing existing technical capacity in the public and private sectors. The government needs to urgently prioritize investments in its public sector platforms and the incubation of private sector platforms, as well as establishing clear leadership, support and accountability structures for developing public sector platforms in order to fully reap their benefits. The government should ensure that both public and private platforms become interoperable with DFS. A strategic approach also needs to be taken to improving the reliability of infrastructure and the leveraging of shared services. In addition, for any of these platforms to be successful, low-cost broadband access is required across Eswatini.

Digital Financial Services

Eswatini's collaborative efforts in modernizing the payments landscape for more than two decades have laid a solid financial infrastructure on which innovative digital financial services can be anchored. Even though around 94 percent of the adult population in Eswatini have access to a mobile phone and 3 in 4 of these adults use mobile money, further opportunities still exist to expand the use of digital payments. However, these opportunities would most likely be constrained by factors including the low percentage of the population with a reliable source of income; the dominance of cash as a preferred payment instrument; low levels of financial literacy and trust; and absence of merchant acceptance points for DFS. The relevant authorities have committed to promoting digital solutions and improving access to financial services, which is demonstrated through the establishment of a financial technology (Fintech) unit at the Central Bank of Eswatini (CBE), issuance of an enabling regulation on mobile money, the ongoing review of the legal and regulatory framework for payments and digital financial services, guidelines for regulatory sandboxes, and the hosting of a Fintech challenge to encourage firms and individuals to develop innovative solutions. Nevertheless, despite the Government's commitment, adequate and sustainable funding to support these individuals and firms is lacking.

This report finds that achieving full interoperability between banks and non-bank payment service providers is a key prerequisite for expanding the usage of DFS and realizing the potential of a cashless society in Eswatini. As authorities work towards full interoperability, consideration should be given to making this part of a broader focus on retail payments and to focusing on additional aspects of the digital economy, such as fast payments, payment aggregation, mobile money, agent network interoperability, and expanding access channels.

Furthermore, the GoE can take the lead in reducing the use of cash by digitizing government payments—government-to-business (G2B) and government-to-individuals (G2P)—as it is one of the biggest users of the payment system. In addition, establishing an enabling framework that supports digital signatures and the verification of identity information would help to address not only the challenges brought about by Covid-19 restrictions, which led to reliance on traditional manual and paper-based processes in financial services, but would also make DFS delivery safer and more efficient.

Digital Skills

Despite the growing demand for and importance of digital skills in Eswatini, digital skills development is significantly hampered by the limited availability of adequate educational curricula and quality training. This problem is further compounded by the lack of digital infrastructure in education institutions, with only 10 percent of primary schools and 60 percent of secondary schools connected to the internet, in addition to high internet connectivity costs, which pose a significant barrier to online and remote learning. Furthermore, there is no global policy for the use of ICT in education; this would help articulate an implementation plan to build digital skills at various levels and specify targets to measure improvements in the education system. While there are several different policies that address broad issues related to ICT in education, they are not coordinated in terms of their implementation, nor do they provide operational details to guide investments. Additionally, the understanding of labor market needs and demand for individuals with different kinds and levels of digital competencies is scarce, which further prevents the deployment of targeted interventions.

To support a digitally literate population and digitally competent workforces, the GoE should first establish comprehensive policies and implementation plans for digital skills. These policy measures should be complemented by plans to develop the necessary digital infrastructure in educational institutions and ensure that all major education and resource institutions are connected to the internet.

Given that systematic linkages between higher education and training and the labor market are underdeveloped, a considerable effort is required to improve labor market information to help guide skill development strategies and plans, including for digital skills. A supply-and-demand analysis is needed to inform a human resource development plan for digital skills, around which employers and training institutions could coalesce. In the meantime, continuing to increase the number and quality of ICT professionals in the country is imperative to increase the base of more sophisticated digital skills, which will have a positive impact across all economic sectors.

Digital Entrepreneurship

After Lesotho, Eswatini's entrepreneurship ecosystem is the least developed in the Southern Africa region. The private sector in Eswatini largely consists of micro-entrepreneurs and businesses that tend to be operated by subsistence entrepreneurs. According to the Global Entrepreneurship Indicators (GEI), Eswatini lags behind its peers in startup skills, networking, technology absorption, and its business environment is not conducive to entrepreneurship. Various public and private sector efforts are largely uncoordinated and small-scale, and thus have limited impact in terms of reach and job creation. The Small Enterprise Development Company (SEDCO) within the Ministry of Commerce provides business advisory support to a range of MSMEs, with mixed outcomes. SEDCO currently does not provide targeted support for digital businesses. In addition, a comprehensive monitoring and evaluation program for existing business support programs is absent, which makes it challenging to collect data on how many of these firms and startups have successfully scaled their businesses and attracted commercial financing. The weak entrepreneurship and innovation ecosystem is also the result of weaknesses in other parts of the digital economy, such as the limited access and affordability of digital connectivity, the disconnect between digital skills needs and supply, and the limited adoption and use of digital platforms and DFS products. The lack of adequate protection for Intellectual Property Rights (IPR) is also of concern.

The GoE's commitment to supporting digital entrepreneurship is evidenced by the establishment of the RSTP, a parastatal agency under the Ministry of Information, Communication and Technology (MICT), which includes an incubation center for digital and digitally enabled firms. RSTP is currently Eswatini's only digital incubator, providing world-class facilities for digital startups, including co-working spaces and meeting rooms. RSTP is well positioned to act as an entrepreneurship ecosystem hub and builder to strengthen collaboration and co-creation across the ecosystem, as well as to foster stronger links to the Southern African ecosystem. In particular, there is an opportunity for the GoE to strengthen the regional integration of digital markets by leveraging its hosting role of the Africa e-Trade Group (housed within RSTP) and *Sokokuu*, the continental e-commerce platform for Africa, with the aim of expanding market access for MSMEs. To effectively leverage RSTP and facilitate the emergence of dynamic startup ecosystem, concerted efforts are required to improve entrepreneurship education and skills, build a pipeline of talent and ideas, and provide integrated financial and non-financial support to early-stage ventures.

Cross-Cutting Issues

Although the planned Eswatini Digital Strategy and ICT Master Plan and existing policy frameworks (such as the e-Government Strategy) help to clearly assign roles and establish a strategy to guide institutions to advance the digital economy, several cross-cutting challenges remain. Addressing these issues would help Eswatini strengthen its ability to deal with individual challenges identified under the five pillars.

Improving institutional coordination. Although Eswatini is making progress towards its digital vision, there is no comprehensive whole-of-government approach that can bring together the various constituencies of the government. Many key objectives identified in existing policies are far from realization, including wider broadband access and greater use of ICT to increase efficiencies across all sectors of the economy.

This lack of progress is due to underlying issues related to poor strategy design and weak political buy-in, but also a lack of effective institutional coordination and inadequate resources to support implementation. The absence of a clear strategy has in turn had an adverse effect on the effectiveness of existing institutions, as key MDAs lack strategic direction and a shared vision.

Addressing remaining regulatory gaps and strengthening implementation of the legal and regulatory framework. While the laws addressing cybercrime, data protection and electronic trade were recently enacted, the corresponding regulations and regulatory bodies now need to be created. Regulatory reforms are also needed to facilitate digital transactions and e-commerce platforms such as an enhanced IP framework, consumer protection, and so forth. As discussed above, the prolonged unbundling process of EPTC, the stalling of legislation that could facilitate improved broadband infrastructure, and resulting legal action have resulted in the high cost of internet access. Digital transformation has been further undermined by the lack of capacity and resources for line ministries' legal staff to draft legislation that incorporates relevant aspects of international best practice.

Bridging the urban-rural digital divide. Apparent differences have emerged between rural and urban populations in terms of access to digital infrastructure and digital services. While official data on the urban-rural divide is not readily available, anecdotal evidence from relevant stakeholders suggests that access to key digital infrastructure and services is largely limited to the urban population in Eswatini. This issue is compounded by differences in education and levels of financial literacy, that act as an additional barrier to access to services such as digital financial services. Addressing these issues will require concerted effort on the part of authorities as well as the crafting of policies aimed at addressing these differences. This should be part of a collaborative process involving all relevant stakeholders.

TABLE 1: Assessment of the strengths, weaknesses, roadblocks and opportunities of each DE4A pillar

Digital Infrastructure		
Main strengths	**Main weaknesses and roadblocks**	**Opportunities**
• Steps towards liberalization initiated • Strengthened regulatory environment through regulatory decisions in areas such as infrastructure sharing, interconnection, and licensing • Reduction in wholesale broadband prices through the Price Transformation Program implemented by the Eswatini Communications Commission (ESCCOM) • Competent telecoms regulator	• Lack of competition in fixed broadband market due to delayed unbundling of EPTC and the exclusivities it benefits from • Lack of national broadband plan • Low adoption of mobile broadband and high usage gap • Unaffordable broadband prices for all user groups (government, educational institutions, businesses and individuals) • Digital divide in urban-rural areas	• Existence of fiber backbone presents an opportunity for good quality broadband internet services if conducive policy and market environment is in place • RSTP provides an opportunity to develop world-class data center facilities

Recommendations

Quick wins

- **R1.1:** Proceed with the unbundling of EPTC while pursuing liberalization of all segments of the value chain in due course. Based on the unbundling report prepared by the International Telecommunications Union (ITU), conduct an EPTC options study to evaluate selected options for the long-term sustainability of EPTC's telecom businesses. Based on the conclusions of the options study, proceed with relevant unbundling of EPTC to facilitate the accounting and functional separation of EPTC's wholesale and retail service businesses, identify potential restructuring areas and leverage private sector investment. Pursuing liberalization would include clarifying the current situation with regards to the international gateway, liberalizing the middle-mile segment after a period of exclusivity after the unbundling, and ensuring that additional players could possibly enter the market.
- **R1.2:** Review and improve the administration of the Universal Access and Service Fund (UASF).
- **R1.3:** Facilitate infrastructure sharing with state-owned enterprises (SOEs), such as the Eswatini Electricity Company (EEC), to expand fiberoptic broadband infrastructure.

High priority

- **R1.4:** Place conditions and regulatory safeguards, such as cost-based wholesale price controls, adequate interconnection regulations and measures to ensure nondiscriminatory and open access to the wholesale network followed by the unbundling of EPTC.
- **R1.5:** Expedite the expansion and certification of the local Tier III data center to encourage the growth of a local cloud services and content ecosystem.
- **R1.6:** Increase demand for and usage of broadband services by reducing or eliminating excise duties and other taxes on feature and early-level smartphones, tablets or laptops, and/or subsidizing or offering low or zero-interest loans for their purchase, as well as by implementing large scale digital awareness and literacy campaigns.

Digital Platforms

Main strengths	Main weaknesses and roadblocks	Opportunities
• Some core platforms and platforms for service delivery in place, i.e., digitized national identification; HR management, tax and customs payments, health services. • A few private sector digital platforms promoting business competitiveness including mobile money • Substantial progress made in increasing birth registration and providing identification to people in Eswatini	• Low government online presence • Lack of interoperability resulting in redundant data collection and lower-quality services • Cyber assets and critical infrastructure not sufficiently secure • Limited e-commerce platforms due to low uptake of DFS • Constrained business environment • Limited demand for service delivery platforms	• Development of an interoperability framework • Strengthened public platform functionality to drive greater efficiency and service delivery • Increased use of platforms to gather citizen feedback on government services • Commitment to increase the coverage, reliability, and security of ID and CR systems to improve trust in the NPR platform • Boosting the use of e-commerce platforms

Recommendations

Quick wins

- **R2.1:** Pilot mobile government apps for core and service delivery platforms that have a high level of readiness, e.g., tax filing, procurement, and health services.
- **R2.2:** Conduct detailed systems assessments, audits and business process reviews to develop technical specifications for core government platforms.
- **R2.3:** Invest in upgrading the National ID/NPR platform and establish linkages to key service delivery platforms to increase equity and accessibility, particularly for social protection and education.

High priority

- **R2.4**: Improve government ICT infrastructure to enable utilization of more advanced public sector platforms.
- **R2.5:** Clarify mandates and strengthen coordination functions to support implementation of e-Government strategy.
- **R2.6:** Promote the use of e-commerce platforms by leveraging regional initiatives and through the design and implementation of an e-commerce strategy.

Digital Financial Services

Main strengths	Main weaknesses and roadblocks	Opportunities
• Solid financial market infrastructure on which to anchor DFS • Proportionate regulation that allows non-bank participation in the issuance of mobile money • High percentage of population with access to mobile phones and growth in agent network • Authorities' commitment to DFS and financial inclusion • Establishment of the Centre for Financial Inclusion with a mandate to drive financial inclusion growth through DFS	• DFS at an infancy stage • Absence of specific retail payments strategy • Lack of full interoperability between bank accounts and mobile wallets • Lack of access to payment channels in rural areas • Bank fees viewed as very high • Lack of sustainable funding for innovative developments • Absence of digital framework for electronic signatures and customer identity validation	• Achievement of large-scale shift to DFS through government payments, informal sector and insurance products, thus boosting financial inclusion • Size of the country and small population creates an opportunity to shift to digitization relatively easily • Targeting of rural areas with specific products and financial education • Spillover benefits from South African banks to DFS

Recommendations

Quick wins
- **R3.1:** Complete the implementation of the online government portal and promote the use of DFS in government payments through a comprehensive national strategy for digital services.
- **R3.2:** Establish an enabling framework that supports digital signatures and the verification of identity information declared by customers.
- **R3.3:** Finalize the review of the Payment Systems Act in order to strengthen and broaden the legal framework for developing DFS.

High priority
- **R3.4** Conduct a comprehensive retail payment cost study with a view to establish the fees to be charged by service providers.
- **R3.5:** Strengthen the oversight and supervision capacity of the CBE to ensure it adequately responds to the development and expansion of DFS in Eswatini.
- **R3.6:** Establish domestic retail payments and credit infrastructure to achieve full interoperability, expand DFS and improve lending.
- **R3.7:** Establish a regulatory framework for international remittances based on relevant standards.
- **R3.8:** Strengthen cooperation between regulators beyond existing bilateral memoranda of understanding (MOUs).

Digital Skills

Main strengths	Main weaknesses and roadblocks	Opportunities
• Government commitment to strengthening ICT in education • Higher level digital skills training improving at the university level including through the Advanced School of IT in the RSTP • Existing Ministry of Education and Training (MoET)'s Educational Management Information System is well-functioning and potentially able to house data on digital skills	• No comprehensive policy for ICT in Education nor implementation plan and no framework for defining skills, competencies, and proficiency levels • Not enough secondary students qualifying for science, technology, engineering and mathematics (STEM) courses and consequent lack of graduates in ICT and STEM related subjects • Lack of connectivity in schools, (Technical Vocational Education and Training) TVET institutions and higher education, and high costs of connectivity • Very few teachers qualified in ICT • Few schools integrating ICT in the learning process • Insufficient 'rapid skilling initiatives' for out-of-school youth and adults • Challenges with under-staffing and under-funding of IT functions in government departments	• Development of a digital skills framework to assess progress in the development of digital literacy and a digitally competent workforce • Plans to undertake a National Skills Survey focusing on selected growth sectors including ICT • Possibility of connecting higher education and TVET institutions to a regional Research and Education Network (REN)

Recommendations

Quick wins
- **R4.1:** Develop an ICT and Education Policy and Implementation Plan.
- **R4.2:** Connect higher education and TVET institutions to a Research and Education Network (REN) as part of the digital master plan.
- **R4.3:** Pilot interventions at secondary school level to build digital literacy skills, particularly in schools that serve poor communities.

High priority
- **R4.4:** Review intermediate and advanced digital skills programs in higher education institutions, particularly courses related to computer science, and incentivize entry into these programs.
- **R4.5:** Strengthen the capacity of the Ministry of Education and Training (MoET) to develop policies, deliver ICT support services and conduct diagnostics.

Digital Entrepreneurship

Main strengths	Main weaknesses and roadblocks	Opportunities
• Government commitment via establishment of RSTP, which houses the country's only digital incubator, a digital skills academy and a data center • Plans by the University of Eswatini to launch iLab, a second digital incubator • Existing private-sector-driven entrepreneurship initiatives, such as the Mbabane Hub, Global Entrepreneurship Network Eswatini chapter, and Limkokwing University's Limkokwing Entrepreneurship Acceleration Platform (LEAP) initiative	• Lack of public-private collaboration in areas of digital entrepreneurship support and access to finance • Business environment constraints including protection of IPR • Insufficient monitoring and impact evaluation of business support programs • Limited capabilities of existing business support organizations to increase the quality and impact of support to high-growth firms • Very limited access to early-stage finance for startups • Lack of differentiated support for growth versus subsistence entrepreneurs	• Partnership with established corporations for Open Innovation programs, benefiting startups • Opportunity to further promote agritech programs relying on MTN and SEDCO's commitments to supporting agriculture entrepreneurs • Accelerated ease of doing business reforms including IPR protection • Expanding opportunities for (M)SMEs to access public procurement • Increasing access to innovative financing instruments including angel and seed stage VC investments • Fostering increased knowledge and experience sharing and learning across the Eswatini and regional ecosystem through the Innovation Bridge Portal initiative

Recommendations

Quick wins
- **R5.1:** RSTP to take the lead in coordinating ecosystem development, entrepreneurship support programs and championing participation in the Innovation Bridge Portal.
- **R5.2:** RSTP to establish an incubation program targeted at supporting early-stage digital startups and a seed financing facility that can co-invest with angel investors and others.

High priority
- **R5.3:** Accelerate business environment reforms including strengthening IP protection to support the growth of micro and small enterprises and tech startups, possibly by leveraging the Electronic Procurement System (e-GP) platform to connect them to public procurement opportunities.
- **R5.4:** Partner with established corporations, including SOEs, to design Open Innovation programs, in order to allow startups to co-create innovative solutions with established companies.
- **R5.5:** Increase access to funding for digital startups by incentivizing angel investments and seed stage venture capital.
- **R5.6:** Strengthen collaboration with regional institutions such as the AU and Southern African Development Community (SADC) to promote digital market integration in the Southern Africa region.

Policy and Legal Landscape

Main strengths	Main weaknesses and roadblocks	Opportunities
• E-Government strategy adopted and under implementation • National Digital Strategy and ICT Master Plan under development • ICT sector identified as one of the critical enablers for the "Post Covid-19 Recovery Plan," including unbundling of EPTC	• No whole-of-government approach; lack of strategic direction and vision • Lack of effective institutional coordination • Legislative gaps	• Recognition of ICT sector and the digital economy as growth enablers in National Development Plan • ICT sector identified as one of the critical enablers for the "Post Covid-19 Recovery Plan," including unbundling of EPTC

Recommendations

Quick wins

• **R0.1:** Finalize the preparation of the Eswatini Digital Strategy to provide high-level objectives and guidance on fostering the growth of the ICT sector and strengthening the digital economy.

High priority

• **R0.2:** Strengthen the regulatory framework to unblock bottlenecks to digital service delivery, by emphasizing the development of implementing regulations for existing laws on data protection and cybercrime, and the creation of the relevant regulatory bodies.

• **R0.3:** Develop close collaboration between upstream and downstream policy actors.

Taking the practical actions identified in the following roadmap will help the GoE achieve the recommendations and thus advance its digital economy and digital transformation agendas:

Phased Roadmap for Key Recommendations

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Digital Infrastructure	**Liberalize the wholesale telecommunications market**		
	• Complete EPTC options study to assess financial and economic impact of key options to address EPTC's financial and operational needs. • Implement final option selected by GoE, including any unbundling of EPTC • Conduct market analysis to establish clear definitions for retail and wholesale markets, designate any operators with dominance or significant market power and impose appropriate remedies on operators. • Reduce transit costs for international connectivity through a virtual landing point and associated regulations.	• Put in place regulatory measures, such as wholesale price controls and adequate interconnection regulations, and guarantee non-discriminatory and open access to the wholesale network to be operated under the Eswatini Infrastructure Corporation.	Increase the affordability of internet prices and the competitiveness of local internet service providers (ISPs).
	Promote policies and regulations that would facilitate infrastructure roll-out		
	• Facilitate infrastructure sharing with SOEs, such as the Eswatini Electricity Company (EEC), to leverage excess fiber capacity. • Develop clear target goals for the Universal Access and Service Fund (UASF) Strategy, including monitoring of the effectiveness and impact of the UASF programs and projects, and diversify operational funding sources for the UASF.	• Expedite the expansion and certification of the local Tier III data center to encourage the growth of a local cloud services and content ecosystem. • Finance or subsidize broadband infrastructure development in areas where commercial viability is low.	Narrow the digital divide especially in rural and remote areas and increase in access to high-speed, quality broadband services.
	Boost demand for broadband services		
	• Reduce or eliminate excise duties and other taxes on feature and entry-level smartphones, tablets and laptops.	• Introduce demand-side subsidies for handsets and tablets and offer low- or zero-interest loans for devices. • Implement large scale digital awareness and literacy campaigns.	Increase the demand and usage of broadband services.

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Digital Platforms	**Strengthen public sector platforms' functionality, interoperability, and leveraging of shared services**		
	• Pilot mobile-Government apps for core and service delivery platforms that exhibit high levels of readiness, e.g., tax filing, procurement and health services. • Conduct detailed systems assessments, audits and business process reviews to develop technical specifications for core government platforms.	• Improve government ICT infrastructure to enable utilization of more advanced public sector platforms. • Provide capacity building opportunities for IT staff to improve the sustainability, operations, and maintenance of these systems, in order to upgrade or re-implement core government platforms.	Increase the efficiency and transparency of the public sector, improve service delivery, and reduce transaction costs for government.
	Upgrade the National ID/NPR platform and establish linkages to key service delivery platforms to increase equity and accessibility		
	• Conduct an in-depth technical evaluation of the ID system.	• Invest in ID systems and reforms to increase NPR registration and inclusivity, and provide interoperable identity verification services to enhance service delivery.	Ensure citizens have unique digital identification which improves access to government services and increases equity.
	Clarify mandates and strengthen coordination functions to support the implementation of the e-Government strategy		
	• Set clear e-Government objectives for i) budget controls for ICT systems investments, operations, and maintenance; ii) a single portal or domain for the whole-of-government; iii) agile and centralized procurements for digital platforms; iv) policies, standards, and compliance monitoring; and v) the establishment and implementation of a center of excellence or centralized IT function.	• Evaluate the structure and mapping of the center of excellence or centralized IT function.	Facilitate the streamlined implementation of e-Government.
	Promote the use of e-commerce platforms through the design and implementation of an e-commerce strategy		
	• Leverage Sokokuu, the continental e-commerce platform launched as part of the Africa e-Trade Group, to increase use of e-commerce platforms. • Consult with the AU and development partners to clarify their vision for an e-commerce strategy and build the capacity of policymakers.	• Develop e-commerce strategy.	Promote the e-commerce market, improving citizens' access to goods and services and translating this into economic gains.

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Digital Financial Services	**Scale up use of digital delivery channels for government payments**		
	• Complete implementation of the e-Government portal to facilitate digitalization of government payments. • Government to step up efforts to stop using cheques; explicitly state strategic direction on DFS and increase efforts to raise awareness and uptake of DFS.	• Move social grants and other G2P payments to digital as far as possible. • Establish an interface between the CBE and Accountant General's office for safety and efficiency. • Reduce high levels of cash use (estimated at 80-90 percent for P2G) by introducing digital revenue collection in revenue collection offices.	Reduce government costs of collecting revenue and increase convenience to the public.
	Allow non-face-to-face verification of customers for DFS onboarding processes		
	• Review and refine Know-Your-Customer (KYC) and Anti-Money Laundering (AML) requirements using a risk-based approach, in order to remove the requirements that are too stringent for most unbanked individuals.	• Establish an enabling framework that supports digital signatures. • Invest in relevant infrastructure to support centralized KYC and link to government registries. • Strengthen legal provisions for the collection and digital storage of documents.	Reduce cost of compliance with customer due diligence when onboarding customers and compliance with KYC and AML requirements.
	Increase interoperability across various payment service providers and DFS services		
	• Strengthen collaboration and establish a forum for discussion between the CBE and private sector to ensure buy-in for the central infrastructure.	• Establish domestic retail payments and credit infrastructure to facilitate full interoperability, expand DFS and improve lending.	Increase DFS in retail payments and consumer convenience through interoperability; introduce credit infrastructure to reduce risks in lending.
	Strengthen the legal framework for DFS		
	• Review of current National Payment System (NPS) Act and finalize draft NPS Bill. • Ensure consistency in regulating payment service providers.	• Enact new NPS Law. • Build oversight and supervision capacity of the CBE to ensure it adequately responds to the development and expansion of DFS in Eswatini.	Foster an enabling environment that supports DFS and open access to payment services.

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Digital Skills	**Promote the use ICT in education and develop a costed, implementable action plan**		
	• The Ministry of Education and Training, in collaboration with Ministry of ICT, should develop a coordinated, costed action plan that defines: (i) the framework for digital skills and proficiency levels to be used in Eswatini; (ii) the actions needed to connect education institutions, train staff such as teachers, education managers, IT systems operators and support staff, procure devices, and reform courses; (iii) the funding requirements and sources needed to undertake these actions in a phased manner; and (iv) the targets to be achieved and monitoring and evaluation processes for reporting on progress towards targets.	• Monitor targets to be achieved on a regular basis and amend plan as required. • Provide information and data to the public on digital literacy levels and the availability of a digitally competent workforce.	Help the government make informed decisions through a coordinated plan that sets targets for and measures progress in digital skills.
	Ensure that all major tertiary education and research institutions are connected to digital infrastructure and start connecting secondary schools to digital infrastructure		
	• Consider establishing a National Research and Education Network (NREN) or connect to a regional REN such as UbuntuNet Alliance, on the basis of a cost comparison and the availability of support services.	• Reform skills training programs in higher education and TVET to build a critical mass of individuals with advanced digital skills and ICT professionals that can drive economic growth and development in several sectors through the application of digital technologies. Reform teacher training programs in tertiary education to include training in intermediate level digital skills.	Expand digital connectivity in tertiary education institutions and build intermediate and advanced digital skills to drive economic growth.
	Strengthen digital literacy skills		
	• In secondary schools where there is almost universal access to electricity and where about 60 percent have access to digital infrastructure, start piloting online teacher training programs to get teachers used to working with digital technology.	• Scale up successful models that employ digital learning solutions in the classroom. • Expand digital infrastructure to primary schools and integrate digital teaching and learning. • Assess digital literacy through framework and targets set in the ICT in Education Policy and Action Plan.	Increased digital literacy for a greater proportion of the population.

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Digital Entrepre-neurship	**Foster increased knowledge and experience sharing and learning across the Eswatini ecosystem as well as from regional and global experience.**		
	Enhance the technical capacity of the RSTP to: • Take the lead in ecosystem development and the coordination of entrepreneurship support programs and to champion participation in the Innovation Bridge Portal. • Establish an incubation program targeted at supporting early-stage digital startups and a seed financing facility that can co-invest with angel investors and others. • Leverage the Africa e-Trade Group and Sokokuu to boost MSME participation in e-commerce and cross-border market activity.	• Provide ongoing support to RSTP and other entrepreneurship support programs to implement investment-readiness programs for emerging digital businesses. • Strengthen collaboration with regional institutions such as the AU and SADC to promote digital market integration in the Southern Africa region, with the aim of expanding business opportunities for entrepreneurs and MSMEs in Eswatini.	**Drive entrepreneurship ecosystem growth through enhanced local and regional linkages and expand market opportunities through the regional integration of digital markets.**
	Linking digital startups to public and private procurement opportunities		
	• Leverage the Innovation Bridge Portal to organize corporate innovation programs to connect startups in Eswatini to corporations, including from the broader region. • Leverage the e-GP platform to connect digital startups to public procurement opportunities, and provide a platform to develop SMEs' skills and technical capacities in accordance with corporations' procurement standards and requirements.	• Launch an open data platform to incentivize data-driven businesses.	**Promote access to markets.**
	Increase access to funding for digital startups		
	• In the short-term, establish linkages with existing sources of early-stage funding available in the region and globally (includes grants, seed funding from angel investors and VCs).	• Establish a seed financing facility that provides a combination of grants and loans to very early stage digital or technology startups that are at the ideation, pre-seed or seed stage, and support capacity building of ecosystem service providers to provide more impactful support. • Crowd-in and de-risk private financing from angel investors and venture capital firms, including regional and global enterprises.	**Increase access to finance for digital startups and businesses.**

	Short-term Actions	Medium/Long-term Actions	Expected Outcomes
Policy and Institutional Development	**Build commitment to legal and policy reforms and adopt pending reforms to unblock bottlenecks in digital service delivery**		
	• Finalize the national strategy that provides high-level objectives and guidance on fostering the growth of the ICT sector and strengthening the digital economy in Eswatini.	• Ensure proper implementation of the recently passed Computer Crime and Cybercrime, Data Protection and Electronic Communications and Transactions Acts. • Initiate and implement regulatory reforms needed to facilitate digital transactions and e-commerce platforms, such as an enhanced IP framework and consumer protection. • Develop close collaboration between upstream and downstream policy actors to clarify mandates and improve implementation.	Foster legal and policy enabling environment that strengthens the digital economy.
	Accelerate critical business environment reforms to support the growth of micro and small enterprises and tech startups		
	• Improve Eswatini's Ease of Doing Business indicators, by implementing critical reforms that create an enabling environment for digital startups and established digital businesses. • Strengthen Intellectual Property Rights (IPR) to facilitate innovation and entrepreneurship.	• Develop and adopt a clearly articulated, multi-year business environment reform agenda with clear objectives, performance targets and oversight and coordination. • Ensure implementation and monitoring and reporting mechanisms are developed in close partnership with the private sector, to enhance investor confidence and remove obstacles to the establishment and growth of new digital businesses.	Foster legal and policy enabling environment that strengthens private sector competitiveness vis-à-vis the digital economy.

Country at a glance: Eswatini

Population (2019) **1.15 M**

GDP (2019)	**US$4.405 Bn**
Rural population (2019)	**78%**
Poverty headcount ratio at national poverty line (% of population) (2017)	**59%**
Literacy rate (2018)	**88%**
Electrification rate	**78%**
Labor force participation rate (2019)	**51.1%**
Labor force participation rate, female (2019)	**47.1%**
Agriculture jobs (% of population) (2019)	**70%**
Doing Business Index, rank (2020)	**121/190**
Digital Adoption Index, score 1-100 (2016)	**0.315**
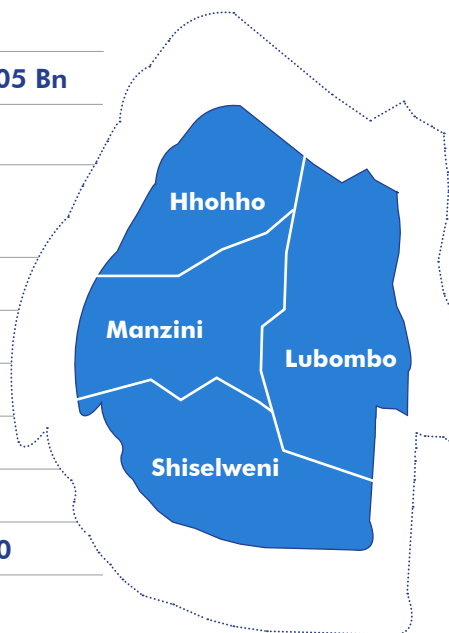
TABLE 2: Eswatini at a glance: key top-level figures[1] and map

The Kingdom of Eswatini is a mountainous, landlocked country in Southern Africa, bordering South Africa and Mozambique. Eswatini's population of 1.15 million people is predominantly rural (76 percent) and relatively young (58 percent aged between 15-64 years)[2]. As a "monarchical democracy," absolute power rests with the monarch. Traditional and parliamentary systems run concurrently.

Eswatini has close economic links to South Africa, on which it depends for about 85 percent of its imports and about 60 percent of its exports[3]. Eswatini is a member of the Common Monetary Area (CMA) with Lesotho, Namibia and South Africa, and the domestic currency, the Eswatini lilangeni (SZL) is pegged at par to the South African rand, which also constitutes legal tender in the country. It is part of the Southern African Customs Union (SACU) alongside Lesotho, Botswana, Namibia and South Africa, which aims to support the free exchange of goods in these countries. While SACU membership brings benefits in terms of revenue from common external tariffs, it also exposes Eswatini to volatile South African financial markets, as experienced during the Covid-19 crisis.

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1   Source: World Bank World Development Indicators (WDI), World Development Report, 2016
2   World Bank, Systematic Country Diagnostic for Eswatini, 2020
3   Ibid.

Eswatini's macroeconomic performance has been hampered by severe climate-change-induced drought and growing fiscal challenges due to rapid growth in the public wage bill, with the pandemic and unrest further dampening growth. Eswatini's growth trajectory has been influenced by developments in South Africa. Annual growth of real GDP averaged 7.6 percent between 1980-95, linked to higher foreign direct investment inflows from South African firms relocating to Eswatini during apartheid. This fell to 3 percent between 1996-2020 after the end of apartheid. Divestment revealed structural constraints such as' a narrow economy and export base[4]. Public debt increased rapidly as a consequence, rising from 10 percent of GDP in 2009 to around 30 percent of GDP in 2019. In 2019, the International Monetary Fund (IMF) urged Eswatini to rationalize expenditures to address its high fiscal deficit and cashflow challenges. GDP contracted by 1.9 percent in 2020 due to pandemic-related impacts but grew by an estimated 3.1 percent in 2021, buoyed by an easing of lockdown measures (though weighed down by ongoing unrest). The pandemic led to the first deep recession since 1976. A recovery in external demand supported export-oriented manufacturing activities in 2021. Public debt increased from 27 percent of GDP in 2018 to an estimated 43 percent of GDP in 2021, reflecting an increase in domestic and foreign borrowing. The government has begun to implement a Fiscal Adjustment Plan for 2021-2023, which is expected to reduce deficits and stabilize debt at around 40 percent of GDP in the medium term. Key aspects of this plan are reducing public wage spending, rationalizing state-owned enterprises (SOEs), increasing domestic revenue, and improving the targeting of social assistance programs.

The economy of Eswatini remains concentrated in a few sectors. The economy is largely driven by an agro-based export sector, and agriculture employs over 70 percent of the population[5]. Sugar is the largest single earner of foreign exchange, contributing up to 14.3 percent of GDP in 2016. Despite the large agrarian population, many Swazis practice subsistence farming only resulting in low productivity. While the service sector's share of GDP is the largest at 51 percent in 2018, it is dominated by wholesale and retail trade which mostly offer low paying jobs.

Manufacturing dominates the industrial sector, which has a 36 percent share of GDP. The private sector in Eswatini is relatively small and suffers from low levels of investment and an unfavorable business environment. In terms of large investments and the formal export sector, the private sector is predominantly dominated by large firms from neighboring South Africa, with a few players from Asia, United States and Europe also present.

Although classified as a lower-middle-income country with a Gross National Income (GNI) per capita of US$2,960, high poverty rates hinder Eswatini's economic and human development. While the national poverty rate has fallen in recent years (from 63 percent in 2010 to 59 percent in 2017), it remains very high, and the country ranks low in human development (144th of 189 countries in the 2017 Human Development Index). Challenges to poverty reduction include the slowdown of economic growth, adverse weather patterns, the high prevalence of HIV/AIDS (27.7 percent among those aged 15 to 49, the highest in the world), high unemployment and high income inequality (Gini coefficient of 49.3). An almost stagnant growth rate in the formal sector has pushed most of the population to the informal sector, with irregular incomes leading to dependence on family members for support.

Sustainable and inclusive development in Eswatini calls for strengthened efforts towards reducing gender inequalities and the rural-urban divide. There are numerous links between income, gender and rural-urban inequalities. The most striking gender disparities are found in the labor market, as female labor force participation rates remain considerably lower than those of their male counterparts. Similarly, poverty in Eswatini has been predominantly a rural phenomenon, with approximately 70 per cent of the rural population living below the national poverty line. Improving infrastructure and service delivery in rural areas could significantly help to reduce rural-urban inequalities.

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4   World Bank, Macro Poverty Outlook for Sub Saharan Africa, 2020
5   World Bank, Systematic Country Diagnostic for Eswatini, 2020

Rationale for Digital Economy Development in Eswatini

FIGURE 1: The digital economy can bring shared prosperity and reduced poverty
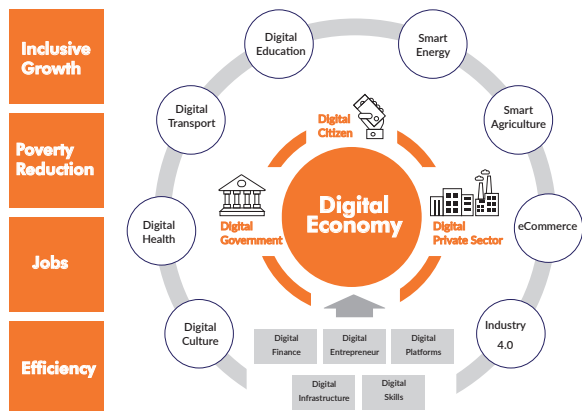
Universal adoption and effective application of digital technologies is expected to characterize economies of the future, shaping their ability to succeed in the global marketplace and offer a better quality of life for their citizens. Disruptive technologies are already altering traditional business models and pathways to development, yielding significant efficiency and productivity gains and increased convenience, as well as supporting better access to services for consumers. They change the way economies of scale are achieved, particularly with online service delivery. Well-functioning digital economies may thus offer potential to achieve faster economic growth, facilitate innovative products and services and stimulate job creation. At the same time, disruptive technologies also carry risks, such as job losses in industries affected by structural change and automation, that need to be effectively managed and mitigated. Assessing strategic investments and interventions based on effective prioritization, sequencing and risk mitigation is a critical first step to enable the growth of the digital economy.

While the digital economy offers multiple opportunities, Eswatini only captures a fraction of this potential. With strong foundations in place, Eswatini can harness digital data and technologies as sources of productivity growth, economic and social inclusion. This can help generate new content, link individuals with markets and public services, and roll out new and more sustainable business models. Most of Eswatini's labor market is informal and characterized by low productivity, and digital technologies provide the opportunity to simplify and facilitate the transition of labor from the informal to the formal economy, as well as to foster the creation of jobs and income growth alongside economic growth. Yet, most Swazis are still locked out of critical digital services, financial inclusion, and markets. Digital startups struggle to attract funding and 'traditional' businesses are only slowly adopting digital technologies and platforms. There is a shortage of workers with solid digital skills, while limited digital literacy holds back the adoption and widespread use of digital products and services.

While the Covid-19 pandemic has compounded Eswatini's existing economic and social challenges, it has also presented an opportunity for Eswatini to accelerate the pace of its digital transformation. The pandemic has led to a sharp decline in economic growth coupled with significant financing needs, at a time when the country already faced deep economic and social challenges. Nonetheless, the pandemic has demonstrated the value that robust digital infrastructure and digital technologies can provide to ensure the continuity of essential services and provide critical support to societies, for instance in the following areas:

- **Information management:** Digital solutions enable the sharing, safeguarding and promotion of factual information in the fight against the Covid-19 pandemic;

- **Detection and containment:** Digital solutions can support advanced virus detection and help contain its spread;

- **Healthcare provider enablement:** Digital solutions can supply front-line healthcare workers with the tools, technologies and capabilities they need to fight the virus;

- **Economic resilience:** Digital solutions can support local and global commerce through levers such as critical infrastructure support, business enablement for small and medium-sized enterprises, and prediction models for policymakers;

- **Social cohesion:** Digital solutions can foster communication and cohesion between and among individuals, corporations and institutions[6] [7].

Consequently, the crisis has sparked an increased demand for digital technologies and services coupled with new opportunities for the development of innovative digital solutions[8]. Meeting these demands would allow Eswatini to deliver critical services to a broad range of consumers, allow firms to adopt productivity-enhancing technologies, and facilitate data-driven policy making.

In acknowledging the critical role that digital technologies are playing in addressing Covid-19 related challenges, the GoE has identified the ICT sector as one of the critical enablers for the fulfillment of its Post Covid-19 Recovery Plan. The plan has been launched to generate enough momentum for the Eswatini economy to move out of the Covid-19 lockdown with a high level of economic production and productivity. This plan is expected to trigger high impact projects that will, in the medium and long term, overcome the social and economic losses stemming from the pandemic. Key ICT priorities identified by the government include: unbundling the Eswatini Post and Telecommunications Corporation (EPTC), leveraging the Royal Science and Technology Park (RSTP)—which hosts the country's only incubator for digital firms—to create a single Center of Excellence for the government, linking government and public procurement to an online auction platform, consolidating and growing the country's Internet Exchange Point (IXP), and establishing a national payment gateway.[9]

Structure of this Report

Each chapter that follows starts with key messages and concludes with a summary of main recommendations. Chapter 2 reviews cross-cutting factors that affect the strategic, institutional and regulatory environment for the digital agenda in Eswatini. The report then proceeds to explore the five foundational pillars of the digital economy in more depth. Chapter 3 looks at the access, affordability, quality and usage of digital infrastructure, as well as the dynamics of the connectivity market, including what needs to happen to get more Swazis online. Chapter 4 analyzes the current use of and scope for expanding digital platforms, in both the public and private sectors. Chapter 5 examines the state and uptake of DFS among individuals, businesses and by the government. Chapter 6 discusses the current state of digital skills attainment and coverage. Finally, Chapter 7 assesses the state of digital entrepreneurship and the culture of innovation in Eswatini.

The report concludes with a discussion of next steps, including a summary of recommendations. These recommendations are intended for a wider audience, including government, the private sector and development partners. However, report findings are also likely to shape World Bank Group (WBG) interventions on related topics moving forward.

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6   Saving lives, Scaling-up Impact, and Getting Back on Track: World Bank Group Covid-19 Crisis Response Approach Paper. World Bank Group. June 2020. Available at: http://documents1.worldbank.org/curated/en/136631594937150795/pdf/World-Bank-Group-Covid-19-Crisis-Response-Approach-Paper-Saving-Lives-Scaling-up-Impact-and-Getting-Back-on-Track.pdf

7   ICT Covid-19 Response: Partnering with Technology Companies to Combat Covid-19: Available at: http://www3.weforum.org/docs/WEF_Tech_4_COVID_Early_Compendium_2020.pdf

8   On April 30, G20 Ministers responsible for the Digital Economy agreed to work together to leverage digital technologies and relevant digital policies to strengthen and accelerate the collective response to Covid-19.

