

# Accelerating Digital Transformation in Zambia

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REPORT

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1818 H Street NW  
Washington DC 20433  
Telephone: 202-473-1000  
Internet: [www.worldbank.org](http://www.worldbank.org)

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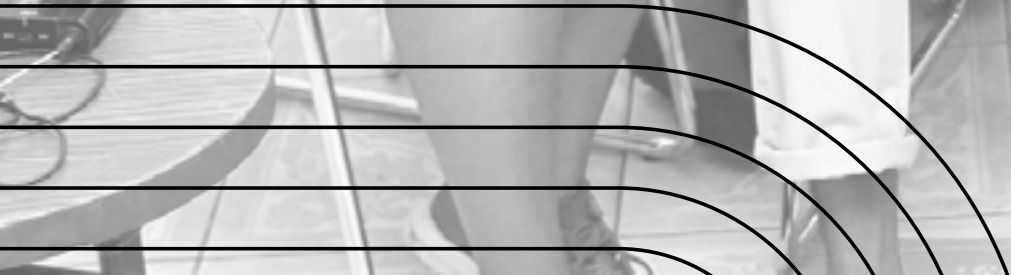
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Comprehensive national stakeholder consultations—engaging both the private and public sectors—were undertaken in preparing and finalizing this document.

# Abbreviations

7NDP	7th National Development Plan
ADC	Accra Digital Center
AFI	Alliance for Financial Inclusion
API	application programming interface
ARPU	average revenue per user
ASYCUDA	Automated System for Customs Data
ATM	automated teller machine
BCI	Business Confidence Index
BoZ	Bank of Zambia
BPO	business process outsourcing
CCPC	Competition and Consumer Protection Commission
CERT	Computer Emergency Response Team
CFIT	China Funds-In-Trust Project
CICO	cash in/cash out
COMESA	Common Market for Eastern and Southern Africa
CPIA	Country Policy and Institutional Assessment
DFS	digital financial services
DigComp	digital competences
EGDI	E-Government Development Index
e-GP	electronic government procurement
EU	European Union
fintech	financial technology
FSDZ	Financial Sector Deepening Zambia
G2B	government-to-business
G2G	government-to-government
G2P	government-to-person
GCI	Global Cybersecurity Index
GDP	gross domestic product
GEDI	Global Entrepreneurship Development Institute
GNI	gross national income
GNIPC	gross national income per capita
GSM	Groupe Speciale Mobile Association
HEMIS	Higher Education Management and Information System
HHI	Herfindahl-Hirschman Index
ICT	information and communications technology
ID	identification
IFC	International Finance Corporation
IFMIS	integrated financial management information system
iHub	innovation hub
INRIS	Integrated National Registration Information System
IoT	internet of things
IP	internet protocol
IPAS	Intellectual Property Automation System
ISP	internet service provider
ITU	International Telecommunications Union
IVR	interactive voice response
K	Zambian kwacha
M&E	monitoring and evaluation

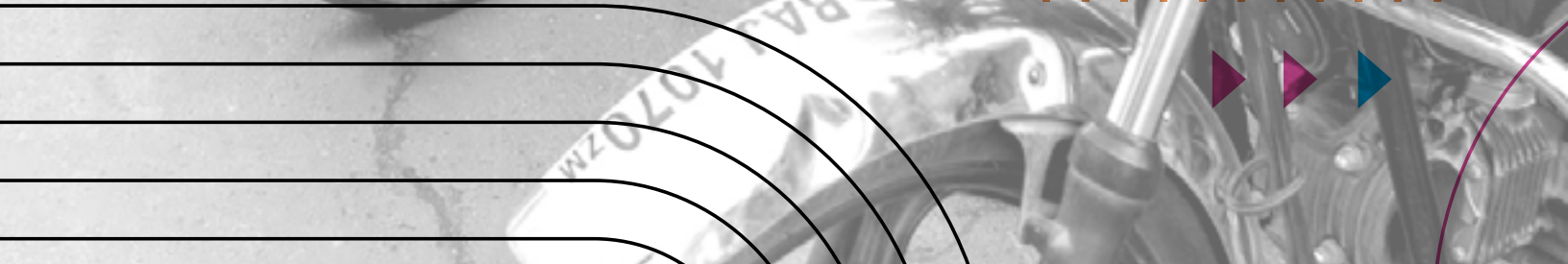


MCTI	Ministry of Commerce Trade and Industry
MIS	management information system
mLab	mobile applications lab
MMS	monitoring management system
MNO	mobile network operator
MoF	Ministry of Finance
MoGE	Ministry of General Education
MOU	memorandum of understanding
MSME	micro, small, and medium Enterprise
MTR	mobile termination rates
NAPSA	National Pension Scheme Authority
NGO	nongovernmental organization
NPS	national payment switch
NRC	National Registration Card
NTBC	National Technology Business Center
OSS	One Stop Shop
P2P	person-to-person
PACRA	Patents and Companies Registration Agency
PMEC	Payroll Management and Establishment Control System
POS	point-of-sale
PSTN	public switching telephone network
SADC	Southern African Development Community
SAP	Systems, Applications, and Products in Data Processing
SDG	Sustainable Development Goal
SME	small and medium enterprise
SMS	short message service
STEM	science, technology, engineering, and mathematics
STI	science, technology and innovation
TBDF	Technology Business Development Fund
TEVET	technical education vocational and entrepreneurship training
TEVETA	Technical Education, Vocational and Entrepreneurship Training Authority
UNCDF	United Nations Capital Development Fund
UNCTAD	United Nations Conference on Trade and Development
USSD	unstructured supplementary service data
WEF	World Economic Forum
ZABS	Zambia Bureau of Standards
ZACCI	Zambia Chamber of Commerce and Industry
ZANACO	Zambia National Commercial Bank
ZDA	Zambia Development Agency
ZECH	Zambia Electronic Clearing House
ZEEP	Zambia Education Enhancement Project
ZICTA	Zambia Information and Communication Technology Authority
ZILMIS	Zambia Integrated Land Management Information System
ZPPA	Zambia Public Procurement Agency
ZRA	Zambia Revenue Authority
ZSPIS	Zambia Social Protection Information System



All dollar amounts are US dollars unless otherwise indicated.







# Executive Summary

Zambia's 7th National Development Plan (7NDP) sets ambitious targets for economic growth and poverty reduction. Technology can play an important role as Zambia advances this vision for economic transformation.

Recent evidence tells us that reaching the goal of universal and affordable internet coverage can raise growth per capita by 2 percentage points per year and reduce the poverty headcount by 1 percentage point per year. When internet coverage is complemented by human capital investments, growth per capita increases by approximately 5 percentage points and the poverty headcount falls by 2.5 percentage points per year. These contributions to growth are mainly due to growth in productivity across economic sectors; digital transformation is thus part and parcel of economic transformation.

The introduction of digital systems can also have a transformative effect on government. It is estimated that developing countries could collectively save 0.9 to 1.1 percent of GDP, equivalent to \$220 billion to \$330 billion annually (IMF 2017), by introducing digital systems in government that increase efficiency and reduce the potential for leakages to occur. Additionally, significant effectiveness gains can be realized by equipping government officials responsible for public service delivery with access to better data and tools.

Improved access to digital technologies and effective use of data and digital systems can thus be powerful tools in the quest to increase private sector productivity, enhance public sector efficiency and effectiveness, and improve the accountability of both the public and private sectors. Indeed, 7NDP includes several digital transformation strategies for these reasons.

This digital economy diagnostic assesses Zambia's strengths and weaknesses with respect to five pillars that together form the foundation upon which the benefits of digital transformation can be realized. These pillars are Digital Infrastructure, Digital Skills, Digital Entrepreneurship, Digital Platforms, and Digital Financial Services. As discussed in the 2016 World Development Report (World Bank 2016), progress in these areas—combined with “analog complements,” that is, a favorable business environment, strong human capital, and good governance—can enable and accelerate development returns.

This digital economy diagnostic was carried out by a multidisciplinary World Bank Group team in close collaboration with a multiministerial working group, led by the Cabinet Office. More than 100 stakeholders from the public and private sectors were engaged in interviews, focus groups, and workshops to derive, triangulate, and validate the findings.

In summary, this analysis finds that Zambia has made significant strides on its path to digital transformation over the past few years. Progress is particularly evident in digital infrastructure, digital financial services, and digital platforms, while more significant gaps remain in digital skills and digital entrepreneurship.

With respect to digital infrastructure, all provincial centers are now linked to the fiber backbone, and the country has a state-of-the-art data center that can be leveraged for government and commercial use. International benchmarks for affordability of broadband have also been met, and the use of mobile phones has increased significantly, reaching 15.5 million mobile subscriptions in 2019, out of which 63.5 percent use broadband. The digital infrastructure foundation has thus been built to now focus on the use of the infrastructure, as well as on ensuring the reliability and security of the infrastructure that is in place. However, last mile connectivity remains a gap, preventing greater use of digital systems in more sparsely populated areas where access to services and markets is more limited, and where digital systems could help reduce transaction costs associated with serving smaller populations. The cost of connectivity also imposes a barrier to greater citizen and business take-up caused by low income levels, calling for measures to reduce connectivity costs.

Despite these remaining connectivity challenges, the take-up of digital financial services (DFS) has increased significantly since 2016. This illustrates that Zambia does not have to wait to deliver more services via mobile; a two-pronged strategy can be pursued that enables more mobile-based service delivery while steps are taken to promote greater last mile connectivity in secondary towns and rural areas.

With regard to DFS specifically, Zambia has had a strong commitment to financial inclusion over the course of the past several years. The country recognized early on that DFS can make financial inclusion

less costly for financial services providers and consumers, and it was among the first set of countries to allow nonbank payment service providers. Access to financial accounts more than doubled from 21 percent in 2011 to 46 percent in 2017, and increased access to mobile money providers has been driving the bulk of this growth since 2016. The private sector clearly sees the provision of DFS as an opportunity; the DFS market now includes 10 banks, 3 mobile network operators, and 5 third-party providers, including financial technology companies. In June 2019, the national payment switch enabled the interoperability of all domestic transactions. This functionality was expected to be available for all point-of-sale and mobile money transactions by the mid-2020. This step would further increase convenience and reduce costs for citizens and businesses.

Substantial progress is also reported to have been made to digitize government salary and pension payments; some gains have been made in government-to-business and government-to-government payments; and early efforts have been made to digitize receipts from businesses and individuals. Early indications are that important results are being achieved: preliminary data from the digitization of government pay slips show that transaction costs decreased by 85 percent and several “ghost” workers were identified and removed. Similarly, when the pension authorities introduced a mobile-enabled module, contributions increased substantially.

These early results demonstrate the promise of greater use of digital payment systems in Zambia. However, several payment systems have just initiated their digitization journey, and most government payments for social cash transfers and subsidies are not yet digitized. Opportunities therefore exist to initiate or expand the digitization of such government payments for the purpose of efficiency gains *and* increasing the resilience of vulnerable and often unbanked populations (for example, smallholder farmers and social cash recipients). With the advancement of DFS, the need to develop adequate consumer protection measures is also pressing.

Payment systems is only one of several areas in which the Zambian government can—and is—taking steps to use digital tools to increase the efficiency of government services. With respect to digital platforms, the 7NDP sets specific targets for providing government services online, and Zambia is now among the top 10 in the least developed countries category of the E-Government Development Index published by the United Nations. The government has launched internal systems for internal government administration, and government-to-person and government-to-business services are increasingly digitized. However, interoperability between systems is often lacking, thus reducing their benefit to citizens, businesses, and government; usage and usability are not consistently monitored, and some systems suffer from a limited scale of implementation or from deterioration.



Furthermore, the ability to authenticate that people are who they say they are is fundamental to financial and public services delivery. The current identification system has several weaknesses in this regard, and the Zambian government has determined that a biometric national ID system would be the optimal approach for Zambia. Investments in a modernized ID system can result in significant fiscal returns, but it can also involve a significant fiscal outlay, thus requiring careful consideration.

To enable Zambia to make greater use of digital technologies as a transformation tool, individuals, businesses, and government must also have the requisite digital skills. This is an area in which Zambia has made less progress. The 7NDP Implementation Plan aims to have information and communications technologies (ICT) mainstreamed in schools, and the new competency-based national curriculum has made ICT a compulsory subject. In practice, however, most schools are not connected to the internet, they do not have adequate access to devices, and teachers have limited knowledge of how to use ICT in teaching and learning. Furthermore, the quality of general education is of serious concern; for example, fewer than one-third of learners pass their grade 12 examination.

Zambia will not realize the full benefits of digital transformation—nor will it meet its 7NDP goal of facilitating “innovative technologies skills development”—unless it also ensures that learners going through the school system are equipped with foundational numeracy and literacy skills. However, there is still room to better leverage digital tools for teacher training and access to up-to-date educational materials, as well as for education policy planning and monitoring and evaluation. With regard to government capacity in digital skills, important gaps remain to ensure the ability across ministries and government offices to systematically develop, maintain, and use digital systems.

The requisite digital and entrepreneurial skills are also needed to advance digital entrepreneurship; it is digital entrepreneurs who will derive innovative solutions to public and private sector challenges that can be resolved through the application of technology. Zambia has seen an increase in the registration of ICT-related firms between 2016 and 2019, and entrepreneurs are initiating innovative digital solutions in a wide array of sectors, including financial services, education, tourism, and agriculture. Although a handful of entrepreneurs are now delivering solutions at scale, most digital enterprises in Zambia are at the very initial stages of development.

Zambia's Global Entrepreneurship Index scores in Startup Skills, Technology Absorption, and Risk Capital are very low, and entrepreneurial confidence is declining. Concerns about these four areas were also expressed repeatedly in the consultations for the diagnostic. Zambia is, however, fortunate to have a range of nascent private entrepreneurship initiatives that, coupled with increasing corporate interest, can lend themselves to public-private

partnerships that make public funds stretch further. The public-private dialogue during the diagnostic process also indicated recognition of the challenge associated with regulating digital innovation and the importance of engaging in continued dialogue to ensure that regulators provide clarity and strike the difficult balance between enabling innovation and ensuring that citizens are protected.

Surprisingly, a relatively large proportion of start-ups focus on e-commerce. This is remarkable given the significant obstacles to e-commerce in Zambia; only a small proportion of the population has a home address, and goods ordered online can therefore not always be efficiently and reliably delivered to the buyer. Long distances and high logistics costs also affect the viability of both domestic and cross-border trade. Considerable improvements in addressing and logistics will therefore be needed before e-commerce significantly benefits Zambia. The government has recognized this obstacle and has recently embarked on the development of a new national logistics strategy.

All in all, Zambia has made important strides in initiating a digital transformation process, but there is still a long way to go. As was acknowledged by H.E. President Lungu in a speech to the National Assembly in September 2019, Zambia's fiscal space is limited, and there is a need to “achieve economic stability, sustainable growth and development, within the spirit of ‘doing more with less.’”

The authors recommend that the government of Zambia develop a digital transformation strategy with a dual focus on meeting the 7NDP targets and improving the country's fiscal space. This recommendation is closely aligned with the “doing more with less” mantra introduced by H.E. President Lungu, and it emphasizes the use of digital technology to improve (1) public sector efficiency and effectiveness, (2) private sector productivity, and (3) accountability across both the public and private sectors.

Against this background, this report suggests that the digital transformation strategy include four strategic themes (figure ES.1): (1) promoting greater use of digital technologies in the economy, (2) reducing government transaction costs and reducing the cost of doing business through digitally optimized government systems, (3) improving the adoption of innovative digital solutions by enabling entrepreneurship, and (4) leveraging data and digital systems to improve sector-specific outcomes in secondary towns and rural areas.

*Promoting greater use of digital technologies in the economy.* Enhanced broadband usage alone contributes significantly to growth and poverty reduction. Additionally, initiatives undertaken under this theme are foundational to greater adoption of digital technologies by citizens, businesses, and government. The probability of success

of initiatives launched under the other strategic themes will thus be limited without progress under this theme. Priority activities suggested under this theme include (1) streamlining compliance costs for connectivity providers; (2) strengthening government capacity in cybersecurity, data privacy, and consumer protection; (3) developing a road map and implementation plan for the rollout of digital ID that carefully considers the costs and benefits of the vast array of design options; and (4) partnering with the private sector to map and fill the digital skills needs for government to successfully design and implement priority digital transformation activities.

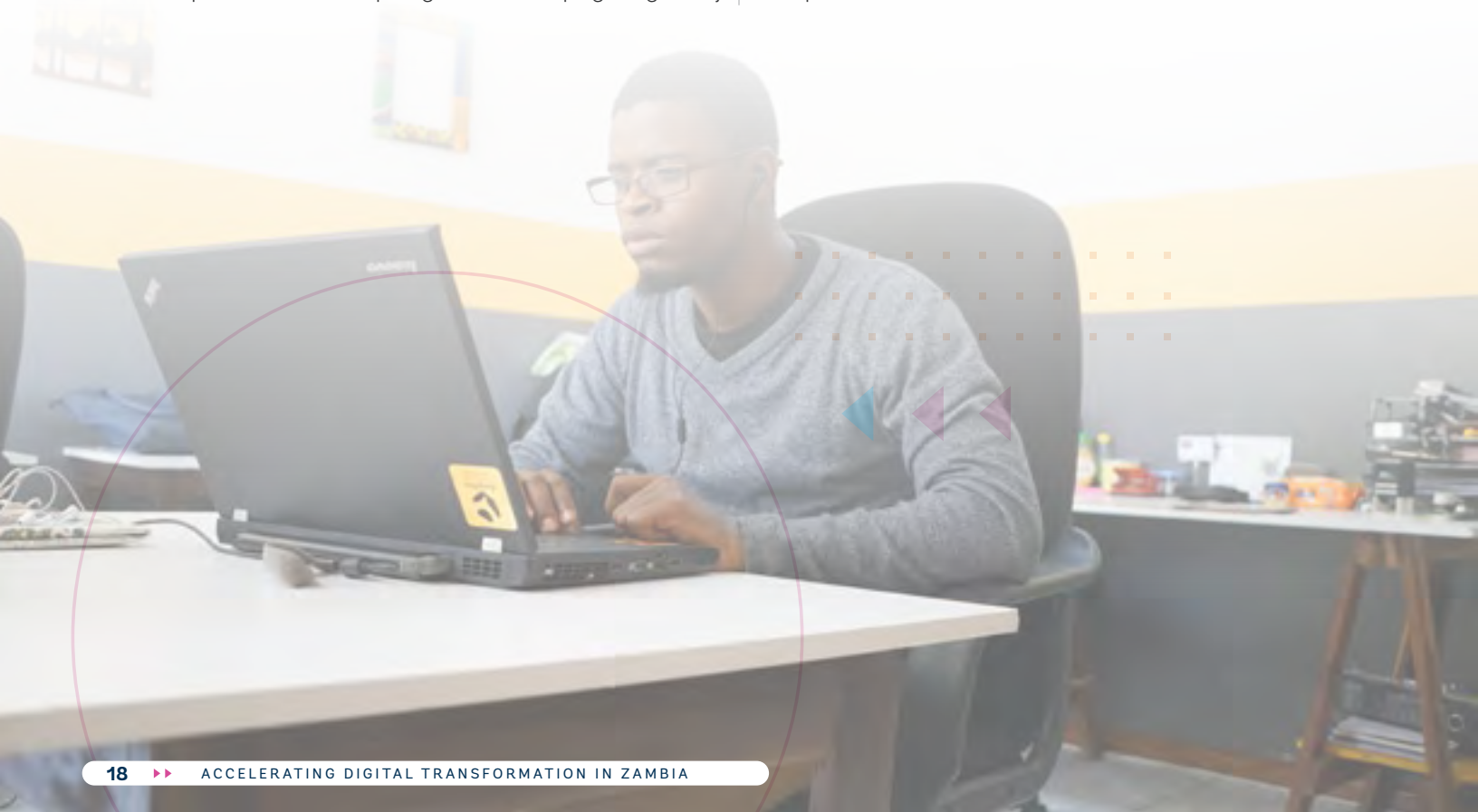
*Reducing government transaction costs and the cost of doing business through digitally optimized government systems.* Initiatives undertaken under this theme will have the most immediate and direct budgetary impact while also promoting private sector activity without much additional fiscal outlay. Priority activities suggested under this theme include (1) developing a government-wide implementation approach to advancing and scaling up digitization of major government payment flows (such as social cash, fertilizer subsidies, school fees, taxes, customs, and licenses), and (2) optimizing and scaling up the e-border management, e-licenses, and public e-procurement systems.

*Improving adoption of innovative digital solutions by enabling entrepreneurship.* Initiatives undertaken under this theme will ensure that the private sector has the capacity to develop innovative solutions to resolve public and private sector challenges. Priority activities suggested under this theme include (1) conducting a regulatory review assessing how tax, labor, and other pertinent regulations affect enterprises at the start-up stage, and developing a regulatory

sandbox for digital innovation that provides digital entrepreneurs with a clearer mechanism for navigating regulatory requirements for innovative products and services; and (2) developing a start-up strategy that includes attention to technology entrepreneurship and that leverages the competency and resources of the Ministries of Higher Education and Commerce, Trade and Industry as well as the private sector and the continental entrepreneurship ecosystem.

*Leveraging data and digital systems to improve sector-specific outcomes in secondary towns and rural areas.* Initiatives undertaken under this theme would focus on the digital transformation of a sector (such as agriculture, education, or health) with the purpose of increasing the effectiveness of public service delivery or increasing productivity and reducing vulnerability. This theme will necessarily draw upon the other three themes, and should be planned spatially to ensure economies of scale and thus increased attractiveness for private sector participation.

While this report provides a suggested prioritization of digital transformation activities, it is recommended that the government create a Digital Transformation Steering Committee to lead the articulation of the digital transformation strategy and implementation matrix. Given that this agenda cannot be achieved by one ministry alone, the committee should have representation from multiple ministries. Relatedly, a dedicated public-private Digital Transformation Advisory Council may be advisable to ensure that the expertise of nongovernmental actors is leveraged in the articulation of the strategy and implementation matrix and to optimize the likelihood that the private sector buys into, and therefore contributes to, implementation.



**PRIORITY DIGITAL TRANSFORMATION ACTIONS**

- 1 Promote greater use of digital technologies in the economy.**

  - **Streamline compliance costs** for connectivity providers, and develop a framework for **PPP investments** in last mile connectivity
  - Strengthen the institutional capacity of government to **protect consumers, data, and critical digital infrastructure**
  - Develop a detailed implementation road map for the **modernization of the ID system**, and implement the same
  - Map **data and skills needs to support evidence-based policy** planning; integrate data collection, accessibility, and analysis into digital government systems planning; and partner with the private sector to implement
  
- 2 Reduce government transaction costs and the cost of doing business through digitally optimized systems**

  - Develop a government-wide implementation approach to **digitize major government payment flows** (social cash, fertilizer subsidies, school fees, tax, customs, and licenses)
  - Optimize and scale the **e-border management, e-licenses, and public e-procurement systems**
  - **Enable data sharing** and compatibility between core government systems starting with enforcing interoperability standards and publishing the API road map
  
- 3 Improve adoption of innovative solutions by enabling digital entrepreneurship.**

  - Conduct a **regulatory review** related to start-ups and develop a regulatory sandbox for digital innovation
  - Develop a **start-up strategy**, including explicit attention to technology entrepreneurship
  - **Invest in PPPs** to seed and scale up programs that build start-up skills, provide startup financing, and link entrepreneurs to regional markets
  
- 4 Leverage data and digital systems to improve sector-specific outcomes in secondary towns and rural areas**

  - Identify two to three priority **sectors for transformation**, agriculture, education, and health
  - Based on current national strategies derive priority challenges to address, engage the digital entrepreneurship community to identify innovative digital transformation solutions that work, and partner with the private sector to replicate and scale them.
  - **Plan spatially** such that economies of scale are achieved, using an integrated approach that takes into account the connectivity, skills, and systems required

**EXPECTED OUTCOMES**


- 

**INCREASED PUBLIC SECTOR EFFICIENCY AND EFFECTIVENESS**
- 


**INCREASED PRIVATE SECTOR PRODUCTIVITY**
- 

**INCREASED PUBLIC AND PRIVATE SECTOR ACCOUNTABILITY**


**7NDP TARGETS**

- 


**REDUCED DEVELOPMENT INEQUALITY**
- 

**ENHANCED HUMAN DEVELOPMENT**
- 

**DIVERSIFIED ECONOMY**
- 

**REDUCED POVERTY AND VULNERABILITY**
- 

**CONDUCTIVE GOVERNANCE**
- MACRO TARGET**



**IMPROVED FISCAL SPACE**

VISION 2030

Note: 7NDP = 7th National Development Plan; API = application programming interface; PPP = public-private partnership.

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CHAPTER

# Introduction

## Zambia's Path toward Inclusive Growth

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Zambia is a strategically located resource-rich country; it borders eight countries and has massive mineral endowments, water and forests, substantial agricultural potential, and sparsely populated land. Zambia's population is about 17.4 million, 45 percent of who are under age 15.<sup>1</sup> The country is therefore one of the world's youngest populations by median age.

Although Zambia achieved lower-middle-income status in 2014, poverty in the country is severe and inequality between urban and poor areas is high. According to the latest available estimates, which date to 2015, 58 percent of the population live on less than \$1.90 per day, and three-quarters of the poor live in rural areas.<sup>2</sup> Zambia ranks 131 out of 157 countries in the 2018 Human Capital Index, reflecting vast human development needs in education and health and in basic infrastructure including water, sanitation, and electricity.

Zambia's impressive economic growth from 2004 to 2014 was largely due to a mining boom. Insufficient productivity growth in agriculture has prevented the sector from laying the foundation for the structural transformation of the economy, and the country is struggling to generate sufficient revenue to cover needed public investments. In the State of the Economy speech in February 2020, the Minister of Finance noted that the government is facing a fiscal deficit of 8.2 percent of GDP, along with a stock of debt of US\$11.2 billion at the end of December 2019 and increasing arrears. More broadly, Zambia is currently ranked 118 out of 137 countries on the 2018 Global Competitiveness Index and has a Country Policy and Institutional Assessment 2018 score of 3.3 out of 6, indicating a significant reform agenda ahead.

1. data.worldbank.org.  
2. data.worldbank.org.

In 2006, Zambia embarked on its first long-term development plan, aimed at becoming a “Prosperous Middle-Income Nation by 2030.” This ambitious plan—referred to as Vision 2030—sets out to pursue a “knowledge-based economy that is fully competitive, dynamic, robust and resilient in an integrated global and liberal environment” (Republic of Zambia, Ministry of National Development 2006, 10). The 7th National Development Plan (7NDP), effective in the period 2017 to 2021, is the fourth plan that pursues the objectives of Vision 2030.

The 7NDP comprises five strategic goals: (1) enhanced economic diversification and job creation, (2) reduced poverty and vulnerability, (3) reduced development inequality, (4) enhanced human development, and (5) conducive governance for a diversified economy.

Zambia can indeed leverage its mining and natural resources, the available agricultural land, the size of surrounding regional markets, and a growing, young population and labor force to achieve its development targets. The World Bank’s Strategic Country Diagnostic published in 2018 suggests the following (World Bank Group 2018):

- More inclusive and sustainable growth can be achieved by (1) improving productivity by enabling better access to markets, land, and technology and reducing the cost of doing business; and (2) enhancing human capital by improving opportunities for the poor through access to markets, better skills, credit, and services.
- Reduced vulnerability of the poor can be achieved by providing transfers to the poor, including subsidies, and minimal health and education services.





# Harnessing Digital Technologies to Achieve Development Targets

The adoption and use of digital technologies provide unprecedented opportunity to increase the productivity and market access of the private sector, increase the efficiency of public expenditures, and enhance the cost-effectiveness of public services.

Reaching the goal of universal and affordable internet coverage with universal penetration of mobile services would raise growth per capita by 2 percentage points per year and reduce the poverty headcount by 1 percentage point per year. When internet coverage is complemented by human capital investments, growth per capita increases by about 5 percentage points while the poverty headcount falls by 2.5 percentage points per year (Choi, Dutz, and Usman 2019). This growth is achieved primarily through productivity gains; in 2017, mobile technologies and services alone generated 7.1 percent of GDP or US\$110 billion in Sub-Saharan Africa, and 50 percent of that value emanated from productivity increases (GSMA 2019). More specifically, African firms using the internet have on average 3.7 times higher labor productivity than nonusers and 35 percent higher total factor productivity (Cirera, Lage, and Sabetti 2016). It also appears that higher internet usage is associated with increased trade: a 10 percent increase in internet use in an exporting country increases the number of products traded between two countries by 1.5 percent (Osnago and Tan 2016). M-PESA—a digital financial service—enabled 185,000 women to move out of subsistence farming and into business or sales occupations (Suri and Jack 2016).

In the public sector domain, it is estimated that developing countries could collectively save roughly 0.9–1.1 percent of GDP, equivalent to US\$220 billion to US\$330 billion annually by introducing digital systems in government that reduce the time and money spent on paperwork and the potential for leakage to occur (IMF 2017). For example, electronic payment cards reduced costs of social transfers in Brazil's conditional cash transfer program, Bolsa Familia, from almost 15 percent to less than 3 percent of total payments (World Bank Group 2014). Evidence from India shows that using smartcards rather than cash for social security payments halved the incidence of demands for bribes (World Bank Group 2014). In Côte d'Ivoire, most secondary school students pay their school fees digitally, virtually eliminating the high levels of theft and bribery that were commonplace (Frydrych, Scharwatt, and Vonthron 2015). Additionally, governments can realize effectiveness gains by increasing the accessibility of data, information, and tools that equip public service

officials such as teachers, health workers, and agricultural extension officers to improve the effectiveness of their services, as well as policy planners to make evidence-based decisions.

African countries have clearly recognized that digital technologies can be harnessed to achieve private and public sector goals:

- In 2015, the African Union adopted Agenda 2063, which aims to increase information and communications technology (ICT) penetration and its contribution to real GDP to double 2013 levels.
- In 2016, 57 percent of countries in Africa provided targeted online services to vulnerable groups.
- From 2014 to 2017, the number of mobile money accounts in Sub-Saharan Africa doubled to 21 percent of all adults.
- In 2018, for the first time, an African city—Lagos—emerged as one of the world's top start-up ecosystems.
- Between 2014 and 2019, entrepreneurship ecosystems, through incubators, accelerators, and tech hubs, grew 10-fold in Africa, numbering more than 400 across the continent today.

Similarly, the aspiration in Zambia's "2030 Vision" is for the country to become an "information and knowledge-based society by 2030," and the 7NDP accordingly includes several digital transformation strategies, including plans to (1) strengthen the legal framework for ICT, (2) improve ICT infrastructure for service delivery, (3) provide electronic services, (4) promote e-business solutions, (5) develop a coordinated innovation and research ecosystem, (6) improve labor productivity through technology, and (7) facilitate innovative technologies skills development.

Although digitization holds much promise, it is important to keep in mind that it is not a substitute for investment in the basics of economic development, notably a favorable business climate, strong human capital, and good governance. Nor can it be taken for granted that digital transformation will have positive inclusion effects without a deliberate effort to ensure that it indeed reduces rather than exacerbates a divide between rich and poor, urban and rural, and men and women. Finally, digitization introduces new risks to consumers, firms, and governments, and will require proactive mitigation. All three aspects are discussed extensively in the World Bank's 2016 World Development Report (see box 1.1).

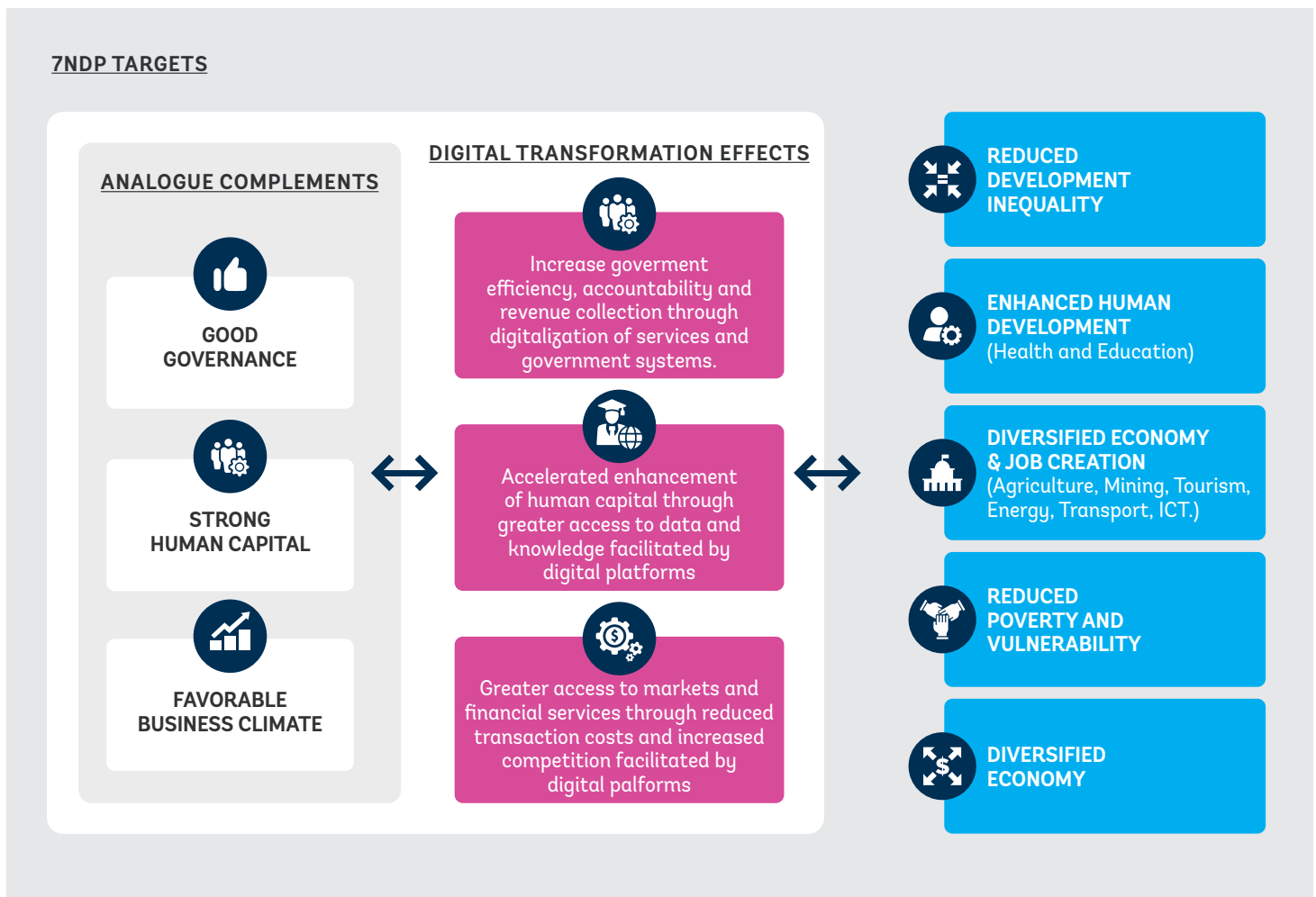
▶▶ **BOX 1.1:**  
**REALIZING THE BENEFITS OF DIGITAL TRANSFORMATION**

In many instances, digital technologies have boosted growth, expanded opportunities, and improved service delivery. Yet their aggregate impact has fallen short and is unevenly distributed. To get the most out of the digital revolution, countries also need to work on the “analog complements,” by strengthening regulations that ensure competition among businesses, by adapting workers’ skills to the demands of the new economy, and by ensuring that institutions are accountable. The triple complements—a favorable business climate, strong human capital, and good governance—will sound familiar, as they should, because they are the foundation of economic development. However, digital technologies add two important dimensions. First, they raise the opportunity cost of not undertaking the necessary reforms. They amplify the impact of good (and bad) policies, so any failure to reform means falling farther behind those who do reform. Second, although digital technologies are no shortcut to development, they can be an enabler and an accelerator by raising the quality of the complements.

Source: World Bank 2016.

As Zambia moves forward with its digital transformation strategy, it is important to ensure that “analog” and digital investments go hand-in-hand. Figure 1.1 illustrates how, on a high level, greater digital transformation can contribute to achieving the 7NDP strategic goals.

▶▶ **FIGURE 1.1:**  
**LEVERAGING DIGITAL TO ACHIEVE THE 7NDP TARGETS**



Source: Original for this report.



# Diagnostic Methodology

The World Bank Group's Digital Economy for Africa: Diagnostic Tool and Guidelines for Task Teams Version 1.0 was the guiding document for this diagnostic. These guidelines were developed and endorsed by a cross-World Bank Group team, representing the Governance, Digital Dividend and Finance, Competitiveness, and Innovation Global Practices of the World Bank and the International Finance Corporation.

The diagnostic tool is organized around five key levers that drive the growth of a digital economy: digital infrastructure, digital skills, digital entrepreneurship, digital platforms, and digital financial services (table 1.1). These levers—or foundations—enable a range of digital transformation opportunities across social sectors such as health and education, and economic sectors such as agriculture, tourism, and manufacturing.



▶▶ **TABLE 1.1:**  
DIGITAL ECONOMY LEVERS



## DIGITAL INFRASTRUCTURE

Digital infrastructure consists of connectivity (such as mobile and internet), the internet of things (such as mobile devices, computers, sensors, and geospatial instruments), and data repositories (such as data centers and clouds).



## DIGITAL SKILLS

Digital skills include (1) user skills for the effective use of ICT tools, systems, and devices; (2) specialist skills to research, develop, design, produce, install, manage, and maintain ICT software and systems; and (3) business skills to be able to identify how digital technologies can create new opportunities or new business models.



## DIGITAL ENTREPRENEURSHIP

Digital entrepreneurship offers new products and services that leverage digital technologies. Digital entrepreneurship can be defined as the process of designing, launching, and running a new business wherein creating or using digital technology is a driver of new value creation.



## DIGITAL PLATFORMS

Digital platforms offer products and services accessible by digital channels. These include government services and systems, as well as commercial platforms offering an array of products and services.



## DIGITAL FINANCIAL SERVICES

Digital financial services provide (1) individuals and households with convenient and affordable digital channels through which to pay, save, borrow, and insure; (2) firms with digital channels through which they can transact with customers and suppliers; and (3) government with digital channels through which to extend or receive payments.

Note: ICT = information and communications technology.

This diagnostic discusses the foundational levers in detail. Although it also touches upon some of the social and sectoral applications, it does not assess them in detail.

The research questions outlined in the diagnostic tool were addressed through the following research methods:

- Review of publicly available studies and data
- Interviews with representatives from the public and private sectors, as well as the cooperating partners, to identify additional studies and data not in the public domain
- Structured interviews and focus groups with public and private sector actors to fill remaining data gaps

It must be noted that the availability of up-to-date, quality data—and in some cases any data at all—was a key challenge for this diagnostic. The team therefore did its best to triangulate data sources and thus derive its findings.

The diagnostic process started with a meeting organized by the Deputy Secretary to the Cabinet convening the Permanent Secretaries of the Ministry of Commerce, Trade and Industry; the Ministry of Transport and Communication; the Ministry of Higher Education; the Ministry of General Education; the Ministry of Home Affairs; the Ministry of National Development Planning; and the Ministry of Finance, along with the heads of SMART Zambia, the Zambia Information and Communication Technology Authority, and the Bank of Zambia.

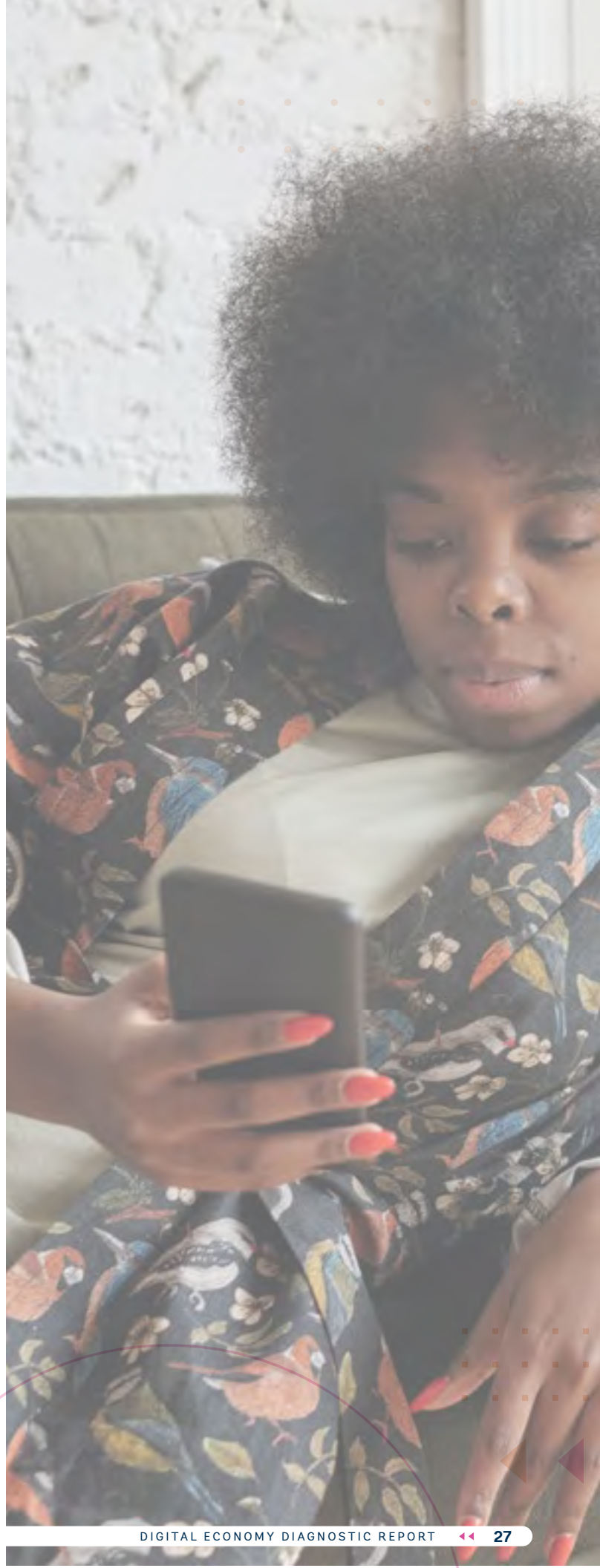
During the meeting, the high-level guiding principles for the diagnostic were agreed on, including the appointment of government focal points in each of the participating bodies referred to above. A World Bank Group Core Team was constituted, comprising specialists from the Finance, Competitiveness and Innovation Global Practice; the Digital Development Global Practice; the Governance Global Practice; the Education Global Practice; and the International Finance Corporation, and a kick-off meeting was held with all the appointed government focal points. In accordance with the research methodology, many one-on-one meetings and focus groups followed. After consultations with more than 100 stakeholders from the public and private sectors, the team presented its high-level findings to the government focal points first, and subsequently to a multistakeholder forum, where more than 50 percent of the attendees were members of the private sector.

Chapters 2–6 of this report outline the achievements Zambia has already made, and the hurdles that remain with regard to each of the digital economy pillars: digital infrastructure, digital skills, digital entrepreneurship, digital platforms, and digital financial services. Following a presentation of the achievements and hurdles, a set of recommendations is provided in each chapter. Chapter 7 summarizes the key findings and provides a set of priority recommendations, taking into consideration Zambia's fiscal situation, development needs, and the current state of each of the digital economy pillars.



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CHAPTER



# Digital Infrastructure

## Definitions and the Importance of Digital Infrastructure

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Digital infrastructure is a core foundation of the digital economy. Broadly, digital infrastructure consists of connectivity (such as high-speed internet and internet exchange points), Internet of Things (such as mobile devices, computers, sensors, voice-activated devices, and geospatial instruments), and data repositories (such as data centers and clouds).

The link between broadband penetration and GDP growth is well established. The International Telecommunications Union (ITU) lists a range of studies that measure the macroeconomic effects of mobile broadband penetration (ITU 2013). The effects vary between countries and periods and range from 0.8 percent to 1.5 percent of additional GDP growth for an increase of 10 percent in mobile broadband penetration. A factor of 1.4 percent additional GDP growth per 10 percent higher broadband penetration applied to the Zambian context would lead to US\$1.9 billion additional GDP over five years (table 2.1).



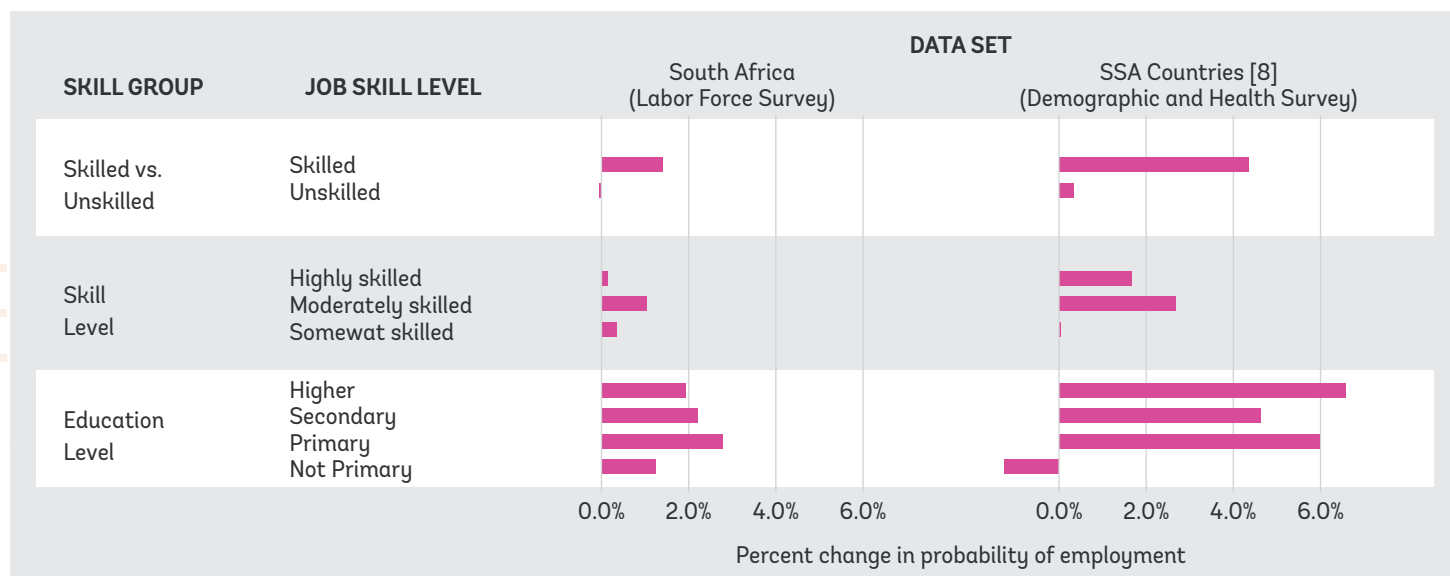
▶▶ **TABLE 2.1:**  
INTERNATIONAL RESULTS ON IMPACT OF A 10 PERCENT  
INCREASE IN BROADBAND PENETRATION ON GDP GROWTH

Authors	Countries	GDP growth (percent)
Czernich and others (2009)	OECD, 1996–2007	0.9–1.5
Koutroumpis (2018)	OECD, 2002–16	0.82–1.40
Qiang and others (2009)	Low-income countries, 1980–2006	1.4
Scott (2012)	Low-income countries, 1980–2011	1.35

An innovative study finds that each 10 percent of additional broadband penetration leads to an increase in employment of between 3.1 and 13.2 percent, depending on the country. Hjort and Poulsen (2019) assess the impact of fast internet on employment in Africa by investigating the impact of submarine cables in countries that did not have access to them before. The study finds that there was a significant and large relative increase in the employment rate in areas where fast internet became available. The increase

in employment ranged between 3.1 percent and 13.2 percent, depending on the country. As illustrated in table 2.2, faster internet increased the employment of workers across educational levels. In 2017, Zambia's labor force stood at 7.1 million. A 3.1 percent increase in employment would mean more than 220,000 new jobs, and a 13.2 percent increase would mean 930,000 additional jobs. These data points illustrate the relative importance of reliable and fast connectivity in today's economy.

