



WORLD BANK GROUP

DIGITAL ECONOMY DIAGNOSTIC

Angola



#DE4A

Digital Economy
for Africa Initiative



DIGITAL
DEVELOPMENT
PARTNERSHIP

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1818 H Street NW, Washington, DC 20433

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This report was produced by the Digital Development Global Practice of the World Bank and prepared by a multi-sectoral team consisting of Daniel Nogueira-Budny (Senior Digital Development Specialist), Delfim Mawete (Financial Sector Specialist), Leandro Costa (Senior Education Specialist), Mazen Bouri (Lead Financial Sector Specialist), Naomi Halewood (Senior Digital Development Specialist), Nicoletta Feruglio (Senior Public Sector Specialist), Siegfried Zottel (Senior Financial Sector Specialist), Toni Eliaz (Senior Private Sector Specialist), Zenaida Hernandez Uriz (Senior Private Sector Specialist), and including Bernardo Correia Barradas (Digital Entrepreneurship Consultant), Celso Fâmio Cunha (Public Platforms Consultant), Deolinda Reis (Digital Skills Consultant), Elizabeth Dodds (Public Platforms Consultant), Emmanuel Vassor (Digital ID Consultant), Luisa Sande Lemos (Digital Entrepreneurship and Digital Skills Consultant), Macmillan Keck (Digital Infrastructure Consultant), Marisa Balas (Digital Platforms Consultant), Mila Malavoloneque (Digital Entrepreneurship Consultant), and Yasodara Cordova (Public Platforms Consultant).

Valuable guidance and contributions were provided by Isabel Neto (Digital Development Practice Manager, East and Southern Africa), Manuel Vargas (Governance Practice Manager), Michel Rogy (Digital Development Practice Manager, West Africa and Middle East), Rashmi Shankar (Finance, Competitiveness, and Innovation Practice Manager, Central Africa), Andre Loureiro (Senior Economist), Charles Hurpy (Senior Digital Development Specialist), Doyle Gallegos (Global Lead for Broadband for All, Lead Digital Development Specialist), Eva Clemente (Private Sector Specialist), Georges Vivien Hounbouon (Economist, International Finance Corporation), Jana Kunicova (Senior Public Sector Specialist), Julian Casal (Senior Financial Sector Specialist), Joseph Kizito (Lead Financial Management Specialist), and Margarete O. Biallas (Senior Operations Officer, International Finance Corporation).

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Acronyms List

AGT	General Tax Administration
APD	Angolan Data Protection Agency
ARPU	average revenue per user
ARSEG	Agency for Regulation of Insurance and Pensions
ATM	automated teller machine
B2C	business to consumer
BAI	Banco Angolano de Investimentos
BDA	Angolan Development Bank
BNA	National Bank of Angola (Banco Nacional de Angola)
BNI	Banco de Negócios Internacionais
BPC	Savings and Credit Bank
C2C	citizen to citizen
C2G	citizen to government
CMC	Capital Markets Commission
CNTI	National Information Technology Commission
DE4A	Digital Economy for Africa
DFS	digital financial services
DNAICC	National Directorate of Civil and Criminal Identification Archives
DNRN	National Directorate of Registries and Notaries
e-AGIA	e-government interoperability architecture
EFF	Extended Fund Facility
EGDI	United Nations E-Government Development Index
EMIS	Interbank Services Company
FAS	Financial Access Survey
FTTx	fiber to the loop
G2B	government to business
G2C	government to citizen
G2G	government to government
GB	gigabytes
GDP	gross domestic product
GDPR	European Union General Data Protection Regulation
GEM	Global Entrepreneurship Monitor
GSM	Global System for Communication

GUE	Single Kiosk for Businesses (Guichet Único da Empresa)
HHI	Herfindahl-Hirschman Index
ICT	information and communications technology (tecnologias de informação e comunicação)
ID	identity documentation
IIMS	Multiple Indicators of Health Survey (Inquérito de indicadores Múltiplos e de Saúde)
IMA	Institute for the Modernization of the Administration (Instituto de Modernização Administrativa)
IMF	International Monetary Fund
INACOM	Angola Institute of Communications (Instituto Angolano das Comunicacoes)
INAPEM	Institute for the Development of Small, Medium-Size, and Micro Enterprises
INE	National Institute of Statistics (Instituto Nacional de Estatística)
INFOSI	National Institute for Promotion of the Information Society (Instituto Nacional de Fomento da Sociedade da Informação)
INFRACOM	Electronic Communications Infrastructure Coordinating Committee
INSS	National Institute of Social Security
IoT	internet of things
IP	Internet Protocol
IT	information technology
ITA	Internet Technologies Angola
ITU	International Telecommunication Union
IXP	internet exchange point
km	kilometers
KYC	know your customer
Kz	kwanzas
LISPA	Payment System Innovation Laboratory
MB	megabytes
Mbps	megabits per second
MESCTI	Ministry of Higher Education, Science, and Technology and Innovation
MHz	megahertz
MINTTISC	Ministry of IT and Telecommunications (Ministerio das Telecomunicacoes e Tecnologias de Informacao)
MNO	mobile network operator
MoF	Ministry of Finance
MSMEs	micro, small, and medium-size enterprises
NDP	National Development Plan

NIF	Unique Tax Number
NPL	nonperforming loan
NPSL	National Payment System Law
P2P	person to person
PAC	ProJovem or Projecto de Apoio ao Crédito
PDFS	Financial Sector Development Strategy
PEGE	Strategic Plan for Electronic Governance
PGIBI	Civil and Criminal Integrated Management Platform (Plataforma de Gestão Integrada da Identificação Civil e Criminal)
PNAGIA	National Plan of Global Architecture for the Interoperability of the Central and Local Administration
POS	point of sale
R&D	research and development
SACS	South Atlantic Cable System
SADC	Southern African Development Community
SAGIT	Angolan Land Information Management System
SAT-3	South Atlantic Telecommunication
SEPE	Portal for Electronic Public Services
SIAC	Integrated Citizen's Services (Serviço Integrado de Atendimento ao cidadão)
SIGE	Education Information Management System
SIGFE	Integrated Financial Management Information System
SIGT	Integrated Tax Management System
SIM	subscriber identification module
SIMTIC	Integrated ICT Monitoring System
SIPIP	Integrated Public Investment Management System
SMEs	small and medium-size enterprises
SMS	short message service
SNCPE	Integrated Procurement System
TVET	technical and vocational education and training
UFA	Universal Financial Access
UIN	unique ID number
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations International Children's Emergency Fund
WACS	West Africa Cable System

About DE4A Assessment

The World Bank Group Digital Economy for Africa (DE4A)¹ flagship initiative supports The Digital Transformation Strategy for Africa (2020–30) prepared by the African Union. The DE4A initiative recognizes that the digital economy can help to accelerate the achievement of the United Nations Sustainable Development Goals and the World Bank’s twin goals. The initiative leverages an integrated and foundations-based diagnostic framework to examine the present level of digital economy development across Africa. The country digital economy assessment maps the current strengths and weaknesses that characterize the national digital economy ecosystem as well as identifies challenges and opportunities for future growth (. To date, DE4As in more than 30 countries on the African continent have been completed or are underway.

Digital transformation is rapidly reshaping the global economy, permeating virtually every sector and aspect of daily life—changing the way people learn, work, trade, socialize, and access public and private services and information. In 2016, the global digital economy was worth some US\$11.5 trillion, equivalent to 15.5 percent of the world’s overall gross domestic product. It is expected to reach 25 percent in less than a decade, quickly outpacing the growth of the overall economy. However, many countries are currently capturing only a fraction of this growth potential and need to invest strategically in the foundational elements of their digital economy to keep pace.

The overarching objective of the digital economy assessment is to examine pathways through which countries can expedite the digital transformation process, seizing opportunities to leapfrog and along the way increasing inclusive development. The analytical framework that shapes this assessment is guided by the premise that five foundational digital elements create the building blocks for unlocking digital transformation and thus determine a country’s ability to build a robust digital economy:

1. *Digital infrastructure* that provides the means for people, businesses, and governments to get online and subsequently access local and global digital services, thus effectively embedding users in the global digital economy. Broadly speaking, digital infrastructure consists of affordable and quality broadband connectivity, but also includes advanced technologies, such as the internet of things and data centers, as well as institutions and rules that oversee the competitive telecommunications market.

¹ <https://www.worldbank.org/en/programs/all-africa-digital-transformation>.