9   Government of the Kingdom of Eswatini (2020), Post Covid-19 Kingdom of Eswatini Economic Recovery Plan

Policy and Institutional Context of the Digital Economy in Eswatini

Key messages:

Policy landscape: While reference to the importance of digital technology is made in Eswatini's existing strategic frameworks, e.g., for e-Government, a clear digital roadmap is still missing. It is therefore urgent to finalize the National Digital Strategy and ICT Masterplan, adding a clear roadmap for implementation of flagship initiatives across different sectors, with clear roles and responsibilities defined.

Institutional framework: In Eswatini, different aspects of the digital economy are under the responsibility of different parts of government (e.g., Government Computer Services and the e-Government unit). Further, their mandates are not well-defined, particularly in relation to that of other relevant agencies, and thus sectoral actors do not necessarily view these agencies as their primary interlocuters for issues related to digitization. This results in weak interagency coordination.

Regulatory framework and reforms: While the laws addressing cybercrime, data protection and electronic trade were recently enacted, the corresponding regulations and regulatory bodies now need to be created. Regulatory reforms are also needed to facilitate digital transactions and e-commerce platforms such as an enhanced IP framework, e-commerce regulations, consumer protection, and so forth. A number of important planned reforms remain incomplete, such as the unbundling of EPTC, which should increase competition in the telecommunications sector in order to facilitate fair pricing for consumers and help develop the necessary infrastructure for Eswatini to have a thriving digital economy.

Importance of High-Level Leadership and Coordination for Digital Transformation

Supporting digital transformation requires high-level political commitment and effective institutional leadership and coordination across government and the wider ecosystem. A clearly articulated and shared vision and roadmap for supporting digital transformation needs to be internalized by all stakeholders, and ideally championed by Eswatini's leadership at the highest level. Effective leadership and stewardship for the agenda is key, including a strong institutional framework with clearly defined roles and responsibilities, where responsible institutions and entities are equipped with the adequate (financial and human) resources and capacity to effectively execute their mandates.

Notably, fragmentation in the leadership of the ICT function in the public sector is often one of the key obstacles to successful implementation of a whole-of-government approach to digital transformation. Eswatini's institutional and strategic framework for digitalization is therefore equally important for the success of digital economy initiatives as the various technical aspects, making it a critical 'analogue' complement[10].

Effective government strategies and policies recognize that telecom and ICT services, especially affordable high-speed broadband access, are critical foundational "utilities" that underpin effective government services and growth in employment, investment and entrepreneurship. The government's role in the market must evolve in line with both global industry trends and the maturity of the Swazi market. Originally, the government's role was as a direct investor and market participant to expand telecommunications services and jumpstart market creation. Today, the private sector is expected to be the primary driver of investment, which challenges State-Owned Enterprises (SOEs) to operate profitably in a competitive context. The Government's primary role should thus be to enable the growth of the sector. This can be done by facilitating the development of an optimized enabling environment and by using policy and regulatory tools to encourage private investment in digital infrastructure, services and competition, reduce infrastructure deployment costs, and improve broadband accessibility.

Diagnostic Findings: Digital Policy and Legal Landscape in Eswatini

While Eswatini is making progress towards rolling out its digital vision, currently there is no whole-of-government approach to bring together the various parts of government. Coordinating digital transformation across Ministries, Departments and Agencies (MDAs) is essential to maximizing the benefits of digital solutions that stem from the real-time transfer of information, interoperable and shared services, and data-driven services. This can also improve citizen-centric service delivery and promote efficient government operations. This section explores the current institutional framework by looking at the strategies currently in place, the institutions tasked with implementing them, and relevant laws and regulations.

Policy and Institutional Framework

Policy Landscape
The Government of Eswatini has identified ICT as a driver of economic growth and sustainable development, and as a national priority that facilitates the attainment of its Vision 2020. The National Information and Communications Infrastructure (NICI) Policy Mission Statement echoes the important role that ICT plays in enhancing socio-economic development. In this statement, the government intends to "enhance national socio-economic development by encouraging the beneficial activities of ICT in all sectors, through the provision of a conducive environment that will progressively maximize the quality and security of the life of the people of Eswatini and make the best use of the country's human and natural resources, and promote multi-layered co-operation and knowledge sharing nationally, regionally and globally"[11].

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10   World Bank (2016). Digital Dividends. World Development Report 2016
11   National Information and Communication Infrastructure Implementation Plan 2012-2016: Available at: www.gov.sz/images/stories/swd%20
      nici%20plan%20-%20final%203.pdf

Furthermore, Eswatini's government views ICT as being of critical importance in eliminating the social divide between the haves and the have-nots. In addition to being perceived as a tool for economic growth and increased productivity, ICT can be an effective tool for poverty reduction when used to meet the needs of the poor[12].

However, Eswatini still does not have an overarching strategy that provides a clear vision and policy direction for developing the ICT sector and advancing the digital economy[13]. The latest ICT Policy development is seen in the NICI Implementation Plan 2012-2016, the update of which is long overdue. Likewise, the e-Government Strategy is long expired, having covered the period 2013-2017. Given the role that the ICT sector is expected to play in driving economic growth and sustainable development, the timely update of this sectoral policy seems indispensable for achieving the goals identified in the NDP[14]. Many key objectives identified in existing policies remain far from being achieved, including enhanced access to broadband and greater use of ICT to increase efficiencies across all sectors of the economy. This is the result of several underlying issues related to poor strategy design and weak political buy-in, as well as the lack of effective institutional coordination and access to adequate resources to support implementation. The absence of a clear strategy in turn has an adverse impact on the effectiveness of existing institutions, as key MDAs lack strategic direction and shared vision.

Currently, the Ministry of Information, Communications and Technology (MICT) is developing the Eswatini Digital Strategy, which will cover all aspects of the development of the digital economy. This will include a national broadband strategy and universal access policy. An ICT master plan is also being developed with support from Taiwan, which will focus more closely on infrastructure development. While these developments are welcome, the preparation of these strategic documents has been delayed.

Institutional Framework
Eswatini's institutional framework for ICT is fragmented across numerous strategic and regulatory documents, which vary in level of finalization or formal legal status. The development of the ICT sector and digital policies in Eswatini is largely driven by MICT, which was established by legal notice No. 25 of 2009 with the mandate to formulate, coordinate and administer ICT policy[15]. The sector is regulated by the independent regulatory authority, Eswatini Communications Commission (ESCCOM), created under the Swaziland Communications Commission Bill (Act no. 10 of 2013), which took over this regulatory role from the EPTC and Eswatini Television Authority (Eswatini TV)[16].

However, the institutional framework for the governance of the digital economy is currently placed within the realm of different institutions, which creates confusion and overlap. In particular, there is a lack of clarity in the institutional mandate for operationalizing e-Government, which is one of the factors slowing down the upgrade and interoperability of digital public sector platforms. The GoE created Government Computer Services within the MICT to digitize government services, as well as the e-Government unit of the Office of the Prime Minister (OPM) to develop relevant policies and strategies and drive coordination between ministries. Stakeholder consultations suggest that the Government Computer Services Department was initially intended to provide technical support and the actual implementation of the strategy, whereas the e-Government Unit would lead only on the strategy and coordination side. However, the lines of demarcation between these responsibilities are not clear and, therefore, subject to interpretation of the institutions, which causes operational challenges for downstream actors. Due to capacity and resource limitations, the government has since transferred Government Computer Services to RSTP to promote greater efficiency and flexibility. The e-Government Unit is now relocating to MICT in order to harmonize and streamline policy development.

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12 National Development Plan: 2019/20 – 2021/22: Towards Economic Recovery: Available at: www.gov.sz/images/CabinetMinisters/NDP-2019-to-2021-22-final.pdf
13   https://www.broadbandcommission.org/Documents/Policy%20Section%20Documents/BRoadbandPolicies2018.pdf
14 In NDP, priorities relating to the digital infrastructure include: (i) Increase access and affordable communication services focusing mainly on creating an enabling legal environment and liberalizing the industry; (ii) Increase bandwidth by modernizing the backbone infrastructure and optimally operationalizing the Royal Science Technology Park; (iii) Promote the use of ICT to increase efficiencies across all sectors of the economy, cf. focus on e-Government.
15 National Information and Communication Infrastructure: Policies, Strategies and Plans – Implementation Plan 2012-2016. Kingdom of Swaziland, Economic Commission of Africa, and Government of Finland
16 Swaziland Communications Commission Act. Available at: https://www.esccom.org.sz/legislation/SwazilandCommunicationsCommissionAct.pdf

The extent to which these adjustments will allow for improved institutional coordination with other ministries engaged in digitalization efforts remains to be seen.

Similarly, regarding digital financial services, there are two competent regulatory authorities. These are the Central Bank of Eswatini (CBE) and the Financial Services Regulatory Authority (FSRA). While responsibilities of each regulator in respect to DFS are generally well delineated and activity-based, some legal provisions need to be clarified in order to avoid overlap and confusion on the part of regulated entities. For example, the Consumer Credit Act empowers the FSRA to supervise all financial institutions that provide credit (i.e., banks and non-banks), while the FSRA should in principle only regulate non-banks.

As it stands, the implementation of digital platforms by other line ministries is either absent or pursued using siloed approaches. On one hand, some sectors, such as health, have an advanced and in-depth strategy with a clear roadmap. One the other, there is a lack of leadership in key areas such as e-commerce, digital entrepreneurship, innovation and digital skills. Overall, there appears to be weak inter-agency coordination, and in particular weak exchange between the general leadership of the MICT and sectoral line ministries where there could be greater synergy, e.g., in relation to the deployment of cross-cutting programs. Consequently, digital transformation efforts are characterized by scattered initiatives across MDAs. Furthermore, efforts to support government digitalization have mirrored the vertical silos of the government, resulting in pockets of progress but also a marked absence of a whole-of-government approach, resulting in low cost efficiency and fragmentation, as will be further discussed in the section on Digital Platforms.

History of Regulatory Actions and Reforms Impacting Digital Economy

The establishment of the parastatal Swaziland Posts and Telecommunications Corporation (SPTC) (now Eswatini Posts and Telecommunications (EPTC)) by an Act of Parliament in 1983 was one of the key events that sparked the emergence of digital economy in Eswatini. At the time, it was a monopoly offering postal services and access to fixed-line telephones. Three years after MTN International had been established as C-Mobile in South Africa in 1994, provision for the establishment of a cellular mobile phone system in Eswatini was made through a ten-year Joint Venture Agreement (JVA) between EPTC and MTN International in 1997-8. King Mswati III made the first cellular phone call in Swaziland during Independence celebrations in September 1998. This was after SPTC had sought to set up its own mobile service but was prevented from doing so by the government. Vodacom, the South African subsidiary of Vodafone, had also unsuccessfully placed a bid in a competition to establish a mobile network (Sutherland, 2014).

Over time, SPTC sought to sell off increasing numbers of its shares to allow it to establish a competing mobile phone system, a move that would also raise the necessary funds to do so. Increased competition would have compelled MTN Eswatini to reduce its very high prices—among the highest in the region—and thereby its substantial profits. The JVA between MTN International and SPTC precluded SPTC from establishing a competing mobile phone system, so long as it retained a controlling share in MTN Swaziland. To overcome this constraint, SPTC offered and successfully sold some shares, but in doing so created conflicts of interest for several parties involved. After SPTC's failure to sell the desired volume of shares, it proceeded to launch a competing fixed wireless system, known as ONE, in May 2010. This was contested in court as a potential violation of the SPTC-MTN JVA. The case was escalated all the way to the International Court of Arbitration, whose decision in March 2012 required SPTC to close down its mobile operations. Around the same time in 2011, SPTC had also signed, without government approval, a 20-year contract with SEACOM for access to international cables through its gateways in Maputo and Mthunzini in KwaZulu Natal.

The government sought but was unable to cancel this contract[17]. The result was major turmoil within SPTC. In 2019, the Eswatini Communications Commission (ESCCOM), the ICT regulator, decided that EPTC (formerly SPTC) should divest from MTN and the regulator announced its plan to allow EPTC to subsequently invest in the retail mobile market subject to EPTC's divestiture from MTN Eswatini[18]. However, this decision was subsequently revoked, considering that it was in the interest of EPTC to remain in the JVA, as it had decided to embark on a turnaround strategy[19]. The processes of (1) increasing competition in the Telecom sector to facilitate fair pricing for consumers, and (2) installing the necessary infrastructure for Eswatini to have a thriving digital economy remain unfinished to this day. In summary, the high cost of cellular communication and access to the internet, and the large profits extracted from the business, have had a strongly inhibitive impact on the development of a digital economy.

Laws and Regulations

A review of enabling legislation for the digital economy over the last twenty-five years demonstrates that the necessary regulatory developments were hindered by a lack of commitment and political interference. This process has been further undermined by a lack of capacity and resources, which prevent legal staff at line ministries from drafting legislation that incorporates relevant aspects of international best practices. Additionally, the Registrar General lacks the capacity and expertise to push draft bills through the legislative process. The consequence has been that recurrent high costs of internet have stunted growth of the digital economy and minimized access for even the most critical stakeholders, such as primary and secondary schools, of which approximately 8 percent and 58 percent have internet access, respectively[20]. Tellingly, as indicated in an interview, the Ministry of Health has made significant progress in digitization thanks to its own system of microwave towers, funded by the U.S.

President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund, enabling it to communicate with many of its clinics while bypassing the commercial cellular phone network(s).

The Electronic Communications Act of 2013 has paved the way for the liberalization of Eswatini's telecommunications sector and the privatization of EPTC. However, two key bills related to digital infrastructure have been drafted but not approved, even though they appeared in an official list of pending legislation at the end of 2017. These are the Eswatini Telecommunications Corporation Bill and the Eswatini Communications Infrastructure Corporation Bill. Per these bills, EPTC will be separated into three entities: Eswatini Telecom and Eswatini Post (both scheduled to be operated independently), alongside the Eswatini Infrastructure Corporation, which will remain state-owned. This unbundling is one of the key priorities of EPTC's 5-year Strategic Plan 2020/21-2024/25, and is intended to facilitate the transformation of EPTC, modernize the backbone infrastructure and upgrade the service portfolio through the expansion of fiber infrastructure[21]. These bills aim to remove control of the backbone infrastructure from EPTC, establish a separate infrastructure corporation, and enable EPTC, as a telecommunications corporation, to establish a third competing mobile network (Government of Kingdom of Eswatini, 2017b). However, according to press reports, the interests of key stakeholders were not sufficiently aligned to allow these bills to be passed into law[22].

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17 AmaBhungane, 2012; Sutherland, 2014.
18 Investigation into the joint venture agreement between MTN Eswatini and the Eswatini Posts and Telecommunications Corporation. ESCCOM. Available at: https://www.esccom.org.sz/publications/notices/docs/FINAL%20ESCCOM%20JVA%20INVESTIGATION%20%20-%20Revised%20 Decision[1].pdf
19 https://www.esccom.org.sz/publications/notices/docs/GENERAL%20NOTICE%20NO%208%20-%20REVOCATION%20JVA%20DECISION%20 2022.pdf
20 Annual Education Census 2017.
21 EPTC. Summary of Strategic Plan 2020/21-2024/25.
22 Rooney, 2019. Natalie Ngosa, Mast Online, June 2018.

After some delay, legislation is moving to allow Eswatini to mature its digital economy. The Computer Crime and Cybercrime Act, the Data Protection Act and the Electronic Communications and Transactions Act were passed on March 4, 2022. The enactment of these key bills will enable critical government services such as digital ID and e-Government, as well as allow local and international companies to provide data-driven business services and models that will be a major catalyst of innovation and digital transformation. The key provisions of the legislation are summarized below.

- The Data Protection Act of 2022 was introduced with the objectives of: (i) establishing a Data Protection Authority, (ii) governing the collection, use, disclosure and care of personal data, and (iii) protecting personal data and the needs of organizations to collect, use, or disclose personal data for legitimate and reasonable objectives. The Act provides for the collection, processing, disclosure, and protection of personal data, and balances the competing values of personal information privacy and sector-specific laws and other related matters. The Data Protection Authority proposed in the legislation would be created under the auspices of the regulator ESCCOM.

- The Computer Crime and Cybercrime Act of 2022 defines and criminalizes offenses against computers and network-related crimes, and provides for the investigation and collection of evidence for such offenses, including the admission of electronic evidence. While the Act defines "critical infrastructure (CI)" and illegal system interference associated with CI, it does not provide concrete measures for CI protection. Furthermore, the Act does not contain any provisions for the establishment of a computer emergency response team (CERT).

- The Electronic Communications and Transactions Act of 2022 provides for the regulation of electronic transactions and electronic communications, the facilitation of the use of e-Government services, the protection of consumers, the limitation of the liability of service providers, and other incidental matters.

Additionally, the 2020-2025 National Cybersecurity Strategy has been published, and plans to establish a CERT or a computer security incident response team (CSIRT) as a department within the National Cybersecurity Agency, with clear functions and responsibilities including incident response. Considering the far-reaching implications of cybersecurity, it will be essential to include a coherent cross-ministerial and horizontal governance structure with a clear mandate for decision-making. The GoE has indicated the need for financing support to roll out cybersecurity structures and infrastructure.

Recommendations & Next Steps

Quick wins

R0.1: Finalize the preparation of the Eswatini Digital Strategy to provide high-level objectives and guidance on fostering the growth of the ICT sector and strengthening the digital economy. Likewise, the ICT master plan should be completed without further delay. Priority should be given to finalizing these strategic documents as soon as possible, while ensuring that consultations and dissemination are undertaken to ensure broad commitment to the implementation of the plans within the public sector and the broader digital ecosystem.

High priority - Medium- to long-term recommendations

R0.2 Strengthen the regulatory framework to unblock bottlenecks to digital service delivery, by emphasizing the development of implementing regulations for existing laws on data protection and cybercrime, and the creation of the relevant regulatory bodies. While the laws addressing cybercrime, data protection and electronic trade were recently enacted, the corresponding regulations and regulatory bodies now need to be created.

Regulatory reforms are also needed to facilitate digital transactions and e-commerce platforms such as an enhanced IP framework, consumer protection etc. As such, it is recommended that the legal and policy reforms progress as quickly as possible, so that they move in lockstep with developments on the ground. In addition, effective regulation is needed in order to foster a robust wholesale market that can support affordable, cost-based wholesale access prices. To do this, ESCCOM needs to conduct a market analysis to identify and designate operators with dominance or significant market power in wholesale markets, as well as the establishment and enforcement of appropriate remedies and operator obligations. This is further detailed in the Digital Infrastructure section.

R0.3: Develop close collaboration between upstream and downstream policy actors.
Cross-ministry, agency and SOE coordination on the interpretation and implementation of policies should be improved.
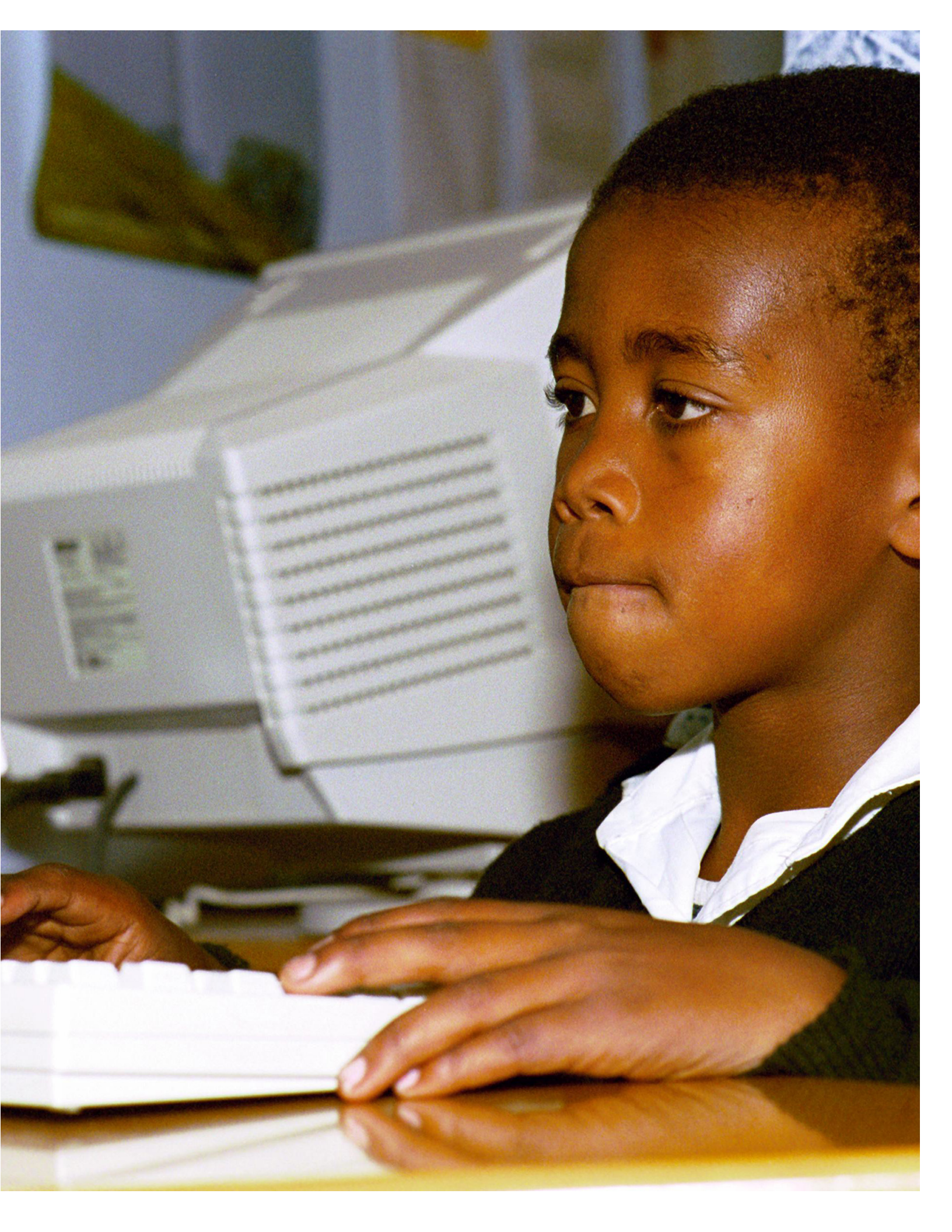
Digital Infrastructure

Key messages:

The importance of digital infrastructure in Eswatini: In order to reap the economic and societal benefits associated with a robust digital economy, universal access to broadband connectivity infrastructure is essential.

Low broadband adoption: Eswatini's low levels of broadband internet adoption are driven by high prices and remaining coverage gaps in rural areas. Furthermore, those that do have access to broadband internet experience low service quality.

Delays in the liberalization agenda: Internet infrastructure investments have been hampered by delays in fully liberalizing the first (international gateway) and middle (backbone) miles of the nation's digital infrastructure. The lack of competition has caused higher prices for retail services than would otherwise exist. Investment in wholesale infrastructure has also been less than optimal due to EPTC's monopoly and lack of financial capacity. The pace of Eswatini's digital infrastructure development will be increased by a full liberalization of the broadband market.

Investments needed: The country needs significant investments to modernize the backbone infrastructure, cross border bandwidth and capacity. For mobile broadband, there is room to further increase access to high-speed, good quality internet services by expanding 4G/LTE networks. While this will be mainly driven by private investment, it is important that the GoE encourage private sector investments to ensure the expansion of mobile networks in rural and remote areas and narrow the digital divide.

Demand stimulation needed: Emphasis needs to be placed on increasing the demand for broadband services through targeted interventions to increase digital inclusion, such as demand-side subsidies for handsets and tablets or low- or zero-interest loans for devices, as well as large scale digital awareness and literacy campaigns.

Importance of Digital Infrastructure

Broadband has the potential to accelerate Eswatini's socioeconomic development. An extensive body of research confirms that broadband penetration and good-quality broadband availability can be important economic growth drivers. Recent research notably estimates that for every 10 percent increase in mobile broadband penetration in African countries, a GDP increase of 2.5 percent can be realized[23]. In particular, it is estimated that a 10 percent increase in broadband penetration in Eswatini would result in an additional US$108.4 million of GDP and 2.46 percent productivity gains[24]. Connectivity can shape countries' development paths through several interrelated channels: i) it can bridge the information gap, alleviating asymmetry problems and improving communication, ii) it is a cost-effective and fast means of connecting all citizens to markets and services, and iii) it increases productivity, lowers transaction costs and optimizes supply chains.[25]

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23 Https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.BDT_AFR-2019-PDF-E.pdf
24 Country Portal by Research ICT Solutions. Available at: https://researchictsolutions.com/ict-evidence-portal-africa/ict_evidence_portal_africa.php
25 Aker and Blumenstock, 2015

More broadly, accessible, reliable, and affordable digital infrastructure is the key foundation upon which an inclusive digital transformation and economy are built. [26] Digital economies are creating unprecedented potential for countries to unleash new opportunities, create jobs, and transform people's lives[27]. Fast internet provides a platform for innovation and is a key input across sectors, reverberating across the entire economy. It enables entrepreneurship, with businesses and individuals using fast internet to create new applications and services in areas such as e-commerce and financial services. It also enables digital service delivery in sectors that are critical for inclusive growth, such as education, health and agriculture. Likewise, it allows the public sector to deliver services to citizens and businesses more effectively and more inclusively. As such, broadband has the potential to transform Eswatini's economy and help the country leapfrog development stages, provided that effective policies are put in place that encourage its use as an essential input by all sectors of the economy.

Additionally, reliable and affordable fixed-line and mobile broadband connections are required to ensure seamless social and economic interaction in a post-COVID world. With more economic and social activities carried out online, digital technologies have helped and will continue to enable economies to handle shocks. Digital connectivity has indeed become a lifeline for individuals, governments and businesses to ensure continuity of economic and social activities.

A key priority for the GoE, as outlined in its NDP, is to ensure the deployment of accessible, robust, reliable, and affordable ICT services to citizens. In the medium to long term, the government intends to focus on improving the efficient and reliable delivery of services across all sectors of the economy through the use of digital technologies. Furthermore, as per the NDP, the government intends to create an enabling environment for broad stakeholder participation and the liberalization of the industry.

Diagnostic Findings: Current State of Digital Infrastructure

The fixed broadband infrastructure in Eswatini is underdeveloped, mainly due to the lack of competition in the sector, which is due to EPTC's dominant position in international connectivity and the national backbone of the broadband value chain. The analysis shows that, despite a significant reduction in recent years, fixed broadband prices remain high and unaffordable to much of the population and small businesses. As a result, the fixed-broadband penetration rate is significantly limited, at only around 1 percent of the population, equivalent to 12,269 subscriptions as of March 2020[28]. EPTC also lacks the substantial funding and economies of scale necessary to fully modernize and deploy upgraded networks. Operational and staffing issues also impact EPTC's capacity to provide these services on a profitable "best in class" basis.

Mobile broadband is the predominant way that the Swazi use the internet. Mobile broadband infrastructure is widely available, with around 90 percent of the population covered by mobile broadband networks (3G or 4G). However, mobile broadband adoption remains considerably low, with a unique mobile broadband subscriber penetration rate estimated to be 35 percent[29] in 2021. This usage gap is driven by several factors that include a lack of digital literacy and digital skills, lack of affordability, and other issues related to relevance, safety, and security. According to the regulator, the mobile network operators in Eswatini—MTN Eswatini and Eswatini Mobile—plan to expand 4G/LTE networks to cover 85 percent population by 2024, a positive step toward enabling universal access to good quality broadband internet for the Swazi. At the same time, the GoE should take measures to ensure the availability of 4G/LTE networks in rural and remote areas, to narrow the digital divide.

26 Draft Digital Transformation Strategy for Africa (2020 – 2030): Available at: https://www.tralac.org/documents/resources/afri-can-union/3013-the-draft-digital-transformation-strategy-for-africa-2020-2030/file.html
27 Draft Digital Transformation Strategy for Africa (2020 – 2030)
28 ESCCOM. Annual Report 2020
29 World Bank DE4A team analysis and estimate, 2022. It is calculated with the number of unique mobile broadband capable subscribers (GSMA) divided by the total population (UN). The number of unique mobile broadband capable subscribers are estimated by dividing (i) number of mobile broadband capable SIM connections by (ii) SIMs per subscriber. Mobile broadband capable is based on unique SIM cards (or phone numbers, where SIM cards are not used) that have been registered on the mobile network in a device capable download speeds of 256 kb/s or greater (agnostic of the device type) at the end of the period. Connections differ from subscribers such that a unique subscriber can have multiple connections.

It could also introduce measures to increase the demand for broadband services, recognizing the crucial role that mobile broadband plays in wider socio-economic development and access to services.

Broadband Penetration

Availability of Broadband Networks

For most of Eswatini's population, mobile broadband is the most widely available technology to access the internet. Mobile technology has demonstrated its ability to reach the underserved, especially low-income populations, women and rural residents. According to the Global System for Mobile Communications Association (GSMA), 90 percent and 30 percent of the population are covered by broadband-capable 3G and 4G mobile networks, respectively, as of Q1 2021[30]. On the other hand, fixed broadband networks are not as widespread and tend to be concentrated in urban areas, where only 24 percent of the population resides[31]. Eswatini did not have its first Asymmetric Digital Subscriber Line (ADSL) broadband connection until September 2018. In 2011, EPTC (formerly SPTC) embarked on an expansion program focused on its ADSL network and added a total of 6,496 ports. As of January 2020, a total of 38 exchange sites were listed as having ADSL functionality[32].

Adoption of Broadband Internet

A relatively high cellular (2G and above) penetration rate has been a key driver for the adoption of mobile internet as the primary technology that Swazis use to access the internet. According to ESCCOM, the total number of mobile subscriptions was 1,211,894, with a penetration rate of 111 percent in 2021. It must be noted, however, that this high number likely double counts individuals with multiple SIMs. The GSMA estimates that the number of unique mobile subscribers for the same period was 889,200.

Despite the high cellular penetration rate and the fact that around 90 percent of Eswatini's population is covered by 3G or better broadband networks, the unique mobile broadband subscriber penetration rate was estimated at 35 percent in 2021[33]. This usage gap highlights the existence of factors other than coverage that hinder people from using the internet, such as a lack of literacy and digital skills, affordability, relevance, safety and security[34].

Fixed broadband, which uses dedicated physical links to high-speed internet, has very limited reach in Eswatini. Although fixed broadband penetration has increased, particularly in urban areas, it remains significantly lower than mobile broadband penetration rates, at a mere 1 percent of the population (15,150 subscriptions as of March 2021)[35]. While this low rate is equivalent to the African average, it is well below the global average of 13.6 percent[36]. A notable market trend is the increasing use of fixed wireless internet services. According to ESCCOM, fixed wireless subscriptions have grown by 26 percent from 9,731 in FY2018/19 to 12,289 in FY2019/2020, surpassing fixed-line broadband services in FY2019/20[37].

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30 Q1 2021. GSMA Intelligence

31 World Bank Open Data: Available at: https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?end=2019&locations=SZ&start=2019&view=bar

32 TeleGeography – GlobalComms Database: Available at: https://www.telegeography.com/products/globalcomms/data/country-profiles/af/Eswatini/broadband.html

33 World Bank DE4A team analysis and estimate. Please refer to footnote 29 for the calculation methodology. According to ESCCOM, the mobile broadband penetration rate reached 101 percent with 1, 105,897 subscriptions in 2021. However, this figure does not take into account double counting for individuals with multiple SIMs, expired accounts as well as foreign tourists buying data plans while in country, which explains a discrepancy from the World Bank estimate used.

34 ESCCOM. Annual Report 2018

35 ESCCOM. Annual Report 2021.

36 Connecting Africa through Broadband: A strategy for doubling connectivity by 2021 and reaching universal access by 2030. Broadband Commission for Sustainable Development

37 ESCCOM. Annual Report 2020.

Affordability of Broadband Services

The high cost of broadband services is a major barrier to internet access in Eswatini and thus contributes to the country's low broadband uptake and usage gap. In 2020, the average price of 1GB mobile data was USD13.31[38], while the cheapest 1GB prepaid mobile data cost USD10.22 in 2019[39]. In other words, Eswatini residents paid on average 3.4 percent of GNI per capita per month to buy the cheapest 1GB of mobile broadband data[40] (and 4.4 percent of monthly GNI per capita to buy the average 1GB mobile data), which is above the global benchmark set at 2 percent or less of an individual's average monthly income[41]. The price for fixed broadband services is even higher: fixed broadband packages cost USD85.70 on average in Eswatini in 2020 (ranked 166 out of 211 selected countries), which is very expensive compared to the cheapest average price of USD6.41 in Ukraine[42].

Similarly, in 2017, Eswatini's ICT price basket for access to fixed broadband internet averaged 19.06 percent of GNI per capita per month[43], indicating that internet unaffordability is a prevailing issue. The high prices are largely attributed to EPTC's monopoly in the wholesale broadband segment, combined with the current duopoly in the mobile market (see below for more detail). The prohibitively high prices thus remain unaffordable for the average consumer. Mountainous terrain in parts of the country and the lack of direct access to submarine cables (as Eswatini is land-locked) also contribute to the high costs of broadband services.

FIGURE 2. Average Price of 1GB Mobile Data in Selected SADC Countries (in US$, 2020)
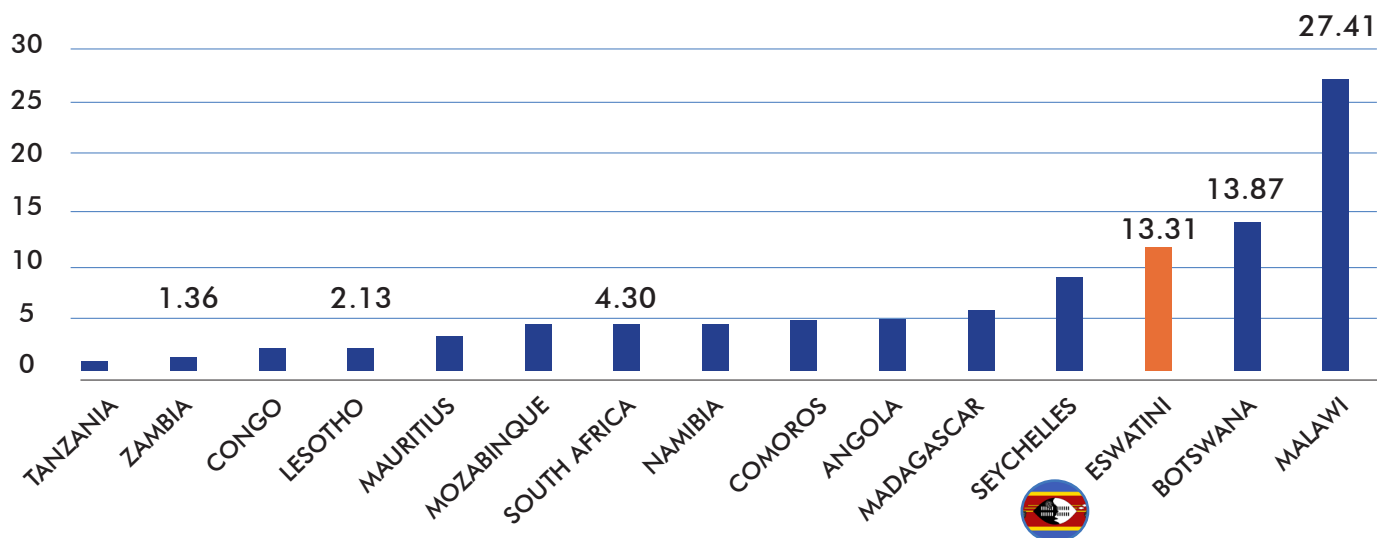
Although the price of broadband services remains high, various efforts to reduce this have yielded positive outcomes. The introduction of a second mobile operator introduced some competition to the mobile market for mobile voice, SMS and data services, thus increasing options for consumers at more competitive prices. The price of 1GB of data dropped from E230 (USD16) to E150 (USD10) in 2019. The Cost-to-Communicate Price Reduction Programme, implemented by ESCCOM, further contributed to reducing prices (see below).

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38   https://www.cable.co.uk/mobiles/worldwide-data-pricing/
39   https://researchictafrica.net/ramp_indices_portal/
40   Calculated based on ITU methodology using the average price of 1GB mobile broadband data from cable.co.uk and the World Bank's GNI per capita (Atlas method) data.
41   Alliance for Affordable Internet 2018 Affordability Report: Available at: https://a4ai.org/affordability-report/report/2018/
42   https://www.cable.co.uk/broadband/pricing/worldwide-comparison/#resources
43   ITU. 2017. ICT Prices

The affordability of internet-ready devices is another major barrier to broadband access in Eswatini. Given that mobile broadband is the principal way in which Swazis access the internet, the price of mobile devices has a major impact on internet use. In GSMA's connectivity index, Eswatini's performance regarding the affordability of mobile internet access devices was in the lower tier, with a score of 17.1 (out of 100)[44]. The cheapest smartphone cost 16.9 percent of per capita GNI in 2021, and was thus unaffordable for most of the population[45].

Quality of Broadband Services

With a mean download speed of 4.51 Mbps[46], and a broadband minimum target download speed of 2 Mbps[47], Eswatini has achieved the DE4A interim target of 3 Mbps by 2021. However, this is well below the DE4A 2030 minimum target of 10 Mbps, which is considered adequate for a country to fully reap the benefits of a digital economy[48]. There is a direct relationship between the quality of broadband service and the extent to which users can fully exploit the range of online possibilities.

The average download speed in Eswatini is suitable for low-intensity services such as general browsing and email, social media, and standard and high-definition personal video calls (e.g., Skype), but does not allow for higher-intensity and productivity-related applications such as video streaming, telecommuting and video teleconferencing (see Annex 3).

Deployment of the Broadband Infrastructure Value Chain

The broadband value chain required to provide universal, affordable, and good quality broadband internet is comprised of four broad segments: first mile, middle mile, last mile, and invisible mile (see by segments of the value chain need to be built incrementally. The value chain incorporates important supporting infrastructure components such as data centers, internet exchange points (IXPs), a reliable electricity supply and affordable internet access devices[49]. The state of digital infrastructure in Eswatini will be assessed using this framework.

BOX 1: Binding constraints to Internet access and usage in Eswatini

When analyzing the provision of digital infrastructure and broadband penetration in Eswatini, it must be kept in mind that Eswatini is a lower middle-income country, where relatively low purchasing power and low electrification rates are binding constraints for the majority of the population.

- Poverty has persisted despite the country's lower-middle-income status. As discussed in the country context section, 59 percent of Swazis lived below the national poverty line in 2017. By international poverty standards, 39 percent lived below the 2011 purchasing power parity (PPP) line of USD1.90 per person per day, and this rises to 60 percent when the 2011 PPP USD3.20 per person per day poverty line for lower middle-income countries is used. Consequently, purchasing power is low and telecom and ICT expenditures are not a priority for most of the population.

- Access to reliable electricity is also a barrier to the expansion of digital infrastructure and broadband penetration in Eswatini. Electricity is required for a range of activities, from recharging access devices to powering mobile network base stations. The country has made significant progress in increasing access to electricity and nationwide household access currently stands at 80 percent. Yet, a significant part of the population remains without electricity, especially in the most remote parts. The country has assessed the cost of addressing the needs of the power sector and estimated that for adequate expansion of the system, the total cost of providing electricity is expected to increase from the current level of around USD 40 million per year to USD 200 million by 2034 (see the Kingdom of Eswatini's Energy Master Plan).