▶▶ **TABLE 2.2:**  
FASTER INTERNET ACCESS INCREASED EMPLOYMENT OF WORKERS  
ACROSS EDUCATIONAL LEVELS IN AVAILABLE DATA SETS



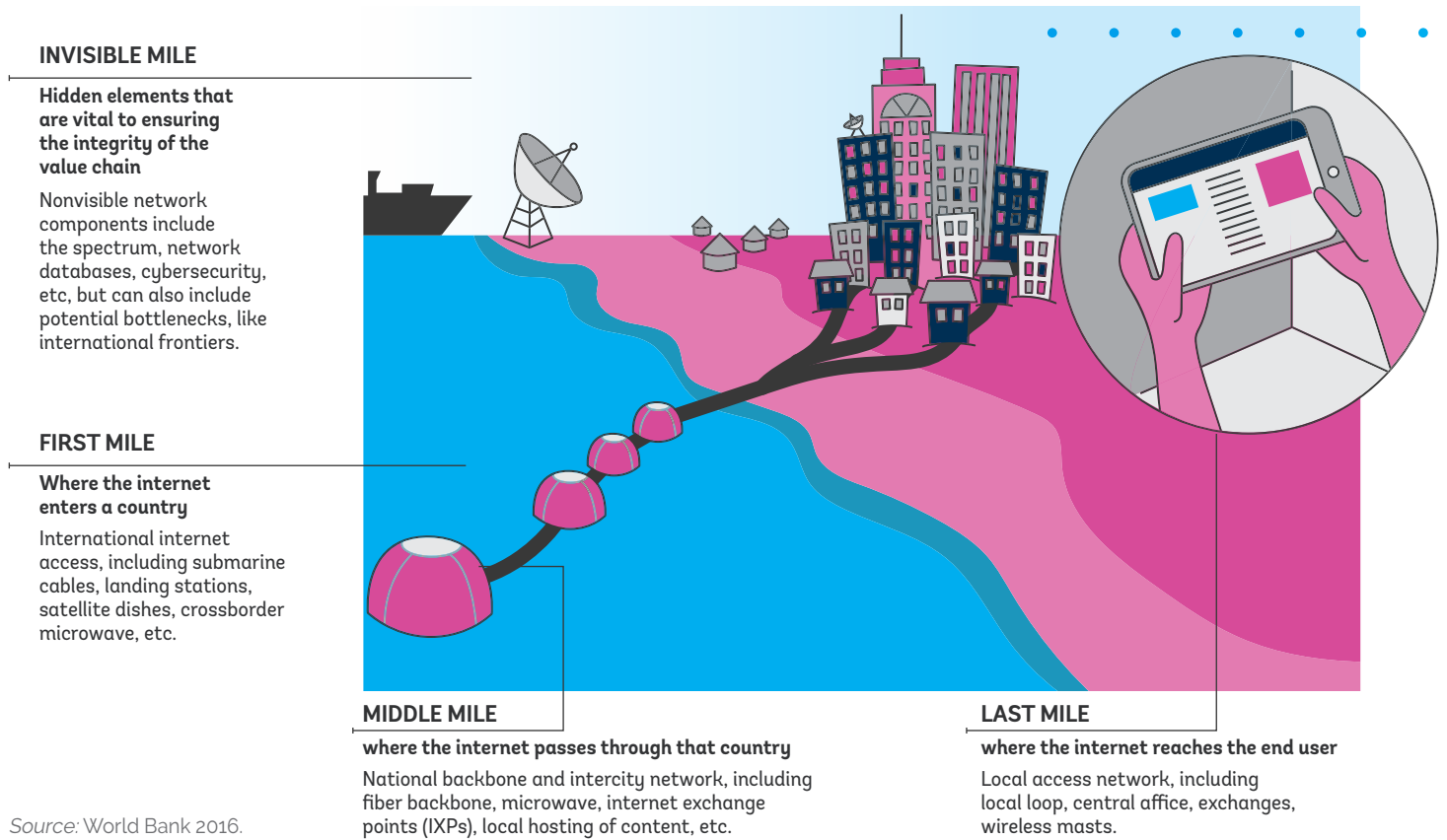
Source: Hjort and Poulsen 2019, table 5 and 6.

The conceptual framework for the analysis of digital infrastructure in this report is based on the 2016 World Development Report, which analyzes the digital infrastructure value chain in four segments: first, middle, last, and invisible mile (World Bank 2016). The internet enters a country (first mile), passes through that country (middle mile) to

reach the end user (last mile) wirelessly or via fiber and copper connections. The invisible mile includes the policy and regulatory factors that affect the performance of the first, middle, and last mile (figure 2.1).



▶▶ **FIGURE 2.1:**  
DIGITAL INFRASTRUCTURE VALUE CHAIN



Source: World Bank 2016.

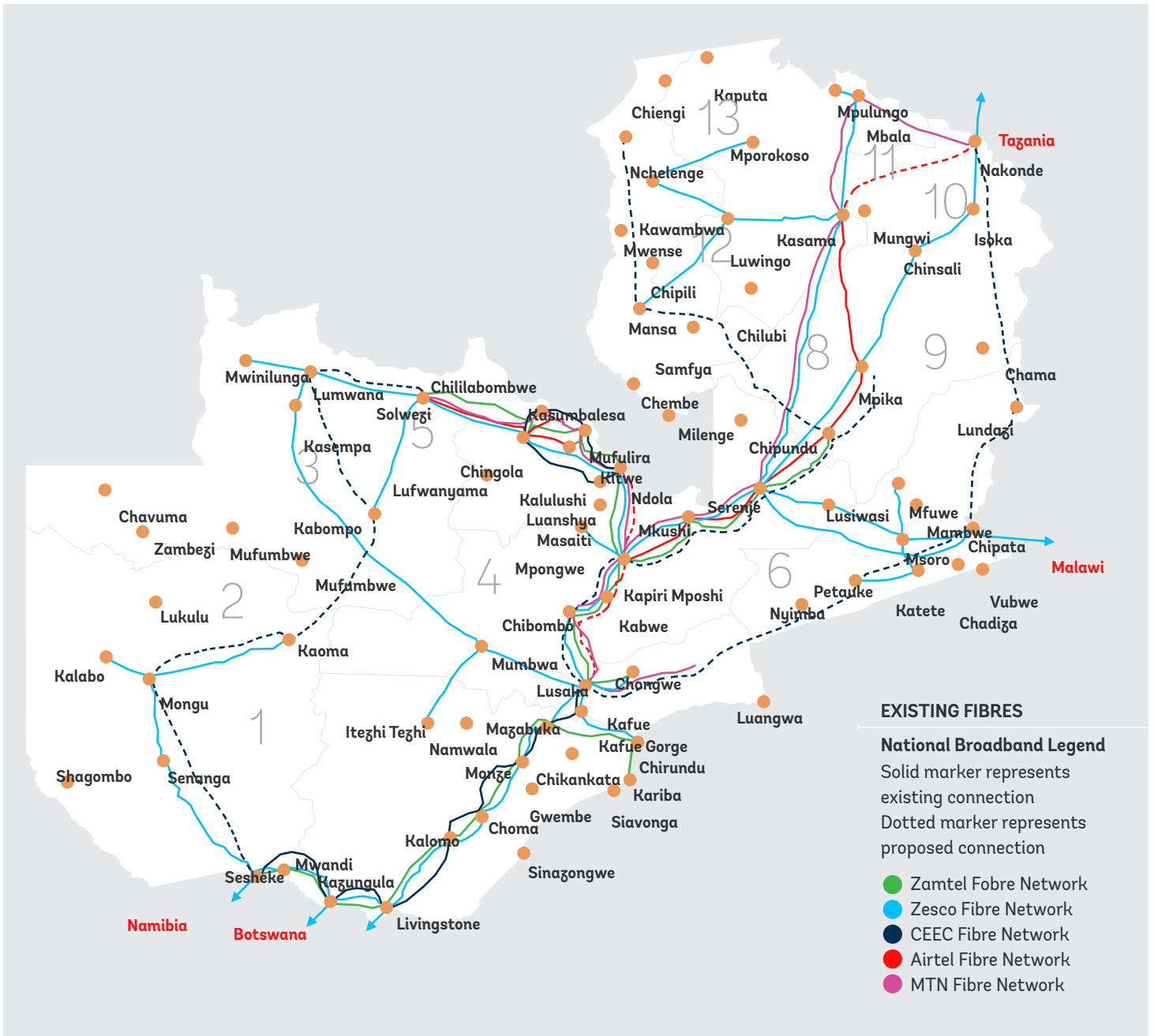
## First and Middle Miles

Zambia is becoming a connecting hub for its eight neighboring countries. FibreCom (a subsidiary of ZESCO) has fiber links to Botswana, Malawi, Namibia, Tanzania, and Zimbabwe. Further links are planned with the Democratic Republic of Congo and Angola. The fiber link to Mozambique is complete on the Zambian side and awaits the connecting link to the border from the Mozambican side. FibreCom prices are not distance but capacity dependent, meaning that bandwidth availability rather than distance determines the cost of connectivity in urban and rural areas, contributing to more affordable data connectivity at the wholesale level. During the consultations conducted for this diagnostic, the internet service providers (ISPs) further indicated that the cost of international bandwidth is not a contributing factor to providing internet services in Zambia.

All provincial centers are linked to the fiber backbones through FibreCom. Additional efforts are underway to link up all district capitals. Out of 116 districts, only 30 had no fiber from either FibreCom or Liquid Telecom Limited. Map 2.1 shows a fiber map combining ZESCO and Liquid Telecom, but does not display the fiber owned by Zamtel, MTN, and others because that information has not been made available to the World Bank team.

National data connectivity via fiber is relatively unreliable in Zambia because of fiber cuts, electricity grid failure, and maintenance issues. Fiber routes are typically duplicated by microwave backhauling for corporate clients so that they have continuous internet connectivity and quality of service, which pushes up the cost of national data connectivity.

▶▶ **MAP 2.1:**  
FIBER MAP



Source: Smart Zambia.

Zambia has, in addition to privately owned data centers, a state-owned Tier 3<sup>3</sup> data center serving public and private organizations. The Zambian National Data Centre is new and state of the art. As of December 2019 it had 82 customers and was operating at 50 percent of its maximum physical space capacity (defined as space available for servers). The Zambian National Data Centre has been designed in such a way that cloud storage capacity can be added quickly for time-sensitive needs. Finally, data centers can play an important role in improving the speed of the online user experience when hosting caches<sup>4</sup> for frequently used online content and media providers such as Google and Facebook.

Zambia has also had its own internet exchange point (IXP)<sup>5</sup> (located at Zamtel) since 2006. IXPs allow ISPs to internet-connect directly to each other, in the process improving quality of service and reducing transmission costs.

3. Tier 3 refers to data centers that have duplicate power sources, network links, and other information technology equipment to keep data safe.

4. "Cache" is a computing capability that stores data so that future requests for that data can be served faster.

5. An IXP is the physical infrastructure through which ISPs and content delivery networks exchange internet traffic between their networks.

See Wikipedia [https://en.wikipedia.org/wiki/Internet\\_exchange\\_point](https://en.wikipedia.org/wiki/Internet_exchange_point).



## Last Mile

This section discusses last mile infrastructure from the perspective of five variables: affordability, access, usage, infrastructure, and competition. While the affordability target of the "price of 1GB mobile

broadband in % of GNP per capita" has been met by one operator, access and usage remain low (table 2.3).

►► **TABLE 2.3:**  
POLICY INDICATORS AGAINST POTENTIAL POLICY TARGETS

Gap	Indicators	Value	Source	Potential policy target	
Affordability	Price of 1 GB mobile prepaid broadband, US\$	1.79	RIS 2019:Q1	n.a.	●
	Price of 1 GB mobile prepaid broadband as a percentage of GNIPC	1.65	RIS 2019:Q1	2	●
Access	Population 15 years and older owning a mobile phone (%)	44.6	ZICTA 2018	90	●
	Population 15 years and older owning a smartphone (%)	13.2	ZICTA 2018	80	●
	Population 15 years and older with access to the internet (%)	14.3	ZICTA 2018	80	●
Usage	Minutes of use per user per month	81	MTN 2018	178 (MTN Rwanda)	●
	MB per month per active data subscriber	1,294	MTN 2018	1,597 (MTN Rwanda)	●
Infrastructure	2G population coverage (%)	93	2018	98	●
	3G population coverage (%)	53	2018	95	●
	4G population coverage (%)	43	2018	70	●
	Percent of districts with fiber	80%	ZESCO	100	●
Competition	HHI	3,595	ZICTA 2018	5,000	●
	MTR, US cents	1.18	ZICTA 2019	1	●
	ICT sector-specific tax (%)	17.5	ZRA 2019	0	●

Note: 2G = second generation; 3G = third generation; 4G = fourth generation; GB = gigabyte; GNIPC = gross national income per capita; HHI = Herfindahl-Hirschman Index; ICT = information and communications technology; MB = megabits; MTR = mobile termination rates; n.a. = not applicable; RIS = Research ICT Solutions; ZICTA = Zambia Information and Communication Technology Authority; ZRA = Zambia Revenue Authority.



Zambia's mobile end-user access is also low in comparison with neighboring countries. Zambia compares favorably with Botswana, Namibia, South Africa, Tanzania, and Uganda on affordability and competition but poorly on access, usage, and infrastructure (figures 2.2 and 2.3). Each variable is discussed in further detail in this chapter.

►► **FIGURE 2.2:**  
BENCHMARKING LAST MILE INDICATORS AGAINST SELECTED AFRICAN COUNTRIES

<b>ZAMBIA</b>		<b>BENCHMARK: Botswana / Namibia / South Africa / Tanzania / Uganda</b>						
<b>AFFORDABILITY</b>	<b>Country-level Indicator</b>	<b>Traffic Light</b>			<b>Comparison Average</b>	<b>Source</b>	<b>Graph</b>	
	Mobile prepaid voice basket (USD)	2.82	●	●	●	3.79	RIS Q4_2019	
	Mobile prepaid voice basket (USD) largest operator	3.11	●	●	●	4.81	RIS Q4_2019	
	Mobile prepaid 1GB basket (USD)	1.55	●	●	●	2.28	RIS Q4_2019	
	Mobile prepaid 1GB (USD) largest operator	3.62	●	●	●	6.17	RIS Q4_2019	
	Effective price (USD)	-	●	●	●	0.004	GSMA Q4_2019	
<b>ACCESS</b>	<b>Country-level Indicator</b>	<b>Traffic Light</b>			<b>Comparison Average</b>	<b>Source</b>	<b>Graph</b>	
	Active SIM cards per 100 inhabitants	78.61	●	●	●	102.41	ITU June 2019 (2018 data)	
	Mobile internet users per 100 inhabitants	27.53	●	●	●	32.36	GSMA Q4_2019	
	Mobile broadband connections per 100 inhabitants	41.94	●	●	●	69.37	GSMA Q4_2019	
	Land-lines per 100 inhabitants	0.59	●	●	●	3.6	ITU June 2019 (2018 data)	
<b>USAGE</b>	<b>Country-level Indicator</b>	<b>Traffic Light</b>			<b>Comparison Average</b>	<b>Source</b>	<b>Graph</b>	
	Average revenue per user in USD (Blended ARPU)	2.35	●	●	●	4.4	GSMA Q4_2019	
	Minutes of Use (MOU) per active SIM	-	●	●	●	0	GSMA Q4_2019	
	Mobile Data traffic per active SIM	379.53	●	●	●	212.36	GSMA Q4_2019	
	Facebook users per 100 inhabitants	12.4%	●	●	●	21%	Facebook May 2019	
	M2M connections per 100 inhabitants	0.9	●	●	●	6.34	GSMA Q4_2019	
<b>INFRASTRUCTURE</b>	<b>Country-level Indicator</b>	<b>Traffic Light</b>			<b>Comparison Average</b>	<b>Source</b>	<b>Graph</b>	
	International bandwidth per user (kbps)	3.92	●	●	●	50	ITU June 2019 (2018 data)	
	% Population covered by 3G signal	53%	●	●	●	73.1%	ITU June 2019 (2018 data)	
	% Population covered by 4G signal	43.4%	●	●	●	42.5%	ITU June 2019 (2018 data)	
	Connections per Base stations	38	●	●	●	37	GSMA Q4_2019	
	Country level investment per subscriber in USD	1.27	●	●	●	2.19	GSMA Q4_2019	
<b>COMPETITION</b>	<b>Country-level Indicator</b>	<b>Traffic Light</b>			<b>Comparison Average</b>	<b>Source</b>	<b>Graph</b>	
	Market concentration (HHI)	3,645	●	●	●	4,181	GSMA Q4_2019	
	Number of Mobile Operators (excluding MVNO)	4	●	●	●	5.33	GSMA Q4_2019	
	Market share of largest mobile operators	43.3%	●	●	●	50.9%	GSMA Q4_2019	
	Highest MNO EBITDA Margin in country	34.8%	●	●	●	41.4%	GSMA Q4_2019	
	Interconnection: Mobile Termination Rates (US ¢)	2.45	●	●	●	2.65	TMG 2015	
	Mobile-specific taxes / TCMO	17.5%	●	●	●	8.3%	GSMA 2016 (2014 data)	

Source: USAID Research ICT Solutions diagnostic tool 2019.

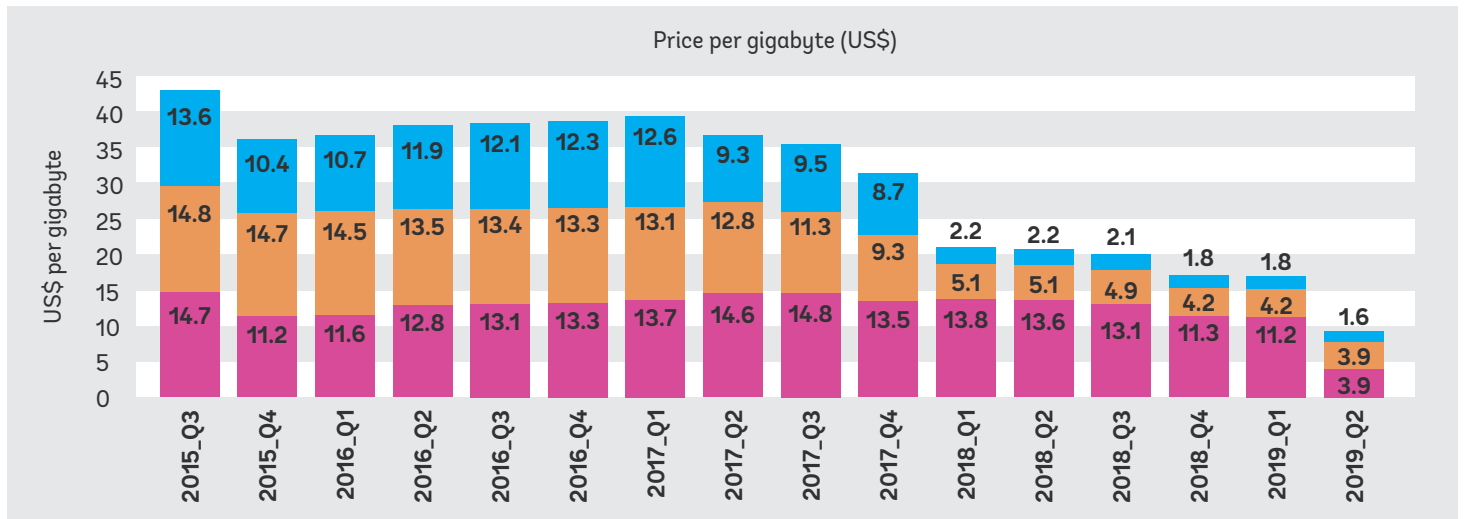
Note: 3G = third generation; 4G = fourth generation; ARPU = average revenue per user; EBITDA = earnings before interest, taxes, depreciation, and amortization; GB = gigabytes; GSMA = GSM Association; HHI = Herfindahl-Hirschman Index; ITU = International Telecommunications Union; MNO = Mobile Network Operator; MOU = minutes of use; RIS = Research ICT Solutions; SIM = subscriber identification module; TCMO = Total cost of Mobile Ownership; USD = US dollar.

## AFFORDABILITY

In 2018, the threat of a new provider rattled the incumbents and led to lower end-user prices. UZI Zambia was awarded a license by ZICTA in March 2018, which led to MTN and Zamtel lowering their data prices. Zamtel has the cheapest prices in Zambia (figure 2.3),

but its network is not yet as extensive as MTN's and Airtel's, and thus only a few people benefited from the lower prices. One gigabyte per month prepaid usage of data on MTN or Airtel was more than double the price of Zamtel in the fourth quarter of 2019.

►► **FIGURE 2.3:**  
CHEAPEST PRICES FOR 1 GIGABYTE PREPAID MOBILE BROADBAND, US\$



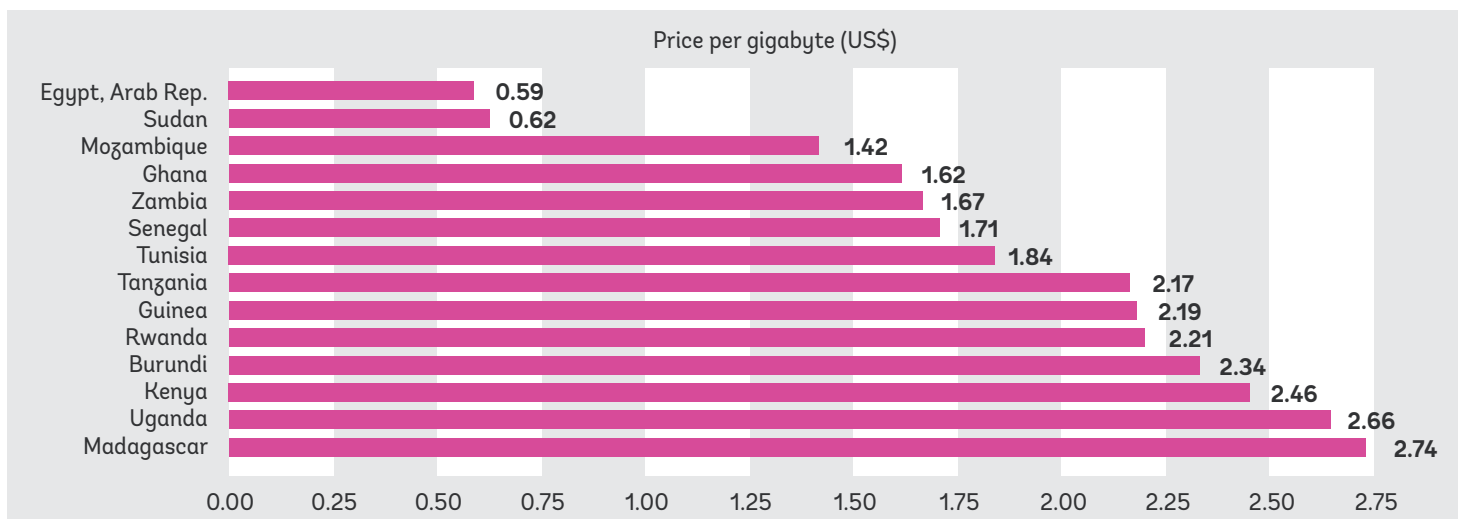
Source: Research ICT Solutions.

● Zamtel ● MTN ● Airtel

When comparing the cheapest available broadband price, Zambia compares well to other Sub-Saharan African countries. In the fourth quarter of 2019, Zambia's cheapest broadband rate (provided by Zamtel) was the sixth cheapest in Africa, on par with Ghana (figure 2.4). However, only 22 percent of the population participating in the 2018 ZICTA survey indicated they subscribed to Zamtel, whereas

73.4 percent subscribed to Airtel and 69.6 percent to MTN. The main reasons cited for preference of one mobile network over the other were avoiding cross-network calls by being on the same network as friends and better quality of service. Quality of service and price are thus both important consumer considerations.

►► **FIGURE 2.4:**  
CHEAPEST PRICES FOR 1 GIGABYTE PREPAID MOBILE BROADBAND, US\$



Source: Research ICT Solutions.

As discussed below, the high cost of devices compared with average income levels is a likely explanation for low mobile phone and smartphone ownership rates.

## ACCESS AND USAGE

The Smart Zambia e-Government Master Plan sets ambitious targets for increasing access and usage of mobile and the internet (Republic of Zambia, Office of the President 2018). By 2021, Zambia endeavors to achieve a mobile subscription rate of 100 percent of the Zambian population, and an internet subscription rate of 60 percent.

The number of mobile and broadband subscribers has also increased consistently since, as have revenues from voice and short message service (SMS) traffic, except for 2019. In 2019 SMS and outgoing minutes per subscriber increased because of increased competition between the three national mobile operators and the anticipation of a fourth operator entering the market<sup>6</sup> (table 2.4 and figure 2.5).

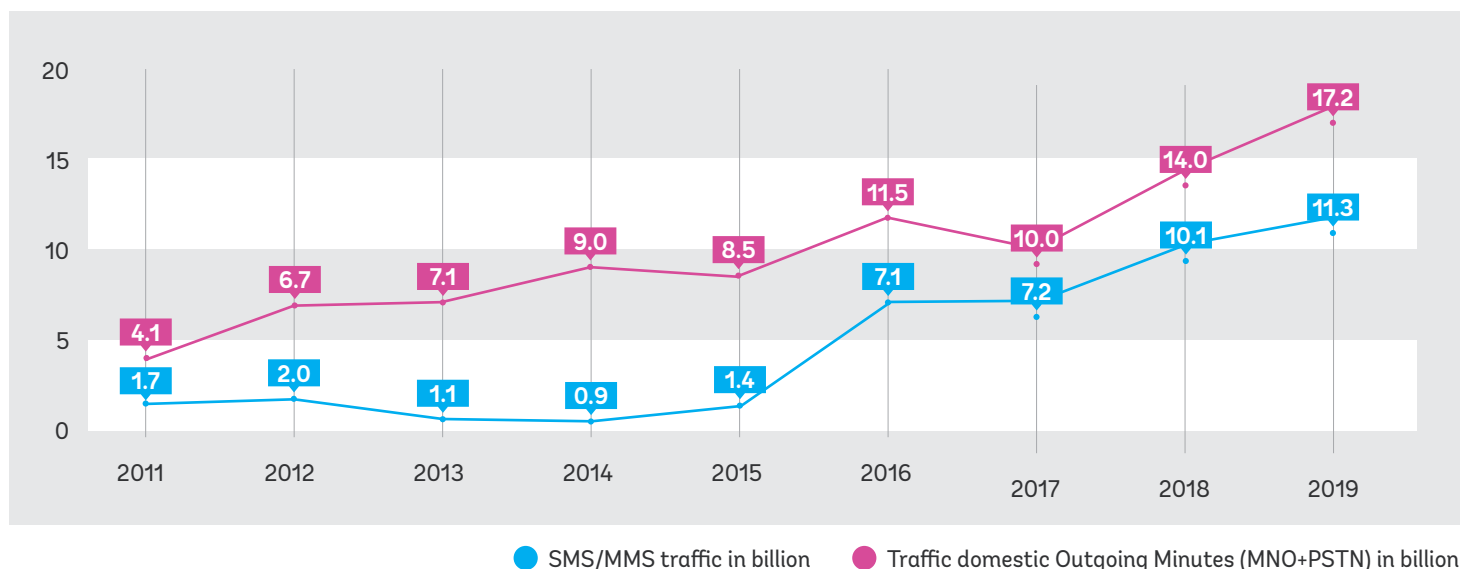
▶▶ **TABLE 2.4:**  
DIGITAL INFRASTRUCTURE USE AND REVENUES, 2013–19

	2013	2014	2015	2016	2017	2018	2019
Revenue (million kwacha)	3,155	4,113	4,527	4,371	4,767	5,324	4,625
ARPU (kwacha)	303	407	392	364	355	344	269
Domestic incoming minutes (MNO+PSTN) (million)	546	1,251	1,620	1,089	1,614	2,031	2,141
Domestic outgoing minutes (MNO+PSTN) (million)	7,132	9,008	8,503	11,500	9,967	13,976	17,227
SMS (million)	1,085	893	1,409	7,070	7,228	10,060	11,271
Minutes of use (monthly)	63	87	74	88	72	87	94
SMS per subscriber per month	9	7	10	49	45	54	55
Outgoing minutes per subscriber per month	57	74	61	80	62	75	83

Source: ZICTA Operators Statistics website (<http://onlinesystems.zicta.zm:8585/statsfinal/ICT%20Indicators.html>).

Note: ARPU = average revenue per user; MNO = mobile network operator; PSTN = public switching telephone network; SMS = short message service.

▶▶ **FIGURE 2.5:**  
TRAFFIC, 2011–19



Source: ZICTA Operators Statistics website (<http://onlinesystems.zicta.zm:8585/statsfinal/ICT%20Indicators.html>).

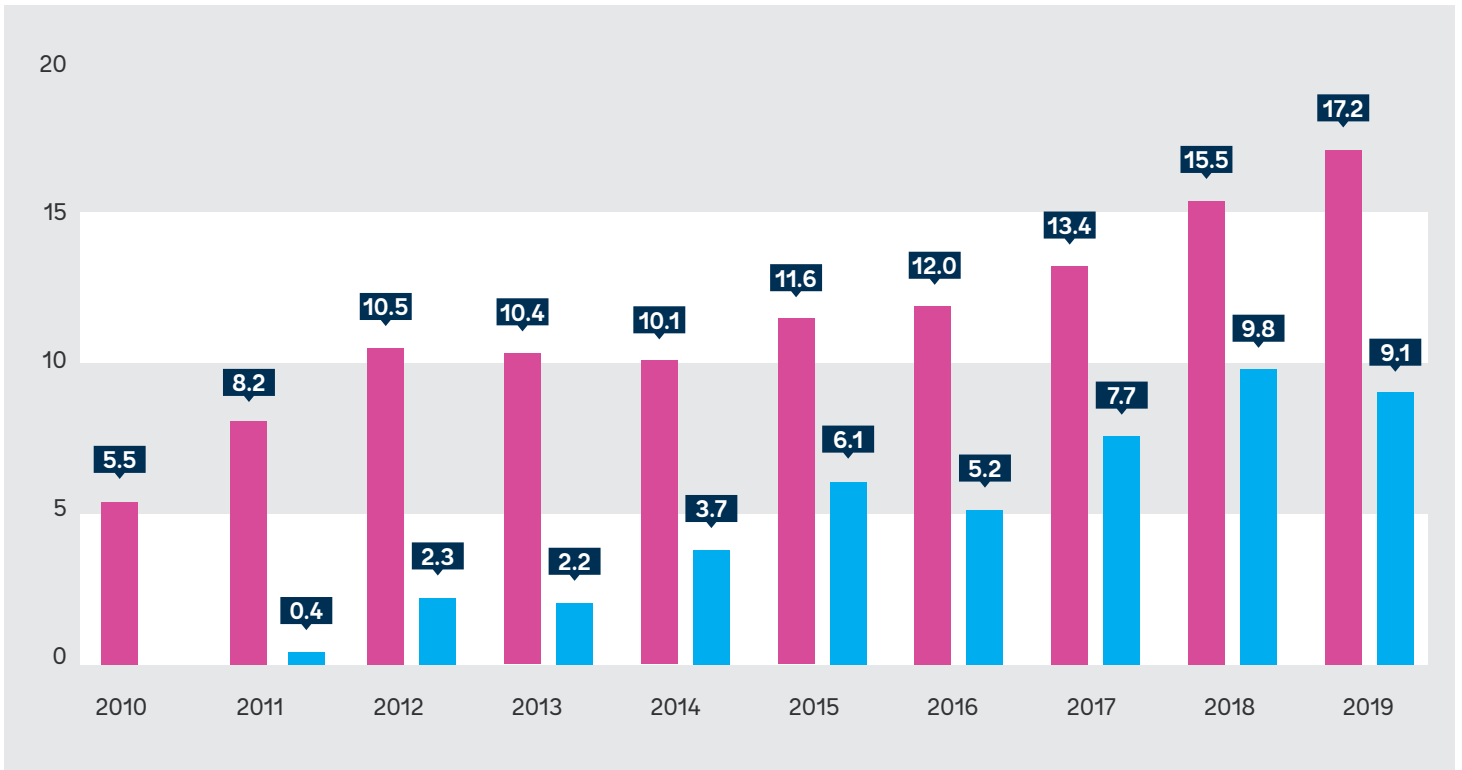
Note: MMS = monitoring management system [IAQ: This is the definition of MMS from the Abbreviations section in the front matter. Is it correct? Or should it be "multimedia messaging service"?]; MNO = mobile network operator; PSTN = public switching telephone network; SMS = short message service.

Finally, SIM card penetration and broadband usage increased consistently. In 2019, 2 million SIM cards were added to the Zambian

economy. The number of broadband SIM cards also went up by 2 million in 2018, but dropped by 700,000 in 2019 (figure 2.6).

6. UZI Zambia Limited was licensed in March 2018 but had not started operation by September 2019 (ZICTA, 2019. "List of licensed electronic communication operators." Public Notice).

▶▶ **FIGURE 2.6:**  
ACTIVE SIM CARDS AND BROADBAND USERS



Source: ZICTA Operators Statistics website  
(<http://onlinesystems.zicta.zm:8585/statsfinal/ICT%20Indicators.html>).


● Active SIM Cards (millions) ● Mobile broadband SIM Cards

In 2018, more than 50 percent of the population had used a mobile phone in the past three months and 45 percent owned a mobile phone. However, there are stark differences in mobile ownership and usage between rural and urban populations; 71 percent of the urban

population used a mobile phone, but only 42 percent of the rural population did so. Similarly, mobile phone ownership is 62.5 percent in urban areas and 33 percent in rural areas (table 2.5), and internet use is 28.1 percent in urban areas but only 5 percent in rural areas.



►► **TABLE 2.5:**  
KEY MOBILE INDICATORS FROM THE ZICTA ICT SURVEY OF 2018

		Zambians Age 10 and Older					
		That used a mobile phone in the past three months	That own a mobile phone	That own a smartphone	Use of over the top applications		
					Messaging	Video calling	Voice calling
<b>ZAMBIA</b>		53.5	44.6	13.2	11.5	5.9	9.7
<b>PROVINCE</b>	Central	50.6	40.7	9.7	8.7	2.9	8.6
	Copperbelt	69.1	56.0	19.2	16.5	8.8	14.2
	Eastern	43.9	35.2	5.2	4.3	1.9	3.6
	Luapula	44.0	32.0	8.8	8.0	3.6	5.5
	Lusaka	72.7	66.7	28.3	24.7	15.6	22.0
	Muchinga	40.9	34.8	7.3	6.6	3.6	5.7
	Northern	34.4	28.7	4.0	3.0	1.0	2.4
	North Western	36.7	32.1	7.9	6.1	2.3	4.6
	Southern	60.6	52.4	16.8	15.2	6.2	10.9
	Western	45.1	30.3	3.9	3.5	1.1	2.6
<b>REGION</b>	Rural	42.1	33.0	4.7	3.9	1.3	3.0
	Urban	71.0	62.5	26.3	23.2	12.9	19.9
<b>SEX</b>	Male	56.9	49.2	14.3	12.8	6.3	10.5
	Female	50.9	41.1	12.4	10.6	5.6	9.0

Source: ZICTA 2018.


Note: ICT = information and communications technology.

There are consistent gender disparities in access to digital infrastructure. For example, access to the internet in Zambia is very low at 14.3 percent. For women, it is even lower at 12 percent, while for men it is 17 percent (table 2.6). Mobile use, as well as mobile and smartphone ownership among women, is also lower than for men.

There is a need to better understand why women have consistently lower access to digital infrastructure than men, and to identify appropriate measures to bridge the gender gap. Zambia has a universal service and access fund that potentially could be used for this purpose.



►► **TABLE 2.6:**  
KEY INTERNET USAGE INDICATORS FROM THE ZICTA ICT SURVEY OF 2018

		Zambians Age 10 and Older			
		That ever used the internet	That use the internet at least once a day	That have an email address	That have any social media account
<b>ZAMBIA</b>		14.3	6.9	7.3	11.2
<b>PROVINCE</b>	Central	10.2	3.4	4.3	8.3
	Copperbelt	19.4	9.2	11.3	16.5
	Eastern	6.2	3.0	2.6	4.7
	Luapula	10.0	4.8	7.0	8.3
	Lusaka	30.3	17.6	14.8	25.2
	Muchinga	10.2	3.8	5.1	8.1
	Northern	4.0	1.6	2.0	3.3
	North Western	9.3	4.1	4.2	5.8
	Southern	17.7	7.1	8.7	10.7
	Western	5.0	2.7	3.5	4.2
<b>REGION</b>	Rural	5.2	1.8	2.4	3.7
	Urban	28.1	14.8	14.8	22.7
<b>SEX</b>	Male	17.3	8.3	9.1	13.1
	Female	12.0	5.9	5.9	9.7

Source: ZICTA 2018.

Note: ICT = information and communications technology.

While internet use in general is low, regular internet use is even lower. According to the 2018 ZICTA survey, of Zambians 10 years or older in rural areas, only 5.2 percent used the internet and only 1.8 percent used the internet daily. In Northern province, only 4 percent of Zambians 10 years or older ever used the internet and only 1.6 percent used it daily. Only half of internet users have an email address but most use social media. The low internet usage in the rural areas in particular, and in Northern and Western provinces, means that IP-based government-to-person services will remain unviable in these areas for the near future, until these last mile connectivity challenges have been resolved.<sup>7</sup>

As mentioned, Zambians are price sensitive. Since the price reductions in 2018 (figure 2.3), MTN's active broadband subscribers increased by 43 percent, twice as fast as the growth of general mobile subscribers. Mobile money subscribers increased by 65 percent from the first quarter of 2018 through the second quarter of 2019 (table 2.7). This is an important illustration of the price sensitivity of Zambian consumers, a factor that should be taken into account when determining the appropriate levels of taxes and duties on the information and communications technology (ICT) sector.

►► **TABLE 2.7:**  
MTN ZAMBIA'S SUBSCRIBER NUMBERS

	2018:Q1	2018:Q2	2018:Q3	2018:Q4	2019:Q1	2019:Q2	Period growth (%)
Mobile subscribers (thousands)	5,638	5,747	6,052	6,459	6,381	6,751	19.7
Active data subscribers (thousands)	1,425	1,515	1,703	1,856	1,961	2,031	42.5
Mobile money subscribers (thousands)	1,040	1,199	1,400	1,595	1,709	1,718	65.2

Source: MTN Investor Relations.

7. The data on the number of internet users provided by the operators and by the ZICTA survey do not align. While the ZICTA survey estimates 1.7 million internet users, MTN estimates 5.2 million data users. The ZICTA survey may underestimate the actual number of users because of the sampling protocol used for the survey. The survey only counts "household members aged 10 years and above that were present at the time of interview in the selected households." Enumerators typically approach households during the daytime, which means that people who were at work were systematically excluded from participating in the survey. Conversely, the MTN statistics likely overestimate the number of internet users; many mobile phone internet users may have more than one SIM card. Nevertheless, tables 2.5 and 2.6 provide a good illustration of the relative level of access and usage across provinces, gender, and rural and urban space.

## INFRASTRUCTURE

Zambia's mobile operators have expanded their broadband network coverage, but Zambia still lags behind leading countries in Sub-Saharan Africa. While 4G-only sites increased by 5 percent between 2016 and 2019, the number of sites that offer 2G, 3G, and 4G simultaneously increased by more than 800 percent (table 2.8), mostly because 3G sites were upgraded to 4G using triple-band antennae. Compared with South Africa, Botswana, Namibia, Uganda,

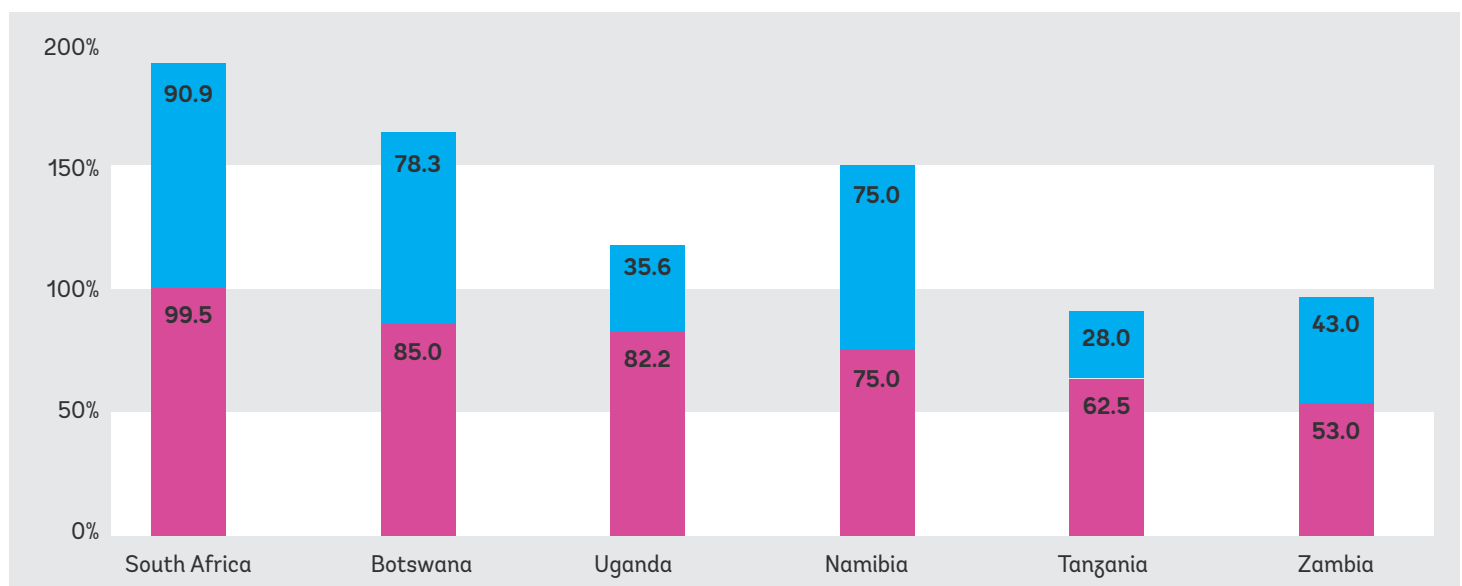
and Tanzania, Zambia has the lowest 3G coverage (figure 2.7). Regarding 4G coverage, Zambia lags behind South Africa, Botswana, and Namibia. For internet protocol-based interactions, such as e-government or e-health, 2.5G or better coverage is required. Where only 2G coverage is available, interactions are limited to voice, interactive voice response, SMS, and unstructured supplementary service data.

►► **TABLE 2.8:**  
AGGREGATED MOBILE NETWORK

	2016	2017	2018	2019	Change, 2016–19
Number of 2G sites	2,697	2,990	3,412	5,081	88
Number of 2G/3G sites	2,354	2,141	2,727	2,906	23
Number of 4G sites	192	254	254	202	5
Number of 2G/3G/4G sites	254	803	1,212	2,316	812
Total 4G	446	1,057	1,466	2,518	465

Source: ZICTA Operators Statistics website (<http://onlinesystems.zicta.zm:8585/statsfinal/ICT%20Indicators.html>).  
Note: 2G = second generation; 3G = third generation; 4G = fourth generation.

►► **FIGURE 2.7:**  
POPULATION COVERAGE COMPARISON



Source: GSMA Intelligence database; ZICTA 2018.

● 3G Population Coverage ● 4G Population Coverage

The government is making significant investments in the mobile network. Map 2.2 provides an overview of current mobile coverage in Zambia. A national fiber backbone is being created, with the aim of installing 1,009 towers in rural areas using Chinese financing. According to the Ministry of Transport and Communication, as of the end of 2019, 722 towers had been erected and out of this, 655 towers

were functional and on air. The rollout is thus on schedule and the ministry expects that it will be completed by the end of the second quarter of 2020. However, the breakeven point for this investment may be difficult to reach unless it is accompanied by initiatives to reduce the cost of access devices, such as smartphones, as well as the cost of internet access, which will drive usage.



▶▶ **MAP 2.2:**  
**MOBILE COVERAGE**



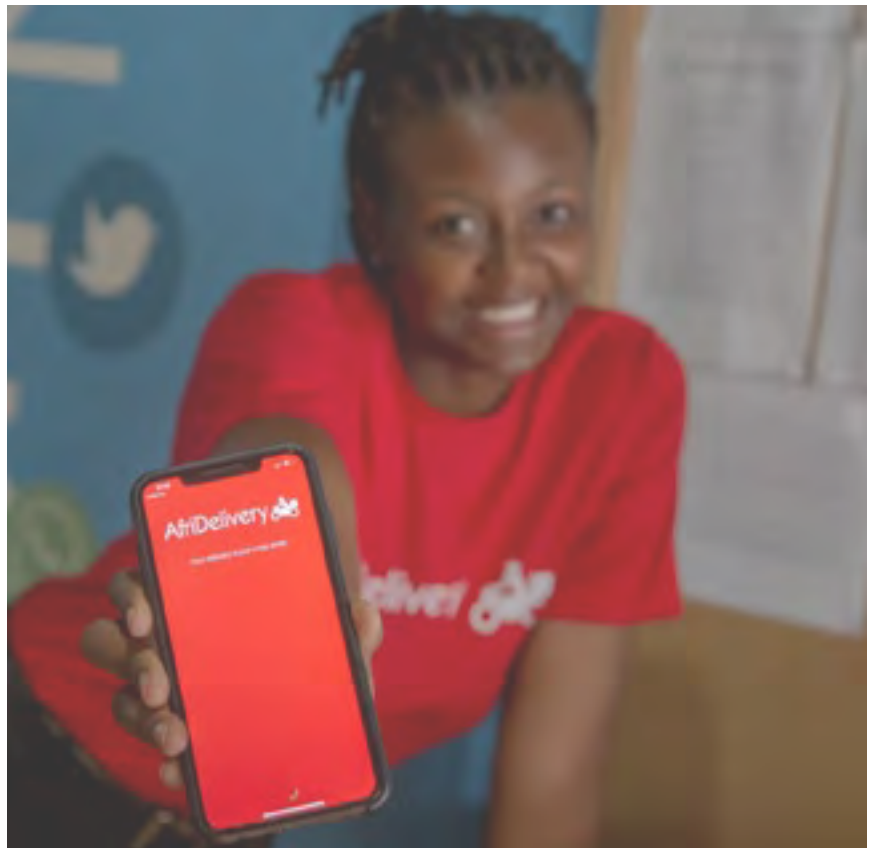
Source: Research ICT Solutions via Carto.com 2G-4G coverage map.  
See <https://usaid.carto.com/builder/9dcc4cbc-fc94-11e5-a3c7-0e31c9be1b51/embed>.  
Note: 2G = second generation; 3G = third generation; 4G = fourth generation.

● 2G ● 3G ● 4G

## COMPETITION

Zambia scores favorably on competition measures. There are three operational national mobile operators, 17 active ISPs, and competition in the first and middle miles, which is typically sufficient to maintain a competitive ICT sector. Furthermore, both Fibrecom and Liquid Telecom are operating their networks on open access principles<sup>8</sup> as prescribed in the 2013 ICT Access Regulations. These regulations promote (1) infrastructure sharing and co-location of equipment, thus encouraging sector players to expand their networks and meet coverage demands; and (2) interconnection between operators, thus improving user benefit.

ICT sector-specific taxes need to be reviewed. As discussed in further detail later in this chapter, it appears that different categories of providers of the same service are taxed differently, providing one category of providers with a competitive advantage over another. This should be reviewed to ensure a level playing field.



8. "Open access principles" typically mean that all suppliers are able to obtain access to network facilities on equal terms.

# Invisible Mile

The invisible mile contains soft or hidden issues that affect infrastructure rollout. These issues include policies, laws, and regulations and their implementation.

Several ICT laws are being prepared, and the 2006 ICT Policy is currently under review. Proposed new legislation includes a cybersecurity bill, an electronic communications bill, and a data protection bill. None of these had been introduced to Parliament by April 2020.<sup>9</sup>

## LICENSING FEES

The "National" and "International" license categories should be combined. According to the 2017 licensing guidelines currently in effect, ZICTA has three types of licenses: (1) Network License, (2) Service (With Network) License, and (3) Service (Without Network) License. Each of these licenses has a geographic component and can be categorized as either International, National, Provincial, or District. While mobile operators have international licenses, internet service providers typically only get national licenses, restricting their ability to serve customers across borders. Liquid Telecom, for example, operates across several countries. The distinction between the National and International license categories inhibits competition if international licenses are not widely issued, which seems to be the case. With an integrated global internet value chain, this distinction artificially segments the market.

ZICTA's license fees are high and not service neutral. Mobile operators fall into the "Holders of a Network License" category and have to pay a license fee of 1.5 percent of gross annual turnover. However, holders of the other service licenses are charged 3 percent. A uniform license fee would reduce competitive distortions (ZICTA 2017).

## TAXATION

The tax regime on digital infrastructure and services needs to be reviewed. Discussions with ISPs, mobile network operators, and other digital infrastructure and service providers indicate that the level of taxes and levies charged prevent increased investments.

Connectivity providers pay a wide number of different taxes and related fees around the world. These charges can be broadly categorized as "generic," and thus applicable to any business operating in a country, and "sector specific" and related to the unique characteristics of the telecommunications sector (table 2.9).

►► **TABLE 2.9:**  
TYPES OF TAXES AND FEES APPLICABLE TO  
THE TELECOMMUNICATION SECTOR

Generic	Sector specific
<ul style="list-style-type: none"><li>• Corporate income taxes</li><li>• Customs duties</li><li>• Social security taxes</li><li>• Value added tax</li></ul>	<ul style="list-style-type: none"><li>• Ongoing regulatory fees</li><li>• One-off license fees</li><li>• Resource fees (for example, for spectrum, numbering, rights of way)</li><li>• Universal service contributions</li><li>• Excises (on domestic calls, international calls, handsets, connection fees)</li><li>• Elevated customs duties (operator equipment, handsets)</li></ul>

Source: Petit and Matheson 2017.