2. *Digital platforms* that enable paperless transactions, remote interactions, and large data exchange, supporting business and inclusive service delivery models in the public and private sectors. Related systems, applications, and services thus have the power to transform the way people, governments, businesses, and civil society interact with each other in all aspects of life by optimizing and automatizing the processes that deliver the outcomes. Digital platforms often help to create economies of scale and leverage network effects to create value and enhance productivity.
3. *Digital financial services* (DFS) that provide individuals and households convenient and affordable means to pay, as well as to save and borrow, using digital tools and platforms. Firms can leverage DFS to transact more easily with their customers and suppliers, as well as to build digital credit histories and access financing. Governments can use DFS to increase efficiency and accountability in various payment streams, including for the disbursement of social transfers and receipt of tax payments. Digital payments are often the entry point for DFS and provide the “rails” through which additional products and use-cases can be developed.
4. *Digital entrepreneurship* and an innovation ecosystem that helps bring the digital economy to life and accelerate digital transformation— with young ventures and innovators helping to generate products and services that leverage technologies and digitally-enabled business models, and traditional industries adopting related solutions— contributing to net employment, enhanced competitiveness, and productivity. Digital entrepreneurship thus helps expand products and services on offer but can also open up new markets.
5. *Digital skills* that support the creation of a digitally savvy workforce. These are critical to building a robust and competitive digital economy, where innovative services, industries, and business models can emerge. Broad-based digital literacy and basic skills acquisition are instrumental to supporting wide adoption and use of digital products and services by the average consumer, and hence they are critical for ensuring digital inclusion. However, the level of intermediate, advanced, and specialized digital skills will determine a country’s ability to embrace digital innovation.

As part of the DE4A initiative, ambitious, high-level targets have been established for all five foundational pillars of the digital economy. The targets are articulated in the DE4A assessment framework (see below), as a way to define and measure success against the overarching goal of ensuring that every individual, business, and government is digitally enabled by 2030. Many of these targets have in turn been embedded in the World Bank Group’s IDA19 commitments.



DIGITAL INFRASTRUCTURE

Universal internet network coverage

Affordable internet for all at less than **2% of GNI per capita**

Interim milestone **Doubling broadband connectivity** by 2021



DIGITAL SKILLS

All 15-year-old students with **basic “digital skills”** competencies

100,000 graduates in **advanced digital skills** programs annually



DIGITAL PLATFORMS

Doubling of online services Index rating for all governments

All individuals are able to prove their **identity digitally**

At least 50% of the population regularly **uses the internet** to access government or commercial services



DIGITAL FINANCIAL SERVICES

Universal access to digital financial services

Africa-wide payment infrastructure platforms in place



DIGITAL ENTREPRENEURSHIP

Tripling the number of new **digitally-enabled businesses** created annually

Financing for **venture capital** to reach **25% of GDP**

Executive Summary

Angola has many of the foundational elements required for a digital economy. The National Development Plan 2018–22 (*Plano de Desenvolvimento Nacional 2018–22*) and the Information and Communications Technology (ICT) White Paper for 2019–22 (*Livro Branco das Tecnologias de Informação e Comunicação*) and its predecessors have guided much of the advancement in the telecommunications and financial sectors, as well as government adoption of information technology (IT) solutions. Angola’s young population also bodes well for the country, pointing to significant capacity to absorb digital technology, if they have access to it. As the two overarching policy documents highlight, the aim is not just to increase the use of digital technologies, but to promote the use of digital technologies to increase productivity and economic diversification, improve livelihoods and lifelong learning opportunities, and increase the welfare of society. Angola has also taken the initial steps to build the complementary safeguards that are necessary for technological advancements, such as cybersecurity and data protection to protect citizens, businesses, and national assets.

The importance of digital services and solutions has increased dramatically with the onset of the COVID-19 pandemic. Affordable broadband prices and high-quality digital services could ensure that economic activities, which can be taken online, can continue during the crisis and through the economic recovery period. For many young Angolans, education could continue through distance learning, minimizing the need to catch up later or miss parts of their curriculum. Governments can ensure the continuity of public services to safeguard the welfare of populations from the negative effects of the crisis on health systems, livelihoods, and food security. Empowering the private sector with FinTech and digital business capabilities is another way to keep businesses afloat and start adjusting to the changing demands for service delivery, such as mobile payments, food delivery, and e-commerce shopping. In addition, government could consider developing programs to accelerate the adoption of digital technologies to boost the digitalization of key industries (such as agriculture) and increase the scope and market access of such digital platforms through supplier development programs.

Angola is at an important crossroads where it could accelerate its digital transformation, and although it is well-positioned to do so, it will require more coordination between sectors. The report shows that moving forward will require even more coordination between government entities and between public and private sector stakeholders. Global experience shows that the pursuit of the digital economy is multidimensional and requires significant coordination and concerted effort between government agencies, the private sector, and citizens. As the report shows, a multi-sectoral view of digital transformation is useful and necessary as there are many synergies that happen across sectors. For instance, the report examines the role of digital

identity documentation (ID) for citizens and businesses to access government services, but also as a critical input to private sector services, such as digital financial services (DFS) and access to education. Access to broadband internet, whether mobile or fixed, is cross-cutting between all the pillars in the Digital Economy for Africa (DE4A) framework as well as digital skills, which together represent the hard and soft inputs required for the digital economy to flourish.

The report finds that acceleration of the digital transformation will require a more inclusive approach to ensure that the benefits are felt by all Angolans. This means making digital communications technologies and services accessible and affordable for more Angolans, addressing the existing digital divides between rural and urban areas, women and men, and income groups. Beyond digital technology and infrastructure, some of the most important aspects fueling the digital economy are the softer capabilities, such as the agility of the marketplace to spur new industries and jobs in the digital space, continued evolution and modernization of government institutions, and equipping citizens and businesses with digital skills and literacy.

This report uses the DE4A framework as a diagnostic tool to examine the status of the pillars of the digital economy in Angola and presents recommendations on the way forward for accelerating digital transformation. The analysis presented in this report is based on desk research and virtual interviews with public and private stakeholders conducted by various World Bank digital economy experts during January 2020 to April 2021. The following summarizes the findings of the assessment and Table ES1 provides a summary of key strengths, weaknesses and recommendations by pillar.

Pillar 1: Digital Infrastructure

Angola's digital infrastructure or telecommunications network infrastructure is highly developed in terms of the country's connectivity to international internet bandwidth infrastructure, namely through Angola Cables. With this connectivity to global networks, Angola has access to international internet bandwidth that could serve its entire population today. Angola Cables' recent procurement of the South Atlantic Cable System (Angola-Brazil) and its interests in the MONET cable system (Brazil-United States) provide an alternate route for international traffic destined for North America from that of the cables routing traffic through Europe. This infrastructure, coupled with a robust regulatory framework, could be leveraged to position Angola to emerge as a digital hub for the Southern Africa region and beyond. However, significant debt has been incurred to deploy this infrastructure and more needs to be done to increase its utilization.

Although international internet capacity has led to the availability of 3G and increasingly 4G services in urban centers, the uptake of data-enabled services is still low in Angola, compared with its neighbors. Angola's total overall mobile subscriber penetration rate of 67 percent is below the 82 percent average for Sub-Saharan

Africa, and it is next to last in the Southern Africa region. As this figure accounts for the number of active subscriber identification module (SIM) cards, it does not represent the number of unique subscribers. There would be significantly fewer unique subscribers based on the use of multiple SIMs by individuals; thus, more than half of Angolans do not own a mobile phone. When examining unique mobile broadband subscriptions that allow for access to the internet, the penetration is even lower at around 38% in 2022, from 32% in 2020. This situation subsequently restricts progress on the other pillars.

The main challenge in this sector today is to ensure a level playing field for all operators, to promote competition and innovation. Angola began opening the telecom market in 2001,² starting with the mobile segment of the market, which led to a period of high growth. Today there are multiple network operators in all segments of the telecom market, which at first glance appears to be highly competitive. However, on closer examination of the market structure and interactions between players—the size of the market share of each operator, interconnections between network operators, infrastructure-sharing practices, and so forth—it becomes evident that competitive market forces are significantly limited. For example, the Herfindahl-Hirschman Index (HHI)³ for the mobile segment of the market is 6,350, indicating a highly concentrated market that is not fully benefiting from competition. The average revenue per user is around US\$18, well above the normal revenue of US\$4–US\$5, indicating that operators are drawing revenue from a small customer base. This situation impacts the price of services and the speed of network infrastructure expansion across the country, especially in rural areas, and ultimately leads to digital divides in the country.

This assessment finds that there is a need to update the policy, legal, and regulatory framework to ensure an enabling environment for more competition. The policy, legal, and regulatory framework would benefit from updates to take into consideration the emerging challenges of the broadband sector and achieve the policy goals of strengthening competition and shifting investment responsibility from the public sector to the private sector. However, even after improvements have been made to the market structure, there will likely still be a need for universal access programs to promote access to unserved and underserved communities.

Pillar 2: Digital Public Platforms

Angola has expanded its use of digital public platforms in recent years with the introduction of various front-end and back-end systems, applications, and services. One of the main challenges that persists is providing access to these platforms to the

² The White Paper on the ICT sector (2001) provides the foundations for development of the mobile market, including for a technology neutral licensing regime.