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44 GSMA Mobile Connectivity Index: Available at: http://www.mobileconnectivityindex.com/
45 Alliance for Affordable Internet, https://a4ai.org/research/device-pricing-2021/
46 Worldwide Broadband Speed League 2019: Available at: https://www.cable.co.uk/broadband/speed/worldwide-speed-league/
47 ESCCOM, ICT Baseline Report – 2017
48 Connecting Africa Through Broadband: Broadband Commission for Sustainable Development: Available at: https://broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.p
49 Connecting Africa Through Broadband: Broadband Commission for Sustainable Development: Available at: https://broadbandcommission.org/Documents/working-groups/DigitalMoonshotforAfrica_Report.pdf

FIGURE 3: Key components of Broadband Value Chain (Source: Innovative Business Models for Expanding Fiber-optic Networks and Closing the Access Gaps, World Bank)
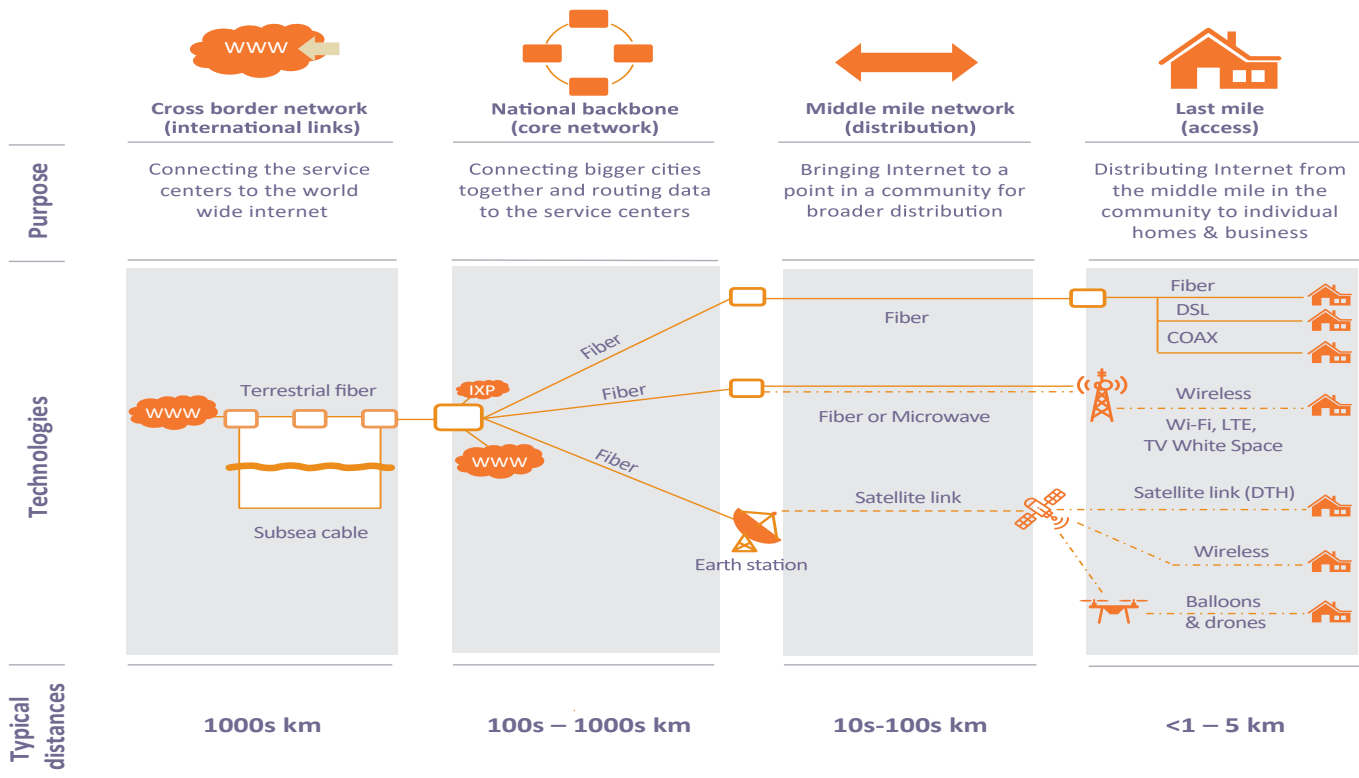
Source: TMG/Salience Consulting, taken from Innovative Business Models for Expanding Fiber-optic Networks and Closing the Access Gaps, World Bank

First Mile: International Connectivity

As a Landlocked Developing Country (LLDC), Eswatini faces international internet connectivity challenges due to its geographical position. It thus depends on neighboring coastal countries for access to undersea cables, international internet bandwidth and general communication connectivity. Long routes, complicated administrative transit procedures, multiple border crossings and inadequate infrastructure all increase the trade and transaction costs incurred by Eswatini. Multiple providers supply international connectivity to operators in Eswatini, connecting the country to undersea cable systems while charging for broadband transit services to those points of access, Interconnection services are offered by three service providers, namely Telkom South Africa and Broadband Infraco for South African interconnections and Tmcel for interconnections with Mozambique.

Another contributing factor to the upward pressure on IP transit costs may be EPTC's contractual arrangements with international internet bandwidth suppliers. These Indefeasible Right to Use (IRU) contracts fix pricing for a long contract term (usually 15 years or more), giving pricing stability but also fixing in any high wholesale pricing for the long term. In addition, EPTC may be charging high prices for the provision of international gateway services to cross-subsidize other unprofitable business lines, thereby increasing the cost of services offered by its competitors, reducing competitors' willingness to provide retail services such as broadband access and increasing barriers to entry for new ISPs.

Middle Mile: Backbone Networks

Eswatini has a fiber backbone network that is approximately 1,200km long. This is comprised of 985km of fiber backbone, 97km of fiber network for connecting corporate clients and 117km of fiber to the cabinet (FTTC). Of the FTTC deployed, 72km of it is in active use with a cabinet install base of 137. Each FTTC installation can provide an average download speed of 10 Mb/s, and an upload speed of 1.5 Mb/s depending on the distance from the FTTC access system and the age of onward copper connections[50].

EPTC completed the digitization of its network in 2011 and has since been upgrading its telecommunications backbone network, to a Next Generation Network (NGN) based on fiberoptic infrastructure. This upgrade has resulted in an improved ability of the network to deliver high-speed broadband services coupled with a marked increase in data consumption. Yet, some operators, service providers and corporations who access the infrastructure operated by EPTC complain of long delays in sourcing fiber backhaul connectivity from EPTC[51]. Concerns about EPTC's management of the middle mile have also been raised when several Members of Parliament (MPs) pressured the government to allow greater access to the fiber network as well as the international gateway in 2017. This request to the government was driven by concerns that EPTC was not managing these assets effectively[52]. Consequently, MTN was allowed to establish its own backbone, due to the inability of EPTC to provide sufficient resources for the launch of 3G and 4G services. MTN fully self-provisions its backhaul network using microwave links and only uses EPTC for the connection between its two data centers and the international gateway.

In a bid to expand the reach and reliability of its broadband network and reduce the cost of network deployment, EPTC entered into a Memorandum of Understanding with the Eswatini Electronic Corporation (EEC) in 2018. This agreement allows EPTC to make use of EEC's optical fiber network. The EEC, a state-owned enterprise, has a monopoly on the transmission and distribution of electricity and has a dominant position in local electricity production. EPTC has intention to negotiate the deployment of last mile fibre over power lines where it would help speed up the deployment of fiber, and has already started using EEC's fiber assets.

Key government offices in Eswatini are currently connected through fiberoptic networks, and there is a plan to connect smaller government offices using microwave links. According to information provided by the Ministry of ICT, 18 out of 21 government ministries are connected through fiber, one connected through a leased line, and the other two connected through microwave technology. The majority of remote government offices are connected using microwave links and a few are connected via leased lines.

Last Mile: Internet Services

Mobile broadband is the predominant way of accessing internet in Eswatini. As noted above, mobile network coverage stands at 90 percent for 3G and 80 percent for 4G, leaving around 10 percent of the population unconnected. Among fixed broadband subscribers, 77 percent use Digital Subscriber Line (DSL) access technologies, 15 percent use fixed-wireless technologies and 8 percent use other access technologies, as of 2018.

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50 EPTC

51 For instance, all new 4G sites on the MTN network do not have fiber backhaul connected to them. Instead, some of the sites have multiple E1 links provisioned by EPTC. Such connections can compromise the performance of the 4G network as fiber backhaul connectivity is required to deliver true high-speed mobile broadband connectivity to customers off a 4G site.

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The last mile is mostly built and operated by operators in the mobile and fixed segments: MTN Eswatini and Eswatini.net for mobile broadband services, and ISPs, such as Real Image, Jenny and Touch IT, for fixed broadband services. In addition, Real Image, the ISP with the second largest market share, currently provides public Wi-Fi hotspots over an unlicensed spectrum at 5.8GHz, which is attributed to the high cost of using fiber as the backhaul solution.

In the last mile for fixed broadband services, EPTC's ownership of the ADSL network and its alleged anti-competitive behavior have affected the quality of ADSL internet services. EPTC sells wholesale ADSL services (line rental and data) to ISPs, yet also competes with the same ISPs it serves, creating an incentive for it to charge higher wholesale prices to ISPs than it charges internally to its own retail business. Some of the anti-competitive behavior alleged by some ISPs, and the resulting consequences on the quality of service, include the following:

- The high wholesale pricing for backhaul connectivity provided to ISPs, forcing them to apply high contention ratios on ADSL services sold. This results in a poor quality of services provided to end-users.

- EPTC's slow response times when addressing lines resold by ISPs, which can take up to several weeks. It is claimed that these response times are not experienced when Eswatini.net makes a similar request, thus providing Eswatini.net with an unfair market advantage.

- ISPs who resell ISDN lines are not able to guarantee continuity of service for customers after service interruptions. This is because EPTC reconnects suspended or faulty lines at a default speed of 1 Mbps irrespective of what the line speed was before the disconnection.

The country currently has no third-party tower providers in the market and relies on Mobile Network Operators (MNOs) to build their own infrastructure or share facilities and infrastructure to the extent possible[53], encouraging passive infrastructure sharing among service providers. A specialized tower operator (towerco)[54] could alleviate cost pressures and provide efficiency gains to the existing MNOs. Many mobile operators in Africa have followed this route to reduce costs and focus on their core businesses.

Supporting Infrastructure

Internet Exchange Points (IXPs): The Mbabane Internet Exchange Point (Mb-IXP), launched in 2014 with the support of the African Union (AU) and implemented by the Internet Society (ISOC)[55], has not been influential in lowering broadband prices in Eswatini. Mb-IXP has 1Gbps fiber backhaul capacity and began operating with multiple peering partners, including Real Image, POSIX and MTN. However, the impact of the IXP in driving connectivity costs down will remain minimal as long as EPTC continues to be the dominant provider of international bandwidth in Eswatini and does not peer through the IXP. Indeed, a significant part of the nation's internet traffic is still exchanged internationally56, further contributing to high costs of content provision and internet usage.

Data Center and Cloud Services: Eswatini has a limited market for data center and cloud services, in part due to high connectivity prices. At present, approximately 70 percent of the content consumed in Eswatini comes from data centers located outside the country. Not only is this more expensive, but international content is also not always relevant to the local population. This lack of relevance can be a disincentive for broadband internet adoption. Notable data center and cloud services offered in the country include the following:

53   Pronouncement of essential facilities and finding of control of essential facilities by dominant operators. 2017.
54   Specialized tower companies that are active in Africa include Helios, Eaton Towers, and American Tower Corporation.
55   Telegeography
56   Up to 70% of the total internet traffic in Eswatini is international.

- EPTC provides data-center-based IT services focused on hosting websites, colocation and disaster recovery services;

- POSIX runs its own public cloud at its data center which is connected to the EPTC IP backbone;

- Real Image provides disaster recovery services.

In a bid to encourage the growth of local data center presence and capabilities, the government plans to centralize the hosting of its ICT software services in a tier-3 National Data Center housed at the RSTP. In addition to providing data center infrastructure services for the government, the data center will also provide the necessary technology infrastructure that will enable companies to outsource their ICT functions and services.

At present, the main government mainframe computers running key government applications (e.g., payroll systems, population registers, etc.) are housed at this data center. Furthermore, it is anticipated that the data center will host and manage the transfer of government software applications from the mainframe-based systems to a cloud-based architecture. While this presents a clear growth opportunity for this data center, a key challenge is the lack of a clear strategy to guide its evolution. While the national e-Government strategy could provide such guidance, it lacks clear ownership, which makes its enforcement difficult[57].

Analysis of Market Structure & Competition

Eswatini's broadband market is characterized by the near monopoly of EPTC in the wholesale market and limited competition in the retail services market. EPTC's dominant position in the middle-mile of the broadband value chain affects both fixed and mobile retail prices as operators have limited alternative ways of connecting their access networks in the last mile. Also, while the fixed broadband retail market has become increasingly competitive, following the licensing of four new ISPs in 2018, the mobile broadband market remains a highly concentrated duopoly, with multinational MTN having approximately 88 percent market share along with substantial financial, operating, technical and marketing resources relative to the other operator.

Consequently, high upstream broadband input costs and limited competition in both the wholesale and mobile broadband segments have been key drivers of the high prices and low service quality experienced by broadband end customers. The lack of active towercos in Eswatini, in contrast to many other African markets, has further limited the potential for economies of scale in the country.

FIGURE 4. Broadband market segmentation in Eswatini
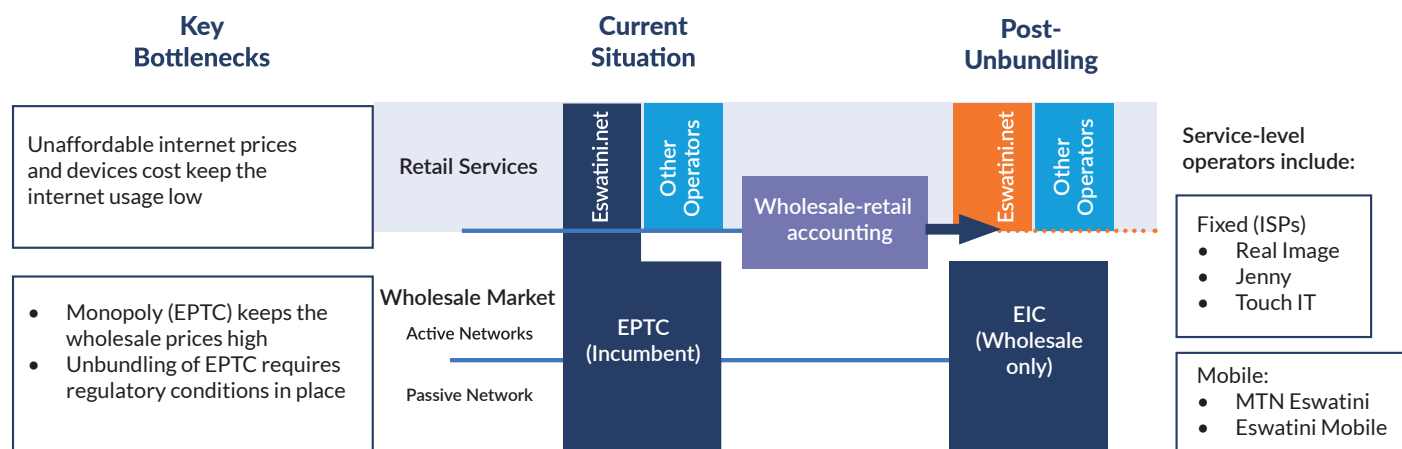
Source: Authors

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57 Africa Union Press Release: Regional Headquarters of the A-e Trade group for Southern Africa: Available at: https://au.int/pt/pressreleases/20190707/regional-headquarters-etrade-group-southern-africa-and-west-africa-have-been

Broadband Wholesale Market

The incumbent and state-owned fixed line operator, EPTC, provides wholesale access and operates active networks. As set out in the Eswatini's Electronic Communications Act (No. 9 of 2013)[58], EPTC maintains exclusivity in key segments of the telecommunications market, including international connectivity, national long-haul network infrastructure, metropolitan network infrastructure, and the ADSL access network, hence its quasi-monopoly in operating the wholesale broadband infrastructure. EPTC is a vertically integrated operator that provides both upstream wholesale access and downstream retail services. However, as noted above, MTN and other ISPs has started establishing its own backbone and self-provisioning its backhaul.

This exclusivity enables EPTC to charge high wholesale prices, which trickle down to end customers through retail service providers, even though wholesale prices have been significantly reduced thanks to the Cost-to-Communicate Price Reduction Programme implemented by ESCCOM, as is further described below[59]. For instance, Internet Service Providers (ISPs) estimate that up to 90 percent of their input costs in the provision of internet and data services are related to purchasing bandwidth from EPTC. As a result, retail prices remain unaffordable and discourage demand for broadband services, which in turn lowers incentives for private sector investment in the sector. Yet EPTC itself lacks the financial and technical resources to effectively upgrade and operate its network to meet the needs of ISPs. As EPTC is a vertically integrated operator, there is a further risk of price and quality discrimination[60], hindering fair and transparent competition at the retail level. This is further elaborated in the next sub-section.

Recognizing the existing market distortion, plans are underway to unbundle EPTC. As discussed in the previous section, there were plans to separate EPTC into three entities: Eswatini Telecom (retail service) and Eswatini Post (both scheduled to be operated independently), along with Eswatini Infrastructure Corporation (EIC; which was scheduled to remain state-owned). According to the aforementioned draft bills, EIC would oversee the establishment, construction, maintenance and operation of the national telecommunications backbone infrastructure, with three year exclusivity from the time the legislation is enacted. Under these bills, all other licensed operators and service providers would have the right to establish last-mile interconnection to the national backbone infrastructure at interconnection rates that are subject to regulatory control.[61] An options analysis is currently being conducted to identify the best way to unbundle and restructure EPTC.

However, substantial investment, technical resources and expertise are required to deploy and upgrade the wholesale networks needed to provide the Eswatini market with affordable, high quality telecom services. Given EPTC's recent operating and financial performance, unbundling alone may be insufficient to achieve this. The introduction of a private sector strategic investment partner could potentially provide the necessary resources to help EPTC's businesses become sustainable and to upgrade the infrastructure. This could be considered as part of a review of the various options available to restructure and strengthen EPTC.

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58   Electronic Communications Bill. Available at: https://investEswatini.org.sz/swaziland-electronic-communications-act/
59   ICT Baseline Report – 2017: Available at: https://www.esccom.org.sz/publications/notices/docs/ICT-BASELINE-REPORT-21-JUNE-2017-final.pdf
60   Broadband Strategies Toolkit. World Bank Group. Available at: https://ddtoolkits.worldbankgroup.org/broadband-strategies/law-and-regulation/opening-vertically-integrated-markets
61   Telegeography GlobalComms Database – Eswatini: Available at: https://www.telegeography.com/products/globalcomms/data/country-profiles/af/Eswatini/Eswatini.pdf

BOX 2. Liberalization of the wholesale market—Experience from other small states and lessons learned

Small-sized countries share a number of characteristics, most notably challenges to promote infrastructure-based competition due to small economies of scale and limited demand. Experience from other countries can provide useful lessons on how to tackle these bottlenecks. Estonia and Montenegro are good comparators for Eswatini, as they inherited a state-owned monopoly in their telecommunications sector, began the processes of liberalization and boosted market competition, and are comparable to Eswatini in terms of population size.

Montenegro, with a population of around 623,000, successfully liberalized its telecom market through sector reform. The 2000 Telecommunications Law ordered the liberalization of fixed line markets from 1 January 2004. Incumbent Crnogorski Telekom (CT, formerly Telekom Montenegro) was designated as having significant market power in both retail and wholesale fixed line markets and was thus subjected to extensive ex ante regulation. Wholesale line rental was launched in 2011 via CT's wholesale reference offers, under the regulator's orders and based on the watchdog's market analyses. Broadband usage has increased steadily since, and Montenegro's household penetration rate was roughly 88 percent in March 2020, well above both the 58 percent regional average and the 82 percent recorded for countries in the same GDP per capita group. **Similarly, Estonia boosted telecom market competition by taking a proactive regulatory approach.** It first created an incumbent operator in the early 1990s, which played an important role in building basic telecommunications infrastructure. It was also the only EU applicant country to have fully unbundled the local loop of the incumbent by January 2003. Estonia's active policy actions ensured the modernization of the fixed network and enabled competition between operators in the mobile network. As a result of the early liberalization of the telecommunications market and intense competition, Estonia has a well-developed communications network: all central and local government agencies, public libraries as well as educational and health institutions have an internet connection, as do all Estonian enterprises.

The experiences from Montenegro and Estonia show that ensuring open access to infrastructure operated by dominant operators is key to accelerating the rollout of broadband in a cost-effective manner, if appropriate regulatory conditions are in place that ensure efficient, open and transparent access to wholesale infrastructure. These conditions include:

Fair wholesale price control: The costs of connecting to the backbone infrastructure should be fair. Best practices suggest that maximum costs for wholesale access should be set by the regulator based on a cost recovery assumption and a reasonable rate of return. The regulator must perform an analysis of the costs involved and decide on the cost control approach to regulate wholesale inputs. Setting wholesale costs too low discourages investment by the dominant operator subject to the obligation, while setting them too high renders the obligation ineffective and discourages alternative operators from connecting to wholesale inputs.

Open and non-discriminatory access: Operators should be offered access to the backbone infrastructure on non-discriminatory terms, to level the playing field for efficient competition. This is an important step to ensure fairness and thus build trust with operators providing retail services.

- **Transparency:** Clear and detailed reference access offers should be published with respect to access to the incumbent's infrastructure.
- **Quality of provided services:** A network management center within the newly established wholesale operator needs to ensure service level agreements (SLAs) are signed with wholesale clients. The quality of provided access services will affect the "buy" and "build" decisions of other operators.
- **Proactive role of the regulator:** The regulator should regulate and work with the wholesale operator to ensure established conditions are clearly outlined and met. The regulator should be equipped to act when these conditions are violated, and should have both the established procedures and capacity to handle disputes between operators. Regulatory stability and consistency create legal certainty for operators, which encourages them to operate on the market and invest. If competition is ensured by applying wholesale regulation, retail regulation may in turn be reduced to a minimum or eliminated, as prices for both fixed and mobile services will be disciplined by wholesale regulation.

Broadband Retail Market

Retail fixed broadband
The retail fixed broadband market has been open to competition, with eight internet service providers (ISPs) currently providing fixed broadband services, including EPTC's retail arm, Eswatini.net (Figure 5). Eswatini.net has around 80 percent market share, followed by Real Image with 16.6 percent, indicating market dominance[66].

ISP	Subscriptions (2019)
Eswatini.net	12,737
Real Image	2,652
Touch IT	350
Jenny	85
Posix	40
Swazi Sat	18
Computronics	17
Datanet	7

FIGURE 5. Fixed broadband market share by service provider (2019)[62]

- 1% — Eswatini.net
- 17% — Real Image
- 1% — Jenny
- 2% — Touch IT
- 80% — Others
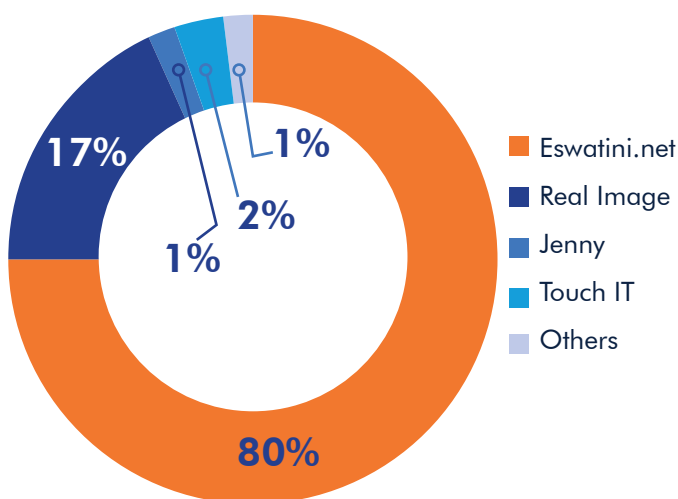
ISPs with smaller market shares are disadvantaged by the presence of the vertically integrated EPTC and high wholesale prices. In particular, due to the exclusivity granted to EPTC in the international gateway and national backbone infrastructure, all ISPs are currently obliged to use the internet gateway operated by EPTC and route all outbound traffic through EPTC's network. Furthermore, the current pricing structure of EPTC, which charges fees for line rental and bandwidth, suggests that liberalizing the wholesale market is necessary to effectively drive down broadband internet prices. Despite the reduction in wholesale prices achieved through the Price Transformation Programme (see below), there has been little change in the pricing of leased lines, which account for much of the costs that ISPs have to bear. Given that EPTC also competes in the retail market, it has an incentive to charge higher prices to ISPs than to its own internal retail network and customers.

Retail mobile broadband
The mobile broadband market is currently liberalized, with a duopoly. However, the market is highly concentrated with MTN Eswatini, the incumbent operator, holding a dominant market position. MTN Eswatini was licensed to operate in July 1998 as a result of the Joint Venture Agreement (JVA) between the MTN Group and EPTC (see the Policy and Institutional Context section). MTN subsequently remained a monopoly until the entry of a second mobile network operator, Eswatini Mobile, in 2017. However, MTN Eswatini maintains its dominance in the retail mobile broadband market with 87.6 percent market share in 2019 (Figure 6)[63].

FIGURE 6. Mobile-cellular market share by operator (share of total subscribers) (September 2019)

MTN

Eswatini Mobile

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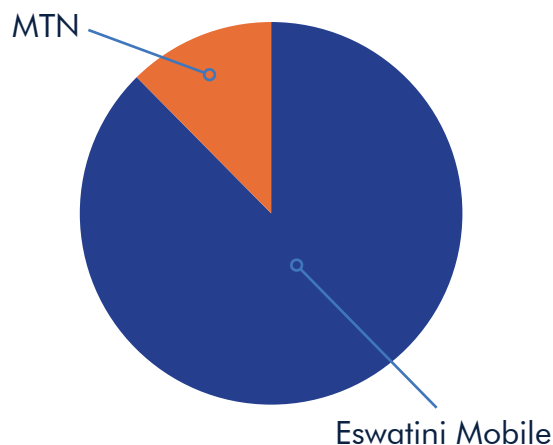
62 ESCCOM Annual Report - 2019
63 Ibid.

Invisible Mile: Legal, Policy and Regulatory Environment

Overall, Eswatini has a relatively modernized and strong telecommunications institutional framework, notably with regards to the regulatory authority and its mandate. This could come as a surprise as the country was one of the last to eliminate monopolies in mobile and fixed-broadband retail markets, through the Swaziland Communications Commission Act of 2013 and the Electronic Communications Act of 2013[64]. In particular, as detailed above, Eswatini has an independent regulatory authority, ESCCOM, created by the Communications Commission Act.

The regulator is competent and has undertaken many initiatives to improve the enabling environment and increase service affordability. This has led to a notable improvement in Eswatini's performance on ITU's regulatory tracker scorecard, with its score increasing from 59.33 in 2018 to 66.67 in 2020[65]. In recent years, ESCCOM has made efforts to improve and encourage competition in the ICT sector. To increase the affordability of internet prices, ESCCOM implemented the Cost-to-Communicate Price Reduction Programme through a three-year glide path in the first phase, which resulted in a 33 percent reduction in wholesale rates in the first year alone, with an overall average reduction of 35 percent further achieved in 2019. In 2021, the Commission undertook a pricing benchmark study, which revealed that at wholesale level, Eswatini had made significant progress in lowering leased line and internet bandwidth costs. Despite this improvement, the country's data prices are still considered high when compared to regional peers. As a result, ESCCOM introduced another three-year glide path (2022/23 – 2024/25) where wholesale rates are to be reduced by an average of 60 percent over the period. At the retail level, the reductions saw operators adopting a pricing philosophy where instead of reducing prices, they tended to increase the volumes, and where the volumes remained constant, the prices dropped.

Advances have also been made with regards to mobile active infrastructure sharing and national roaming guidelines. In 2021, ESCCOM reviewed the regulatory framework on infrastructure sharing. A majority of stakeholders surveyed agreed that there is need for including active network sharing elements. Consequently, the Commission issued and published the Mobile Active Network Infrastructure Sharing and National Roaming Guidelines.

Likewise, ESCCOM worked on the deployment of network capacity and progressive policies necessary to ensure the availability of resilient infrastructure and services at all times. In this regard, Business Continuity and Disaster Recovery Guidelines for the ICT sector were issued in 2021. The main objectives of the guidelines are to guide and assist service providers to put in place the necessary processes and systems for improving network resilience and assuring continued service availability, and to engage with industry and stakeholders on a framework for improving network resilience and recovery by identifying several approaches (e.g., redundancy and business continuity) to ensure uninterrupted service delivery. The guidelines are still under consultation and the process will be completed in 2022.

However, regulatory uncertainty exists in the definition of a national backbone and what constitutes self-provision in last mile, including its limits, calling for a clear market definition. As per the current legislation, EPTC does not have exclusive rights over the international gateway but still has exclusivities for fiber. However, the situation is not clear for some market players. In recent years, this uncertainty has resulted in situations where licensed operators have attempted to stretch the boundaries of what they can do using their interpretation of the regulations. For instance, ESCCOM disclosed that the Commission investigated two licensees for an alleged contravention wherein they were providing internet services without connecting to the national backbone infrastructure exclusively established, constructed, maintained, and operated by EPTC.

64 ITU. Measuring the information Society Report 2018 – Volume 2. 2018. https://www.itu.int/en/ITU-D/Statistics/Documents/publications/misr2018/MISR-2018-Vol-2-E.pdf.
65 https://www.itu.int/net4/itu-d/irt/#/tracker-by-country/regulatory-tracker/2018

Radio frequency spectrum management and planning in Eswatini is governed by the provisions of the Electronic Communications Act, No.9 of 2013. This is further elaborated in the Electronic Communications Regulations of 2016, which empowers ESCCOM to manage efficient and effective use of radio frequency spectrum[66] along with other essential functions including spectrum allocation, frequency planning coordination and assignment, issuing licenses, regulating and administering the use of radio frequencies, and monitoring and enforcement of procedures[67]. The frequency spectrum in Eswatini is assigned by ESCCOM through the administrative authorization process and in accordance with license requirements. Unlike the trend of issuing licenses for terms of 10 to 20 years[68], the stipulated duration of a radio frequency spectrum license in Eswatini is only one year until renewal. This short-term license term is less likely to ensure regulatory certainty and encourage investment from the market, and is not in line with the best practices recommended by ITU. ESCCOM has recently issued spectrum licensing guidelines that are meant to address the information shortcomings of the regulations and better present spectrum licensing information to ensure that applicants know what to expect from ESCCOM when applying for licenses. These guidelines were issued for public consultation and have not yet been operationalized. Lastly, ESCCOM published (i) a reviewed band plan for Terrestrial Fixed Services bands, which gives a channeling structure for all bands currently allocated to fixed services, outlines the currently assigned spectrum and also recommends steps to be taken to ensure that all assignments are in accordance with the proposed band plan, and (ii) a review of the International Mobile Telecommunications (IMT) band plan and roadmap, which outlines the process and timelines to be followed to make new spectrum bands available to existing and future service providers.

BOX 3. Universal Access and Service Fund

In addition to its mandate to improve the enabling environment for the telecom sector, ESCCOM is entrusted with ensuring the development of ICT services in the country. To achieve its mandate, the Commission established the Universal Access and Service Fund (UASF) following the terms of section 29 of the Electronic Communications Act, 2013. The core mandate of the Fund is the advancement of communications services, with a focus on achieving universal access to quality, reliable and affordable communications services in Eswatini. These targets support the view that widespread and affordable access to ICT is key to promoting social inclusion, and to bringing the benefits of development to the marginalized and disadvantaged, including the poor and the unemployed, women and the disabled.

A number of universal service and access programs have been carried out in the last few years, including:
- Assisting the Ministry of Agriculture to connect 17 veterinary offices.
- Supporting children living with disabilities through support to the School for The Deaf Primary and High School with technology capabilities to assist in administration, learning and teaching.
- Distribution of laptops in schools.
- Provision of public WIFI hotspots.
- Network expansion in underserved areas, as well as upgrading 2G sites to be compatible with current technological developments, resulting in the expansion of broadband services in underserved areas through the provision of LTE.

However, the administration of the Fund could be strengthened to improve delivery at scale. At present, it is not clear what impact assessment strategy is in place for UASF-funded initiatives. Furthermore, MTN currently makes most of the contributions, which can create significant leverage for MTN and a potential conflict of interest. The government could broaden the contribution criteria beyond profitability to ensure the financial sustainability of the UASF.

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66 ESCCOM. The Electronic Communications (Radio Communications and Frequency Spectrum) Regulations, 2016. Available at: https://www.esccom.org.sz/regulations/The-Electronic-CommunicationsRadio-Communications-and-Frequency-Spectrum-Regulations-2016.pd

67 https://www.esccom.org.sz/mandate/spectrum/

68 ITU. Digital Regulation Platform: Spectrum management: Key applications and regulatory considerations driving the future use of spectrum. Available at: https://digitalregulation.org/spectrum-management-key-applications-and-regulatory-considerations-driving-the-future-use-of-spectrum/

Constraints to High-Speed Internet Development

The development of Eswatini's broadband infrastructure is constrained by a number of factors primarily associated with the presence of the vertically integrated, SOE dominance in the wholesale broadband market. While the introduction of the Electronics and Communications Act of 2013 set the stage for the establishment of a more competitive market, the slow pace of implementation continues to be at the heart of several structural challenges and associated issues that include:

- The high cost of broadband services, driven by the lack of competition. Despite a significant reduction in wholesale prices imposed by the regulator, EPTC can still charge relatively high internet wholesale prices due to its dominant position in key segments of the broadband value chain. This is especially evident in the fixed line market, whereby high input costs for ISPs are invariably passed on to customers. Likewise, in the mobile market, increased competition amongst mobile network operators is needed to drive down service prices. High domestic and international connectivity prices continue to impede a greater uptake of internet services, which has seriously inhibited the development of a digital economy.

- Low quality broadband services, driven by EPTC's inefficient provision of backhaul services. Wholesale customers have complained about constraints in sourcing fiber backhaul connectivity from EPTC. This may be due to the speed at which EPTC is able to deploy fiber connections, or the preferential treatment that EPTC is reported to give to its retail division and customers. Furthermore, EPTC's ownership of the ADSL network has been driving anti-competitive behavior and has affected not only the competitive nature of the access segment, but also the quality of broadband services, notably ADSL internet services.

- EPTC's lack of financial and technical resources as monopoly access provider. Deployment and management of high-quality broadband networks require substantial and nimble financial, contracting, technical, operating, marketing and other resources. EPTC has found it challenging to obtain and manage these resources.

Other pressing issues are holding back the expansion of the country's digital infrastructure and broadband penetration:

- Investment in network expansion, particularly in underserved areas and hard to reach areas. The current ailing economy could lead to a decrease in revenue for operators that contribute to the UASF. A decrease in operator revenues has a direct impact on the size of contributions that the Fund receives annually, and consequently affects the ability of the government to finance the expansion of infrastructure to all citizens, particularly those in underserved areas.

- Affordability of mobile internet access devices. Mobile internet access devices are not affordable for most individuals in the country, even though this is the primary way in which Swazis access the internet.

- The limited local market for data center and cloud services. At present, approximately 70 percent of the content consumed in Eswatini comes from data centers that are located outside the country. Besides the added cost of consuming content that comes from outside the country, international content is not always relevant to the broader population. This lack of relevance can be a disincentive to the adoption of broadband internet.

Recommendations & Next Steps

Quick wins

R1.1: Proceed with the unbundling of EPTC while pursing liberalization of all segments of the value chain. The nation's Post Covid-19 Economic Recovery Plan highlights this activity as an ICT enabler that the country must address as a matter of urgency. This exercise will help increase competition, reduce communication costs, and reduce entry barriers for smaller communications services providers. The following steps could be taken:

- Based on the unbundling report prepared by the ITU, conduct an EPTC options study to evaluate selected options for the long-term sustainability of EPTC's telecom businesses.

- Based on conclusions of options study, proceed with relevant unbundling of EPTC to facilitate the accounting and functional separation of EPTC's businesses, identify potential restructuring areas and leverage private sector investment.

- Pursuing liberalization would include clarifying the current situation with regards to the international gateway, liberalizing the middle-mile segment after a period of exclusivity after the unbundling, and ensuring that additional players could possibly enter the market.

R1.2: Review and improve the administration of the Universal Access and Service Fund. This could include developing and reporting on well-defined targets, including monitoring the effectiveness and impact of UASF programs and diversifying operational funding sources.

R1.3: Facilitate infrastructure sharing with SOEs, such as the Eswatini Electricity Company (EEC), to expand fiberoptic broadband infrastructure. This would enable broadband operators to expand their networks by harnessing existing utility infrastructure such as electricity, rail, water and sewer networks. The government should consider mandating the provision of adequate communication ducts on all new roads, especially in major cities and highways. Focus should also be placed on the implementation of the MoU already signed between EPTC and EEC. This would present further opportunities for operators to lower the cost of network deployment and speed up the development of broadband networks.

Medium- to long-term recommendations

R1.4: Place conditions and regulatory safeguards, such as cost-based wholesale price controls, adequate interconnection regulations, and measures to ensure nondiscriminatory and open access to the wholesale network followed by the unbundling of EPTC. To ensure a successful market outcome, the right legal and regulatory mechanisms must be put in place to guarantee that retail service providers have equitable access to wholesale network services that are affordable and delivered in an efficient manner. This is particularly important given the significant market power that the wholesale service provider is likely to wield. Without these conditions in place, the intended goals of the unbundling might not be achieved, and corresponding bottlenecks in the retail market might remain. See Box 2 for suggested conditions that ensure access to wholesale infrastructure is provided in an equitable, open, and efficient manner. Furthermore, in light of MTN's investments in its own international gateway access and backbone infrastructure, clarifying that all exclusivities on digital infrastructure are to be removed while supporting the implementation of regulatory measures to encourage infrastructure sharing would encourage operators to invest in and share infrastructure, and thus avoid the need for duplicative investments.

R1.5: Expedite the expansion and certification of the local Tier III data center to encourage the growth of a local cloud services and content ecosystem. Plans are underway to increase the capacity of the existing data center, including the construction of a disaster recovery site 50km away from the primary site. Additionally, the facility's Tier III status has not been certified by a globally recognized standard for data center reliability and overall performance such as the Uptime Institute. The provision of reliable, affordable local hosting services can encourage the development of local content and cloud service ecosystems. Furthermore, an increase in locally hosted content and cloud services can lead to a reduction in internet service access costs that include international transit charges, and higher latencies associated with accessing externally hosted content.

A point worth noting is that this data center is intended to house the planned Integrated Government Services platform and national IXP, which have both been highlighted as critical ICT enablers for the success of the Covid-19 Economic Recovery Plan.

R1.6: Increase demand for and usage of broadband services. This would include reducing or eliminating excise duties and other taxes on feature and entry-level smartphones, tablets or laptops, and/or subsidizing or offering low- or zero-interest loans for their purchase. Subsidies could be targeted at priority segments in society, such as women and marginalized populations. Large scale digital awareness and literacy campaigns could also be implemented to boost demand for digital services.

Digital Platforms

Key messages:

- **Public sector platforms:** Key public sector platforms such as financial management, revenue collection, human resources management, digital identification, and delivery of services in key sectors such as health and education are in place. However, several of the digital systems supporting these functions do not yet leverage the range of software functionalities available to align with government business processes or international standards. Further, they are not optimally user- or citizen-centric.

- **Private sector platforms:** Major large-scale private sector digital platforms have a very limited presence in Eswatini, with the exception of social media platforms. There are also a few burgeoning e-commerce platforms and platforms leveraged by local entrepreneurs (see Chapter 7). Other common digital private sector platforms such as ride sharing platforms have yet to gain traction in Eswatini, due to a constrained business environment and lack of reliable ICT infrastructure.

- **Interoperability:** Eswatini lacks an interoperability framework and most public and private sector platforms are not interconnected, even in cases where doing so would generate efficiency gains for providers and users. As a result, there is clear demand from government agencies and the private sector (banks, MNOs) to not only scale up connectivity, but also interoperability. Although the development of an interoperability framework is underway, it has been hindered by the poor condition of government IT infrastructure and lack of clarity of mandates.

- **Coordination, capacity building and utilization of skills:** At present, Eswatini doesn't have an embedded or systematic approach to coordinating the development and utilization of public and private sector platforms within its digital economy. Lack of clearly defined roles and mandates across institutions has already delayed progress in advancing e-governance and creating incentives for a digitally enabled private sector. As the digital economy develops, there will be an increased need for strengthened interinstitutional coordination, and change management will play a significant role in ensuring that the transition from analogue processes to digital platforms can overcome the challenges that result from lack of capacity and passive resistance.

Importance of Digital Platforms

Digital platforms offered by governments, businesses and non-governmental organizations have the potential to transform the way these entities interact with each other. The potential benefits of digital platforms stem from their ability to virtually connect people and things as well as to facilitate digital interactions and transactions, including the exchange of information, goods and services. Platforms can also improve access to, efficiencies in, and the quality of service delivery. Digitizing service delivery can increase user convenience and generate savings for government and businesses. For governments, digital platforms can increase the efficiency and effectiveness of core functions and services, reduce unnecessary duplication of systems, combat fraud and corruption by increasing the

security and traceability of transactions, and improve civic engagement and accountability. Consequently, one of the main priorities identified in the GoE's National Development Strategy, *Vision 2022*, is the establishment of e-Government as part of the process of attaining economic growth.

Commercial digital platforms have created new markets by enabling more consumers to access better and more cost-efficient goods and services; they also unlock new jobs and income opportunities for suppliers and individual contractors. Commercial digital platforms are multisided online marketplaces that enable producers and users to create value together by removing market frictions, facilitating interactions and matching, and by exploiting and managing direct and indirect network effects. They offer distinctive benefits for users, for example, lower transaction costs, lower search costs, lower prices of intermediate and final goods, and better quality of products and services. However, commercial digital platforms also present important risks, usually in the form of anticompetitive behavior and lack of consumer and contractor protection. Network effects and winner-takes-all dynamics may foster market concentration, and incumbents may engage in collusive and discriminatory practices that affect new entrants and suppliers, usually by exploiting data as a source of market power, among other potential anticompetitive practices.

In this chapter, the assessment of Eswatini's digital public platforms is divided into two key areas: (1) core public sector platforms, namely those used to improve the function and efficiency of critical government administrative functions, and (2) public sector platforms for service delivery, which are citizen-facing platforms that improve access to government services.

Management of digital platforms requires strong governance frameworks and may require legal and regulatory reforms such as strengthening procurement rules and ensuring that solutions developed by the private sector meet requirements for data protection and ownership, cyber security, and intellectual property. Well-developed requirements facilitate the integration and use of specific digitized procedures, like secure e-signatures and electronic Know Your Customer (eKYC), as efficient substitutes for the corresponding analog processes. Efficacy in this role requires the capability to manage partnerships for and procurement of digital platforms. It also

requires access to and retention of skilled talent both within the civil service and private sector. Thus, digital platforms need to be supported by a strong enabling environment. Such an environment includes a framework of analog complements consisting of measures to address the digital divide, particularly in regard to gender, socio-economic class, education, and rural vs. urban areas, as it impacts addressable market opportunities; government procurement of IT and other digital services; and digital and business skills of the population for inclusion in the digital market as consumers, entrepreneurs, and suppliers.

Diagnostic Findings: Current State of Digital Platforms

In robust digital economies, governments play an active role in designing, overseeing and/or developing digital public sector platforms and a critical role in supporting firms to operate digitally enabled businesses. Furthermore, governments can strengthen oversight and monitoring mechanisms to promote a competitive business environment, while also ensuring that there are clear and effective safeguards in place to protect user data and the integrity and resilience of the platforms put in place. In Eswatini, the government has yet to take up these core functions, so that digital public and private sector platforms remain nascent and disjointed as a result.