The existence and rates of the different taxes and charges vary by country.

In Zambia, the corporate income tax rate in the ICT sector can reach 40 percent. The general corporate income tax rate across sectors is 35 percent. However, telecommunication companies pay 35 percent for the first 250,000 Zambian kwacha, but 40 percent for turnover higher than 250,000 Zambian kwacha (Zambia Revenue Authority 2019). There is no clear economic rationale for applying a higher tax on ICT than on other sectors, particularly given ICT's enabling effect on other sectors and its utility for public sector service delivery.

Import duties on ICT hardware are partially zero-rated. For example, routers are zero-rated but switches are not. This disparity could be reviewed to ensure consistency.

The 2010 amendment to the excise duty of 17.5 percent means that bandwidth provisioning to end users is also included.<sup>10</sup> The Zambia Revenue Authority (ZRA) informed the Internet Service Providers Association of Zambia, at a meeting held on July 18, 2018, that the excise duty on the sale of airtime and bandwidth provisioning has been payable from January 1, 2011. ISPs are thus required to backpay these duties, which will increase the wholesale price for backhauling and the retail price for fiber-based end-user connectivity (leased line and metro ethernet). The excise duty thus not only increases retail prices for mobile voice, SMS, and data directly, but also indirectly through increasing input costs, leading to a cascading tax burden. The airtime excise duty makes up about 0.6 percent of total tax revenues. There are two important considerations here: First, should there be an excise duty on air time, and if so at what rate? Second, when changes are made to taxes and levies, what effect does the requirement of backpaying have on the bottom line and the investor confidence of the connectivity providers?

9. <http://www.parliament.gov.zm/publications/all-bills>.

10. The Customs and Excise (Amendment) Act No. 47 of 2010 amended the Customs and Excise Act and came into operation on January 1, 2011 (Republic of Zambia 2010).

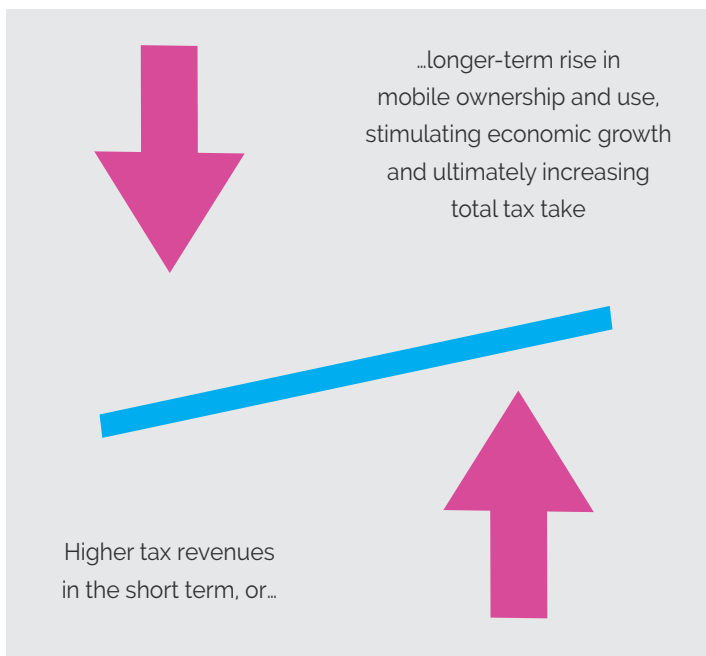
## Recommendations

Zambia has made significant investments in digital infrastructure since 2014. As a result, all provincial centers are linked to the fiber backbone, and the country has a state-of-the-art data center that can be leveraged for government and commercial use. The foundation has thus been built to now focus on the use of the infrastructure, as well as on ensuring the reliability and security of the infrastructure that is in place.

Digital infrastructure reliability is likely to improve when the reliability of electricity is improved. Energy reform is thus closely tied to Zambia's ability to leverage the digital transformation to achieve its national development targets. Zambia could also consider a public-private partnership to improve maintenance—and thus the resilience—of the national backbone.

Regarding expanded internet access, which in the case of Zambia translates to last mile internet access, and its affordability, a key policy decision for Zambia is whether the internet should be considered a public good similar to roads, for example. Achieving universal and accessible internet can indeed be a legitimate public policy goal because of the enabling benefits of internet access for productive sectors and public services. A decision that internet access is a public good should guide decisions on the taxes and fees levied on the sector, and the potential use of the universal access and service fund for public-private partnerships (figure 2.8).

►► **FIGURE 2.8:**  
TAX TRADE-OFF



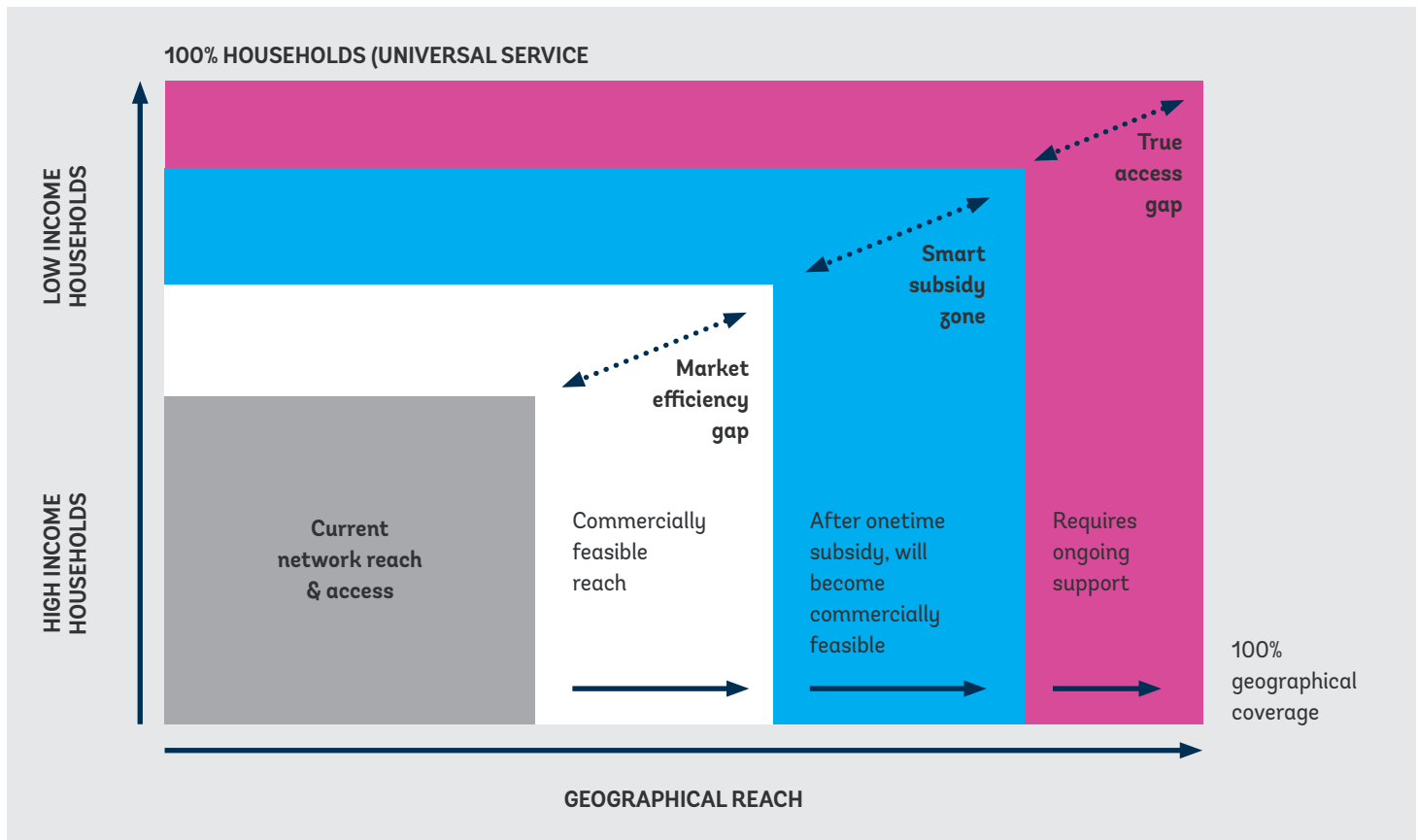
Source: Exelby 2011.



The private sector can and should take the lead in providing internet networks and services. As illustrated in figure 2.9, the first priority should be to close any market efficiency gap that may exist. A critical decision point for government is how to determine the optimal level of taxes and fees on the ICT sector from a societal point of view. For example, although excise taxes on mobile phone services or

international calls may raise immediate revenue for the treasury, higher taxes translate into higher prices for consumers, thus limiting ICT use. High taxes also reduce margins, leaving less earnings to invest in infrastructure. Additionally, discrepancies in the tax and fee structure can inadvertently create an uneven playing field, which eventually hurts consumers.

►► **FIGURE 2.9:**  
UNIVERSAL SERVICE: DISTINCTIONS WITHIN ACCESS



Source: Bogojevic, Gospić, and Murić 2012.

Second, Zambia may consider cases in which one-time subsidies are needed to trigger private sector investment. Although the bulk of the investment required to achieve universal internet access can come from the private sector, many countries have invested public money to improve internet access for poor households and those living in remote areas. Third, commercial viability may not be achievable in some areas, and these may be areas where the government determines that ongoing subsidies are needed. However, subsidies of this kind are notoriously difficult to get right, and the government should carefully review lessons learned if embarking on this approach.

Petit and Matheson (2017) provide guidance on the trade-offs in taxation of telecommunications in developing countries. These guidelines could provide a useful framework for reviewing the optimality of the ICT tax regime in the Zambian context. The authors recommend that Zambia conduct a comprehensive review of the full menu of taxes and fees levied on the sector to identify what may be optimal at this time. Technology, business models, and market conditions evolve rapidly in this sector, naturally requiring periodic comprehensive reviews and adjustments.



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CHAPTER



# Digital Skills

## Definitions and the Importance of Digital Skills

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Digital skills refer to the ability to use information technologies to find, evaluate, use, share, and create content. Although no context-specific digital skills framework has been developed in African countries, the European Union's Digital Competence (DigComp) framework provides an extensive guide to developing digital competencies and proficiencies that can be adapted to country-specific contexts.

The DigComp framework is also recognized by the International Telecommunications Union (ITU 2018). Given that contextual factors matter, policy makers can use frameworks such as DigComp to develop locally relevant guidelines for digital skills in Zambia. The DigComp 2.1 framework consists of five broad competence areas, collectively representing 21 competencies (table 3.1). Parallel to the competence areas are eight proficiency levels, grouped further into four additional proficiency levels—foundation, intermediate, advanced, and highly specialized. The framework is especially useful for defining basic and intermediate skills that need to be acquired by the youth population.

►► **TABLE 3.1:**  
DIGCOMP 2.1 FRAMEWORK

Competence areas	Competencies	Proficiency levels
Competence area 1: Information and data literacy	1.1 Browsing, searching, filtering data, information, and digital content	0.9–1.5
	1.2 Evaluating data, information, and digital content	
	1.3 Managing data, information, and digital content	
Competence area 2: Communication and collaboration	2.1 Interacting through digital technologies	Intermediate (levels 3–4)
	2.2 Sharing through digital technologies	Advanced (levels 5–6)
	2.3 Engaging in citizenship through digital technologies	
	2.4 Collaborating through digital technologies	Highly specialized (levels 7–8)
	2.5 Netiquette	
	2.6 Managing digital identity	
Competence area 3: Digital content creation	3.1 Developing digital content	Foundation (levels 1–2)
	3.2 Integrating and re-elaborating digital content	Intermediate (levels 3–4)
	3.3 Copyright and licenses	
	3.4 Programming	
Competence area 4: Safety	4.1 Protecting devices	Advanced (levels 5–6)
	4.2 Protecting personal data and privacy	Highly specialized (levels 7–8)
	4.3 Protecting health and well-being	
	4.4 Protecting the environment	
Competence area 5: Problem-solving	5.1 Solving technical problems	Foundation (levels 1–2)
	5.2 Identifying needs and technological responses	Intermediate (levels 3–4)
	5.3 Creatively using digital technologies	
	5.4 Identifying digital competence gaps	

Source: Carretero, Vuorikari, and Punie 2017.

The competence areas identify individual abilities that need to be covered under broader digital skills, while proficiency levels correspond broadly to the types of tasks involved in different types of occupations. Hence, the *foundation* level of proficiency in digital skills covers abilities required to carry out simple tasks using simple digital technologies, such as the capacity to use basic digital devices or applications. Foundational digital skills are typically used in vocational or informal sector occupations and occupations involving routine tasks. *Intermediate* level proficiency would typically be required in middle-level occupations such as skilled technicians and the general workforce in formal small and medium enterprises. *Advanced* level proficiency, which requires greater analytical skills as well as theoretical knowledge, is typically required of occupations with a high level of information and communications technology (ICT) intensity, involving applications of digital technologies, including information technology engineers and increasingly, finance professionals. Last, the *highly specialized* level

of proficiency digital skills are required in scientific and advanced professional occupations and underpin the ability to develop new digital technologies, products, and services.

Digital competencies, apart from the most basic—such as using a mobile phone for voice calls or simple messages—cannot be developed without foundational literacy and numeracy skills.

Certain competencies, such as communication and collaboration, as well as higher levels of proficiency in all areas of competence, also require socioemotional skills. Such skills include characteristics such as perseverance, empathy, trust, self-control, and self-esteem. A World Bank (2016) report therefore establishes that, to manage the disruptions and opportunities that digital technologies may create in the labor market, policies that build strong foundational cognitive and socioemotional skills and promote basic digital skills and lifelong learning need to be adopted.

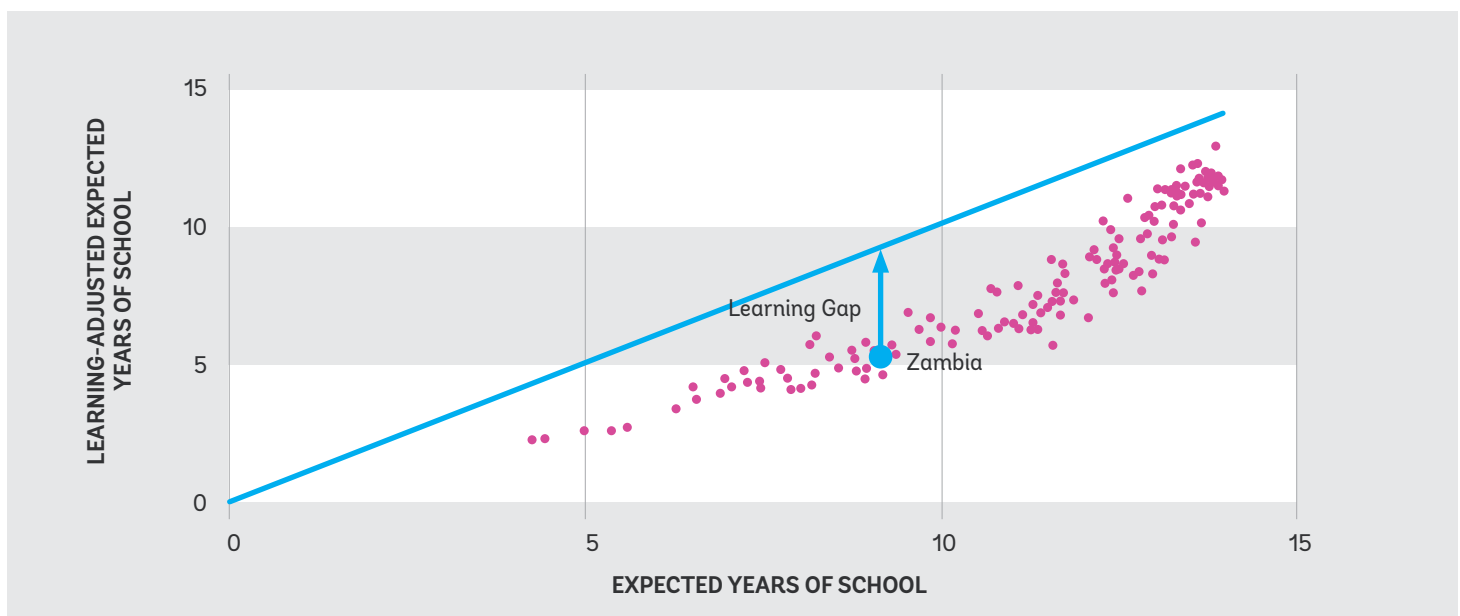


# Education System Performance

In Zambia, secondary school enrollment increased by nearly 75 percent between 2000 and 2010, faster than the rate experienced by any high-income country during its fastest phase of secondary expansion (World Bank Group 2019d). However, according to the latest statistics (Zambia Ministry of General Education 2018), the net enrollment at secondary school is estimated to be 20 percent, which is lower than the Sub-Saharan African average of 35.6 percent (World Bank Group 2020). The current 7.9 average years of schooling is also still quite low (Schwab 2018), and children's gross enrollment

in preprimary education stands at about 8 percent (UIS 2020). A more positive achievement is that slightly fewer than 90 percent of children enroll in primary school, of whom almost all (96 percent) complete primary schooling. In comparison, about two-thirds of young people enroll in secondary schooling (63 percent), and only half of this group complete secondary schooling (52 percent). Only about 10 percent of the population between the ages of 25 and 54 have some form of tertiary qualification (WEF 2017).

▶▶ **FIGURE 3.1:**  
LEARNING-ADJUSTED EXPECTED YEARS OF SCHOOLING



Source: Bogojevic, Gospić, and Murić 2012.

The quality of basic education is also concerning. Children in Zambia can expect to complete 9.2 years of preprimary, primary, and secondary school by age 18. However, when years of schooling are adjusted for quality of learning, these children's education is only equivalent to 5.2 years, a learning gap of 4 years (figure 3.1) (World Bank Group 2018a). A recent publication (UIS 2019) tracking global progress of the Sustainable Development Goal (SDG) related to inclusive and equitable education (SDG4) reports that only 1 percent of Zambian grade 2 or 3 learners achieved at least a minimum proficiency level in reading during 2014. In the same year, only

9 percent of grade 2 or 3 learners achieved at least a minimum proficiency in mathematics. An Early Grade Reading Assessment conducted among grade 2 pupils in seven local languages in Zambia also showed that most of the learners could not read connected text quickly and with accuracy, with scores varying between 4 percent (Chitonga language) and 22 percent (Silozi language) (RTI International 2015).

This background is critical to understanding the state of digital skills as a subset of skills in the Zambian context.

# Current State of Digital Skills Supply and Demand

## POLICIES GUIDING THE DEVELOPMENT OF DIGITAL SKILLS

Zambia's 7th National Development Plan (7NDP) includes targets to scale up ICT skills in public and private service institutions and to mainstream ICT in schools. More specifically, the 7NDP Implementation Plan aims to have 80 percent of staff in public and private institutions skilled in ICT by 2021, although the level of skills is not specified.

Despite 7NDP targets for ICT skills, the reference to promoting ICT skills varies considerably among the most prominent policies that, in principle, guide digital skills development (box 3.1). For example, in 2019, the first National Higher Education Policy was launched. However, beyond stating the importance of increasing participation, particularly for women, in science, technology, engineering, and mathematics (STEM) fields, there is no mention of ICT or digital skills in the policy. In the latest draft of the National Technical Education Vocational and Entrepreneurship Training (TEVET) Policy, the use of ICT at all levels of TEVET is targeted to be mainstreamed as part of the objective to enhance the quality and relevance of TEVET. Although the policy draft makes several references to developing entrepreneurial skills, there

is no specific mention of digital skills or their possible relationship to entrepreneurship. Finally, two other newly formulated policy documents relevant to the development of digital skills are the Science, Innovation and Technology Policy, which recognizes the need to invest in research and development and acknowledges the scarcity of ICT skills nationally, and the Open Education Resources Strategy, currently under development.



### ►► **BOX 3.1:** **MOST PROMINENT POLICIES GUIDING DIGITAL SKILLS DEVELOPMENT**

- 1998 – Technical Education, Vocational and Entrepreneurship Training Act
- 2006 – Zambia Vision 2030
- 2006 – National Information and Communication Technology Policy
- 2006 – Fifth Development Plan (2006–2010)
- 2009 – Electronic Communications and Transactions Act
- 2009 – Information and Communication Technologies Act
- 2011 – Zambia Qualifications Authority Act
- 2011 – The Education Act
- 2013 – Higher Education Act
- 2013 – Teaching Profession Act
- 2016 – Zambia National Broadband Strategy and Action Plan (2016–2021)
- 2017 – Seventh National Development Plan (2017–2021)
- 2017 – 7NDP Implementation Plan
- 2018 – Information and Communications Technology Association of Zambia Act
- 2018 – Public Service ICT Human Capital Development Standard
- 2019 – National Higher Education Policy
- 2019 – National Technical Education, Vocational and Entrepreneurship Training (TEVET) Policy (draft)
- 2019 – Science, Innovation and Technology Policy

Note: 7NDP = 7th National Development Plan; ICT = information and communications technology.

## DIGITAL SKILLS SUPPLY

The education system plays a significant role in supplying the country's digital skills and competencies. Unfortunately, concerns about the quality of education overshadow the potential of innovative interventions, such as the mainstreaming of ICT subjects. Besides poor foundational literacy in reading and mathematics, both primary and secondary education student learning outcomes in Zambia have been consistently low, with minimum levels of performance in English and mathematics of grade 5 learners as low as 22 percent and 33 percent, respectively (World Bank Group 2018a). Beyond the formal curriculum, the Ministry of General Education has partnered with international organizations to contribute to educational outcomes (see boxes 3.2 and 3.3).

Progression through grades is also a challenge, with more than 90 percent of learners passing the grade 7 examination and less than a third passing grade 12 (Republic of Zambia, Ministry of General Education 2017). Of the 126,434 candidates who wrote final grade 12 examinations in 2016, only about 12 percent were absorbed into universities (Republic of Zambia, Ministry of Higher Education 2019b).

### ▶▶ **BOX 3.2:** **ZAMBIA EDUCATION ENHANCEMENT PROJECT**

With support from the World Bank, the Ministry of General Education is implementing the Zambia Education Enhancement Project. The project aims to improve poor learning outcomes, particularly in mathematics and science, which are foundational skills for the acquisition of digital skills. The project provides teacher training tailored to equip teachers with the right subject knowledge and pedagogical skills to teach mathematics and science effectively and supports the provision of textbooks and the development of locally relevant early reading materials and supplemental materials. In addition, the project is assisting the government to strengthen education data management, analysis, and use by upgrading the centrally managed Education Management Information System and developing government capacity to use real-time data for evidence-based policy formulation. Detailed project information: <http://projects.worldbank.org/P158570?lang=en>.

### ▶▶ **BOX 3.3:** **LET'S READ—HARNESSING DIGITAL TECHNOLOGIES TO MONITOR PERFORMANCE**

In partnership with the Ministry of General Education, the Let's Read project runs from 2019 to 2024 in five provinces (Eastern, Muchinga, North Western, Southern, and Western). The project aims to help about 1.4 million children from more than 4,000 schools from preprimary to grade 3 to read with comprehension and fluency in one of Zambia's seven official local languages of instruction.

The Let's Read project aims to strengthen the delivery of the primary literacy curriculum by developing and implementing a reading intervention package, including teaching and learning materials, teacher training, and improved coaching and supervision.

The Let's Read project is leveraging digital technologies to assess pupil learning (nine times per year) and track school performance. Digitization is thus used as a tool to support evidence-based adjustment of the curriculum to improve education outcomes.

Source: USAID Zambia 2020

The data within the education system regarding achievements in digital skills implementation is limited. At the general education level, the various subsystems associated with education data require significant strengthening to function effectively. Although examination data are collected at grades 7, 9, and 12 by the Examinations Council of Zambia, there is no other consolidated data on learner assessment records, which makes it difficult to track progress in implementing digital skills within the school system. The situation is worse at the higher education level—there is currently no operational higher education management information system and thus no consolidated data on student enrollment and graduation disaggregated by program type. Likewise, as the UNESCO (2016) education policy review highlighted, there is limited evidence of effective monitoring and evaluation processes. Thus, if the development of digital skills in the country is to be underpinned by reliable data, a significant strengthening of national educational management information systems and monitoring and evaluation processes is required. Zambia is not unique in this challenge. Digital Economy country reports from Kenya, Lesotho, and Rwanda also report a lack of data related to different levels of digital skills development. In contrast, South Africa has an established Higher Education Management Information System that enables the tracking of qualifications.

## CURRICULUM

A major curriculum reform intended to better link the primary and secondary education sector with relevant and desired labor market skills was launched in 2013. This reform implied a shift from a content-based to a competency-based curriculum. A significant challenge in implementing this curriculum is funding. The national budgetary allocation to education and skills has declined steadily from 20.2 percent of the national budget in 2015 to 15.29 percent in 2019. In addition, about 84 percent of this budget is channeled toward salaries, resulting in a lack of adequate funding allocated to obtaining relevant resources, such as ICT equipment, or the upskilling of teachers (Kabombwe and Mulenga 2019).

Primary and secondary schools mainstream ICT through compulsory subjects. From grade 1, learners are introduced to Creative and Technology Studies, of which ICT forms a part. In grades 5–7, learners take Technology Studies and from grade 8 onward, they take Computer Science. The secondary school curriculum for Computer Science is more detailed and builds from an understanding of hardware and working with text, data, and multimedia in different programs to mastering more advanced programming, problem solving, and safety issues.

The Curriculum Development Centre, responsible for school curricula and providing inputs to teacher training curricula, has received a directive from Parliament to review and update the secondary school Computer Science curriculum to focus on programming, coding, and systems development. The syllabus, currently in draft form, will aim to move disciplinary thinking in Computer Science from consumers to systems developers. However, successful implementation of this directive will depend on the corresponding investments that will need to be made.

## INFRASTRUCTURE

Close to 6,000 Zambian schools (5,412 primary or 61 percent, and 168 secondary or 17 percent) are without any source of power or electricity access (Republic of Zambia, Ministry of General Education 2018). Access to computers is another challenge. There is one computer for every 119 children in the school system. Copperbelt province has the highest ratio, at one computer per 77 learners, compared with Northern province, where there is one computer for every 235 learners. Only 8.5 percent of all primary schools have permanent computer laboratories and 5.8 percent have internet access (Republic of Zambia, Ministry of General Education 2018). On a provincial level, slightly more than 22 percent of primary schools in the Copperbelt and Lusaka provinces have permanent computer laboratories, compared with less than 3 percent in Muchinga and Northern provinces. Similarly, primary schools in the Copperbelt and Lusaka provinces have the highest levels of internet access at about 14 percent. In contrast, only about 2 percent of primary schools in Northern and Western provinces have internet access.

Access to computer laboratories and the internet is more prevalent among secondary schools (Republic of Zambia, Ministry of General Education 2018). More than half of secondary schools have permanent computer laboratories (54 percent) and almost a third have access to the internet. Provincially, all secondary schools in Copperbelt province have permanent computer laboratories (with additional access to permanent, temporary, and incomplete laboratories), but just over half have internet access. In contrast, only about a third of secondary schools in the Northern, Muchinga, and Luapula provinces have permanent computer laboratories. With the exception of Copperbelt province, fewer than half of secondary schools in all nine other provinces have access to the internet. No comparative information is available at the tertiary level.

Fortunately, the situation looks much better for selected colleges, some of which have a student-computer ratio of 10:1, with 50 to 100 percent internet access for students and staff. In addition, the Zambian Education and Research Network is leading efforts to roll out connectivity in the higher education sector.

Efforts to expand the supply of digital skills will depend heavily on strategies to expand access to electricity, ICT infrastructure, and affordable broadband connectivity as discussed in further detail in chapter 2 on Digital Infrastructure. Other digital skills country reports from Kenya, Lesotho, and Rwanda (World Bank Group 2019a, 2019b, 2019c) also reflect the difficulties of implementing ICT subjects under severe infrastructure challenges.

## TEACHER EDUCATION

Although teachers are required to upgrade their credentials to meet new education policy standards, digital skills are not included in the new minimum requirements for primary or secondary teachers. In 2017, 13,425 students were enrolled for teaching qualifications in public education colleges (837 early childhood education, 9,033 primary school teachers, and 3,555 for secondary schools). The learner-teacher ratio is higher for primary schools (42:1) than for secondary (30:1). Although 99 percent of teachers are trained, the minimum qualification to teach at the primary level has been raised from a certificate to a diploma. Similarly, to teach most subjects at the secondary level, teachers are required to have a bachelor's degree. This indicates that all current primary teaching certificate holders, as well as about 75 percent of secondary school teachers who do not have at least a bachelor's degree, will be required to upgrade their credentials. The Ministry of General Education has embarked on a "Fast Track" training program that will allow teachers to upgrade their qualifications to enable them to qualify to teach at the secondary level, especially in science, mathematics, and technology subjects (Republic of Zambia, Ministry of General Education 2018). However, there is no mention of ICT skills in the new minimum requirements for a diploma for primary school teachers and a bachelor's degree for secondary teachers.

Some efforts are being made to develop the capacity of educators in ICT literacy and the use of technology in teaching and learning. Through the Smart Zambia initiative, the Zambia ICT College offers ICT training for professionals and had trained 4,500 teachers in ICT-related courses as of 2019. Another positive development has been the adaptation of the UNESCO ICT Competence Framework for Teachers to provide a guiding framework for ICT skills development of educators in Zambia, but the framework has not been used in any sustained way across the systems to create effective preservice and in-service professional development opportunities for educators. Some initiatives have been undertaken by nongovernmental organizations (NGOs) and international organizations to intervene in education with technology and accompanying teacher training, but these efforts have not been implemented on a large scale (box 3.4).

▶▶ **BOX 3.4:**  
**NONGOVERNMENTAL INITIATIVES  
TO PROMOTE DIGITAL SKILLS**

- Camara, a nonprofit organization partnering with the Ministry of General Education to provide schools with computers and ICT training to teachers
- Compu-Connect Education, an e-learning and multimedia company supplying schools with devices, software, and teacher training
- iSchool Zambia, providing devices, power, teacher training, and curriculum-related software to schools; a partnership between iSchool Zambia, ZICTA, and Microsoft has also supplied computers, digital content, and software to 400 schools
- Zambian Teachers Forum, which promotes a self-learning computer skills training program, Active Touch
- iMlango, an e-learning program developed for African primary schools
- NSOMO digital kits, which provide simulated examinations, video and audio tutorials, summarized notes, and motivational e-books
- UNESCO China Funds-In-Trust Project, which aims to equip teachers with twenty-first century skills to enable quality teaching and learning

## **SPECIALIZED SKILLS TRAINING IN THE PRIVATE SECTOR**

Several educational institutions provide ICT training programs taking different forms, such as short courses or degree programs, and ranging in outcomes from certificates to more formal and specialized qualifications. The Zambian tertiary education sector consists of six public universities, 60 registered private institutions, and 284 Technical Education, Vocational and Entrepreneurship Training Authority facilities, of which 26 are public (TEVETA 2017). Three of the most prominent higher education institutions, the University of Zambia and the Mulungushi and Copperbelt Universities, offer a variety of degree programs and short courses, most of which include courses in emerging sector trends. Some alternative programs in natural sciences or business studies also offer ICT as elective subjects. Unfortunately, these courses attract very few students. In the absence of national post-school sector statistics, data provided by these three institutions reveal that fewer than 300 degree-course graduates are produced annually.

Both higher education and TEVET institutions are fraught with challenges. Higher education challenges include poor industry-institution links, outdated curricula, inadequate qualifications of academic staff, and a lack of general resources. Institutions are not producing graduates with relevant skills demanded by the labor market, resulting in graduates struggling to find work or employers having to retrain them (Republic of Zambia, Ministry of Higher Education 2019b). Similarly, despite significant efforts to strengthen the TEVET system, major challenges persist. Related to ICT, these challenges include the use of outdated technologies, resulting in a mismatch between institutions and industry; the slow pace of curriculum reform contrasting with fast-paced changes happening in technology in industry; inadequately qualified trainers; poorly equipped training institutions; inadequate funding; and inappropriate teaching and learning materials. These challenges prevent the TEVET system from functioning optimally (Republic of Zambia, Ministry of Science, Technology and Vocational Training 2019). Regarding equity, only about a quarter of students in higher education STEM fields are female. While persistent sociocultural barriers contribute to low participation, constraints to implementing and maintaining interventions also play a role in the low participation of women in STEM fields (Republic of Zambia, Ministry of Higher Education 2019b). Similarly, of the approximately 22,000 students enrolled in TEVET colleges, fewer than a third are female and even fewer women participate in STEM. Inequities are also found in the urban-rural divide, with 80 percent of colleges located in urban areas and only 20 percent in rural areas.





## SPECIALIZED SKILLS TRAINING IN THE PRIVATE SECTOR

Three privately run technology entrepreneurship support organizations operate in Zambia— BongoHive, Jacaranda Hub, and WeCreate (see further discussion in chapter 4 on Digital Entrepreneurship). Additionally, several private initiatives provide peer learning and training in coding, including the following:

- Agora Code Community was established in 2015 by three individuals with a vision of building a community that teaches members how to write code. It provides people in the 18–35 age demographic with software development workshops and training, and is also becoming a hub for the growth of game development. On an annual basis, Agora Code Community serves between 60 and 100 people.
- forLoop Zambia was founded in 2016 and is a chapter of forLoopAfrica, an Africa-wide community that focuses on bringing software developers and enthusiasts together to learn. The vision of forLoop is to be the largest independent developer network, with members building the future of tech in Africa. In 2018, forLoopAfrica trained 170 developers.
- Hackers Guild, founded in 2014, is a technology bootcamp targeted at youth. It provides training in software development skills, as well as mobile and web application development. It has received financial support from the embassy of Finland and is an official GitHub partner, thereby allowing its students access to repositories, premium products, and events, as well as a larger community of software developers to assist with code troubleshooting. Since its inception, 84 developers, of whom about a third are women, have been trained in their two course offerings: a three-month JavaScript training bootcamp and a two-month specialization course. The Hackers Guild also runs the Rural Coding Series and School Clubs (box 3.5).

### ▶▶ BOX 3.5: HACKERS GUILD

#### *Rural Coding Series*

From 2016 to 2018, the Hackers Guild, in partnership with US Peace Corps volunteers, ran six Rural Coding Camps in communities where the volunteers were situated. Lessons focused on using technology to solve problems in their respective communities. At the end of each camp, groups of students from each invited school were encouraged to form clubs in their schools or communities and were provided with computer equipment comprising Raspberry Pi computers, seven-inch thin-film transistor screens, and solar panels. The program reached 455 girls, 314 boys, and 294 adult mentors.

#### *School Clubs*

The Hackers Guild currently runs School Clubs for students in grades 8 to 12. The clubs are formed mostly in schools that have computer laboratories, and Hackers Guild provides software and tools to help with club activities. Each school club is provided with hardware (BBC Microbit or Arduino kit) for the electronics and robotics part of the clubs. Once schools are approached about participation, five days of after-class time is requested to introduce the clubs and materials to the students. Club leaders and patrons are identified from participating learners and teachers. Once the club is formed, the Hackers Guild returns after two months for evaluation. The clubs are then invited to compete with other clubs to help assess how they are learning. By 2019, there were 10 clubs in Copperbelt province and 15 clubs in Lusaka, with a total of 800 student members.

Source: Interview with Charles Mwanza, co-founder and chief executive officer, Hackers Guild, August 2019.

▶▶ **BOX 3.6:**  
**ICT-ENABLED WORK**

Information and communications technologies (ICTs) have made it easier for workers to find jobs and for employers to find skilled workers. As ICTs support a trend of increasingly digitized work, they have also enabled innovation in the types of work on offer. Already, online employment marketplaces are helping some people worldwide find work by connecting them with employers globally. Some of these marketplaces connect ICT workers with employers worldwide, while others connect workers with employers in local markets, in a mix of jobs that very often are not ICT related. ICTs have also been creating new forms of work, including microwork—in which a larger task is disaggregated into small pieces that are farmed out to a large number of workers, spreading work and income-earning opportunities. Another area of emerging opportunity is online contracting—in which workers find and do work online, often through internet-based employment exchanges and platforms. These new forms of work create opportunities for workers who are less skilled than those employed in business process outsourcing, and who might have limited access to ICT. As illustrated in map B3.6.1, an increasing number of African platforms are emerging to connect African job seekers with employers.

Jumia, Africa's largest e-commerce platform, is a good example of a company creating ICT-enabled jobs. Jumia is now present in 16 countries, delivers more than 8 million packages a year, and has, on average, 500 million clicks per day. However, only 0.6 percent of all retail in Africa is conducted online. Jumia has found a solution to make e-commerce work even for customers who are not online. Jumia works with about 10,000 commission-based sales agents across Nigeria (named J-Force). A J-Force member is usually a young person with the "basic user skills" as defined by the Organisation for Economic Co-operation and Development, such as a recent graduate or a young mother, eager to make some part-time income. After receiving training from Jumia on customer service and the intricacies of how to shop, order, and pay on the site, J-Forcers then engage with their neighbors and the larger community to help those without internet access or unfamiliar with e-commerce to shop online and deliver the goods.

▶▶ **B3.6.1**  
**GIG WORK VENTURES IN AFRICA 2019**



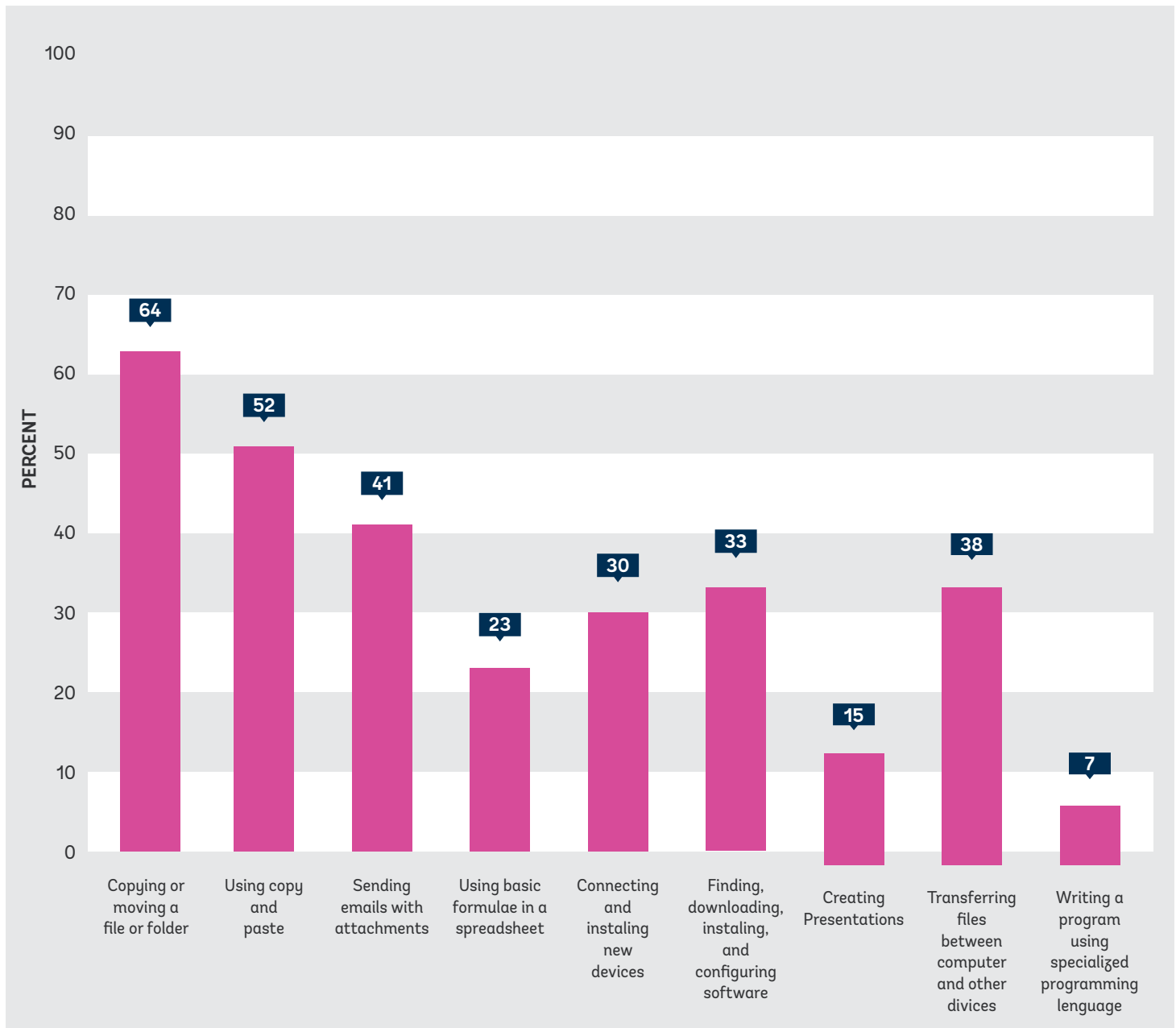
Source: "Does the 'Gig Economy' Help Create Jobs in Africa?" (<https://briterbridges.com/does-the-gig-economy-help-create-jobs-in-africa>).

## THE CURRENT STATE OF DIGITAL INTERACTION

Most Zambians have some level of foundational digital skills, but intermediate and more advanced ICT skills are in short supply. As discussed in chapter 2 on Digital Infrastructure, the 2018 ZICTA ICT survey results illustrate the increasing but low and uneven access to digital devices (ZICTA 2018). However, Zambians' interactions with mobile technologies show that at least 8 out of 10 people have some level of foundational digital skills (ITU 2013). But only 7 percent of Zambians know how to use a computer; 12 percent in urban areas

and 3 percent in rural areas. This figure is highest for 15-to-19-year-olds, 19 percent of whom know how to use computers. Of the 7 percent who indicated that they know how to use a computer, the majority listed proficiency in basic skills such as copying, pasting, and sending emails. About a third can download, install, and configure software, and only 15 percent can create electronic presentations. Proficiency in specialized skills such as programming was indicated by 7 percent (figure 3.2).

►► **FIGURE 3.2:**  
PROFICIENCY IN USING A COMPUTER



Source: ZICTA 2018.



## DIGITAL SKILLS AND THE LABOR MARKET

Currently, 0.4 percent of all employed people in Zambia work in the ICT sector (Republic of Zambia, Ministry of Labour and Social Security 2018). It is, however, difficult to obtain an accurate figure for how many Zambians have ICT jobs. For example, a computer scientist employed by a government agency to maintain the agency's computer network is not captured in the statistics of the number of people working in the ICT sector. The Organisation for Economic Co-operation and Development provides a useful classification of categories of ICT workers: ICT specialists, who "develop and put in place the ICT tools for others," and where the main output of the job is ICT; *advanced users*, that is, a "competent user of advanced, and often sector-specific, software tools," and where "ICTs are not the main job but a tool"; and basic users, who are "competent users of generic tools... needed for the information society, e-government and working life," and where "ICTs are a tool, not the main job" (OECD 2005, 6).

Employment in the ICT sector, as well as government and private sector ICT jobs, across all three categories of ICT workers is likely to increase rapidly in the near future, driven by demand from both the public and private sectors, and will include ICT-enabled work (box 3.6).

Two important, large-scale opportunities exist to guide the supply of and demand for ICT skills. First, 17 percent of the Zambian adult population have their own businesses, albeit mainly in the informal sector. There is significant potential for the use of ICT in micro, small, and medium enterprises, in which the development of relevant skills, such as web development, application development, content management, digital product development, e-business skills, and many others will play a foundational role (UNCTAD 2018).

Second is the vision of a Smart Zambia. This includes integrating ICT into all major sectors, such as tourism and agriculture; investing in economic, environmental, and natural resource monitoring and forecasting; mainstreaming ICT in all education; and creating a Smart Government with services such as identity management digitization that will allow for better record keeping of births, deaths, and so on (Habeenzu 2017; World Bank Group 2016). Considering the planned expansions related to the vision of a Smart Zambia, it is safe to assume that demand for a variety of specialized digital skills will outstrip current supply. Indeed, as discussed in chapter 5 on Digital Platforms, a shortage of digital skills has already become a key challenge.



## Recommendations

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Zambia will not realize the full benefits of digital transformation—nor will it meet its 7NDP goal of facilitating “innovative technologies skills development”—unless it also ensures that learners going through the school system are equipped with foundational numeracy and literacy skills. Today, fewer than one-third of learners pass their grade 12 examination; the quality of general education is thus of serious concern. However, there is room to better leverage digital tools for teacher training and access to up-to-date educational materials, as well as for education policy planning, monitoring, and evaluation. With regard to digital skills specifically, the 7NDP Implementation Plan aims to have ICT mainstreamed in schools, and the new competency-based national curriculum has made ICT a compulsory subject. However, most schools are not connected to the internet and do not have or have limited access to devices, and teachers have limited knowledge of how to use ICT in teaching and learning and do not have access to electricity. The situation is better at the secondary and tertiary school levels, and a handful of private initiatives can be leveraged as complements to the public school system. Against this background, this report recommends the following actions.

*Improve the quality of foundational skills (literacy and numeracy).* Foundational skills such as literacy and numeracy are the bedrock of the science, technology, engineering, and mathematics fields that underpin the digital ecosystem. The same skills that allow for improved opportunities in the major professions of the current Zambian economy will also constitute critical enablers of any future digital workforce. Excellent students are the product of skilled teachers and enabling environments. Improved and targeted teacher training and supporting resources in the form of a planned curriculum, pedagogical oversight, textbooks, learning materials, and auxiliary services for the running of schools are essential enablers of high-quality foundational skill formation.

*Improve educational progression.* To enable the technical education of future generations, students at the secondary school level must be provided the support, resources, and trained educators that will allow them to progress into higher education. Improving educational progression and obtaining advanced technical skills are only possible through tertiary training. To fill the opportunities of the future, the students of today need the tools, training, and resources that will allow this progression.

Adopt a strategic conceptual framework for the development of digital skills in Zambia to inform policy and practice. Formulating a high-level conceptual understanding of the necessary skills, competencies, attitudes, and levels of proficiency required for success in the digital sphere will be critical for the development of an informed policy and practice regarding digital skills in Zambia.

Mapping the current Zambian educational curriculum against the DigComp 2.1 Framework could be an ideal place to start. By understanding areas of overlap and difference with the framework, policy makers will be able to identify the types of skills and practices that need to be addressed and the interventions required to achieve appropriate levels of proficiency in each area.

The intersection between digital skills, entrepreneurial skills, and business skills should be included in the conceptualization. These three areas are mutually reinforcing features of a modern economy, and deepening the societal knowledge base in any one area will enhance the others.

Examining and quantifying the current skills ecosystem will also facilitate the identification of key stakeholders and their respective roles within this system, providing a deep network base for engaging strategically with key actors and areas for improvement. An interministerial task team to align digital skills policies with other national policies and priorities is therefore strongly recommended.

*Provide policy direction and coherence for digital skills development.* The degree to which digital skills are being incorporated into Zambian national plans and policies is highly variable. Government-level direction on digital skills policy is needed. The development of a structured approach for ensuring the incorporation of specific skills, knowledge, and digital-age values and attitudes into national plans, policies, and long-term visions will be critical to ensuring the viability of the emerging digital economy.

Digital skills policy needs to capture not only the efficient and effective use of digital technology, but also the development of complex interpersonal, entrepreneurial, and innovation dimensions. Privacy, data protection, and cybersecurity remain important to all discussions of digital skills policy. The development of a clear, structured policy approach must seek to find a balance between the framing of individual skills and proficiencies and accounting for the specific industry context in which skills are used and required.

The input of the wider community, industry bodies, leaders, and academia will be necessary to drive the digital transformation of Zambia at the policy level.

*Address last mile digital infrastructure challenges.* Zambia will not be able to fully leverage digital technologies to achieve education outcomes if the last mile digital infrastructure challenges cannot be overcome. As discussed in chapter 2 on Digital Infrastructure, more can be done to entice private sector investment and smart public-private partnerships to close this gap. Actions include a review of



taxes and fees levied on the ICT sector in relation to public policy goals associated with leveraging digitization for transformation, as well as improved spatial planning for last mile connectivity, such that economies of scale can be achieved. Additionally, numerous interventions resulting from partnerships between the Ministry of General Education and national or international organizations are currently in place. Programs addressing access to devices and educational software, teacher training in an ICT curriculum, and literacy development need to be coordinated and scaled up to maximize and spread their adoption.