³ The HHI is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. It can range from close to zero to 10,000. An HHI of 2,500 or greater indicates a highly concentrated marketplace.

general population, since online user identification or even the basic proof of identity (ID card) remains a major issue in the country. The ID coverage rate is slightly over 30 percent⁴ according to data from the Ministry of Justice and Human Rights. Given the necessity of regulatory identity verification (“know your customer” for banks, for instance) that service providers must conduct before service delivery, limited ID coverage generates exclusion and prevents fully unlocking the potential of the digital economy. The Government of Angola can leverage and intensify its efforts on the Birth Promotion Registration and ID Card Issuance Project (*Projecto de Massificação do Registo Civil e Atribuição do Bilhete de Identidade*), which it launched in 2019 on the foundation of the Civil and Criminal Identification Integrated Management Platform (*Plataforma de Gestão Integrada da Identificação Civil e Criminal*), to increase birth registration and ID card coverage rates. The ID systems can be the building blocks for inclusive and data safe service provision, but to maximize their impact, it is important not to think about ID systems in isolation. It is only when deployed together with other digital platforms, mainly digital payment systems, complemented by interoperability and data governance frameworks, that digital ID systems can be truly transformative for digital public administration, service delivery, and the private sector.⁵

Notably, the Portal for Electronic Public Services (SEPE), which was launched in January 2019, aims to provide a single, centralized platform and access point for government information and services, which increases the necessity for interoperability among government systems. Currently, SEPE provides access to more than 170 services across 15 government agencies. The services include downloading schoolbooks free of charge, creating a company online, printing Social Security cards, providing tax identification number validation, licensing for imports/exports, and obtaining a property registration certificate, among others. Other central platforms providing digital services include the Municipal Portal, Taxpayer Portal, Social Security Portal, and E-Procurement Portal, among others.

Recognizing the need to ensure a safe online environment, the government has started to develop a legal and regulatory framework for data protection and cybersecurity. On data protection, Angola is one of only 17 African countries with a Data Protection Law. The Angolan Data Protection Agency (*Agência Angolana de Protecção de Dados*) was established in October 2019 to supervise the collection and treatment of personal data, enforce data protection legislation, and, when needed, impose penalties. More recently, Angola ratified the African Union Convention on Cybersecurity and Data Protection. But there is a need to develop the strategy for cybersecurity quickly and launch the Center for Response, Study, and Treatment of ICT incidents, to protect critical infrastructure and information services from cyberattacks.

⁴ <http://www.servicos.minjusdh.gov.ao/noticias/638/um-milhao-de-bilhetes-emitidos-em-um-ano>.

⁵ World Bank (2020). Digital Economy for Africa Country Diagnostic Tool and Guidelines for Task Teams.

Despite Angola’s achievements, its score on the United Nations E-Government Development Index has improved only marginally, from 0.31 in 2010 to 0.38 in 2022.

Angola’s global ranking on the index has fallen from 132nd to 157th of 193 countries, demonstrating Angola’s slower overall progress compared with peer countries. Furthermore, Angola’s low ranking on the United Nations E-Participation Index (168th of 193 countries in 2022) demonstrates significant weaknesses in the provision of information and limited opportunities for citizen consultation and decision making online.

This assessment finds that interoperability is a key policy priority for advancing digital government in Angola.

Many past investments and efforts to digitalize government functions have taken place within silos, with individual ministries implementing their own systems. This has led to missed opportunities for shared infrastructure and resulted in costly, duplicate investments. The National Plan of Global Architecture for the Interoperability of the Central and Local Administration (*Plano Nacional da Arquitectura Global para a Interoperabilidade da Administração Central e Local do Estado*) (PNAGIA) was approved by Presidential Decree in 2018 to facilitate sharing of data, information, and systems across agencies and enhance the proximity, diversity, and efficiency of services offered to citizens and businesses. Although the launch of SEPE represents an important step in this direction, progress in implementing the PNAGIA has so far been slow. Recognizing that interoperability across public platforms is an ambitious goal, this assessment recommends prioritizing interoperability of those government systems that are fundamental for streamlining public service delivery, including by leveraging, strengthening, and expanding identification.

Pillar 3: Digital Financial Services

DFS are one of the avenues through which financial inclusion can be enhanced. DFS could meet the financial needs of poor and unbanked consumers and traditionally more vulnerable groups, such as women and people in rural areas. Angola has great potential to expand the use of DFS and the government is taking steps to foster their development. Despite progress in recent years, less than 50 percent of adults had a financial account in 2019, and the number is lower for women (41 percent) and in rural areas (29 percent). Such low coverage is due to severe limitations in points of access to financial services, which are highly concentrated in Luanda province; inadequate card payment infrastructure; limited alternatives in payment accounts; and a low level of financial literacy, especially in rural areas. Other problems faced by the Angolan authorities and market participants include the inadequacy and lack of trustworthiness of national identity documents and inefficiency in electricity, IT, and communications infrastructures.

Angola’s bank-led model, facing the drawbacks described above, has yet to tackle financial inclusion and improve access to DFS. Banks have not yet seized the

opportunity represented by agent banking to increase outreach to nontraditional segments. Although an agent banking regulation has been in force since August 2012, banks have not perceived the opportunity and due to lack of strong competition from nonbanks, have not enhanced their networks. Still, despite the lack of specific regulation on electronic money, several bank-led mobile payment services were launched in recent years. The most successful was Xikila Money, which reached more than 200,000 active users in 18 months, showing the demand for mobile money, before the National Bank of Angola (*Banco Nacional de Angola*) (BNA) closed the parent bank due to nonobservance of regulations. At the same time, recourse to formal savings and borrowing is still scarce, and innovative services such as digital credit have yet to appear.

On a positive note, BNA is working on an overhaul of the entire legal and regulatory framework to align Angola with international best practices—with support from the World Bank and in coordination with stakeholders, the Angolan Institute of Communication, and other government entities. The new framework, comprising not only the new National Payment System Law, but also the new Law on Financial Institutions, will be complemented with several BNA regulations covering, inter alia, payment systems, oversight, electronic money, and incorporation and supervision of payment service provider and system operators. The new legal framework will provide the conditions under which nonbank entities can provide payment services to the unbanked and underbanked, promoting competition in the market and between different services. In addition, BNA has established the Payment System Innovation Laboratory to nurture a group of digital entrepreneurs with the potential to develop FinTech solutions.

This assessment finds that the ongoing regulatory reforms as well as recent market initiatives are promising for greater uptake of DFS in Angola. Moving forward, steps must be taken to ensure effective implementation of the new rules, interoperability, and a level playing field, including addressing issues around communications infrastructures, pricing, and access. To promote DFS, the government could address financial inclusion with a clear strategy, strengthen consumer protection and cybersecurity, and further support FinTech actors and the digitalization of government payments.

Pillar 4: Digital Entrepreneurship

A nurtured digital business environment is a key element to unlock economic opportunities in the digital economy. The National Development Plan 2018–22 highlighted the importance of digital entrepreneurship. The Plan recognized that a stronger entrepreneurial ecosystem driven by innovative solutions will lead to improvements in poverty levels, inclusion of minority groups, more competitive firms, and therefore employment opportunities. Given the need for diversification of the

economy, with the creation of jobs for youth, digital businesses have the potential to transform Angola's economy.

Angola's digital entrepreneurship ecosystem is nascent and yet young and dynamic. Compared with other Sub-Saharan African countries with high gross domestic product, such as South Africa, Angola's ecosystem is small. However, it has been growing in recent years, with several support initiatives and digital startups and platforms emerging across different industries. Based on studies analyzed for this report, Angola's digital entrepreneurship comprises more than active 50 digital businesses. Digital platforms, and in particular e-commerce, are gaining ground, with mostly local startups addressing demand for transportation, food and retail deliveries, among others.

There are several challenges to further developing digital businesses in Angola. Improvements in the ICT infrastructure are required for further expansion of digital businesses. Key factors such as high prices of telecom services, low penetration rates throughout the country, and poor reliability of connectivity services and power (internet and electricity) pose a threat for digital enterprises aiming at expanding operations beyond the capital, Luanda. Services provided by digital businesses, including e-commerce, are concentrated around urban areas, mainly around Luanda, Benguela and Huambo (as these are profitable areas). Other obstacles include the high cost and limited availability of logistics, underdeveloped payment solutions, limited access to finance and investors, and weak digital skills including for software development and engineering.

The culture of risk aversion toward entrepreneurship and especially women entrepreneurs will need to be examined. A growing number of networking and support initiatives are tackling these challenges. For example, Angola's main telecom company, Unitel, runs a scholarship program for women to study technology and innovation, called "Women for the Future." Entrepreneurs lack access to bank financing, and early-stage financing, including venture capital and angel investors, is not available. A more coordinated approach is needed to developing digital businesses, grounded on insights and data (which can be done in collaboration with businesses operating in the sector) on how the adoption of digital business models by various sectors is impacting the market. Several actions can be taken by the government to promote a digital business and entrepreneurship culture in Angola, including an enabling regulatory environment, strengthened business support services, skills, and infrastructure.

Pillar 5: Digital Skills

Of the five pillars of the digital economy, the Digital Skills pillar is currently the least developed in Angola. The transition to a digital economy requires not only the adoption of technological solutions in the economy and society, but also the development of digital skills capacity. It is fundamentally important that the digital skills

transformation begins at the basic levels of education. A more digitally literate population can unleash the potential and benefits that global trends in technology can bring to the social and economic environment. In the case of Angola, there is strong interest in the public and private sectors to improve the quality of digital skills within the education curriculum as well as increase demand for labor with digital skills, particularly to address the needs of the growing digital enterprise ecosystem. In addition, the country's large and growing young population—66.47 percent of the population is younger than age 25⁶—represents a positive opportunity for digital economy transformation.