Eswatini ranks 128 out of 193 countries on the 2020 United Nations' global e-Government Development Index (EDGI), which is below the average for sub-Saharan Africa and well below the average for the Southern Africa region. Still, Eswatini's ranking has increased 13 points since 2018, in part due to the increase in the online services index. It is below the continental average and other Southern African Customs Union (SACU) and Southern African Development Community (SADC) countries. As a small landlocked country, reasonable comparators would include other landlocked African countries and small island developing states (SIDS). Eswatini is outperformed by SIDS such as Mauritius and Seychelles, by landlocked countries such as Ethiopia, Rwanda, Uganda, Zambia and Zimbabwe, and by upper-middle-income countries such as South Africa and Namibia.

Digital Public Sector Platforms in Eswatini

Core Public Sector Platforms

The core public sector platforms in Eswatini, such as for revenue collection, financial management, and human resources management, lack critical functionalities and most have been designed in-house by the government. For nearly all of these systems, the government is pursuing upgrades or system re-implementation to better align their functionalities to relevant ministries' business processes. These systems are critical for the government's implementation of the Post Covid-19 Economic Recovery Plan, as they will support more efficient government expenditures and equitable access to government services and resources. In particular, the need to increase access to procurement for youth and MSMEs is prominently featured in the plan. The following paragraphs give a brief overview of each of these core public sector platforms. Additional details are available in Annex 3.

Tax and Revenue Platforms. The digital systems managed by the Eswatini Revenue Authority (formerly the Swaziland Revenue Authority, SRA)—the Resource Management System (RMS) tax system and Automated System for Customs Data (ASYCUDA) World customs system—are well developed. These are third-party platforms that are maintained by SRA's IT staffing complement, which is highly capable and well-trained[69]. As part of the implementation of new systems, SRA introduced a single Taxpayer Identification Number (TIN), which is a unique 9-digit identifier generated by the RMS and used for both tax and customs. All business owners and persons required to file taxes by law must register for a TIN. SRA also has an electronic tax system available for citizens and businesses to file their taxes. Currently, most commercial entities use the platform, but many individuals do not. To address this, SRA will launch a campaign to motivate taxpayers to pay digitally. VAT is collected at ports of entry and registered in the ASYCUDA World system. SRA is developing an interoperability program that would automate back-office communications between relevant government systems so they can track customs data in real-time.

However, interoperability with the government mainframe is a challenge. SRA's 2021/2022 to 2023/2024 Strategic Plan added a fourth strategic program, which is informed by regional and international conventions and initiatives to which Eswatini is party and must implement. This program would build upon Eswatini's existing trade MOUs with South Africa and Mozambique.

Financial and Public Expenditure Management Platform. The Eswatini Ministry of Finance uses a computerized financial system, which controls and reports expenditures on a cash basis. However, the absence of a more robust, digitized and integrated financial management system that is interoperable with other key government platforms is considered as a contributing factor to the lack of financial controls for government spending. Recently the Treasury introduced an Invoice Tracking System (ITS), a stopgap measure for tracking expenditures and arrears, while the Integrated Financial Management System is being implemented. This system is a basic IT application which records invoices and payment instructions, creates batches of invoices that correspond to those in the existing accounting system, submits these batches online to the Treasury, reviews and verifies the invoices, and records invoices marked as paid from specific bank accounts.

Public Procurement Platforms. Public procurement is a source of major government expenditure. The Eswatini Public Procurement Regulatory Agency (ESPPRA) has several digital platforms to aid business participation in public procurement processes, and has developed its own digital systems for improving the tracking of and access to government-issued tenders. These include: (1) a database for tender alerts, where businesses opt-in to be notified during stakeholder engagement activities; (2) a website with tender information, including freely downloadable tender documents, bidder qualification requirements, opening and closing dates of the tenders, views of the bid evaluation scores, notice of intention to award, and information about the entity eventually awarded the tender; and (3) a tender review and advertising portal, which sends emails to prospective bidders in the database. Tenders are also advertised via social media.

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69   The IT department is small with two directors: one for innovation and systems who supervises 15 staff and the second for infrastructure and servers with 11 staff. Everything for the RMS is done by the vendor and there is a standing contract for support visits.

These platforms were created and are maintained internally by ESPPRA IT staff and have improved access to government procurement. Still, ESPPRA would like a more integrated and robust electronic procurement system (e-GP) that interfaces with the other relevant government agencies and comprehensively tracks procurements and grievances. Public procurement is one of cabinet's five priority areas; however, this prioritization has not resulted in a higher budget allocation and execution for procurement programs.

Human Resources Platform for the Civil Service. The Ministry of Public Service uses a Human Resource Management Information System (HRMIS) developed in 2006 by the Ministry of ICT's Government Computer Services Division and stored in the government's mainframe. The HRMIS supports management of the size and structure of the civil service, maintains employment records, and manages its payroll. This system contains civil servants' ID information and is linked to the National Population Register (NPR). However, several key functionalities that are available in more recently designed HRMIS systems—such as employee record tracking and interfaces with payroll—are not yet available in Eswatini's system. This is because the original system was not intended to be a robust and comprehensive HR management system, but rather a simple employee tracking system, and because budgetary allocations for further investments in the system have not moved forward in recent years. Envisioned upgrades include establishing interoperability with the National ID system and treasury for payroll disbursement as well as integration of performance management tracking and data.

National Identification and Population Register Platforms. Eswatini has an integrated civil registration and national ID system based on an NPR that is managed by the Ministry of Home Affairs (MOHA) and hosted in the Ministry of ICT's shared data center. The system is structured around Personal Identification Numbers (PINs), which are issued at birth and last throughout a person's lifetime. Basic ID cards are issued using the PIN at age 16, after deduplication using fingerprints. Cards are issued to both citizens and foreigners, but the latter receive a different color card. Currently, approximately 53 percent of persons ages 16 and over have a National ID card. The NPR has basic functionalities and is well managed. At the same time, the digital identity verification and authentication capabilities offered by the system are currently limited. As a result, Eswatini's ID system is not able to support other government platforms, especially those for service delivery, such as health and education with maximum efficiency. There are also gaps in terms of functionalities to provide people with more oversight and direct control over their data and credentials.

Spotlight on Digital Identification

The NPR system is an important asset for Eswatini, and on the whole is better developed than many Civil Registry and ID systems in Sub-Saharan Africa. Birth registration has increased dramatically in the last decade and now stands at 70-80 percent for children under five. In addition, the NID and PIN are widely used by people as proof of identity in their daily lives and in other government systems. Furthermore, the NPR—while generally underfunded and understaffed—appears to have quality, dedicated staff with good technical knowledge and a high level of commitment to improving the system and serving the people of Eswatini.

At the same time, a number of challenges remain:
- **Persistent coverage gap for children and adults.** Because civil registration laws require parents to prove their citizenship during the birth registration process, parents who are not registered themselves cannot register their children, and adults who were not registered at birth are then unable to obtain the NID until they do so. This creates a risk of statelessness and can lead to denial of services for which ID is required (e.g., school enrollment).

- **Outdated and bureaucratic systems.** NPR systems have not been adequately upgraded since the early 2000s and do not meet relevant performance and security standards. In addition, many steps of the registration process rely on paper-based data capture, which can lead to inaccuracies in the data with respect to the NID, passport, and other documents. Beyond inefficiencies and security risks, the existing systems add to the time and opportunity cost for people registering vital events and applying for NIDs.

- **Limited identity services and digital ID.** Although a number of government databases store the PIN, there are only a few systems that are able to perform identity verification checks against the NPR using this number. Furthermore, digital authentication technologies that use the existing NID card have not yet been deployed, and other alternative solutions do not currently exist to allow for secure in-person or remote authentication.

- **Reforms needed to enhance the legal and regulatory framework.** While some enabling laws do exist, such as for civil registration and identification the NPR, certain aspects of this legislation are out of date and create significant barriers to full inclusion and digitalization. In addition, as detailed in the Policy and Institutional Context section, while Eswatini has a data protection law and cybercrime law in force, full implementation of these laws needs to be pursued. Strong legal and regulatory foundations need to be in place to enable the system to securely and inclusively provide critical services—to public and private entities.

- **The Government of Eswatini views the NPR as a foundational resource for the country and seeks to improve the inclusivity and security of the system and leverage it to provide better services.** Meetings with MOHA, Ministry of Economy, Ministry of ICT, and Registrar General confirmed a high level of political commitment to improving the NPR system. The primary goals of the government are to respond to the main challenges listed above, including:
  - Ensuring that the system is **inclusive of all people in Eswatini**, regardless of age or nationality;
  - **Increasing security** and reducing fraud related to identity documents, passports, and border crossing;
  - Responding to demand from **other ministries and the private sector** (e.g., banks and MNOs) for ID verification services and to enable the unique identification of service users.

Public Sector Platforms for Service Delivery

The platforms designed for service delivery across the public sector include Ministry of Health platforms and the Ministry of Tinkhundla's (local government) One-Stop Service Centers. The Ministry of Education has a Management Information System, but this system was not able to be evaluated for this assessment. These platforms have some limited interoperability with the NPR but are not yet interfaced with e-payments systems. Additionally, the use of digital citizen engagement and feedback platforms in Eswatini has not yet begun. There are no ongoing Open Data initiatives and government data that is publicly available is sparse. For example, while most ministries include a subset of governing laws and policies on their website, statistical information about implementation of ministry initiatives and delivery of services is less readily available. Summary information about government budget and expenditure is available; however, detailed budget and expenditure is not. The Office of the Chief Economist publicizes quarterly circulars, but these are only available in hard copy.

Health Systems: The Health Resource Management System (HRMS) was launched in 2015 and connects 178 of the country's 334 health facilities. Given the infrastructure and connectivity constraints Eswatini faces (see Chapter 3 on infrastructure), the Ministry of Health has installed their own microwave technology to provide connectivity. System information is available in real-time to those connected. In the system, patients have a PIN, which is a unique identifier at facility level. The PIN is the same as a citizen's national ID number and is the basis for the interoperability linkage with the population database register. The Ministry of Health is also rolling out a Client Management Information System (CMIS). A quality management system was piloted in December 2019 and is interoperable with CMIS and is the digital arm of a program designed to gather citizen feedback on health services. Feedback regarding the availability of medication, the cleanliness of facilities, and the bedside manner of medical staff is collected and measured against existing performance indicators. It uses a text-based system where clients opt-in. To run and maintain these systems, the Ministry of Health employs network engineers, database administrators, software developers, statisticians, and

health information officers.

Tinkhundla One-Stop Service Centers: Ministry of Tinkhundla (Local Government) is establishing digitally enabled one-stop service centers in every Tinkhundla (region) to facilitate improved service delivery in rural areas. At the one-stop service centers, people would be able to access passport and national ID services, update birth and death registration details, and complete vehicle registration. There are also programs within Tinkhundla to enhance wireless access in selected Tinkhundla service points, such as ESCCOM's UASF program for targeting rural areas to improve ICT and communications. The Ministry of Tinkhundla has future plans to connect all the one-stop service centers with the government-wide area network and offer a full range of digital services to citizens.

Summary of the Status of Public Sector Platforms

Digital public sector platforms in Eswatini range widely in terms of functionality (see Figure 7 for a heatmap comparison of platforms and Annex 3 for detailed descriptions of each system). On the one hand, Eswatini has well-developed healthcare service delivery platforms with dedicated infrastructure and an automated connection to the population register. On the other hand, it does not have a digitized integrated financial management system that tracks government expenditures, which contributes to large inefficiencies in government spending. The landscape of public and private sector platforms in Eswatini is steadily evolving with the introduction of various back-end and front-end systems, applications and services. Although Eswatini was one of the pioneers of digital government in Africa, beginning its efforts as early as 2003, it now lags behind regional comparators in terms of digital platform development.

FIGURE 7. Heat Map of Public Sector Platforms in Eswatini

Name of Platform [Ministry, department, agency]	Level of system development	level of interoperability	level of tailoring to gorvenment business processed	Gapsin access and coverage for target user groups	level of staffing dedicated to upgrades operations and maintance
National Population Registry [Ministry of Home Affairs]	MODERATE	MODERATE	MODERATE	HIGH	MODERATE
Invoice Tracking System [Ministry of Finance]	LOW	LOW	LOW		
Human Resource Management Information System [Ministry of Public Service]	MODERATE	MODERATE	MODERATE		LOW
Digital Procurement Systems [Eswatini Public Procurement Regulatory Agency]	MODERATE	LOW	HIGH	MODERATE	HIGH
Revenue Management System [Eswatini Revenue Authority]	HIGH	MODERATE	HIGH		HIGH
AYSACUDA World [Eswatini Revenue Authority]	HIGH	MODERATE	HIGH	LOW	HIGH
Health Management Information Systems [Ministry of Health]	HIGH	MODERATE	HIGH	LOW	HIGH
One-stop Service Centers [Ministry of Tinkhundlal}	MODERATE	MODERATE	MODERATE	MODERATE	

Legend: **HIGH** (orange) · **MODERATE** (light blue) · **LOW** (dark blue)

Note on Methodology: The list of platforms here is non-exhaustive and includes those for which the authors were able to have in-depth consultations. Each rating—low, moderate, high—is determined based on the information available in Annex 3, which details the status of various public sector platforms. Low indicates an area where the stakeholders describe major challenges or a negligible level of advancement or achievement. Moderate indicates some self-reported development but also a clear need and desire for improvement. High indicates a reasonable level of development (especially in comparison to other platforms) and where updates and challenges are aspirational or future-oriented, rather than based on current functions.

Digital Private Sector Platforms in Eswatini

Eswatini has few fundamental private sector platforms in place and lags behind comparators in this regard. Each platform is discussed below.

Digital Payment Platforms. Digital payment platforms are underdeveloped with few public and private sector platforms enabled for online payments. Eswatini's DFS environment is still evolving and weak DFS usage and adoption hampers full access to services developed by digital entrepreneurs. An enabling DFS environment is also critical to promoting e-commerce usage among individuals and (M)SMEs. While Eswatini also needs to boost internet penetration to grow e-commerce, it also needs to promote trust and accountability in online transactions.

Digital Commerce and Marketplaces. Both international indices and stakeholder consultations indicate that Eswatini has a low state of readiness for digital commerce and marketplaces. The three key indices for private sector platforms (see Annex 1) place Eswatini in the bottom quartile, which indicates that growth potential is limited and improving the enabling environment is key. Further, stakeholder consultations indicated that private sector platforms are unable to grow their user base and reach scale partly due to the limited uptake of digital payments, aside from mobile money. While mobile money is widely and broadly used (three out of four adults), e-commerce and other digital platforms (including ride sharing platforms) have yet to gain traction in Eswatini. In other African countries, digital platforms such as e-commerce and gig economy platforms (e.g., online freelancing), and the transport and logistics sector have been catalytic for kickstarting digital and tech-enabled entrepreneurship. This has occurred through the sensitization of the customer base to the use of online platforms and by creating job opportunities for lower-skilled individuals (such as drivers). The benefits of e-commerce are not solely for digital startups, they also enable firms and SMEs in remote areas to access local and international markets through their supply chains.

This is partly attributed to the constrained business environment which also extends to the virtual business environment. E-commerce and gig-economy platforms also rely on a robust on-the-ground logistics and support system. Given that many Eswatini entrepreneurs are considered "livelihood entrepreneurs", a possible logistics model has yet to be fully designed and implemented.

Webhosting and Domains. Stakeholders cited unavailability of local webhosting and domains as a barrier to public sector efficacy and private sector growth. For example, government ministries do not have a protected e-mail system and even cabinet-level officials use private email accounts to conduct government business.

Social Media Platforms. While internet use in Eswatini is still relatively low (see chapter on digital infrastructure), social media use is growing, providing an opportunity to increase access to information on goods and services. While there are no robust statistics available on how the Swazi population uses social media platforms, stakeholders have indicated that this is dominated by leisure-based internet consumption. The dominant social media platforms in Eswatini are Facebook, Twitter, LinkedIn, and Instagram. For domestic firms, these digital platforms can be leveraged to sell goods and services.

Regional Digital Platforms. Eswatini expects to benefit from digital capacity building and increased access to intercontinental trade; however, this depends on the passage of critical legislation governing digital transactions discussed in the Policy and Institutional Context section. The box below illustrates the rise of digital commerce and marketplace platforms in Qatar, which has widespread applicability to Eswatini MSMEs (see Box 4). Creating a successful business environment for MSMEs is critical to the implementation of Eswatini's Post Covid-19 Economic Recovery and Response Plan, where the proposed strategy is to link MSME to "Big Projects" in the private sector to catalyze growth.

In late 2019, Qatar's Ministry of Transport and Communications (MoTC) launched "Theqa" (https://www.theqa.qa/), an online portal to promote Qatar's e-commerce gateway, as part of efforts to enhance consumer confidence in the local e-commerce sector and improve the quality of services provided by local online suppliers, in addition to providing traders and shoppers with the latest updates in the sector. The launch of Theqa is part of Qatar's National e-Commerce Roadmap and the national guidelines, which aim at supporting local e-commerce enterprises and helping traders understand and adopt international best practices and standards.

To obtain Theqa's trust mark, local companies or e-commerce businesses must fulfill a set of standards. The portal helps evaluate each participating company's website to check if it meets Theqa's security and safety requirements, and also ensure that proposed services conform to specifications. The company is then granted a certificate and a trust mark, which is subject to annual renewal on Theqa's website.

According to Qatar's MoTC, there are currently over 500 e-commerce websites registered in the Ministry's e-commerce directory (https://ecommerce.gov.qa/). These e-commerce websites comprise a mix of larger retailers and startups. Qatar's e-commerce rates are steadily rising; in 2019, the e-commerce penetration rates rose from 15 percent to 37 percent.   Sources: Theqa website; MoTC's Impact Survey Report-2019

Interoperability and Shared Services

Leveraging shared services and following a whole-of-government approach to digital transformation, with an emphasis on ensuring interoperability of systems, holds transformational potential for many governments. ID systems, trust services and data exchanges with shared repositories can help reduce leakage and fraud by ensuring that services reach their intended beneficiaries or suppliers. Beyond service delivery, digital public platforms can provide new channels for public engagement, feedback and information sharing, including CivicTech tools. When digital platforms are built according to international standards and/or standards as agreed by local experts, they spur the development of new applications, and facilitate interoperability. Standards also catalyze private sector innovation by supporting the ease of doing business, improving regulatory and tax compliance, broadening customer bases, generating new markets, and fostering entrepreneurship. Furthermore, leveraging open-source software can result in cost savings, greater efficiency and prevention of vendor lock-in.

In Eswatini, Government ICT infrastructure is provided through a central architecture managed by the Government Computer Services Department of the Ministry of ICT in Mbabane. Some core government IT systems, such as the Civil Registry, currently run on an IBM mainframe and other necessary hardware located in a "computer room," which provides only modest physical security. Key government mainframe computers are also located at the RSTP, as discussed further in Chapter 7. The RSTP system stores critical data including correctional services, public service payroll, immigration and NPR data, government vehicle registration and the national exam system. The RSTP has plans to build a National Data Center, and the government is considering providing hosting services for government data through this facility. However, the physical location of the RSTP is considered less than ideal for coordination with some key government stakeholders as it is outside Mbabane and not accessible by public transport. Thus, contractual arrangements would need to clearly indicate how much autonomy the government would retain over facilities management if this arrangement were to move forward.

Access to ICT infrastructure in Tinkhundla is currently limited, with only a few centers having electricity and connection to the government-wide area network; however, expansions are planned. Businesses and other government ministries' offices are encouraged to take advantage of the shared government infrastructure that the Ministry of Tinkhundla will provide, rather than investing in their own infrastructure and thus potentially creating costly redundancies. Some of these important improvements may come to fruition as part of the implementation of the Post Covid-19 Economic Recovery Plan, which explicitly highlights the need to

leverage the Tinkhundla One-Stop Service Centers to create economic opportunities for youth.

Two upcoming projects will further expand government IT infrastructure. The WonderPort project by the Natie Kirsh Foundation aims to connect all schools via TV white space. The Ministry of ICT is running a Taiwanese-funded project to connect government facilities by microwave, running parallel to the existing fiber networks. The completion of both projects, along with the envisioned expansion of connectivity for health facilities and Tinkhundla, would also facilitate connectivity for schools and other government facilities. The government aspires to eventually take over the operation and maintenance of this infrastructure.

Stakeholder consultations indicated that there is clear demand from government agencies and the private sector (banks, MNOs) to not only scale up connectivity, but also interoperability. This is especially so for the NPR, to allow biometric authentication, as well as the SRA, Ministry of Tinkhundla, Ministry of Heath, and Ministry of Home Affairs. It is the primary responsibility of the Ministry of ICT to put in place a policy to support interoperability and to ensure the readiness of government systems and infrastructure for this purpose.

As elaborated previously, one of the platforms that requires the greatest level of integration and interoperability with government systems is the National Identification system. While the PIN is recorded by many government agencies, the use of these systems by relying parties is essentially manual. The NID is often visually inspected or photocopied as a proof of identity or to record a person's PIN (e.g., for banks, MNOs, HRMIS, etc.), but there is currently no option for digital authentication and limited interoperability for identity queries with other systems.

The Ministry of Health's Client Management Information System (CMIS) is a use case for interoperability with the NPR. It is one of the most advanced core government systems in the country. Both adults and children are registered in the CMIS using their PIN, enabling some information sharing of demographic fields. The Ministry of Health reports that this has increased the accuracy of the system, reduced processing time, and ensured the uniqueness of patients, which has been an issue in the past (i.e., people going to multiple health facilities

to collect the same medication).

In order to prevent denial of service, the Ministry of Health engages MOHA to work with unregistered people and create a temporary ID number for those who do not yet have a PIN.

The process of moving towards an interoperability framework has been hindered by the current condition of government IT infrastructure and the lack of clarity of mandates. The e-Government unit, which is being relocated to MICT[70], has been given a mandate to produce an interoperability strategy and related standards; is also a common forum for discussions on standards and interoperability. At the same time, stakeholder interviews suggest that the Ministry of ICT is responsible for technical implementation of the e-Government strategy, also including setting technical standards. As such, the distinctions between the mandates of the Ministry of ICT and the e-Government unit are not yet fully clarified. On 4 March 2022, the Electronic Communications and Transactions Act No. 3 of 2022 entered into force, which specifies the role of the Ministry of ICT with respect to interoperability in certain areas. Nevertheless, clarity at a broader level would be ideal for coordination and to ensure the government can deliver on its commitment to this reform.

Coordination, Capacity Building, Utilization of Skills

The government's aspirations for greater interoperability of digital platforms will also increase the need for a robust strategy and inter-institutional coordination. In collaboration with the United Nations Development Programme (UNDP), the government developed the 2017-2019 e-Government operational framework, which laid out quick wins as well as short-, medium-, and long-term priorities. There is also a four-year e-Government strategy covering 2016-2020, which guides the overall government approach to developing and interfacing public sector platforms. The implementation of these strategies falls within the mandate of the e-Government unit, which is being relocating from the Office of the Prime Minister to MICT to ease coordination for the e-Government agenda. However, the lack of clarity of mandates affects the interoperability framework, the RSTP's datacenter, and coordination with ESCCOM

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70 The e-Government unit also has some responsibility for steering and oversight of government digital systems and hardware.

regarding backbone infrastructure. The level of autonomy and authority of these entities also impacts their ability to deliver on their mandates. Box 5 describes South Africa's State Information Technology Agency and how it is structured to deliver on these important coordination needs.

The e-Government strategy is slated to be updated to focus on standards, monitoring and coordination. It would also include an operational framework that would facilitate implementation, monitoring and evaluation. There is a need for all relevant stakeholders to come to the table and contribute to updating the strategy, which did not occur during the development of the original strategy. There is also a set of proposed recommendations provided by UNDP during its 2019 e-Government evaluation. It is the view of some stakeholders that guidance from the Prime Minister would be required to tease out relevant issues and provide a clear path forward. Change management is also critical to integrating and sustaining the changes proposed in the e-Government strategy.

In general, change management plays a significant role in ensuring that the transition from analogue processes to digital platforms can overcome challenges resulting from lack of capacity and passive resistance. Effective change management combined with capacity building resulted in the effective implementation of the Ministry of Health's management information systems. The government has recognized this in its e-Government strategy. There is a change management specialist within the Office of the Prime Minister (OPM) who has been working to gain traction in this area, but progress has been slow. Further, given that change management capacity is centralized within the OPM, coordination is critical to its utilization by other parts of government. Given the aforementioned coordination challenges, it remains unclear how change management will play out with the transition of core systems from the MICT mainframe to the new shared RSTP data center.

Several digital public sector platforms in Eswatini have been designed, implemented, operated and maintained by internal IT staff within the relevant ministry department or agency. In some cases, they have been developed by MICT and then handed over to the relevant ministry. For example, the NPR was built by MICT and handed over to the Ministry of Home Affairs. The NPR platform now appears to have

quality, dedicated staff with good technical knowledge and a high level of commitment to improving the system and serving the people of Eswatini. Similarly, the Ministry of Public Service used MICT to design their HRMIS system. Staff at ESPPRA and SRA have the capability to design, operate and maintain some or all functionalities of their various digital systems. In a few cases, the support of international consultants or vendors has been leveraged, such as for the SRA's RMS system and the digital Health Management Systems. Although several digital public sector platforms have limited functionality and do not incorporate state-of-the-art technology and standards, in part due to lack of budgetary allocation for such improvements, there is significant technical capacity within government that should be leveraged and enhanced as part of future developments.

Bearing in mind the existing technical capacity within government, Eswatini has challenges with understaffing and underfunding its IT functions. Nearly all ministries, departments and agencies had unfilled IT positions in the civil service establishment or were vying for such positions to be placed in the establishment. The incoming government has also had to contend with what the Minister of Finance described in February 2019 as 'an unprecedented economic crisis', resulting from fluctuating Southern African Customs Union revenues, a terminal decline in the mining sector, and a collapse in revenues from the critically important sugar industry.

More recently, as of July 2020, the Covid-19crisis upended the county's financial outlook and spurred the prioritization of ICT and education as one of the Post Covid-19 Economic Recovery Plan priority sectors. These factors, taken together with the cost of prestige projects, have resulted in a total freeze on government recruitment and non-essential expenditure. It is not clear whether the incentives are properly aligned for critical actions to be taken to translate to expenditure on government platforms or the ICT sector more broadly. This may particularly be true in cases where the implementation or upgrades of digital systems may reduce or eliminate opportunities for discretionary activities, such as in payments, hiring, and tender awards.

BOX 5. South Africa's State information Technology Agency as an Example of Coordination Agencies for e-Government

The Republic of South Africa's State Information Technology Agency (SITA) was created in 1998 within the Department of Public Service and Administration, and later attached to the Department of Telecommunications and Postal Service for the procurement of IT services, standard setting and product authentication, security of government data, and provision of e-Government services. In 2002, SITA's legal nature was changed to that of a private company fully owned by the state under the South Africa Companies Act. Now, as a parastatal entity, SITA is expected to work together in collaboration with these departments in providing project management and other support to all e-Government projects.

SITA's statutory mandate is to:
- Improve service delivery to the public through the provision of information technology, information systems and related services in a maintained information systems security environment to departments and public bodies; and
- Promote the efficiency of departments and public bodies through the use of information technology.

Functionally, SITA has four core activities: (1) centralization of all government IT procurement, including adherence to minimum interoperability standards; (2) maintenance of key back-office government systems such as financial management, payroll and procurement systems; (3) provide or maintain a private telecommunication network or a value-added government network; and (4) provide training and/or technical, functional or business advice to government.

In practice, there are some exceptions to how these mandates are carried out. Sometimes there are technical reasons such as ongoing use of legacy systems or lack of interoperability that prevent the minimum operability standards from being met. Still, SITA is expected to develop the necessary integration platform to connect each department's back-end systems with the central portal (front office), with the objective of improving the level of online services (connected services).

One key benefit of SITA's status as a parastatal is that the Board of Director has the authority to hire based on training, skills, competence and knowledge and to determine the remuneration allowances and service benefits of its staff. Making these two functions independent of government civil service recruitment and renumeration has proven important for hiring and retaining highly qualified staff.

Recommendations & Next Steps

Based on the above analysis, the following recommendations are proposed to strengthen Eswatini's public and private sector platforms.

Quick wins

R2.1: Pilot mobile government apps for core and service delivery platforms that have a high level of readiness, e.g., tax filing, procurement, and health services. Mobile government, or M-government, is a paradigm shift in digital service delivery in recognition of the high usage of mobile internet and mobile devices. The adoption of M-government will enable the marginalized and poor to access government services more easily through their mobile devices.

R2.2: Conduct detailed systems assessments, audits and business process reviews to develop technical specifications for core government platforms. These assessments will help strengthen public sector platform functionality, interoperability, and leveraging of shared services—possibly through an upgrade or re-implementation of core public sector platforms—while building capacity.

Nearly all ministries, departments and agencies that currently manage core digital platforms— such as ID, HRMIS, public expenditure tracking and procurement management—should consider upgrading or re-implementing these platforms in order to strengthen compliance, increase efficiency, and reduce costs. Doing so would translate to significant progress in the ability of the Government of Eswatini to manage its revenues and expenditures, as well as strengthen core functions such as civil service management and government procurement. It would also greatly improve service delivery for citizens in the areas of identity authentication and access to education, health and digital financial services, among others, especially if M-government tools are leveraged. Progress should be made in alignment with the existing e-Government strategy and interoperability policy.

Therefore, system improvements should be preceded by detailed systems assessments, audits and business process reviews, to ensure the development of proper technical specifications. This approach is being utilized for the financial management system, e-GP, and National ID/NPR (see Annex 3) and could be replicated for others. Further, these upgrades should leverage ISO standards and tailor international best practices to fit the country context and government business processes. Given that the government of Eswatini has a sizable cadre of IT professionals that are sufficiently skilled to assist in the development, implementation, operations and maintenance of these systems, these professionals should be involved in system roll-out and offered the opportunity to build their capacities as much as possible. If third-party software and vendors are used, it is recommended that their contracts include provisions on building the capacity of local IT professionals in the process of designing and implementing their software.

R2.3: Invest in upgrading the National ID/NPR platform and establish linkages to key service delivery platforms to increase equity and accessibility, particularly for social protection and education. As a first step, it is recommended that Eswatini carefully assess its existing system to benchmarking against other comparable systems, identify priority areas for reform, and serve as critical input for future potential system upgrades. This assessment should provide both an in-depth technical evaluation of the strengths and weakness of the current NPR systems; identify priority needs and use cases across sectors in order to make concrete recommendations for improving the system's inclusivity, security, and utility; and evaluate the current legal and regulatory framework for the ID system and other relevant areas (e.g., civil registration, customer due diligence, etc.), and its assets and gaps.

BOX 6. Digital System's Role in Capacity and Equitable Access in Procurement

In Eswatini, public procurement makes a significant contribution to capital flows. However, the awardees of large government procurement contracts have been historically limited to a small pool of vendors. The ESPPRA views digitization of public procurement processes as a critical mechanism for diversifying the type and size of the companies receiving government contracts. When combined with capacity building and more robust grievance redress mechanisms, e-Procurement can be leveraged to level the playing field.

ESPPRA is particularly interested in increasing SME participation in public procurement. At present, large companies dominate construction-related procurements, and SME participation is mostly constrained to common use items such as cleaning and office supplies or small-to-mid-sized consultancy contracts.

ESPRRA has launched training programs with the University of Eswatini to level the playing field for SMEs. The main objective is to build the capacity of suppliers and increase their participation in government procurement. The programs focus on helping suppliers become more familiar with the Public Procurement Act, its provisions, and reforms proposed under the new Procurement Act. They also show suppliers how to access existing ESPPRA digital systems for bidding process notification and grievance redress. In the future, ESPPRA would like the training program to cover the e-Procurement system which is planned to be launched in 2023.

Procurement reforms have not yet reached the level of targeting specific disadvantaged groups to increase their access to and participation in public procurement. Currently, there is print media and advertising of tenders in rural areas, and the requirement to pay to view full tenders has been removed to increase accessibility to all types of supplier. The adoption of e-Procurement will be a critical milestone providing the foundation for considerable transparency and efficiency gains and promoting participation in public procurement.

ESPPRA still feels there is a need to better understand the challenges SMEs face in bidding for and being awarded public procurement contracts. It is thus planning to conduct a study to understand what exactly the barriers are and who is most effected.

Achieving the Government's goals for the NPR will require investments in infrastructure and technology, business process re-engineering, and reforms to the legal and regulatory framework. Given the importance of the NPR as a critical system and the potential role it can play across the government and economy, it is essential to approach these reforms holistically and with clear outcomes in mind in order to avoid common risks. Service delivery outcomes should be prioritized so that they ID system can be leveraged to better target and deliver social protection services and ensure accesses to education for school-aged children. This would require a strong and well-interfaced system that is interoperable with key service providers. It would also be aided by the leveraging of mobile technologies to increase and make more efficient birth and death registry.

Medium- to long-term recommendations

R2.4: Improve government ICT infrastructure to enable utilization of more advanced public sector platforms.

Investments in government ICT infrastructure and connectivity would enhance the performance of public sector platforms. Leveraging RSTP could help in this respect; for this to be successful, the respective mandates of RSTP and MICT would need to be clarified, and the accessibility of RSTP to government staff (bearing in mind its remote location) and any infrastructure redundancy and disaster recovery requirements would need to be fully considered. A strategic approach to enhancing infrastructure reliability and connectivity will therefore be critical to ensuring digital public sector platforms are maximally beneficial to government and citizens.

R2.5: Clarify mandates and strengthen coordination functions to support implementation of e-Government strategy.

The government of Eswatini should clarify the mandates of ministries, departments and agencies that have responsibilities linked to the e-Government strategy and clearly position one particular entity to lead the agenda. Doing so may require keeping the primary entity in charge of e-Government mapped to the executive branch— as the e-Government unit had been thus far—or mapping it to another influential ministry, such as finance.

Furthermore, providing this entity with some semi-autonomous functions, such as those related to the recruitment and retention of employees, would be beneficial. Lack of clarity in this respect has thus far resulted in stalled implementation of critical activities that would improve digitization of back-office functions and service delivery. In particular, the government would benefit from aligning around a set of objectives: i) budget controls for ICT systems investments, operations and maintenance; ii) a single portal and domain for the whole-of-government; iii) agile and centralized procurements for digital platforms; iv) policies, standards, and compliance monitoring; and v) the implementation and establishment of a center of excellence or centralized IT function. If the existing e-Government strategy suffered from limited consultations, an important starting point would be to re-initiate consultations and agree with stakeholders on how to reach shared objectives going forward. Concerted efforts in change management are also critical. To be successful, the range of stakeholders that may be affected by these changes or asked to contribute to their implementation should be consulted and sensitized early.

R2.6: Promote the use of e-commerce platforms by leveraging regional initiatives such as the Africa e-Trade Group and through the design and implementation of an e-commerce strategy.

Development of an e-commerce strategy needs to be supported by parallel initiatives to improve ICT coverage and affordability, digital skills training programs, and implementation of DFS, including fintech. In the short run, Eswatini should leverage its hosting role for the Africa e-Trade Group and *Sokokuu*, the continental e-commerce platform launched under the same regional initiative, to boost the use of e-commerce platforms. In the long run, the World Bank can partner with the AU to help the government design and implement an e-commerce strategy that also provides capacity building for policymakers, including relevant line ministries and parastatal agencies, and MSMEs and business development service providers.

Digital Financial Services

Key messages:

- **Current state of Digital Financial Services:** DFS are still at an infancy stage, with mobile money as a key driver.

- **Infrastructure: The foundational infrastructure is in place to anchor DFS;** however full interoperability between bank accounts and mobile wallets is yet to exist.

- **Regulatory framework:** The existing regulatory framework supports the development of DFS and encourages participation of banks and non-bank service providers in mobile money issuance.

- **Covid-19** has revealed the need to fast track the development of a framework that facilitates digital verification of customers.

- **Role of banks in provision of DFS:** Banking services are viewed as expensive; however, banks are fast embracing DFS in partnership with mobile network operators, and opportunities exist to boost DFS and financial inclusion.

Importance of Digital Financial Services

Digital financial services (DFS) comprise a broad range of financial products and services, such as payments, transfers, savings, credit, insurance, securities, financial planning, and account statements, that are delivered via digital or electronic technologies, online channels or via a mobile phone[71]. The DFS ecosystem consists of banks and non-bank financial institutions (NBFIs) and is usually supervised by central banks as the leading regulatory authorities.

DFS are critical in providing individuals and firms with convenient and affordable channels by which to pay, as well as to save and borrow. Firms can leverage DFS to transact more easily with their customers and suppliers, as well as build digital credit histories and seek financing. By using DFS, governments can increase efficiency and accountability in various payment streams, including for the disbursement of social transfers, collection of taxes and other revenues. To ensure safety and soundness, the DFS ecosystem must be anchored on a forward-looking and proportionate legal and regulatory framework (e.g., to allow market entry and innovation), robust financial infrastructures (e.g., national payment systems and credit reporting systems), and the development and deployment of low-cost delivery channels (e.g., agents, point of sale devices, automated teller machines, mobile phones).

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71 G-20 High-Level Principles for Digital Financial Inclusion, 2016.

Eswatini's collaborative efforts in the modernization of payment systems for over two decades have laid the foundations for financial activity and settlement of interbank obligations. Notable achievements include the implementation of the real-time gross settlement (RTGS) system that connects all four commercial banks (FNB, Standard Bank, Nedbank and Eswatini Bank) to the Central Bank of Eswatini (CBE), and the Swaziland Automated Electronic Clearing House (SAECH) which operates a cheque clearing system and an electronic funds transfer (EFT). Despite these developments, cash remains the dominant means of payment, as evidenced by the fact that customers receiving mobile money usually cash it out with agents. Additional efforts are therefore needed to broaden access to financial services for the entire population, particularly in rural areas, where significant disparities with urban areas are apparent in access to basic services and infrastructure, education and level of financial inclusion, among others.

The development of the financial sector in Eswatini is echoed in various strategies including the National Development Strategy (NDS), the Poverty Reduction Strategy and Action Plan, the Financial Sector Development and Implementation Plan (FSDIP), the National Payment System Vision and Strategy and the National Financial Inclusion Strategy (NFIS). Through alignment of these strategies and support of policies that promote innovation, and deepen access and usage of products and services, Eswatini's authorities have committed to transforming the financial system to meet the needs of wider society. The Centre for Financial Inclusion (CFI), an agency set up under the Ministry of Finance, has set key priorities in driving the financial inclusion agenda with DFS being recognized as critical in supporting the attainment of national targets. Collaboration between the public and private sectors has been identified as key in adopting measures to broaden and deepen the financial system, promoting competition, innovation, interoperability, flexibility and adaptability, and financial inclusion.

Diagnostic Findings: Current State of Digital Financial Services

Digital financial services in Eswatini are still at the infancy stage, with some initiatives in the payments and lending segments. Mobile money has been the key driver of digital financial services in Eswatini. The Eswatini Central Statistics Office and Centre for Financial Inclusion note[72] that about 94 percent of adults in Eswatini have access to a mobile phone, while around 3 in 4 adults use mobile money.

Financial Inclusion and Account Ownership

According to Finscope, in 2018, 87 percent of the population in Eswatini was financially included, 85 percent formally and 2 percent informally. Formal inclusion refers to services provided by regulated banks and non-bank service providers, while informal inclusion refers to services provided by unregulated, entities such as stokvels (i.e., central collective savings and loan schemes) and community burial societies. Formal inclusion is through access to formal accounts, such as bank accounts or mobile money and mobile wallets (52 percent use banks and 33 percent use non-banks only). While the level of bank account access lags comparator countries like Namibia and South Africa, the share of informal access to financial services and products is also far smaller in Eswatini (2 percent) when compared to Namibia (24 percent) or South Africa (53 percent).

The increase in non-bank formal account ownership was primarily driven by an increase in mobile money accounts, contributing to the growth of digital payments from around 40 percent of the adult population in 2014 to 67 percent in 2018. Finscope 2018 shows that 3 in 7 adults use both mobile money and bank accounts to manage their financial needs. Approximately 66 percent of adults reported making a digital payment in the last 12 months, of whom 77 percent used a mobile money account and 28 percent used a bank account.

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72 Eswatini State of Financial Inclusion 2019: Eswatini Central Statistics Office, Centre for Financial Inclusion and Finmark Trust

FIGURE 8. Current Level of Financial Inclusion[73]

ESWATINI (2018)

NIGERIA (2018)

NAMIBIA (2017)

SOUTH AFRICA (2016)

■ Banked ■ Other formal ■ Informal
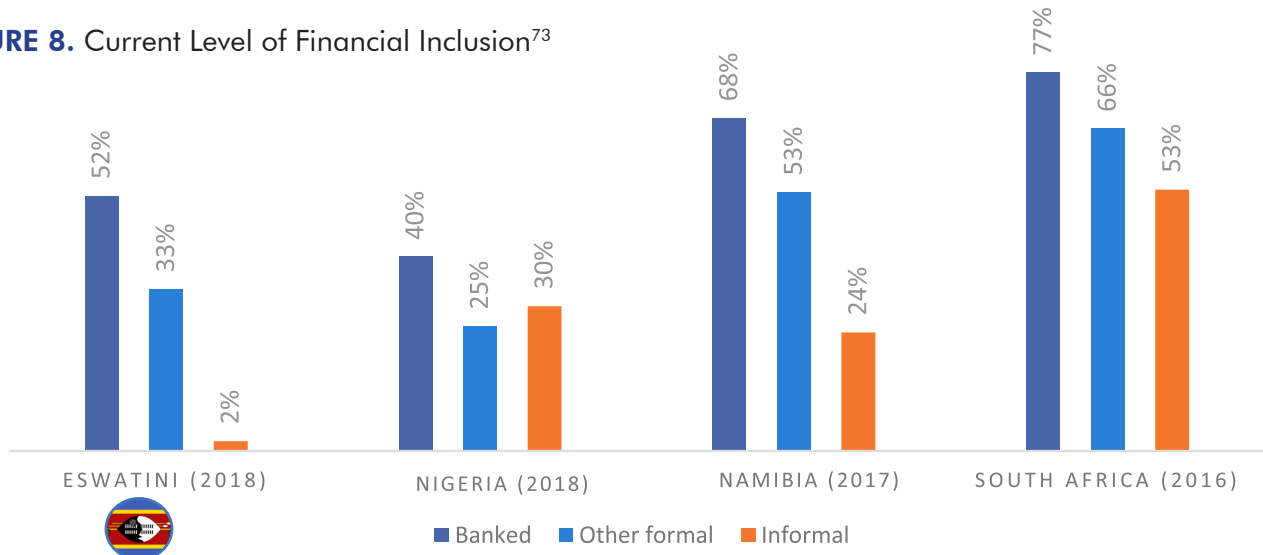
Despite advances in financial inclusion, there is a persistent gender and urban-rural gap in terms of bank account ownership. While 52 percent of men have a bank account respectively, this falls to 49 percent for women. There is a similar urban and rural divide in terms of bank account ownership: 66 percent of urban adults surveyed under the 2018 Finscope Survey had a bank account, versus only 44 percent in rural areas. Ownership of non-bank formal accounts is more predominant in rural areas, where 37 percent report having non-bank accounts compared to 23 percent in urban areas. The higher informal account ownership in rural areas can be attributed to the perception that informal mechanisms are cheaper and more accessible compared to formal means.