*Improve the quality of digital skills developed through school curricula.* Schools need to use digital technologies as an integral component of their learning and teaching programs. Building a curriculum that enables students to become confident and creative developers of digital solutions through the application of information technology and computational thinking will require appropriately skilled teachers, improved facilities including infrastructure, and targeted skills. Continued expansion of the number of qualified ICT teachers will be a vital component of a wider strategy in updating senior secondary school digital curricula to include more advanced digital skills training. Only through the increase of qualified teachers will it be possible to encourage students to explore the full capacity of information systems to innovatively transform data into digital solutions through computational design and systems thinking. The review of the computer science curriculum as mandated by Parliament could make an important contribution to digital skills education; however, the Curriculum Development Centre also needs to be clear on how a reviewed curriculum would be implemented and assessed.

*Increase the supply of digital skills of different levels through the expansion of informal skills training.* Successive waves of digital technology adoption, and the related skills gaps that have emerged, are neither experienced at the same pace in all industries, nor influencing all occupations and activity categories to the same extent. Whereas some industries have evolved by gradually adopting past waves of technology in small increments, others have spurred ahead into social media, mobile technology, cloud computing, analytics, and the Internet of Things. As a result, the need for digital skills across the workforce is highly uneven. Therefore, it is necessary not simply to focus on developing skills in the advanced technology fields, but to also expand the informal skills sector. Critical to this multisectoral, multilevel approach will be the use of alternative and collaborative initiatives, such as informal, community-based, or NGO-guided training in basic digital and information literacy. In this complementary strategy, both the formal and informal sectors will benefit in parallel. For example, by upskilling the informal sector in mobile applications and tools, and providing the informal sector

wider access to such systems, the private sector will benefit from both a wider potential market and a broader skills base from which to hire employees.

This strategy could be further strengthened by the training of civil servants and technocrats, possibly through mentorship programs between academia and industry, and would result in broader acceptance and understanding of the importance of digital upskilling across the workforce.

*Include ICT in the TEVET curriculum.* The TEVET policy is an essential part of a suite of initiatives for strengthening workforce participation and capability in the economy. However, the latest draft of the TEVET policy strongly focuses on entrepreneurship with limited space afforded to the centrality of digital training content. The TEVET curriculum should endorse the importance of digital skills and accord them "essential skills status" within the context of vocational education. In the future, training design and delivery should be increasingly influenced by the need for actionable software, hardware, and organizational database skills with a focus on scaling up digital skills training in TEVET institutions.

*Increase the number of people with ICT qualifications.* It has never been more important to address the gap between the number of degree-qualified candidates being produced and the number required by industry. The number of ICT qualifications currently being awarded through short courses or degree-level courses in Zambia is very low. Scaling up capacity for the delivery of short, skills-based courses will be a valuable investment in meeting urgent needs. However, ultimately the skills shortage will require a coordinated response to deliver a consistent stream of ICT graduates if Zambia is to meet the needs of its burgeoning digital economy. Higher education institutions should be at the forefront of this endeavor. The creation of a broadened curriculum of university-level short courses, in combination with the leveraging of partnerships with online training institutions, will eventually begin to close the gaps in scarce or essential skills. One way to address scarce skills is through the introduction of specialized certification skills courses developed in close collaboration with industry.

*Build stronger public-private partnerships.* All available Digital Economy diagnostic reports, including those for Kenya, Lesotho, Rwanda, and South Africa, recommend stronger public-private partnerships. Social impact bonds are examples of how such public-private partnerships could be used to develop specialist digital skills. In South Africa, the Inclusive Youth Employment Pay for Performance Platform was developed to place 600 young people into jobs. The partnership between several funders, investors, Gauteng provincial

government, and service providers not only trained and placed all 600 young people into jobs, but expects to scale the partnership to 5,400 jobs. Initiatives such as this could contribute to addressing a wide variety of challenges these countries face, including high unemployment rates and skills gaps, and relieving some pressure placed on the formal education system.

*Improve monitoring and evaluation of educational data.* The absence of data, especially in the tertiary education sector, needs to be addressed. For the government to strengthen the digital economy, it is critical to be able to assess risks, understand trends, and identify gaps in the share of skills and the needs of industry through time. Building a skilled workforce will take time, measurement, and policy calibration. To monitor and track the type and length of courses being run and the number—and quality—of students graduating from higher education providers, procedures and systems must be put in place. Alongside the monitoring and evaluation of data, the Central Statistical Office may also be able to provide support through surveys conducted at the household level.

*Create pathways for specialists and emerging ICT jobs.* Structuring pathways for technical specialists and emerging areas of future digital workforce demand is vital to building a culture of innovation in Zambia. As the speed and sophistication of digitization increases, data become more valuable, crowdsourcing booms, and social platforms become major drivers of commerce, a better understanding of the specific skills a Smart Zambia will require to build, maintain, and innovate in this new economy will become paramount. Identifying and prioritizing pathways to capture the growth in specialization and new categories of digital work will be essential to meeting industry demand.

*Facilitate more collaborations to meet urgent demands.* Meeting the urgent needs of an environment in which demand for a technically proficient workforce increases, and existing industry strains under competitive pressure for a shrinking pool of digital experts, will require multisectoral collaboration.

Using external institutions to provide online educational content in collaboration with national institutions will allow for efficiently scaling up current educational practice. Extending the use of public-private partnerships through the implementation of development financing instruments such as social impact bonds may allow for the rapid provision of essential digital skills training in areas of immediate need, while shifting risk from the public to the private sector. The establishment of laboratories or innovation hubs through collaboration between industry and academia, as well as the accreditation of digital skills training content, will stimulate centers of excellence and attract, as well as produce, new information workers to fill the growing demands of the current and future digital economy.

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CHAPTER





# Digital Entrepreneurship

## Definitions and Analytical Framework

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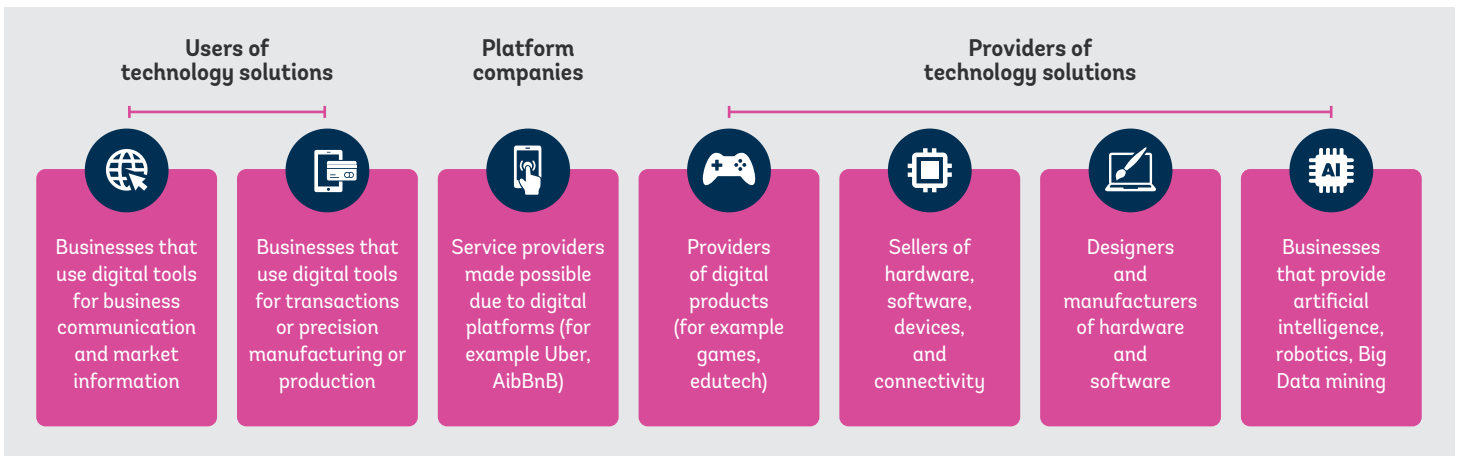
For the purpose of this diagnostic,

- *Entrepreneurship* is defined as the process of designing, launching and running a new business (Hsieh and Wu 2018).
- *Digital entrepreneurship* is defined as the process of designing, launching and running a new business wherein creating and using novel digital technologies is a driver of new value creation. New digital ventures are thus characterized by high intensity use of new digital technologies (particularly social, mobile, analytics, and cloud solutions) to improve business operations, invent new (digital) business models, sharpen business intelligence, and engage with customers and stakeholders through new (digital) channels.

Figure 4.1 provides an illustration of the wide range of digital entrepreneurship. When the term “digital entrepreneurship” is used in this chapter, it generally refers only to platform companies and providers of technology solutions.



►► **FIGURE 4.1:**  
DIGITAL ENTREPRENEURSHIP DEFINED

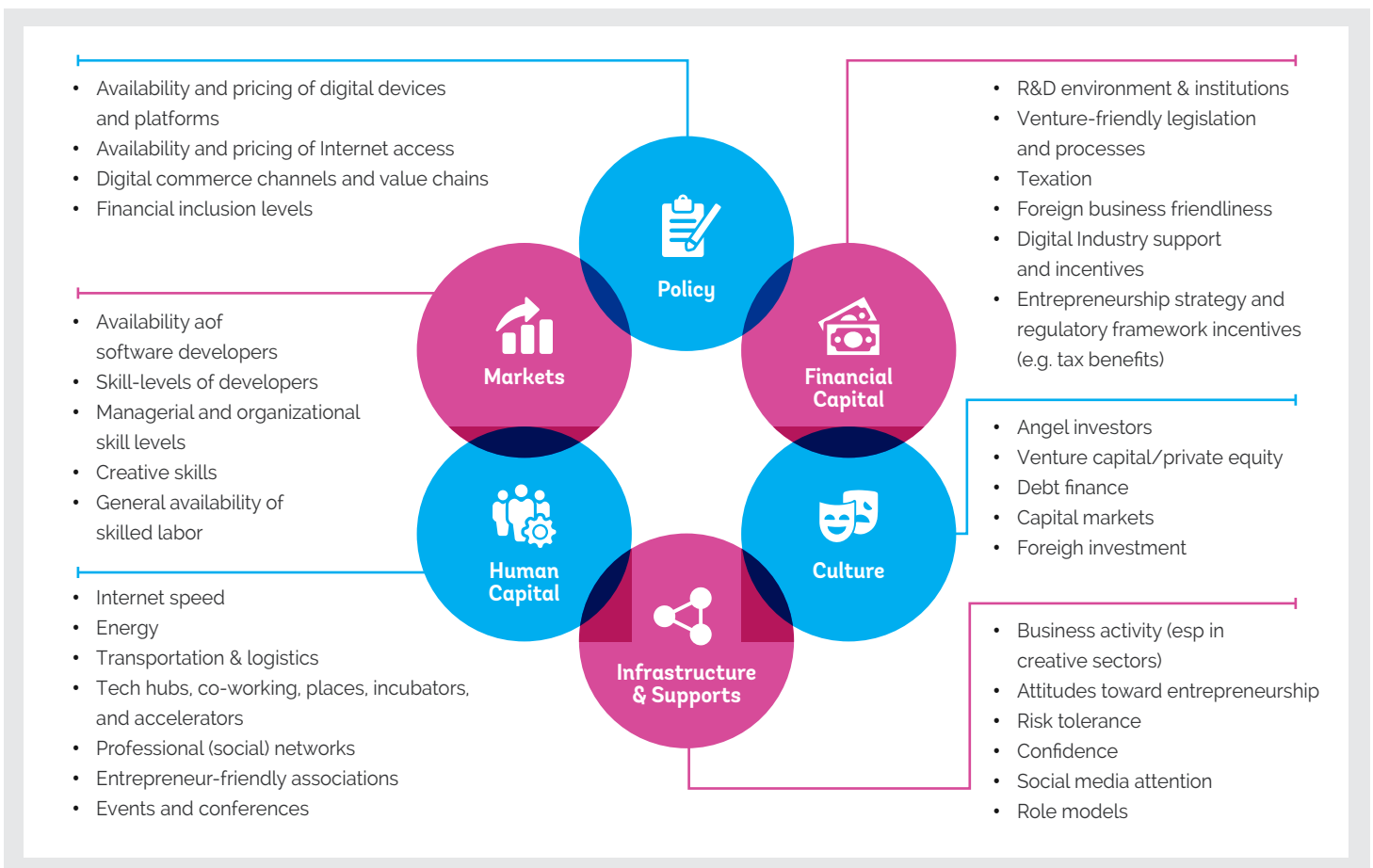


Source: Original figure for this publication.

The notion of a digital entrepreneurship ecosystem is used to analyze the enabling environment for digital entrepreneurship. In this framework, markets, policy, financial capital, human capital, culture, supports, and infrastructure constitute the key interdependent variables that create an enabling environment that either is or is not

conducive to digital entrepreneurship (figure 4.2). Human capital and infrastructure are discussed extensively in the Digital Skills and Digital Infrastructure chapters, respectively. Therefore, this chapter focuses on markets, policy and regulation, supports, and finance.

►► **FIGURE 4.2:**  
DIGITAL ENTREPRENEURSHIP ECOSYSTEM



Source: World Bank Group.

## Market Size

The market for digital entrepreneurs comprises consumers, businesses, and government. The Zambian consumer market is quite small if measured by purchasing power—although the population stands at 17 million, 57.5 percent live on less than \$1.90/day. Comparatively, as illustrated in table 4.1, among the benchmark

countries, Rwanda has a smaller consumer market, while Côte d'Ivoire, Ghana, and Kenya all have significantly larger markets than Zambia. Zambian entrepreneurs are therefore more likely to have to tap into regional markets to grow their businesses.

►► **TABLE 4.1:**  
ZAMBIAN CONSUMER MARKET

Population Size (million)	Rural Population (%)	GDP per Capita (\$)	Poverty Headcount (% living on less than \$1.90/day)
Rwanda (12.2)	Ghana (45)	Rwanda (748)	Ghana (13.3)
<b>Zambia (17.0)</b>	Côte d'Ivoire (50)	<b>Zambia (1,513)</b>	Côte d'Ivoire (28.2)
Côte d'Ivoire (24.3)	<b>Zambia (57)</b>	Côte d'Ivoire (1,537)	Kenya (36.8)
Ghana (28.8)	Kenya (73)	Kenya (1,594)	Rwanda (55.5)
Kenya (49.7)	Rwanda (83)	Ghana (2,046)	<b>Zambia (57.5)</b>

As discussed in chapter 2 on Digital Infrastructure, the number of mobile and broadband subscribers in Zambia is increasing; as of 2018, 9.8 million out of Zambia's population of 17 million were using mobile broadband. This number already offers a potential consumer market for mobile solutions such as digital payments, e-commerce, and other platform services such as ride-sharing. As government efforts to promote last mile connectivity continue, the addressable market will grow accordingly.

However, the 2018 Zambia Information and Communication Technology Authority (ZICTA) survey shows that out of the 14.3 percent of the population who have access to the internet, only 5.6 percent use the internet for online shopping, 5.5 percent use it for internet banking, and only 10 percent use it for "business." The consumer market for internet-based solutions is thus very small in Zambia, relating back to issues of limited connectivity and affordability (see chapter 2 on Digital Infrastructure) and limited digital skills as discussed in chapter 3 on Digital Skills.

The Zambian business market segment comprises approximately 490,000 registered firms. Although the business market segment is more likely to yield a profitable business proposition for digital entrepreneurs than the consumer market, data on firm-level use

of digital technologies in Zambia is very scarce and dated. The most recent representative collection of data on this topic was the World Bank Enterprise Survey conducted in 2013. At that time, 20 percent of firms had a website and 53 percent had access to email. Furthermore, 35 percent of manufacturing firms used information and communications technologies (ICT) for marketing and 25 percent for managing inventory or selling online. Services firms made much less use of ICT; only 22 percent used ICT for marketing and about 15 percent used it for selling online. These usage patterns trailed those of Kenya, but they were ahead of Ghana by a significant margin. A new World Bank Enterprise survey is underway and will be completed in 2020. This survey will provide updated data on firm-level ICT usage in Zambia, which is likely to have increased significantly in line with expanded connectivity.<sup>11</sup>

Digital financial services are likely the most immediately relevant and value-adding services for the majority of firms in the economy, and the entrepreneurial community is responding. As detailed in chapter 6 on Digital Financial Services, a 2018 survey counts 25 financial technology firms (fintechs)<sup>12</sup> operating on the market (UNCDF 2018). Entrepreneurs are also responding with solutions to logistics, market, and education challenges. Box 4.1 features eMsika, which is a good example.

11. The next Enterprise Survey will be concluded in 2020 and includes the following questions related to ICT use: (1) At the present time, does this establishment have its own website or social media page? (2) In fiscal year 2018, did this establishment use mobile money to receive payments from customers? (3) In fiscal year 2018, what percentage of annual sales did this establishment receive from customers using mobile money? (4) In fiscal year 2018, did this establishment use debit or credit card payments via point-of-sale devices to receive payments from customers? (5) In fiscal year 2018, what percentage of annual sales did this establishment receive from customers using debit or credit card payments?

12. Different definitions of fintech have been used by international bodies and national authorities. Drawing on these, the Bali Fintech Agenda proposed by the International Monetary Fund and the World Bank Group adopts a broad interpretation of fintech to describe the advances in technology that have the potential to transform the provision of financial services spurring the development of new business models, applications, processes, and products.

▶▶ **BOX 4.1:**

**EMSIKA: A ZAMBIAN DIGITAL SOLUTION FOR THE AGRIBUSINESS SECTOR**



eMsika was founded in 2016 by Elton J. Chirwa and Gilbert Mwale, both Zambians, ages 26 and 25, respectively. Elton and Gilbert grew up in Chipata. Their lives were characterized by farming, especially Gilbert's, whose father was a manager in the Eastern Cooperative Union until it was privatized, which led to the family depending on growing maize and tobacco. They did not grow any other crop nor did they keep livestock, which meant they earned a seasonal income and led a tough life. Gilbert believed farming was for the poor until he went to India to study and learned that technology, such as e-commerce, can make access to agricultural inputs easier. Elton and Gilbert then decided to research why so many farmers in Zambia struggled with production and productivity. They found that one of the biggest problems is access to quality farm inputs, just like in the case of his father who only stuck to growing two crops. This prompted them to start an online company to service the agriculture market for farm inputs targeting farmers and agro-dealers who lack access to quality inputs.

To date, eMsika has reached 1,200 farmers, 6 agro-dealers, and 15 agricultural input suppliers. eMsika's services allow the target audience to focus on their core competence while eMsika conveniently helps them find and receive farm inputs using their mobile phones, both smart and feature phones.

According to Gilbert, "In the next 5 years, eMsika would like to take advantage of the African Continental Free Trade Agreement (AfCTA) to upscale into the COMESA [Common Market for Eastern and Southern Africa] and SADC [Southern African Development Community] regions."

In addition to the immense volume of small and medium enterprises (SMEs), the government can be a significant market for digital entrepreneurs. As discussed in chapter 5 on Digital Platforms, a range of initiatives to advance digital government-to-citizen and government-to-business services have been initiated. There is also scope to initiate, leverage, and scale up digital platforms in the delivery of health, education, and agricultural services (see box 7.3 in chapter 7). Opportunities for Zambian digital entrepreneurs to participate in the development of such solutions can occur through government procurement and through government publication of an application programming interface (API)<sup>13</sup> road map, and entrepreneurial support facilitated through technology entrepreneurship hubs. With regard to opportunities to leverage government procurement, well-structured joint ventures between emerging entrepreneurs and larger, more experienced international firms could be encouraged to facilitate knowledge transfer to Zambia's nascent local private sector, while still benefiting from the experience of more mature firms. If the procurement route is pursued, it is critical that payments occur on time—small and growing companies do not have sufficient cash flow to buffer significantly delayed payments. Such issues have led to low uptake of government procurement opportunities in South Africa, for example. Developing and publishing an API road map would allow software developers to identify upcoming opportunities for solution development. Developers could be informed of these opportunities through an industry forum facilitated by the government, focusing on areas of development of high priority to the government (see further discussion on this in chapter 5 on Digital Platforms).



13. . APIs are digital codes that are at the core of establishing interoperability between systems.

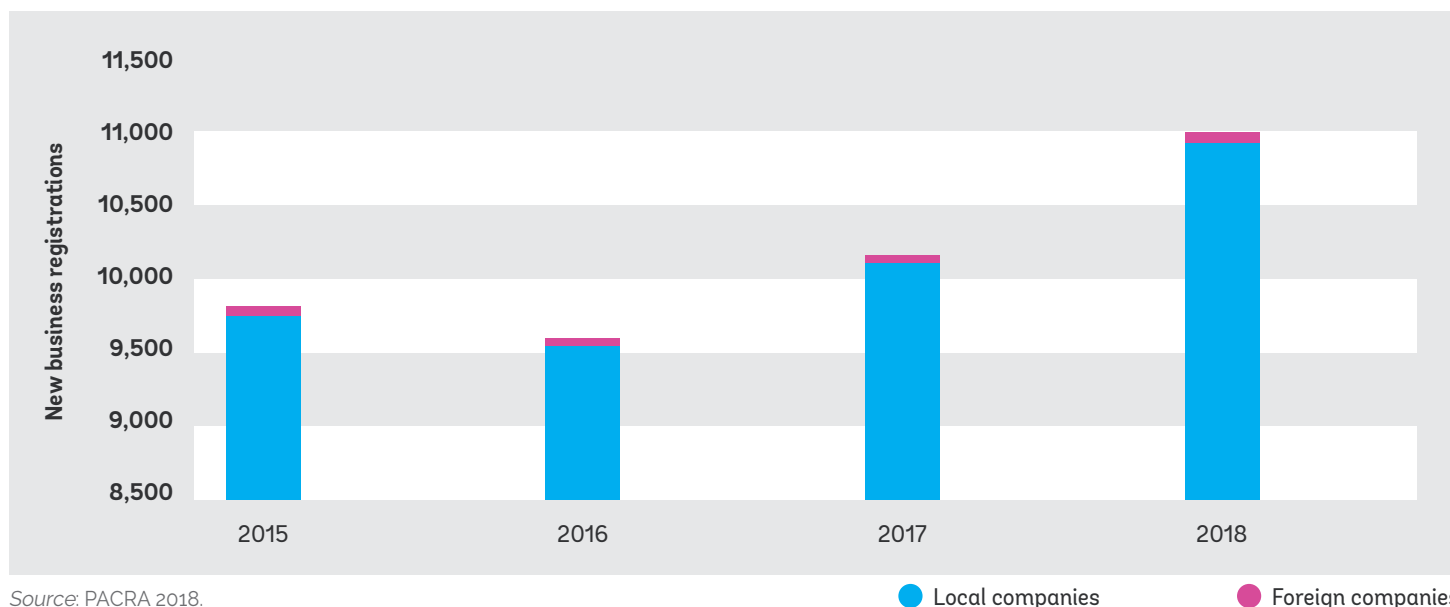
# Entrepreneurial Performance and Business Confidence

## THE STATE OF ENTREPRENEURSHIP IN ZAMBIA

Digital entrepreneurship takes place within the broader context of entrepreneurship generally. It is thus important to understand the state of entrepreneurship at a general level before delving into digital entrepreneurship specifically.

Since 2016 the number of new business registrations has increased steadily (figure 4.3), but business confidence and perceptions of the likelihood of achieving growth have declined. The increase in new business registration is driven by locally owned businesses in wholesale and retail trade, by a wide margin. These businesses are likely to be composed primarily of necessity-driven entrepreneurs who see an opportunity to gain income for their families in trading.

▶▶ **FIGURE 4.3:**  
NEW BUSINESS REGISTRATIONS, 2015–18



Source: PACRA 2018.

This necessity-driven entrepreneurship is corroborated by the trends in the Global Entrepreneurship Index. As illustrated in table 4.2, the percentage of entrepreneurs that start businesses motivated by opportunity rather than necessity is declining, as is the perceived

likelihood that opportunity entrepreneurs will achieve significant growth. Similarly, the Zambia Chamber of Commerce and Industry (ZACCI) Business Confidence Index shows declining trends in business confidence over the first two quarters of 2019.<sup>14</sup>

▶▶ **TABLE 4.2:**  
PERCENTAGE OF ENTREPRENEURS IN ZAMBIA WHO START BUSINESSES  
MOTIVATED BY OPPORTUNITY RATHER THAN NECESSITY

	2016	2018	Trend
Opportunity start-ups <sup>a</sup>	38	30	↓
High growth <sup>b</sup>	11	9	↓

Source: Global Entrepreneurship Index 2018.

Note: a. Opportunity start-up is a measure of start-ups by people who are motivated by opportunity.

b. High growth is a combined measure of the percentage of high-growth businesses that intend to employ at least 10 people and plan to grow more than 50 percent in five years (Gazelle variable) with business strategy sophistication (Business Strategy variable) and venture capital financing possibility (Venture Capital).

14. The Business Confidence Index (BCI) is collected through a survey delivered by ZACCI. According to ZACCI, a BCI higher than 100 points signifies positive sentiments about the business climate and a BCI lower than 100 points signifies negative sentiments about the business climate. Zambia's BCI has been low, scoring 23.6 points in the first quarter of 2019 and 51.3 points in the second quarter of 2019.

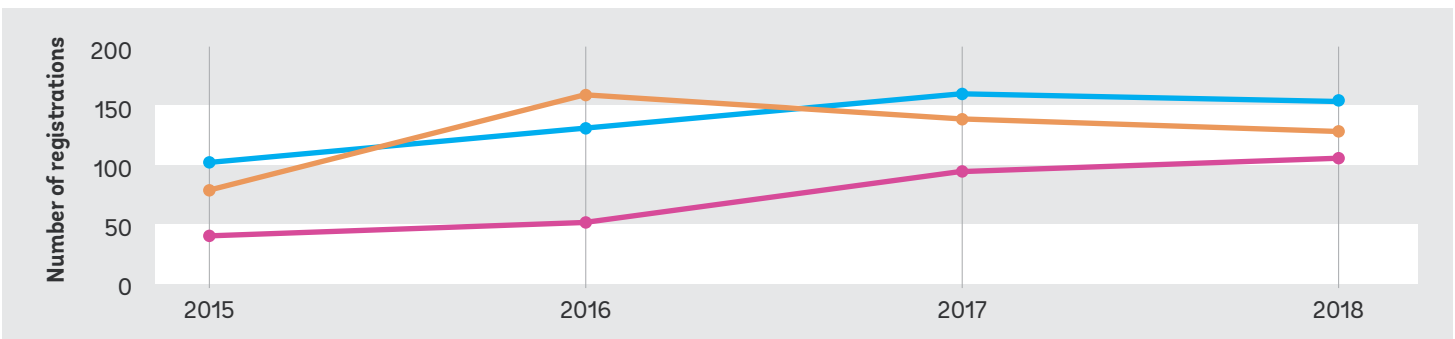


Although the above points provide an indication of perceived potential for growth, actual firm performance data, such as change in sales revenue or employment, are generally not available, suggesting that improved interoperability between the Patents and Companies Registration Authority and the Zambia Revenue Authority could provide valuable data points for the purpose of informing evidence-based policy formulation (see chapter 5 on Digital Platforms for further discussion on interoperability).

## THE STATE OF DIGITAL ENTREPRENEURSHIP IN ZAMBIA

The direct contribution of the ICT sector to GDP more than doubled, from 1.6 percent in 2010 to 4.4 percent in 2018. ICT company registrations also grew steadily from 2015 to 2018. As illustrated in figure 4.4, the most significant growth in new ICT company registrations is in the “computer programming activities” subcategory. This growth is occurring despite the shortage of quality skilled labor (see chapter 3 on Digital Skills), and it is perhaps also an indicator of the increased demand for programming skills. In 2017 and 2018, the highest number of new company registrations were in the “other information technology and computer service activities” subcategory.

▶▶ **FIGURE 4.4:**  
NEW ICT COMPANY REGISTRATIONS IN ZAMBIA



Source: PACRA 2018.

● Computer consultancy and computer facilities management activities
 ● Computer programming activities
 ● Other information technology and computer service activities

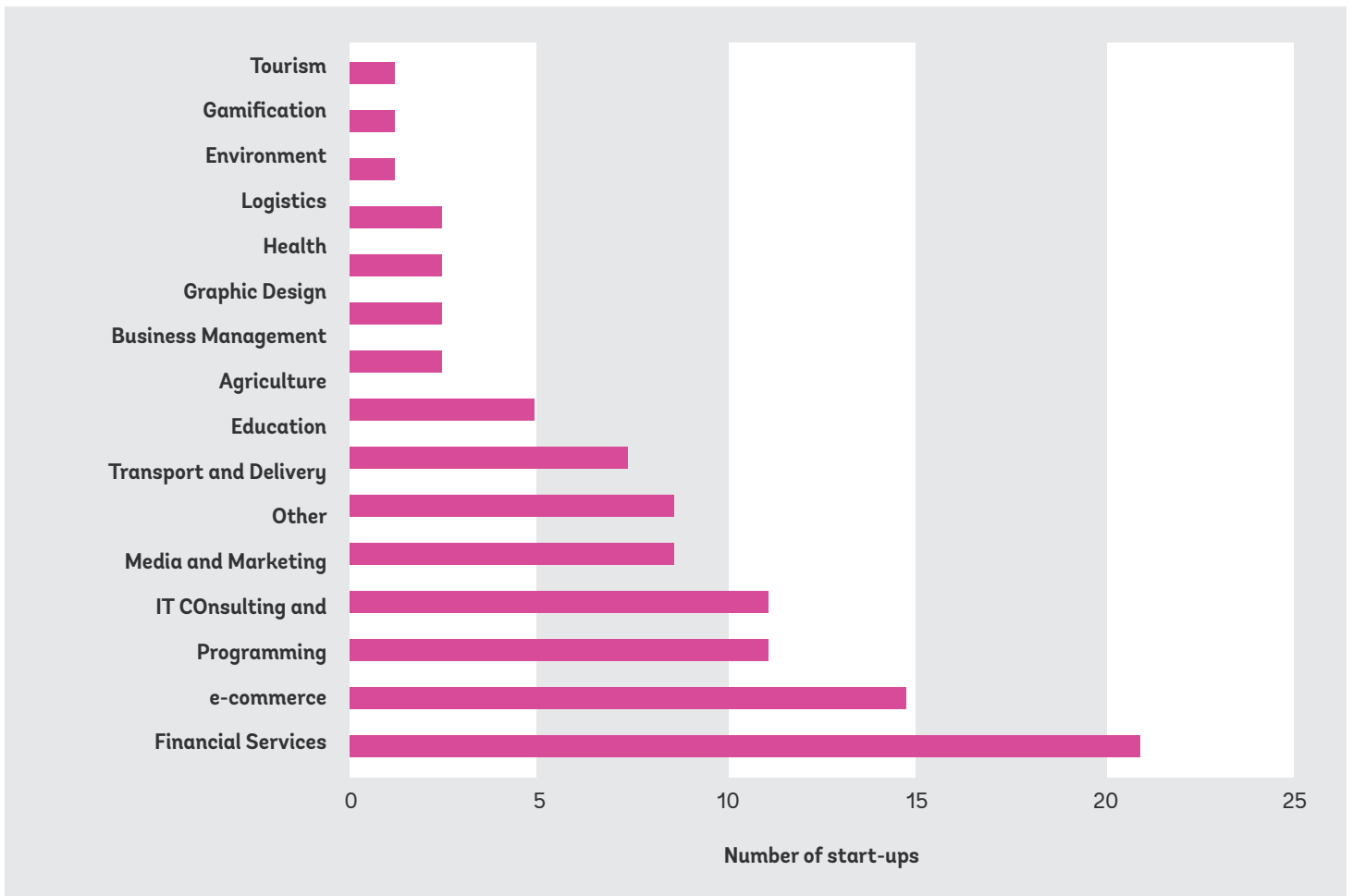
Many digital enterprises do not define themselves as ICT companies. For example, an enterprise that uses a digital platform for the purpose of ride-sharing may classify itself as a transport company rather than an ICT company, and a payment service riding on a mobile platform may classify itself not as an ICT company, but as a financial services provider. It is therefore a challenge to obtain, in any country, a full overview of all digital enterprises. However, in an attempt to gauge what the start-up community in Zambia is engaged with, all the digital entrepreneurship support organizations (tables 4A.1 and 4A.2 in annex 4A) in Lusaka were contacted and a list of entrepreneurs that have participated in their programming requested. The enterprises on this list that are currently engaging with customers were then identified. This exercise yielded a list of about 120 digital enterprises operating across a range of “traditional” sectors, including tourism, health, agriculture, education, and financial services.

The largest digital enterprise categories were focused on digital financial services (20 percent) and e-commerce (15 percent) (figure 4.5). The former is not surprising given the rapid uptake of digital financial services, but the focus on e-commerce is a surprise, given the significant obstacles in Zambia. Only a small proportion of the population in Zambia has a home address. Goods that are ordered online can therefore not always be efficiently and reliably delivered to the buyer. Long distances and high logistics costs also affect the viability of both domestic and cross-border trade. Although these firms are currently earning revenue, whether they can become profitable and sustainable in the long run is not clear. Significant improvements in the addressing system and logistics likely need to be made for e-commerce companies to be viable in Zambia. See chapter 5 on Digital Platforms for a more detailed discussion.





▶▶ **FIGURE 4.5:**  
SECTORAL AREA OF FOCUS FOR EARLY-STAGE DIGITAL ENTERPRISES



Source: World Bank primary research for this publication.

# The Enabling Environment for Digital Entrepreneurship

Even though Zambian entrepreneurs see opportunities, they lack the skills and resources to convert these opportunities into viable—and growing—enterprises. With regard to an enabling environment for entrepreneurship, the 2018 Global Entrepreneurship Index ranks Zambia 102nd out of 137 countries worldwide, and 9th out of 30 countries in Sub-Saharan Africa. This is quite similar to the country's

2016 ranking. Zambia's highest scores are in Opportunity perception and Internationalization, whereas the lowest scores are found in Startup skills, Technology Absorption, High Growth Enterprise and Risk Capital. As illustrated in figure 4.6, these are the same scores as in 2016. Unfortunately, if going by the GEDI data, the trend appears to be going toward a less, rather than more, enabling environment.

▶▶ **FIGURE 4.6:**  
CHANGE IN THE ENTREPRENEURSHIP ECOSYSTEM, PERCENT



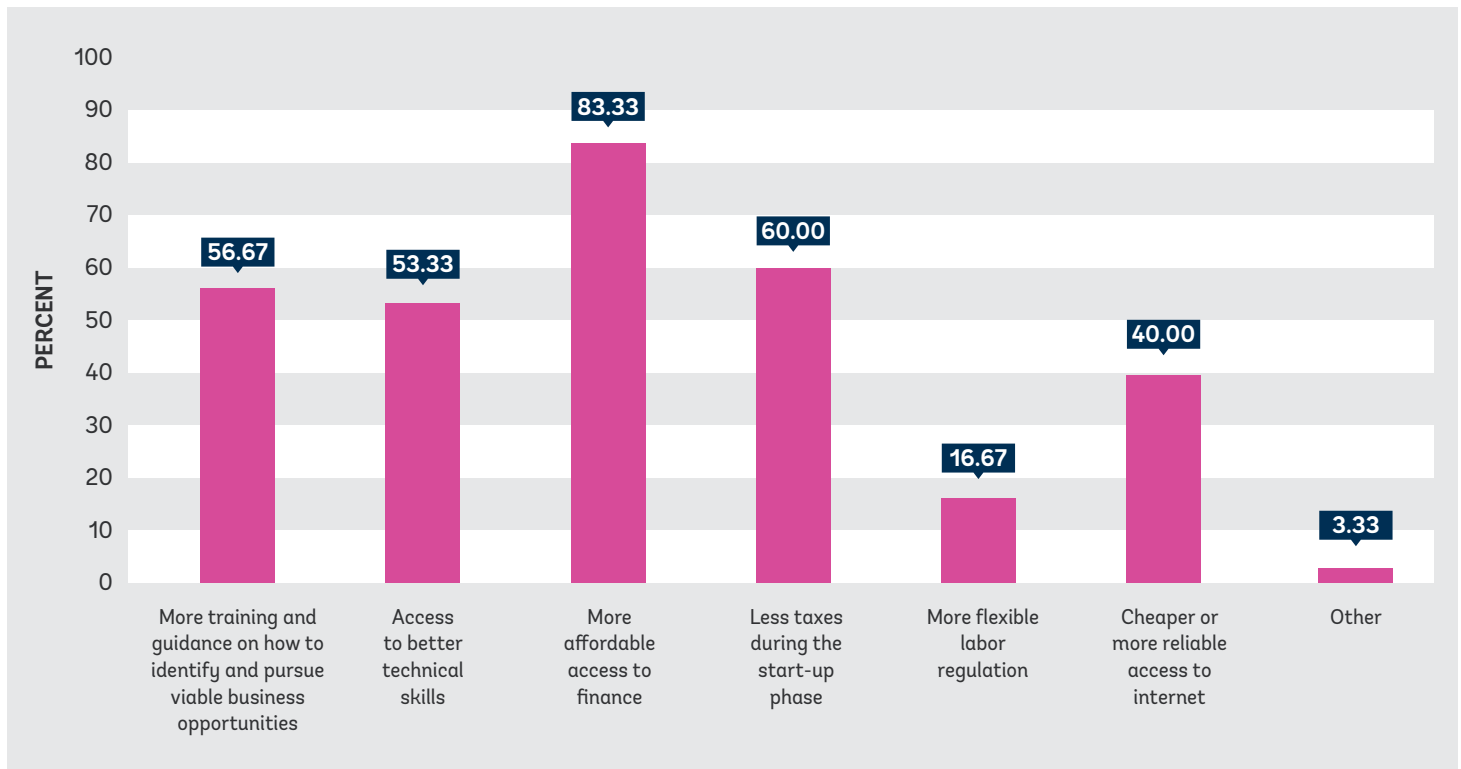
Source: Global Entrepreneurship Index 2016, 2018.

● 2016 ● 2018

The authors distributed a survey to 40 early-stage digital enterprises in Zambia. These entrepreneurs were asked, "In your view, what do entrepreneurs that are starting a digital business in Zambia today need most to optimize their chance of creating a profitable business?" The answers of the 30 entrepreneurs who responded to the survey align well with the trend observed in the Global Entrepreneurship

Index (figure 4.7), as do the views of entrepreneurship support organizations interviewed for this diagnostic report. Additionally, the authors' survey captured tax constraint as a barrier. This topic was investigated further and is elaborated in chapter 5 on Digital Platforms.

►► **FIGURE 4.7:**  
DIGITAL ENTREPRENEURS' VIEW OF WHAT IS MOST NEEDED  
FOR DIGITAL ENTREPRENEURS TO START AND GROW THEIR BUSINESSES

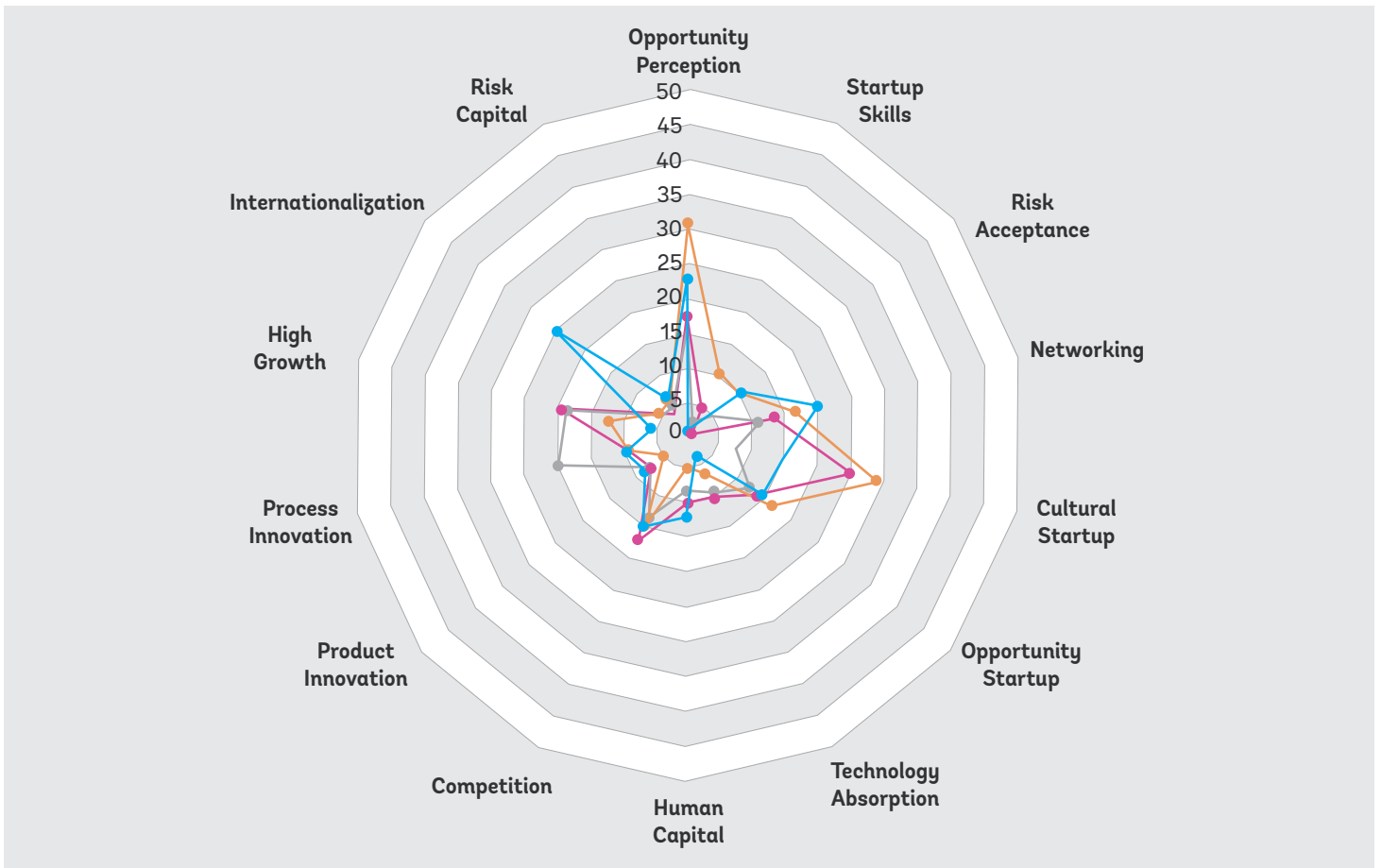


Source: Survey of 40 early-stage digital enterprises in Zambia, 2019

The authors distributed a survey to 40 early-stage digital enterprises in Zambia. These entrepreneurs were asked, "In your view, what do entrepreneurs that are starting a digital business in Zambia today need most to optimize their chance of creating a profitable business?" The answers of the 30 entrepreneurs who responded to the survey align well with the trend observed in the Global Entrepreneurship

Index (figure 4.7), as do the views of entrepreneurship support organizations interviewed for this diagnostic report. Additionally, the authors' survey captured tax constraint as a barrier. This topic was investigated further and is elaborated in chapter 5 on Digital Platforms.

►► **FIGURE 4.8:**  
ZAMBIA'S ENABLING ENVIRONMENT FOR ENTREPRENEURSHIP COMPARED WITH BENCHMARK COUNTRIES



Source: Global Entrepreneurship Index 2018.

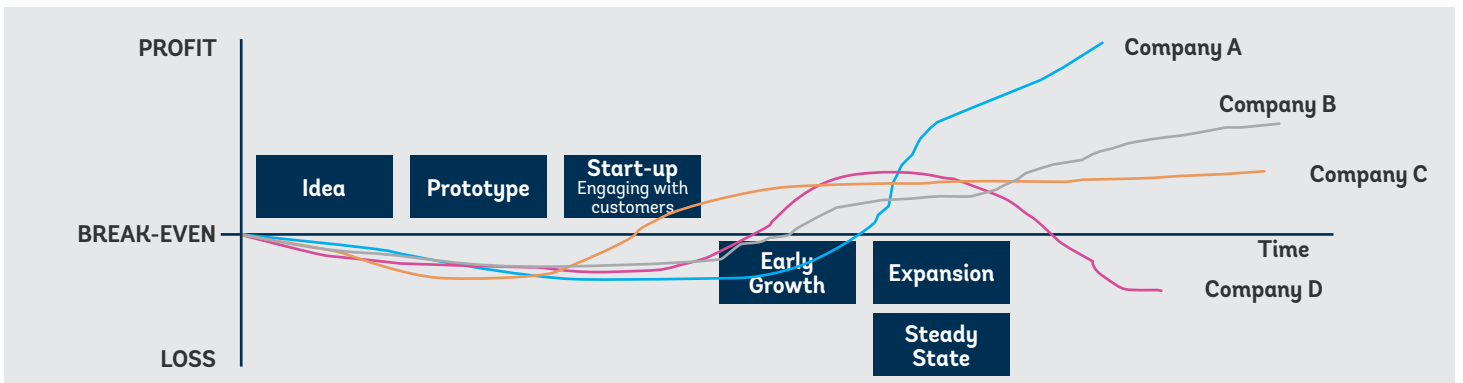
● Zambia ● Ghana ● Kenya ● Rwanda

### ENTREPRENEURSHIP FROM START-UP TO SCALE

Entrepreneurship can be thought of as a process. For market opportunities to materialize into market entry and growth, entrepreneurs must recognize the opportunities, possess the ability and resources to pursue them, and be willing to follow this path instead of other potentially rewarding options such as present or alternative employment or unemployment. An entrepreneur's willingness is closely tied to perceived risk and reward. It is thus

critical to think of entrepreneurship policies as a means not only to enable the entrepreneur's entry into the market (that is, registering a business or making the first sales), but to enable a young firm's growth. This is important because the needs of entrepreneurs change as they move from idea to prototype to engaging with customers (start-up) and finally to earning revenue, making a profit, and investing in growth (figure 4.9).

►► **FIGURE 4.9:**  
BUSINESS LIFE CYCLE



Source: Original figure for this publication.

A wide range of policy options are in place to promote entrepreneurship in any given sector, the main categories of which are summarized in figure 4.10. The majority of these policy options are also applicable to digital entrepreneurship specifically, although national quality infrastructure and industrial policies may be less so, compared with entrepreneurship in other sectors. The

policy instruments most relevant to digital entrepreneurship are highlighted in blue. The next sections discuss to what extent these policy instruments are used to promote digital entrepreneurship in Zambia, and to the extent possible, whether they are having the desired effect on the start-up and growth of digital enterprises.

►► **FIGURE 4.10:**  
POLICY INSTRUMENTS TO ENABLE ENTREPRENEURSHIP

DIRECT SUPPORT					REGULATORY AND INDIRECT SUPPORT					
Provision of goods and services		Collaborative policies	Nonmarket incentives	Market-based incentives		Advocacy and voluntary	Regulations			
Technology, extension support, business advisory, and supplier development	Indicators	Science and techno parks	Clusters and networks	Competitive grants, prizes, inducement, and ex post recognition awards	Public procurement	Equity finance	Fiscal interventors	Mentoring and coaching	Standards	Intellectual property rights
	Accelerators	National quality infrastructure						Grants and matching grants	Loan guarantees	Networking and access to information
					Vouchers				Tax and insolvency	Spatial policies
									Industrial policies	Trade and FDI policies

Source: Grover, Medvedev, and Olafsen 2019.  
Note: FDI = foreign direct investment.

## POLICY AND REGULATION

Zambia does not have an entrepreneurship policy per se, but three policies are currently under development that could be harnessed to improve the enabling environment for entrepreneurship generally and digital entrepreneurship specifically. These initiatives include a new Science, Technology and Innovation (STI) Policy, shepherded by the Ministry of Higher Education; and the 2009–2019 Micro, Small, and Medium Enterprise (MSME) Policy and the new E-commerce Policy led by the Ministry of Commerce, Trade and Industry. The Science and Technology Council anticipates that the new STI Policy will be tabled for Cabinet approval by the end of 2020, while the new MSME and E-commerce policies will likely be tabled for Cabinet approval in the first quarter of 2020.

The new policies under development do not touch on the regulatory environment for entrepreneurs. Although the updated STI Policy

and Implementation Plan envision significant investment in the capacity of—and resources available to—innovators, it is silent on the “incentive regime,” that is, the regulatory factors that affect entrepreneurs’ perceptions of risk and reward and thus their willingness to invest in growth (these factors are largely captured under “Regulations” in figure 4.10). The 2009 MSME Policy also does not discuss the incentive regime for the start-up and growth of enterprises in any detail, although reference is made to the Companies Act, the Income Tax Act, and the National Employment and Labor Act as being relevant to MSME development.

The state of business registration, insolvency, taxes, labor, and intellectual property regulations and procedures and their implications for incentives for entrepreneurs generally, and digital entrepreneurs specifically, is discussed below.



## Business Registration

Zambia currently scores 85 out of 100 on the Starting a Business indicator of the World Bank's Doing Business Rankings (World Bank Group 2019) (table 4.3). This score is a slight improvement from 2018 and is significantly better than Côte d'Ivoire and Ghana, but worse than Kenya and Rwanda. Although significant improvements have been made that reduce the time and complexity of registering a business in Zambia (see chapter 5 on Digital Platforms), the cost of starting a business is greater than 30 percent of income per capita. This cost, of course, creates a hurdle for self-made entrepreneurs who are not independently wealthy. Comparatively, the cost of starting a business is 24.9 percent of income per capita in Kenya, 15.5 percent in Ghana, 14.8 percent in Rwanda, and 2.7 percent in Côte d'Ivoire.