However, the current digital economy agenda lacks a national vision specifically focused on modernization of the education system to provide a more robust digital skills curriculum. In addition, the improvement of digital skills in Angola would require a country action plan on several other aspects, including developing infrastructure, addressing gender education gaps and regional disparities in access to the internet, improving the quality and quantity of technical and vocational education and training courses focused on digital skills development, and addressing the lack of available data on all levels of education. If efficiently addressed, a robust digital economy in Angola would require policies that continue to foster digital skills for human capital development.

The way forward to strengthen digital skills in Angola: in the short term, the government could consider incorporating a more specific digital skills development agenda into the Education Development Plan and continue encouraging digital development programs driven by public-private partnerships (for example, sponsoring digital equipment for schools and expanding access to the internet). For the short-to-medium term, special consideration can be given to the adoption of a National Skills Framework. It would include digital competency assessments, improvement of mechanisms for monitoring and assessing the educational data, and the development of digital competencies for teachers. The government should consider long-term measures that will continue addressing the digital infrastructure challenge (for example, access to affordable and reliable internet) and the challenges of the low levels of literacy (for example, access to education and improvement of school infrastructure).

⁶ CIA World Factbook, 2020, "Explore All Countries: Angola," <https://www.cia.gov/the-world-factbook/countries/angola/#people-and-society>.

Table ES.1. Summary of Key Strengths, Weaknesses, and Recommendations, by Pillar

PILLAR	KEY STRENGTHS AND ASSETS	KEY WEAKNESSES AND ROADBLOCKS
DIGITAL INFRASTRUCTURE	<ul style="list-style-type: none"> • Strong foundation in policy, legal, and regulatory framework • Independent sector regulator with increasing autonomy expected in the near future • Highly developed, state-of-the-art international connectivity infrastructure • Multiple network operators in each segment of the market with potential for growth • Fiber optic cable owned by energy and railroad companies open for use by telecom operators through infrastructure-sharing regulation • Government's plans to divest state shares in selected telecom companies • Significant potential for Angola to become a digital hub for the Africa region 	<ul style="list-style-type: none"> • Severe market concentration despite multiple operator environment • Competitive behavior significantly restricted due to market concentration as well as significant state ownership of telecom companies together with cross-ownership of the companies • Lack of competitive behavior keeping service price high, quality low, and coverage focused on the more profitable urban centers (leading to digital divides) • Insufficient enforcement of key regulations promoting competitive behavior, contestability, network efficiencies, and market predictability • Key infrastructure currently tied up with Angola Telecom • Significant gaps in implementing universal service adequately, thus leaving many dark spots across the country • Limited focus on enabling cross-border communications connectivity with neighboring countries
<p>RECOMMENDATIONS:</p> <ul style="list-style-type: none"> • Quick wins (short term): <ul style="list-style-type: none"> – R 1.1. Amend the Angolan Institute of Communication (INACOM) Organic Law to enable new and expanded roles as sector regulator in an increasingly complex and dynamic broadband sector. – R 1.5. Finalize mobile payment system regulation with complementarity to the regulation developed by Bank of Angola (see the Digital Financial Services pillar). • High priority (short-to-medium term): <ul style="list-style-type: none"> – R 1.2. Strengthen INACOM's capacity to be a neutral referee in an increasingly complex and dynamic broadband sector. Going forward, INACOM will need to increase its regulatory tools to ensure a level playing field for all service providers. – R 1.7. The Ministry of IT and Telecommunications and the Ministry of Finance to continue working under the joint working group under the Privatization Program on restructuring and divestitures in telecom companies. This cooperation will be critical to ensure that divestment decisions are made to enhance sector development rather than hinder it. • Long term: <ul style="list-style-type: none"> – R 1.3. Develop a forward-looking regulatory project plan for developing and implementing INACOM-related reforms that are not in the current plan, such as planning for a 5G market, establishing procedures for resolving disputes between network operators, and ensuring cybersecurity in digital infrastructure and oversight of advanced technologies (artificial intelligence and the internet of things). Overall strengthening of data collection, analysis, and monitoring would also help reinforce the regulator's role. – R 1.4. Conduct tariff assessments across the telecom value chain to identify any bottleneck issues and ensure nondiscriminatory, cost-based access to essential infrastructure. – R 1.6. Update the universal service program as a more holistic, commercially oriented, and sustainable program based on research on underserved areas with a view to prioritize and group areas together appropriately to improve economic viability and sustainability. – R 1.8. Promote Angola as a digital hub for the Southern Africa region and increase cross-border flows of communication services with neighboring countries. 		
PILLAR	KEY STRENGTHS AND ASSETS	KEY WEAKNESSES AND ROADBLOCKS

<p style="text-align: center;">DIGITAL PUBLIC PLATFORMS</p>	<ul style="list-style-type: none"> • Comprehensive data protection legislation • A strong e-government strategy (2013–17) that defines concrete targets, objectives, projects, and programs e the Institute for the Modernization of the Administration (IMA) Strategic Plan (2022-2027) • Existence of a government agency (IMA) that leads digital government projects and defines standards and guidelines • Expanded offering of digital services through a growing number of portals, applications, and systems • The Portal for Electronic Public Services platform aims to provide a single access point for government information and services • Development of the government’s private network (Rede Privativa do Estado) providing a common infrastructure for service sharing across government agencies • An ambitious digital identification initiative and platform 	<ul style="list-style-type: none"> • Need to update e-government strategy going forward • Lack of a whole-of-government cybersecurity strategy • Institutional silos leading to fragmentation and limited coordination in development and implementation of digital platforms • Weak policy framework related to access to information and data protection • Few platforms enabling citizen feedback and exchange of information with citizens • Insufficient interoperability of existing initiatives and platforms, including civil registration and identification • Low coverage of IDs, with birth certificate being a requirement and thus an additional obstacle to increasing coverage
<p>RECOMMENDATIONS:</p> <ul style="list-style-type: none"> • Quick wins (short term): <ul style="list-style-type: none"> – R 2.2 Establish IMA’s Council for Information Technologies to create an information and communications technology (ICT) coordination mechanism among cross-sector government ministries. – R 2.3 Update data protection legislation. • High priority (short-to-medium term): <ul style="list-style-type: none"> – R 2.1 Strengthen IMA’s capacity as an enforcer of standards and guidelines. – R 2.4 Develop a whole-of-government digital transformation strategy. – R 2.5 Develop a cybersecurity strategy. – R 2.6 Improve ICT infrastructure and internet connectivity. – R 2.8 Adopt a new information technology system for civil registration that can be scaled up and enable the creation of a centralized civil registration database. – R 2.10 Ensure the adoption of e-government interoperability architecture. – R 2.11 Prioritize interoperability between civil registration and ID systems. • Long term: <ul style="list-style-type: none"> – R 2.7 Reinforce the digital authentication layer for e-government services. – R 2.9 Prioritize citizen-centric digital services and adopt the once-only principle. – R 2.12 Consider establishing a unique identification number. 		
<p style="text-align: center;">DIGITAL FINANCIAL SERVICES</p>	<ul style="list-style-type: none"> • Strong commitment to promote financial inclusion and progress in access to financial services in recent years • Ongoing efforts led by the Bank of Angola to overhaul the legal framework for payment systems in line with international good practice and to support FinTech • Strong interest and demand for mobile money shown by rapid growth of first attempts 	<ul style="list-style-type: none"> • Decline in banking activity and access points due to economic crisis • Lack of regulation for mobile money and competition from mobile network operators has discouraged the development of digital financial services • Limited ID availability and no provisions for tiered know-your-customer requirements for low-value accounts • Weaknesses in consumer protection and limited financial literacy
<p>RECOMMENDATIONS:</p> <ul style="list-style-type: none"> • Quick wins (short term): <ul style="list-style-type: none"> – R 3.1 Support should be provided to the BNA, based on the new NPSL, to finalize the regulations for the new payments service providers and improve access to the market by new players. • High priority (short-to-medium term): <ul style="list-style-type: none"> – R 3.2 Support Angola in enhancing the consumer protection framework. – R 3.3 Design and adopt a national financial inclusion (including financial education) action plan. – R 3.4 Support effective implementation of interoperability. • Long term: <ul style="list-style-type: none"> – R 3.5 Provide advisory services to digital financial services stakeholders. – R 3.6 Support bill payment aggregation and FinTech development. 		