FIGURE 9. Account Ownership across Gender and Location[74]

MALE

FEMALE

URBAN

RURAL

■ Banked ■ Other formal ■ Informal

84
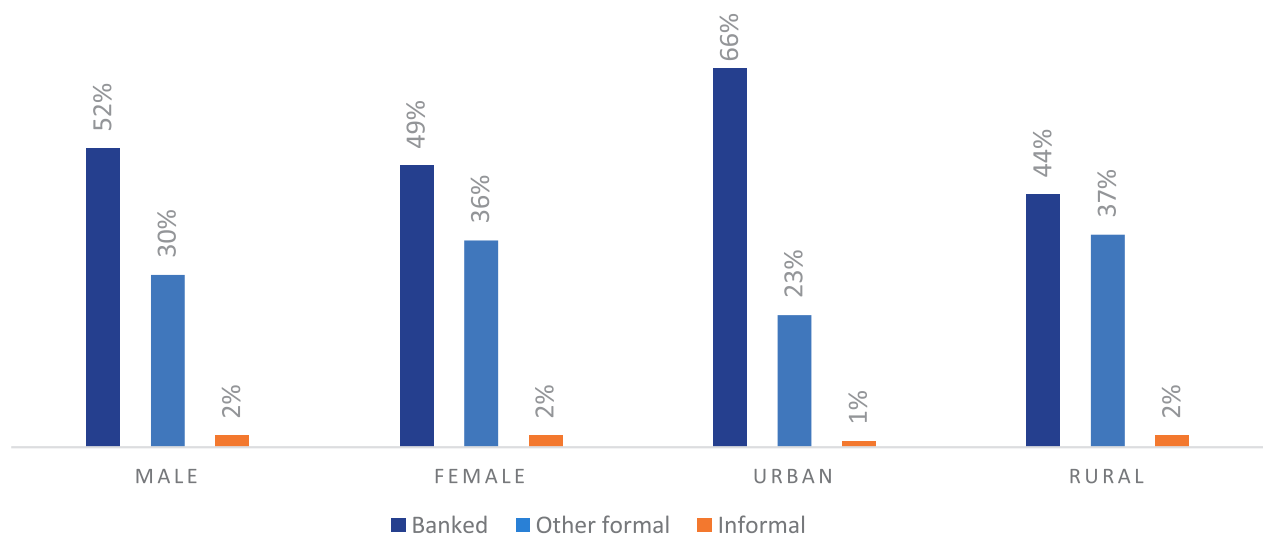
Financial Access Points

The number of traditional access points has mostly remained constant in Eswatini, whereas the number of mobile money agents has steadily increased. While there has been limited change in the number of commercial bank branches and ATMs per 100,000 adults, the continuous increase in the number of mobile money agents provides an opportunity to achieve financial inclusion for the remaining 15 percent of adults in Eswatini who do not have a formal transaction account.

Non-bank mobile money providers use agent networks to sign up customers and provide cash-in, cash-out (CICO) facilities. One of the providers has around 7,000 agents, including agents that have kiosk-type premises and others that do not (for example, those operating by the side of the road or in markets). According to Finscope 2018, a mobile money agent is within 30 minutes proximity to 84 percent of respondents. In addition, approximately 44 percent and 39 percent report that an ATM and bank branch is within 30 minutes distance, respectively.

FIGURE 10. Number of access points per 100,000 adults
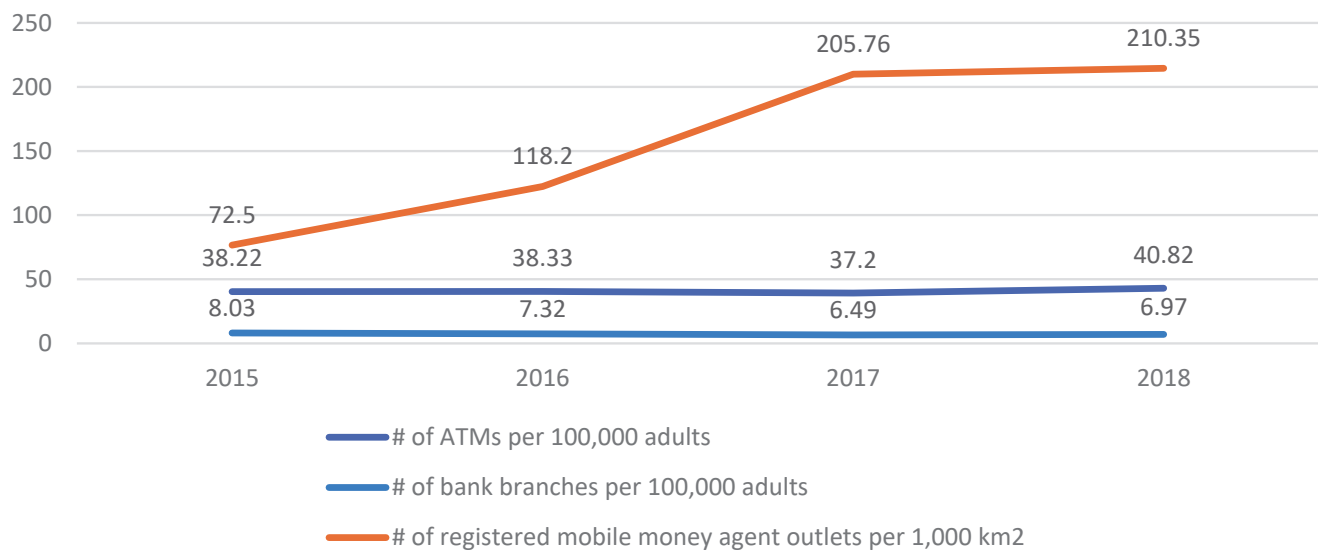
Source: IMF Financial Access Survey

Among those that do not have either a bank account or a mobile money account, the majority have access to these services. Finscope 2018 found that 70 percent have access to but deliberately choose not to open a formal transaction account, or cannot use the services due to lack of affordability. However, 37 percent do not have access to a financial institution or mobile money, or do not have identity documents. This segment is thus excluded due to institutional design and needs market development interventions.

Savings and Credit

Digital credit provision is slowly emerging in the Eswatini financial sector. One non-bank credit institution, Letshego Holdings, has been authorized by the Financial Services Regulatory Authority (FSRA) to provide digital credit. In this context the company partnered with MTN to pilot its quick loan product which registered over 100,000 customers within six months. Commercial banks remain the dominant providers of credit; hence provision of digital credit will likely remain constrained in the same way that traditional bank loans are. However, the active pursuance of digitization plans by some banks should lead to a marked increase in the provision of digital credit and savings.

The Eswatini Stock Exchange is also implementing a phased automated trading platform which includes virtual trading. This is set to create an opportunity to broaden the scope of DFS in the country.

Saving through formal channels has increased in Eswatini, which has largely been driven by mobile money. Approximately 50 percent of adults in Eswatini report using a mobile money account to save. The 2018 Finscope Survey shows that 55 percent of adults save with formal institutions compared to 40 percent in 2014. As a result, the percentage of those saving through informal channels decreased from 13 percent in 2014 to just 3 percent in 2018. Furthermore, adults that reported saving at home has reduced from 12 percent in 2014 to 5 percent in 2018.

FIGURE 11. Saving Channels[75]
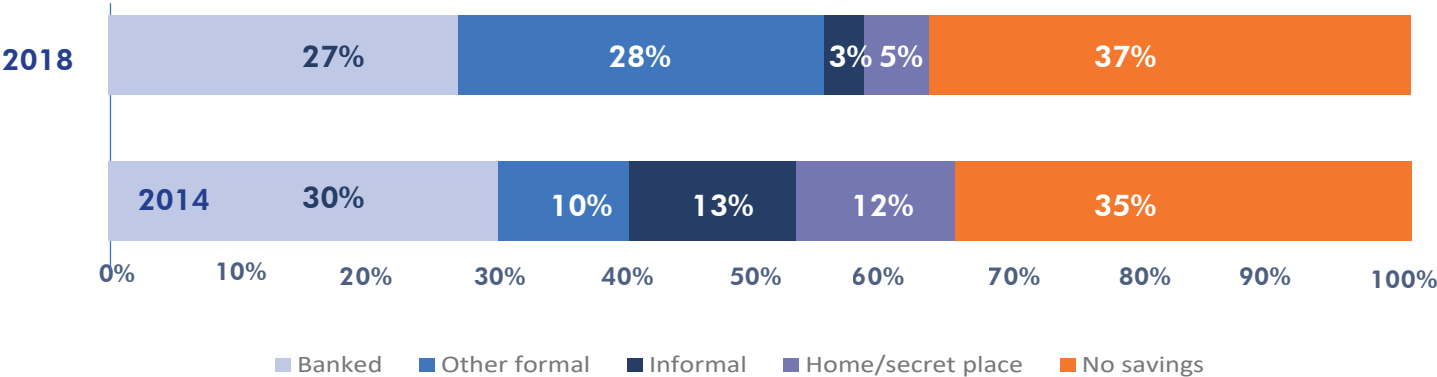
Informal borrowing still dominates access to credit in Eswatini. While 12 percent of adults in Eswatini report borrowing from formal institutions, the majority of those that borrow use informal sources. Finscope 2018 shows that 11 percent rely only on borrowing from family or friends and do not use any formal or informal financial credit or loan products, and 11 percent rely only on informal sources such as moneylenders and family and friends. However, borrowing is not very common; 66 percent of adults reported not borrowing at all, neither from family or friends nor from formal or informal financial service providers.

75   Source: Finscope 2018

FIGURE 12. Sources of Borrowing[76]

	Banked	Other formal	Informal	Family/friends only	Not borrowing
2018	8%	4%	11%	11%	66%
2014	7%	3%	16%	15%	59%
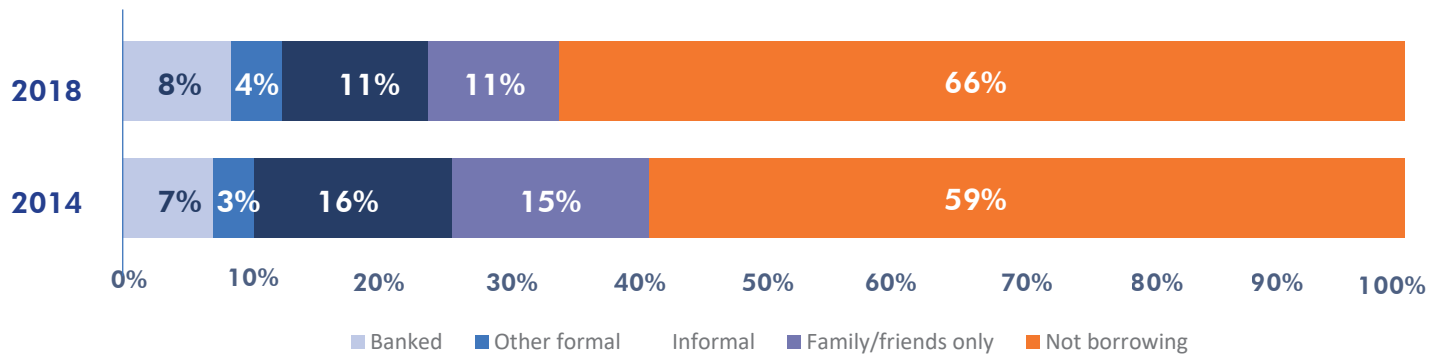
Role of Banks in Provision of Digital Financial Services

The banking sector offers a wide range of banking products and services. These include ordinary savings accounts; purpose-oriented savings accounts (for example, for students); fixed- or flexible-term investment savings accounts (which may roll over automatically); notice-based savings accounts; group savings accounts; time-based deposit accounts; current accounts; and e-wallets and prepaid cards and vouchers. Related services include automated teller machines (ATMs), debit cards, remittance-type services, and internet and mobile phone based banking.

Although the four commercial banks primarily offer traditional financial services, they are fast embracing DFS in partnership with the two mobile network operators. These partnerships are bilateral in nature, between an MNO and a bank, and are used by banks to expand their product offerings. The banks also hold the trust accounts opened by MNOs for the provision of mobile money services. Two banks also provide services through agents, one of which uses EPTC while the other uses a variety of corporate agents, including a retail supermarket chain.

Savings and Credit Cooperative Organizations (SACCOs) offer ordinary and specific-purpose savings products (such as for school fees and retirement), as well as loans. The ordinary savings products are usually used as collateral for loans and are subject to strict withdrawal limits and frequencies.

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76 Source: Finscope 2018

Role of Fintechs and Other Non-banks in the Provision of Digital Financial Services

As broadly defined[77], the Eswatini fintech firms providing DFS are currently limited to the two MNOs: MTN and Eswatini Mobile. Hence the fintech sector is still at an early stage of development. The CBE has established a Financial Technology Unit manned by two research-oriented graduate trainees. The main objective of the Unit is to actively monitor Fintech developments locally and globally, seek to understand emerging technologies[78] and their associated risks and regulation, and ultimately inform policy. Eswatini sees an opportunity to leapfrog and embrace new technologies to provide financial services and boost financial inclusion, especially for the unbanked rural population. The Fintech Challenge held in 2019, a collaborative effort between Eswatini's regulatory authorities[79], the University of Eswatini (UNISWA), the CFI and the RSTP, with support from FinMark Trust (FMT), is an example of the state's commitment to promoting digital solutions and improving access to financial services.

The themes chosen for the Fintech Challenge were wide-ranging and provided an opportunity for technological advancements in DFS. However, an aspect that may prevent these opportunities from being realized is a lack of adequate and sustainable funding to support individuals and firms in developing innovative solutions that can help address financial challenges. In addition, since the majority of the population lives in rural areas, the effects of innovation may fail to have a wider reach given that innovation tends to build on existing traditional products.

Guidelines for Fintech regulatory sandboxes were issued in March 2020 to promote the testing of innovative financial services in a controlled environment. In this context, one startup has been approved by the CBE, while an application for a second one is under active consideration.

As a member of the Global Financial Innovation Network (GFIN)[80], the CBE is set to benefit through international interaction with other regulatory authorities, sharing new ideas and experiences across various jurisdictions. Eswatini is also an active participant in the SADC Fintech Working Group, which has been tasked to develop SADC central banks' policy positions on financial technology developments, including crypto assets. The CBE leads a sub-committee tasked with establishing formalized, structured and transparent mechanisms for engagement with the fintech industry, service providers and other stakeholders for the development of innovative facilitators or tools such as sandboxes, hubs, labs, hackathons and accelerators.

Policy and Regulatory Environment

The CBE and the FSRA are the financial sector regulatory authorities for bank and non-bank market players respectively. Both regulators are empowered by specific provisions in their respective statutes. Each regulator's responsibilities with respect to DFS are clearly delineated and activity-based to avoid overlap.

The Central Bank of Swaziland Order 1974, Financial Institutions Act, Financial Services Regulatory Authority Act and the National Clearing and Settlement Systems (NCSS) Act constitute the main pieces of legislation governing financial services in Eswatini. The Practice Note for Mobile Money Service Providers (MMSPs) issued in 2019 in accordance with these statutes provides the framework for the licensing and supervision of mobile money service providers and digital financial services in general. The Practice Note recognizes four competent regulatory authorities with respect to MMSPs: the FSRA, the Financial Intelligence Unit (FIU), ESCCOM and the CBE.

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77 New entrants in the financial sector that specialize in offering DFS. Examples of Fintechs include digital payment providers, digital insurers, digital-only banks, and peer-to-peer lending platforms. World Bank DFS April 2020.

78 The unit conducts research on emerging technologies such as Artificial Intelligence (AI), Crypto-assets, Distributed Ledger Technology (DLT), Central Bank-issued Digital Currency (CBDC), Internet of Things (IoT), and Application Programming Interfaces (APIs) and their application in finance.

79 CBE, FSRA, ESCCOM

80 An international group of financial regulators seeking to support financial innovation in the interests of consumers and provide more efficient ways for innovators to interact with regulatory authorities. https://www.thegfin.com/

While there is clear understanding among regulators on their responsibilities regarding MMSPs and DFS, some legal provisions need to be clarified to avoid overlap and confusion on the part of the regulated entities. For example, the Consumer Credit Act gives powers to the FSRA to supervise all financial institutions that provide credit, which includes both banks and non-banks. The inclusion of banks in this provision creates an overlap, as the CBE also has an explicit mandate to supervise banks.

As supervisor and overseer of the payment system, the CBE is aware of its responsibilities in this area. However, the oversight capacity needs to be strengthened in order to ensure continued safety and efficiency in the payment system, and to allow the CBE to adequately respond to challenges brought about by innovative developments in DFS. Supervisory and regulatory technologies are not present in Eswatini, hence reporting and regulatory processes remain manual.

However, authorities are keeping abreast with developments in this area. The NCSS Act is being reviewed to strengthen the oversight mandate of the CBE and ensure the adequacy of the legal framework in supporting the development and regulation of innovative financial services. Similarly, the FSRA is undertaking a comprehensive review of all laws that are relevant to its operations with a view to ensure consistency.

The advent of Covid-19 has revealed the challenges of relying on traditional manual and paper-based processes in financial services. The importance of having mechanisms in place to digitally validate and verify customer identity using public registries has been brought to the fore. However, in the absence of a supporting legal framework, this will likely remain a challenge and stifle the development of digital financial services.

Delivery Channel & Product Innovation

Full interoperability across financial service delivery channels provided by banks and non-banks is yet to be achieved. While the ATM and point of sale (POS) channels owned by all commercial banks are interoperable, through the use of VISA and Mastercard cards and the retail payments infrastructure in South Africa, Swaziland Building Society (SBS) ATMs operate on a closed network and can only be accessed by SBS customers using an SBS debit card.

Until recently, mobile money services were limited to bilateral arrangements between banks and the two MNOs; hence there was no mobile money wallet-to-wallet interoperability. Currently, MTN Eswatini and Eswatini Mobile are the only mobile money service providers (MMSPs) in operation. Customers can only move money from their bank accounts to their mobile wallets within their own banks, but not across banks. However, the integration exercise to facilitate P2P payments between the two MMSPs was completed in June 2020 and officially launched in December 2020.

According to Finscope 2018, mobile money accounts increased from 107,000 in 2014 to 454,000 in 2018. With the launch of mobile wallet-to-wallet interoperability, Eswatini may see a further increase of mobile money accounts in the future, as customers embrace the convenience of seamless transactions. Mobile money wallets are mostly used to purchase airtime and pay utility bills and school fees.

The NPS legislation allows Financial Service Providers (FSPs) to contract with agents as third-party delivery channels. The legal and regulatory framework aims to create a level playing field for FSPs with respect to the use of agents. FSPs are monitored by the CBE to ensure compliance with Anti-Money Laundering/Combating the Financing of Terrorism (AML/CFT) obligations. While all FSPs are governed by the same legislation, regulations and guidelines on AML/CFT issues[81], there is a general perception that requirements for the engagement of agents by banks are more stringent than they are for MNOs.

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81 These include the MLFTP Act, (as amended), Financial Action Task Force (FATF) Recommendations, United Nations Security Council Resolutions (UNSCR) Regulations, 2016 and the AML/CFT Guidelines for Financial Institutions, 2016

Managing Risks of Digital Finance

Cybersecurity risk: Eswatini authorities consider cybersecurity as a top priority, and have benefited from cyber capacity building initiatives driven by the ITU aimed at raising stakeholder awareness on cybersecurity issues. Draft cybersecurity guidelines have been compiled to provide guidance to the financial sector on this matter. The completion of the Eswatini National Cybersecurity Strategy and the promulgation of the Computer Crime and Cybercrime Law in March 2022 underscores the state's commitment to protection against cyberthreats.

Protection of e-money customer funds: To mitigate risks in the provision of mobile money services, MMSPs are required to open trust accounts with licensed and supervised banks. Trust account balances are regulated and protected from claims in the event of insolvency. The CBE has allowed the payment of interest on trust accounts, subject to a negotiated rate with the bank holding the account. However, the interest is not meant to benefit the MMSP; proposals for its use should be submitted to the CBE for approval.

Infrastructure

Retail Payments Infrastructure

The SAECH is the key retail payments infrastructure in Eswatini, comprising of a cheque clearing system and an EFT system. The SAECH is owned by commercial banks and the CBE in equal proportions. It is designated as systemically important; hence is bound by the applicable international standards in this area, namely the CPSS–IOSCO Principles for Financial Market Infrastructures. Notwithstanding the role played by the building society, credit institutions and mobile money service providers in the provision of financial services, these actors have no direct access to the cheque clearing and EFT system.

Interoperability in the card payments area is currently limited to the four commercial banks issuing foreign cards (VISA and Mastercard), which are accepted at their ATM and POS terminals. There is no local card switch in Eswatini; hence transactions made with these cards are switched in South Africa.

The Swaziland Building Society has traditionally issued closed loop cards which can only be used within individual institutions' networks. The CBE, in collaboration with the banking industry, is stepping up efforts to establish a local payment switch and set the direction for achieving full interoperability across bank and non-bank service providers for all services. Given the recurrent costs associated with payment switches, it would be useful for the discussions to explore the possibility of implementing instant payments, using the existing infrastructure operated by CBE, as a way of boosting the usage of transaction accounts, and to address the issue of non-card-based interoperability.

Open and inclusive retail payments infrastructure can lay the foundations to drive digital financial services. Existing access restrictions to retail payments infrastructure, as well as the lack of full interoperability across financial products and platforms, inconvenience customers and present constraints to expanding digital financial services in a seamless manner.

Credit Infrastructure

The Trans Union Credit Bureau (Pvt) Ltd, a South African registered company with offices in Manzini, is the sole distributor of credit information to creditors and financial sector players. Trans Union is regulated by the FSRA under the Consumer Credit Act 2016, which provides the legal basis for the licensing and regulation of credit bureaus, regulation of consumer credit, protection of consumer rights and consumer credit education. Currently, reporting to the credit bureau is mainly based on negative information and limited in the types of data provided. Weak governance arrangements on the submission and processing of data to the credit bureau and the absence of a framework for handling disputes and protecting data compromise the effectiveness of credit reporting. The absence of a movable collateral registry in Eswatini has constrained lending to MSMEs, since only physical property is accepted as collateral for lending purposes.

Leveraging Recurrent Payments to Increase Usage of DFS

Government payments

The government is one of the biggest users of the payment system, making payments to both businesses (G2B) and individuals (G2P), as well as collecting payments from both businesses and individuals in the form of taxes, duties and service fees. Currently the Government Treasury Office uses the EFT system and the RTGS system to pay suppliers. The use of cash and cheques is still significant, with lots of paperwork employed in the payment process. Payment of taxes is possible through mobile money; however, revenue collection offices predominantly accept cash. Despite the fact that 64 percent[82] of social grant recipients have a bank account, grant payments are predominantly paid by cheques, which are then cashed over the counter. Opportunities therefore exist for the government to expand the digital footprint by abandoning the use of cash and cheques and replacing them with electronic means of payment.

Remittances

According to the Finscope survey, 70 percent of adults in Eswatini used formal channels (banking channels or mobile money) to send money in 2018, which is a significant increase from the 26 percent recorded in 2014. Only 6 percent sent or received money through family and friends, compared to 17 percent in 2014.

SwaziPost has provided remittance services for years without any cross-border regulatory or compliance requirements. Through Sivinini Money Transfer, SwaziPost provides a safe, fast and convenient platform for transferring money from person to person (P2P) through its branch network across the country, and to South Africa, Lesotho and Botswana.

The authorities in Eswatini have included the development of solutions to ensure secure and faster transfer of remittances at domestic and cross-border level as one of the key areas of focus in supporting fintech. Expanding DFS by linking existing retail payments infrastructure with money-transfer-operator models for both sending and receiving countries provides a seamless process

that yields efficiency, convenience, inclusion and cost saving benefits. However, this needs to be supported by deliberate measures to boost uptake, since efficiency and convenience benefits can be subjective depending on the user's perception. The ongoing development of the retail payments leg of the SADC cross-border payment system is expected to bring significant changes in the cost of cross-border remittances. The banning of exclusivity clauses in the money transfer sector is a positive policy stance by the CBE and a critical step to encouraging the entry of new players, who may bring innovative products that shift money transfer services away from cash and towards digital channels.

Constraints to Digital Financial Services Development

Although mobile money has emerged as the key driver for DFS, cash is still preferred as a convenient, "fee free" primary payment instrument for consumers. The high levels of cash withdrawals at ATMs, cash in/cash out activities at mobile money agent locations and currency in circulation are all evidence of this. The existing non-cash-based payment instruments, such as cards and mobile money, are not widely acceptable at merchant outlets. This creates the unintended effect of pitting electronic payment instruments against cash, which is seen as offering security in case of an emergency. With a banked population of just over 50 percent, banks and branches located in and around cities only, a high rural population (78 percent), a largely informal sector and low income levels, Eswatini is home to a variety of disparities, which require specific targeted interventions in the development of digital financial services. The concentration of banks and branches around cities contributes to the urban-rural gap in access to banking channels.

Banks remain the main providers of loans to the formal sector. However, the absence of a collateral registry acts as a constraint to the development of digital credit: loans are either denied or offered at a high cost to borrowers, as banks aim to offer secured loans.

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82   Finscope 2018

Lack of adequate funding presents another constraint to the development of DFS, particularly on the part of authorities to fund individuals and firms in developing innovative solutions. The development of affordable products that are specifically targeted to the needs of the rural population, the informal sector and low-income population, inter alia, requires financial resources and collective effort by both government and the private sector.

Recommendations & Next Steps

Based on the above analysis, the following recommendations are proposed to strengthen the development and usage of DFS in Eswatini.

Quick wins

R3.1: Complete the implementation of the online government portal and promote the use of DFS in government payments through a comprehensive national strategy for digital services. The partnership forged by the government and MTN in response to the challenges posed by Covid-19 shows that scaling G2P payments to digital can be achieved in the short term. The full establishment of a government portal and payment gateway, as envisaged in the National Development Strategy—Vision 2022, automating the manual interface between the Accountant General's office and the CBE (as the government's bank), and introducing measures to ensure daily transfer of funds revenue into the government's account could help enhance efficiency and faster movement of payments and realization of revenue. Apart from reducing the cost and risks associated with the use of cash and cheques, digitizing G2P payments gives beneficiaries access to financial services and account ownership, which ultimately boosts financial inclusion. Such payments need to be supported by safe and efficient payment programs, which can also serve as effective tools in the pursuit of other public policy objectives, such as the modernization of the national payments system, promotion of financial inclusion and ultimately contribute to the country's economic development agenda. The digitization of financial services should be pursued in earnest and anchored in a national strategy that is developed collaboratively by all relevant stakeholders.

R3.2: Establishing an enabling framework that supports digital signatures and the verification of identity information declared by customers. This is considered critical not only during pandemics but for safe and efficient delivery of digital financial services and for AML/CFT purposes more generally. Current verification arrangements involve physical presentation of documents to financial service providers, with no verification of the information given by the customer via a link to the public database. This poses risks given that customer due diligence is a fundamental element of the onboarding process for digital financial services.

R3.3: Finalize the review of the Payment Systems Act in order to strengthen and broaden the legal framework for developing DFS. The National Clearing and Settlement Systems Act (NCSSA) has provided the legal basis for the development of the payments system in Eswatini since 2011. The entry of non-bank service providers and advent of innovation and increasing focus on digital payments has triggered an ongoing review of the NCSSA, with a view to address any gaps and ensure consistency across all relevant pieces of legislation. The protection of interests of payers and payees in payment instruments has become even more important in DFS, in order to prevent erosion of confidence in the payment system. It is recommended that the process of reviewing the NCSSA be completed to ensure a comprehensive, clear and predictable legal environment that guarantees the settlement of obligations, a transparent dispute resolution mechanism and adequate provisions for the oversight and supervision of DFS.

Medium- to long-term recommendations

R3.4 Conduct a comprehensive retail payment cost study with a view to establish the fees to be charged by service providers. Bank charges are considered high in Eswatini, and this can discourage savings and the use of formal account services. With the introduction of mobile payment services and new technologies, banks and MNOs have formed alliances which can help to expand outreach and digital financial services. However, high fees can be a barrier to the uptake of DFS. Mandatory cost disclosure by banks and other financial service providers should be considered as a way of promoting transparency.

R3.5: Strengthen the oversight and supervision capacity of the CBE to ensure it adequately responds to the development and expansion of DFS in Eswatini. The CBE subscribes to international standards and is aware of the importance of the payment system oversight function in contributing to financial stability and improving the quality of services to end-users. The dynamic nature of DFS has added more regulatory pressure to the CBE. In this regard, it is recommended that the CBE strengthens its supervision and oversight capacities, in both numbers f staff and skills, in order to adequately respond to developments in new payment channels such as remittances and innovative payment mechanisms, including mobile payment services.

R3.6: Establish domestic retail payments and credit infrastructure to achieve full interoperability, expand DFS and improve lending. Financial market infrastructures which facilitate the clearing and settlement of financial transactions, and support prudent lending practices, are key for risk management, decision making and expanded financial inclusion through DFS. Plans by authorities to explore the possibility of establishing a national payment switch in collaboration with the banking industry have been noted. Stepping up these efforts, with the CBE taking the lead in setting the direction, is considered necessary to achieve full interoperability across various payment service providers. Furthermore, there is scope to widen the collaborative platform for retail payments development in general, given the entry of non-bank players in the innovative payments space.

Authorities should introduce measures to address existing gaps and enhance the credit reporting system so that it can better serve the needs of reporting institutions. Consideration should also be given to introducing a modern movable collateral registry in the country to facilitate lending to SMEs.

R3.7: Establish a regulatory framework for international remittances based on relevant standards. The absence of a regulatory framework to govern the operations and oversight of money transfer operators poses risks to the financial system and to consumers. A framework to regulate the remittances market needs to be developed in accordance with the applicable standards in this area, namely the General Principles for International Remittance Services[83], which are designed to raise awareness on consumer protection issues, create a proportionate legal and regulatory framework, establish competitive market conditions and governance and risk management practices, and encourage innovative developments in the provision of remittance services.

R3.8: Strengthen cooperation between regulators beyond existing bilateral MOUs. The mobile money ecosystem in Eswatini has four key regulators: the CBE, ESCCOM, the FIU and the FSRA. In line with recommended best practices, regulators should cooperate with each other in fulfilling their respective mandates. The cooperative arrangement should be based on effective and efficient communication and consultation. Further consideration should be given to establishing an MOU to bring the Eswatini Post DFS and payment services units under the regulation and oversight of a financial sector regulatory authority.

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83   https://www.bis.org/cpmi/publ/d76.pdf

Digital Skills

Key messages:

- **Policy framework and policies:** There is no comprehensive ICT in Education Policy that focuses specifically on building 'digital skills' as the ultimate desired outcomes, and no existing framework for defining skills, competencies and proficiency levels. Without such a policy, strengthening digital skills remains a largely underfunded priority and actual progress in the acquisition of these skills is difficult to measure.

- **Underlying infrastructure issues:** There is a lack of digital infrastructure and connectivity, particularly in primary and secondary schools, and even for some TVET colleges and higher education institutions. Lack of connectivity is mainly attributable to high internet access costs. The lack of affordable, high-speed broadband for universities remains a significant hurdle for the use of technology in education and research, and even more so for connecting faculty and students in Eswatini to international teaching and research resources.

- **Insufficient supply of advanced digital skills:** While systematic labor market information to inform program and curriculum development is not available, several studies point to a supply-demand mismatch between the TVET and higher education systems and the labor market. Far too few students qualify for STEM-related courses after senior secondary school, and when they do, the programs are not well aligned to labor market needs. The systematic linkages between higher education and training and the labor market are also underdeveloped.

- **Capacity:** The Ministry of Education and Training (MoET) does not have sufficient ICT capacity to deal with the growing demand for digital skills that need to be provided through education and training institutions.

Importance of Digital Skills

The demand for digital skills in Eswatini is growing, as a result of three factors: (i) technology is disrupting production processes in key manufacturing and service sectors which, in turn, change the skills requirements of occupations, affecting both new entrants to the labor market and older workers. Across the formal and informal economy, there is and will continue to be a need for stronger cognitive skills, socio-behavioral skills and digital skills; (ii) technology is changing how people work, and the rise of digital platforms and the gig economy in both Eswatini and the broader region will put a premium on the digital skills of its citizens; and (iii) being part of a region dominated by the relatively mature digital economy of South Africa, where many Swazis go to find jobs, also creates a need for better digital skills.

Digital skills represent a continuum of diverse skills which can be fostered through formal education and training as well as through informal learning. Digital skills can be defined as an individual's capacity to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately. Digital skills are often understood in simplistic terms, for instance, the ability to use a mobile phone for a simple transaction or to access and surf the internet; or, at the other end, to carry out coding and software programming. However, the concept of digital skills is deeper and broader, encompassing diverse human capacities. Individuals may differ in their level of proficiency in these different competencies. At the higher end of the digital skills continuum, individuals will have the ability to deploy digital technologies, develop new applications and come up with solutions to new problems. It is important to highlight that access to digital devices does not necessarily translate into digital skills, even at the basic level, although they are an essential pre-condition for them.

Every country needs a 'digitally competent workforce' and 'digitally literate citizens' to reap the wider benefits that digital transformation brings to the economy and society. 'Digitally competent workers' drive the development of vibrant digital economies. They can also raise labor productivity by enabling the application of digital tools and processes across diverse areas, including the informal service sector, agriculture, energy, transportation, health, education and government services, to name a few. Digitally literate citizens can better reap the wider benefits of a digital society by gaining access to more, better and safer information and engaging with the broader community. Citizens who lack the capacity to identify credible information from competing sources and make appropriate judgements may fall into the traps of the digital world, including financial fraud and (especially for young people and children) physical and other forms of abuse and exploitation.

Digital Skills Frameworks can help to classify digital skills and enable employers, education and training providers and individuals to assess the competencies and proficiency levels that are required for different occupations and functions. The World Bank's Digital Economy for Africa (DE4A) Country Diagnostic Tool identifies two frameworks that can be used to classify digital skills:

UNESCO's Digital Literacy Global Framework is based on the European Union's DigComp 2.1, that identifies different levels of proficiency in seven areas of competence (Figure 13) across four broad levels of digital skills that are applicable to many occupations. The four levels of digital skills adopted in DigComp 2.1 are:

- **Foundational:** *With guidance, deals with simple tasks that involve remembering content and instructions.*
- **Intermediate:** *Independently deals with well-defined, routine and nonroutine problems that involve understanding content.*
- **Advanced:** *Independently deals with and provides guidance to others on different tasks and problems that involve applying and evaluating content in complex situations.*
- **Highly specialized:** *Independently resolves complex problems with moving pieces, guides others, contributes to professional practices and proposes new ideas to the field.*

FIGURE 13. Framework for all professions: 7 Competencies/Skills and 4 Proficiency Levels
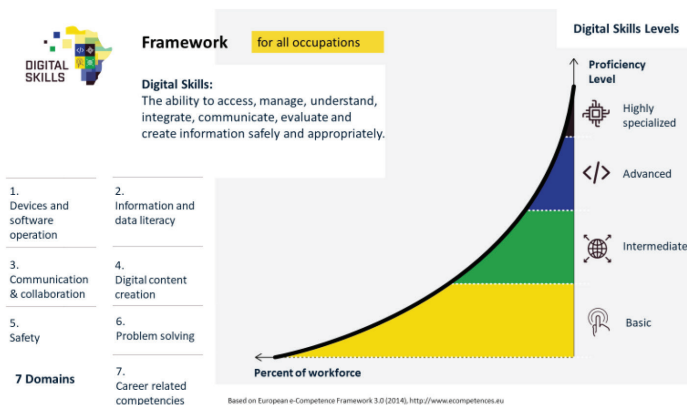
Source: Prepared based on Carretero, et.al.(2016) and UNESCO (2018)

Foundational digital skills are typically used in vocational or informal sector occupations and occupations involving routine tasks. These are skills that every person in the labor force should have. Intermediate-level proficiency would typically be required in mid-level occupations such as skilled technicians and the general workforce in formal small- and medium-sized enterprises.

Advanced-level proficiency, which requires greater analytical skills as well as theoretical knowledge, is typically required of occupations with a high level of ICT intensity, involving applications of digital technologies, including IT engineers, and increasingly, finance professionals. Lastly, the highly specialized level of digital skills proficiency is required in scientific and advanced professional occupations and represents the ability to develop new digital technologies, products, and services[84].

The EU e-Competence framework was developed for ICT professionals and technical workers, who underpin the development and spread of digital technologies. This framework is envisaged as a tool to articulate the competencies required and deployed by ICT professionals including both practitioners and managers. There are 5 e-Competence areas derived from the ICT business processes PLAN–BUILD–RUN–ENABLE–MANAGE, and 5 proficiency levels for each e-Competence (Figure 14). The e-Competence levels e1-e5 broadly correspond to the education levels of upper secondary to postgraduate education in ICT disciplines.

FIGURE 14. Frameworks for ICT Professionals
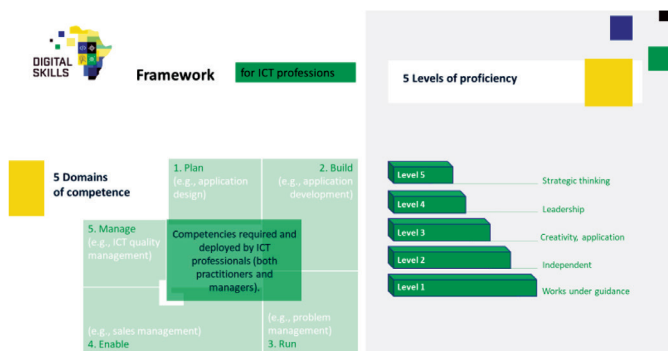
Source: Prepared based on the E-Competence framework by the European Commission (2017).

This chapter summarizes the current state of digital skills in Eswatini, using the framework of digital proficiency levels and the equivalent education level (see Table 3) to determine the extent to which digital skills are demanded by the labor market and the level of digital skills that is supplied by the education and training sector. However, the digital proficiency levels at each stage of education vary from country to country based on the quality of education and training services provided.

TABLE 3. Four Levels of Skills and Education Level Equivalent

Proficiency level	Education level equivalent
Foundational	Primary/Secondary Education
Intermediate	Post-secondary TVET
Advanced	Undergraduate degree/diploma
Highly specialized	Postgraduate degree

Diagnostic Findings: Current State of Digital Skills

Policy Frameworks and Strategies for Digital Skills

The GoE has committed to supporting ICT in education through various national and sectoral policies, though there are gaps in developing a framework for digital skills and ICT in education. The main Ministries involved in the area of digital skills and ICT in education are the Ministry of ICT and the Ministry of Education and Training (MoET). Within the MICT, the Government Computer Services Department is responsible for ICT infrastructure, internet connectivity, and ICT-related procurement of devices for the MoET as well as primary and secondary schools. On the other hand, TVET and higher education institutions have autonomy on ICT-related matters. The MICT in Eswatini assigns one sectoral officer to support each line ministry, though given the shortage of ICT professionals, many sectoral staff support more than one ministry. The MoET is responsible for matters concerning implementation of the ICT strategy for the education system, but does not have a designated unit responsible for ICT. There are five staff members at the MoET assigned to ICT in education within the Inspectorate Unit, i.e., four regional ICT inspectors and one ICT inspector at the central level. The focus for these officers is ensuring that primary and secondary schools are delivering ICT classes in line with the curriculum.

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84   World Bank, 2019, Lesotho Digital Economy Assessment, Background Paper.

The MoET has an existing Education Management Information Systems Unit (EMIS) that hosts data from all educational institutions (though at the Education Development Center and TVET levels, data for private institutions in lacking) which is updated annually. The data is collected from education institutions through manually completed forms and is entered and analyzed at the central ministry level. Over the next five years, UNICEF will support the MoET to digitize the EMIS system so that data is collected electronically at a decentralized level and then aggregated at the central level. The back-end operations of this system are supported by the MICT sectoral officer for the MoET.

The National Digital Strategy under development, which will lay out the government's plan for a time-bound expansion of internet infrastructure, will inform the MoET's development of its own ICT Policy and Strategy in Education. This is dependent on the availability of ICT infrastructure in schools needed to further strengthen education and training related to digital skills and the integration of education technology in teaching and learning processes. The MoET is also in the process of completing an Open Distance Learning Policy which also advocates for better internet connectivity, in terms of both access and affordability, across educational institutions and for all students.

While the overall environment for digital skills development is conducive to economic growth, important factors such as the existence of a national digital skills framework (that outlines digital competences at different levels) and detailed cyber security rules for ICT in Education are not part of existing policies. Moreover, it is significant that the term 'digital skills' (or digital competencies), which has a broader meaning than ICT, does not exist in Eswatini. Rather, the focus in education policy seems to be on ICT as a curriculum subject and a management tool, rather than as a mechanism to facilitate the building of digital skills in the country.