►► **TABLE 4.3:**  
EASE OF STARTING A BUSINESS

	Starting a Business			
	Ranking 2018	Score 2018	Ranking 2019	Score 2019
Côte d'Ivoire	44	91.72	26	93.70
Ghana	110	84.02	108	84.29
Kenya	117	83.20	126	82.41
Rwanda	78	87.66	51	91.39
Zambia	101	84.89	102	85.07

Source: World Bank Group 2018, 2019.

## Insolvency

What will happen if the business fails also affects an entrepreneur's willingness to start a new business—an inherently risky proposition. Zambia currently scores 42 out of 100 on the Resolving Insolvency indicator of the Doing Business rankings (table 4.4), which leaves much room for improvement. Kenya and Rwanda score significantly higher, while Ghana lags behind Zambia by a wide margin. The efficient resolution of insolvency is important both for the entrepreneur directly and for investors, which has been recognized by Zambian authorities. The World Bank Group is therefore actively assisting the government in implementing the new Corporate Insolvency Act by providing capacity-building to commercial judges, strengthening the implementation of the collateral registry, and assisting the insolvency regulator (the Patents and Companies Registration Agency) in performing its duties.

►► **TABLE 4.4:**  
EASE OF RESOLVING INSOLVENCY

	Resolving Insolvency			
	Ranking 2018	Score 2018	Ranking 2019	Score 2019
Côte d'Ivoire	77	47.81	80	48.00
Ghana	158	24.77	160	24.94
Kenya	95	43.11	57	57.41
Rwanda	78	47.79	58	57.20
Zambia	89	44.85	99	42.42

Source: World Bank Group 2018, 2019.

## Intellectual Property Protection

Digital entrepreneurs are perhaps more likely than entrepreneurs in many other sectors to have intangible assets that are core to their value proposition. Therefore, adequate intellectual property protection is important for encouraging investment in this sector. According to the World Economic Forum's Global Information Technology Report, Zambia scored 3.96 out of 7 in the level of intellectual property protection in 2017, which is a drop from 2016 (table 4.5). Compared with the benchmark countries, Zambia ranks second to last. However, Zambia's 2018 Trade Policy clearly acknowledges that effective protection of intellectual property rights is "necessary for technology transfer, innovation and economic development," and sets concrete objectives to strengthen the "implementation of national intellectual property rights legislation" (Republic of Zambia, Ministry of Commerce, Trade and Industry 2018, 14).

►► **TABLE 4.5:**  
STATE OF INTELLECTUAL PROPERTY  
PROTECTION IN ZAMBIA

	IP protection (index 1–7)		
	2016	2017	Variation (%)
Côte d'Ivoire	3.93	3.75	-4.58
Ghana	3.93	4.06	3.31
Kenya	3.96	4.36	10.10
Rwanda	5.26	5.18	-1.52
Zambia	4.23	3.96	-6.38

Source: Baller, Dutta, and Lanvin 2016; World Economic Forum, Global Competitiveness Index 2016.  
Note: IP = intellectual property.

## Taxes and Fees

Although corporate tax rates have little effect on starting a business, given that revenues are nonexistent or negligible, they do have an impact on profitability and incentive to scale up. The standard corporate tax rate in Zambia is 35 percent, but the rate varies from industry to industry. For example, companies in farming and agro-processing pay a 10 percent tax, whereas companies in mining, fertilizer manufacturing, and nontraditional exports pay a 15 percent tax. ICT companies pay a 35 percent tax on profits up to 250,000 Zambia kwacha (K) and 40 percent on profits beyond K 250,000. There is no tax holiday, across industries, for the early stage of very small firms. However, this study has not looked at available tax deductions that may be of particular benefit to entrepreneurs.

As is common in most countries, business owners also pay labor-related fees. An employer's contribution to the Zambian National Pension Scheme is 5 percent of the salary of an employee (up to a ceiling of K 1,073.80 per month), and contributions to the Public Service Pension Fund and the Funeral Insurance Fund are 1 percent and 0.6 percent, respectively. There is also a municipal tax known as a "personal levy," which is a maximum of K 15 per year. An employer's contribution to the Workers' Compensation Fund is assessed according to the risks employees face in the workplace. These fees are payable as soon as a start-up registers the company.

## Labor

Of particular importance to Zambia is the recently approved Information and Communication Technology Association of Zambia Act of 2018. The intent of the act is to "regulate the professional conduct" of "information and communications technology professionals," defined as "a person who possesses the knowledge, competence and skill to conduct research, plan, design, write, test, provide advice and improve information and communications technology systems, software and related concepts for specific applications and has appropriate combination of recognized qualifications and practical experience." A prospective member must apply to the association and pay a fee. Membership has been made mandatory, and practicing without it is punishable by prison: "A person shall not practice as an information and communications technology professional, unless that person holds a practicing certificate issued by the Board under

this Act... (3) A person shall not employ or engage any person who does not hold a practicing certificate. (4) A person shall not operate, either on that person's own behalf or on behalf of another person, an information and communications technology business that does not have a registered member with a valid practicing certificate in its employment. (5) A person who contravenes this section commits an offence and is liable, on conviction, to a fine not exceeding seven hundred thousand penalty units or to imprisonment for a term not exceeding seven years, or to both."

The key challenge with this act is that although membership is mandatory by law, it is not clear (1) what constitutes an "appropriate combination of recognized qualifications and practical experience," and (2) what "related concepts" include, and therefore how far reaching the act is. In contrast to professions such as medicine or law, there is no one standard certification for an ICT professional. This industry in particular has many people who acquire their ICT skills outside of formal education but are fully proficient. It would thus be very difficult to derive a standard metric to which all applicants should be held. The act could thus lead to anti-competitive behavior excluding legitimate professionals or businesses from the market. Moreover, the act may encourage skilled Zambian ICT professionals to find work outside Zambia, thus decreasing the pool of the very same professionals of which there is currently a shortage.

Preparation for a digitized economy would require some coordination of policies related to education, the labor market, taxes, housing, social protection, and research and innovation (OECD 2019). In the South African country report, policy coordination is highlighted as a key recommendation (World Bank Group forthcoming). The policy landscape in South Africa is well developed, and significant progress has been made to implement policies that could optimize a digital economy. However, coordination between governmental departments is lacking, resulting in an education system that does not respond to digital skills needs, digital skills research that takes place in a different department than the National Skills Authority, and no explicit policy guidance on how the digital skills gap in different sectors should be addressed. Zambia can learn from South Africa's experience by assigning an interministerial task team to align digital skills policies with other national policies and priorities.



## FIRM-LEVEL CAPABILITY AND SUPPORTS

Zambia's 2009 MSME Development Policy states that "the culture of entrepreneurship and business practice is still not well developed among Zambian citizens. This could be related to a cultural mind set of dependency and a low propensity for risk taking. This has resulted in low levels of entrepreneurial ability and business management competency among most SMEs. These low levels of entrepreneurial skill and management competency have limited the ability of most MSMEs to grow beyond the establishment phase."

The 2019 Global Entrepreneurship Index indicates that Zambia's risk acceptance is 22 percent and cultural support 29 percent. The Risk Acceptance score is similar to that of Ghana, and ahead of those of Kenya and Rwanda, but Cultural Support for Entrepreneurship is much higher in Ghana and Rwanda than in Zambia. By contrast, high-income countries that are regarded as highly entrepreneurial, namely Sweden, Switzerland, and the United States, score 75, 89, and 98 percent, respectively, for Cultural Support.

With regard to evolution in entrepreneurial skills and management competency, the 2018 Global Entrepreneurship Index indicates that factors related to firm-level capability such as start-up skills, technology absorption, and human capital rate very low. Entrepreneurial skills and firm-level capability thus remain at low levels, even though the 2009–2018 SME Policy focused significantly on building entrepreneurial and SME capacity, and increasing SME access to market opportunities, business development services, finance, and operating premises. In the area of capacity development, a key goal of the SME Policy includes "to improve innovation and level of technology and technical know-how among SMEs," while policy strategies include a range of instruments such as "entrepreneurship training at all levels of the education system," "institutes of MSMEs and Entrepreneurship in selected business schools," business incubation centers, technology innovation centers, and annual award schemes and competitions.

It appears, however, that several of these programs were not implemented, likely because of a lack of funding. A policy review is currently ongoing with an objective of releasing an updated strategy by the end of 2020.

The entrepreneurship capacity-building service offer in Zambia is quite young, and there are few digital entrepreneurship capacity-development players. Three government-funded entrepreneurship support organizations provide capacity-building services to digital

entrepreneurs in Zambia: the Zambia Development Agency (ZDA) (under the Ministry of Commerce, Trade and Industry), the National Technology Business Center (NTBC) (under the Ministry of Higher Education), and the innovation program run by ZICTA (under the Ministry of Transport and Communication). Neither of the three major universities—University of Zambia, Mulungushi University, and Copperbelt University—appear to have innovation, technology, or entrepreneurship centers or institutes. They do, however, offer ICT and business curricula and are increasingly integrating ICT in the business course curricula and vice versa. It is not clear what the entrepreneurship offering is at the secondary school level.

Out of the three organizations, only ZICTA has an offering specific to digital entrepreneurs; ZDA offers general business capacity building and NTBC offers intellectual property protection services, which in principle could be valuable to digital entrepreneurs. An overview of the mandate and capacity building offered by these organizations is provided in table 4A.1 in annex 4A.

ZICTA and NTBC struggle with continuity in their programming because of budget uncertainty. The number of beneficiaries and the scope of services that can be provided therefore change from year to year. All three organizations have capacity-building staff only in Lusaka.

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In addition to the publicly funded entrepreneurship capacity-development organizations, several private initiatives have emerged since 2010. Organizations that specifically target digital entrepreneurs include BongoHive, Jacaranda Hub, and WeCreate (table 4A.2 in annex 4A). Additionally, private corporations have played a significant role in promoting the growth of tech hubs on the continent (box 4.2). This approach is also starting to emerge in Zambia. For example, Zanaco recently initiated an innovation center; Liquid Telecom is helping to accelerate Zambia's emerging gaming and Internet of Things ecosystem through a partnership with BongoHive; and Barclays has been assisting the activities of several of the governmental and nongovernmental entrepreneurship support organizations in Zambia.

▶▶ **BOX 4.2:**

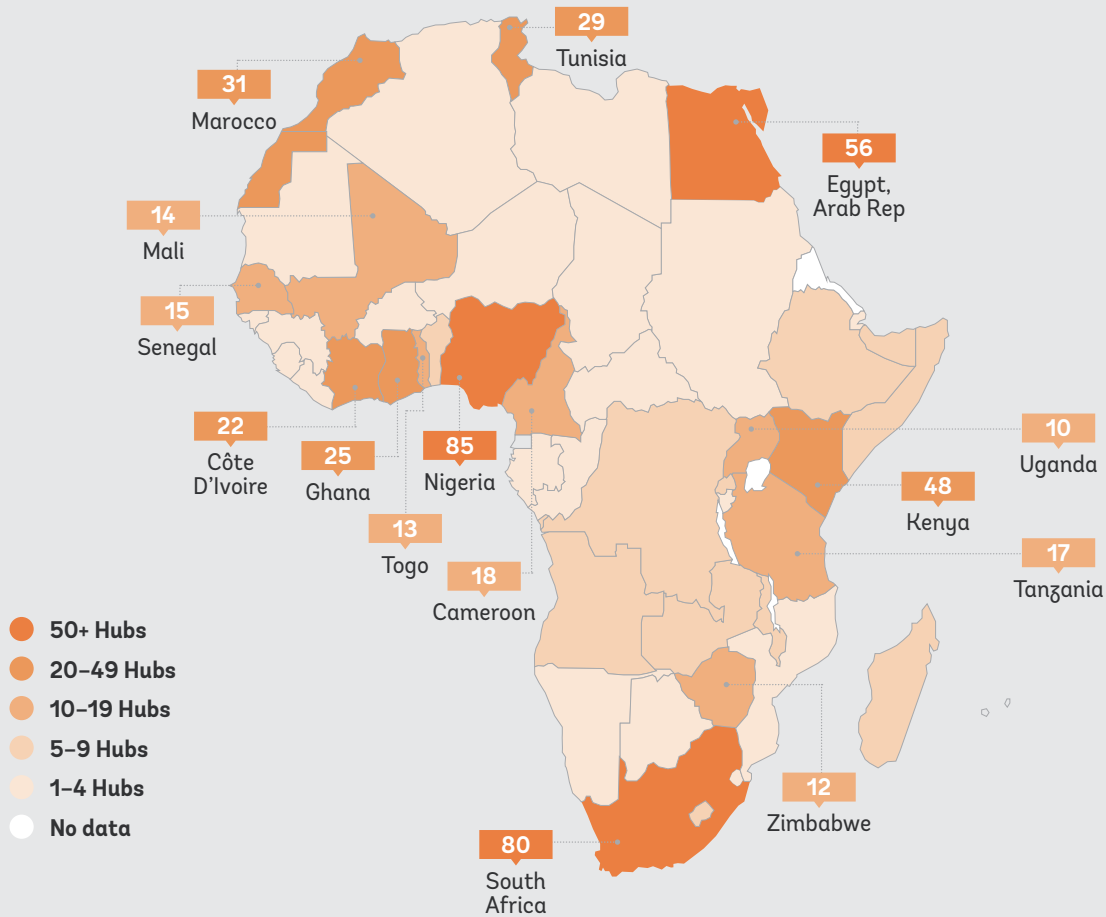
**BUILDING THE CAPACITY OF TECHNOLOGY ENTREPRENEURS ACROSS THE CONTINENT**

According to an overview prepared by Briter Bridges and the GSM Association, there are now more than 600 tech hubs across Africa, an increase of 40 percent since 2017. While Zambia and Rwanda have fewer than four such hubs, Côte d'Ivoire has 22, Ghana 25, and Kenya 48 (map B4.2.1). Government and the private sector have key roles to play in advancing this support system across the continent.

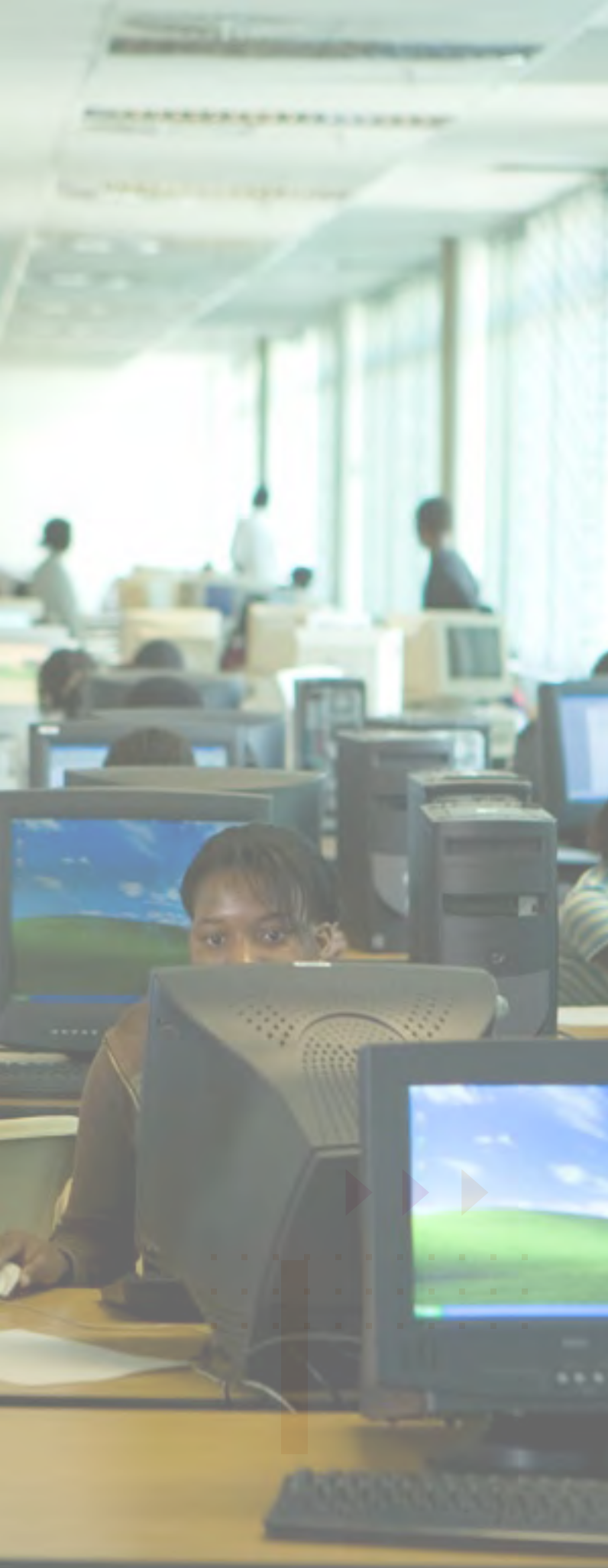
Internationally, government support for tech hubs generally takes three forms: (1) funding for the operational budget of the hub; (2) provision of free or subsidized real estate, electricity, and connectivity; or (3) financing for the entrepreneurs that benefit from the hub. These models can be found in high- and low-income countries alike. Some governments also set corporate participation in the hub as a prerequisite for government funding so as to leverage the market knowledge and network of the corporation to further the growth of start-ups benefiting from the hub.

Corporations have taken a more active role in establishing or supporting tech hubs globally. Indeed, a large number of hubs across Sub-Saharan Africa have been supported by mobile operators and internet providers. According to Briter Bridges, the mobile network operator Orange has been setting up Orange Fab labs across Francophone Africa, while MTN and information and communications technology infrastructure providers such as Liquid Telecom have also launched in-house tech hub initiatives (such as MTN's Y'ello Startup in Abidjan) in several markets on the continent. Financial institutions such as Standard Bank have also entered the game by setting up incubators in countries including Angola and Mozambique. Similarly, Standard Chartered Bank recently set up eXellerator in Nairobi.

▶▶ **MAP B4.2.1:**  
**OVERVIEW OF TECH HUBS IN AFRICA**







Additionally, there are four coding communities in Zambia that focus on promoting programming skills—Agora Code Community, Hackers Guild, forLoop Zambia, and Facebook Developer Circle, which were formed in 2015, 2014, 2016, and 2017, respectively. These communities are complemented by the recently launched Barbara Munyati Cisco Academy and Oracle Academy at the University of Zambia (see chapter 3 on Digital Skills for further discussion of these initiatives).

All in all, while countries such as Ghana and Kenya are getting to a stage in the evolution of their entrepreneurship ecosystems where consolidation and focus is required, Zambia's entrepreneurship support system is nascent and needs further investment to boost entrepreneurial and technical capabilities. Importantly, sustained programming is needed that creates a pipeline of entrepreneurs who recognize market opportunities and have the aspirations and knowledge to derive marketable ideas. This process starts in the school system, and is then followed by initiatives such as hubs, incubators, and accelerators. Among these initiatives, very little support is currently available to assist technology entrepreneurs beyond the idea stage with building their enterprises. This assistance requires knowledge of the dynamics of the technology sector and experience-based guidance to entrepreneurs. Finally, while current initiatives are primarily available in Lusaka, these offers need to be extended to other cities, such that a critical mass of creative tech entrepreneurs is generated.

The Implementation Plan accompanying the new STI Policy rightly envisions increased investment in "incubation centers," and the establishment of "innovation hubs," "innovation high tech centers," and "science and technology parks." Technology transfer offices in universities and links with industry are also envisioned. Curiously, however, the Implementing Institutions mentioned in the plan only include the Ministry of Higher Education and the National Science and Technology Council. The Ministry of Commerce, Trade and Industry is not included, nor are any private sector organizations. The 2009–2019 MSME Policy is also under revision and features plans around entrepreneurship capacity development, making this is an opportune juncture to review how the Ministry of Higher Education and the Ministry of Commerce, Trade and Industry, along with the Ministry of Transport and Communication, for digital specifically, can design a more comprehensive approach to advancing entrepreneurship support. There is also clearly an opportunity for partnerships with the private sector, whether they be corporations or nongovernmental entrepreneurship support organizations such as BongoHive, Jacaranda Hub, and WeCreate. In addition to the ideas outlined in the new STI Policy, one concept floated by the SMART Zambia Institute, the Ministry of Commerce, Trade, and Industry, and ZICTA is the potential for an "innovation park" that would provide the infrastructure required for digital entrepreneurs. A good example of this is in place in Ghana, and could offer helpful ideas and lessons for Zambia (see appendix B).



## FINANCIAL CAPITAL

Access to finance is a real challenge for entrepreneurs in Zambia, and even more so for digital entrepreneurs. As a rule of thumb, digital entrepreneurs at the start-up phase generally need \$10,000–\$25,000; entrepreneurs at the acceleration stage need \$25,000 up to about \$500,000; and entrepreneurs at the scale-up stage hit the \$1 million and above mark. There are many regional and international investors willing to make deals in the latter category, so the core challenge is at the start-up and acceleration stages. This is common across countries, but in Zambia the challenge is more acute—there are no grant programs available to technology entrepreneurs; the banking sector is lending at exorbitant rates because of Zambia’s macro and national debt situation; there is only one fund investing in the sub \$100,000 range (Zenga Ventures); and only one fund is investing in the \$100,000–\$500,000 range (Kukula Seed Fund).

According to the World Economic Forum Global Competitiveness Report, which ranks venture capital availability in countries on a scale from 1 to 7 (1 being extremely difficult and 7 being extremely easy<sup>15</sup>), venture capital availability in Zambia is ranked at 2.16—worse than Côte d’Ivoire, Ghana, Kenya, and Rwanda—and the trend is a slight worsening (table 4.6).

►► **TABLE 4.6:**  
EASE OF ACCESS TO VENTURE CAPITAL

	Venture Capital Availability [1 = extremely difficult; 7 = extremely easy]		
	WEF Global Competitiveness Report, Executive Opinion Survey, 2016–17 (2016)	WEF Global Competitiveness Report, Executive Opinion Survey, 2016–17 (2017)	Variation
Côte d’Ivoire	3.02	2.72	-9.93
Ghana	2.35	2.57	9.36
Kenya	2.93	3.03	3.41
Rwanda	3.28	3.24	-1.22
Zambia	2.21	2.16	-2.26

Source: World Economic Forum 2016.  
Note: WEF = World Economic Forum.

Discussions with more than 100 early-stage digital entrepreneurs revealed the following funding sources for the very few entrepreneurs that had been able to secure external funding: GSMA Ecosystem Accelerator Innovation Fund (UK-based grant program funded by UKAid and Australia Aid), Ground Squirrel Ventures (US-based equity seed fund), Barclays Bank, Hivos Impact Capital (equity investments and convertible loans in the food and lifestyle sector in Southern Africa; based in the Netherlands with an office in South Africa), Kukula Seed (Zambia-based equity seed fund funded by UKAid), United Nations Capital Development Fund, Zambia National Commercial Bank, and Financial Sector Deepening Zambia. Three of these eight are international sources, illustrating that while there is a need to create a funding vehicle targeting the start-up stage in particular, a complementary strategy is to ensure that promising Zambian start-ups are seen by regional and international early-stage investors.

According to Partech, 2018 was a record year for the African venture capital market; 146 African tech start-ups raised a total of \$1.163 billion in equity through 164 rounds, significantly more than the \$560 million raised in 2017 (Partech Partners 2018). Funding increased across the business life-cycle stages. Kenya, Nigeria, and South Africa absorbed 78 percent of the total funding in 2018, exactly the same as in 2017. Although numerous investment facilities are available regionally (figure 4.11), Partech only recorded one funding round in Zambia, totaling about \$1 million. The Emerging Markets Private Equity Association recorded only one deal in Zambia in 2016, and none in 2017. In comparison, \$266 million was deployed in 15 venture capital deals in Ghana in 2016–17.

The Zambian government recognized the early-stage financing challenge many years ago; the 2019 revision of the STI Policy notes that the 1996 Policy provided for “the creation of a Venture Capital Fund,” but the fund did not materialize because of “inconsistencies in the Science and Technology Act No. 26 of 1997 and the policy on the operationalization of the Fund. In addition, the size of the money market; limited expertise in venture capital management; inadequate financial resources; and the limited output of research and development products also contributed to the Fund not materializing. The Policy also provided for the establishment of a Technology Business Development Fund (TBDF) to promote the involvement of MSMEs in the commercialization of locally developed technological products and innovations. Although the TBDF has been established, it is yet to have a significant impact on the sector as the Fund remains inadequate.” It may thus be time to review potential options for creating a public-private partnership in the early-stage-financing segment. Other relatively unexplored possibilities in Zambia include the promotion of angel investing and crowdfunding (see boxes 4.3 and 4.4).

15. “In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? [1 = extremely difficult; 7 = extremely easy]”

▶▶ **BOX 4.3:**  
**LEVERAGING HIGH NET WORTH INDIVIDUALS FOR EARLY-STAGE INVESTMENTS**

An angel investor is a private individual who directly invests his or her personal assets in new and growing businesses. Angels invest individually or in collaboration with others. Angels commonly contribute much more than just cash; they often have industry knowledge and access to networks that they make available to their investees. Business angel networks are emerging in many countries across the continent, most recently in Benin, Mali, Senegal, and Togo. These networks have a variety of operating models. For example, South Africa's Jozi Angels entered a partnership with the South African government's Technology Innovation Agency to co-invest alongside members of this investor network, intending to pilot a public-private partnership. Similar approaches have been adopted in Lebanon and Morocco.

▶▶ **BOX 4.4:**  
**TAPPING INTO THE "CROWD" FOR EARLY-STAGE FUNDING**

Crowdfunding uses the internet to bring together individuals ("the crowd") who commit money to projects and companies they want to support. Kickstarter and Indiegogo are among the most well-known platforms for individuals to pledge money for projects they want to support. Similarly, Kiva.org has been funding small business owners in emerging markets for more than a decade, and GoFundMe is a more recent entrant in leveraging internet-based crowdfunding for small businesses. New platforms are also emerging offering equity products, including AngelList, CircleUp, and OurCrowd. Crowdfunding offers businesses another alternative for raising money, but it is not without risk for the investor or investee. Crowdfunding thus poses new regulatory challenges for governments, and world-wide regulations related to various forms of crowdfunding are still under development.

From a regulatory perspective, Zambia is tracking relatively well for investor protection compared with the benchmark countries in this analysis, but it still has a score of 5.3 out of 10, which leaves significant room for improvement. There does not appear to be any capital gains tax, which would be an incentive at exit, but there are also no income tax write-offs associated with investing in start-ups.

Finally, access to finance must always be assessed from a supply- and demand-side perspective. Because start-up skills and level of innovation score low in Zambia, investibility in early-stage enterprises may also be low. Any intervention in the early-stage finance sphere must thus be coupled with one in firm-level capability.

▶▶ **FIGURE 4.11:**  
**START-UP INVESTMENT LANDSCAPE IN AFRICA**



Source: Briter 2018.

## Recommendations

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Zambia saw an increase in the registration of ICT-related firms from 2015 to 2018. Entrepreneurs are deriving innovative digital solutions in a wide array of sectors, including financial services, education, tourism, and agriculture. However, entrepreneurial confidence is declining, and both firm-level capability and early-stage finance are at lows. These factors are not specific to digital enterprise, but also span across other sectors. Articulation of an entrepreneurship strategy and investment in financial and nonfinancial entrepreneurship support are needed. In this regard, Zambia is fortunate to have a range of nascent private entrepreneurship initiatives, coupled with increasing corporate interest, both of which can lend themselves to public-private partnerships that make public funds stretch further. Also recommended is a regulatory review that includes an assessment of how the current tax regime, ICT-related import duties, licensing fees, and the ICT Association Act affect the ability of innovative digital enterprises to start and grow their businesses.

Although the market for digital entrepreneurs is small, entrepreneurship—digital or not—is core to Zambia’s ability to transform its economy. Recent research has shown that high-growth firms tend to be younger than the average firm, and they are not necessarily small. Many high-growth firms are already larger than the average firm at the beginning of a high-growth episode (Grover, Medvedev and Olafsen 2018). A business life-cycle approach is thus needed for an entrepreneurship policy to have the desired effect, and such policies should be cross-sectoral first, and then address any particular constraints in specific sectors. Two key recommendations are provided below.

*First, develop an early-stage entrepreneurship strategy, which should include a subsection on technology entrepreneurship specifically.* It appears that Zambia has not yet introduced a business life-cycle perspective into its policy and regulation framework. Such a strategy would necessarily entail collaboration between the Ministry of Commerce, Trade and Industry; the Ministry of Higher Education; and the Science, Technology and Innovation Council in its formulation. As illustrated by the emergence of several private initiatives over the past few years, the government also has a real opportunity to develop this strategy and the implementation plan in coordination with the private sector, thus leveraging financing and know-how.

This is an opportune time to develop such a strategy, given the ongoing review of the MSME Policy and the Science, Technology and Innovation Policy. A framework for collaboration with the private sector in the implementation of these two policies to leverage private sector know-how and resources could also be included, and the institutional stewardship of the early-stage-entrepreneurship—including technology—agenda could be clarified.

Important inputs to the articulation of this strategy would be a review of the incentive regime for early-stage entrepreneurship and a review of lessons from the implementation of previous policies and strategies. The review of the incentive regime could include engaging the Business Regulatory Review Agency to review (1) the tax regime for start-ups and early-stage investors, (2) the effect on digital enterprises of duties on ICT-related equipment, (3) the framework for participation of local entrepreneurs in public procurement, (4) the ZICTA licensing regime for digital enterprises, (5) the potential impact of the new ICT Association Act on the competitiveness and growth of the ICT sector, and (6) Patents and Company Registration Agency registration types and implications. Additionally, a review should be undertaken to assess what can be done to reduce the cost of registering a business and to improve the insolvency regime. A reform agenda could then be developed for inclusion in the strategy. The review of lessons from the implementation of previous strategies is important because both the old STI Policy and the old MSME Policy had visions for the implementation of policy instruments that could indeed enable early-stage entrepreneurship, including technology, yet implementation was not what it could have been. Therefore, a key question is what could be done differently in the future to increase the chances of success

*Second, seed and scale up (technology) entrepreneurship hubs and early-stage financing instruments through public-corporate and regional partnerships.* Such hubs are likely needed at secondary school and university levels, and at the level of professionals that venture into starting their own businesses after several years of work experience. Each level needs a different approach, aligned with the capabilities of that level. To leverage scarce public resources, Zambia could consider public-private partnership funding for the operation of technology entrepreneurship hubs and for seed funds (that is, in the form of a revolving fund), and offering corporations tax incentives for in-cash or in-kind support to entrepreneurship endeavors such as internships, coaching, and facilities.

During the expansion of such hubs, it will be important to clarify what government organizations are best positioned to provide, and what private initiatives are best able to offer. Entrepreneurship hub models range from those that simply offer an occasion for entrepreneurs to meet and exchange experiences with other entrepreneurs; those that offer training programs, mentoring, and coaching; and those that offer physical facilities and equipment. Increasingly, more research is becoming available internationally on these various operating models and their performance (GALI et al. 2017; ITC 2019). This literature can be consulted to articulate an approach that fits the Zambian context. Additionally, it may be useful to take the initial mapping done for the purpose of this analysis one step further,

and through a public-private co-creation process develop a “core competence map” that indicates which organizations can best be leveraged to do what.

Given the challenge with last mile digital infrastructure and low-level digital skills in Zambia, it may be wise to explore shared facility models, similar to the Accra Digital Center in Ghana (see appendix B) and iHub in Kenya, that can serve as hubs for up-skilling and reliable internet access for teachers and entrepreneurs. A model for such investment elsewhere includes using public funds for construction and infrastructure (such as reliable power) and then soliciting a private sector operator and anchor tenants that can create a market-driven environment for entrepreneurs and skills provision. Given that such models have now been developed in several countries, a significant body of lessons has emerged that explores what makes some of these endeavors “white elephants” while others thrive. The design and investment plan of any such initiatives should thus carefully examine these lessons and adapt them to the Zambian context before any decisions are made as to the location, scope, or business model.

Importantly, such a public-private partnership model should necessarily be accompanied by a solid monitoring and evaluation framework that provides incentives for positive outcomes. Too often, entrepreneurship support programs are monitored by counting outputs such as the number of entrepreneurs trained, or the number of SMEs served. Such metrics are not meaningful gauges of the effectiveness of entrepreneurship programs. Rather, monitoring and evaluation systems should focus on learning and business transformation outcomes.

Because many entrepreneurship-support initiatives that provide either support with start-up skills or investments are occurring at the regional level, a concerted effort should be made to ensure that the entrepreneurship-support organizations in Zambia are visible at that level. A potential avenue may be to host pitch events that regional or international organizations are delivering on the continent. This approach could serve the dual purpose of gaining Zambia visibility on the regional entrepreneurship scene while signaling to the Zambian entrepreneurship community that there are wider opportunities and possibilities opening up for partnerships with other entrepreneurs on the continent to reach a bigger market.

The Kenya Industry and Entrepreneurship Project provides a useful reference point for what a public-private-partnership approach to enhancing the innovation and entrepreneurship ecosystem could look like (box 4.5). Although the Kenyan entrepreneurship ecosystem is more advanced than that in Zambia, the approach remains highly relevant to the Zambian context.

▶▶ **BOX 4.5:**  
**THE KENYA INDUSTRY AND  
ENTREPRENEURSHIP PROJECT**

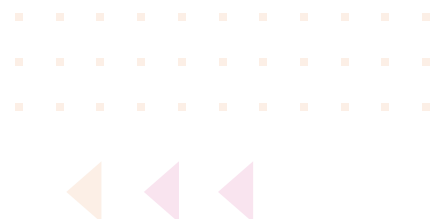
In Kenya, most incubators and accelerators have been funded by the development community. This funding over time changed from core operational funding to funding of very specific and time-bound projects, leaving many of these incubators and accelerators with a very thin operational budget that affected both the strategic focus and internal capacity of these entities.

The Kenya Industry and Entrepreneurship Project (KIEP) is a \$50 million project that is being implemented by the Ministry of Industry, Trade and Cooperatives of Kenya, with support from the World Bank Group.

KIEP aims to strengthen the innovation and entrepreneurship ecosystem in Kenya by building the capacity of incubators, accelerators, and rapid technology skills providers through performance-based grant funding. It also seeks to connect the Kenyan ecosystem to international networks of talent and support infrastructure, and foster links between start-ups and traditional industry. In addition, KIEP aims to bridge the technical skills gaps in the market by linking young talent and academia to the private sector.

KIEP was launched in June 2019 and will run until 2024.

*Finally, as the government advances its approach to support a new generation of private sector firms and solution providers, establish a platform for public-private dialogue. First, entrepreneurship ecosystem representatives should be engaged in a facilitated discussion of priority challenges that need to be addressed in the ecosystem, and then an implementation matrix and accountability framework should be developed that outlines what will be done by whom and by when, thus enabling the government and the private sector to assess progress and jointly discuss adjustments that may be needed.*





## Annex 4A Governmental and Nongovernmental Entrepreneurship Capacity-Building Organizations

►► **TABLE 4A.1:**  
GOVERNMENT-FUNDED ENTREPRENEURSHIP CAPACITY-BUILDING ORGANIZATIONS

	ZDA	NTBC	ZICTA Innovation Program
Mandate	ZDA was established by the ZDA Act of 2006. It became operational in 2007. ZDA has a broad mandate including SME development, export development, and investment promotion.	NTBC was established by the Science and Technology Act No. 26 of 1997 and Statutory Instrument No. 136 of 1999. It has been operational since 2002. NTBC was established to promote, market, commercialize, and transfer technologies in Zambia.	ZICTA's primary mandate is to regulate the ICT sector. However, the Information and Communication Technologies Act No. 21 of 2009 also provides ZICTA with a mandate to "promote research, development and the use of new and appropriate technologies." It was under this remit that ZICTA started the ICT Innovation Program in January 2016.
Target beneficiary	Entrepreneurs and MSMEs at all stages of the business life cycle and in all sectors.	Innovators and entrepreneurs at all stages of the business life cycle.	Youth between the ages of 18 and 35 who have an ICT-related business idea.
Current offer to digital entrepreneurs	According to ZDA, a total of 2,100 MSMEs were supported in 2018. It is not clear, however, how many of these were digital enterprises. The service offer is also described in very general terms, that is, "capacity building" and "business incubation" for MSMEs. It is therefore difficult to discern what may be valuable to digital entrepreneurs specifically.	In 2018, more than 3,500 beneficiaries applied for support from NTBC. However, it is unclear how many entities NTBC will be able to support because of the limited funding allocated in the national budget. It is also not clear how many of these applicants were digital enterprises. In principle, however, NTBC has a business development and intellectual property capacity-building offer that could be valuable to digital entrepreneurs.	In 2018, ZICTA's Innovation Program enrolled 60 start-ups in a four-month training program. In 2017, 20 start-ups were enrolled. The program's capacity is highly dependent on securing external funding year by year, and its offer thus varies accordingly.
Funding model	ZDA is funded by a national budget allocation through the Ministry of Commerce, Trade and Industry. It has also received funding from Barclays Bank and most recently the mining companies First Quantum Minerals and Lumwana Barrick.	NTBC is funded by a national budget allocation through the Ministry of Higher Education. It has also received funding from cooperating partners including Denmark, Finland, Norway and USAID in the past. No fees are charged to beneficiary entrepreneurs.	ZICTA initiated the Innovation Program with its own retained earnings. The vision was that the program would, over time, become an ICT incubator that would attract external funding. External project funding has to date been provided by Barclays Bank and IHS Towers. No fees are charged to beneficiary entrepreneurs.

Source: ICT = information and communications technology; MSMEs = micro, small, and medium enterprises; NTBC = National Technology Business Center; SME = small and medium enterprise; USAID = United States Agency for International Development; ZDA = Zambia Development Agency; ZICTA = Zambia Information and Communication Technology Authority.



►► **TABLE 4A.1:**  
**NONGOVERNMENTAL ENTREPRENEURSHIP CAPACITY-DEVELOPMENT**  
**ORGANIZATIONS THAT TARGET DIGITAL ENTREPRENEURS**

	<b>BongoHive</b>	<b>Jacaranda Hub</b>	<b>WeCreate</b>
Vision	BongoHive was started in 2011 by four entrepreneurs. The original vision was to create a community for like-minded technology entrepreneurs, where they could meet to exchange knowledge. Over time, the offer has evolved to assisting scalable start-ups by enhancing skills, accelerating growth, strengthening networks, increasing collaboration, providing a forum for ideas exchange, and reducing barriers to entrepreneurship.	Jacaranda Hub was started in 2017 by an entrepreneur who also has corporate experience. Her vision for Jacaranda Hub is to "play a leading role in connecting entrepreneurs to global markets, collaborative opportunities, skills development, financing, latest technologies and exposure."	WeCreate was started in 2015 by a Public Enterprise Development Specialist with support from the US Department of State and in collaboration with Caterpillar Foundation, GriffinWorx, and the African Women Entrepreneurship Program. WeCreate is specifically designed to advance gender equality in entrepreneurship and to address barriers faced by women seeking to start and grow a business.
Target beneficiary	Idea and start-up stage entrepreneurs.	Idea and start-up stage entrepreneurs, particularly youth.	Idea, start-up, and early-stage, pre- and post-revenue.
Current offer to digital entrepreneurs	BongoHive provides three offers to digital entrepreneurs: a three-month program targeting idea-stage entrepreneurs that supports them with testing their idea, a three-month program targeting start-ups to accelerate their growth, and a scale-up program targeting the most promising start-ups. Additionally, a range of master classes are offered to teach specific skills on app development, social media, and so forth.	Jacaranda Hub provides two offers to digital entrepreneurs: one includes a network of tech hubs and accelerators that can support start-ups with design, development, and market access, and the other focuses in particular on supporting entrepreneurs who aim to solve major social or environmental problems through innovation. About 600 young people benefited from these programs in 2018.	WeCreate offers trained and certified mentors to support women entrepreneurs with business model development, go-to market strategies, technology and innovation, as well as social training (life skills), and a safe and positive environment to develop a business.
Funding model	The start-up of BongoHive was supported in-kind by VVOB, the former employer of the founders. Today, 5 percent of operating expenditures are covered by fees charged to the entrepreneurs. Cooperating partners have provided in-kind support, and the US Embassy and Comic Relief have provided funding.	Jacaranda Hub is largely self funded. Some 20 percent of the operating expenditures are covered by revenues from the start-up journal published by Jacaranda Hub. Partners have also provided in-kind support.	WeCreate has received funds from cooperating partners, the US Department of State, Citi Foundation, and Atlas Mara. It also raises funds from fees covering 22 percent of the budget.

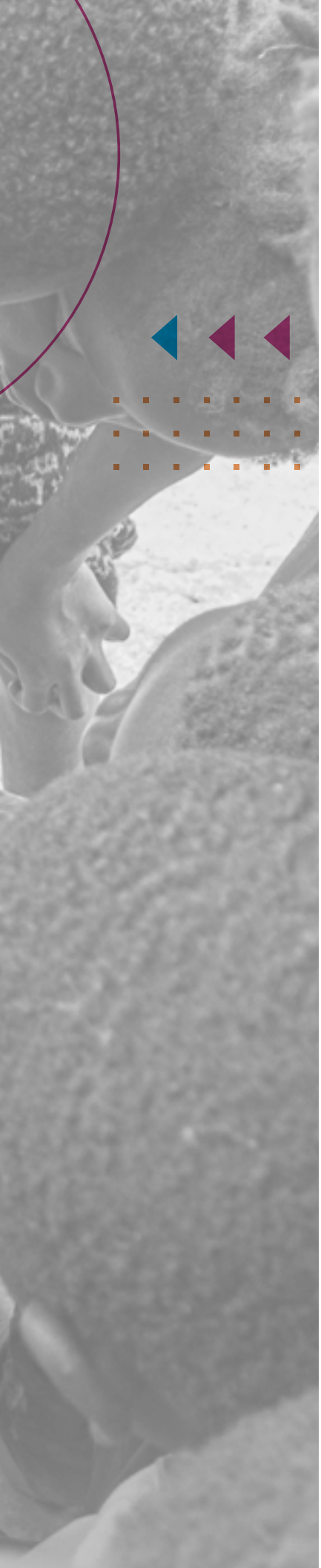
Source: ICT = information and communications technology; MSMEs = micro, small, and medium enterprises; NTBC = National Technology Business Center; SME = small and medium enterprise; USAID = United States Agency for International Development; ZDA = Zambia Development Agency; ZICTA = Zambia Information and Communication Technology Authority.

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CHAPTER



# Digital Platforms

## Definitions and Analytical Framework

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Digital platforms can be defined as digital systems and interfaces (for example, web- and mobile-based sites, applications, and software) that facilitate communications, transactions, and service delivery for government, people, and business through digital channels. Digital public sector platforms are often part of wider e-government systems that are designed to leverage information and communications technology (ICT) to enhance transparency, accountability, and efficiency in public administration and services delivery.<sup>16</sup> Digital private sector platforms support a business environment in which producers and consumers or users create value through digital interaction. Digital platforms can thus serve people, businesses, and government agencies in all aspects of life, including health care, education, commerce, transportation, and public benefits.

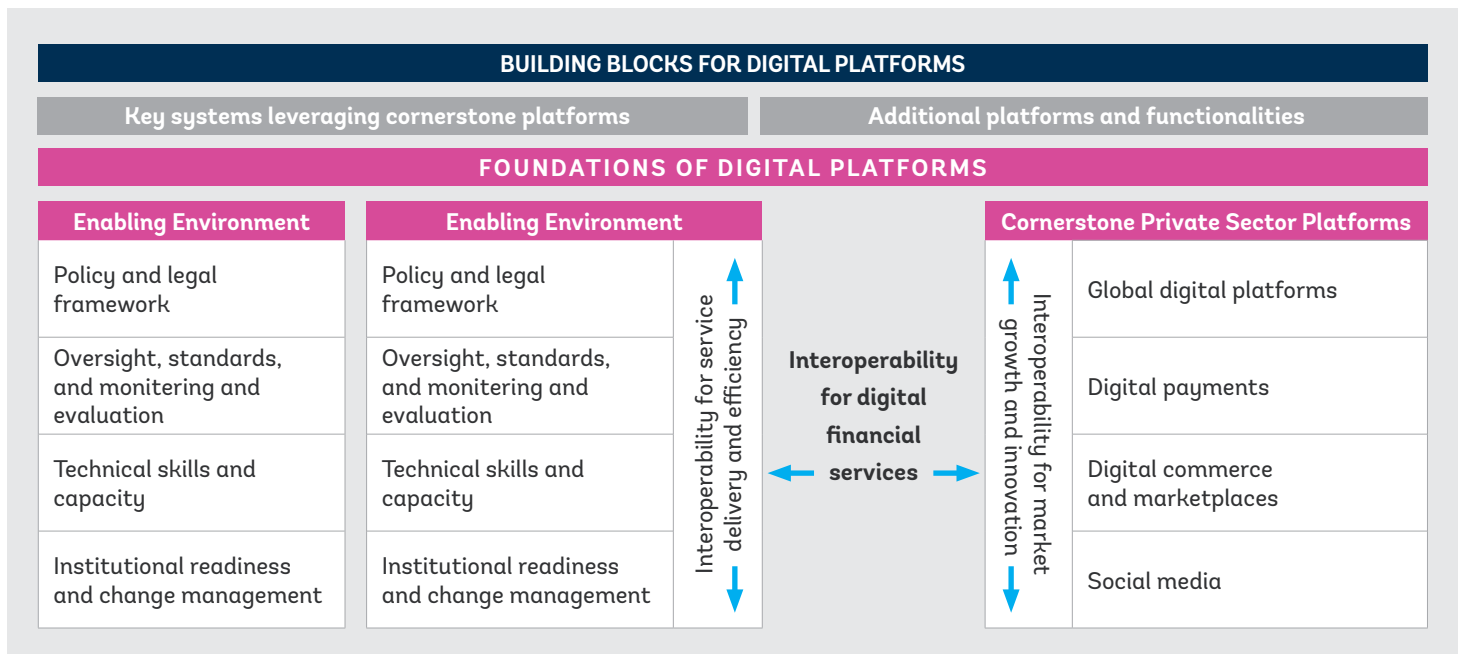
Figure 5.1 serves as a conceptual framework for this chapter's discussion of digital platforms, and the status of each conceptual area in Zambia is discussed in turn.

16.. "Government as a platform" thus commonly features in many countries' e-government strategies; see <https://gds.blog.gov.uk/category/government-as-a-platform/>.





►► **FIGURE 5.1:**  
FOUNDATIONS AND BUILDING BLOCKS FOR DIGITAL PLATFORMS



Source: Original figure for this publication.



# The State of Digital Platforms in Zambia

The SMART Zambia e-Government Master Plan sets a target of having 180 government services online by 2021. According to the SMART Zambia Institute, the target has already been achieved; 212 government services were online by the end of 2019.

Zambia is among the top 10 of the least developed countries for e-government, yet still underperforms with respect to regional comparators on several standardized indexes (table 5.1). The United Nations' E-Government Development Index (EGDI) ranks Zambia

among the highest performers in Africa (15th of 54 countries) and as a midlevel performer among Southern African Development Community countries (6th of 15 countries). Zambia is outperformed by three (Ghana, Kenya, and Rwanda) of the four benchmark countries, but it performs better than Côte d'Ivoire. The EGDI is produced every two years, and an updated version will be published in 2020. Any improvements made by Zambia between 2017 and 2019 will only be captured in the 2020 Index.

►► **TABLE 5.1:**  
KEY INDICATORS FOR ZAMBIA'S DIGITAL PLATFORMS

Assessment dimensions and measures or indicators	Zambia	
	Score	Ranking
<b>PUBLIC SECTOR PLATFORMS</b>		
2018 UN E-Government Development Index <sup>a</sup>	0.4111 on a scale from 0 to 1, where the world average is 0.55	133 out of 193 countries
Online Service Index <sup>b</sup> within the 2018 UN E-Government Development Index	0.4792 on a scale from 0 to 1	119 out of 193 countries
Open Data Implementation Score within the 2016/2017 Global Open Data Index <sup>c</sup>	19 percent on a scale from 0 to 100	72 out of 94 countries
<b>PRIVATE SECTOR PLATFORMS</b>		
UNCTAD 2018 B2C <sup>d</sup> E-Commerce Index	27 on a scale from 1 to 100	127 out of 151 countries
WEF 2016 Executive Opinion Survey: ICT Use for Business-to-Business Transactions	4.67 on a scale of 1–7, where 7 is best	n.a.
WEF 2016 Executive Opinion Survey: B2C Internet Use	3.94 on a scale of 1–7, where 7 is best	n.a.

Source: Compilation for this publication.