PILLAR	KEY STRENGTHS AND ASSETS	KEY WEAKNESSES AND ROADBLOCKS
DIGITAL ENTREPRENEURSHIP	<ul style="list-style-type: none"> • A Dynamic and young digital entrepreneurship ecosystem • Government recognizes the importance of digital entrepreneurship for economic and social development • E-commerce digital platforms are gaining ground, and most are local startups • Business support services, infrastructure, and networking opportunities are increasing 	<ul style="list-style-type: none"> • Digital ecosystem is highly concentrated in Luanda • Poor payment solutions and internet access/cost remain a barrier for further expansion of digital businesses • Weak digital skills, including of users and service providers • Limited availability and high cost of local logistics services • Lack of investors and access to finance for digital entrepreneurs • Weak public-led support programs for entrepreneurs
<p>RECOMMENDATIONS:</p> <ul style="list-style-type: none"> • Quick wins (short term): <ul style="list-style-type: none"> – Consider nominating a champion with the mandate to promote digitalization of businesses. – To foster innovation, consider exchanges between entrepreneurs, medium-size and large firms, and academics. – Foster interactions between entrepreneurs and investors to facilitate access to finance. • High priority (short-to-medium term): <ul style="list-style-type: none"> – Potential to adopt a consumer protection law to cover e-commerce. – Strengthen the capacity of existing incubators and accelerators. – Accelerate the adoption of AgriTech businesses through tailored, focused publicly funded programs. – Boost women’s participation in digital businesses through gender focused programs. – Encourage technology-based courses at all levels of education. – Create bridges between training providers and technology companies to fuel the growth of digital businesses. • Long term: <ul style="list-style-type: none"> – Further improve of the regulatory and policy framework to encourage business creation and innovation. 		
DIGITAL SKILLS	<ul style="list-style-type: none"> • Growing number of young people entering the labor force every year • Strong interest from the public and private sectors in improving the quality of all levels of education and allowing a more inclusive education system • Increased demand for basic digital skills, particularly to assist the growth of digital enterprises 	<ul style="list-style-type: none"> • Need for a unified national vision to modernize the education system, leverage digital technologies, and provide the necessary digital skills curriculum • Government programs often lack scalability and meaningful traction • Need to strengthen collaboration between different stakeholders (private and public sectors) to address gaps in digital skills • Limited availability of data on the achievement of digital skills implementation in education • Unaffordable and weak broadband services continue to hinder school digital skills development, particularly for those in rural areas and/or attending public schools • Women and girls’ literacy rates and digital skills capacity remain low • School capacity to integrate new digital technologies remains limited by the lack of computer and internet access • Technical and vocational education and training courses remain low in quality and quantity across the country, particularly for ICT training

RECOMMENDATIONS:

- **Quick wins (short term):**

- Incorporate a more specific digital skills development agenda into the Education Development Plan.
- Continue to encourage public-private partnerships in the development of digital solutions for schools.

- **High priority (short-to-medium term):**

- Adopt a National Digital Skills Framework at all levels of education.
- Develop a Digital Competence Assessment platform for digital skills assessment.
- Improve mechanisms for monitoring and assessing educational data.
- Develop a teachers' professional development program and guidance on classroom management.

- **Long term:**

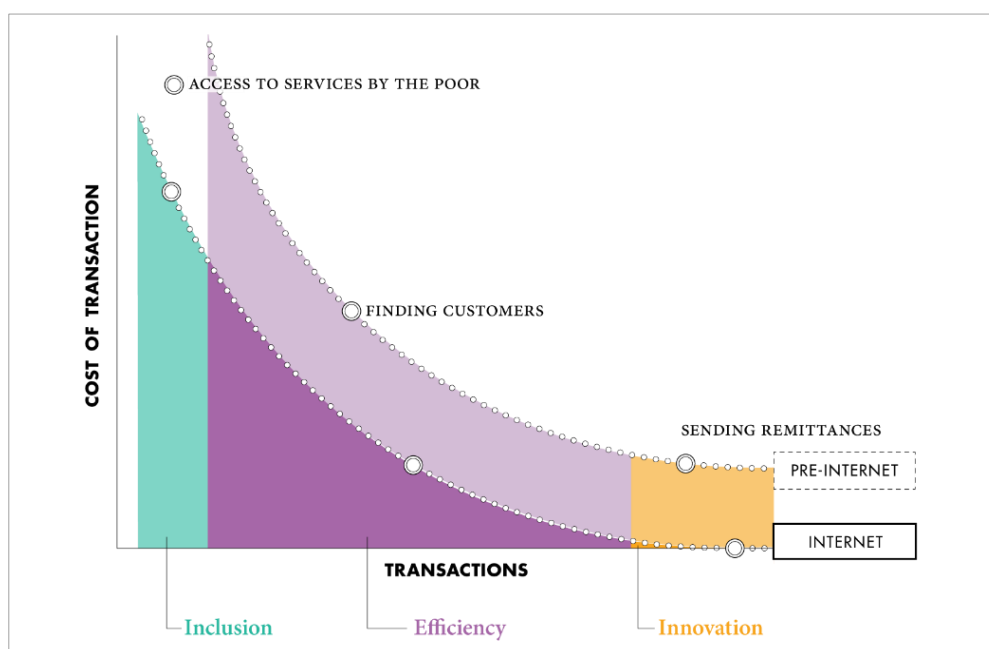
- Continue to address digital infrastructure challenges and low levels of literacy.

1. Digital Infrastructure

1.1 Importance of Digital Infrastructure

In broad terms, digital infrastructure consists of fixed and wireless infrastructure for broadband connectivity, such as high-speed internet networks; internet exchange points; data repositories, such as data centers and clouds; and the internet of things (IoT). The links between broadband infrastructure and long-run rates of economic growth are well documented. The internet promotes inclusion, efficiency, and innovation by lowering the cost of transactions, expanding markets and services to excluded communities, and making supply chains more efficient. Figure 1.1 shows how the internet affects development.

Figure 1.1: Internet's Effect on Development



Source: World Bank 2016.

An extensive body of research has found an impact of increased investment in broadband on economic growth. World Bank research estimates that a 10 percent increase in broadband penetration in developing countries is associated with a 1.4 percent increase in gross domestic product (GDP) (Kim, Kelly, and Raja, 2010). A McKinsey study⁷ estimates that increased access to the internet could contribute some US\$300 billion to Africa's GDP by 2025, with the largest impact being on six key sectors of the economy: education, health, agriculture, financial services, retail, and government. At the firm level, there is also indication that firms that invest more in information

⁷ https://reports.weforum.org/global-information-technology-report-2015/1-5-creating-the-next-wave-of-economic-growth-with-inclusive-internet/?doing_wp_cron=1623275968.3937709331512451171875

and communications technology (ICT) have higher levels of productivity and are more profitable.⁸ Broadband provides a platform for growth and innovation across all sectors. Broadband enables entrepreneurs and businesses to develop and use new applications and services in areas such as e-commerce and financial services. It also enables digital service delivery in sectors that are critical for inclusive growth in Angola, such as agriculture, education, and trade. And broadband allows the public sector to deliver services to citizens and businesses more effectively and inclusively. Thus, broadband has the potential to transform Angola's economy and help the country leapfrog development stages, provided that effective policies are put in place that encourage its use as an essential input by all sectors of the economy.

1.2 Diagnostic Findings: The Current State of the Digital Infrastructure Pillar

The National Development Plan (NDP) 2018–22 identifies the telecom sector as a key area for reform, and it is expected that the following that will likely be approved on the first quarter of 2023, for the period of 2023 to 2027 does the same. The Plan established the following sector reform objectives, that effectively have produced some positive gains in the sector: (1) ensure access to fixed services, (2) ensure affordable mobile access to Angolans, (3) create the conditions required for internet access with a view to building an information society for Angola, (4) increase access to broadband through international submarine cables, and (5) promote efficient spectrum management. Parallel to the NDP, the ICT White Paper 2018–22 sets out national objectives and targets for the development of a vibrant broadband sector that aims to serve all Angolans. This section provides an overview of the state of development of the broadband market in Angola and the main drivers that can be strengthened from the market perspective to help the country accelerate further and reach its ambitions linked to digital infrastructure.

1.2.1 Benchmarking Indicators

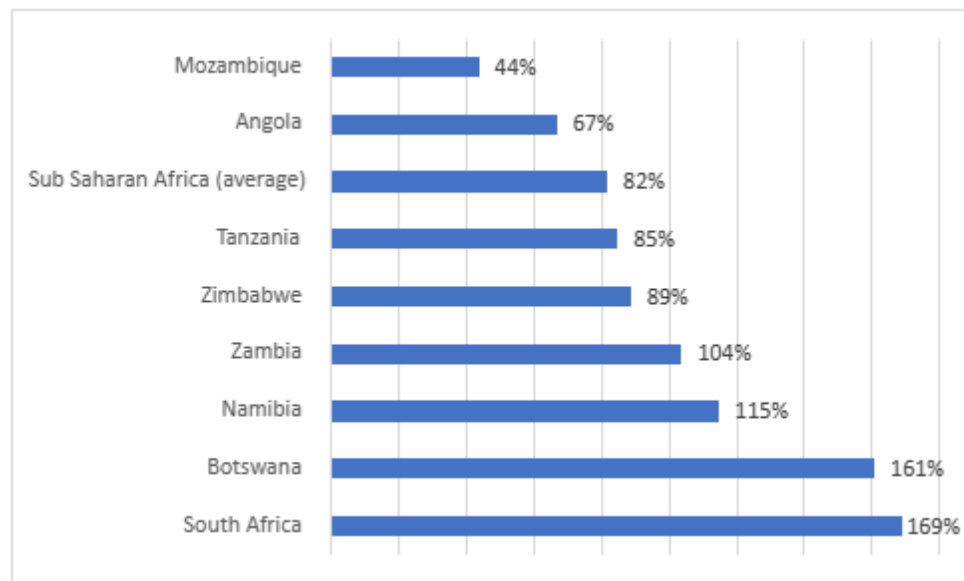
Broadband Penetration

The level of adoption of broadband is among the most important indicators of the level of readiness for overall digital services and the usage of data as an economic driver. Overall mobile penetration rate in Angola increased from 49 percent in 2020 to 67 percent by the end of the third quarter in 2022, due to the entrance of the fourth awarded mobile licensed operator, Africell. Even with this considerable increase, the rate still below the average of 82 percent for Sub-Saharan Africa (figure 1.2). As this figure accounts for the number of active subscriber identification module (SIM) cards, it does not represent the number of unique subscribers. There would be

⁸ Qiang, Clark, and Halewood (2006).