In addition, the policy frameworks and building blocks needed to strengthen digital skills are currently missing in Eswatini. There is also an absence of a clear, sequential plan to connect education institutions (potentially with the support of a National Research and Education Network, NREN), that builds on the digital infrastructure expansion plan. Furthermore, there is no framework for measuring digital skills and competencies in Eswatini or training teachers and education management on digital skills, procuring devices and software, building support services within the MoET and MICT, and the eventual integration of ICT into teaching and learning policy. Most importantly, there is no overall ICT in Education Policy to articulate an implementation plan to build digital skills at various levels and specify targets for improvement of digital competencies in the education system. Without such a policy, the strengthening digital skills remains largely underfunded and actual progress is difficult to measure.

BOX 8. Connecting Educational Institutions through a Research and Education Network (REN)

Most African universities still do not have access to high-speed broadband. This is the case in Eswatini, where most universities receive limited bandwidth, with speeds of less than 100 Mbps (Megabits per second). By way of comparison, in the United States, the State Educational Technology Directors' Association (SEDTA) recommends a target for schools in 2017-18 of 1 Gbps (Gigabits per second) per 1000 students; for 2020-21, the suggested target is 3 Gbps per 1000 students. If a university wants to use commonly available digital tools such as online videos, open education resources, remote instruction and video streaming, a 1Gbps bandwidth should be considered as the lower bound for acceptable broadband connectivity.

This lack of affordable, high-speed broadband for African universities remains a significant hurdle to the use of technology in education and research and even more so for connecting African faculty and students to international teaching and research resources. Remedying this situation should be a strategic objective, especially as there can be significant spillovers for the school education system, especially secondary schools and technical or vocational centers.

The general approach to university connectivity worldwide is to develop a National Research and Education Network (NREN) mandated to connect all universities in a country and to link to international RENs. There has been considerable growth in the establishment of NRENs in the Africa region, although around 30 countries still do not have a functioning NREN. There are also three sub-regional bodies that have helped to connect NRENs and share resources amongst them, including UbuntuNet Alliance that connects countries in East and Southern Africa. Most NRENs have a mandate to connect not only universities, research and tertiary education institutions, but also Technical Vocational Education and Training (TVET) institutes, Teacher Training Colleges, medical colleges, libraries, and even hospitals.

NRENs typically lease the high-speed backbone from private or national fiber networks. In some cases, they operate and own last mile connections to member institutions. NRENs are effective when universities have well-managed data networks and encourage the use of technologies. More mature NRENs have provided training and support to universities in these areas.

Given Eswatini's position in the region, establishing an NREN and connecting to others in the region such as UbuntuNet and possibly the Tertiary Education and Research Network (TENET) in South Africa, should be seen as priorities in the forthcoming ICT Master Plan for the country. The cost of establishing a national REN as opposed to connecting to an existing regional REN should be explored.

Source: Adapted from World Bank, 2019, 'Connecting Africa's Universities to Affordable High-Speed Broadband Internet: What Will it Take?'

The Demand for Digital Skills

Currently, there are no estimates of the demand for individuals with different kinds and levels of digital competencies. There are no skill surveys in Eswatini, though the National Human Resource Planning and Development Unit of the Ministry of Labor and Social Security is planning to conduct a National Skills Survey focusing on selected growth sectors: agriculture, energy, education and ICT, manufacturing and agro-processing and tourism. When completed, the results will provide a better understanding of the demand for different occupations and the skills required, including the digital competencies needed.

For this chapter, we focus on the available—albeit limited—data on the demand for digital skills. In 2018, the Swaziland Economic Policy Analysis and Research Centre (SEPARC)[85], conducted an Industry Labor Force Skills Gap Investigation focused on the automotive, electrical engineering, and ICT industries. The study found that shortage of digital competencies is a major bottleneck for the development of these industries, especially within the electrical engineering and electronics areas, which are closely connected to the development of digital technologies. Based on interviews with a sample of private and public companies and graduates from Gwamile Vocational and Commercial Training Institute (VOCTIM) and Eswatini College of Technology (ECOT), the leading TVET institutions in Eswatini, the SEPARC has identified key occupations where there is an abundance or scarcity in technicians[86]. It also has also identified the key competency areas where there are specific skills deficiencies, and these are outlined in Table 4 below for the ICT industry.

Technicians in short supply in the ICT industry include network engineers and operators, programmers and software and system developers and engineers. The study found that the country's ICT graduates are competent in installing and running software and can provide home and office support in basic assembly, disassembly and set-up of computer hardware. However, they lack the advanced coding and programming skills to develop original, Eswatini-owned software and systems.

TABLE 4. Key Scarce Technicians, Abundant Technicians, and Skill Competencies/Deficiencies in the ICT industry

Scarce Technicians	- Network Engineers and Operators - Programming, Software, and Systems Developers
Abundant Technicians	• Computer operators • Support Technicians • Database administrators • IT administrators
Key Skill Competencies	• Theoretical knowledge, can install programs in PC, can assemble and provide basic computer hardware and software support • Understanding programing language (C+, C++) and hardware installation, troubleshooting, installing new programs, cabling, planning, assembling and disassembling
Key Skill Deficiencies	• Lack of knowledge in routing and switching, designing full networks according to company specifications • Lack of experience in programming, coding, and software development, graphics and internet systems, printing specialists. Lack of knowledge on security systems and specialized software for retail, accounting, and banking, and business analytics

Source: Swaziland Economic Policy Analysis and Research Centre (2018)

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85 Swaziland Economic Policy Analysis and Research Centre (2018) Industry Labor Force Skills Gap Investigation: A Focus on the Automotive, Electrical Engineering, and ICT Industries in Swaziland.
86 This finding alone refers to the TVET system, and not to higher education graduates.

In the automotive industry, the study found that the country is struggling to keep up with technological changes, including continuous evolutions in car makes, models, and associated functionalities. Eswatini lacks individuals who have advanced car servicing skills, skills for wiring and computer box repairs and automatic gearbox repairs, and a lack of knowledge and innovation on newer engines and car models, as well as a lack of auto-electrical skills. Acquiring these competencies requires an individual to have digital skills to at least an intermediate level.

A review of mostly white-collar jobs advertised in local newspapers over the last 12 months[87] revealed that more than half (53 percent) of the 300 vacant positions advertised explicitly required basic digital skills, i.e., knowledge of the standard Microsoft package, and a further 5 percent of vacant positions required advanced digital skills in software such as CAD or Pastel. These job vacancies were mainly in government (the largest employer in Eswatini), public utility services, NGOs, health care, office and accounting roles, financial services, and retail or wholesale services. 42 percent of the job vacancies did not explicitly require basic digital skills, which included a large number of recruitments for primary school teachers. Other job advertisements that did not require digital skills were in the tourism and hospitality, construction, transport, auto-repair, manufacturing and mining sectors.

Within the public service, Eswatini has major challenges with understaffing and underfunding of its IT functions in government departments. Most line ministries do not have units dedicated to IT functions, but rather have one sectoral officer that is seconded from the Ministry of ICT to each line ministry. At the time of this study, nearly all of the ministries, departments and agencies had unfilled IT positions in the civil service establishment, or were vying for such positions to be placed in the establishment.

While data on the demand for digital skills is scare in Eswatini, available information and discussions with employers and government officials point to a dearth of advanced and highly specialized digital skills in the country.

The SEPARC, which focuses on the TVET level, suggests that a significant shortage exists particularly for roles such as network engineers and system developers (advanced skills), whereas in the public service, there is a need for both individuals with advanced skills and entry level staff such as support technicians and IT administrators (intermediate skills).

The technological advances in the region also require more people with advanced and highly specialized digital skills. Given the scarcity of data, conducting National Skills Surveys in priority economic sectors remains vital.

The Supply of Digital Skills

In the Africa region, many public education and training systems have generally not been forward-looking in aligning education and training outcomes to industry needs, in terms of requisite workplace skills and in adopting new technologies for the future of work. There remains a disconnect in terms of curricula offered by education and training providers and the requisite skills and competencies demanded by employers. This section reviews the supply of digital skills in Eswatini through the formal education and training system.

Figure 15 shows the structure of the education system in Eswatini. Early Childhood Care and Development programs for children aged 3-5 years old are primarily offered by private providers; followed by seven years of free compulsory primary education, after which students have to pass a Grade 7 primary school leaving exam to secure a place in junior secondary education. Secondary education, which is neither compulsory nor free, comprises of three years of junior secondary education culminating in a junior certificate examination, while the next two years of senior secondary education leads to a General Certificate of Education (GCE). Few students who complete secondary education transition to tertiary education, which comprises of Technical Education and Vocational Training (TVET) and university education. Non-formal education, offering flexible class schedules, is offered in two schools in Eswatini for students who drop out of the formal education system. The assumption in this chapter is that people who complete the defined education levels in Table 4 above reach a certain level of digital proficiency.

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87 The job adverts were provided by MoET.

FIGURE 15. Structure of Education System in Eswatini
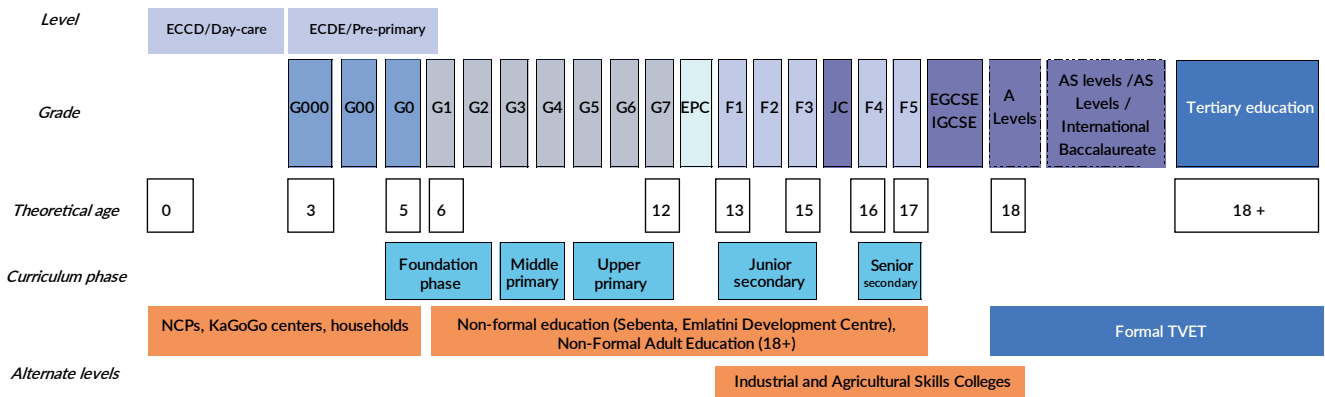
Source: Education Status Analysis for Eswatini, World Bank (forthcoming)

Foundational Digital Skills

Primary Education: The new General Education Framework stipulates that ICT is to be taught as a subject in primary school starting in Grade 3 from 2021 onwards, and will be rolled out through to Grade 7 in 2025, provided schools have the necessary facilities and teaching staff. There are, however, several challenges in rolling out ICT as a subject in primary schools.

Firstly, there is a general shortage of primary school teachers with expertise in ICT. The 2017 Annual Education Census found that only 15 of 7,832 primary school teachers in Eswatini had either a certificate in IT education or a diploma in computer science. The actual number of teachers with ICT knowledge is probably higher, but this information is not captured in the annual education census. While EMIS data captures other qualifications for teachers, including a Bachelor of Science, Bachelor of Commerce, Honors, Masters, and so on, the data does not further disaggregate this into the specific field of study undertaken. Second, **access to a computer by children at primary school level is very low**, be it in school or at home (see Figure 16). This is particularly the case for children living in rural areas. Approximately 20 percent of pupils in urban primary schools had access to computers in 2017, but only 4 percent of pupils in rural primary schools.

FIGURE 16. Equipment and facilities for ICT in 624 primary and 285 secondary schools, 2017
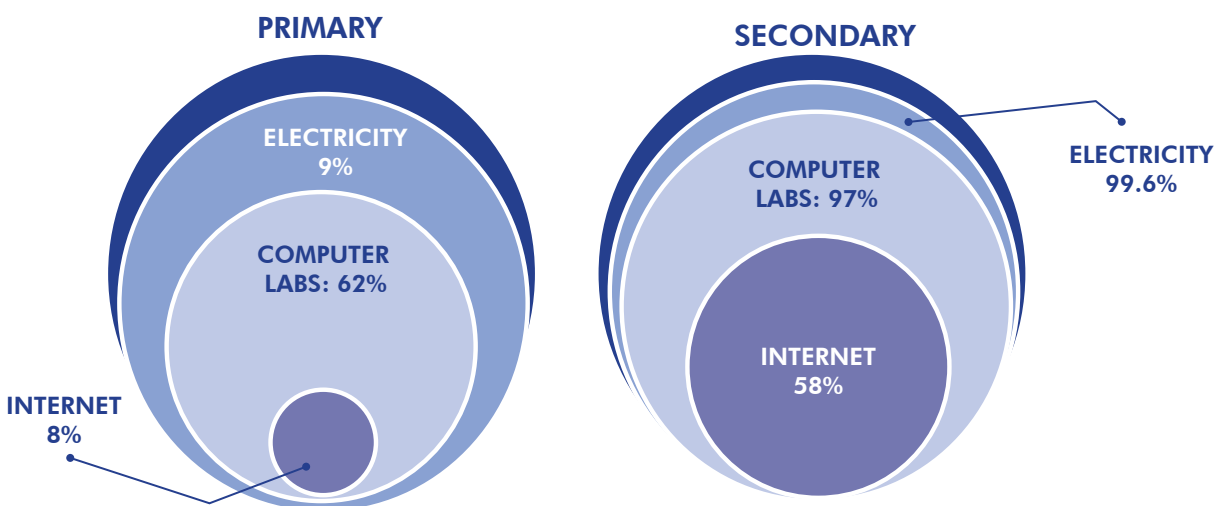
Source: Annual Education Census 2017

Third, less than 10 percent of the total 624 primary schools are connected to the internet (see figure above), whether for administrative or teaching purposes. This, together with the shortage of qualified teachers, shows that massive investments are required to meet the target of introducing ICT as a subject in primary education. Finally, **few primary schools use digital technologies for teaching purposes.** While most schools have radio or recording systems for teaching English, very few, if any, primary schools have so-called 'smart classrooms' equipped with digital learning technology, such as computers, specialized software, audience response technology, assisted listening devices, networking, or audiovisual capabilities.

Secondary Education: At the secondary education level, access to ICT equipment and facilities is much higher, with almost all 285 schools having access to electricity and computer labs and almost 60 percent having access to the internet (see figure above). Schools in Manzini have the most access to computers, although 3 out of 10 students in junior secondary schools and 2 out of 10 students in senior secondary schools in the region do not have access to computers at school88. The cost of internet connectivity, poor coverage in rural areas, and unstable connections are the challenges most often mentioned in reports on use of ICT in secondary schools.

Secondary schools face similar challenges to those experienced by primary schools in attracting teachers qualified in ICT (see box 9 below). Only 152 of 7,017 teachers in secondary education have either a certificate in IT education, a BSc in Computers and Mathematics or a diploma in Computer Science. Only just over half the secondary schools in Eswatini have a qualified IT teacher.

BOX 9. Pre-service and In-service training of teachers

The University of Eswatini, Southern African Nazarene University, William Pitcher Teacher Training College, Ngwane Teacher Training College and the Eswatini College of Technology all offer teachers training programs. Basic ICT and digital skills are part of the teacher training curriculum at all the institutions.

Ngwane Teacher Training College is the leading primary teacher training institution in Eswatini. The college does not offer any qualifications purely in ICT, but all students receive lectures and write examinations at both the first- and second-year levels in ICT competencies. Students at the third-year level can choose to specialize in ICT and Math or ICT and Science. The main challenges faced by the college on delivery of the ICT part of the curriculum are the high costs of internet connectivity and the slow speed of the internet, which must service a total of 960 students and 70 lecturing staff. In 2019, only 22 of the graduates were specialized in ICT and Math or ICT and Science in their third year of training.

William Pitcher College offers a Primary Teaching and Secondary Teaching Diploma. Specializations include languages, education, practical arts, social studies, sciences and applied science. In 2019/2020, there were a total of 18 graduates from the three-year Secondary Teaching Diploma with a specialization in ICT.

Teacher training capacity in ICT and ICT-related subjects does not meet the demand for primary or secondary school teachers with this qualification. Furthermore, there is an unmet demand for upgrading the ICT competencies of a considerable number of existing teachers both at primary and secondary level.

Around 55 percent of secondary schools currently offer ICT as an examinable subject at the certificate level (Swaziland General Certificate of Secondary Education (SGCSE)/International General Certificate of Secondary Education (IGCSE89)). Most schools that do not offer ICT as an examinable subject offer some basic ICT literacy courses. MoET estimates that by the time of graduation from high school, approximately 75 percent of the learners have acquired basic ICT literacy skills at a foundational level (e.g., word processing, creating presentations or using the internet90).

Too few students qualify for Science, Technology, Engineering and Mathematics (STEM)-related courses after graduating from senior secondary school. In 2019, only 1 of 5 secondary school graduates opted for either Mathematics, Physical Science or ICT as an examination subject in senior secondary school. Of these, only 29 percent scored a mark above a C in Math and Physical Science, which is usually the minimum grade required to enter higher education. Less than 10 percent of the 2019 senior secondary education cohort qualified for higher education in STEM-related fields. STEM education is important, not only for fulfilling the needs of the future workforce that will require critical thinkers receptive to technological advances, but also for producing researchers and innovators who can help to solve challenges in the economy. The reasons for this low uptake and performance in Mathematics, Physical Science and ICT are varied, and could be the result of a lack of trained teachers who can deliver this content to students in a way that is exciting and understandable, or a lack of facilities and materials to conduct certain classes (e.g., only 51 percent of primary and secondary schools have science laboratories, and many do not have sufficient operational budgets to purchase supplies to conduct experiments in class).

Rapid Skilling Initiatives: There are a few 'rapid skilling initiatives' aimed at improving foundational level ICT skills among individuals (mostly adults and out of school youth) with no or very limited digital skills in Eswatini. These are usually short courses, with a flexible schedule, typically offered to adults and youth who are looking to improve their knowledge of digital skills. As illustrated in the table below, there are three main non-commercial providers of rapid digital skills programs in Eswatini. In addition, several private, for-profit training providers offer short courses in ICT at different levels. Sebenta National Institute and the Rural Education Centers are two public providers under the MoET that offer a variety of adult literacy and non-formal education services with a focus on rural communities. Both providers offer short courses ranging from 3-12 months on basic computer literacy and computer skills with either internal or external certification (see table below). UNESCO, in collaboration with the MoET, also offers a digital literacy program for communities in rural areas with a focus on "empowering adults and high school leavers to be digitally literate."

TABLE 5. Digital literacy programs targeting out of school youth and adults, 2020

Institution	Program	Enrollment	Duration	Form of assessment
Sebenta National Institute	Basic Computer Literacy	23	3 months	Internal
	International Computer Driving License (ICDL)	10	N/A	External (ICDL)
Rural Education Centers	Computer skills	150	12 months	External - City & Guilds for Levels 1, 2 and 3
UNESCO	Digital Literacy Program	40	6 months (1 hour per week)	Internal

89   IGCSE is developed and managed by Cambridge University International Exams.
90   Response by MoET to request for information by the World Bank.

In addition, the Swaziland Institute of Management and Public Administration, under the Ministry of Public Service, offers short courses in basic computing, as does the Eswatini National Library, which falls under the Ministry of ICT. However, no data on these programs in terms of enrolment and completion was available at the time of this study.

In summary, while various educational policies in Eswatini mandate the provision of foundational digital skills in primary and secondary education, as well as for adults and out-of-school youth, there are several constraints to implementing these policies. Firstly, only 10 percent of primary schools and just over 50 percent of secondary schools have access to internet, and many of these have slow connections. Secondly, many schools do not have computers for students to use; of the schools that do have computers, it is not clear how many are functional. Third, very few teachers in primary and secondary schools are qualified in ICT, though there is an ongoing training program to raise teacher competencies in ICT. Fourth, few schools integrate ICT within teaching and learning processes, and this limited the number of schools that were able to use online learning systems during the Covid-19 pandemic. Fifth, there is no information available about the level of digital skills among primary and secondary school teachers. Lastly, there are insufficient rapid skilling initiatives available for out-of-school youth and adults to learn foundational digital skills, which is seen as a necessary for all citizens in a lower middle-income country such as Eswatini.

Intermediate Digital Skills

Eswatini has 70 Technical Vocational and Education Training (TVET) institutions, of which 27 are public, 29 are private and for-profit, and 14 are run by NGOs, churches and communities[91]. The institutions offer programs in 60 areas ranging from traditional vocational programs to specialized technical and professional programs, such as business management, computer programming, and education. Twenty institutions offer computer programming, but very few offer specializations for mechanical, electrical, electronic and computer technicians, which are areas of a high demand. While around half of institutions have internet access and computers in working condition, very few use ICT to deliver training online. The table below shows enrollments in the five main public TVET institutions under the MoET.

TABLE 6. Number of students by formal public TVET institutions under MoET, 2013 and 2016

Institution	Enrolled students 2013	Enrolled students 2016
Manzini Industrial Training Centre	183	243
Nhlangano Industrial Training Centre	90	127
ECOT	945	1,043
Siteki Industrial Training Centre	88	105
VOCTIM	139	176
Total	**1,445**	**1,694**

Source: EMIS for 2016 data; World Bank (2014) for 2013 data

Eswatini College of Technology (ECOT), Manzini Industrial Training Center and VOCTIM are the three institutions that dominate TVET enrollments in the country. While VOCTIM offers programs at basic TVET level, ECOT trains higher level technicians in engineering. The Manzini Industrial Training Center offers a Certificate in International Computer Driving License (ICDL), which is accredited by the ICDL's head office in the United Kingdom. Around 1 in 4 students enrolled in these five TVET institutions study engineering or IT-related subjects (see Figure 17).

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91   World Bank (2014): Assessing Swaziland's Technical and Vocational Education and Training System to Improve Economic Growth.

FIGURE 17. Enrollment by type of formal public TVET program under MoET, 2016

Category	Percent
Arts, Crafts and Upholestry	2%
Commercial	3%
Agriculture	3%
Metal Works	4%
Information Technology	8%
Motor related	12%
Business Adminstration	14%
Engineering	16%
Education	16%
Construction related	22%
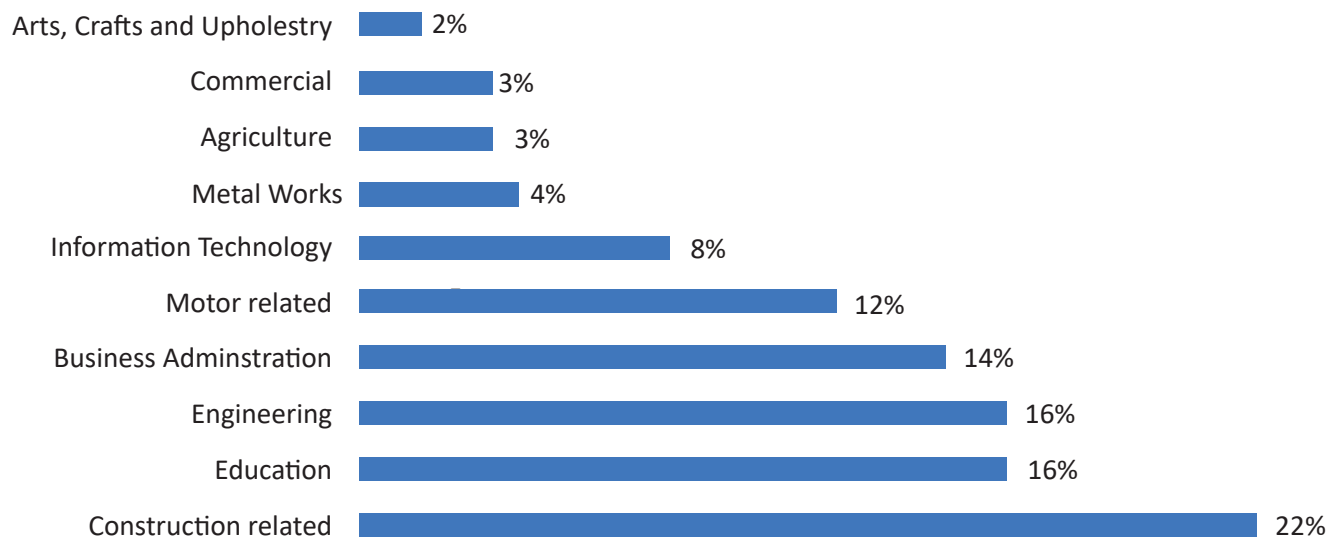
ECOT offers diploma courses in Computer Science, Electrical and Electronics Engineering, and Telecommunication and Electronics Engineering. The programs are three-year full-time courses. The minimum entry requirement to the program is IGCSE credits (grade C or better) in Mathematics or Physical Science, and at least a pass (symbol E or better) in English language. The college produces about 25 diploma holders a year in each of the courses. ECOT also offers a wide selection of short-term skill upgrading courses, in fields such as ICT, electronics and electrical engineering.

VOCTIM does not offer specialized ICT courses, but digital skills are part of the curriculum through practical integration in selected technical programs, particularly automotive mechanics, electrical and mechanical engineering. Automotive mechanics trainees use automotive diagnostics tools such as scanners and laptops with scanning software for diagnosis of engine-related faults. Electrical engineering has introduced programmable logic controls (plcs) as applied in industrial wiring for the programming, control and running of industrial machinery and equipment. In mechanical engineering, the training includes use of software like auto-CAD and CAM, for drawing and design. Students who study business finance and accounting at VOCTIM take courses in digital skills related to computerized accounting and the Microsoft Office package. VOCTIM also offers fee-based short upskilling courses for individuals as well as enterprises.

The overall number of students enrolled in TVET programs is low in Eswatini, and there are also concerns with the quality of training in many institutions. A 2015 study by SEPARC found several factors that affect the quality and relevance of TVET programs in Eswatini, including: (i) lack of or weak collaboration between TVET institutions and industry, including the establishment of national occupational standards; (ii) inadequate physical resources, which include facilities, equipment, and machinery as well as the high cost of internet connections; (iii) weak and fragmented institutional environment supporting TVET; (iv) lack of adequate funding for TVET institutions; (v) outdated curricula and training modules; and (vi) inadequate capacity amongst TVET instructors.

There is insufficient data on programs offered by private TVET providers in Eswatini, but data from the largest public TVET institutions indicates a lack of graduates in ICT and STEM-related subjects and a shortage of institutions offering more specialized programs related to digital and ICT infrastructure, such as for network engineers and PLC technicians, as well as in areas such as programming, software and systems development and mechatronics.

Advanced and Specialized Digital Skills

Advanced and highly specialized digital skills are provided by higher education institutions such as universities, colleges, and polytechnics. Enrollments in the four largest higher education institutions are shown in the table below, totaling around 11,400 students in 2017. Over the past decade, university enrolment has increased both absolutely and relatively[92], but participation rates are still low compared to other countries in the region. Women are well represented in Swazi universities. The share of female students has been 50 percent and above since 2012, reaching a peak of 54 percent in 2016 and 2017. With a female participation rate of 46 percent in 2017, only the private Limkokwing University of Technology stayed below the 50 percent threshold. Just over 80 percent of students are enrolled in undergraduate programs, 15 percent in distance education programs and 4 percent in postgraduate programs.

Enrolment shares by department in the four largest universities reveal a striking neglect of STEM programs, raising concern about the labor market relevance of the tertiary education sector. Of those enrolled in the higher education institutions listed above, about 800 students (7 percent) are enrolled in 3–4-year IT programs, and about 570 (5 percent) are enrolled in 3-year science and engineering programs (see figure below), meaning only a small number of students graduate annually with these advanced qualifications in the country.

FIGURE 18. Undergraduate enrolment by department, 2017

Department	Percent
Arts, Crafts and Upholestry	2%
Commercial	3%
Agriculture	3%
Metal Works	4%
Information Technology	8%
Motor related	12%
Business Adminstration	14%
Engineering	16%
Education	16%
Construction related	22%
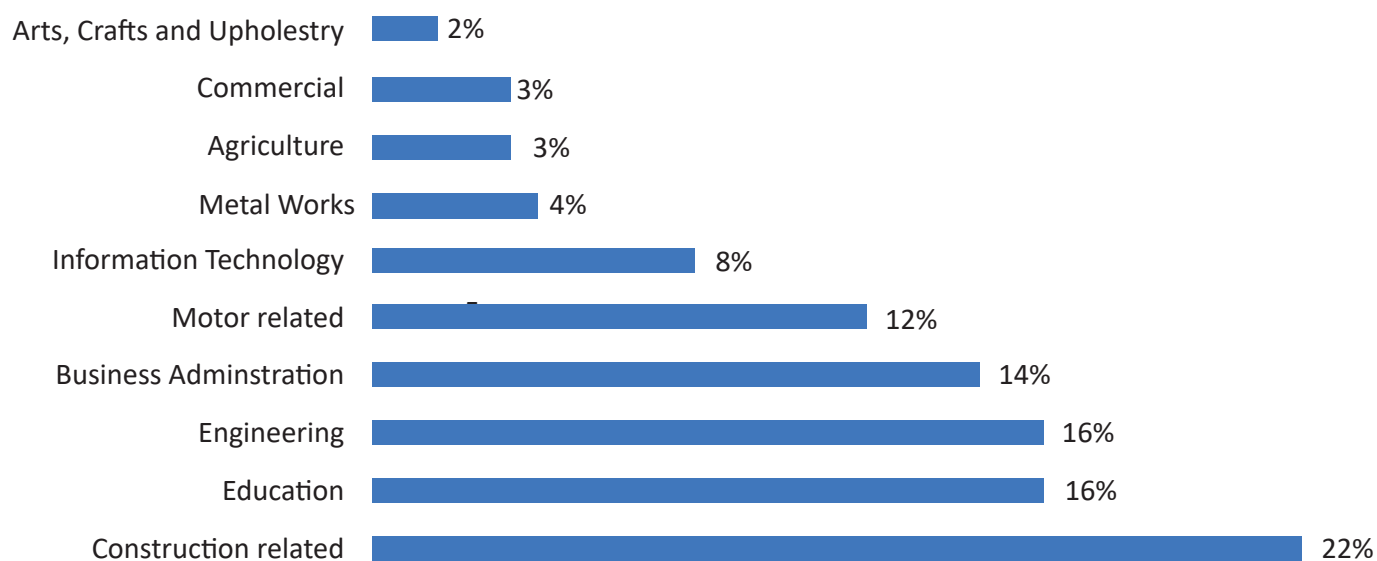
Source: EMIS, 2017

The University of Eswatini had around 50 students graduating from programs run by its Department of Computer Science in 2019 and about 14 graduates from programs under the Department of Electrical and Electronic Engineering. Challenges highlighted by both departments include prohibitively high internet access costs, particularly for students, and limited broadband infrastructure coverage, which is a barrier to e-learning. At times, the bandwidth does not meet quality of service requirements for some of the teaching tools. The students also lack multimedia devices such laptops and tablets which are needed to access the internet, yet there are also insufficient facilities in the computer laboratories (desktops) to service all the students.

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92   The drop in enrollment in 2017 compared to the year before is owed to a reduction in the intake of the Eswatini Christian University following accreditation issues. In 2020, enrolment of the ECU has recovered to about 250 students (information provided by the university management).

The Limkokwing University of Technology is a Malaysian global network of universities. The university specializes to a large extent in multimedia, IT and digital skills. It is fast expanding its capacity and soon expects to produce more graduates per year than any of the existing tertiary institutions in Eswatini. A World Bank report (2010) found that several factors limit Eswatini's higher education system from helping to facilitate the country's transition to knowledge-driven growth. Access to education is too low to supply Eswatini with the necessary high-level skills required to lead knowledge-driven growth. Access is also inequitable by rural locations and low socioeconomic status. Higher education in Eswatini is of reasonable quality, though the observed quality may be substantially aided by the system's stringent selectivity and exclusivity. For its teaching and research programs, higher education has low output in Eswatini. For research programs there seems to be a low level of expertise among professors, combined with insufficient research funding. Other constraints are the lack of clear mechanisms for centering the university in the national development dialogue, poor information on the labor market, lack of strategic guidance in terms of sector policies and strategic plans and lack of a national human resource development strategy.

Recognizing the importance of science, technological innovation and digital skills, the Government of Eswatini has established the Royal Science and Technology Park (RSTP) under the Ministry of ICT. The RSTP is divided into two divisions, which consist of the IT Park and the Biotechnology Park. The Advanced School of Information Technology (ASIT), located at the RSTP IT Park, is operated by Aptech Limited, a global retail and corporate training provider. ASIT offers 2-year diplomas and various short-term courses in various ICT-related subjects. The goal of ASIT is to have an ICT-literate Swazi society and offers courses in software development, multimedia, cyber security and forensics, and hardworking and networking.

These five courses enable students to carry out a range of digital occupations such as web designers, java and C# programmers, web developers, net apps engineers, graphic designers, audio and video editors, 2D and 3D animators, motion graphics designers, hardware specialists, network and server administrators, cloud architecture and ethical hackers, security administrators, and forensics and cybercrime investigators. The establishment of ASIT is seen as a means to increase not just the number of ICT graduates in Eswatini, but also to increase the quality and relevance of graduates' digital skills. The first cohort of students graduated from ASIT at the end of 2020.

On the whole, the number of students graduating with relevant, advanced digital skills in Eswatini is limited. Universities in Eswatini have challenges related to a lack of collaboration with employers to understand labor market needs as well as constraints with internet connectivity, and inequities in access to higher education. While establishing the ASIT is one response to these issues, supporting existing universities in delivering high quality and affordable programs to students remains a priority.

BOX 10. Remote Learning in response to the COVID-19 Pandemic

The Eswatini education system has been seriously affected by the Covid-19 pandemic. All schools and institutions of higher learning were closed on 20 March 2020 when the country instituted lockdown measures. Working with the Ministry of Health, the National Disaster Management Agency and development partners, the MoET put in place measures to ensure the continuity of education during the pandemic, including through online learning programs where possible.

Specifically, MoET undertook the following actions in response to the Covid-19 pandemic:

Basic education level
- Training of teachers to teach lessons over radio and television broadcast
- Developing and broadcasting lessons (radio, television, and print) for students, targeting completing classes first (Grades 7, Form 3 and Form 5)
- Broadcasting weekly programs on mental health and a psychosocial program for learners
- Engaging mobile service providers to upload multimedia lessons and ensure educational websites are zero-rated, i.e., a price of zero is applied for the data traffic associated with these websites
- Some schools and education institutions (mostly private schools) provided lessons through e-learning platforms such as Google Classroom, Zoom and others

TVET and tertiary education level
- Tertiary and TVET institutions used various technologies to teach students remotely, including Google Classroom, WhatsApp, email, Zoom, student portals, blackboards, and so on.

While the actions of the government to ensure continuity of learning while schools were closed are commendable, the differential access to remote learning and conditions at home are likely to widen the existing learning inequalities in Eswatini. Children from the most educated and wealthiest families are better able to cope with the challenges posed by the crisis and sustain their learning at home. They are more likely to have computer equipment and connectivity, a space to work, and books and other learning materials at home. As a result, children without this support find themselves at an even greater disadvantage when schools reopen.

The Covid-19 pandemic has highlighted the digital divide between the wealthy and the poor, stemming from challenges related to access and reliability of electricity, access to teaching and learning devices such as laptops, tablets and smart phones, low coverage of internet connectivity, the high cost of data bundles, the ability of teachers and students to use digital technologies effectively for teaching, and the engagement of parents in supporting children to learn remotely. It also highlighted the need for close collaboration between the MoET and the MICT in supporting remote learning.

Policy Recommendations for Eswatini on Digital Skills

The Government of Eswatini has acknowledged the importance of building digital competences to keep up with technological advances that spur economic development, but also the importance of digital skills in transitioning to knowledge- and innovation-driven growth. This is reflected in the growth and development strategy for the country as well as within several education and training policies. There are, however, several areas of improvement in supporting the development of digital skills in the country that are highlighted below.

Quick wins

R4.1: Develop an ICT and Education Policy and Implementation Plan: There are several different policies that address broad issues related to ICT in Education, but these policies are not coordinated in terms of implementation and do not provide operational details to guide investments to support digital skills development. There is also no existing policy that focuses specifically on building digital skills as the ultimate desired outcome, and no existing framework for defining skills, competencies and proficiency levels. The existing and planned policies do address issues of infrastructure development (e.g., the planned Master Plan), training of teachers in ICT and reforming courses, but these policies are uncoordinated.

A coordinated action plan is needed that draws together multiple stakeholders, led by the MoET and MICT, to define: (i) the framework for digital skills, competencies and proficiency levels to be used in Eswatini; (ii) the actions needed to connect education institutions, train staff such as teachers, education managers, IT systems operators and support staff, procure devices, and reform courses; (iii) the funding requirements and sources to undertake these actions in a phased manner; and (iv) targets to be achieved and processes for monitoring and reporting on targets.

R4.2: Connect higher education and TVET institutions to a Research and Education Network (REN) as part of the digital master plan: The lack of affordable, high-speed broadband for African universities remains a significant hurdle to the use of technology in education and research, and even more so for connecting African faculty and students to international teaching and research resources. Remedying this situation should be a strategic objective and connecting the major universities and TVET institutions to high-speed broadband should be included in the forthcoming digital Master Plan. Establishing a National Research and Education Network (NREN) or connecting to a regional REN such as UbuntuNet Alliance should be considered based on a comparison of costs and the availability of support services.

R4.3: Pilot interventions at secondary school level to build digital literacy skills, particularly in schools that serve poor communities. This can be done through the integration of ICT-enabled teaching and learning in priority subjects such as Mathematics and Science. The pilot could test various models of digital skills training, starting with teachers and then students in secondary schools, and eventually moving to primary schools, with the aim of improving digital literacy across the population.

Medium- to long-term recommendations

R4.4: Review intermediate and advanced digital skills programs in higher education institutions, particularly courses related to computer science, and incentivize entry into these programs. There is a general perception that many of the current TVET and higher education programs in Eswatini are of low relevance for employment, but too little is known about actual market needs. While systematic labor market information to inform program and curriculum development is not available, several studies point to a supply-demand mismatch in the TVET and higher education systems. The problem includes outdated curricula, instructors who do not have enough industry experience, and the lack of national occupational standards for priority trades. Considerable effort is required in Eswatini to improve labor market information for skills development planning, including digital skills. The National Human Resource Planning and Development Unit of the Ministry of Labor and Social Security is beginning this process by conducting a National Skills Survey focusing on selected growth sectors: agriculture, energy, education and ICT, manufacturing and agro-processing, and tourism. To complement this survey, the Government of Eswatini needs to assess the supply of skills in these priority sectors and focus on plugging the gaps related to the quantity and quality of skills provided in priority trades.

This complementary supply and demand analysis would form the basis of a comprehensive human resource development plan, including for digital skills, around which employers and training institutions can coalesce. In the interim, there is a need to build a critical mass of individuals with advanced digital skills and ICT professionals that can drive economic growth and development in several sectors through the application of digital technologies.

R4.5: Strengthen the capacity of MoET to develop policies, deliver ICT support services and conduct diagnostics: The MoET does not have sufficient capacity to deal with the growing demand for digital skills to be provided through education and training institutions. Currently, there is only one person at the national level, seconded from the MICT, who supports the entire ministry with ICT-related matters. There are ICT inspectors in each of the four regions, but their expertise and skills are in line with supporting and monitoring the implementation of ICT in the curriculum, rather than operational and support services related to hardware or networking issues. If the MoET is to move towards ICT-enabled teaching and learning, which is particularly relevant currently given the Covid-19 crisis and the need for more remote learning opportunities, it needs to develop its own capacity to plan, deliver, monitor and support the development of digital skills and ICT-enabled teaching and learning.

Digital Entrepreneurship

- **Public and private sector collaboration on the digital startup agenda:** There is a need to increase collaboration and partnership between the RSTP and private sector actors for better integrated and more impactful digital entrepreneurship support and access to early-stage finance.

- **Business environment reforms to stimulate private sector competitiveness:** Eswatini can improve its performance on the Doing Business indicators. Identified reforms include strengthening the business environment to support the growth of micro and small enterprises especially in terms of business entry, operations and exit.

- **Implementing monitoring and evaluation frameworks:** Public sector support programs lack robust results measurement frameworks. Enhancing monitoring and evaluation of support programs will be critical to strengthening outcomes and analyzing the impact of public sector interventions.

- **Strengthening the capabilities of existing business support organizations to increase the quality and impact of support to high-growth firms:** Currently business support organizations mostly cater to traditional MSMEs, that are primarily micro or subsistence firms. RSTP is the only known digital incubator in the country that targets firms with potential for growth and scale, and there is room to enhance its capacity.

- **Increasing access to early-stage finance for startups:** There is a clear need to differentiate between sources of financing for tech startups compared to subsistence entrepreneurs. The Youth Enterprise Revolving Fund (YERF), which caters to traditional SMEs, does not constitute an appropriate financing source for startups.

- **Improving the IP framework for startups:** To be internationally competitive, Swazi SMEs need to constantly improve efficiency, reduce production costs, and enhance the reputation of their products and services through investments in research and development or by acquiring new technology. Without IP protection, there is a strong risk that SMEs will be disincentivized from innovating.

- **Leveraging opportunities from digital financial services:** An established DFS environment promotes trust and accountability in online transactions and contributes to the development and uptake of digital platforms, such as e-commerce marketplaces and use of online or mobile apps for ordering from restaurants, groceries, and other goods and services.

Importance of Digital Entrepreneurship

Digital entrepreneurship is a key pillar of a digital economy for Eswatini and instrumental for sustained economic growth, wealth creation and higher standards of living[93].

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93   World Intellectual Property Organization (WIPO), 2018.

Digital entrepreneurship[94], for the creation of new ventures in the digital sector[95], is also critical for the development of digital private sector platforms, which can bring the digital economy to life. Digital ventures offer new products and services, leverage new technology and business models, and open new markets. They can contribute to net employment growth and help enhance the competitiveness and productivity of the economy, especially post Covid-19.