Note: EGDI = E-Government Development Index; ICT = information and communications technology; n.a. = not applicable; WEF = World Economic Forum.

- The EGDI is produced by the UN Department of Economic and Social Affairs (UNDESA) every two years. The EGDI score is a weighted average of three normalized scores on three dimensions of e-government—scope and quality of online services (Online Service Index), development status of telecommunication infrastructure (Telecommunication Infrastructure Index), and inherent human capital (Human Capital Index).
- The Online Service Index is based on data collected from an independent survey questionnaire, conducted by UNDESA, which assesses a number of features related to online service delivery, including whole-of-government approaches, open government data, e-participation, multichannel service delivery, mobile services, usage uptake, digital divide, as well as innovative partnerships through the use of information and communications technologies.
- The Global Open Data Index assesses the extent to which national government data in key categories are openly available. These categories include the national government budget, spending, procurement, election results, company register, land ownership, national maps, administrative boundaries, locations, national statistics, draft legislation, national law, air quality, and water quality (<https://index.okfn.org/>).
- Also known as "e-commerce," allows vendor to provide services or products directly to a consumer via a website for direct purchase from the company or a retail marketplace that connects consumers to multiple companies and brands. The index is calculated as the average of four indicators using data for 2017 or the latest available:
  - Account ownership at a financial institution or with a mobile-money-service provider (percent of population ages 15 and older)
  - Individuals using the internet (percent of population)
  - Postal Reliability Index
  - Secure internet servers (per 1 million people)

# Cornerstone Public Sector Platforms

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Zambia has several cornerstone public sector platforms in place, although the level of development of their functionality varies. Stakeholders pinpointed delays in the rollout of a National ID (identification) system as a critical missing piece. They also noted that the absence of an ID with a unique identifier is an impediment to service delivery. Stakeholder consultations also showed that there is an appetite for increased offerings of government-to-citizen services and for overall improvement of the accuracy of information citizens will receive. However, key limitations include infrastructure, particularly in rural areas and in the northern part of the country (see chapter 2 on Digital Infrastructure); leakages within government systems, including digital platforms; and limited interoperability with financial institutions, including mobile money providers (see chapter 6 on Digital Financial Services). Each cornerstone platform is discussed below.

## DIGITAL IDENTIFICATION SYSTEMS

Zambia has National ID and civil registry systems under the auspices of the Ministry of Home Affairs. An estimated 85 percent of the population has a National ID (National Registration Card [NRC]). High enrollment is attributed to the ID system being linked to the electoral registration system. The NRC is a widely accepted form of identification in Zambia. For example, commercial banks request some combination of an NRC, driver's license, and passport to provide financial services to consumers. The civil registry is an analog system that is decentralized to the district level, and an estimated 15 percent of the population is enrolled. Authentication is performed via letters issued to ID holders. Previously, the civil registry was digitized and managed by the Ministry of Finance, National Planning Data Centre Unit. However, operators lost their jobs during the digitization and eventually the digital database fell into disrepair.

Stakeholders expressed renewed interest in digitizing the National IDs and Civil Registry to ensure identity authentication and to integrate it with birth, marriage, and death registration; biometric details (photo, fingerprints); and passport data. This interest is motivated by a need to better understand which citizens are receiving services and to account for the leakage resulting from the misuse of funds designated for such services. There is also increasing concern about the duplication of effort when collecting citizen data. In the absence of a centralized and unified National ID, several line ministries have launched efforts to create fit-for-purpose IDs that would provide authentication for the recipients of their specific services. In addition, the quest for unique citizen authentication has been affected by delays in decision-making and variable political support over time.

As illustrated in Clark (2018), a modernized ID system can result in significant fiscal benefits. For example, in Thailand the national ID number was used by a cash transfer program to crosscheck the eligibility of beneficiaries against tax, occupational, and other databases, saving between \$29.7 million and \$59.4 million; in India's state of Andhra Pradesh, biometric smart cards reduced leakage in social wage benefits by approximately 10.8 percentage points, and in pension benefits by approximately 2.9 percentage points; in Malawi, integration between the national ID and voter registration eliminated the need for a separate voter ID card, saving approximately \$44 million ahead of the 2019 elections; and in Argentina, integration between tax databases and other registers via a unique ID improved tax audits, generating approximately \$44 million in additional revenue from a reduction in tax fraud.

Since 2015, significant investments have been made on the part of the government of Zambia and its cooperating partners in moving toward a digitized National ID system. During that time, the initial architecture for the Integrated National Registration Information System (INRIS) was defined and partially built, although the government does not yet have the source code from the vendor. Furthermore, use cases within the country for functional service-specific ID systems (for example, pensions) were developed. Updates to the regulatory framework are already underway. The adoption of Statutory Instrument No. 34 of 2019 will allow for biometric enrollment of citizens in the form of an e-ID. The Central Statistical Office will also include questions on birth and death registration and the possession of a National ID in the upcoming census. However, some stakeholders noted that some citizens have privacy concerns, for example, that by citizens' confirming their identity the government may use the ID as a means of surveillance. If this concern does arise, a significant effort will be required to encourage citizens to enroll in the system.

In 2019, the government put in place a government-wide implementation arrangement for digitization of the National ID. A project steering committee chaired by the Cabinet Office oversees implementation, while a project management committee led by the Ministry of Home Affairs coordinates rollout, and the project implementation team is led by the National Pension Scheme Authority (NAPSA). Various technical working groups also report into the project implementation team structure.

The intent of INRIS is to ensure that the new ID can be used by citizens to benefit from a wide range of government services. According to a statement issued by the Minister of Home Affairs in December 2019, INRIS will be linked to a smart ID with biometrics and a mobile money wallet that can connect to the national payment switch. Additionally, application programming interfaces (APIs) will be developed to connect INRIS with major public and private service providers. NAPSA has set a target for smart ID enrollment to begin by the second quarter of 2020 with a kickoff by the President. Costing has been done to enroll all Zambians ages 16 and older by October 2020; others will be added incrementally with newborns added at birth. Because the ID cards the government previously procured will not be able to support the key functions NAPSA envisions, NAPSA is considering using them for the older populations that are less likely to access the sophisticated features. The appropriate cards would still need to be procured. Existing NRC data will not be integrated into the INRIS system, and a new database will be constructed using decentralized recruiting agents to enroll people into the system. NAPSA has requested an extension of the upcoming census questionnaire to include biometric data collection and geo-location tagging, so that the results can be visualized with interactive maps. Three legislative updates are required to support the Smart ID rollout and have been submitted to the Ministry of Justice: (1) Statutory Instrument No. 34 to allow a nominal know-your-customer fee to be charged, (2) updating the National Registration Act to define what the term "biometric data" includes and to give the Registrar General the power to delegate civil registrations to agents (civil servants), and (3) updating electoral registration regulations to allow voting by fingerprint.

## FINANCIAL MANAGEMENT SYSTEMS

An Integrated Financial Management Information System (IFMIS) is provided to all line ministries by the Ministry of Finance. The government's IFMIS platform has been running since 2010. It was originally introduced as government-wide financial reform, but is now more broadly positioned as part of the country's e-governance agenda. When it was rolled out, it was considered a major breakthrough in digitization and government-to-government services. At the time, government funding for information technology (IT) infrastructure was low and donor financing was then used to establish local area connectivity and data centers. This financing facilitated the creation of the government wide area network, which was needed to connect the relevant ministries to the IFMIS. The provincial governments were later brought online.

Given that it was one of Zambia's first digitized government systems, the IFMIS was also a landmark platform. It allowed better planning and accounting for financial resources through the country's treasury single account. Use of the IFMIS and the treasury single account has also allowed online payments for services and account reconciliation to occur in real time. There is even short message service notification available to payment recipients. In 2019, the government IFMIS team completed a needs assessment that provided an overview of possible improvements to the existing modules of the platform and additional processes that could easily be digitized. The assessment showed that the system is performing well with respect to expenditures because of the requirement to use the treasury single account. However, the link with the Bank of Zambia is not automated and analog processes are still required to complete expenditure transactions. The payroll and e-procurement systems still require the development of middleware for automation and integration.

IFMIS users from other ministries noted that several improvements are needed to make the system leakage-proof and to create an audit trail. Revenue collection occurs mostly outside of the system. Further integration priorities are revenue streams generated by the Zambia Revenue Authority (ZRA), immigration by Home Affairs, land administration, and the Road Traffic and Safety Agency (for payments related to vehicle registration, fines from traffic violations, and so on). Integration with ZRA will use shared services, and development of the functionality is 90 percent complete. The interoperability with the immigration e-Visa platform is already working but a user interface needs to be built. These improvements include a payment confirmation function (especially for ZRA input taxes), notations for vendors that identify the source of payments, improved functionality and detail of access logs, and immediate reconciliation of payments and accounts.

Although the IFMIS is one of the longest-running e-government platforms in Zambia, it faces challenges with uptake and sustainability. Stakeholders noted that the original rollout of the system was slow, primarily because of challenges with change management. The system still needs to be connected with central government agencies, interface with the ZRA platform to account for revenues, and complete decentralization to local governments. The IFMIS technical team also has a 90 percent service-level agreement with the ministries, but there are challenges with downtime, often due to connectivity issues. Several system upgrades are needed, although major milestones for upgrades and expansions are generally only met with donor funding.



## HUMAN RESOURCE MANAGEMENT

Since 2010, the government has used a Payroll Management and Establishment Control System (PMEC) to manage the size and structure of the civil service<sup>17</sup> and its payroll. The PMEC platform is a Systems, Applications, and Products in Data Processing– (SAP-) based system that was initially planned to only link the civil service establishment with the government payroll. PMEC will eventually be fully integrated with the IFMIS platform, which will run the accounting processes of payroll operations. The system uses employee IDs as unique identifiers and is linked with financial institutions for the disbursement of funds. Furthermore, the PMEC system has designed digitized portions of the recruitment and performance processes as well as producing electronic pay slips; however these are yet to be launched for staff use. Thus far, the digitization of pay slips through a standalone system has resulted in an estimated 85 percent reduction in transaction costs. Digitizing the payroll also helped identify “ghost workers” and government employees whose duty station or ministry was incorrectly entered into the system. Eventually, PMEC, via the IFMIS, will be connected to the national payment switch to enable fully electronic transactions, and will have automated human resource and document management functions (for example, recruitment and performance appraisal). Additional interfaces with local governments, the electronic procurement system (discussed below), and the ZRA e-tax system for automatic tax deductions are envisaged.

## DIGITAL PROCUREMENT SYSTEMS

Zambia’s electronic procurement system (e-GP) is managed by the Zambia Public Procurement Agency (ZPPA) and is used to track government agencies’ procurement processes for the full life cycle of the transactions. At present, the system has established interfaces with more agencies than are actively using the system. Currently, 35 agencies in Lusaka have interfaces, 18 are actively using e-GP, and 118 have accounts but are not fully using the functions or are not

fully interfaced. ZPPA’s target is to bring all ministries into the system by 2021, eventually connecting 384 central-level entities. Some procuring entities, such as Zamtel, are completing hundreds of transactions per year within e-GP. The IFMIS already manually tracks fund flows within e-GP, but ZPPA also wants to fully link vendors’ bank account information with the IFMIS. The e-GP system is also connected to the national business registry.

Before the rollout of e-GP, the procurement reporting system experienced a high risk of error and perceptions of unfairness and inequities in the procurement process. Since 2015, the decentralization of public procurement and the digitization of the procurement system has allowed ZPPA to take on more of a supervisory than a transactional role. Stakeholders noted that e-GP has the potential to significantly reduce costs for bidders (for example, for travel), increase competition, and increase value for money for the procuring agencies. The platform has also assisted with appeals processes by providing clear procurement records.

Improved infrastructure, increased financing, and better change management are needed to expand the use and uptake of e-GP. A major infrastructure challenge is connectivity, especially in the rural areas, because of lack of fiber and equipment needed for backup and recovery. Stakeholders also cited high costs of service-level agreements for maintaining the e-GP software as a challenge. Currently, ZPPA has 17 staff working on the whole system, including for decentralized users. System users have also identified “customer care” as a requirement for further integration with the IFMIS. ZPPA wants to take over the development, operation, and maintenance of the system themselves because of ongoing challenges with the system vendor, so more funding for the platform and for staff with additional technical capacity would be needed. However, funding bottlenecks were identified as a significant challenge.

17. The Government of the Republic of Zambia includes line ministries, legislature, intelligence, judiciary, and police in its civil service. The military is excluded.



# Building Block Platforms for the Delivery of Goods and Services

## PUBLIC SERVICE DELIVERY AND PAYMENT SYSTEMS

Numerous digital platforms designed for public service delivery and government payments are in operation in Zambia. An enterprise service bus, which allows all government entities to access enterprise software from a single online platform, is in place. Shared services architectures are also being developed. However, most service delivery platforms developed independently by government line ministries are not yet interoperable. All of these platforms have the potential to increase efficiency and transparency of government interactions and transactions. The public sector platforms that are interfacing or have the potential to interface with e-payment and mobile money infrastructure are discussed first. Then the public sector platforms that increase efficiency of other government interactions, such as regulations, reporting, and information sharing without a payments component, are discussed.

### Platforms Potentially Increasing Efficiency of Government Payments

*Domestic Tax Payments.* Taxpayers in Zambia are able to pay domestic taxes digitally through the web-based Tax Online and unstructured supplementary data service-enabled Tax on Phone platforms, which allow users to file returns. However, major challenges to tax collection are the large cash economy and large informal sector. Furthermore, interfaces with banks for e-payments or mobile money accounts are not yet available. Although the Tax Online platform is functional, several stakeholders noted that its interface is not user friendly.

*Zambia Social Protection Information System (ZSPIS).* In 2019, SMART Zambia, with technical assistance from the Food and Agriculture Organization of the United Nations, completed the development of ZSPIS. ZSPIS is designed as an integrated management information system (MIS) with a payments module that can serve social protection programs. ZSPIS will replace the legacy MIS that was used to store data about beneficiaries but had no payment module. The ZSPIS includes a single registry function as well as a payment tracking function and integration with payment service providers. To date, two programs have been integrated into ZSPIS: the government's Social Cash Transfer program and the Food Security Pack. Together, these programs have more than 700,000 beneficiaries. The system was developed to include three possible beneficiary authentication methods, including through an NRC, a mobile e-code, and biometric details. One of the payment gateways was developed under the World Bank-funded Girl's Education and Women's Empowerment and Livelihoods project with integration to five payment service providers, and another was launched via Zoono. All payments will now be through mobile money providers and banks; no cash payments will be made through government employees.

*One Stop Shop (OSS) Business Facilitation Centers and the Intellectual Property Automation System (IPAS).* The OSS is both a brick-and-mortar center and a web-portal that allows new businesses to access and complete all the procedures required to start a business. The OSS was designed and configured in house by the Patents and Companies Registration Agency (PACRA), which is a semi-autonomous agency of the Ministry of Commerce, Trade and Industry (MCTI). The system was created in 2009 and was decentralized to all the provinces and the cities of Livingstone and Kitwe in 2011. It is an automated business registry service with full online registration facilities, starting from a company name search to final registration after an online payment for the business license. A call center is available for inquiries. Although the proportion of businesses registering online has increased over time, still only 10 percent of all registrations are currently performed online. However, the majority of payments are made online using Visa's credit and debit card system. An online application can typically be completed in four hours, and then applications are reviewed and either approved or denied by a project team. The platform then uses web services to share the information with other relevant agencies such as ZRA, NAPSA, ZPPA, the Ministry of Finance, the Immigration Department, Workers Compensation and Control, and the Ministry of Lands. The next system upgrades will allow the OSS to receive information from these agencies as well. PACRA also manages IPAS and a digital collateral registry. IPAS allows automated processing for trademarks, patents, designs, and copyrights. The collateral registry is available but is underutilized because many people do not see its usefulness.

*Customs and e-Single Window.* Zambia uses the Automated System for Customs Data (ASYCUDA) World system, which is a web-based customs system created by the United Nations Conference on Trade and Development (UNCTAD) and managed by in Zambia ZRA. The web-based system was first introduced in 2014, and Zambia upgraded its system to the latest version when it became available from UNCTAD. The platform allows the various transactions required for customs clearance to occur through a single payment platform, thus reducing the time that otherwise would be spent making payments at different offices.

Under the World Trade Organization Trade Facilitation Agreement Article 10.4, countries are required to have a digital "single window" that enables those transiting goods through a border to submit documentation to, or comply with the data requirements of, the relevant authorities through one single system. Zambia is leveraging the ASYCUDA World System to add modules that interact with other noncustoms agencies such that the entity filing the documentation is automatically notified about all relevant permits, clearances, and



documentation requirements needed for the particular product that is being imported or exported. A core feature of this system is a risk management system and automated scanning, which reduce the time it takes for manual inspection of goods. The performance of ASYCUDA and the single window is continuously monitored. Performance measurements were completed in the first quarter of 2020 at the Chirundu border post and at the Kasingula, Victoria Falls, and Kenneth Kaunda International Airport border posts.

Stakeholders cited coordination and interoperability as particular challenges to full implementation of the single window. These challenges result from the numerous legal instruments and agencies involved in border control.

*National Pension Scheme Electronic Portal (e-NAPSA).* In 2017, NAPSA created a web- and mobile-enabled pensions platform (e-NAPSA) to facilitate enrollment into the national pension scheme and employer payments of pension contributions. Enrollment is available for both formal and informal employment, and NAPSA is making a large push to include the informally employed. The informal employment function was launched in March 2019 and within the first six months, 700 million Zambia kwacha (K) had been contributed by those in the informal sector. This large uptake is partially attributable to e-NAPSA being mobile-money enabled. The e-NAPSA platform has also helped identify fraudulent use of IDs because of the verifications required at the time of registration and when declaring pension beneficiaries.

### **Platforms Potentially Increasing Efficiency of Regulations, Reporting, and Information Sharing**

*e-Cabinet.* Materials for Cabinet meetings are now electronically generated. According to SMART Zambia, this has reduced the costs of running Cabinet processes from K 68 million to K 10.2 million per year, saving 60 percent. E-Cabinet has also brought efficiency in that Cabinet ministers have easier access to the relevant documents and make decisions more quickly.

*Zambia Integrated Land Management Information System (ZILMIS).* The Ministry of Lands launched ZILMIS in 2013. The platform tracks land registration, the deeds and data obtained from land surveys, the surrender of lease rights, and land-related disputes. The data system is based on geographic information system infrastructure, and modules are being installed to define plot boundaries. Currently ZILMIS is a standalone system though it requires information from the National Spatial Data Infrastructure system to complete its processes. ZILMIS is being used to store data as part of the national land audit and national land titling program. The rollout focused only on state land given that legislation does not allow private land titling. Also, land data are decentralized but need to be centralized and digitized to be input into the database.

*National Development Planning Monitoring Management System (MMS).* The Ministry of National Development Planning uses an MMS to track the progress toward Zambia's development goals as stated in the 7th National Development Plan (7NDP). Specifically, the system monitors the implementation of programs and the development of indicators, while helping implementing institutions track and analyze information electronically. Each ministry is requested to upload relevant business processes and work plans to the platforms and to update their progress against them. These updates include linking deliverables to the key performance indicators in the 7NDP, associating projects with geographic locations through an interface with Google Earth, reporting on funds received and spent, and indicating the milestones met for project and program delivery. The system is also able to track development indicators not directly related to the 7NDP, such as international obligations on climate change. At present, the MMS is a government-to-government system, but eventually a version of the system with publicly disclosable information may be added. Key challenges for the system are interoperability with other government platforms and the standardization of reporting and tracking processes across ministries.

## **DIGITAL CITIZEN ENGAGEMENT AND FEEDBACK PLATFORMS**

The use of digital citizen engagement and feedback platforms in Zambia has not yet begun. There are no known citizen feedback mechanisms designed to capture citizens' feedback on specific government services, and there is no centralized avenue for gathering citizens' feedback. This is reflected in Zambia's ranking of 132 (out of 195) in the world on the E-Participation Index. No active plans for rolling out such mechanisms were mentioned by stakeholders during consultations.

## **OPEN DATA PLATFORMS**

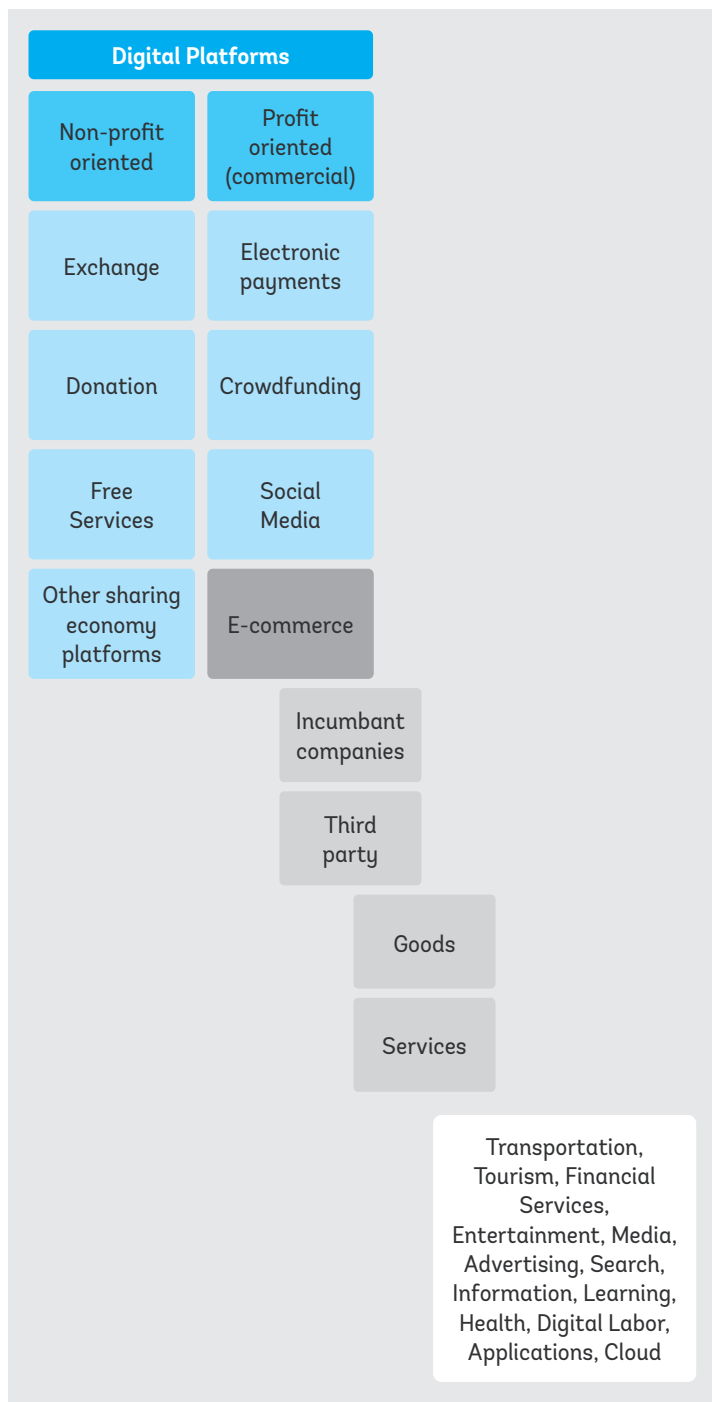
At present there is no national legislation, policy, or initiative covering open data or right to information in Zambia. The availability of data to the public is important for the monitoring and evaluation of systems and programs as well as for evidence-based policy making. Although Zambia does provide data to the International Monetary Fund Dissemination Standards Bulletin Board, it does not participate in the Open Government Partnership. The Global Open Data Index lists 15 key information items or services per country; making these data publicly available is considered international best practice. Of these 15, Zambia makes only 5 available in some form, resulting in the country's rank of 72 of 94 on the Global Open Data Index (2016/2017). The most open information includes national statistics data, air quality data, and government budget information. Moderately open information includes national laws and draft legislation. The remaining indicators do not have any publicly available information.<sup>18</sup>

18. These indicators include procurement, administrative boundaries, national maps, weather forecasts, company register, detailed election results breakdowns, addresses and postcodes, water quality, detailed accounts of government spending, and land ownership (under development).

## PRIVATE SECTOR PLATFORMS

Private sector digital platforms can broadly be classified as profit-oriented digital platforms (commercial platforms) and non-profit-oriented digital platforms. Well-known examples of commercial platforms include Amazon, Alibaba, PayPal, Airbnb, and Kickstarter. Non-profit-oriented digital platforms include Wikipedia and other free service, exchange, or donation platforms. Figure 5.2 illustrates the various categories of commercial and nonprofit digital private sector platforms.

►► **FIGURE 5.2:**  
**DIGITAL PRIVATE SECTOR PLATFORMS**



Source: Adapted from UNCTAD 2018.

Zambia currently has more than 50 active private sector platforms, of which 15 are Zambian owned or operated. However, as discussed in chapter 4 on Digital Entrepreneurship, there is limited support for digital platform start-ups. There is also a lack of access to the robust consumer and industry data needed to design platforms that can resolve public or private sector challenges. Furthermore, the consumer market is limited by the high price and low reliability of internet access, and the potential for e-commerce is limited by slow progress toward physical addressing and poor trade logistics. Combined, these factors have resulted in the slow growth of private sector platforms. Still, primary research carried out for this report illustrates that platform companies constitute a significant proportion of all early-stage digital enterprises in Zambia (see chapter 4 on Digital Entrepreneurship).

Zambian private sector platforms are leaning toward the use of credit cards and PayPal instead of mobile payments. In aggregate, across the private sector platforms operating in Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zambia 80 percent accept credit cards, 41 percent accept cash, and 40 percent accept mobile payments. Cash is most prevalent in the transportation sector, while mobile payments are particularly prevalent for platforms operating in the agricultural sector. In Zambia, 87 percent of private sector platforms accept credit cards, 28 percent accept cash, 33 percent accept mobile payments, and 56 percent accept PayPal. In Zambia, it appears that several platforms have shifted to using PayPal as the preferred payment method during the course of 2018.

Zambia is ranked 26th of 44 African countries and 127th of the 151 countries in the 2018 edition of the United Nations Conference on Trade and Development (UNCTAD) Business-to-Consumer E-commerce Index. E-commerce can be divided into "incumbent companies" that sell their own goods or services digitally, and "third-party" providers—also called "multisided platforms"—that derive revenue by facilitating interactions between two or more distinct groups of users (at least a buyer and a seller). According to Chetty (2019), 268 new multisided platforms were launched in Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zambia in 2018 alone. These numbers have increased dramatically over the past 13 years. In a 2019 survey undertaken by Insight2Impact (Smit et. al 2019), on average, 1.3 percent of adults in Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, and Uganda earned income by participating in such platforms, and slightly more than 50 percent of these participants reported that this source of income was essential for meeting their basic needs. These proportions are similar to those observed in more digitally advanced and higher-income countries.

Zambia is one of the top 10 countries in Africa for individuals shopping online, at 5.1 percent of the population (table 5.2). However, the growth of e-commerce is limited because of weak physical addressing, expensive trade logistics, limited internet use and

smartphone access, low financial inclusion, and poor digital skills (see chapter 2 on Digital Infrastructure, chapter 3 on Digital Skills, and chapter 6 on Digital Financial Services). Additionally, perceived risks from the lack of identity authentication (know-your-customer) requirements hinders platform development and expansion. Nevertheless, reforms are in progress. In 2017, ZamPost joined the Universal Postal Union: Operational Readiness for E-commerce Project for quality-of-service improvements in postal deliveries.

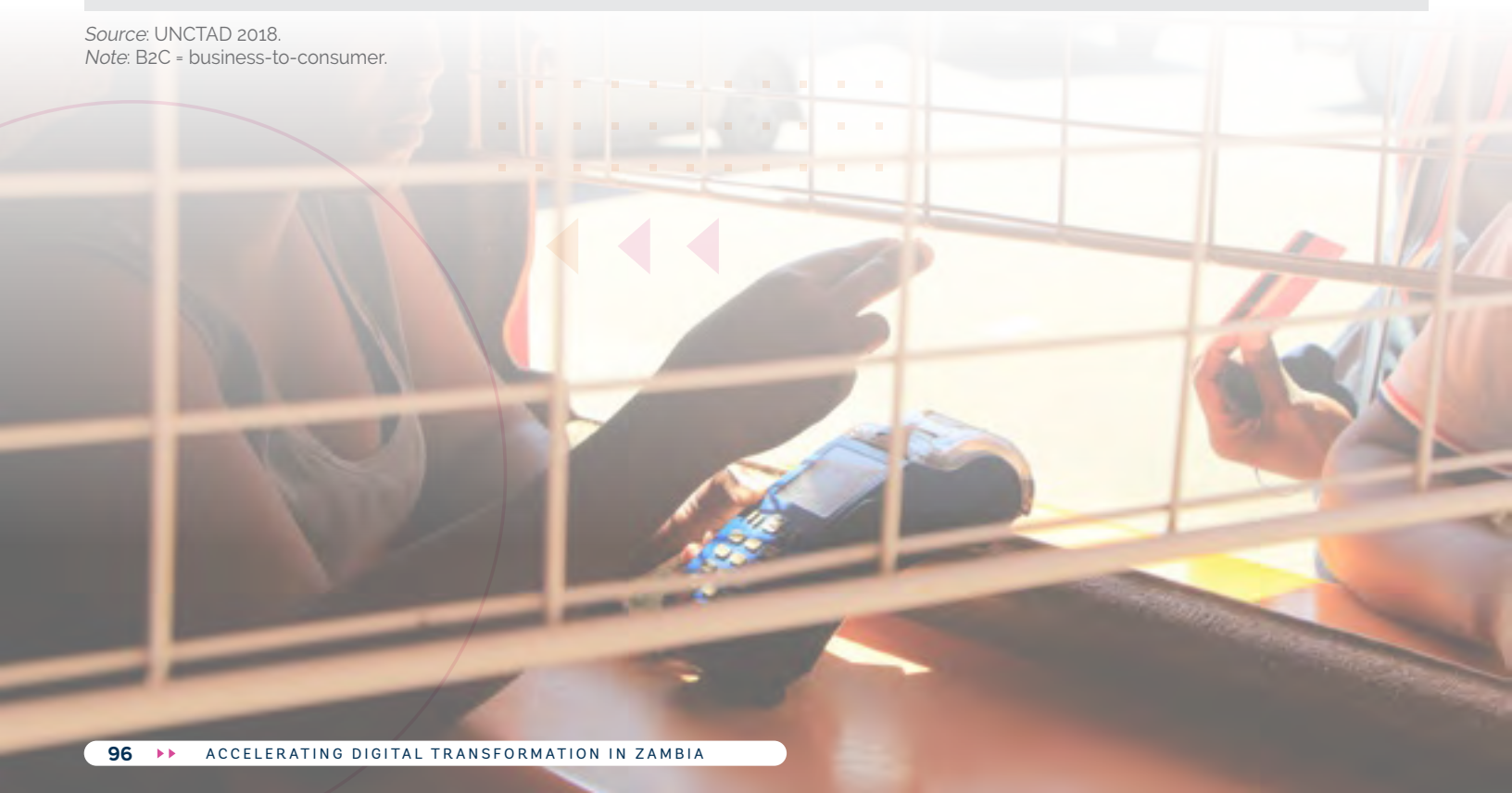
According to the eTrade assessment carried out by UNCTAD in 2018, ZamPost is handling an increasing volume of parcels and small packages driven by e-commerce. Furthermore, the Zambia Information and Communication Technology Authority (ZICTA) is aiming to complete physical addressing in all 10 provinces by 2023, and the MCTI is developing new e-commerce and logistics strategies that will provide a blueprint for increasing efficiency and reducing cost in trade.

▶▶ **TABLE 5.2:**  
TOP 10 AFRICAN COUNTRIES USING E-COMMERCE

Rank	Country	Online purchase (% of those age 15+) 2017	Online shoppers (thousands)	Online shoppers (thousands) rank in Africa	B2C index rank in Africa	Internet use	Shoppers (% of internet users)
1	Libya	14.6	629	10	13	20	67
2	Mauritius	14.4	129	26	1	55	26
3	Namibia	12.1	184	21	11	31	24
4	Kenya	9.3	2,614	3	7	39	24
5	South Africa	7.9	2,929	2	3	59	13
6	Gabon	6.1	74	29	12	62	10
7	Tanzania	5.3	1,593	4	16	25	21
8	Zambia	5.1	459	11	26	24	21
9	Tunisia	4.7	366	14	4	56	8
10	Mozambique	4.3	665	9	32	23	19

Source: UNCTAD 2018.

Note: B2C = business-to-consumer.



## Interoperability Framework and Shared Services

Zambia's digital platforms landscape is fragmented, but has several key pieces in place that support the development of an interoperability framework and the use of shared services. Numerous platforms housed in individual government agencies were developed separately (mostly without using standardization protocols), and were not necessarily designed to be linked to any external platforms or a shared services system. However, the introduction of enterprise services and shared systems has facilitated links between several government platforms through the development of standardized APIs and middleware. Also, the introduction of a government wide area network in 2014 and a government data center in 2016 has served to consolidate e-government platforms' approaches to data storage and rescue.

Government ICT infrastructure design, operation, and maintenance are still mostly dispersed within the ministries. Stakeholders felt that donor influence exacerbated this challenge by promoting specific systems for specific purposes; for example, the Ministry of Health has numerous donor-promoted systems. However, within the past few years, SMART Zambia has been mandated to promote standards for agencies creating new platforms, provide support for operations and maintenance of e-government systems, and build the capacity of government agencies using platforms.

SMART Zambia has set guidelines to facilitate interoperability among public sector platforms, and government-to-business<sup>19</sup> interoperability with private sector platforms, for example, commercial banks. Although enterprise architecture is in place, the government is also scoping open source software, open architecture, and open interface platforms, for example, for rollout of the National ID. Furthermore, provisions of the electronic government bill (discussed in the section titled "Legal and Policy Framework") will put in place a legal mandate for institutions to follow with regard to platform design.

Nearly all stakeholders consulted discussed challenges with interoperability and lack of connectivity for local government and in rural areas. For example, several agencies (ZRA, ZPPA, PACRA) want to establish or improve links to IFMIS or the national payment switch as part of decentralization efforts. In fact, strengthening local governments' institutional capacity, accountability, and management of resources, including through their use of digital platforms, is the focus of the World Bank Public Sector Governance for Service Delivery Project.

19. Government-to-business work interoperability focuses on service delivery across a variety of sectors with the aim of delivering said service in the most efficient (cost-effective and time-sensitive) way possible for firms.

20. Examples include Cabo Verde and Estonia.

21. For example, Kenya addresses digital literacy through the Kenya Basic Education Curriculum Framework and discusses it in the ICT Authority Strategic Plan 2013–2018.

## Enabling Environment

Zambia's enabling environment for the development and use of digital platforms is defined by its policy and legal framework; oversight, standards, and monitoring and evaluation (M&E); technical skills and capacity; institutional readiness; and integration of change management.

### POLICY AND LEGAL FRAMEWORK

Zambia's policy and legal framework for digital platforms is undergoing reforms designed to lessen constraints affecting the advancement of digital platforms. Experiences from other countries<sup>20</sup> show that a thriving digital economy with digital platforms that are reliable and secure and that create efficiencies for users requires (1) a clear ICT policy and strategy, and an organization with a mandate to implement it, and (2) a legal framework that at a minimum addresses the following issues: competition in the ICT sector, privacy and data security, cybersecurity, e-commerce, intellectual property, data ownership, digital literacy,<sup>21</sup> and open data.

A suite of bills under review by Parliament will update the existing legal framework to address key aspects of the digital economy. ZICTA oversees key parts of the existing legal framework, in particular, the ICT Policy of 2006, a memorandum of understanding (MOU) with the Competition and Consumer Protection Commission regarding ICT (UNCTAD 2012), the ICT Act of 2009, and the Electronic Communications Act of 2009. Although stakeholders feel the existing legal framework is set up well for stimulating private sector competition, several updates are in progress that will make the framework more comprehensive and better aligned with international best practice. The ICT Policy of 2006 is considered overdue for revision. Planning for the updates has begun, but the revisions have not started. The ICT Act of 2009 and the Electronic Communication Act of 2009 were transposed into four bills presented to Parliament in June 2019: (1) an electronic government bill that will fall under the auspices of SMART Zambia and that is in principle agreed on by the Cabinet, (2) an electronic commerce and transactions bill, (3) a data protection bill, and (4) a cybercrime and security bill, which will establish a cybersecurity agency. These bills still need to be passed to come into effect. In addition, the SMART Zambia Master Plan was approved by the Cabinet in 2019.

Cybersecurity emerged as a particularly critical need. Zambia ranks 12th in the African region and 59th globally on the Global Cybersecurity Index (ITU 2018). In addition to the pending legal



updates for cybersecurity, a ZICTA technical committee is charged with setting cybersecurity standards for government platforms. Furthermore, Zambia is establishing a computer emergency response team. Still the Global Cybersecurity Index recommends that governments lay out a clear cybersecurity strategy, use a cloud for cybersecurity purposes, create child online protection mechanisms, establish benchmarking and metrics for monitoring cybersecurity, enhance public awareness, institute professional cybersecurity specifications, and create education and research programs on cybersecurity. With respect to these topics, Zambia still has significant room for growth and improvement.

Stakeholders also indicated a need for Zambia to update and review several other ICT-related policies. Along with the upcoming ICT bill, a new procurement bill will require government entities to use e-GP. Stakeholders further highlighted the need for a new registry and design act for intellectual property to address digital and web-based intellectual property. The current Trade Marks Act is being repealed and a Service Marks Act is being introduced. There will also be a law on traditional knowledge, expressions of folklore, and bioresources that will protect intellectual property from originating traditional knowledge and communities. However, most implementing policies for these laws are not yet available.

## **OVERSIGHT, STANDARDS, AND MONITORING AND EVALUATION (M&E)**

Several agencies have oversight responsibilities to review the design and acquisition of digital public sector platforms, as well as storage and processes for information platforms. The Zambia Bureau of Standards (ZABS) is the overarching regulatory body that sets all industry standards, including for the ICT sector. For ICT, this regulatory mission is carried out under the auspices of an MOU between ZICTA and ZABS. SMART Zambia also plays a role in setting and implementing standards for all public sector platforms. The ICT policy guides agencies procuring these platforms regarding interoperability and provides a checklist of whether the design or maintenance of platforms should be done in house or outsourced. SMART Zambia's standards unit further supports these agencies and also determines whether outsourcing can occur.

ZICTA convenes five technical committees that examine emerging and existing international standards for ICT and present them to ZICTA for implementation. Newly developed platforms' compliance with standards is regulated by ZABS. The ZICTA committees address (1) ICT and the Environment; (2) Networks, Technology and Numbering; (3) Quality of Service and Performance; (4) Cybersecurity and Future

Networks; and (5) Internet of Things and Multimedia Applications. The committees are composed of 15 to 20 subject-matter experts from academia, technology companies, and regulatory bodies. At present, the technical committees do not meet as frequently as envisioned and face constraints such as funding and long-term sustainability.

Agencies auditing platforms' information and processes include but are not necessarily limited to the Auditor General, the ZPPA, the Ministry of Finance (MoF), and SMART Zambia. The Auditor General has access to IFMIS content for forensic auditing and the ZPPA plans to train its IT officers in forensic auditing. The ZPPA and MoF have conducted IT audits for their systems, while the ZPPA, in collaboration with SMART Zambia, performed a quality review of the e-GP platform to examine developer and vendor management, provide guidance on web services integration and connectivity improvements, and draft an MOU on vendor working arrangements. Similarly, the MoF's IT unit has trained auditors to access the records of specialized ministries and has carried out an audit of the IFMIS.

No unified system is in place for the monitoring and evaluation of public platforms' performance or the requirements for gathering data on efficiencies and costs. While the MoF and ZRA do some tracking, most other agencies indicated they do not yet conduct M&E activities. The MoF tracks cost savings resulting from IFMIS; ZRA does not formally track user experience but relies on user feedback. There is some performance data on the single window, and a program within the ZRA corporate strategy unit is attempting to track and analyze the benefits of implementing the trade platforms. Lack of publicly available M&E data constrains evidence-based policy analysis and generation as well as public participation.

With respect to private sector platforms, the management of the e-commerce agenda falls under the MCTI. The Competition and Consumer Protection Commission is a statutory body established with a dual mandate to protect competition and consumers in Zambia. With the assistance of the World Bank, the government established a Business Regulatory Review Agency as a statutory body under the MCTI. One of the agency's mandates is to carry out regulatory impact assessments to avoid unnecessarily burdensome regulations for businesses. However, no interministerial or public-private coordination mechanism focuses on e-commerce. UNCTAD suggests that one option for improving interministerial coordination on e-commerce would be to link such discussions to the National Trade Facilitation Committee, such as through the formation of a subcommittee.





## TECHNICAL SKILLS AND CAPACITY

A range of technical skills and capacities could support the digital transformation; however, they are difficult to retain in the public sector. Stakeholders noted that adequate technical skills are needed to improve and expand digital platforms in Zambia—ranging from the maintenance of ICT infrastructure to coding and developing the platforms themselves. For example, PACRA has been able to develop in-house capacity sufficient for the development, operations, and maintenance of its own systems (see box 5.1).

Key areas where developing capacity is critical include the following:

- *Digital infrastructure.* Additional infrastructure to implement the retention strategy that requires seven years' retention of data, expanding the government wide area network, and increasing the rollout of towers, especially to serve schools and hospitals
- *Design and implementation.* Designing the technical specifications and quality controls for system design and implementation, accessing hard-to-reach areas for the digitization of analog documents, Java skills, and sufficient provisions for a skills handoff with vendors
- *Procurement and contract management.* Negotiating with software and hardware vendors, allocating the budget appropriately, defining realistic timelines for procurement, and moving procurements forward when authorizing agents lack familiarity with technical issues
- *Cybersecurity.* Building the capacity of different sectors on cybersecurity issues
- *Judicial reform for the digital economy.* Enhancing capacity and awareness in the judicial systems: laws are viewed as a means to increase public awareness about the relevant topics but people do not necessarily see the practical implications of the laws and how they will support the development of a robust digital economy.

Several activities are being designed to increase capacity within government and the private sector. SMART Zambia aims to develop a Centre of Excellence at its headquarters to improve the delivery of services to ministries. Additionally, the decentralized SMART Zambia staff supporting the provincial and local administrative levels require more training and a larger workforce. This could also be an area in which the government partners with the private sector to ensure adequate support to ministries and line agencies embarking on digitization.

### ▶▶ **BOX 5.1:** **PACRA USE CASE FOR TECHNICAL SKILLS AND CAPACITY**

Since 2011, the Patents and Companies Registration Agency (PACRA) has steadily built and expanded its internal capacity and now manages its platforms self sufficiently. It has upgraded the data center, developed information technology (IT) systems in house, put in place an automated call center, and digitized human resources and incident management systems. It has networked its satellite offices and shares data real time. Sufficient staffing and the agency culture have been key to PACRA's achievements. Eight full-time IT staff work at the central office in Lusaka, although it was noted during consultations that more staff would be ideal. The agency actively encourages information sharing, and IT staff have a sense of ownership of the platforms and systems they develop. There is also a test environment where staff can explore, create, and innovate. Furthermore, skills transfer is built into all vendor contracts with PACRA, and the source code for software is handed over if custom systems or software are designed. Because of the in-house expertise that has been built, PACRA has received support requests from other agencies, such as the Department of Cooperation in the Ministry of Commerce, Trade and Industry and the Business Regulatory Review Agency.

## INSTITUTIONAL READINESS

The state of institutional readiness for digital platforms is moderate, and there are persistent challenges with donor coordination, the ability to mobilize necessary funds for ICT project sustainability, adapting legal frameworks, and decentralizing access to platforms. Multiple donor efforts support the development of digital platforms, particularly in priority sectors like health and education. However, to date, coordinated efforts have not prevented the proliferation of incompatible platforms or platforms with redundant functionalities. Relevant ministries also have a limited ability to secure the budgetary allocations to sustain these platforms after donor funds are gone. Stakeholders also cited challenges with incentives for institutions to begin using public sector platforms. Decentralization has also

presented a major challenge to institutional readiness. Although the main challenge for decentralization is lack of infrastructure in rural areas and for serving local government, there is also a skills issue.

The SMART Zambia Electronic Government Master Plan (Master Plan) approved by the Cabinet in March 2019 guides the policy making and procedures for digital public sector platforms. The goal of the Master Plan (2019) is to provide a clear road map for the acceleration of efforts to “deliver quality and responsive services to citizens, non-citizens, businesses as well as improving collaboration within government.” The Master Plan includes three phases as outlined in table 5.3.

►► **TABLE 5.3:**  
IMPLEMENTATION SCHEDULE FOR THE E-GOVERNMENT MASTER PLAN

Description	Foundation Stage 2018–21	Integration Stage 2022–26	Connected Government Stage 2022–30
Policy, legal, regulatory, and institutional arrangements	<ul style="list-style-type: none"> <li>Establishment of policy, legal, and regulatory environment</li> <li>Institutional frameworks</li> <li>Human resources development</li> <li>Development and adoption of ICT standards and guidelines</li> </ul>	<ul style="list-style-type: none"> <li>Enhancement of the policy, legal, regulatory, and institutional framework</li> </ul>	<ul style="list-style-type: none"> <li>Review of the policy, legal, regulatory, and institutional framework</li> </ul>
ICT infrastructure	Implementation of <ul style="list-style-type: none"> <li>Cloud computing national data center</li> <li>National optical fiber broadband backbone</li> <li>Metropolitan area networks</li> <li>Local area networks</li> <li>Information security</li> <li>Universal access mobile communication services</li> </ul>	Integration and enhancement of <ul style="list-style-type: none"> <li>ICT network connectivity infrastructure to unserved and underserved districts</li> <li>Value added services on cloud computing</li> <li>Information security</li> </ul>	Enhanced integration of <ul style="list-style-type: none"> <li>Infrastructure and value added services to unserved and underserved areas</li> <li>Information security</li> </ul>
E-services (enhancing country competitiveness and social well-being)	Development and adoption of <ul style="list-style-type: none"> <li>E-applications and online services</li> <li>Core e-government foundational e-applications</li> <li>Common applications</li> <li>Sector-specific applications</li> <li>Multiple channels of electronic service delivery</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced integration of e-applications to cloud computing environment and more online services on government transactional portal</li> </ul>	<ul style="list-style-type: none"> <li>Seamless and highly customized interactive systems on the cloud with value added services</li> </ul>

Source: SMART Zambia Electronic Government Master Plan (Republic of Zambia, Office of the President 2019).

Note: ICT = information and communications technology.

## CHANGE MANAGEMENT

Limited evidence suggested concerted change management efforts were used to facilitate the adoption of digital platforms and to increase the likelihood of their sustained use. Stakeholders felt this was partially attributable to prevalent views that ICT is a support function rather than an efficiency function and a core means of doing business. Stakeholders also cited a reluctance caused by the potential for the systems to decrease leakage and the increased transparency, accountability, and efficiency digital platforms could bring. Reducing opportunities to interact outside the protocols

and the potential of ICT-related jobs being outsourced have also slowed the uptake of platforms. However, one key counterexample is the IFMIS. Formalized training and change management were used to introduce users to the technology and the treasury single account, although stakeholders felt that there was initially some apprehension about the processes and the paper trail. For the ZPPA, change management for e-GP has been a challenge, and users try to “frustrate” the system.

## Recommendations

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The 7NDP outlines targets for when to provide government services online, and Zambia has made significant progress in this regard. However, significant gaps remain before Zambia can realize the full benefits of digitization in the public sector. The government has launched internal systems for financial management and the payroll, for example, and government-to-person and government-to-business services are increasingly digitized. However, interoperability between systems is often lacking, thus reducing their benefit; usage and usability are not consistently monitored; and some systems suffer from a limited scale of implementation or from deterioration. Emphasis should therefore now be on optimizing, scaling up, and securing systems and services that have already been put on the path toward digital transformation, and relatedly to ensuring proper authentication of users to avoid fraud.

Poor coordination (within the government and among donors) and inconsistent messaging regarding leadership of the digital transformation agenda have been obstacles to faster and more comprehensive progress. Specifically, these challenges have resulted in

- *Lack of systems' interoperability* resulting in inefficiencies or the hampering of platform development
- *Inadequate change management*, compounding the interoperability problem by creating avenues for analog processes to run in parallel to or be used instead of automated digital processes
- *Lack of connectivity* at the local level preventing the use of platforms, and in the case of public sector platforms, a commensurate reduction in transparency and accountability
- *Lack of financing* and interest to put in place functionalities that would completely digitize and automate critical platform functions

These challenges combined have resulted in the low penetration of digital services and solutions in the rural areas of Zambia, the siloed development of digital platforms, and internal debates regarding "ownership" and leadership for ongoing and future platform development. Therefore, the ongoing digitization push from the center of government needs to come from an entity with a clear mandate to coordinate across government ministries, departments, and agencies, as well as with the private sector for the purpose of driving digital development. The mandate could include bolstering M&E, facilitating coordination between entities, publicizing road maps for critical platform and infrastructure development, and ensuring change management and financing through the final stages of platforms' development and interfacing.