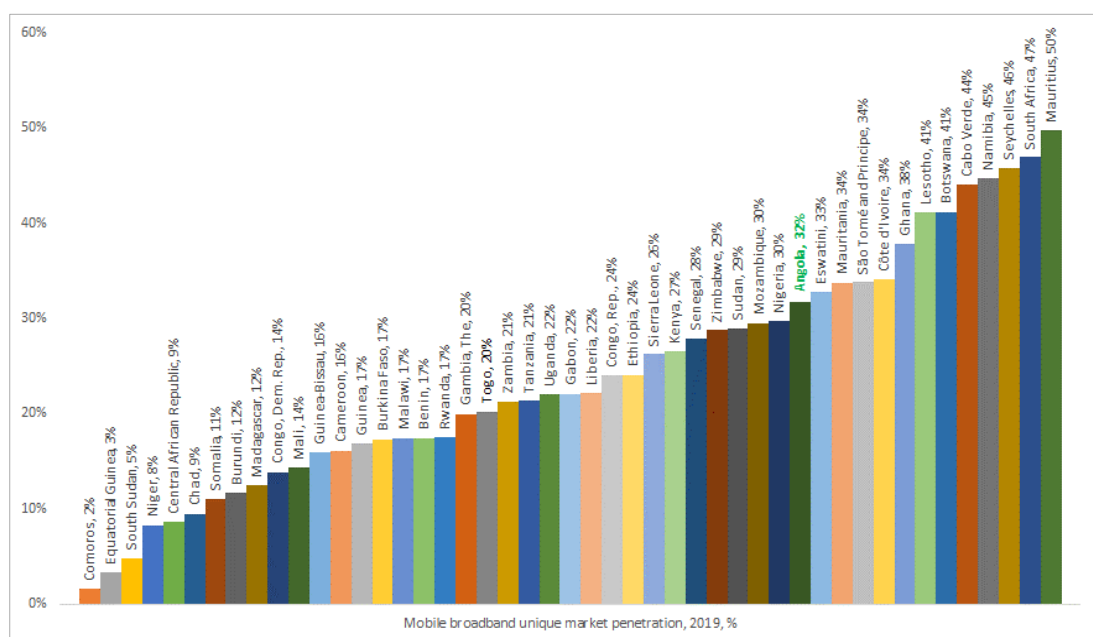
significantly fewer unique subscribers based on the use of multiple SIMs by individuals; thus, more than half of Angolans do not own a mobile phone. When examining unique mobile broadband subscriptions, the penetration is even lower at around 32% (figure 1.3) by 2020, recently data from the world Bank, shows an increase to 38 percent in 2022, which still below the 50 percent mark, but similar to the Sub-Saharan region average that ranges from 36 to 38 percent.

Figure 1.2: Current Mobile Penetration across Large Countries in Southern Africa



Sources: Angolan Institute of Communication; GSMA; other public and private sources (data from 2021 and 2022).

Figure 1.3: Mobile Broadband Unique Penetration in Sub-Saharan Africa

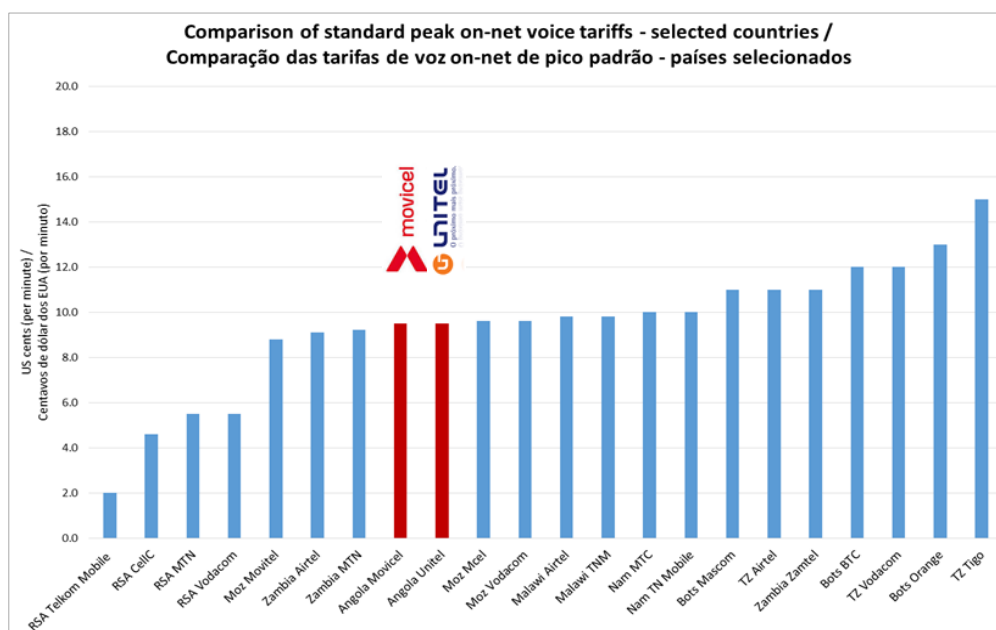


Sources: GSMA; World Bank data.

Affordability

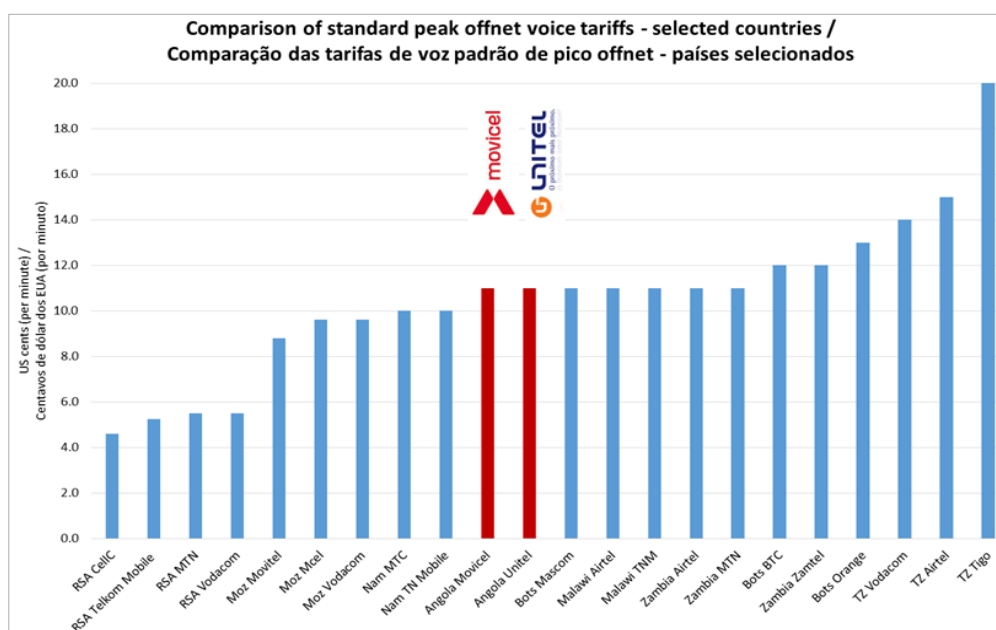
Basic tariffs for voice calls in Angola are in line with those in other countries in the Southern Africa region. Figures 1.4 and 1.5 show comparative pricing for operator-published standard peak on-net and off-net voice services in April 2019.

Figure 1.4: Comparison of Standard Peak On-Net Prepaid Voice Tariffs



Sources: Tariffs published on operator websites, converted to US\$ by Macmillan Keck (April 2019).