The GoE's Ministry of Commerce, Industry & Trade (MCIT) has two dedicated agencies providing support for Small and Medium Enterprises (SMEs): the SME Unit and the Small Enterprise Development Company (SEDCO). The SME Unit is responsible for coordinating a range of financial and non-financial support programs across various ministries, parastatals, and local organizations. SEDCO is mandated to provide business advisory support to (M)SMEs, including digital businesses. Most of their current portfolio of 127 enterprises are in agribusiness. SEDCO does not award grants, but does offer subsidized office space. SEDCO also sponsors an annual "Entrepreneur of the Year" competition that provides award money to the national winners. The Unit is working towards establishing a common data platform of programs and beneficiaries and a standard results monitoring and evaluation framework. These instruments, when established, will significantly enhance the role and effectiveness of the Unit in establishing a better coordinated and more impactful national SME program. However, in the absence of a monitoring and results framework, the impact of SEDCO's efforts is difficult to quantify and assess. SEDCO management is aware of the need to enhance its role, delivery capacity and effectiveness in supporting digital startups.

The establishment of the RSTP, as a public enterprise under the MICT, signals the GoE's commitment to supporting the digital entrepreneurship ecosystem. The objective of the RSTP is to foster innovation and technology commercialization, as well as to coordinate the various elements of the R&D cluster and provide a focal point for research, industry linkages and incubation of tech startups.

The RSTP consists of a Biotechnology Park and an Innovation Park, which also houses the e-Government center, the National Data Center as well as the regional e-trade platform. The RSTP is therefore well positioned to play a critical role in fostering the development of digital businesses[96], and potentially be a core driver of the digital economy in Eswatini.

Eswatini generally lags behind South Africa, Namibia and Botswana in terms of startup skills, networking and technology adoption opportunities (as shown in Figure 19) and can benefit from greater regional cooperation and networking. Given its small economy and a still developing ecosystem, there is potential to strengthen the role of support organizations (such as incubators, accelerators, innovation hubs and co-working spaces) and improve access to early-stage financing (such as seed, angel, impact investment, venture capital, and grants). Furthermore, there is a need to increase specific skills (both technical and business), access to markets, and establish an overall conducive business environment that motivates the creation and use of novel digital technologies.

FIGURE 19. Global Entrepreneurship Index scores for selected indicators (1.0 is the maximum score[97]

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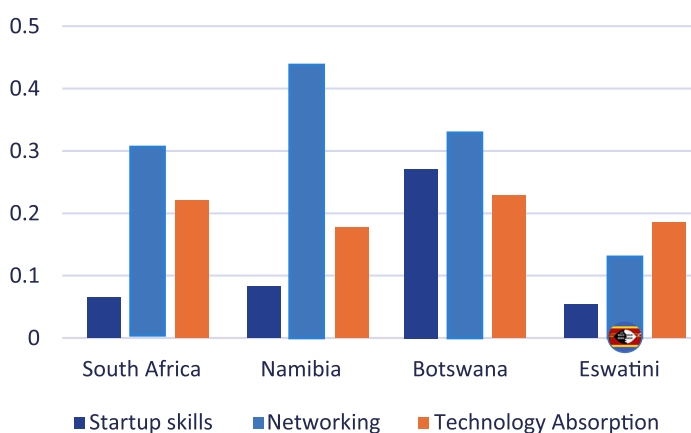
94 The term 'Digital Entrepreneurship' most commonly refers to the process of creating a new— or novel —Internet enabled/delivered business, product or service. The definition used here includes startups that bring new digital product or service to market. Welsum, v. D., World Bank Group, "Enabling Digital Entrepreneurs" 2016.
95 These are typically defined as young (under 5 years) firms that are pursuing growth.
96 WBG Stakeholder interview.
97 2018 Global Entrepreneurship Index

Diagnostic Findings: Current State of Digital Entrepreneurship

Eswatini's fledgling efforts to support digital entrepreneurship can be strengthened and scaled through improved coordination and focus. There are small scale efforts to support entrepreneurship in Eswatini including digital entrepreneurship. However, these efforts are uncoordinated and have limited impact in terms of reach and job creation. Entrepreneurs face hurdles in starting and operating a business, access to early-stage finance is challenging, and effective technical training, coaching and mentoring support programs for entrepreneurs are scarce. There is no systematic tracking or measurement of results and impact and there are limited opportunities for ecosystem actors to interact, network and collaborate. As discussed in the Digital Infrastructure chapter, the quality and cost of broadband access is also a major obstacle for digital entrepreneurs and subsequently hampers accessibility of ICT devices to rural populations, contributing to an urban-rural digital divide[98]. The shortage of critical technical and business skills, concerns over protection of IP and the overall lack of an entrepreneurial culture are other binding constraints.

State of the Digital Entrepreneurship & Innovation Ecosystem

Digital Startups and Digitally Enabled Entrepreneurs

Eswatini's private sector is relatively small, dominated by micro-enterprises and livelihood entrepreneurs operating in the agriculture sector. The Eswatini Finscope Micro, Small and Medium Enterprises (MSME) Survey estimated that there's a total of 59,283 formally registered business owners in the country, who employ approximately 93,000 people. However, only 8 percent of total MSMEs are small and medium enterprises, meaning that the majority are micro-enterprises, and most businesses are in rural areas[99].

Current government-supported activities and interventions offer limited support to helping micro-enterprises grow and achieve greater scale, and many business support providers have limited rural reach. These factors demonstrate that the enabling environment for overall business development is significantly lacking. There are very few digital businesses in Eswatini. CrunchBase[100] analyzes 19 companies active in Eswatini, with three firms categorized as operating in the ICT sector: SupplyAfrica[101], Vision Software PTY[102] and ScopeHost Operating Company. Notably, only ScopeHost Operating Company is headquartered in Mbabane.

The figure below summarizes all small business owners (including informal firms) in Eswatini, with digital firms captured under the "other services" category.[103]

FIGURE 20. Small business owners in Eswatini

123 thousand (19%) Business owners

79% 97k individual entrepreneurs

21% 26k business owners with employees

IMPORTANT CONTRIBUTION TO EMPLOYMENT

Employing 67 THOUSAND people

Less than 5 employees = 85%
5 employees and more = 15%
% of formal businesses = 26%

Creating about
164 thousand
employment opportunities including owners

INCOME/LIVELIHOODS
Small business owners in Eswatini

DRIVEN BY:
Agriculture (22%)
Retail (20%)
Other services (17%)
Accommodation & food services (12%)
Arts, entertainment and recreation (7%)
Manufacturing (5%)

There are 123 thousand business owners in Eswatini (down from 154 thousand in 2014), employing a total of 67 thousand people (excluding the business owners themselves). As such, the sector contributes significantly to job creation with a total of 164 thousand people working in the sector. Further it contributes to poverty alleviation as survivalist businesses play a vital role, especially as a buffer against slipping into deeper poverty and as such reducing individual and household vulnerability.

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98 According to 2018 FinScope data, 71 percent of adult Swazis (defined as 16 years or older) live in rural areas and only 29 percent live in urban areas.

99 2018 FinScope Making Access Possible SME Eswatini Diagnostics

100 According to CrunchBase data, the majority of firms operational in South Africa are headquartered outside of Eswatini. This includes MTN, AfriCar Group, AutoZone, Little Green Beverages.

101 SupplyAfrica is an e-commerce platform headquartered in Pretoria, South Africa.

102 Vision Software PTY is an entertainment and edutainment software sales in South Africa and has 16 full-time employees. The company has regional offices in Durban and Cape Town and is rapidly building export sales into Kenya and four neighboring countries (Zimbabwe, Namibia, Botswana and Swaziland).

103 2018 FinScope Consumer Survey Highlights

The Royal Science and Technology Innovation Park, Eswatini's only digital incubator, hosts world-class facilities, including co-working spaces, offices, and meeting rooms for companies in its portfolio. RSTP currently supports 36 digital startups, of which 41 percent are women-led, via a three-year incubation program that provides non-financial support such as technical and managerial training, access to the internet and to co-working or office spaces. Financial support (predominantly grants) is sourced through partnerships or applications to other funding sources.

Access to finance

The availability of early-stage financing is extremely constrained. While access to finance is an overall constraint for all MSMEs in Eswatini (the SME financing gap was estimated at 45 percent of GDP in 2017, and almost half of Eswatini SMEs face liquidity problems due to Covid-19), early-stage financing opportunities are especially limited. The Youth Enterprise Revolving Fund (YERF), under the Ministry of Sports, Culture and Youth, only provides loans (ranging from E50,000 to E150,000) to youth-led enterprises; SEDCO[104] serves as the YERF's incubation service provider. The YERF is exploring a partnership with MTN to develop a new financial product targeting existing youth-led businesses that will provide grants in the amount of E100,000. However, YERF funding is inadequate for digital and digitally enabled startups, as it is targeted more towards subsistence entrepreneurs whose needs are very different from the financing needs of growth entrepreneurs. Eswatini lacks grant funding organizations (such as foundations), angel investors, venture capital funds, and critical sources of early-stage financing. The RSTP has plans to organize and launch an angel investor network to address this critical gap. Currently, digital entrepreneurs self-fund or apply to pan-African funding programs, such as the Tony Elumelu Foundation[105] and organizations and early-stage funding opportunities in South Africa.

Market access

Eswatini entrepreneurs are hampered by a small domestic market and limited access to regional and global markets. The lack of local and international market linkages are a major impediment to business growth for most MSMEs, which rely heavily on public procurement opportunities. A few businesses, especially in the agriculture (vegetable and fruits), agro-processing, and arts and crafts sectors have successfully penetrated international markets. However, the volumes involved are still low and targeted efforts are required to increase the participation of Swazi MSMEs in regional and global value chains and take advantage of regional market opportunities. The establishment of the e-Trade Group for southern Africa at the RSTP Data Center is a significant asset that can be leveraged successfully to help address this challenge.

Public procurement opportunities are still limited for SMEs. The Eswatini Public Procurement Regulatory Agency (ESPPRA) is well positioned to implement a full e-GP platform that will facilitate transparent access for SMEs and startups to public procurement opportunities. Currently these opportunities are dominated by larger firms that have the required technical and financial capacity.

The market for digital goods and services is hampered by the lack of digital platforms. While mobile money is widely and broadly used, e-commerce and other digital platforms have yet to gain traction in Eswatini, given the small size of the market as well as connectivity and digital literacy constraints. For example, PayPal is not available, while SupplyAfrica, an e-commerce platform, is currently not fully operational. Due to the limited use of DFS products, the use of private platforms for transactional purposes (versus for social media) has yet to take off in the country. There are opportunities to adopt a targeted approach to seek new investments in private digital platforms that will in turn provide significant opportunities for SMEs to provide new digital services and products. See Chapter 4 on Digital Platforms for more details.

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104   SEDCO's Entrepreneur of the Year awards includes cash prizes but these typically benefit SMEs with demonstrated market traction
105   The Tony Elumelu Foundation, based in Lagos, Nigeria, manages a USD $100 Million seed fund that awards USD $5,000 to successful applicants. To date, it has funded 9,000 entrepreneurs from across all of Africa.

Policy Framework and Business Climate for Digital Entrepreneurs

Prior to the Covid-19 pandemic, Eswatini's economic competitiveness was marginally improving. While its overall 2020 Doing Business ranking declined by four spots to 121 of 190106, Eswatini made improvements on the following indicators: Starting a Business, Dealing with Construction Permits, Getting Electricity, Registering Property and Resolving Insolvency. Additional reform efforts are needed to improve the Getting Credit (rank 94/190) and Protecting Minority Investors (140/190) indicators. Eswatini's performance in other global indicators such as the Global Entrepreneurship Index (GEI) and the World Economic Forum's (WEF) Global Competitiveness Index remained mostly stagnant. Eswatini's poor rankings are a combination of low business dynamism (limited competition) and a small market size.

TABLE 7. Snapshot of Eswatini's Economic Competitiveness

Snapshot of Eswatini's Competitiveness			
Index	Ranking	Change in Ranking	Top Performing Sub-Saharan Africa (SSA) Economies
World Bank's Doing Business 2020 ranking	121/190	▼ 4	• Mauritius (13/190) • Rwanda (38/190)
2018 Global Entrepreneurship Index ranking	86/137	▲ 2	• Botswana (52/137) • South Africa (57/137) • Namibia (61/137)
World Economic Forum's 2019 Global Competitiveness Index ranking	121/141 **Key Indicators:** ICT Adoption: 119 Skills: 101 Business Dynamism: 119 Innovation Capability: 134	Maintained ranking	• Mauritius (52/141) • South Africa (60/141)

Over the past two years, Eswatini has made strides in some areas of business regulation, particularly in starting a business, obtaining construction permits, securing electricity and registering property. Despite these positive reform efforts, Eswatini's businesses still face a range of challenges. According to the World Bank's Enterprise Survey data, the major business environment obstacles for firms include corruption, access to quality electricity, high tax rates, crime, and competitor practices in the informal sector. Reforms are underway to improve the business-enabling environment through lower trade licensing fees and reduced time to issue trade licenses, as well as by strengthening commercial dispute resolution. Nevertheless, an accelerated and sustained reform program could lead to significant improvements.

Eswatini has no investment law to create incentives for early-stage investments. Businesses may be issued with a Development Approval Order for up to ten years, allowing them to pay only 10 percent corporate tax, instead of the standard flat rate of 27.5 percent applicable to corporate entities. The Minister of Finance is authorized by law to grant Development Approval Orders for approved new investment, business or development enterprises in the manufacturing, mining, international services and tourism sectors, to entities that do not compete with existing Swazi companies. This incentive is not available for investors in early-stage financing nor for businesses operating in other sectors, including agriculture and ICT.

The functionality of the online business registration portal needs to be improved. The business registration portal does not accept online payments and its operational reliability needs to be improved. Fees for business licenses and taxes do not differentiate between small enterprises and larger corporations, creating disincentives for small firms to register. Eswatini's business environment could be significantly strengthened by the adoption of digital platforms and the provision of efficient digital G2B and G2P services.

Eswatini's Intellectual Property (IP) framework is not optimized for technology-based businesses, although the World Intellectual Property Organization (WIPO) is currently reviewing Eswatini's IP framework. IP protections are critical for supporting emerging technology-based businesses. There is scope for a broad-based business and regulatory environment reform agenda to improve the ease of starting, operating and exiting a digital business in Eswatini.

Implementation of the revised MSME Policy of 2018[107] needs to be accelerated. The MSME Policy is intended to provide a coherent and comprehensive policy framework for MSMEs that drives the public and private sectors in achievement of these goals and objectives. The eight strategic pillars identified in this policy are:
(i)   Increase access to financial products and services;
(ii)   Strengthen MSME business support institutions and structures;
(iii)   Strengthen the legislative and regulatory framework for the development of MSMEs;
(iv)   Promote and develop a culture of entrepreneurship and innovation;
(v)   Strengthen the domestic and international competitiveness of MSMEs;
(vi)   Define, recognize, and protect the informal sector;
(vii) Develop and improve the position of and support to MSMEs owned by women, youth, and disadvantaged groups; and
(viii) Enhance policy implementation and integration by improving dialogue between key stakeholders.

Each pillar also identifies a critical gap in the current ecosystem and highlights the need for well-coordinated efforts amongst public sector agencies and units within MCIT. While the policy articulates promotion of ICT usage, there are no specific initiatives to support the digital transformation of businesses.

The fintech working group that includes the Financial Services Regulatory Authority (FSRA) and the Central Bank of Eswatini (CBE) is a promising initiative. There is scope to expand support to the fintech sector[108]. The CBE's commitment to the fintech working group is promising. Continuous collaboration with the private sector is necessary to (1) ensure that the regulatory environment promotes the development and use of fintech products, particularly by digital startups, and (2) a strategic approach is adopted to promote universal financial inclusion and the increased use of mobile payments and other digital financial services products.

Support Organizations

The small number of entrepreneurship support entities in Eswatini are primarily public sector supported or are country-level chapters of global organizations. These include the RSTP, the Mbabane Hub[109], an initiative of the WEF Global Shapers, SEDCO, the Global Entrepreneurship Network—Eswatini chapter, Enactus, and Junior Achievement Eswatini (JAE). According to a joint Briter Bridges and GSMA Accelerator Programme Mapping of Tech Hubs in Africa 2019[110], Eswatini hosts fewer than four tech hubs, with only RSTP explicitly supporting digital entrepreneurs and categorized as an incubator. SEDCO's incubation program does not leverage digital skills or digital strategies (e.g., digital marketing) but is attempting to deploy e-learning solutions for its incubation program participants. There are currently no accelerators established in Eswatini but various United Nations Development Program (UNDP) acceleration challenges could be considered as incubation plus programs, as they offer grants to idea-stage entrepreneurs and up to 6 months of business advisory support. Many of these initiatives were established less than five years ago and the efficacy of these programs has yet to be measured.

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107   Full Policy is available at http://www.gov.sz/images/MSME-Policy.pdf.
108   WBG Stakeholder interview
109   The Mbabane Hub is a registered non-profit in Eswatini, a pre-requisite to be affiliated with the WEF's Global Shapers network. Mbabane does have a physical space but it is primarily used to host events and other gatherings for members as part of its revenue model.
110   GSMA article and infographic available here: https://www.gsma.com/mobilefordevelopment/blog/618-active-tech-hubs-the-backbone-of-africas-tech-ecosystem/

Recently, several private sector entrepreneurship initiatives and activities have emerged, primarily targeting youths via educational institutions. JAE, a non-profit affiliated with Junior Achievement Worldwide, provides financial literacy and entrepreneurial education to secondary-school-aged youth. JAE's cohort consistently ranks among the top two performing countries during Junior Achievement Worldwide entrepreneurship competitions. However, the program found that follow-on entrepreneurship support for JAE participants wishing to pursue serious entrepreneurial endeavors post-graduation is deficient. As a result, the former CEO of JAE established the Global Entrepreneurship Network's (GEN)[111] Eswatini chapter as a parallel initiative to crowd-in additional resources and contribute to the budding entrepreneurial culture. These efforts need to be complemented by continued business development support and access to early-stage financing. Awareness of and access to opportunities for emerging entrepreneurs are currently limited, though the establishment of a Youth Chamber of Commerce and Industry is meant to address this need.

At the tertiary level, Enactus[112] and Limkokwing University run entrepreneurship programs. Enactus Eswatini organizes a national competition which has benefited 14 teams, 589 students, and supported 3 projects to date. Limkokwing University of Creative Technology runs the Limkokwing Entrepreneurship Acceleration Platform (LEAP) for final year students. Both programs are sector agnostic but encourage the use of creativity and technology. The University of Eswatini plans to launch iLab, an incubation center, to complement RSTP initiatives that encourage graduates to pursue entrepreneurial activities.

Private sector youth entrepreneurship activities include MTN and previously, Swaziland Beverages. MTN runs several initiatives including "21 days of yell'o," which includes an activity on business training and financing for innovative ideas. As part of a regional initiative, Swaziland Beverages ran a Kickstart competition that provided seed grants, in the form of asset purchases, to innovative enterprises. The Swaziland Beverages Kickstart program is no longer active.

Agritech is an emerging sector of interest and there are opportunities to connect startups to corporations through Corporate Innovation programs. MTN and UNDP, alongside RSTP as the implementation agency, are supporting several agritech challenges for ideation-stage entrepreneurs. It is unclear if these programs will provide extensive and longer-term business advisory support to nurture and develop these entrepreneurs into revenue generating firms. Unfortunately, existing business development service (BDS) providers, including RSTP and SEDCO, are unable to provide the necessary advisory support, and the participation of agritech and food tech startups remains very limited.

The table below provides an overview of the entrepreneurship activities described above.

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111 The Global Entrepreneurship Network operates a platform of projects and programs in 170 countries aimed at making it easier for anyone, anywhere to start and scale a business. GEN Global, based in Washington, DC, organizes an annual Global Entrepreneurship Conferences which includes a ministerial track for policymakers and publishes an annual Startup Genome report. Unfortunately, Eswatini's ecosystem is not currently featured in this analysis. GEN's global chapters are well-known for organizing annual Startup Weekend events, typically occurring in the fall.
112 Enactus, affiliated with Enactus Worldwide, leverages its experiential learning platform to facilitate knowledge exchange amongst its 37 member countries.

TABLE 8. Mapping of Entrepreneurship Activities in Eswatini

Program	Sponsor(s)	Beneficiaries	Funding Provided	Status
Swaziland Beverages Kickstart	Swaziland Beverages	~28 youth-owned SMEs	Y – total E5.1m (approx. USD $340,000)	Inactive
21 days of yell'o	MTN in partnership with YERF	7 youth-owned SMEs in agriculture & honey production	Y – E100,000 per startup (approx. USD $6,666)	Active
SEDCO Incubation Program - Entrepreneur of the Year Award	SEDCO under Ministry of Commerce, Industry & Trade	127 MSMEs, primarily agribusinesses; also provides training to YERF loan applicants - 8-9 regional winners and 1 national winner	N Y – N/A	Active Active
SME Unit (policy unit for SME development)	Ministry of Commerce, Industry & Trade	N/A	N	Active
Youth Enterprise Revolving Fund (YERF)	Parastatal under Ministry of Sports Culture & Youth Affairs	MSMEs	Y – loan from financial institution	Active
Junior Achievement Eswatini (JAE)	Government of Eswatini, Eswatini Mobile	Secondary school aged youth entrepreneurs	Y – E50,000 to top 5 (approx. USD $3,333)	Active
UNDP AgriTech Challenge	UNDP, RSTP	AgriTech startups	Y	Active
Global Entrepreneurship Network (GEN) Eswatini	GEN Global	Swazi entrepreneurs	N	Active
Fintech Hackathon	Fintech working group (includes Central Bank of Eswatini & FSRA)	5 fintech ideas	Y – N/A	Active
RSTP	Parastatal under Ministry of ICT	36 digital startups	N	Active
Mbabane Hub	World Economic Forum (WEF) Global Shapers	16 shapers (individuals)	N	Active
Limkokwing Enterprise Acceleration Platform	Limkokwing University	Final year students	N	Active
Enactus – entrepreneurship learning platform for social enterprises	Enactus Worldwide	Social enterprises	N/A	Active
iLab	University of Eswatini	N/A	N/A	Pipeline

Constraints to Digital Entrepreneurship Development

Eswatini is a small market for digital consumers, meaning new and emerging digital firms need to internationalize to achieve scale and profitability. Eswatini's Investment Promotion Agency (EIPA) plays a limited role in helping micro- and small-enterprises access international markets, since targeted beneficiaries are medium-to-large enterprises. RSTP's incubation program currently provides limited support to digital entrepreneurs seeking to internationalize. Stakeholders also cited a desire to maximize opportunities within the domestic market, such as goods and service providers to existing large firms, before entering international markets.

Lack of e-commerce platforms limit the ability of MSMEs and digital businesses to access broader marketplaces. Efforts to promote e-commerce platforms need to be tied to an enabling and competition-friendly business environment and reforms to accelerate DFS uptake and usage.

Eswatini's private sector environment is characterized by low dynamism and the regulatory framework is not optimized for MSMEs and digital startups. Despite marginal improvements on Doing Business indicators, digital entrepreneurs remain constrained by a poor business environment and lack of pro-competition policies.

Early-stage financing is almost non-existent for digital entrepreneurs. Critical sources of early-stage financing (pre-seed and seed funding) are extremely limited. There are no local angel networks or VC funds. UNDP and corporations such as MTN provide limited grant financing for startups. Commercial bank loans are not suitable financing sources for digital businesses.

Recommendations & Next Steps

The following recommendations represent critical first steps towards unlocking bottlenecks and constraints within Eswatini's digital entrepreneurship ecosystem, to be implemented concurrently with efforts to increase access to broadband, digital platforms and skills, as highlighted in the other sections of this report.

Quick wins

R5.1: RSTP to take the lead in ecosystem development, coordination of entrepreneurship support programs and championing participation in the Innovation Bridge Portal (IBP). Given the size and maturity of the ecosystem, there are opportunities to increase collaboration and sharing of resources amongst ecosystem actors to reduce fragmentation and duplication of support programs and scale successful initiatives. The RSTP is well positioned to perform the role of an ecosystem hub and champion. It can leverage the IBP for networking opportunities and private-public collaboration to further strengthen the range and quality of support services offered, including impactful coaching and mentoring, and provide a repository of data on entrepreneurship. The first step to take would be a comprehensive mapping and evaluation of the existing public and private sector programs supporting entrepreneurship, as well as establishing a common data platform for monitoring and evaluation and leveraging the IBP. Being part of a regional network will provide increased opportunities for entrepreneurs and startups to benefit from the considerable experience and resources available in South Africa and elsewhere.

R5.2: RSTP to establish an incubation program targeted at supporting early-stage digital startups and a seed financing facility that can co-invest with angel investors and others. The RSTP will also benefit from capacity enhancements and increased collaboration with private partners both from Eswatini and from the region, which will result in increased knowledge exchange and enhanced local and regional linkages to drive ecosystem growth.

Medium- to long-term recommendations

R5.3: Accelerate business environment reforms including strengthening IP protection to support the growth of micro and small enterprises and tech startups, possibly by leveraging the e-GP platform to connect them to public procurement opportunities. Eswatini's Post Covid-19 Economic Recovery Plan places improving Eswatini's ease of doing business as a top priority. Several reforms have been recently adopted and are being implemented, as described earlier. There are also ongoing initiatives to strengthen intellectual property rights, which will facilitate innovation and entrepreneurship. Nevertheless, developing and adopting a clearly articulated, multi-year business environment reform agenda with clear objectives, performance targets and oversight, coordination, implementation and monitoring and reporting mechanisms, in close partnership with the private sector, will enhance investor confidence and remove obstacles to the establishment and growth of new digital businesses.

R5.4: Partner with established corporations, including SOEs, to design Open Innovation programs, in order to allow startups to co-create innovative solutions with established companies. Through the ecosystem network championed by the RSTP, there are opportunities to organize corporate innovation programs to connect startups in Eswatini to local and regional corporations. The e-GP platform could also be a powerful instrument to connect digital startups to public procurement opportunities, while providing a platform for developing the skills and technical capacity of SMEs in accordance with the procurement standards and requirements of corporations. Agritech and food tech startups will benefit tremendously from partnering with corporations and tapping into their use cases in order to develop new products and innovative solutions for climate-related challenges. The Government could also create an open data platform to incentivize new data-driven businesses.

R5.5: Increase access to funding for digital startups by incentivizing angel investments and seed stage venture capital. While YERF focuses on funding subsistence youth entrepreneurs, there is scope for the government to establish a seed financing facility that provides a combination of grants and loans to very early-stage digital and tech startups that are at the ideation, pre-seed or seed stage, as well as support capacity building of ecosystem service providers to provide more impactful support. This facility could also be set up in a manner to crowd-in and de-risk private financing from angel investors and venture capital firms including those from the region or globally. Such a facility could be managed by private partners under a governance mechanism with clearly established performance targets.

R5.6: Strengthen collaboration with regional institutions such as the AU and SADC to promote digital market integration in the Southern Africa region. The assessment has shown that limited market access is one of the key barriers for entrepreneurs and MSMEs in Eswatini to grow and expand. As the host country for the AU e-Trade Group's digital platforms, hosted at RSTP's data center facility, champion of the pan-African Sokokuu e-commerce platform, Eswatini can leverage its position to facilitate the integration of markets. The enhanced access to regional and global value chains will help develop and expand business opportunities particularly for MSMEs and entrepreneurs in Eswatini.

Conclusion: The way forward

Cross-cutting priorities

- **Priority 1:** Improve the enabling environment for the digital economy

- **Priority 2**: Expand and close gaps in access to digital infrastructure and digital services as well as address affordability to boost demand

- **Priority 3:** Enhance government capacity and improve the quality of digital public services

- **Priority 4:** Strengthen digital skills of the Swazi population and create an enabling environment for private sector investment, entrepreneurship, and innovation to facilitate digital technology adoption

- **Priority 5:** Enhance regional integration through the digital economy

The digital economy is a key driver of economic growth, innovation and prosperity, and an essential element in Eswatini's resilience to future shocks. Digitalization can help the government and businesses to extend the reach of their services at an unprecedented scale. The emergence and maturity of the digital economy in a country also has potential to create new economic opportunities, and the increased use of digital data can help improve economic and social outcomes. While the value of the digital economy is expected to grow from 15.5 percent to a quarter of global GDP between 2016 and 2026[113], digital inequalities and uneven access and adoption of the internet are widening, not just between countries but also within countries[114]. Therefore, closing the infrastructure gap in Eswatini, complemented by strengthening other foundational pillars, can yield clear economic benefits, create employment opportunities and lead to better services for its citizens.

A holistic approach is necessary to create an enabling environment for the digital economy, and thus maximize the promising potential of digital economy in Eswatini. An overarching, whole-of-government national strategy that provides a high-level vision and objectives for the digital economy and digital transformation will help the GoE shift away from fragmented and siloed interventions. Institutional coordination and collaboration should also be strengthened, with clear articulation of the mandates and responsibilities of relevant MDAs to ensure far-reaching impact of digital transformation in Eswatini.

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113   Oxford Economics. Digital Spillover: Measuring the true impact of the digital economy. Available at: https://www. oxfordeconomics.com/recent-releases/digital-spillover
114   Broadband Commission. State of Broadband 2020. https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROAD-BAND.21-2020-PDF-E.pdf

This report has shown that the potential of digital economy is currently unrealized in Eswatini. While the liberalization of the ICT and telecommunication sector has begun, the process has not yet been completed. This delay has prevented growth in the sector due to the lack of market competition and sufficient private sector investment. As indicated in the government's Post Covid-19 Recovery Plan, the liberalization of the ICT industry includes completing the unbundling of EPTC, in order to expand digital infrastructure and increase the affordability of digital services.

Ongoing efforts to leverage digital platforms in the public sector are largely fragmented across various departments and agencies. The use of digital public platforms will become more effective and efficient by ensuring greater interoperability and focusing on shared services. Improved institutional coordination is needed to ensure the full implementation of the currently stalled e-Government strategy and the development of interoperability of digital public platforms. Furthermore, the government can play a greater role in promoting the use of e-commerce platforms, for example through an e-commerce strategy.

The development and adoption of DFS in Eswatini is mainly driven by the use of mobile money. While there is a foundational infrastructure in place on which the growth of DFS can be anchored, full interoperability between various systems and DFS products has yet to be accomplished. The urban-rural gap is particularly remarkable in terms of access to DFS. The full-fledged development of the DFS ecosystem would require strengthened institutional cooperation, particularly among regulators, effective oversight and supervision by the CBE, and interoperability across various payment service providers. As mentioned previously, promoting the use of DFS should be supported by the establishment of a government portal and payment gateway, as envisaged in the NDP.

Digital skills, or the lack thereof, currently present a bottleneck to the development of an inclusive digital economy in Eswatini. Digital skills and relevant policy instruments are currently focused on the narrow definition of ICT as a curriculum subject and management tool, rather than a mechanism to facilitate digital skills and capabilities in the country. The lack of digital infrastructure and connectivity in primary and secondary schools is prevalent, which is associated with the high cost of internet access.

Lastly, the business environment in Eswatini does not effectively promote digital technologies and platforms and there is a lack of support for entrepreneurs and startups. There is room for greater public and private sector collaboration to scale up digital entrepreneurship support and increase access to finance. RSTP, a parastatal agency, is the only known digital incubator in the country with significant potential for growth and scale. More integrated financial and non-financial support should also be provided to early-stage ventures.

Based on the preceding analysis, five broad priority areas emerge as opportunities for Eswatini, where both public and private efforts are needed to accelerate the emergence of the digital economy. All recommendations are more fully elaborated in individual chapters of this report.

Priority 1: Improve the enabling environment for digital economy

This priority area focuses on addressing identified policy, legal, and regulatory gaps, and stimulating the enabling environment for digital technology adoption and usage in Eswatini. The measures outlined under this priority area can assist Eswatini in improving digital infrastructure, facilitating institutional coordination, and providing a vision for whole-of-government commitment to the realization of the digital economy. While key foundational pillars linked to this priority primarily concern digital infrastructure and digital public platforms, the enhanced policy and regulatory environment will also help advance other pillars of digital economy in Eswatini.

Priority	Recommendations

Quick wins	• **Complete the preparation of the National Digital Strategy and ICT Masterplan that provide high-level objectives and guidance on fostering the growth of the ICT sector and strengthening the digital economy in Eswatini.** The strategy should include a consultation with public and private sector stakeholders.
	
	• **Provide missing pieces of sector-specific strategies and policy frameworks.** Ongoing efforts in different pillars of the digital economy can be accelerated by adopting supplementary policies and strategic visions, such as:
	  • **E-commerce strategy** for promoting the use of e-commerce platforms
	  • **Review for the Payment Systems Act** for strengthening legal frameworks for developing a DFS ecosystem
	  • National strategy for **facilitating the implementation of the government portal** and promoting the use of DFS in government payments
	  • **ICT and Education Policy and Implementation Plan** that will help integrate digital connectivity in educational institutions to improve digital skills training and the use of ICT-enabled teaching and learning

Medium-term	• **Strengthen institutional coordination and collaboration.** Effective and efficient cross-ministry, agency and SOE coordination and collaboration between upstream and downstream policy actors is essential to create far-reaching impact. Clarifying mandates of the MDAs that are responsible for operationalizing the e-Government Strategy would facilitate the development of digital public platforms and e-Government services. • **Strengthen the regulatory framework to unblock bottlenecks to digital service delivery,** by emphasizing the development of implementing regulations for existing laws on data protection and cybercrime, and the creation of the relevant regulatory bodies. • **Complete the unbundling of EPTC and pursue full liberalization of the market.** Measures need to be in place to ensure the accounting and functional separation of EPTC into wholesale and retail services, that will translate into improved market competition and increased broadband affordability. Measures to be taken include setting clear market definitions for retail and wholesale markets, and conducting whole pricing analysis.

Priority 2: Close gaps in access to digital infrastructure and digital services and address affordability to boost demand

This priority area addresses the identified gaps in access to affordable and good quality broadband connectivity and essential digital services, such as DFS, particularly in rural areas. The limited access to digital infrastructure is exacerbated by the high cost of internet, which is largely influenced by insufficient market competition in the broadband market. While supply-side actions are needed to bridge infrastructure coverage gaps in underserved areas, it is even more crucial to create demand for internet connectivity and digital services through policy measures to close the existing large usage gap.

Priority	Recommendations
Quick wins	• **Improve administration of the Universal Access and Service Fund (UASF) to generate a greater impact in expanding digital infrastructure in rural and remote areas.** A well-functioning UASF can be leveraged as a vehicle to expand access to digital infrastructure, including 4G/LTE mobile networks, in rural areas where the incentives for market investment are low.
Medium-term	• **Facilitate cross-sectoral infrastructure sharing by leveraging the excess fiber capacity owned by utility companies and the development of local Tier III data centers.** This can support the government's commitment to anchor the ICT sector as an enabler of the post-Covid-19 economic recovery. • **Increase demand for and usage of broadband services.** Given that the high cost of devices is one of the key barriers for the Swazi in accessing the internet, innovative financing mechanisms to subsidize the purchase of end-devices should be considered. Large scale digital literacy and awareness campaigns could also be considered to create more demand for digital services.

Priority 3: Enhance government capacity and improve the quality of digital public services

This priority area focuses on improving the public sector's ability to guide digital transformation in Eswatini by bolstering government capacity and institutional coordination for enhancing digital service delivery and increasing interoperability in public-sector-driven platforms and services.

Priority	Recommendations
Quick wins	• **Update and expand public sector platforms so they are tailored to government business processes and underpinned by the most advanced, context-appropriate technologies and standards possible.** Specially, government has identified the National ID, HRMIS, procurement, and public expenditure management platforms as urgently needing upgrades. Upgrading the National ID and NPR platform and establishing linkages to key service delivery platforms will contribute to increasing social equity and accessibility of public services such as education and social protection. • **Strengthen interoperability of platforms, leverage shared services, and strengthen underlying infrastructure to facilitate a whole-of-government approach to digital transformation.** Ensuring the interoperability of systems and digital platforms could strengthen the GoE's ability to manage its revenue and expenditure as well as core functions such as management of the civil service and government procurement. It would also improve service delivery for citizens in the areas of identity authentication and access to education, health, and digital financial services.
Medium-term	• **Establish retail payments and credit infrastructure to achieve full interoperability and expand DFS.** Achieving full interoperability across various payment service providers would help achieve authorities' plans to establishing a national card switch in collaboration with the banking industry. Furthermore, there is a scope for widening the collaborative platform for retail payments given the entry of non-bank players in the retail innovative payments space. • **Strengthen the oversight and supervision capacity of the CBE to ensure it adequately responds to the development and expansion of DFS in Eswatini.** The dynamic nature of DFS has added more regulatory pressure to the CBE, whose supervision and oversight role needs to be enhanced to respond to developments in new payment channels such as remittances and innovative payment mechanisms, including mobile payment services, in a timely manner.

Priority 4: Strengthen the digital skills of the Swazi population and create an enabling environment for private sector investment, entrepreneurship, and innovation to facilitate digital technology adoption

This priority areas focuses on the strides that Eswatini needs to make to improve the digital skills of its population, ranging from basic literacy to advanced digital skills and talent. Furthermore, key actions are outlined under this priority to foster an environment to attract private sector investment in the digital economy and promote digital entrepreneurship for the creation of an innovation ecosystem. Jointly addressing the challenges in digital skills and digital entrepreneurship development in Eswatini, combined with the government's efforts in creating an environment for the emergence of the digital economy, will help its citizens and businesses thrive in a digital world.

Priority	Recommendations
Quick wins	• **Increase the digital literacy of the population by piloting interventions at secondary school level to build digital skills, particularly in schools that serve poor communities.** This can be done through the integration of ICT-enabled teaching and learning in priority subjects such as Mathematics and Science. The pilot could test various models of digital skills training, starting with teachers and then students in secondary schools, and eventually moving to primary schools, with the aim of improving digital literacy across the population. • **RSTP to establish an incubation program targeted at supporting early-stage digital startups and a seed financing facility that can co-invest with angel investors and others.** The RSTP will also benefit from capacity enhancements and increased collaboration with private partners both from Eswatini and from the region, which will result in increased knowledge exchange and enhanced local and regional linkages to drive ecosystem growth
Medium-term	• **Strengthen MoET's capacity to develop policies, deliver ICT support services for education and conduct diagnostics.** The MoET needs to develop its capacity to plan, deliver, monitor and support digital skills development and ICT-enabled teaching and learning, particularly in light of the increased need for remote learning opportunities. • **Strengthen linkages between education and training institutions and employers to enhance labor market relevance of the skills development system.** Efforts to involve employers and workplace experts in the identification of programs and content development, and to build capacities in the private sector to actively participate in higher education and training development, can enhance these linkages. Developing a governance and management system that facilitates better linkages between the higher education and training system and employers at the national, regional and education/training institution level should be a priority. • **Accelerate business environment reforms to support growth of micro and small enterprises.** As prioritized in Eswatini's Post Covid-19 Economic Recovery Plan, improving its business environment should be a medium-to-long-term activity, as it is tied to a range of factors including ICT affordability and a constrained private sector environment. Business environment reforms include simplifying and digitizing business registration and regulation procedures and differentiating between MSMEs and large corporations.

Priority 5: Enhance regional integration through digital economy

Developing and advancing its digital economy agenda can also improve Eswatini's regional integration with South Africa and other neighboring countries. This has the potential to further attract private investors and create jobs with larger market bases, as well as to increase social benefits, such as the facilitation of the cross-border labor flow and immigration. The actions outlined under this priority area will assist Eswatini in preparing the policy measures and regulatory frameworks necessary to facilitate cross-border transactions and the flow of knowledge and skills.

Priority	Recommendations
Quick wins	• **Connect major education and research institutions through a national REN, connected to a regional REN.** The lack of affordable, high-speed broadband for universities in Eswatini remains a significant hurdle for the use of technology in education and research, and even more so for connecting their faculty and students to international teaching and research resources. Therefore, connecting major universities and TVET institutions to high-speed broadband should be a priority in the forthcoming digital Master Plan. Establishing a national REN and connecting to a regional REN, such as the UbuntuNet Alliance, should be considered based on a cost comparison and the availability of support services.
Medium-term	• **Strengthen the collaboration with regional institutions such as the AU and SADC, in particular by leveraging Eswatini's host role for the AU e-Trade Group's digital platforms, to promote digital market integration in the Southern Africa region.** These collaborations would aim to expand business opportunities for entrepreneurs and MSMEs in Eswatini through regional e-commerce and digital trade platforms. • **Establish a regulatory framework for international remittances based on the relevant standards.** A framework for the regulation of the remittances market needs to be developed in accordance with applicable standards in this area, namely the General Principles for International Remittance Services. • **Deepen regional and international linkages to leverage other entrepreneurship ecosystems and promote access to additional incubation and acceleration support, access to finance, and access to markets.** The Southern Africa region is a top-ranking entrepreneurship ecosystem in SSA, thanks to the quality of local support structures and its ability to attract and convene a global audience. Swazi entrepreneurs should be encouraged to receive additional business advisory support from regional and international acceleration programs.