The following recommendations focus on activities that are in line with national priorities as set out in the 7NDP. They can also be used to create hubs and themes that crowd in government, donor, and private sector resources around key issues. Approaching the recommendations in phases would improve the likelihood of successful uptake, facilitate mindset shifts around the role and benefits of digital platforms, and build incentive structures so that the development of platforms advances. The recommendations seek to develop and enhance coordination and strengthen leadership while addressing the key technical and policy concerns affecting digital platforms. Activities that would likely bring about concrete and visible results in the medium term (three to five years) require focusing on the following key areas.

*Strengthen the legal and policy environment.* The updates to the ICT legal framework that are awaiting adoption by Parliament must proceed to ensure that clear guidelines are in place as the public and private sectors adopt increased digitization. These updates include the Electronic Commerce and Transaction Bill, the Data Protection Bill, and the Cybercrime and Security Bill. In addition, a government-wide strategy for digital transformation should be developed as a subset of a higher-level economic transformation strategy. The policy framework would include existing documents such as the SMART Zambia Master Plan. As such strategies are developed, wide stakeholder consultation must be undertaken and full transparency in the decisions made and the implementation matrix adopted must be ensured.

*Improve institutional readiness.* In support of the government-wide strategy recommended above, the government should aim to clarify leadership roles for the digital transformation. This process may include establishing an oversight or coordination body at the center of government or instituting new business processes with clear lines of reporting and responsibility, as necessary. Improving oversight and coordination would also require systematizing change management, which could be achieved using dedicated capacity-building programs and performance incentives, which could also be linked to benchmarking. It is also critical to build internal capacity regarding digital skills for civil servants and elected officials, especially in local government.

*Enhance interoperability.* A central concern of public and private sector stakeholders alike was low prevalence of interoperability and automation between platforms as well as accessibility of platforms at the local level. Therefore, it is recommended that the government create, publish, and regularly update an API road map. APIs are digital codes that are at the core of establishing interoperability between

systems. An API road map would allow software developers and other relevant parties to view upcoming opportunities to design these interfaces, coordinate their development, and ensure their adherence to technical standards. Developers could be informed of these opportunities through an industry forum facilitated by government. Ideally, these activities would be supported by a funding pipeline dedicated to “last mile” development.

*Enhance functionality and delivery of digital services.* Many digital services are currently under development or planned for development in the near future. It is recommended that the government first focus on platforms that contribute to a reduction in expenditures, an increase in revenue collection, or protection of the most vulnerable, then second on platforms that contribute to enhanced private sector productivity and improved human capital. A focused approach will enable targeting of investments and development of use cases from which key lessons can be derived and applied to other service delivery platforms. To best support delivery of these services, cornerstone public sector platforms such as the IFMIS and e-GP would need to be decentralized down to local government (specific recommendations for the e-procurement system are in appendix C). This decentralization would improve accounting for and efficiency of government management of fund flows. Key considerations in developing the approaches for these digital services would be their potential to leverage open data and civic technology. Along these lines, establishing an M&E platform for digital development with benchmarking for infrastructure rollout and service delivery will be critical to ensuring consistent improvements to service delivery.

*Lay the foundation for more evidence-based policy planning.* Data are a key input for cost-effective policies. Therefore, the central role of government data, both as an input and an output, in steering and informing policy options in Zambia needs to be amplified. Data, technical, and policy know-how are all severely lacking, most notably data that are disaggregated by gender, age, income level, geography, and other key dimensions. Without timely and quality data, institutions will not have an accurate grasp of the gaps and be able to identify the right policy options. As the government embarks on the digitization of services, it has a significant opportunity to include a strategic approach to leveraging data collected to inform policy.

*Strive toward unique citizen identity authentication.* Key services such as digital financial services, immigration, conditional cash transfers, and agricultural subsidies would become more efficient if unique, digital citizen identification were to become available to all of Zambia’s citizens. Although digital identification can be provided in numerous ways, ideally it would have the minimum capability to link with automated interfaces with key platforms such as social assistance systems and digital banking and payments. Upfront investment would be required to roll out the systems, including investment in the requisite technology and enrolling populations through a decentralized campaign. An increased level of sophistication of the technology used will increase the marginal cost of each ID, which will have to be weighed against the government’s key objectives for having a unique ID system. As of August 2019, the Zambian government had decided to pursue a biometric identification system with specific plans to be delineated by the Cabinet in the future.





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CHAPTER



# Digital Financial Services

## Definition and Importance of Digital Financial Services

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Digital financial services (DFS) can be defined as the broad range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances, and insurance. In this context, the term “digital channels” refers to the internet, mobile phones (both smartphones and digital feature phones), automated teller machines (ATMs), point-of-sale (POS) terminals, near field communication-enabled devices, chips, electronically enabled cards, biometric devices, tablets, phablets, and any other digital system. DFS models usually use agents and the networks of other third-party intermediaries to improve accessibility and lower the overall service delivery cost (AFI 2016a). DFS is expanding financial inclusion through digital access to and use of formal financial services by excluded and underserved populations, both globally and in Zambia. To be viable, such services should be suited to the customers’ needs and delivered responsibly, and at a cost both affordable to customers and sustainable for providers (Lauer and Lyman 2015). (See appendix D.)

Digital technologies can improve the delivery of financial services (for example, payments, savings, credit, and insurance products) and contribute to a deeper, more efficient, and more inclusive financial sector. DFS enables individuals, private businesses, and the government to access financial services more efficiently and conveniently. With greater financial inclusion, individuals are enabled to better manage household financial well-being, invest in education and nutrition, and save and borrow to launch and grow businesses—all of which contribute to poverty reduction and economic growth. According to the Group of 20 high-level principles for DFS (GPFI 2016), more than 2 billion adults globally do not have access to

formal financial services, thereby excluding them from opportunities to improve their livelihoods. DFS offer an important opportunity to close this gap in financial inclusion by providing affordable ways for the financially excluded and underserved groups (the majority of whom are women, youth, and populations living in rural areas) to save, make payments, access credit, and buy insurance. DFS are able to reach more people now than nearly 50 percent of people in the developing world already own a mobile phone (World Bank Group 2014).

The 2017 Global Findex data reflect the continued evolution of financial inclusion and the recent progress that has been driven by digital payments, government policies, and a new generation of financial services accessed through mobile phones and the internet. The power of financial technology to expand access to and use of accounts is demonstrated most persuasively in Sub-Saharan Africa, where 21 percent of adults now have a mobile money account—nearly twice the share in 2014 and easily the highest of any region in the world. The Findex emphasizes that owning an account is an important first step toward financial inclusion, but to fully benefit from having an account, people need to be able to use it in safe and convenient ways. It also underlines that digital technology alone is not enough to increase financial inclusion. Ensuring that people benefit from DFS requires a well-developed payments system, good physical infrastructure, appropriate regulations, and robust consumer protection safeguards. Financial services also need to be tailored to the needs of disadvantaged groups such as women, poor people, and first-time users of financial services who may have low literacy and numeracy skills (Demirgüç-Kunt et al. 2018).

Although the causal relationship between financial inclusion and household welfare remains a matter of debate, significant evidence supports a positive link (Aron 2018; CGAP 2019). The most notable evidence shows that access to mobile money helped female-headed households increase consumption by 18.5 percent and enabled women to switch from relying on subsistence farming into starting small businesses as their main occupation, while also reducing their reliance on multiple part-time jobs (Suri and Jack 2016). Another notable study from Bangladesh reports a 7 percent increase in consumption among rural households and migrants from these households who start using electronic remittances after receiving training and hands-on help to use the service (Lee et al. 2018).

DFS are, however, not without risks, such as overindebtedness and higher exposure to cybercrimes. Moreover, less literate and illiterate individuals would still need to depend on help from others to be able to use DFS, thereby limiting their use and increasing risks of fraud. Hence, to maximize the benefits of DFS, service providers and regulators would need to build their institutional capacity to adequately address these risks.

Widely available, well-designed DFS that meet appropriate customer protection standards can play a transformational role in Zambia's socioeconomic development. Several key government documents indicate the government's commitment to promoting financial sector development, financial inclusion, and DFS:

- The National Financial Sector Development Policy 2017 (Republic of Zambia, Ministry of Finance 2017a) provides a framework for the development of a stable, resilient, competitive, innovative, and inclusive financial sector that contributes to broad-based wealth creation and sustainable economic development. It recognizes the role of the national payment system in helping accelerate the country's transition from cash to digital payments.
- The National Financial Inclusion Strategy 2017–22 (NFIS) (Republic of Zambia, Ministry of Finance 2017b) aims to achieve universal access to and usage of a broad range of quality and affordable financial services that meet the needs of individuals and enterprises. It sets out to increase the formal financial inclusion of adults from 38 percent in 2015 to 70 percent by 2022. The NFIS includes "improved outreach and adoption of DFS" as one of the key drivers for reaching these targets and has a dedicated working group on delivery channels and digital payments.
- The National Payment System Vision and Strategy 2018–2022 (Bank of Zambia 2018a) outlines framework payment systems that are inclusive, affordable, appropriate, efficient, secure, and interoperable. It aims to achieve this goal through a clear regulatory framework, a cyber security monitoring system, an increase in access points and interoperable retail payment systems, digitized government payments, safer and more efficient remittance services, and promotion of DFS through increased sensitization. It also recognizes the emergence of priority areas such as financial inclusion, cybersecurity, and consumer protection.

The government has also made several global commitments related to DFS:

- Under the Alliance for Financial Inclusion's (AFI) Sochi Accord Fintech for Financial Inclusion (AFI 2018), the Bank of Zambia has committed to develop a fintech policy by 2020 jointly with the Zambia Information and Communication Technology Authority to promote financial inclusion, including for women.
- The financial technology (fintech) policy commitment builds on Zambia's commitment to the 2016 Denarau Action Plan on Women Financial Inclusion (AFI 2016b) under the AFI's Maya Declaration, according to which the target is to halve the gender gap at a national level by 2022.



# Current State of Digital Financial Services

Access to financial accounts and the use of formal financial services has rapidly increased over the past few years, driven by several key regulatory and market developments. Access to financial accounts by the population older than age 15 more than doubled from 2011 to 2017, with increased access to mobile money providers driving the bulk of the growth since 2015. Supply-side data suggest access is likely to have substantially increased in 2018, again driven by mobile money. The market has developed rapidly, with exponential growth in the customer base of mobile money providers and their partnerships with banks and fintechs to enable the introduction of new DFS products. The Bank of Zambia's regulatory actions have enabled market development and thereby access and use of DFS. This section presents key elements of these developments and discusses some of the main challenges that remain.

## ACCESS TO AND USE OF DIGITAL FINANCIAL SERVICES

The rapid increase in mobile money accounts has been a major contributor to expanding financial access and usage in Zambia. According to the Global Findex, the proportion of the population older than age 15 with financial accounts (both financial institution and mobile money accounts) increased from 21 percent in 2011 to 46 percent in 2017; the primary driver of growth was an increase in access to mobile money accounts—from 12 percent in 2014 to 28 percent in 2017 (figure 6.1).<sup>22</sup> Increased access to mobile money accounts also seems to be driving increased usage of financial services. According to the Global Findex 2017, 39 percent of the surveyed population reported having made or received digital payments, compared with 29 percent in 2014.<sup>23</sup>

There is, however, a persistent gender gap as well as a rural-urban divide for overall financial access and usage. While Findex reports 52 percent of surveyed males owned an account in 2017, only 40 percent of surveyed females owned one, and only 41 percent of the

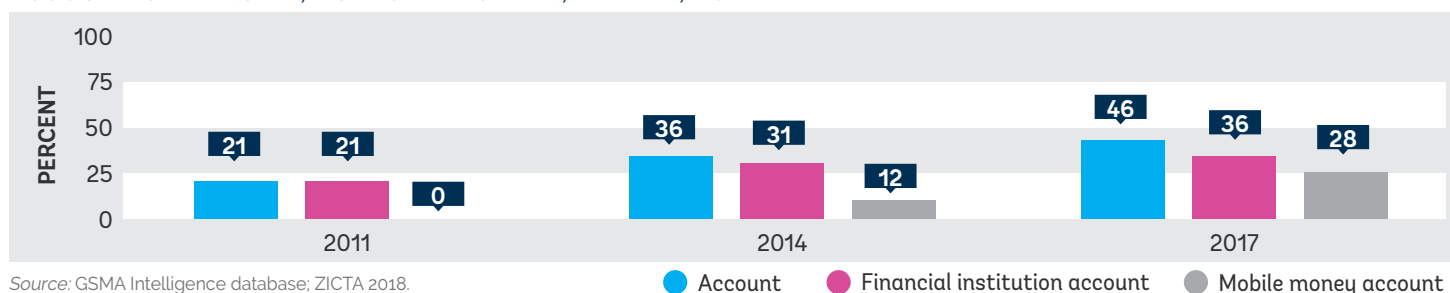
surveyed rural population. The access gap is narrower for mobile money; 26 percent of surveyed females compared with 30 percent of surveyed males, and 26 percent of the surveyed rural population compared with 28 percent of the entire surveyed population. The gap is also reflected in usage; 35 percent of surveyed women report having made or received digital payments in 2017 compared with 43 percent of men, and only 34 percent of the rural population compared with 39 percent of the surveyed population.

Supply-side data indicate that the trend of increasing financial access may have accelerated and that the use of DFS is increasing. The number of active DFS accounts, defined as accounts that have been used to conduct at least one transaction during a 90-day period, rose from 2.3 million in 2017 to 4.3 million in 2018, an 89 percent increase (UNCDF-MM4P and Bank of Zambia 2019).

Although not all of this information corresponds to an increase in financial inclusion, given that many customers have multiple mobile accounts, it is likely to have made a significant contribution.<sup>24</sup> The volume of mobile money transactions and POS transactions increased substantially in the three year period from 2016 to 2018 (386 percent and 268 percent, respectively) while the volume of ATM transactions has decreased (4 percent) (Bank of Zambia, n.d.).

Zambia's levels of financial inclusion are high relative to Sub-Saharan Africa and income-group averages, but its levels are lower than three out of the four benchmark countries. According to the Global Findex 2017, Zambia had a higher level of account ownership than the average for low-income countries and Sub-Saharan Africa. The comparison with select countries presents a mixed picture. The levels of account ownership in Zambia are comparable to that in Côte d'Ivoire, but lower than those in Ghana, Kenya, and Rwanda (figure 6.2).

▶▶ **FIGURE 6.1:**  
ACCOUNT OWNERSHIP, AGE 15 AND OLDER, ZAMBIA, 2017

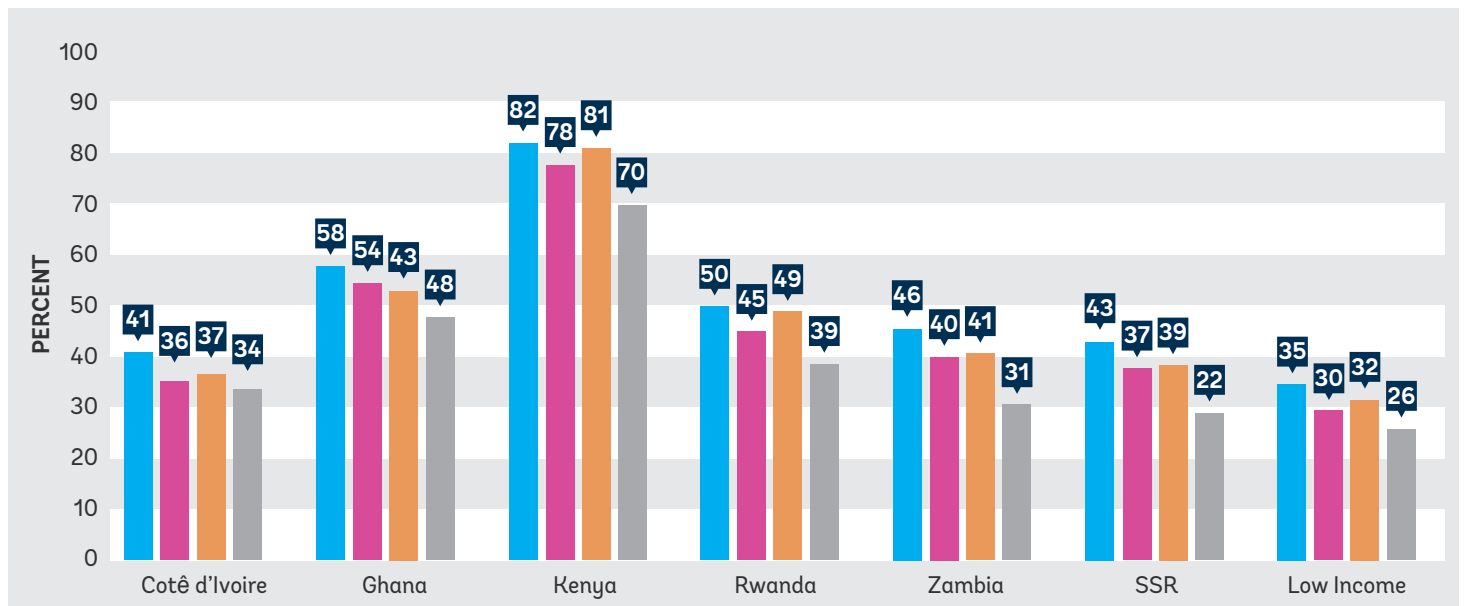


Source: GSMA Intelligence database; ZICTA 2018.

22. The Global Findex definition of "account" includes all types of accounts—both financial and mobile money. The Global Findex survey in 2011 did not yet include data on mobile money accounts.  
 23. Mobile money transfers and even value added services such as digital credit can be carried out with a basic mobile handset using the unstructured supplementary service data short code menu that only needs a 2G telecommunication network. In 2018, Zambia had 45 percent mobile phone ownership and 93 percent 2G network coverage.  
 24. GSMA Intelligence reports 1.84 SIM cards per unique subscriber as of the fourth quarter of 2018.



▶▶ **FIGURE 6.2:**  
ACCOUNT OWNERSHIP, BENCHMARKED COUNTRIES, 2017



Source: Global Findex 2017  
Note: SSA = Sub-Saharan Africa.

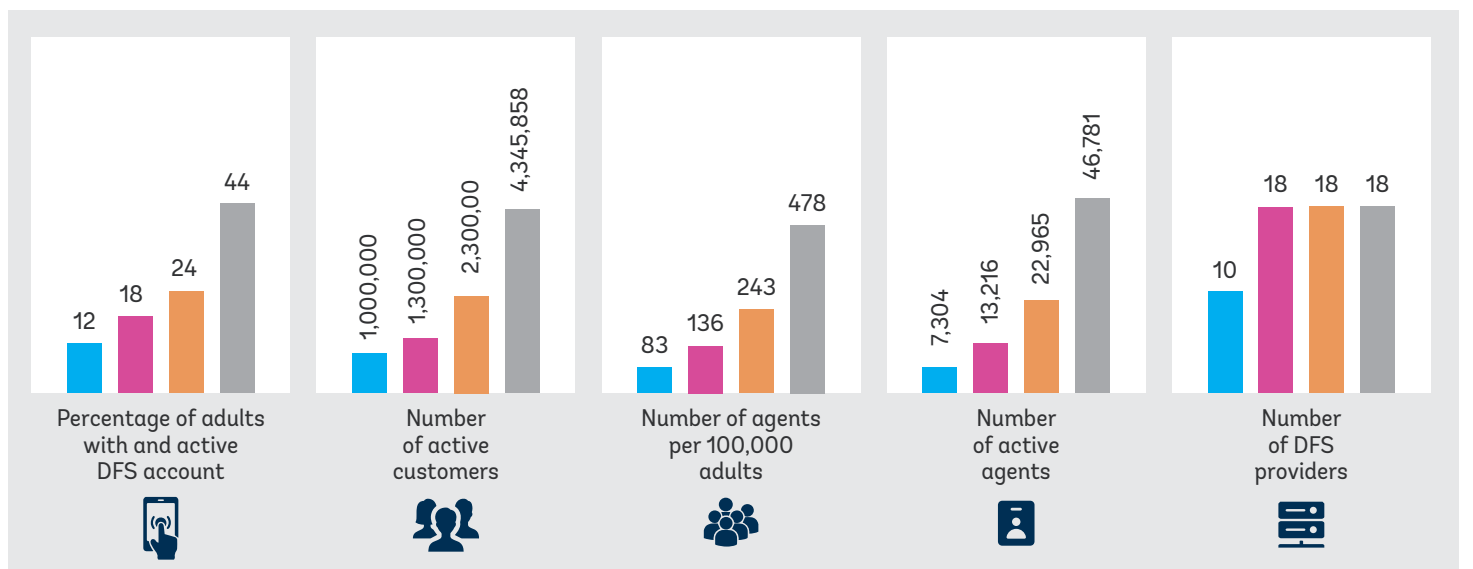
● Age 15 and older ● Female ● Rural ● Poorest 40 percent

## MARKET DEVELOPMENT

The DFS market has expanded rapidly since 2016, although the number of providers has remained steady. UNCDF's State of the Digital Financial Services Market in Zambia, 2018, reports 18 providers of DFS, comprising 10 banks, 3 mobile network operators, and 5 third-party providers including fintechs.<sup>25</sup> Figure 6.3 shows trends in key market development indicators.<sup>26</sup> Partnerships between banks

and nonbank financial service providers, fintechs, and real-sector companies (utilities, agribusinesses) are accelerating, which is leading to the growth of new products and services. Financial service providers are exploring digital innovations and partnerships, such as mobile banking applications, bank agent distribution channels, and bank-to-wallet links, to reduce reliance on physical branch services.

▶▶ **FIGURE 6.3:**  
DFS MARKET TRENDS



Source: UNCDF-MM4P and Bank of Zambia 2019.  
Note: DFS = digital financial services.

● 2015 ● 2016 ● 2017 ● 2018

25. The 10 financial service providers (banks and microfinance institutions) identified by the report as offering DFS include Atlas Mara, Ecobank, FINCA, First National Bank, Investrust Bank, UBA, and Zanaco. The Bank of Zambia's website lists 18 banks, 35 microfinance institutions, and 8 leasing and finance companies as registered financial service providers (UNCDF-MM4P and Bank of Zambia 2019).

26. The report team calculated the indicators based on responses provided by providers participating in the survey. In 2018, 13 providers, including all three mobile money providers, the bank with the largest outreach, and the two largest third-party providers, participated in the survey.

## MOBILE MONEY

Mobile network operators have the majority market share of active DFS customers, and mobile money transactions dominate the use of DFS. Zambia has three mobile money providers (MTN, Airtel, and Zamtel), which together accounted for 88 percent of active DFS customers in 2018 (UNCDF-MM4P and Bank of Zambia 2019). MTN and Airtel, which have the largest market shares, are 2 of the 62 mobile money deployments globally that claim 1 million or more active accounts. Mobile money transactions account for 83 percent of the market share of the combined transaction volume of mobile money, ATM, and POS transactions.<sup>27</sup>

Agents continue to play a key role; the agent network has grown rapidly and new models are emerging. Although the share of over-the-counter transactions at agent locations has declined, they still contribute 45 percent of the value of transactions, as compared with users conducting person-to-person transfers from their own mobile devices or wallets (UNCDF-MM4P and Bank of Zambia 2019). This creates a challenge for agent liquidity, a key barrier reported for expanding DFS into rural areas. However, as figure 6.3 shows, the number of active agents more than doubled in 2018 compared with 2017. Although, agent exclusivity is banned in Zambia, in practice, most agents only serve one service provider, primarily one of the mobile network operators. However, a notable development is the rapid growth of the agent network serving Kazang, a fintech platform that provides access to the two main mobile money providers and some banks. This business model may be the beginning of a shared agent network that could support and promote better agent viability, especially in rural areas.

The uptake of second-generation DFS products, defined to include digital credit, savings, insurance, pay-as-you-go services, and merchant payments, has been rapid.<sup>28</sup> UNCDF reports that active users of second-generation products grew from 1.3 million in December 2017 to 2.3 million in December 2018, while use of second-generation products grew 72 percent by volume and 43 percent by value during the same period. This demonstrates the role DFS can play in helping Zambia achieve broader financial inclusion beyond digital payments.

Digital credit is the second-generation product that has had the most uptake. MTN and Airtel have partnered with JUMO, a technology company with operations in multiple African markets and operating in

Zambia with a nonbank financial institution license, and banking partners (Barclays and Standard Chartered) to offer small, short-term loans through mobile money accounts. With approximately 1.2 million active customers, these nano-loans primarily target short-term consumer credit for the mass market. The digital savings product Kasaka, launched by MTN in partnership with JUMO and Barclays, is reported to have gained 10,000 savers in the first quarter after its launch.<sup>29</sup>

Merchant payments and mobile money bulk payments are available but not yet widely used. Both MTN and Airtel have merchant wallets but usage is still relatively low.<sup>30</sup> Insurance underwriters and mobile network operators are also partnering to facilitate premium payments via mobile money, although this arrangement is not a digital insurance product.<sup>31</sup> The use of mobile money bulk payments by businesses, development and humanitarian organizations,<sup>32</sup> and government cash transfers is a potential opportunity to drive the adoption of DFS, strengthen investment in distribution networks, and promote overall financial inclusion.

## MOBILE AND AGENT BANKING

Several banks have already digitized their services to varying degrees. Some banks, including FINCA, Stanbic, Investrust, FNB, and Atlas Mara, are offering mobile banking with smartphone applications available to customers for account management, although most of these target the already banked population. Zanaco is an exception—it launched its own mobile wallet (a transactional account with light know-your-customer procedures) and aims to extend services to the lower-income segment and into rural areas with its own agent network. Others are creating bilateral partnerships with mobile network operators to link bank accounts with mobile wallets for push-pull functionality (that is, bank-to-wallet), which enables customers to get cash out at bank ATMs without cards, and cash-in or out at mobile money agents.<sup>33</sup>

Agency banking has yet to become widespread.<sup>34</sup> Agency banking could offer a range of banking services beyond cash-in–cash-out services provided by mobile money agents in locations that remain un- or underserved and where brick-and-mortar branches are not viable. The recent rapid growth in the number of mobile money agents offers potential for some of them to become banking agents. Furthermore, the increased potential for profitability can attract new entities to this business segment.

27. During this period, the volume of POS transactions has also shown remarkable growth, at 268 percent, while the volume of ATM transactions has declined 4 percent and check transactions have declined by 33 percent. By transaction value, ATM transactions accounted for 56 percent of the combined value, while mobile money accounted for 27 percent and POS transactions the rest. See Bank of Zambia: Payment Systems Statistics website (<https://www.the Bank of Zambia.zm/payment-systems-statistics.htm>).

28. First-generation products include cash-in, cash-out; person-to-person transfers; bill and utility payments; airtime top-ups; and bulk payments.

29. See "MTN Zambia and Barclays Bank partner on the new KASAKA mobile saving product" (<https://www.techtrrends.co.zm/mtn-zambia-and-barclays-bank-partner-on-the-new-kasaka-mobile-saving-product/>).

30. Bulk payments are estimated to be 15 percent of total value of DFS transactions, and merchant payments are estimated to be 8 percent (UNCDF-MM4P and Bank of Zambia 2019).

31. Examples include paying premiums via Airtel Money for the MLIFE policy and via MTN Airtime for MTN Zambia Life after Life coverage.

32. One example is the UNHCR and UNCDF digital payments pilot in the Meheba refugee settlement in 2018.

33. Airtel Money allows bank2wallet with Barclays Bank and Standard Charter, while MTN is integrated with Access Bank and Barclays Bank. The Zamtel Kwacha mobile wallet is not integrated with any bank.

34. Based on stakeholder interviews, only Finca, Madison Finance, and Zanaco have to date launched agent banking services.

## INTERNATIONAL REMITTANCES

The emergence of innovative money transfer operators and new partnerships are benefiting Zambia. Although Zambia is not as dependent on international remittances as most of its neighboring countries, these developments are important given that the average cost of international remittances in the region is among the highest in the world. For example, Mukuru operates regionally and enables mobile transfers and cash-in-cash-out through stores and has partnered with Zoono in Zambia.<sup>35</sup> Traditional money transfer operators and mobile network operators are also beginning to partner up to enable customers to receive transfers into their mobile wallets (for example, MTN and WorldRemit), and other bilateral partnerships are emerging (such as MTN Zambia and EcoCash Zimbabwe). These innovations could result in lower prices and better choices for consumers (World Bank Group 2018).

## FINTECH

Zambia's ecosystem of fintech start-ups is growing. A 2018 survey by UNCDF counted 25 fintechs operating in the market (UNCDF-MM4P and Bank of Zambia 2019). These fintechs are developing innovative products and services for digital credit and insurance, pay-as-you-go energy, payments and transfers, and the aggregation of payments. Fintechs are anticipated to expand partnerships with other digital enterprises to support solutions in health care, agritech, group savings, and small and medium enterprise (SME) business. For example, one fintech (ZPOS) has developed a platform to support SME transactions, which can be used to create financial profiles for financial service providers to use when assessing creditworthiness and extending financing. As discussed in chapter 5 on Digital Entrepreneurship, fintech is one of the most active subsectors for the tech start-up community in Zambia.

## Enabling Environment for Digital Financial Services

The Bank of Zambia has played a key role in facilitating the growth of DFS. A key action taken is publication of the National Payment Systems Directives on Electronic Money Issuance, issued in 2015 and updated in 2018 (Bank of Zambia 2018b). These directives allow for providers other than commercial banks to offer services issuing e-money and distributing or redeeming e-money through a distributor or agent. These directives also allow simpler know-your-customer requirements for e-money accounts.

Full operationalization of the national payment switch (NPS) is expected to play a key role in improving the enabling environment for the growth of DFS. The NPS project, managed by the Zambia Electronic Clearing House (ZECH) and overseen by the Bank of Zambia, achieved a key milestone in June 2019 when it enabled the interoperability of all domestic ATM transactions. However, the interoperability of POS and mobile money transactions has been delayed and is now expected to be achieved by June 2020.

Key elements of the credit infrastructure necessary for the growth of digital credit for individuals and enterprises have been established. These include the Moveable Property (Security Interest) Act No. 3 of 2016, a web-based collateral registry for moveable assets in 2017, and the enactment of the Credit Reporting Act of 2018. Banks and microfinance institutions also report to a functioning private credit bureau (TransUnion). However, the functionality of both the moveable collateral registry and the credit reporting system is still limited and needs to be strengthened for the full benefits to DFS to be realized. A key enhancement to the credit reporting system that can benefit DFS users is the feeding of utility bill payment data into the credit information system.

Key actions being taken to strengthen financial consumer protection and financial capability would also strengthen the enabling environment for DFS. The three financial sector regulators—the Bank of Zambia, the Pensions and Insurance Authority, and the Securities and Exchange Commission—and the Competition and Consumer Protection Commission (CCPC) signed a memorandum of understanding in early 2019 to align their approaches to financial consumer protection. In a measure to protect consumers from fees deemed unwarranted, the Bank of Zambia also issued a directive in 2018 banning several bank charges and fees. Last, the effective adoption of the Second National Strategy on Financial Education, launched in December 2019, can also play a key role in the enabling environment for DFS.<sup>36</sup>

Multiple other initiatives are also contributing to the development of an enabling environment for the DFS sector through established forums for dialogue, knowledge sharing, and the promotion of professional standards. The Payment Association of Zambia, formed in early 2019, is expected to serve as a payment system industry association with a mandate derived from the National Payment Systems Act of 2007 and with authorization from the Bank of Zambia. The NFIS working group on delivery channels and digital payments, which includes a broader set of actors, also provides opportunities to advance issues relevant to the DFS sector. Last, market research, professional development, and industry development initiatives by key entities such as Financial Sector Deepening Zambia (FSD Zambia) and UNCDF's Mobile Money for the Poor program are making critical contributions to strengthening the enabling environment for DFS in Zambia (Chikumbi 2019).

## Constraints to Digital Financial Services Development

Several factors constrain the growth of DFS in Zambia. Many of them are discussed in this report, including limited mobile and broadband connectivity (chapter 2 on Digital Infrastructure), the absence of a digital identity (chapter 5 on Digital Platforms), and limited digital skills (chapter 3 on Digital Skills). Additionally, the following five areas need improvements for Zambia to fully benefit from the potential of digital financial services.

35. See Mukuru website (<https://www.mukuru.com/send-money-to-zambia/>).

36. The strategy can be accessed from the FSD Zambia website at <https://www.fsdzambia.org/news-item/bank-of-zambia-launches-the-national-strategy-on-financial-education-ii/>.



### LIMITED SHARED AGENT NETWORK

As previously discussed, most DFS agents in Zambia are franchises of a single service provider. This situation results in low profitability for the agents and an insufficient number of agents with sufficient cash liquidity. Furthermore, in many markets where mobile money is thriving, agents offer mobile money services as one of several business lines (for example, corner shop, agriculture supplier, pharmacy, hardware store), which improves the viability of an agent's business and expands liquidity sources. Such agents also have an incentive to accept digital payments, which can contribute to addressing the challenge of limited opportunity to use e-money without cashing out.<sup>37</sup> The emergence of platforms such as Kazang seems to be starting to address the issue of limited shared agent network-agent viability. Further enhancements in increasing the ease of business registration by the Patents and Companies Registration Agency can also contribute to a larger number of rural businesses becoming agents.

### ABSENCE OF FULL DFS INTEROPERABILITY

The lack of full interoperability is an obstacle to developing the market for mobile money, creating diverse services, and providing incentives for uptake. Users are not able to make payments directly to mobile wallets of other mobile network operators, though off-net transfers are available, which means customers can send from their mobile wallet to a nonaccount holder and the recipient receives a voucher or token that they take to an agent for cashing out. This may be a valuable service

for customers, especially those with lower digital literacy, but it incurs higher fees than direct wallet-to-wallet transfers, does little to promote continued use of DFS, and perpetuates agent liquidity challenges, especially in rural areas. It may also contribute to unused accounts (70 percent of accounts were inactive in 2018) because customers may open accounts when receiving money from senders, and then let the accounts go dormant. Bulk payments are also constrained, because payers are required to establish multiple service provider contracts for recipients using different mobile money services.

### LACK OF IMPROVEMENTS IN CREDIT INFRASTRUCTURE

Improvements in the credit infrastructure, a key requirement for scaling up digitally enabled credit, have not been fully leveraged. The enactment of the Moveable Property Act, the establishment of the web-based collateral registry, and the enactment of the Credit Reporting Act are key reforms and infrastructure improvements that can strengthen the ability of DFS providers to provide credit digitally to individuals and enterprises. However, use of the moveable collateral registry and credit reporting system remains much below potential. Lenders are not registering most of the moveable asset-based loans and are not always searching the registry for prior registrations—both omissions increase their credit risk. Reporting to the credit bureau by bank and nonbank financial institutions is not yet complete, and reporting of nonfinancial transactions (utility payments) has yet to start.

37. The Bank of Zambia's National Financial Inclusion Strategy 2017–2022 compares access per 10,000 adults for branches, ATMs, and mobile money agents across nine countries, and in 2016 Zambia had lower overall density of financial access points than several neighboring countries, with financial access points being highly concentrated in Lusaka and a few other densely populated urban centers along the main trade corridors. See <http://www.thebankofzambia.zm/National-Financial-Inclusion-Strategy-2017-2022.pdf>.





## LIMITED DIGITIZATION OF MAJOR GOVERNMENT PAYMENT FLOWS

The majority of government receipts from businesses (business-to-government, or B2G) and individuals (person-to-government, or P2G) are not digitized and are still transacted in cash, checks, and vouchers. The Government Payment Flows Diagnostic published by FSD Zambia and UNCDF (2017) reports that only 14 percent of B2G payments and 4 percent of P2G payments were made digitally in 2016. The government has largely digitized its salary and pension payments and tax payments to the Zambia Revenue Authority since then. However, several major government payment flows, such as school fee payments, agricultural subsidy payments, and social cash transfer payments, that reach a much larger number of people are yet to be fully digitized. School fee payments are estimated to be about 44 percent of volume of all P2G payments; agricultural subsidy payments reach about a million farmers; and Social Cash Transfers reach about a half million beneficiaries. Digitization of government payments has lagged because of the absence of a government-wide approach, inadequate interoperability of data platforms and financial management systems, lack of full interoperability of the national payment system, and change management challenges.

Digitization of government payments has also been hampered by government procurement processes, which typically select one or two payment service providers for a given program, resulting in limited service provider choices for payment recipients, and thus reduced convenience for the target beneficiaries.<sup>38</sup>

## NASCENT FINANCIAL CONSUMER PROTECTION

The early stage of development of the financial consumer protection regime and financial capability challenges of DFS consumers are also key constraints to increasing the use of DFS. The ability of consumers to trust a financial product is critical to its adoption and use, and a well-functioning financial consumer protection regime plays a key role in building this trust. Nonetheless, the financial consumer protection regime in Zambia is in the early stage of development notwithstanding some of the key actions that have been taken recently (see the section titled "Enabling Environment for Digital Financial Services"). In addition, the World Bank's 2016 financial capability survey identifies several capability limitations that can be critical constraints in the ability to choose from among DFS products offered in the market (Zottel, Joubert, and Khoury 2017).

38. . FSD Zambia and UNCDF-MM4P (2017) highlight the need to review and improve the government's tendering process for digital payments.

# Recommendations

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DFS are expected to continue growing in Zambia, driven by technology-oriented financial institutions and companies and increasing access to mobile phones and telecommunication infrastructure. However, the pace and robustness of this growth could be enhanced by public policy measures that provide incentives for innovation and competition among service providers while strengthening consumer empowerment. This section recommends three high-level actions to be taken by the government and one high-level action to be taken by private sector stakeholders.

## **ACHIEVE FULL INTEROPERABILITY OF PAYMENTS AND PROVIDE INCENTIVES FOR ITS USE BY THE MARKET**

The Bank of Zambia and ZECH should prioritize the achievement of full interoperability of payments. As discussed previously, the first phase of the NPS project successfully achieved interoperability of ATM payments by linking nearly all banks to the national payment switch. However, the interoperability of POS payments and mobile money payments, originally envisaged to be completed by December 2019, has been delayed. The Bank of Zambia and ZECH should take all necessary actions to ensure that this is achieved at the earliest. As was previously mentioned, these two channels already have the largest volumes of transactions, and achievement of full interoperability can therefore play a key role in driving the growth of DFS usage.

In parallel to ZECH and the Bank of Zambia's efforts toward achieving full interoperability in the payment infrastructure, the government should provide incentives to the private sector to fully use this key infrastructure component. Interoperability across payment services offered by banks and nonbanks, including mobile money providers, is expected to result in consumer benefits and cost savings for service providers, thereby driving the market to use the infrastructure. However, use may still be slow because of an insufficient number of aggregators building use cases. Fintechs can play a key role in this space; therefore, the government needs to assess factors that may be constraining their growth and take corrective actions as a priority.

The fintech working group, constituted by the Bank of Zambia, is a step in the right direction and should be strengthened. However, the government may want to consider expanding its mandate and capability by including experts from outside the Bank of Zambia (including key government ministries, agencies, and the private sector). The working group should review barriers for fintechs to ensure the business environment is conducive to the entry to new companies (for example, through tax policy and incentives), the framework is clear for compliance and certification of financial platforms, the regulatory guidance is clear, and there is

a clear pathway for fintechs to link into the NPS. Broad ecosystem recommendations and guidance on best practices are available in the International Monetary Fund–World Bank Group Bali Fintech Agenda (appendix E).

## **ACCELERATE DIGITIZATION OF MAJOR GOVERNMENT PAYMENT FLOWS**

The government may want to consider developing a government-wide policy and approach to digitizing government payments. This effort can provide high-level impetus for digitizing payments and ensuring a coordinated effort across various ministries and agencies. This effort can build on analytical work already undertaken, such as the Government Payments Flow Diagnostic, but may need to be supported by further analytical work. Key elements of such an approach need to include the use of financial accounts instead of vouchers; providing payers and recipients with a choice among multiple service providers, including mobile money providers; and adequate investments in building user awareness and understanding.

A major opportunity to digitize government payments is the flagship Fertilizer Input Subsidy Program. This program provides agricultural input subsidies worth more than \$135 million to more than 1 million farmers every year. Although the Ministry of Agriculture, in collaboration with Smart Zambia, launched a digitization effort in 2017, this endeavor has been significantly rolled back because of initial implementation challenges. Well-designed digitization of the Fertilizer Input Subsidy Program can use financial accounts, including mobile accounts, to transfer the payments and can crowd in DFS providers to develop and offer value added services such as digital savings, digital credit, and digital insurance services tailored to the needs of the farmers.

Another major government payments flow to consider digitizing is the Social Cash Transfer program. The Social Cash Transfer program, which reaches about half a million beneficiaries and makes up 21 percent of volume of all government-to-people (G2P) payments, remains a fully cash-based program. Although the remote locations of some recipients would not allow full digitization of these payments, partial digitization is definitely possible and desirable for beneficiaries located in areas with good access to DFS and where the beneficiaries are willing to receive digital payments. As with agricultural input subsidies, digitizing social transfers can contribute to the increased use of DFS and benefits to beneficiaries by reducing leakage and costs of access. The digitization of payment of livelihoods grants under the government's \$65 million GEWEL project, supported by the World Bank, provides valuable lessons on how digitizing G2P payments can be undertaken in a manner that enables the use of DFS and that is beneficial to target beneficiaries.

## STRENGTHEN CONSUMER EMPOWERMENT OF DFS USERS

The consumer protection capabilities of financial sector regulators, particularly of the Bank of Zambia, need to be substantially strengthened to ensure that appropriate consumer protection measures are in place and effectively practiced. The memorandum of understanding between the financial sector regulators and the CCPC in 2019 is a step in the right direction. However, much more needs to be done to strengthen the consumer protection capabilities of the regulators, who are expected to take the lead on consumer protection aspects relating to financial services. Key DFS-related consumer protection issues that need regulatory attention include developing consumer protection rules, standards, and practices for digital payments (including transparency of fees charged and clear recourse mechanisms for delays in receiving funds from failed transactions); protecting DFS consumer data; and ensuring that costs of default by financial consumers are proportionate to the costs to service providers.

The rapid growth of digital credit in recent years calls for priority attention to this DFS product. Although digital loans provide a valuable service to users, they also carry risks of overindebtedness and disproportionate costs of default (Izaguirre and Mazer 2018). The current requirement that all credit defaults, including digital credit and irrespective of size, be reported and remain on the credit record of the borrower for seven years should be reviewed. Many of these borrowers are accessing formal financial services for the first time, and this requirement has the potential to adversely affect financial inclusion (by constraining future access to credit to these borrowers, particularly from the banking sector).

Finally, new data collection methodologies, such as artificial intelligence-based algorithms to create financial profiles from digital transactions, raise issues of customer data privacy rights that should be included in a consumer protection framework. This data may be collected without the knowledge of the data owner and can have negative implications for the individual's ability to obtain loans or insurance, or to control whether it is being reported to the credit bureau and how to dispute negative information. Regulations on data governance will need to ensure consumer data privacy rights, including for digital savings and credit. By reviewing and adapting relevant policies, the Bank of Zambia can increase the availability of responsible DFS, and improve consumer welfare.<sup>39</sup>

Finally, the government needs to ensure that national financial education efforts cover DFS adequately and needs to monitor the efficacy of these efforts. As DFS become more widespread, it is important to ensure that consumer capability to effectively use DFS (to shop and compare DFS provided by different providers, be informed and avoid falling victim to scams, and avoid excessive use) is built through financial education initiatives beyond just sensitization campaigns. A good example of a cost-effective approach is the initiative recently launched by Financial Sector Deepening Zambia and Zazu that delivers financial literacy courses via mobile phones through unstructured supplementary data service, short message service, and voice. Efforts to promote consumer capability must be carried out in collaboration with private and nonprofit stakeholders. The interest earned on the mobile money trust account in which customer mobile money balances are held could be a potential source of funding to support financial capability initiatives, provided that a carefully researched action plan in consultation with DFS stakeholders demonstrates feasibility.



39. Guidance on client protection principles and responsible finance can be referenced at the SMART Campaign website (<http://smartcampaign.org/>).



## BUILD STRATEGIC CAPACITY IN THE PRIVATE SECTOR TO INNOVATE AND DELIVER DFS AT SCALE

Private sector stakeholders need to collaborate to drive collective action around fair competition, market intelligence, and a common vision for growing DFS. Building a collaborative network across the ecosystem provides opportunities for participants to clarify regulatory constraints, gaps, and overlaps (for example, digital transaction limits, a tiered know-your-customer framework); encourages business partnerships for experimentation; fosters a level playing field; takes collective action; and supports a common vision for creating a robust DFS ecosystem. Building such a network requires regular dialogue between DFS stakeholders, and may need new structures to pool resources for activities of collective benefit (for example, market research, shared agent network). Cosponsored efforts to provide capacity building and knowledge sharing to sector stakeholders should be cost effective and create professional standards.

Strengthening private sector capacity for data analytics and skills development for consumer-centric product innovation and market expansion is critical. The availability of up-to-date and relevant market data facilitates the analysis and understanding of customer needs that allow for customer segmentation and tailored DFS. To continue to drive the adoption and use of DFS, service providers will need to use such market data to develop different use cases such as school fee payments, agriculture value chain payments, merchant payments, and credit to micro, small, and medium enterprises as a way to create value for the service provider and customer. Access to relevant data is essential and there are several public sources in Zambia,<sup>40</sup> but it is also critical to enhance capacity and skills within the private sector to make use of the data for decision-making purposes.<sup>41</sup> DFS increasingly

relies on having a skilled workforce, particularly in the area of data science (refer to chapter 3 on Digital Skills for more information about professional development). Box 6.1 shows that cutting-edge innovations are already happening in Zambia.

Strategic capacity building in the private sector is critical for identifying opportunities for partnerships within and outside the financial services industry and for operationalizing them. One example is financial sector providers partnering with fintechs to adopt platform-based business models (for example, digital credit). Such models offer the opportunity for the diversification of revenue streams for service providers. Fintechs in Zambia are beginning to offer relevant technology-driven ideas and solutions; however, the financial sector has not yet fully embraced such business model innovations, and most segments still struggle to transform their traditional banking operations. A critical part of the ecosystem that can benefit from improved strategic capacity in the private sector is shared distribution channels. The last mile delivery channel is critical for extending mobile money and agent banking to rural areas, but building a robust and reliable agent network requires considerable investment. A shared agent network solution among DFS providers, including third-party aggregators, could be more economical and less operationally challenging to financial institutions, allowing them to focus on their core business. A shared solution has the potential to lower costs of agent networks, increase efficiency, ease liquidity constraints for agents, and improve service delivery to customers. A shared, fully interoperable agent network could be explored among multiple DFS providers.<sup>42</sup>

### ▶▶ BOX 6.1:

#### USING BLOCKCHAIN-BASED DIGITAL FINANCIAL SERVICES FOR AGRIBUSINESS PAYMENTS TO FARMERS

A key challenge for most farmers in Zambia is that their produce is sold in cash, leaving them without an electronic transaction record. This means they do not have an electronic payment history, which can be critical in getting access to savings, credit, and insurance services from formal financial service providers.

A partnership between AB InBev, the parent company of Zambian Breweries; BanQu, a blockchain-based platform; and Musika, a local nonprofit market development company is aiming to change this. The platform creates a decentralized digital ledger of each transaction for the produce bought on the platform, and instead of cash, each farmer can choose to receive a digital payment through either Airtel or MTN, the two largest mobile

money providers in Zambia. The platform also tracks the volume of goods delivered, the quality of those goods, and the price paid. Both the agribusiness and farmers benefit from increased traceability and transparency in their supply chain.

In 2018, about 2,000 cassava farmers in Zambia began selling their harvests to Zambian Breweries through the platform. The company added a mark-up to the payment due to farmers to offset the cost of withdrawing cash from the mobile money agents. In 2019, all farmer payments in Zambia are expected to be made through the platform, and building on the Zambian experience, InBev is currently expanding its digital payment initiative to Uganda and India.

Source: <https://www.fastcompany.com/90328012/this-digital-ledger-helps-small-farmers-get-a-fair-deal>; and personal communication with Katie Hoard, Global Director, Agricultural Innovation and Sustainability, AB-Inbev.

40. Financial Sector Deepening Zambia's FinScope surveys, United Nations Capital Development Framework's financial service provider surveys, the Bank of Zambia's Credit Market Monitoring initiative, and Zambia Information and Communication Technology Authority's use of information and communication technology services surveys.

41. IFC (2017, 27) describes the Data Science Analytic Framework for Business Intelligence, and key skills: performance reporting and traditional business intelligence are enabled by descriptive and diagnostic data analytics, while further information optimization can be achieved using predictive and prescriptive data analytics.

42. Agent interoperability involves agents using a single float for multiple e-money providers, and ideally a single POS. Agent interoperability is still nascent but working successfully in a few markets, such as Tanzania.