Figure 1.5: Comparison of Standard Peak Off-Net Prepaid Voice Tariffs

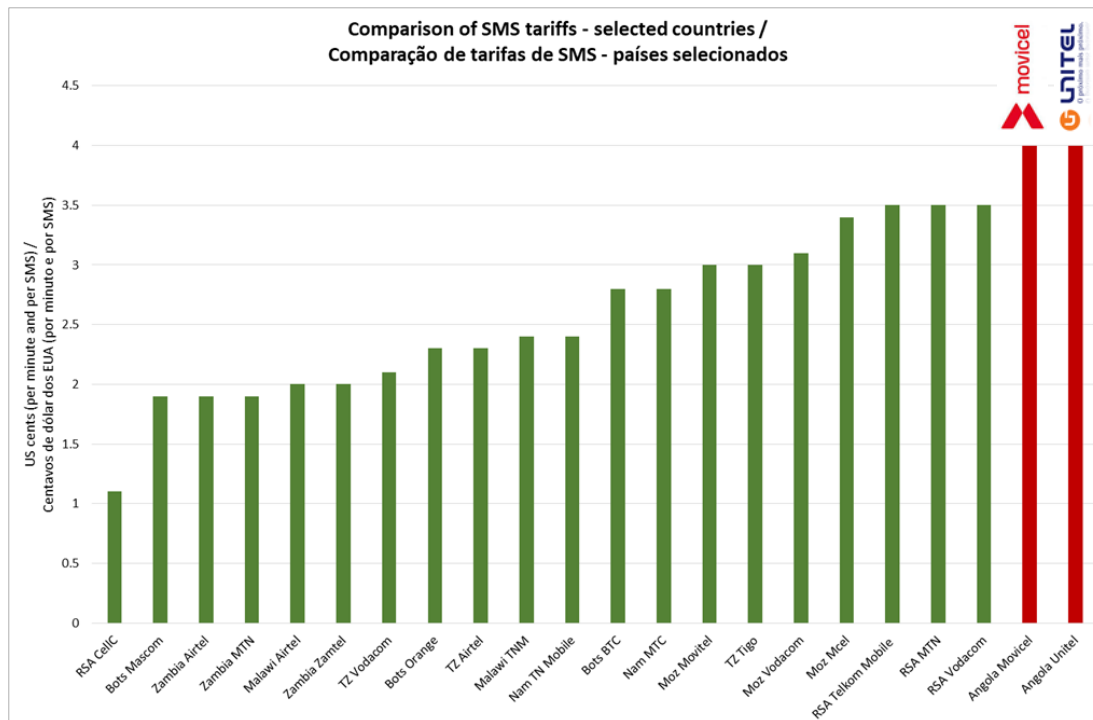


Sources: Tariffs published on operator websites, converted to US\$ by Macmillan Keck (April 2019).

However, mobile short message service (SMS) prices in Angola are the highest in the region, as shown in figure 1.6. It is important to note that voice and SMS prices are

most relevant for the lower income population in Angola who cannot afford a data-enabled smartphone and use a basic or feature phone.

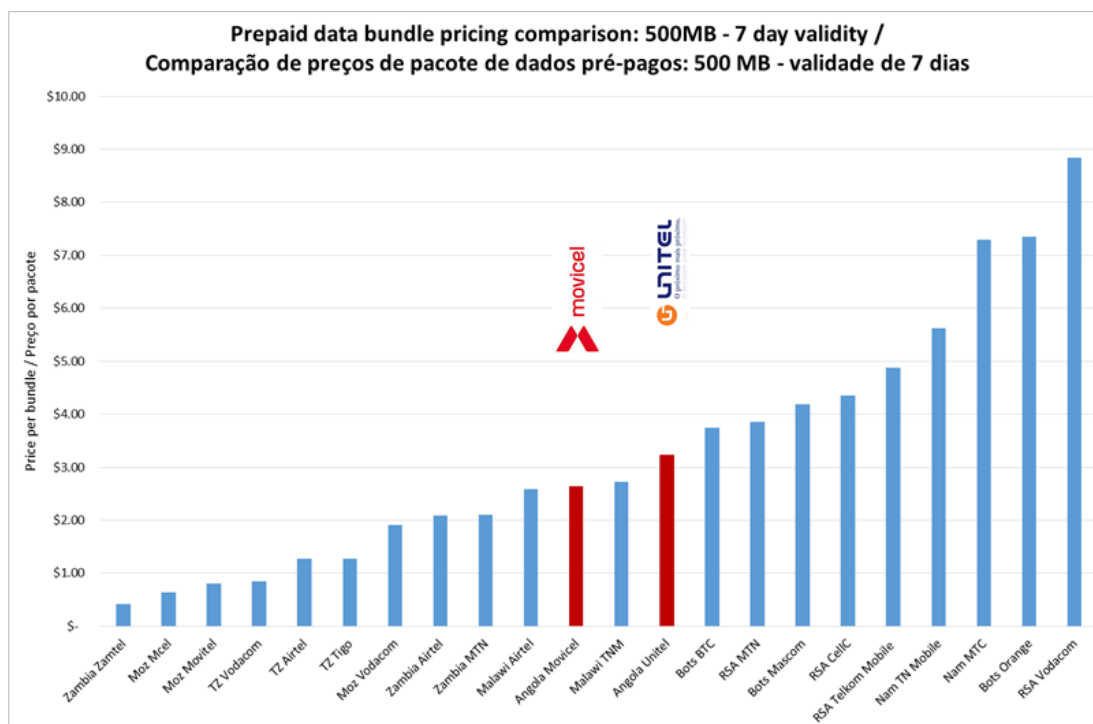
Figure 1.6: Comparison of Standard National SMS Tariffs



Sources: Tariffs published on operator websites, converted to US\$ by Macmillan Keck (April 2019).

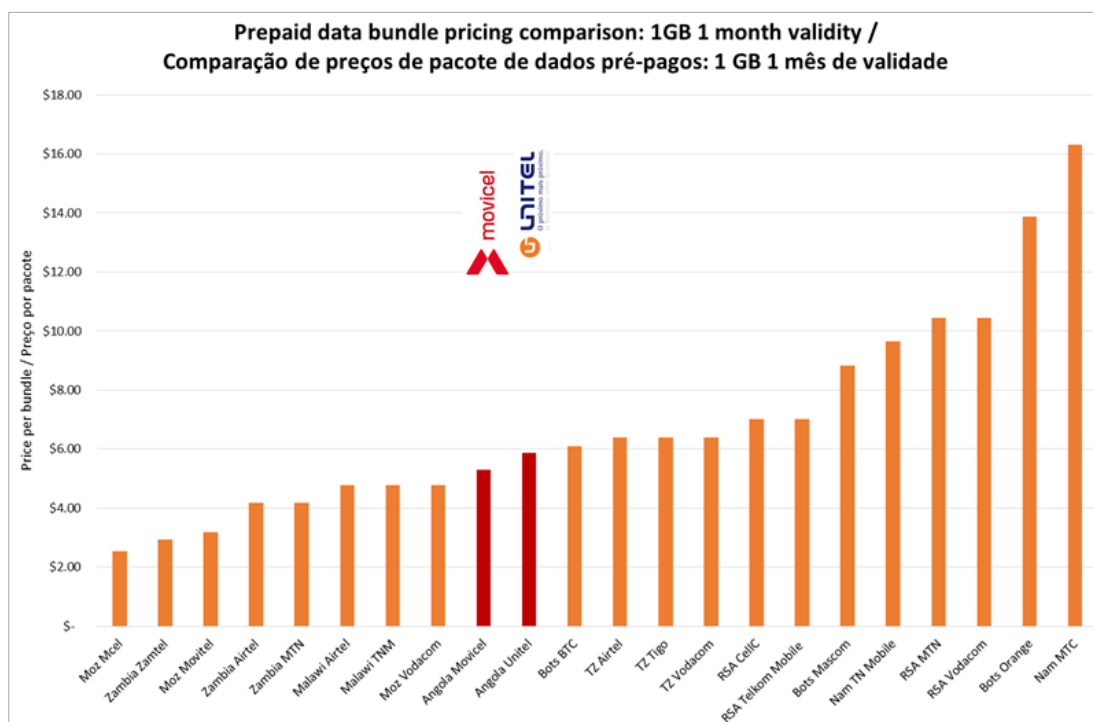
Mobile data prices in Angola are more in line with those in the region than mobile voice and SMS prices. Figures 1.7 and 1.8 compare operator-published mobile data prices for different bundles as offered in April of 2019.

Figure 1.7: Comparison of Prepaid Data Bundle Pricing for 500 MB Seven-Day Bundle



Sources: Tariffs published on operator websites, converted to US\$ by Macmillan Keck (April 2019).