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Annex 1: Key Indicators

TABLE 9. Benchmarking penetration, affordability and coverage

Indicator	Eswatini	Lesotho	Botswana	Namibia	South Africa	Africa	World
World Bank Analysis for DE4A (2019) Unique Mobile-bb Subscription (2021 estimates)	35%	46%	45%	47%	58%	37%	-
Internet penetration (ITU 2017) Percentage of the population using the Internet	47	29	47	51	56	22	49
Active mobile-bb subscriptions (per 100)	13	49	67	59	70	25	62
Fixed broadband subscriptions (per 100)	0.7	0.2	1.4	2.7	2.0	0.4	12
Affordability (cable.co.uk 2020) Average price of 1GB (USD)	13.31	2.13	13.87	4.78	4.30	-	-
Coverage (GSMA) 3G Population Coverage (%) (Q2 2020)	89.25	99.97	90.00	75.00	99.50	83.03	92.66
4G Population Coverage (%) (Q2 2020)	30.00	75.00	80.17	75	96.48	50.92	85.85
Quality (cable.co.uk 2020) Average Mobile-bb download speed (Mbps)	4.51	7.43	2.78	3.91	14.04	4.51*	24.83
ITU ICT Development Index (2017)	-	133	105	118	92	-	-
ITU Regulatory Tracker (2020)	66.67	70.83	70150	75.67	82.33	-	-

Note: * Sub-Saharan Africa average

Annex 2: Digital platforms

Table 10. Benchmarking Targeted Download Link Speeds

Country	Defined/ Targeted Download Link Speed
Kenya	40 Mbps in urban areas and 5 Mbps in rural areas by 2017 (set in 2013)
Australia	100 Mbps available to 93% of homes, schools, and businesses by 2018
Finland	100 Mbps connections available to every household by 2016
EU "Digital Agenda for Europe"	All Europeans to have access to connections with speeds of at least 30 Mbps by 2020, with 50% or more of households having access to speeds in excess of 100 Mbps
Sweden	40% of households and businesses having access to 100 Mbps connections by 2015, and 90% by 2020
United States	Minimum downlink speeds increased in 2015 from 4 Mbps to 25 Mbps, and the minimum uplink speed from 1 Mbps to 3 Mbps.

Source: ESCCOM ICT Baseline Report

FIGURE 21. Broadband Speed Guide

Activity	Minimum Download Speed (Mbps)
General Usage	
General Browsing and Email	1
Streaming Online Radio	Less than 0.5
VoIP Calls	Less than 0.5
Student	5 - 25
Telecommuting	5 - 25
File Downloading	10
Social Media	1
Watching Video	
Streaming Standard Definition Video	3 - 4
Streaming High Definition (HD) Video	5 - 8
Streaming Ultra HD 4K Video	25
Video Conferencing	
Standard Personal Video Call (e.g., Skype)	1
HD Personal Video Call (e.g., Skype)	1.5
HD Video Teleconferencing	6
Gaming	
Game Console Connecting to the Internet	3
Online Multiplayer	4

Source: Federal Communications Commission[1]

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1   Federal Communications Commission: Broadband Speed Guide: Available at: https://www.fcc.gov/consumers/guides/broadband-speed-guide

Annex 3: Digital Platforms

Definitions of Digital Platform Elements

This annex elaborates the definition, purpose and benefits of the concepts that form digital platforms. It begins by discussing public sector platforms, including interoperability frameworks, then commercial platforms and finally the enabling environment.

Public Sector Platforms: Core Components

Digital Identification Systems. Digital proof of identity is achieved through systems that often link civil registration details (e.g., birth, marriage or death) to biometric data (e.g., a photo, fingerprint or retinal scan) and even the e-signature of a given person. Beyond "traditional" physical forms of identification, such as ID cards, birth certificates and passports, the emergence of the digital economy has created a need for verifiable digital identity credentials. With digital proof of identity, citizens can access basic services[2] and digitized transactions[3] and exercise key rights, such as voting and land ownership. Digital ID systems can also accelerate trade and market integration by enabling secure cross-border transactions and access to services.

Interoperability Frameworks. Interoperability frameworks allow countries to pursue and implement a "whole-of-government"[4] approach to the digitalization of core government systems, which automates business processes and leads to increased efficiency, accountability, improved service quality and reduced leakages of government funds. However, many countries' public sector platforms have major challenges with interoperability as a result of two key factors. Firstly, platforms are developed in silos in line ministries or at different administrative levels and are fit-for-purpose but lack the functional requirements that would allow for future integration. Secondly, different platforms are often funded by different donors who may have preferences for specific systems. In the absence of standardization protocols in the recipient country, these systems also lack the features required for future integration with other platforms.

Digital Service Delivery Systems, Citizen Feedback Mechanisms and 'CivicTech'. Organizations may opt to use digital channels (such as online portals, mobile phones and social media) to offer client-facing services. By offering services digitally, organizations may improve the cost and efficiency of such delivery, and offer ease and convenience to clients. These services may span all aspects of a person's or a firm's life. For people, digital services can span from cradle to death, including birth registration, digital identification, education, healthcare, driver's license, taxation, vehicle registration, property registration, pension, social security, social protection, and death registration. For firms, digital services may span from starting to closing a business, including business registration, taxation, capital raising, initial public offering, financial reporting, and bankruptcy filing.

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2 Some examples of these services include cash transfers and other social safety net payments, agricultural subsidies, medical services, business licensing and tax filing.
3 Business such as banks, for example, can use digital ID systems and trust services to meet know-your-customer (KYC) requirements for account opening.
4 A whole of government approach moves countries away from siloed structures and applications that reflect the needs of specific ministries, departments or agencies and towards the development of interoperable systems, underpinned by a shared vision and effective strategic coordination.

Digital platforms can also provide avenues for public engagement, feedback, and information sharing, shortening the accountability loop and increasing the responsiveness and quality of service delivery. Both public and private platforms can facilitate the aggregation of public feedback and monitoring of service quality. Public platforms may be fit-for-purpose and managed by specific MDAs, soliciting feedback directly from their users or constituents via SMS, phone or web portal. Private platforms may similarly be fit-for-purpose, targeting specific customers. Widely available private platforms, like social media, where MDAs and companies have accounts, can also constitute channels via which the public provides feedback, alerts entities to problems, or expresses preferences and drives demand for new products and services. By providing a channel for citizens to voice concerns and hold the government accountable, CivicTech can increase government responsiveness to citizen needs, which can help improve overall confidence and trust in public services.

In some countries, digital service delivery systems include functionalities for gathering citizen feedback within a single platform to create a feedback loop. For the purposes of this report, these types of platforms are discussed separately, as Eswatini does not have a platform with these functionalities. Further, digital service delivery systems focus on government-to-citizen service delivery. Citizen feedback mechanisms focus on citizen-to-government information flows that should eventually be used to improve service delivery, regardless of whether that service is delivered through a digital platform or not.

Public Sector Platforms: Use Cases

Digital Financial Management Systems. Digital financial management systems enable the government to digitally account for its various revenue streams and expenditures in order to prevent overspending and facilitate accounting and auditing functions. Often revenues and expenditures are tracked in separate platforms operated by revenue authorities and finance ministries or national treasuries, respectively. If separate, these systems should be interoperable and automated so that government expenditures can be counted against both incoming revenue and agreed-upon budget allocations in real-time.

Human Resource Management Systems. Digital human resource management systems enable governments to track and manage the size and structure of their public service cadre (e.g., an establishment list) and associated costs of maintaining the public service (e.g., salaries, benefits and pensions), and perform analysis to understand the impact of HR spending (i.e., the wage bill) on the macroeconomy. Digital HR platforms should track employees' rank (grade), duty station, the ministry, department or agency to which they are assigned, their salary and commensurate payroll information, and link their position to the establishment list. To function optimally, these systems should be able to authenticate the identity of public servants and pensioners through a digital ID in order to prevent payments to unauthorized individuals and link to the digital financial management system to automate payroll.

Digital Procurement Systems. Digital procurement systems create efficiencies in public procurement processes and have the potential to generate significant benefits to government through enhanced quality of goods and services procured and reduced transaction costs and contractual issues with vendors. Digital procurement systems can (1) shorten transaction waiting periods and processing times; (2) enable more bidders to identify tender opportunities and thus enhance competition; and (3) increase transparency in tender award processes and reduce appeals. Ideally, procurement systems should be transparent, facilitating some level of access to the public to find and track procurement opportunities, and allow government audit and accounting institutions to analyze government expenditure. Further, interoperability with a digital financial management system would help expedite and track payments to vendors.

Commercial Platforms

Digital Commerce or 'e-Commerce'. E-commerce platforms offer retail services online and connect buyers with sellers, which facilitates the formalization of commercial transactions and can passively generate basic standards and quality control through customer ratings and feedback. The creation and use of e-commerce platforms is low across the African continent, but globally, uptake of e-commerce has fueled GDP growth. A robust e-commerce ecosystem should center around online businesses, startups and their customers, and would also include telecommunications, logistics, transport, shipping, and manufacturing companies[5]. E-commerce platforms can also allow disadvantaged groups (e.g., farmers, rural households and women) to more readily access new markets.

Digital Payments and Mobile Money. Digital payment platforms increase the efficiency of financial transactions through low-cost delivery channels (e.g., agents, point of sale devices, automated teller machines and mobile phones). Firms can use digital payment platforms to transact more easily, build digital credit histories and seek financing. Governments can leverage digital payment platforms created by the private sector to increase efficiency and accountability for payment streams, such as disbursement of social transfers and receipt of tax payments. These platforms are also often the entry point for digital financial services (e.g., banking, savings and credit) because they allow payments to flow through traditional banking systems or through mobile money providers, such as M-PESA in Kenya or Alipay and Tenpay in China. This topic is covered extensively in the Working Paper on Digital Financial Services.

Digital Marketplaces. Digital marketplaces aggregate produces and services offered by multiple providers into a single platform and help create value through digital matching, economies of scale, strengthened competition between companies, reduced information asymmetries, and improved variety, quality, and value for money of goods and services[6]. Digital marketplaces are particularly important for the growth of SMEs, with Business-to-Citizen (B2C) and Business-to-Business (B2B)[7] platforms enabling access to a broader customer base at reduced cost. Digital marketplaces also help combat unemployment by more efficiently connecting employers to job seekers, matching talent with market needs, and lowering the transaction costs of hiring. If barriers to regional data sharing and trade have been sufficiently reduced, digital marketplaces can increase local companies' access to foreign goods and services.

Social Media and Apps. Social media and applications (apps)—such as Facebook, Twitter, WhatsApp and ride sharing apps—are arguably the platforms with the highest levels of usage globally and have thus been transformative in the digital economy. These platforms can connect people to ideas and resources that were previously out of reach, which is why many public and private sector actors leverage them to improve service delivery and market themselves. Although social media holds great potential, many have been cautious of the risks associated with such platforms, as identity authentication is difficult and there is little validation of the information being disseminated.

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5   https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d09_en.pdf
6   Guellec and Pauvnoc 2017.
7   Supports digital transactions between businesses (e.g., wholesalers, retailers, distributors, etc.) for products, information, and services

Enabling Environment

Policies and Regulations. Policy and legal frameworks allow government to facilitate the development of the digital economy. Frameworks should be forward-looking, adaptive, and technology-neutral to facilitate uptake and innovation while also addressing relevant risks. A country's policy and legal framework establishes the 'rules of the game' that govern public sector financing, implementation, operations, maintenance and oversight over digital platforms and related infrastructure. Such rules typically cover issues such as cybersecurity, data access, ICT standards, government ownership of ICT systems, and e-commerce, to name a few. An enabling environment can increase online trust, which is necessary for systems to scale up. Nevertheless, well-designed frameworks to not necessarily translate to effective implementation. In cases where there is limited functioning of government line ministries or legislative bodies, some countries have also found it beneficial for the framework to create or designate a specific government entity (semi-autonomous or directly reporting to the presidency) to provide strategic and technical guidance for the whole of government and serve as a focal point for the private sector with respect to interoperability between public and private sector platforms.

Systems and Infrastructure. In addition to relying on physical ICT infrastructure, digital platforms have their own internal systems and infrastructure on which they operate, including operating systems and software, shared services, and user interfaces. Optimal platform systems and infrastructure require (1) fast, reliable affordable connectivity; (2) proper design and customization based on actual business processes, enforcement of standards and protocols, especially with regard to interoperability; (3) properly-structured relationships and contracts with vendors; (4) the ability to store, archive and back up data; and (5) robust cybersecurity to protect governments', businesses' and citizens' sensitive data. Both government and the private sector have a direct role in funding and managing the systems and infrastructure used in platforms.

Standards and Protocols. Standards and protocols for designing, operating and interfacing digital platforms—such as those for developing Application Program Interfaces (APIs), ensuring data quality, and tracking usage and reliability—are critical in creating a sustainable digital economy and maximizing the efficiencies gained through use of digital platforms. Ideally, the policy and legal framework would require the development of standards for data provenance, accuracy, timeliness, and completeness; data archiving, preservation, and redundancy; data analytics; interoperability of systems; security and authentication; system reliability and maintenance; vendor contracts; and service-level agreements within government and with vendors. Robust yet customizable standards and protocols are critical to realizing a whole-of-government approach and systematic monitoring and evaluation (M&E) of platforms' performance.

Skills, Capacity Building and Change Management. Public and private sector actors require specific skills to maximize the benefits of digital platforms, which include technical ICT knowledge to operate, maintain, and improve their systems; procurement and contract management skills to manage ICT vendors; the ability to coordinate on technical issues both within and beyond their sector; and change management skills to facilitate the adoption of new platforms. Unfortunately, many countries lack capacity in these areas, constraining them to hire expertise from international firms. Poorly designed contracts may leave the door open for ICT vendors to maintain ownership over government systems or data, require frequent systems upgrades at a high cost to government, or develop systems on proprietary software such that government cannot easily sever the relationship with the vendor without having to recommission an entirely new system from scratch. The adoption of digital platforms thus requires significant changes in the way governments and firms operate, as well as taking stock of key digital assets and developing incentives and drivers to effect change via the use of platforms. Without solid change management, costly ICT systems may go un- or underutilized, may not be sufficiently customized to meet user needs, and may eventually fall into disrepair.

Open Data. Increasingly, the public demands or is offered transparency over public and private sector data to facilitate innovation and increase accountability. There are many approaches to open data, including no data sharing, providing pre-analyzed data upon request to stakeholders on a 'need-to-know basis,' and wide sharing of raw data on fully accessible platforms. Governments may mediate data sharing to various degrees through the policy and legal framework. Private sector actors may do so through legal mechanisms such as contracts on information disclosure. Actors are increasingly implementing aspects of open data best practices and putting in place processes for collecting, storing, and sharing public sector data in standardized formats. There are also numerous international initiatives and organizations dedicated to increasing data availability and enhancing frameworks and protocols for data sharing.

Digital Platforms in Eswatini

Public Sector Platforms

Digital Identification Systems.
Eswatini's foundational ID systems are managed by MOHA, and include a national population register based on civil registration and a national ID card issued to adults. Each of these systems are linked by a unique identifier, called the Personal Identification Number or PIN. The NPR has been a centralized, digital system since 2000 that is hosted and maintained by the Ministry of ICT in a shared data center. It represents an important asset for Eswatini, and is generally stronger than many CR and ID systems in Sub-Saharan Africa. Major achievements include a huge increase in the birth registration rate over the past decade, which now stands at 70-80 percent for children under five. In addition, the NID and PIN are widely used by people as proof of identity in their daily lives and in other government systems. Death registration was low in the past but has increased significantly after the introduction of funeral benefits. Furthermore, the NPR—while generally underfunded and understaffed—appears to have quality, dedicated staff with good technical knowledge and a high level of commitment to improving the system and serving the people of Eswatini.

Under the current system, birth registration and the issuance of identity cards are closely linked with each other and the determination of nationality. Children are assigned PINs during birth registration, which requires proof of parents' nationalities in order to establish the nationality of the child. At age 16, individuals can apply for the NID card based on their NPR record and PIN. Cards are issued to both citizens and foreigners, but the latter receive a different color card.

Applications to register vital events and obtain a NID are processed in one of 14 centers that include NPR windows (separate for CR and NID) and other government services, including a separate payments window. Birth registration is a largely manual process that involves a paper application that is re-entered by hand and sent to the central system for PIN issuance. Although the process is completed on the same day, limited computerized workstations and unreliable internet often create delays. The application is then typed and sent to the central system for validation and deduplication using an Automatic Fingerprint Identification System. If a person wants to apply for a NID but was never registered at birth, they first need to complete the birth registration process to obtain a PIN before applying for a NID.

Card production is carried out centrally by NPR staff within 48 hours and distributed to regional centers for collection. The PIN is a 13-digit structured number based on date of birth, gender, citizenship, and a serial number. The NID is a basic card that includes a 2D barcode encoded with the PIN and two encrypted fingerprints. Applicants authenticate using fingerprints to collect the card. The first card is free, but replacements—which are reportedly frequent—require payment of a fee. The NPR system also has an Unstructured Supplementary Service Data (USSD) application for people to track the processing of their cards.

However, challenges remain. There are persistent coverage gaps for children and adults. Despite major and largely successful efforts at sensitizing people to the importance of birth registration—particularly from a public health perspective—some obstacles remain. Chief among these is the fact that civil registration laws require parents to prove their citizenship during the birth registration process, which many are unable to do. This creates a cycle of under-registration: parents who are not registered themselves cannot register their children, and adults who were not registered at birth are then unable to obtain the NID until they register their birth and obtain the PIN, which may be impossible without their parents' registration. This partly explains the relatively low NID coverage rate for adults, which is around 50 percent. There are particular concerns about the risk of statelessness and denial of services for which ID is required due to lack of documentation (e.g., school enrollment requires birth certificates). Mop up campaigns are planned to address these issues and ensure the inclusion of the elderly and disabled persons.

A general lack of resources means that IT systems have not been adequately upgraded since the early 2000s—nearly 20 years ago—and do not meet performance or security standards. For example, there is currently no disaster recovery site for the data center (an IMB mainframe), most systems run older software that is no longer secure, data are not encrypted, and NID cards cannot be revoked or invalidated.

There are limited identity services and digital ID. Although a number of government databases store the PIN, there are only a few systems that are able to perform identity verification checks against the NPR using this number. Such services are limited not only by technology—e.g., the lack of other digital systems, and the capacity of the NPR server—but also by the lack of governance and trust frameworks as well as privacy-by-design measures (e.g., tokenization) necessary to protect people's PINs and other personal data as they become more frequently used. Furthermore, digital authentication technologies using the NID card have not yet been deployed, and other alternative solutions do not currently exist to allow for secure in-person or remote authentication.

Reforms needed to the legal and regulatory framework. ID systems require a comprehensive legal and regulatory framework. While some enabling laws do exist, such as for civil registration and the NPR, certain aspects of this legislation are out-of-date and create significant barriers to full inclusion and digitalization (e.g., paper-based processes, application requirements, etc.). In addition, while Eswatini has data protection and cybercrime laws in force, regulations for the existing laws need to be prepared and the relevant regulatory bodies need to be created.

The Government of Eswatini views the NPR as a foundational resource for the country and seeks to improve the inclusivity and security of the system and leverage it to provide better services. Meetings with MOHA, the Ministry of Economy, MICT, and the Registrar General confirmed a high level of political commitment to improving the NPR system. The primary goals of the government are to respond to the main challenges listed above, including:
- Ensuring that the system is inclusive of all people in Eswatini, regardless of age or nationality
- Increasing security and reducing fraud related to identity documents, passports, and border crossing
- Responding to demand from other ministries and the private sector (e.g., banks and MNOs) for ID verification services and to enable the unique identification of service users.

Given this commitment and the central role that an inclusive and trusted ID system can play in the government's overall goals of improving efficiency and service delivery and growing the digital economy, there is a clear opportunity to strengthen the NPR.

Achieving the government's goals for the NPR will require investments in infrastructure and technology, business process re-engineering, and reforms to the legal and regulatory framework. Given the importance of the NPR as a critical system and the potential role it can play across the government and economy, it is essential to approach these reforms holistically and with clear outcomes in mind in order to avoid common pitfalls. For example, many countries in Africa have focused on building ID systems with the latest technology, which may not always be necessary for—or capable of—meeting priority use cases and concerns, and typically comes at a high cost and with vendor lock-in. In-depth technical assessments of the current systems, that take into account the local context and requirements for future use cases, are crucial for identifying priority reforms and ensuring that investments and design decisions are fit for purpose.

To assist the Government of Eswatini with this deeper technical analysis, the World Bank's Identification for Development (ID4D) Initiative has undertaken two parallel assessments:

- ID4D Diagnostic: A Diagnostic, which provides a more in-depth technical evaluation of the strengths and weakness of the current NRC systems, and identify priority needs and use cases across sectors in order to make concrete recommendations for improving the system's inclusivity, security, and utility.
- ID Enabling Environment Assessment (IDEEA): The IDEEA, which provides a comprehensive assessment of the current legal and regulatory framework for the ID system and other relevant areas (e.g., civil registration, customer due diligence, etc.), and its assets and gaps.

Together, these two assessments can serve as a useful benchmark, identify priority areas for reform, and serve as critical input for future potential support from the World Bank.

Financial Management Systems

The Eswatini Ministry of Finance uses a computerized financial system, which controls and reports expenditure on a cash basis. However, the absence of a more robust, digitized and integrated financial management system that is interoperable with other key government systems is considered a contributing factor to the lack of financial controls for government spending. Recently the Treasury introduced a stopgap measure for tracking expenditures and arrears while the Integrated Financial Management System is being implemented, called the Invoice Tracking System (ITS). The system is a basic IT application which records invoices and payment instructions, creates batches of invoices that correspond to those in the existing accounting system, submits these batches online to the Treasury, reviews and verifies the invoices, and records invoices marked as paid from specific bank accounts.

Public financial management outcomes are affected by the weak financial management information system. Consolidated budget data suggests that there were expenditure deviations varying between 15 and 25 percent over the last three years (2017-2019). In addition, domestic expenditure arrears rose to 6.7 percent of GDP as at end-2019, up from 5.9 percent of GDP reported in January 2018. This is in part attributable to weak expenditure controls, especially the lack of effective control of expenditure commitments at the level of line ministries. This undermines fiscal discipline. According to the Accountant General, core rules are not complied with on a routine and widespread basis, through direct breach of rules or unjustified routine use of simplified or emergency procedures. The 2016 Auditor General report highlights a lack of compliance with internal controls, which is repeatedly observed. The 2019 budget speech highlighted outstanding domestic arrears as a key risk to the country's fiscal status but did not indicate the total value of those arrears. This indicates a need to strengthen both analog and digital public financial management in Eswatini.

Human Resource Management

The Ministry of Public Service uses a Human Resource Management Information System (HRMIS) that was developed in 2006 by the Ministry of ICT's Government Computer Services Division and is stored in the government's mainframe. The HRMIS started off as a management system that was primarily utilized by the accounting cadre. Therefore, certain features that the government considers important for a HRMIS are not currently implemented. The Ministry of Public Service continues to have IT support from the Ministry of ICT for system maintenance.

The HRMIS has links to the civil service recruitment process. Each fiscal year, budget is allocated for positions that are to be opened and the corresponding values are posted in the HRMIS. Once an appointment is confirmed by Civil Service Commission (CSC), then position is created in HRMIS. However, documentation about the appointment is not shared across the CSC and Ministry of Public Service and duplicate information must be submitted to both agencies in order for it to be linked to the HRMIS. Certified documents are linked to the person's application and personnel file in the HRMIS.

One key functionality that could be improved is that of employee records tracking and links to payroll. At present, each civil servant has three identifiers within the system: (1) a unique employee identifier (derived from part of the civil servant's graded tax number and linked to their National ID number), (2) a personnel file number (used for tracking their CSC application), (3) a post code (used to match a person with their mapped position type within the civil service establishment, e.g., HR officer in the Ministry of Finance). In principle, only civil servants with post numbers are to be paid. But the current HRMIS contains a glitch which enables employees without these numbers—namely persons not holding an established post within government—to be paid. This results in potentially significant financial losses for the government.

The Ministry envisions several upgrades to the system. One includes simplifying the employee identifiers by utilizing the National ID and including biometric details in the HRMIS. The HRMIS used to be able to store and show employee photos, but this functionality has been lost. Another upgrade includes interoperability with the Treasury for payroll distribution. Currently the Treasury and the central bank use EFT to disburse salaries, but the Ministry of Public Service sends the payroll information to them manually.

The Ministry of Public Service also envisions digitizing their performance management system in the near future. The performance management system is primarily analog and was designed in 2018. However, the Minister has yet to announce the commencement of its implementation. The main objective of the performance management system is to make career development and progression more transparent and objective. With respect to digitization, the ministry would like to move to a digital balanced score card for civil servant performance, with immediate supervisors as assessors, and integrate this into the HRMIS. Given that the HRMIS was designed in-house by government staff, it has not yet been decided if this modification would be done internally or by a vendor.

Digital Procurement Systems

The Eswatini Public Procurement Regulatory Agency (ESPPRA) has several digital platforms to aid businesses in participating in public procurement processes. There is (1) a database for tender alerts where businesses opt in to be notified during stakeholder engagement activities; (2) a website with tender information, including freely downloadable tender documents and bidder qualification requirements, opening and closing dates of the tenders, views of the bid evaluation scores, notice of intention to award, and name of entity eventually awarded the tender; and (3) a tender review and advertising portal which sends emails to prospective bidders from the database. Tenders are also advertised via social media.

These platforms were created and are maintained internally by ESPPRA IT staff. There are currently two IT staff members supporting these platforms, although ESPPRA originally envisaged that five staff would be required. Budgetary constraints have prevented the hiring of more personnel and some outsourcing may eventually be required. ESPPRA also runs these platforms via their own servers; however, capacity is already overloaded and will need to be upgraded. ESPPRA found that having private servers was more reliable than using government infrastructure.

Public procurement is one of the cabinet's five priority areas; yet this prioritization has not resulted in higher budget allocation and execution for procurement programs. However, this dynamic may shift given that the need to increase access to procurement for youth and MSMEs is prominently featured in the Post Covid-19 Economic Recovery Plan. ESPPRA previously planned an SMS project with MTN to have tender notifications sent to prospective bidders' cell phones, but this was eventually put on hold due to lack of funds. Nonetheless, there are other plans to make tendering a more accessible process, including developing partnerships with post offices, local services centers and Tinkhundla where internet connectivity allows increased access to the tender portal. ESPPRA is also developing an e-procurement strategy, and aspires to have a consolidated e-procurement system with enhanced functionality and interoperability with key agencies. It also plans to create a national supplier database that is automatically connected with Eswatini Revenue Authority and linked to Tax Identification Numbers (TIN).

During the consultations, legal reforms for procurement were cited as a critical issue, given that government plays a large role in the market. The ESPPRA legal department is drafting proposed amendments to the 2011 Public Procurement Act. Part of the suggested amendment mandates authorities to promote participation of local companies, most of which are SMEs. The amended Act would also allow ESPPRA to generate revenues from advertisements placed by government agencies, charges for specialized audits not in annual audit plan, user paid training services, and value for money audits. Additionally, and amendment of the 2011 Citizens' Economic Empowerment Bill is in draft stages and waiting to be passed. .ESPPRA is also developing an MOU with SEDCO to develop a curriculum for training SMEs on procurement procedures.

Domestic Tax Payments, Customs, and e-Single Window

In 2011, the Swaziland Revenue Authority (SRA) was established to unify two previously separate units dealing with customs and tax. One of the major reforms introduced by the SRA was a Value Added Tax (VAT). There was a legacy digital tax management platform used prior to the introduction of VAT and this system was migrated. Now, there is one digital platform for customs (ASYCUDA World) and another for tax (Revenue management system [RMS]). The Ministry of ICT was involved in the migration to the RMS platform and also managed previous versions of ASYCUDA World.

SRA runs their digital systems with a slim staffing complement. The IT department is small, with two directors: one for innovation and systems who supervises 15 staff and the second for infrastructure and servers with 11 staff. Everything for the RMS is done by the vendor and there is a standing contract for support visits.

As part of the implementation of new systems, SRA introduced a single Taxpayer Identification Number (TIN), which is a unique 9-digit identifier generated by the RMS and used for both tax and customs purposes. All business owners and those required to file taxes by law must register for a TIN. Private persons who are formally employed are not required to file unless their earnings exceed 1.2 million Rand and businesses do not file on their behalf. In the future, SRA eventually wants to move towards using the National ID number within their systems, especially for sole proprietors or others who do not require a TIN.

SRA has an electronic tax system available for citizens and businesses for file their taxes. Currently most commercial entities use the platform but many individuals do not yet do so. To address this, SRA will launch a campaign to motivate taxpayers to pay digitally. As part of this transition, SRA will no longer accept cash at government service points, but will accept credit and debit cards. Mobile money payments from citizens to SRA are not yet possible, but the necessary upgrades to the system for Automated Clearing House (ACH) and mobile money transfers are envisaged. Refunds, however, can be processed and issued through ACH transfer functionality in the RMS. An KYC 'lite' process is used to verify recipient bank details. Namely, SRA issues a refund letter to the recipient for confirmation and verifies the rightful bank account owner by cross-checking their TIN and national ID information.

SRA acknowledges that income tax collection is an area that requires sensitization and change management. It is moving towards a self-declaration model, but is concerned that compliance will decrease because people are not yet sensitized to this approach. Further, much of the data that SRA requires for monitoring of tax compliance is held by other ministries and is submitted manually. This data includes, but is not limited to, the register of companies, business licensing information and deeds register, and a public provident fund.

VAT is collected at ports of entry and registered in the ASYCUDA World system. All 8 commercial borders, the airport and the inland rail freight depots are connected to the SRA server via the ASYCUDA World system. The system has few issues with downtime and connectivity and customs payment are typically processed within 3 hours. Implementation of a single window is underway but incomplete.

SRA is developing a program designed to create interoperability for automating back-office communications between the relevant government systems so that they can track data in real-time. However, interoperability with the government mainframe is a challenge. Full data transfer from the legacy system and inputting of paper-based archival data has been slow. In some instances, end users have used this incomplete transition to justify resistance to the newer system, citing mistrust in the quality of data. In 2021, SRA will begin operating under a new organizational strategy, which may advocate for the development of a SACU-wide trade system. This would build upon Eswatini's existing trade MOUs with South Africa and Mozambique.

Health Management Information Systems

The Health Resource Management System (HRMS) was launched in 2015 and connects 178 of the country's 334 health facilities. Given the infrastructure and connectivity constraints Eswatini faces (see chapter on Infrastructure), the Ministry of Health has installed its own microwave technology. Towers have been built throughout the country and a dedicated signal is used for real-time dissemination of information. The costs are covered by The Global Fund and the connected health facilities do not incur reoccurring charges. The government is working with PEPFAR to set up high-elevation infrastructure sites to achieve last-mile connectivity for the remaining facilities.

Information in the system is available in real-time to those connected. In the system, patients have a PIN, which is a unique identifier at facility level. This is the same PIN used for a citizen's national ID number and is the basis for interoperability with the NPR. Babies receive a PIN at birth, and can get a National ID at the age of 16. For those without an NID or PIN, the system creates a placeholder for them by generating a barcode for record retrieval and issuing a personal health card, called a "Red Card," which facilitates easy retrieval of records. Each facility has a dashboard to improve the quality of health data available and data use. The dashboards are updated on weekly basis during facility standing meetings to assure quality. There is also a built-in notification system that alerts the Ministry of Health in the event of an outbreak of disease such as measles or malaria.

The Ministry of Health is also rolling out a Client Management Information System (CMIS). Initially, the development intended to use an opensource platform but in the end, the system was custom-built using MySQL in collaboration with a US Centers for Disease Control quality assurance program. The system complies with the relevant ISO standards and is linked with sector key performance indicators. The CMIS is integrated with the HRMS, and if there is a misalignment between data in CMIS and civil registries, the Ministry of Health is notified and works with regional home affairs offices to correct the irregularities.

A quality management system was piloted in December 2019 and is interoperable with CMIS; this is the digital arm of a program designed to gather citizen feedback regarding health services. Feedback regarding availability of medication, cleanliness of facilities and the bedside manner of medical staff is collected and measured against existing performance indicators. It uses a text-based system where clients opt in. Health officials can program into the system indicators of interest, such as age bracket, according to their needs, e.g., for family planning. SMS and calls are placed through a toll-free number. The system is widely considered a success story within government. Other ministries, such as the Ministry of Public Service, have approached the MoH for support in developing their own client satisfaction systems and training databases.

To run and maintain these systems, the Ministry of Health employs network engineers, database administrators, six software developers, statisticians, and health information officers. Some of these positions are funded from the government budget and others through donor financing. There is a data management team responsible for data extraction and matching, then sharing with the ministry's M&E unit. Interns from Limkokwing University of Creative Technology and other universities with IT and Computer Sciences departments are also hired to fast-track rollout of specific software upgrades. Still, staffing remains a challenge, as is road connectivity, which is an issue when IT experts need to be deployed to health facilities to resolve system problems. Increasing the level of government-funded staff is critical to allow the MoH to be able to sustainably implement its future goals for the systems.

Multiple plans exist to expand digital health management information systems. Improvements to the HRMS include adding biometric verification and linking it with the PIN; developing a national repository of data; improving production of facility-level reports; and setting up an interoperability platform or an Application Program Interface (API) that would link with laboratory results and drug management data. For the CMIS, there are plans to develop a 'CMIS lite' for use by health professionals traveling to remote areas and in-patient client management modules. There is also discussion of developing a dedicated SMS gateway for health.

The implementation of the health information management systems has produced significant positive results for health care delivery in Eswatini. Prior to implementation of the systems patients experienced excessive wait times and there were reported instances of people going to multiple sites for the same drugs, causing critical drugs to fall out of stock. The system has enabled the government to transition from situation where they were simply counting HIV and AIDS cases to one where they are able to slow the rate of transmission and achieve a decline in disease prevalence.

Buy-in and commitment from the Prime Minister to introduce e-Government and pilot it in the health sector was instrumental to the successes in digitizing health care service delivery. An e-health strategy was developed and launched by the Prime Minister and the systems were introduced at the community level, to ensure local buy-in. Furthermore, the integration of universities to build capacity and help capture health data was considered as another success factor. A Tinkhundla program has also been introduced to train chiefs on gathering community-level health information using iPads.

Local government

The Ministry of Tinkhundla (Local Government) is establishing digitally enabled one-stop service centers in every Inkhundla (region) to facilitate improved service delivery in rural areas. Priority Inkhundla for establishing centers are those that do not already have a clear service point or town center at an ideal geographic location. As of January 2020, there were three fully functioning centers in Siphophaneni, Matata, and Sihlutse. There are four priority centers for development in Luve, Sithobelweni, Lomahasha, and Maiwane.

At the one-stop service centers, people would be able to access passport and national ID services, update birth and death registration details, and complete car registration. The Ministry of Tinkhundla is also looking to develop skills and service profiles throughout the centers. It also wants to create a marketplace for local skills and services that shows lists of services, sourcing of local products, and contact persons available at local level, as a way to reduce economic migration. They plan to do so by leveraging and existing platform run by a private entity.

There are also programs within Tinkhundla to enhance wireless access in selected Inkhundla service points. This includes an ESCCOM program targeting rural areas to improve ICT and communications. The Ministry of Tinkhundla has future plans to connect all the one-stop service centers with the government-wide area network and offer a full range of digital services to citizens.

Private Sector Platforms

Digital Commerce and Marketplaces

There are currently no digital commerce or online marketplaces in Eswatini, though the MICT hopes to launch an e-commerce and e-trade strategy with technical assistance from the AU. The potential for e-commerce uptake is typically measured by financial inclusion indicators (described above and in the DFS chapter) and by ICT and mobile penetration rates (detailed in the Digital Infrastructure chapter).

Social Media Platforms

Despite the lack of digital marketplaces and e-commerce platforms, social media users make up 23 percent of the population[8]. Ninety-seven percent of active social media users access platforms via mobile devices, and this represents a critical opportunity for employing social media marketing strategies by MSMEs. Some key statistics include:

- 96.8 percent of Facebook users accessed via any kind of mobile device compared to 85 percent of users accessing only via mobile device;
- The number of people that Facebook reports can be reached with adverts is 250,000, with reported advertising reach of 13 percent of the population aged 13+;
- The number of people that Instagram reports can be reached with adverts is 38,000, with reported advertising reach of 4.9 percent of the population aged 13+;
- The number of people that Twitter reports can be reached with adverts is 20,400, with reported advertising reach of 2.6 percent of the population aged 13+; and
- The number of people that LinkedIn reports can be reached with adverts is 61,000, with reported advertising reach of 9.5 percent of the population aged 18+.m

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8   According to the #Digital2020 Eswatini report, figures current as of January 2020.

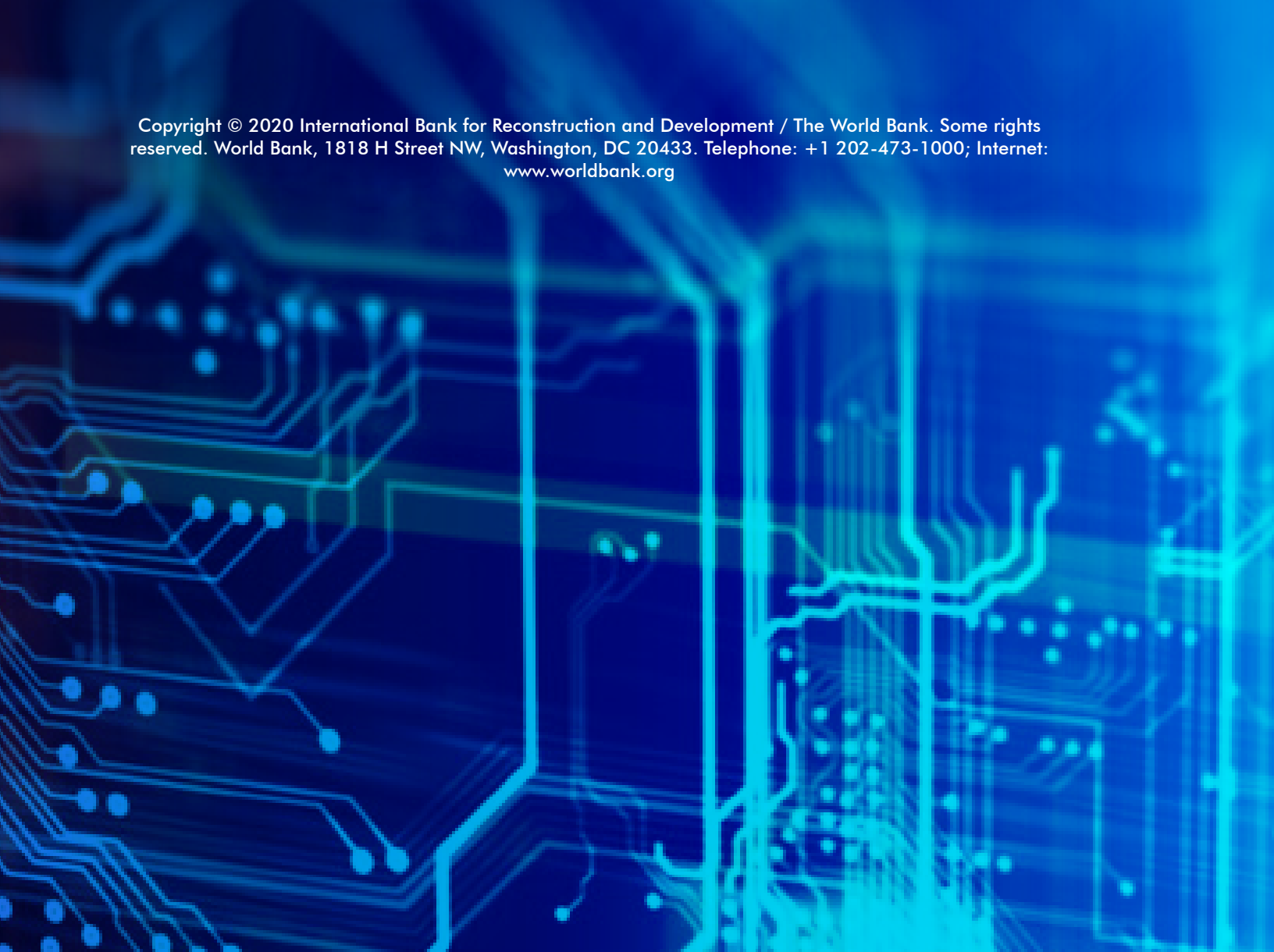# Annex 4: Summary of Digital Competences

TABLE 11. Summary of Digital Competences, based on EU DigComp 2.1 and Digital Literacy Global Framework (DLGF)

Competence Areas	Competences	Proficiency Levels
1. Devices and software operation a	Identify and use hardware and software tools and technologies.	*Foundation* (Levels 1 and 2) - Can deal with simple tasks that involve remembering content and instructions but also requires some guidance to execute.
	2 competences involving physical and software operations of digital devices.	
2. Information and data literacy	Search for, judge the relevance (including its source) and organize digital content.	
	3 competences involving browsing, evaluating, and managing digital content.	●●●●●●●●●●
3. Communication and collaboration	Interact and engage in citizenship through digital technologies while adhering to netiquette and managing one's digital identity.	*Intermediate* (Levels 3 and 4) - Can independently deal with well-defined, routine and nonroutine problems that involve understanding content.
	6 competences involving communicating, collaborating, and engaging in citizenship through digital technologies as well as netiquette and digital identity management.	
4. Digital content creation	Create new or modify existing digital content while correctly applying copyright and licenses as well as programming.	●●●●●●●●●●
	4 competences involving developing and integrating digital content as well as understanding copyrights, licenses, and programming.	*Advanced* (Levels 5 and 6) - Can deal with and provide guidance to others on different tasks and problems that involve applying and evaluating content in complex situations
5. Safety	Ensure security measures while safeguarding against risks threatening devices, privacy, health, and the environment.	
	4 competences involving protecting devices, personal data, privacy, and health as well as the environment.	
6. Problem-solving	Solve problems in digital environments and use digital tools to innovate and keep abreast of the digital evolution.	●●●●●●●●●●
	5 competences involving resolving digital issues, creatively using digital technologies, bridging personal gaps in digital skills as well as computational thinking.	*Highly specialized* (Levels 6 and 7) - Can resolve complex problems with few or several moving pieces, guide others, contribute to professional practice and propose new ideas to the field.
7. Career-related competences*	Use specific career-related digital technologies and content to have access to opportunities in the digital economy.	
	2 competences involving operating specialized digital technologies as well as working with digital content for specific career-related fields.	

Source: Based on Carretero et al. 2017, and UIS 2018.

Note: a. Proposed by UIS as additions to the DigComp 2.0 framework, which was subsequently updated to DigComp 2.1.

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