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CHAPTER



# Recommendations

## Introduction

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As indicated in the previous chapters, Zambia has made significant progress on the path to putting in place the foundational building blocks for digital transformation to occur. Zambia is thus in a good position to leverage digital technologies to accelerate progress toward meeting the 7th National Development Plan (7NDP) targets. However, Zambia currently has limited budgetary room to invest in new development initiatives and must carefully prioritize which digital transformation initiatives it invests in.

The authors recommend that the government of Zambia develop a digital transformation strategy that contributes to meeting the 7NDP targets and improving the country's fiscal space. This recommendation is closely aligned with the "doing more with less" mantra introduced by H.E. President Lungu and the Minister of Finance's 2020 Budget Speech (see box 7.1), and it emphasizes the use of digital technology to improve public sector efficiency and effectiveness, private sector productivity, and accountability across both the public and private sectors.



▶▶ **BOX 7.1:**

**GOVERNMENT OF ZAMBIA COMMITMENT TO DIGITAL TRANSFORMATION**

Minister of Finance, the Honorable Dr. Bwalya Ng'andu spoke about the government's commitment to digital transformation in his 2020 budget speech:

"To enhance transparency and accountability in public service delivery, Government will continue rolling out electronic platforms. This will not only reduce the cost of doing business for both the private and public sectors, but also enhance information sharing;

"to enhance domestic resource mobilization, Government in the medium term will implement the following measures: "i. Continue with the modernization and automation of revenue collection processes and provision of Government services. The Government will implement a service platform and payment gateway to create efficiencies in service delivery and enhance tracking of revenues."

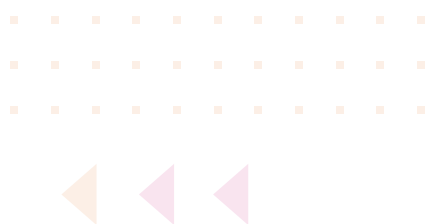
To achieve these three strategic objectives, the authors suggest four initiatives:

- 1) *Promote greater use of digital technologies in the economy.*  
As discussed in chapter 1, enhanced broadband usage alone contributes significantly to growth and poverty reduction. Additionally, initiatives undertaken under this theme are foundational to greater adoption of digital technologies by citizens, businesses, and government. The probability of success of initiatives launched under the other strategic themes will thus be limited without progress under this theme.
- 2) *Reduce government transaction costs and the cost of doing business through digitally optimized government systems.*  
Initiatives undertaken under this theme will have the most immediate and direct budgetary impact while also promoting private sector activity without much additional fiscal outlay.
- 3) *Improve adoption of innovative digital solutions by enabling entrepreneurship.* Initiatives undertaken under this theme will ensure that the private sector has the capacity to develop innovative digital solutions to resolve public and private sector challenges.
- 4) *Leverage digital systems to improve sector-specific outcomes* (such as health, education, and agriculture) in secondary towns and rural areas. Initiatives undertaken for this theme would have a comprehensive approach to transforming a sector, leveraging progress made under each of the three previous strategic themes.

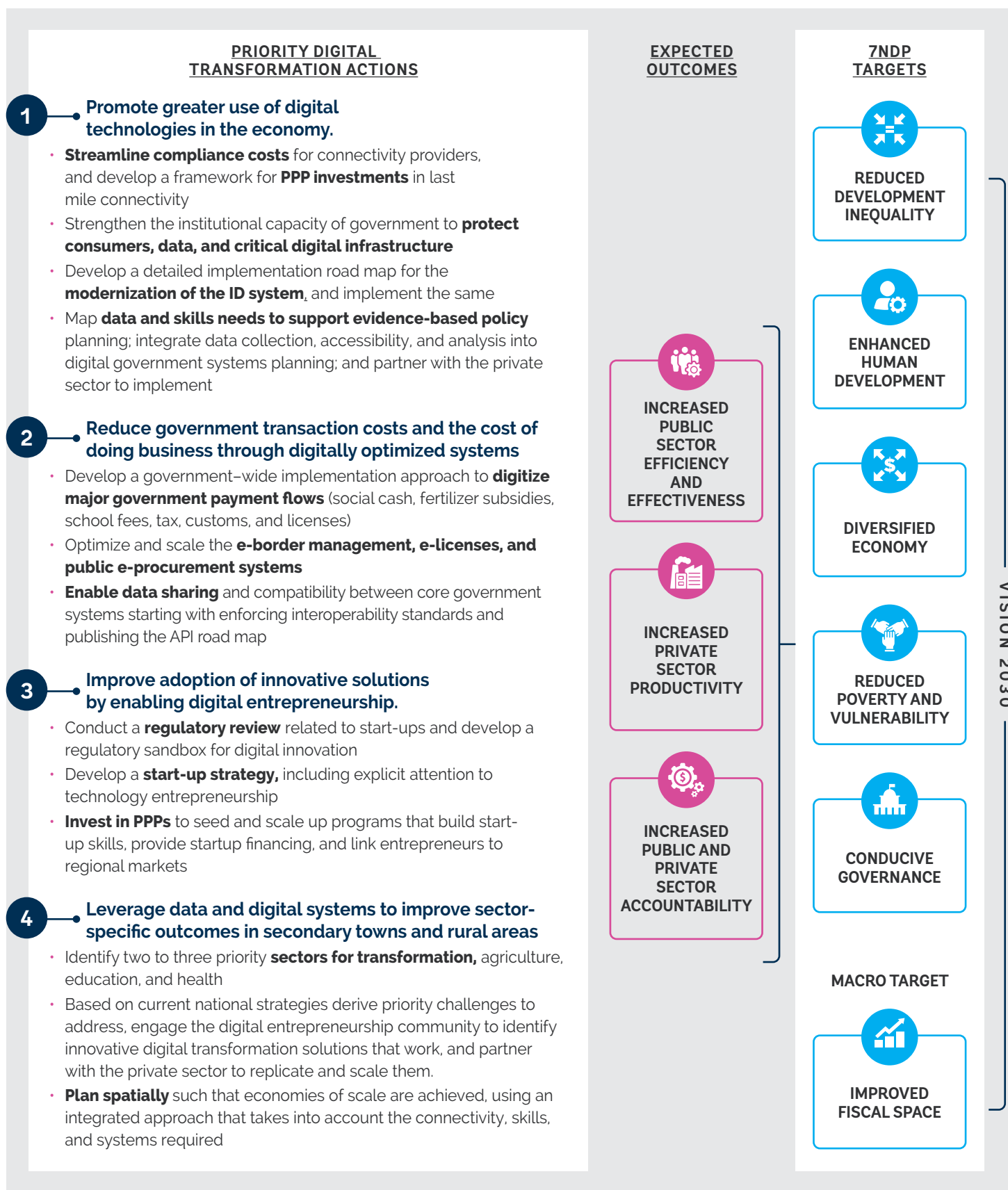
At the request of the government of Zambia, the authors have suggested a prioritization of the recommendations presented in this report, organized under each of these strategic themes. The diagnostic process resulted in a combined 27 recommendations (appendix F provides a full overview). Based on the authors' review of these 30 recommendations and the three strategic objectives, as well as logical sequencing of activities, figure 7.1 presents the suggested 12 priority activities. These activities include development of strategies and implementation plans, regulatory activities, and investments. The highest cost items include (1) public-private partnership investments in last mile infrastructure (under Initiative 1), (2) implementation of digital ID (under Initiative 1), and (3) implementation of Initiative 4. These three items were included in the priority activities because of the corresponding high impact and catalytic effect effective implementation will have.

Although the authors have provided a suggested prioritization, it is recommended that the government create a Digital Transformation Steering Committee to lead the articulation of a digital transformation strategy and implementation matrix. Once the steering committee has derived the priority outcomes sought, it is recommended that it carry out a detailed costing of the activities. Subject to the amount of resources the government would like to invest at this point, and the time it will take to ensure that the government has adequate capacity to plan for and ensure effective implementation of activities, it is then advisable to separate the activities into a Phase 1 and Phase 2 implementation plan that stretches over a five to seven year period.

Given that this agenda cannot be achieved by one ministry alone, the steering committee should have broad-based representation. At a minimum, the committee should include the core ministries related to each of the digital economy pillars. Relatedly, a dedicated public-private Digital Transformation Advisory Council may be advisable to ensure that the expertise of nongovernmental actors is leveraged in the articulation of the strategy and implementation matrix and to optimize the likelihood that the private sector may contribute resources to a strategy into which they have bought in. Further suggestions for the roles and composition of the Digital Transformation Steering Committee is outlined in appendix G.



▶▶ **FIGURE 7.1:**  
PRIORITY DIGITAL TRANSFORMATION ACTIVITIES



VISION 2030

Note: 7NDP - 7th National Development Plan; API - application programming interface; PPP - public-private partnership.

# Initiative 1: Promote Greater Use of Digital Technologies in the Economy

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The authors recommend that implementation of Initiative 1 be approached in two phases: phase 1 would focus on (1) streamlining the compliance cost of connectivity providers, (2) enhancing cybersecurity and consumer protection, (3) initiating implementation of digital identification, (4) mapping the data and skills needed to support evidence-based policy planning, and (5) mapping the digital skills needed to effectively implement priority digital transformation activities. Phase 2 could focus on (1) leveraging public-private partnerships to enhance last mile connectivity in secondary towns and rural areas, planned alongside Initiative 4 implementation; and (2) designing a comprehensive digital skills strategy as part of education reform. A discussion of the phase 1 recommendations follows.

In Zambia, the cost of broadband is an impediment to increased use of digital tools. A key policy decision for Zambia is whether the internet should be considered a public good like roads, for example. Achieving universal and accessible internet connectivity can indeed be a legitimate public policy goal because of the enabling benefits of internet access for productive sectors and public services. A decision, if made, that internet access is a public good should guide decisions on the taxes and fees levied on the sector, and the potential use of the universal access fund for public-private partnerships.

A top priority is to close any market efficiency gap. A critical point for the government is determining the optimal level of taxes and fees on the information and communications technology (ICT) sector from a societal point of view. For example, although excise taxes on mobile phone service or international calls may raise immediate revenue for the treasury, higher taxes translate into higher prices for consumers, thus limiting ICT use. High taxes also reduce margins, which leaves less earnings to invest in infrastructure. Additionally, discrepancies in the tax and fee structure can inadvertently create an uneven playing field, which ultimately hurts consumers.

To assess whether the cost of broadband can be reduced and coverage expanded by increased private sector investment, it is recommended that a comprehensive review of the taxes and fees levied on the ICT sector be conducted. This review should include modeling of whether the tax regime is striking the optimal balance between higher tax revenues in the short term and a longer-term increase in the use of broadband, increased productivity, and ultimately increased total tax intake. Further strategies are also needed to facilitate and safeguard fair competition, including changing the license regime to service neutrality.

As digital usage increases among citizens, business, and government, stronger consumer protection, including cybersecurity, is critical.

Adequate cybersecurity is not cheap nor easy to implement. However, the cost of not performing adequate security will cost governments and society far more. Given the suggested emphasis on payment systems in the first phase of the digital transformation strategy (see Initiative 2), cybersecurity in the financial sector could also be a first-order priority. Security capabilities must thus be built into initial system design, accompanied by adequate resources to meet availability, confidentiality, and integrity requirements. Governments must take a leadership role through suitable cybersecurity policy formation and regulatory oversight on critical ICT assets and data. Users must be informed and educated as to the proper, safe, and secure use of ICTs, and have clear consumer recourse mechanisms for ensuring their data are kept private, secure, and protected from misuse. Risk-based asset management and a continuous security review will be key for the delivery of efficient and effective ICT services within society.

Several bills on cybersecurity, data protection and privacy, and electronic payments are being prepared. These bills must be finalized and investments made in implementation capacity, along with raising the awareness of consumers, businesses, and government officials. Conducting a security audit of critical ICT infrastructure and systems and the associated implementation road map is recommended, and the government may want to consider establishing a cybersecurity agency. The World Bank funded an assessment of Zambia's cybersecurity maturity and a feasibility assessment for a cybersecurity agency in 2017. This work will need to be updated, but it can form a basis for conducting a cost-benefit analysis of the level of investment needed now to protect Zambian assets.

Given the unique nature of the risks involved, attention needs to be paid to consumer protection of digital financial services (DFS) users specifically. The memorandum of understanding between financial sector regulators and the Competition and Consumer Protection Commission is a good starting point for financial sector regulators to focus on consumer protection as it relates to DFS. Further actions needed include development of consumer protection rules, standards, and practices for digital payments (including transparency of fees charged and clear recourse mechanisms for delays in receiving funds from failed transactions); protection of DFS consumer data; and ensuring that the cost of default by financial consumers is proportionate to the cost to service providers.

The ability to authenticate that people are who they say they are is fundamental to DFS as well as to public service delivery. Modernization of Zambia's ID system is therefore needed. As

indicated in chapter 5, the government has decided to develop a biometric national ID system. Deciding on the design features of a digital ID system has significant cost-benefit implications, as discussed in Koshy et al. (2018). The cost of implementation across the world appears to vary from \$4 to \$14 per citizen, depending on design choices, scope, country characteristics, and legacy systems. This cost would translate into a cost of between \$70 million and \$230 million in the Zambian context, which is a significant outlay at a time of very limited fiscal space. Investments in a modernized ID system can result in significant fiscal returns, stemming from reduced fraud in government-to-person transfers, reduced administrative costs, and increased tax collection (Clark 2018). Furthermore, it can significantly contribute to financial inclusion by enabling electronic know-your-customer, which reduces the cost to financial institutions of meeting know-your-customer requirements, and thus enables them to better serve low-income customers.

As Zambia embarks on a transition to biometric ID, it is thus crucial that objective guidance be obtained on the complex set of trade-off decisions needed to make cost-effective choices that strike the right balance for Zambia specifically. In addition to the investment in the system itself, legislative updates are needed for the biometric ID to be adopted. Along with modernization of the ID system, the government may want to assess whether this could be the right time to modernize the civil registration system. Many policies are dependent on accurate population data. Thus, an investment in an up-to-date civil registry can enhance the ability of the government to more accurately project the level of public service expenditures needed in any given geographic area.

The digital transformation activities recommended in this report will only be successful if, first, the government has adequate digital skills to plan, implement, and monitor systems. The authors therefore recommend that the government partner with the private sector to map the digital skills needs and deliver the digital skills upgrading required to ensure effective implementation.

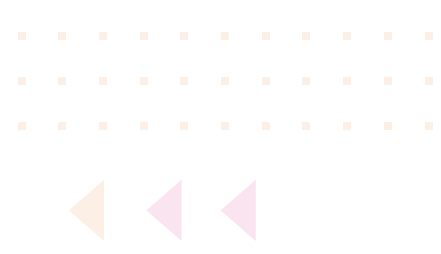
Second, an investment must be made in the collection and analysis of data derived from the digital systems implemented, and in making anonymized and aggregate data available to government departments and the public to support evidence-based decision-making and the development of innovative solutions. To ensure that the data generated through implementation can indeed be used to inform policy decisions, the departments of planning in the relevant line ministries must be engaged in the requirements-development process, such that real-time data are made easily accessible to key stakeholders. This again illustrates the importance of ensuring that adequate consumer protection regulation is in place regarding data privacy. There are practical ways to make useful data points available to government and the private sector without disclosing sensitive data.

## Initiative 2: Reduce Government Transaction Costs and the Cost of Doing Business through Digitally Optimized Government Systems.

It appears that a comprehensive government-wide payments policy, accompanied by targeted investments in advancing payment systems implementation related to social cash transfer, fertilizer subsidies, school fees, taxes, customs, and license payments, should be a high priority. Additionally, the government can reduce the cost of doing business and open market opportunities for the private sector, and simultaneously “do more with less” by enhancing government-to-business services, including optimizing the procurement, border management, and licensing systems.

A clear cost-benefit framework should be developed to identify which systems should be optimized and scaled up first. Once the priority systems have been identified for optimization and scale-up, the next steps would be to first review the user experience and efficiency of each system; second, to scale up and fully digitize each system; and third, to develop a monitoring and evaluation framework, and actively adapt the systems in line with user experience over time. This scale-up would need to be complemented by a deliberate effort to gain buy-in at all levels of the ministry involved, along with an awareness campaign targeting the beneficiaries of the system.

In the process of optimizing and scaling up, interoperability should be a key consideration to enhance aggregate efficiency gains. It is recommended that standards be developed for information exchange across government systems along with an application programming interface road map that enables both government and nongovernmental systems to interact and add value.





## Initiative 3: Improve Adoption of Digital Solutions by Enabling Entrepreneurship

To build a critical mass of innovators and entrepreneurs who can create, adapt, and implement innovative digital solutions to resolve public and private sector challenges, the authors recommend first, improving regulatory dialogue and second, investing in increasing start-up finance, start-up skills, and shared infrastructure. Box 7.2 provides one of many examples of Zambian innovations possible with the right support.

### ▶▶ **BOX 7.2:** **MUSANGA LOGISTICS—A ZAMBIAN DIGITAL SOLUTION TO LOGISTICS CHALLENGES**



Njavwa is the co-founder and chief executive officer of Musanga Logistics based in Lusaka,

Zambia. He founded Musanga in 2016 with the support of the Tony Elumelu Foundation and BongoHive. Before starting Musanga, Njavwa worked in the logistics sector for six years. He noticed that there had been no change in the sector for many years. "We saw the mobile phone as a great opportunity to connect shippers looking for transportation to transport owners looking to earn income," said Njavwa.

Musanga has developed two mobile applications. One application allows shippers to arrange delivery and track packages in real time through smartphones, and the other application was created for drivers (transporters) to access and manage delivery requests. Through the applications, transport logistic solutions and analytic reports are provided at low cost to enable business transactions.

Drivers and cargo owners are among Musanga's target market. To date, Musanga has delivered more than 3 million kilograms of cargo involving 600 drivers (transporters) on its platform. Musanga has also recently entered into agreements with large companies in Zambia to deliver cargo to Walvis Bay in Namibia.

Njavwa said, "In the next five years, our goal is to become a key enabler of trade and logistics in Africa and to be part of a solution to increasing trade in Africa."

Source: Interview of founder by authors.

The authors suggest that a mechanism (perhaps in the form of a regulatory sandbox<sup>43</sup>) be created to support digital entrepreneurs in navigating the regulatory environment while also providing regulators with sufficient comfort that risks are managed. Innovative use of digital technologies gives rise to a wide range of new products, services, and business models that introduce new benefits and new risks to society. This poses a challenge for regulators who need to strike a delicate balance between enabling innovation while also protecting citizens and national interests. If regulators wait to introduce regulation, regulatory uncertainty may discourage investment, and if regulation is introduced too early, overregulation may stand in the way of innovation and societal benefits. A regulatory sandbox can thus improve public and private understanding of what the benefits and risks are, and what the most beneficial regulatory approach may be.

The recently introduced ICT Association Act appears to be an example of well-intended regulation leading to unintended negative consequences. As discussed in this report, the act may lead to a reduction of the digital talent pool available to support Zambia's digital transformation efforts, and in the worst case, anticompetitive behaviors. The authors therefore suggest that this act be reviewed.

The authors further recommend that the government develop an early-stage entrepreneurship strategy that includes a subsection on technology entrepreneurship specifically. Figures 4.9 and 4.10 can be used as organizing frameworks for this strategy. Also, while chapter 4 on Digital Entrepreneurship includes significant data points upon which to develop the strategy, the authors recommend that a comprehensive review of the incentive regime for early-stage entrepreneurship (including but not limited to digital) be carried out as input to the strategy and possibly selected regulatory reforms. As discussed in this report, a wide range of regulations affect entrepreneurs' incentives to start and to grow a business. However, thus far, a business life-cycle approach has not been taken in business regulatory reviews.

Finally, the government could consider seeding and scaling up private initiatives that build start-up skills and provide start-up funding and shared infrastructure for innovative entrepreneurs. This effort would require that the entrepreneurship strategy include a framework for collaboration with the private sector.

More detailed recommendations on each of these areas is provided in chapter 4 on Digital Entrepreneurship.

43. "Regulatory sandbox" is a term used to describe a framework set up by a regulator to allow small-scale, live testing of innovations by private firms in a controlled environment (operating under a special exemption, allowance, or other limited, time-bound exception) under the regulator's supervision. This concept has been used extensively in the DFS field by regulators in the United Kingdom; Hong Kong SAR, China; Singapore; and elsewhere.

## Initiative 4: Leverage Data and Digital Systems to Improve Sector-Specific Outcomes in Secondary Towns and Rural Areas

Zambia has the opportunity to leverage its backbone digital infrastructure to enhance outcomes in sectors such as agriculture, education, and health, which could be particularly transformative in secondary and rural towns. It is recommended that digital transformation in these sectors be approached from a spatial perspective, that is, by rolling out digital transformation initiatives that target agriculture, education, and health in one specific geographic area at a time. In this way, economies of scale can be achieved for last mile connectivity, geospatial mapping, awareness raising, and digital skills development to make adequate use of the online services offered. Some stakeholders suggested that the footprint of the postal service perhaps could be leveraged for this purpose, which is a potential avenue to explore. Box 7.3 outlines some of the many ways digital technologies can be leveraged to achieve development outcomes in the agriculture, education, and health sectors. Similarly to Initiative 1, strategic cost-benefit assessments must be carried out to determine which sector will yield the "biggest bang for the buck" in the medium and long terms.

Although significant strides have been made in increasing connectivity in Zambia, many local government offices, schools, health centers, and agricultural extension services have yet to be connected. Last mile connectivity and reliable power are lacking in some areas. In others, connectivity is available, but the public institutions do not have funds to pay the connectivity fees.

The following activities are recommended:

- Invest in last mile power and connectivity for critical institutions in agriculture, education, and health. Priority geographic areas would need to be selected so that a phased approach could be adopted and economies of scale achieved from the perspective of connectivity, geospatial mapping, digital skills development, and awareness raising. Prioritization will also help make it more attractive for the private sector to participate in last mile connectivity efforts (see Initiative 1: Phase 2 for further details).
- Digitize payment systems related to agricultural subsidies, education, and health payments, starting with those indicated under Initiative 1.
- Invest in seeding and scaling up innovative solutions to improve education, health, and agricultural extension outcomes. Based on the current national health, education, and agricultural strategies and problem statements, derive priority challenges to address, and engage with and provide incentives to entrepreneurs and the private sector to derive and test new solutions, explore the adaptation of solutions tested elsewhere on the continent, and develop a road map for implementation.

▶▶ **BOX 7.3:**  
**DIGITAL TRANSFORMATION OF AGRICULTURE, EDUCATION, AND HEALTH**



In **agriculture**, digital tools can provide farmers with more relevant and timely information on agronomic best practices, pests, diseases, weather, and market prices, thus increasing their productivity and reducing their vulnerability

- Enhance farmers' knowledge of and access to a wider range of suppliers, distributors, and off-takers, thus increasing their profitability
- Enhance farmers' access to transparent and affordable financial services
- Enhance the quality and efficiency of government services targeting farmers

A 2019 review of the digitalization of African agriculture (CTA 2019) indicates that according to currently available data on digital solutions applied in the agriculture sector in Africa, digital advisory services yield a 10–70 percent smallholder income increase and digital market link services yield a 15–100 percent increase. The report includes valuable insights and recommendations for entrepreneurs, governments, and development partners.



In **education**, digital tools can

- Provide teachers and students with more ready access to knowledge and educational materials
- Support the monitoring of learning outcomes
- Provide reliable data on the availability of teaching materials, school equipment, the number and qualification of teachers, and the attendance of students and teachers

For example, in Kenya, Eneza's mobile-based e-learning platform provides learners with access to the curriculum, real-time engagement with teachers, reader boards, and learning competitions. For \$0.10 per week, learners get unlimited access to the content on the platform. A flexible financing model allows users to pay for the service daily or weekly by using mobile money. To date, the platform has reached nearly 5 million learners, who scored 22 percent higher on national tests compared with their peers.

The World Bank conducted a review (Trucano 2016) designed to help policy makers make informed decisions about how best to use information and communications technologies to meet educational objectives.



In **health**, digital tools can

- Improve patient connectivity and communications
- Improve the delivery and tracking of essential commodities and services
- Enhance health care capabilities

For example, in Rwanda drone technology is used to deliver blood supplies thanks to a partnership between the government of Rwanda and the California-based robotics company Zipline, Inc. In Uganda, about 27,000 government health workers use a mobile health system called mTRAC to report on medicine stocks across the country, while in Ghana, partners—including Novartis Foundation, the Ministries of Health and Communications, and the National Health Insurance Agency—are scaling up an initial pilot telemedicine system to connect frontline health workers with consultation centers in referral hospitals several hours away, where doctors and specialists with the right expertise are available.

Recently published guidelines on digital transformation in health care include that of BMZ (2018) and that of the World Health Organization (2019).

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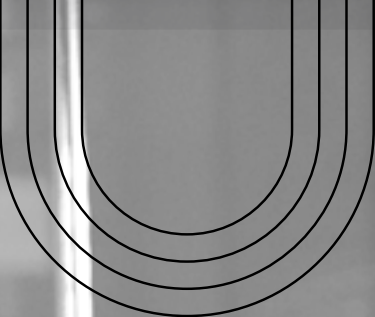
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# Appendixes

## Appendix A: Overview of Key Relevant Acts and Policies

Zambia Development Agency Act No. 11 of 2006 (currently under revision)	The act provides for trade, investment, and industrial development in Zambia through a coordinated private sector-led economic development strategy.
Companies Act, 2017 (No. 10 of 2017)	The act provides for legalization of business operations in Zambia through the registration of companies, trademarks, industrial design, and patents.
Income Tax Act (Chapter 323 of the Laws of Zambia)	The act governs the taxation of profits of limited companies and incomes of enterprises.
Patents Act No. 40 of 2016	The act provides for the protection and administration of patents, to provide for the patentability of inventions.
ICT Association of Zambia Act N.A.B.7 of 2018	The act establishes the Information and Communications Technology Association of Zambia and provides for its functions; provides for the registration of information and communications technology professionals and regulates their professional conduct in the interest of the information and communications technology sector; and provides for matters connected with, or incidental to, the foregoing.
National Employment and Labor Market Policy (NELMP)	The revised NELMP is aimed at making full, productive, and freely chosen employment and decent work a reality for all, by facilitating the creation of formal job opportunities and promoting the translation [[AQ: “transition” instead of “translation”?]] from informal jobs to formal ones, reducing underemployment and increasing earnings from work, reducing income inequalities, and building an effective labor administration to manage the labor market.
Technical Vocational and Entrepreneurship Training Policy	This policy is intended to guide the development of a system of technical education and entrepreneurship training that will satisfy the demands and requirements of Zambia’s labor market and socioeconomic conditions.
Science, Technology and Innovation Policy (currently under revision)	This policy embeds science and technology as part of the culture of key sectors to promote competitiveness in the production of a wider range of quality goods and services.
Higher Education Policy 2019	This policy is aimed at coordinating, regulating, and improving the quality and relevance of higher education and skills training in Zambia. Specifically, it focuses on quality and relevance, access and participation, equity and inclusiveness, and efficiency and effectiveness.

## Appendix B: Ghana's Accra Digital Center

The Accra Digital Center (ADC) was initiated in 2011 with support from the World Bank and the Rockefeller Foundation. The ADC was established to meet the demand for affordable "plug-and-play" facilities for existing and prospective information technology and business-process outsourcing companies. The center is also home to a mobile applications lab and an innovation hub, allowing the ADC to serve as an incubation hub for technology start-ups working in emerging technologies such as the Internet of Things, cybersecurity,

artificial intelligence, and so on. With \$10 million funding secured from the eTransform Ghana program, 12 warehouses were refurbished and repurposed by the Ministry of Communications to support the development of the information technology and business-processing services industry.

As of January 2020, ADC is hosting 30+ business-process outsourcing and technology companies.

▶▶ **FIGURE B.1:**  
ACCRA DIGITAL CENTER



The Ministry of Communications facilitated the development of an independent company, Ghana Digital Center Limited, with its focal node based in the ADC. This organization plans to develop more

digital support centers across Ghana based on the lessons learned from the ADC.

## Appendix C: Indicative Plan of High Priority Actions for Strengthening the Value of Zambia's e-GP System

	Actions	Priority	Purpose
1.	Develop communication strategy and implement communication program	High	Sensitization and buy-in at political, executive, management, and support levels of the government; citizen awareness and business community buy-in
2.	Business continuity plan	High	Define e-GP operation and management governance and ensure sustainability
3.	Make use of e-GP System mandatory	High	Voluntary use of e-GP System fails to encourage procuring entities to take up the e-GP system, but allows them to remain in the status quo.
4.	Develop and implement a systematic and ongoing program of capacity building for the procurement workforce and other key stakeholders, including use of Massive Open On Line Course (MOOC) e-learning courses	High	Build the capacity of different stakeholders in using e-GP
5.	Promote citizen engagement through a comprehensive and integrated open contracting system	High	Should integrate data from manual and electronic procurements and make that data accessible to citizens for their consumption so they can make significant contributions as watch dogs and informed and responsive citizens.

Note: e-GP = electronic government procurement.



## Appendix D: Digital Financial Services Elements and Cost Savings

The essential components of digital financial inclusion are as follows:

- Digital transactional platforms enable customers to make or receive payments and transfers and to store value electronically through the use of devices that transmit and receive transaction data and connect to a bank or nonbank institution permitted to store electronic value.
- Devices used by customers can either be digital devices (mobile phones and the like) that transmit information or instruments (payment cards and the like) that connect to a digital device such as a point-of-sale terminal.
- Retail agents that have a digital device connected to communications infrastructure to transmit and receive transaction details enable customers to convert cash into electronically stored value (cash-in) and to transform stored value back into cash (cash-out).
- Additional financial services—credit, savings, insurance, and even securities—using the digital transactional platform may be offered by banks and nonbanks to the financially excluded and underserved, often relying on digital data to target customers and manage risk (World Bank Group 2014).

Digital financial services have significantly lower costs than more traditional financial services that rely on manual and paper processes, analog technologies, and physical branches, including the following (Goldfarb and Tucker 2019):

- Storage, computation, and transmission of data (for example, storing account records on paper is more expensive than storing information electronically; calculating a borrower's credit score is faster with access to more data points; sending payment instructions through application programming interfaces is easier than via fax or check)
- Searching for information (for example, a bank's search for borrower information or a consumer's search for the best savings rate)
- Replication (for example, creating money in digital form is cheaper than using paper or coins)
- Transportation (for example, the costs of handling and transporting physical cash for payments, including security, or of traveling to a bank branch or to a supplier to make a payment)
- Tracking (for example, digital technologies make it easier to connect individuals and assets with information about them; digital transfers increase traceability of payments, helping to fight illicit transactions and thereby reducing the illicit and grey economies)
- Verification of identity and reputation (for example, digital verification of credit repayment behavior and ownership of collateral makes it easier to certify the reputation and trustworthiness of an individual, and ownership of assets)

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## Appendix E: The International Monetary Fund– World Bank Group Bali Fintech Agenda

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In October 2018, the IMF and World Bank launched the Bali Fintech Agenda—a joint call to support financial technology (fintech), as well as encourage greater international cooperation and guidance around emerging fintech policy issues. The following 12 principles were adopted jointly by the IMF and the World Bank Group:

1. Embrace the promise of fintech
2. Enable new technologies to enhance financial service provision
3. Reinforce competition and commitment to open, free, and contestable markets
4. Foster fintech to promote financial inclusion and develop financial markets
5. Monitor developments closely to deepen an understanding of evolving financial systems
6. Adapt regulatory frameworks and supervisory practices for orderly development and stability of the financial system
7. Safeguard the integrity of financial systems
8. Modernize legal frameworks to provide an enabling legal landscape
9. Ensure the stability of domestic monetary and financial systems
10. Develop robust financial and data infrastructure to sustain fintech benefits
11. Encourage international cooperation and information sharing
12. Enhance collective surveillance of the international monetary and financial system

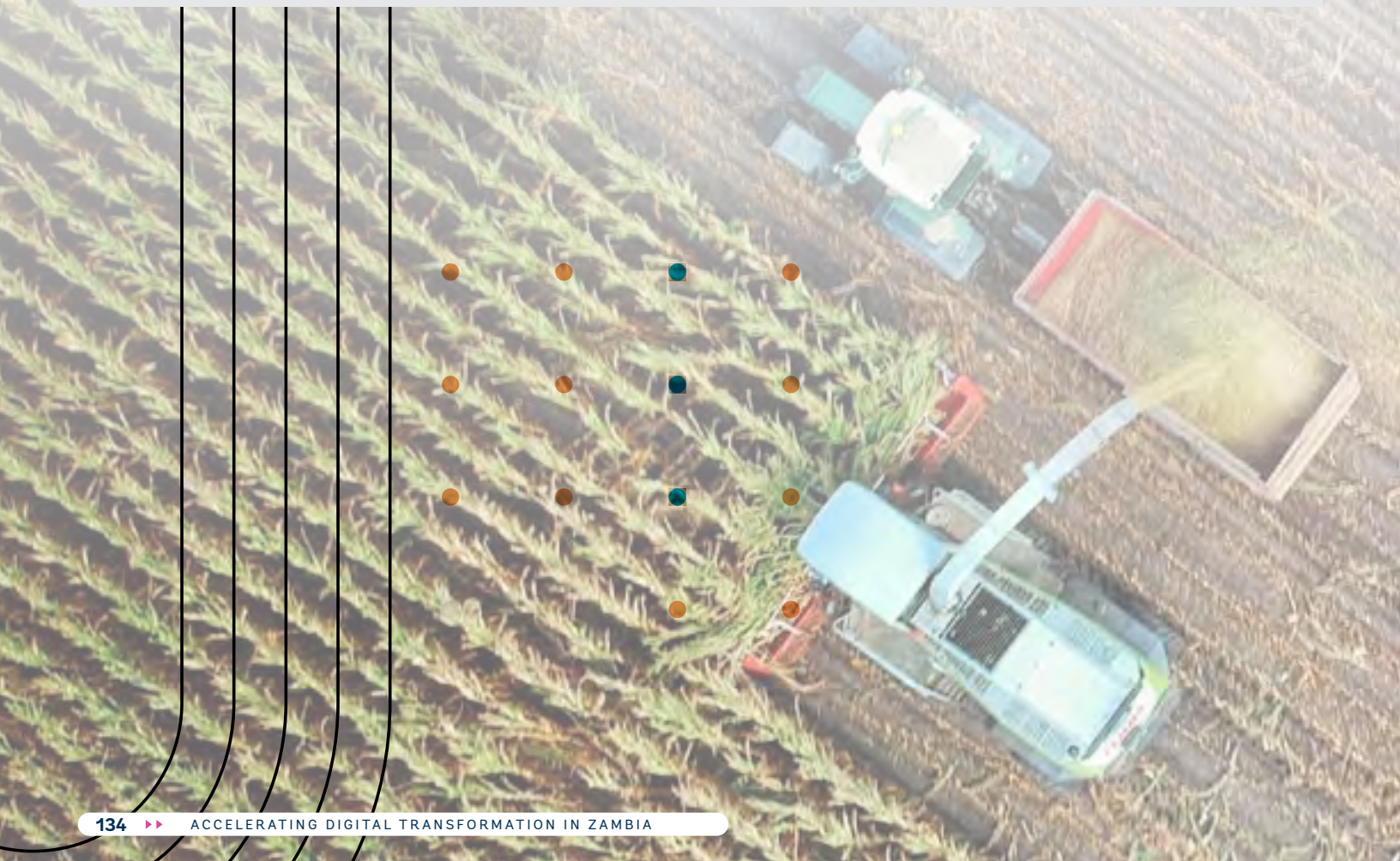
The agenda builds on the Group of 20 High-Level Principles for Digital Financial Inclusion, published by the Global Partnership for Financial Inclusion in 2016, which capture the evolving nature of digital financial services and calls for policy evolution alongside technology, product, and service innovation.

## Appendix F: Overview of Findings and Recommendations

In October 2018, the IMF and World Bank launched the Bali Fintech Agenda—a joint call to support financial technology (fintech), as well as encourage greater international cooperation and guidance around emerging fintech policy issues. The following 12 principles were adopted jointly by the IMF and the World Bank Group:

Achievements	Hurdles	Recommendations
<b>DIGITAL INFRASTRUCTURE</b>		
<ul style="list-style-type: none"> <li>• Zambia is connected to six neighboring countries and connections to the remaining two are planned for 2019.</li> <li>• All provincial centers are linked to the fiber backbone, and 80 percent of the districts have fiber passing through them.</li> <li>• Mobile broadband coverage is increasing and is currently at 53 percent.</li> <li>• 1GB mobile broadband costs less than 2 percent of GNI per capita.</li> </ul>	<ul style="list-style-type: none"> <li>• Fiber backhauling is relatively unreliable because of fiber cuts, electricity grid failure, and maintenance issues.</li> <li>• Smartphone ownership and internet use is very low; only 14.3 percent of people use the internet.</li> <li>• Gender differences in access and use persist.</li> <li>• Corporate income tax rates are relatively high and there are inconsistencies in license fees and levies.</li> </ul>	<ul style="list-style-type: none"> <li>• Review excise duties, corporate tax rates, import duties, and license fees for connectivity providers, and model the fiscal implications of potential reductions.</li> <li>• Review whether providers of the same service are treated equally from a regulatory perspective and implement corrective actions as needed.</li> </ul>
<b>DIGITAL SKILLS</b>		
<ul style="list-style-type: none"> <li>• There is national recognition of the importance of digital skills. ICT has been made compulsory in primary and secondary schools, and SMART Zambia and ZICTA have donated equipment and educational content to some schools.</li> <li>• Teacher training in ICT skills has been initiated, and private initiatives have started delivering digital skills training.</li> <li>• A variety of short courses and degrees are offered at selected public higher education institutions.</li> <li>• Digital entrepreneurs have started developing solutions for the education sector.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited collaboration between private and public sectors to obtain an overview of digital skills needed in public and private sector national strategy, and lack of an implementation road map for digital skills development.</li> <li>• Infrastructure and resource challenges (electricity; access to computers and last mile internet in schools).</li> <li>• Limited teacher capacity to use ICT.</li> <li>• Most interventions are not scaled, not sustainable, and only reach a small number of learners.</li> <li>• Low quality of foundational literacy and numeracy skills.</li> <li>• Entrepreneurial and technical skills gaps hinder more rapid advancements of entrepreneurial digital solutions.</li> </ul>	<ul style="list-style-type: none"> <li>• Map the current ICT school curriculum against the DigComp 2.1 framework to gain a comprehensive overview of which digital skills and competencies need to be developed.</li> <li>• Increase the number of qualified ICT teachers.</li> <li>• Enhance last mile connectivity and access to devices in schools.</li> <li>• Partner with the private sector to deliver basic digital literacy skills and improve training for civil servants and technocrats.</li> <li>• Update the senior secondary school digital curriculum to include more advanced digital skills training.</li> <li>• Scale up digital skills training in TEVET institutions.</li> <li>• Expand short courses in advanced ICT skills through partnerships between higher education institutions and private providers.</li> <li>• Across the board, explore opportunities to leverage online courses or contract in the private sector through public-private partnerships.</li> <li>• Invest in improving monitoring and evaluation data in the education sector, including for progress in digital skills.</li> </ul>

Achievements	Hurdles	Recommendations
<b>DIGITAL ENTREPRENEURSHIP</b>		
<ul style="list-style-type: none"> <li>• The on-going review of the SME Policy, ZDA Act, and the Science, Technology and Innovation Policy provides an opportunity to assess how the entrepreneurial and technical skills gaps can be bridged.</li> <li>• There appear to be six digital entrepreneurship support organizations and five developer communities in Zambia. A few corporations have also started engaging in entrepreneurship support.</li> <li>• A Cabinet Memo was recently submitted to the Cabinet to develop an “Innovation Park” in Copperbelt province (its establishment of the same s also mentioned in the 7NDP).</li> <li>• There is a significant latent domestic market in digital solutions related to education, agriculture, logistics, and financial services.</li> <li>• The Ministry of Transport and Communication and the Ministry of Commerce, Trade and Industry have initiated an effort to procure digital solutions from entrepreneurs.</li> </ul>	<ul style="list-style-type: none"> <li>• Low level of start-up skills.</li> <li>• Limited availability of programmer skills.</li> <li>• Limited availability of start-up financing (this gap was recognized in government policies, but budget allocations were not made toward this purpose).</li> <li>• No public funding available for nongovernmental entrepreneurship support organizations, and corporations are less active than in many other African countries. Government programs (ZICTA; NTBC) receive very limited funding or do not have expertise in digital (ZDA). Programs stop and start in line with these organizations’ ability to secure sponsorship.</li> <li>• The private sector worries that the newly passed ICT Association Act may exclude legitimate ICT professionals from the market.</li> <li>• There are no tax holidays or rebates for early-stage enterprises.</li> <li>• Consumers have limited internet access and purchasing power.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop an entrepreneurship strategy that includes a subsection on digital entrepreneurship. Such a strategy would need collaboration between the Ministry of Education and the MCTI.</li> <li>• Review the incentive regime for digital entrepreneurs, including the taxes for start-ups, as well as the effect of duties on ICT equipment, the ZICTA licensing regime and PACRA registration categories, and the ICT Association Act from the perspective of enabling digital innovation and entrepreneurship.</li> <li>• Enhance the advancement of start-up skills and early-stage financing by seeding and scaling up (technology) entrepreneurship hubs through public-private and regional partnerships.</li> </ul>





Achievements	Hurdles	Recommendations
<b>DIGITAL PLATFORMS</b>		
<ul style="list-style-type: none"> <li>• Clear political will and government leadership for the development of platforms; specific targets are included in the 7NDP.</li> <li>• Several ICT bills are under preparation (cybersecurity, data protection and privacy, and electronic financial transactions).</li> <li>• Several cornerstone platforms for efficiency have been initiated, including IFMIS, e-procurement [[AQ: e-GP?]], e-tax.</li> <li>• Several platforms for service delivery are emerging, including customs–single window, business registry, cash transfers.</li> <li>• Availability of government-owned ICT infrastructure, including a Tier 3 data center.</li> <li>• Moderately developed enterprise architecture.</li> <li>• Zambia currently has 39 active private sector platforms, out of which 15 are Zambian.</li> <li>• ZICTA has initiated a physical addressing project and aims to complete all 10 provinces by 2023.</li> <li>• MCTI is developing new e-commerce and logistics strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited ICT skills in government and lack of change management when introducing platforms within the government.</li> <li>• Lack of maintenance of platforms</li> <li>• No operational digitized system to verify citizens' identities.</li> <li>• Core platforms are not fully linked, interoperable, or automated, resulting in continued inefficiencies.</li> <li>• No national cybersecurity agency. Cyber assets and critical infrastructure require security improvements.</li> <li>• No monitoring of the use or performance of digital platforms.</li> <li>• Growth of e-commerce is limited because of weak physical addressing, expensive trade logistics and limited internet use, smartphone access, financial inclusion, and digital skills.</li> <li>• Perceived risks from lack of identity authentication (know-your-customer requirements).</li> <li>• Limited support to platform start-ups and poor matching of available skills with market demand.</li> <li>• Lack of access to the robust consumer and industry data needed to research and launch platforms.</li> </ul>	<ul style="list-style-type: none"> <li>• Clarify leadership roles and ensure transparent, effective, and responsive coordination across government.</li> <li>• Develop a systematic internal change management program and external awareness initiative that accompanies the rollout of digital government systems and services.</li> <li>• Develop a monitoring and evaluation plan for the effective rollout of digital government systems and services.</li> <li>• Optimize and scale up digital delivery of services to citizens and businesses in three to five priority sectors aligned with the 7NDP targets.</li> <li>• To optimize the development return on investment in government systems, enhance authentication of users through modernization of the national ID, advance interoperability between systems through an API road map, and enhance cybersecurity to ensure that citizens, businesses, and government are protected.</li> <li>• Expedite the promulgation of updates to the ICT legal framework that are awaiting adoption in Parliament.</li> <li>• Develop strategies for open data and civic technology.</li> </ul>



Achievements	Hurdles	Recommendations
<b>DIGITAL FINANCIAL SERVICES</b>		
<ul style="list-style-type: none"> <li>• Payment System Vision and Strategy 2018–22 adopted.</li> <li>• Fintech group constituted in Bank of Zambia.</li> <li>• Phase I of interoperability project completed with national payment switch facilitating interoperability between ATMs.</li> <li>• Emerging bilateral arrangements between banks and e-money providers enabling bank-to-wallet transactions.</li> <li>• Agents are nonexclusive by regulation.</li> <li>• A web-based collateral registry for moveable assets was established in 2017.</li> <li>• Tax payments to Zambia Revenue Authority are fully digitized.</li> <li>• Government salary and pension payments are mostly digitized.</li> <li>• Some examples of partnerships (banks, MNOs, third-party providers) successfully embracing new business models (for example, digital savings and credit).</li> <li>• Most digital start-ups in Zambia appear to be in DFS.</li> <li>• For companies providing electronic payment solutions, the BoZ has kept license fees at a minimum.</li> <li>• MoU recently signed between financial sector regulators and Competition and Consumer Protection Commission to align approaches on financial consumer protection.</li> <li>• Second National Strategy on Financial Education is in an advanced stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Payment System Act revision pending.</li> <li>• Agency banking guidelines have not been formally issued.</li> <li>• Phases II and III of the interoperability project for point-of-sale devices and mobile money are not yet complete.</li> <li>• Digitization of the largest G2P program—the Fertilizer Input Subsidy Program—is not leveraged to expand financial inclusion because of use of vouchers and in-kind support.</li> <li>• No targeted public initiatives to provide incentives for digitization of school fee payments.</li> <li>• Social Cash Transfer program is still cash based.</li> <li>• Requisite digital skills to support industry growth are missing (for example, data analysts with finance or DFS industry knowledge).</li> <li>• Business barriers for fintech start-ups (for example, no minimum turnover before turnover tax starts, inadequate availability of early-stage financing and mentoring).</li> <li>• Limited institutional capacity in financial consumer protection and inadequate consumer protection mechanisms.</li> <li>• Weak financial and digital literacy among customers.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure full interoperability of payments and provide incentives for its use by the market.</li> <li>• Consider expanding the fintech working group, constituted by BoZ, to include representatives of key government ministries, agencies, and the private sector to ensure that regulations are conducive to innovation and clear for compliance purposes.</li> <li>• Accelerate the digitization of major government payment flows through a government-wide policy and approach to digitizing government payments. The Fertilizer Input Subsidy Program and the Social Cash Transfer program are priorities.</li> <li>• Strengthen the consumer protection capabilities of financial sector regulators.</li> <li>• Build strategic capacity in the private sector for data analytics and skills development for consumer-centric product innovation and market expansion.</li> <li>• The private sector may want to consider a shared agent network solution to potentially lower the cost of agent networks, increase efficiency, ease liquidity constraints, and improve service to customers.</li> </ul>

Note: 7NDP = 7th National Development Plan; API = application programming interface; ATM = automated teller machine; BoZ = Bank of Zambia; DFS = digital financial services; fintech = financial technology; G2P = government to people; GB = gigabyte; GNI = gross national income; ICT = information and communications technology; IFMIS = Integrated Financial Management Information System; ; MCTI = Ministry of Commerce, Trade and Industry; MNO = mobile network operator; MoU = memorandum of understanding; NTBC = National Technology Business Center; PACRA = Patents and Companies Registration Agency; SME = small and medium enterprise; TEVET = technical education, vocational and entrepreneurship training; ZDA = Zambia Development Agency; ZICTA = Zambia Information and Communications Technology Authority.



## Appendix G: Establishing a Digital Transformation Steering Committee

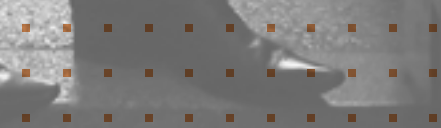
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The role of the Digital Transformation Steering Committee would be to promote (1) a harmonized approach to leveraging digital technologies for transformation across each of the 7th National Development Plan targets; (2) adequate protection of consumers, including but not limited to cybersecurity; (3) enabling regulations for nongovernmental organizations and entrepreneurs to start and scale up innovative solutions and to partner with government; and (4) the coordination, monitoring, and evaluation of government and donor-funded initiatives leveraging digital technologies for economic transformation.

A first deliverable of the Digital Transformation Steering Committee should be the digital transformation strategy and implementation matrix that includes a road map for implementation with clear targets and accountability, along with an implementation framework

that leverages public and private sector capability and resources. In preparation for this Digital Economy Diagnostic report, more than 100 professionals representing entrepreneurs, academia, corporations, nongovernmental organizations, and government officials were engaged. This group can continue to be leveraged to further articulate a strategy and implementation plan.

Additionally, the Digital Transformation Steering Committee will need to provide guidance for acceptable frameworks for calculating the estimated costs and benefits and fiscal implications (positive or negative) of strategic initiatives proposed for implementation, and monitoring the outputs, outcomes, and impacts of a proposed initiative.





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