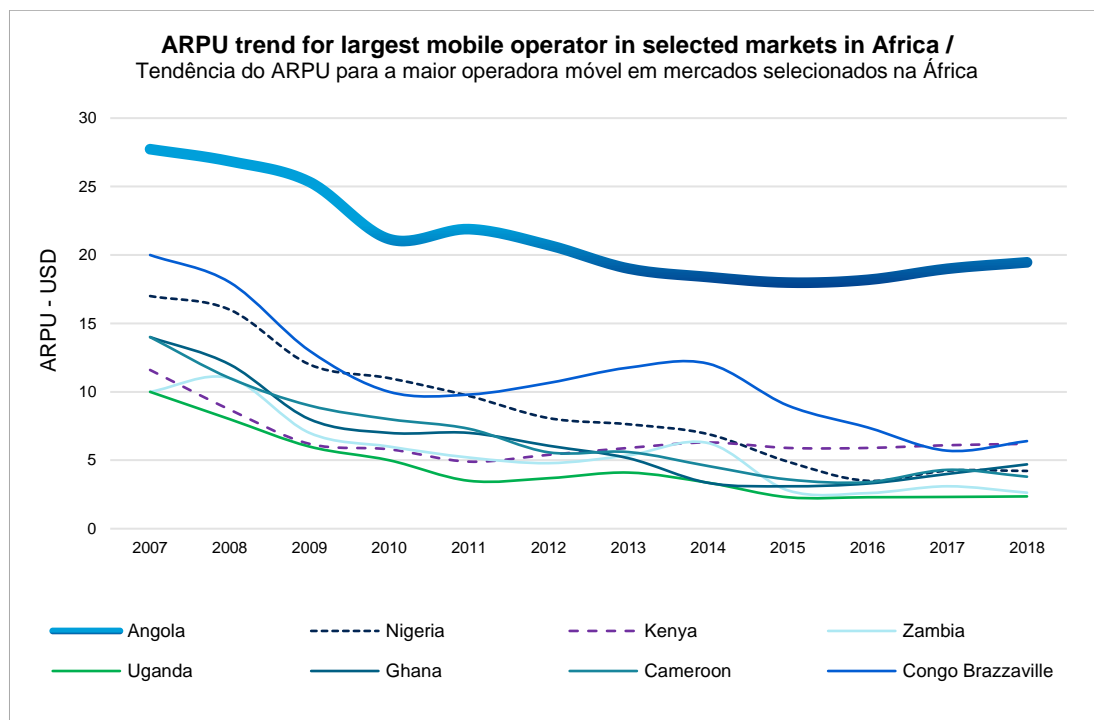
Figure 1.8: Comparison of Prepaid Data Bundle Pricing for 1 GB 30-Day Bundle



Sources: Tariffs published on operator websites, converted to US\$ by Macmillan Keck (April 2019).

However, Angola’s average revenue per user (ARPU) is above normal, revealing lack of effective mobile competition since 2010. Figure 1.9 compares the ARPU of Angola and other African countries over the past 12 years. The ARPU in Angola indicates that operators are drawing revenue from a small customer base.

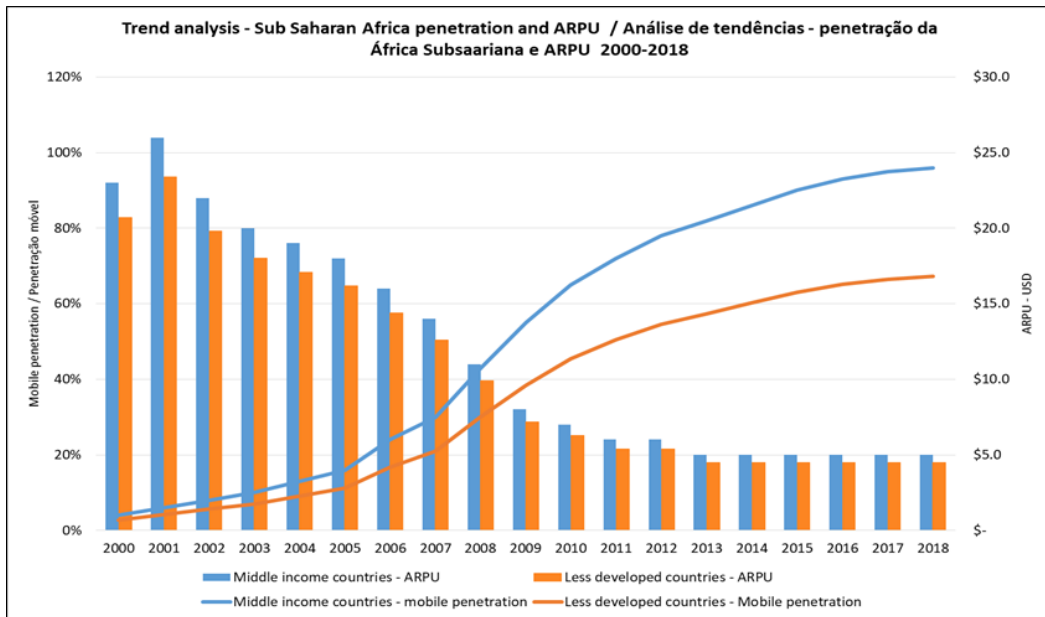
Figure 1.9: Comparison of the ARPU in Angola ARPU and Seven Other Countries



Sources: GSMA; Macmillan Keck (2019). Note: ARPU = average revenue per user.

Figure 1.10 illustrates the relationship between the ARPU and subscriber penetration in Sub-Saharan Africa over 2000–18. Angola has sustained ARPU levels that are more than three times the average levels in the middle-income countries in Sub-Saharan Africa and about four times the average levels in less-developed countries. Such high ARPU levels, which are only sustainable due to lack of competition, are directly correlated with Angola’s low subscriber penetration levels.

Figure 1.10: Mobile ARPU and Subscriber Penetration Trends in Sub-Saharan Africa, 2000–18

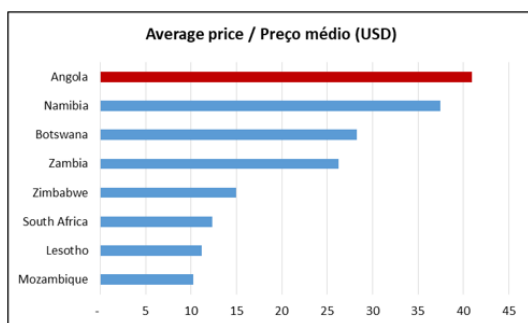


Source: GSMA. Note: ARPU = average revenue per user.

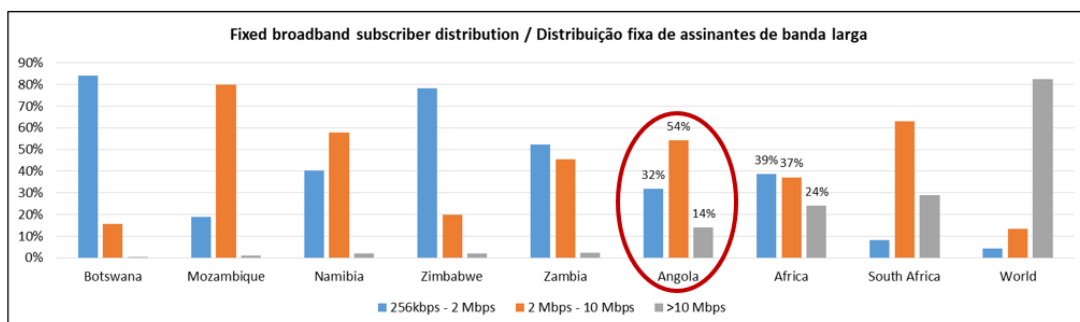
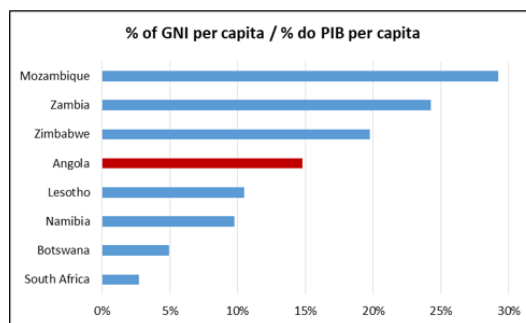
The market assessment evaluation of price, affordability, and value found that Angola has higher prices and less value for money than its neighbors in Southern Africa. International Telecommunication Union (ITU) data from 2017 are the only sufficiently comprehensive and reliable comparative data. The results are shown in figure 1.11.

Figure 1.11: Fixed Broadband Price, Affordability, Speed, and Volume in Southern African States

a. Average price (US\$)



b. Percentage of GNI per capita



Source: ITU 2017. Note: GNI = gross national income; Mbps = megabits per second.

Although more recent data were not available for Angola, it is still useful to examine the ITU data comparing entry-level monthly fixed broadband plans between Angola and other countries in Southern Africa.⁹ The data reveal that in 2016:

- Angola had one of the highest levels of fixed broadband plan prices in Southern Africa.
- Angola had median affordability due to its higher per capita income.
- Angola had the lowest promised download speed in Southern Africa.
- Angola had no data cap, which may be compensating for the slower download speeds.

1.2.2 Market Structure and Competition

The World Bank's *World Development Report 2016: Digital Dividends*¹⁰ provides a useful framework for analyzing the internet broadband supply chain, starting from the first mile (the point where the internet connects a country to international networks), through the middle mile (the national backbone and intercity network, including fiber backbone and internet exchange points (IXPs)), to the last mile (reaching the end user through a local access network). The framework also highlights an invisible mile (the intangible parts of the network, such as spectrum, licensing, taxation, competition, cybersecurity, and so forth), which could constrain or promote broadband

⁹ ITU (2017).

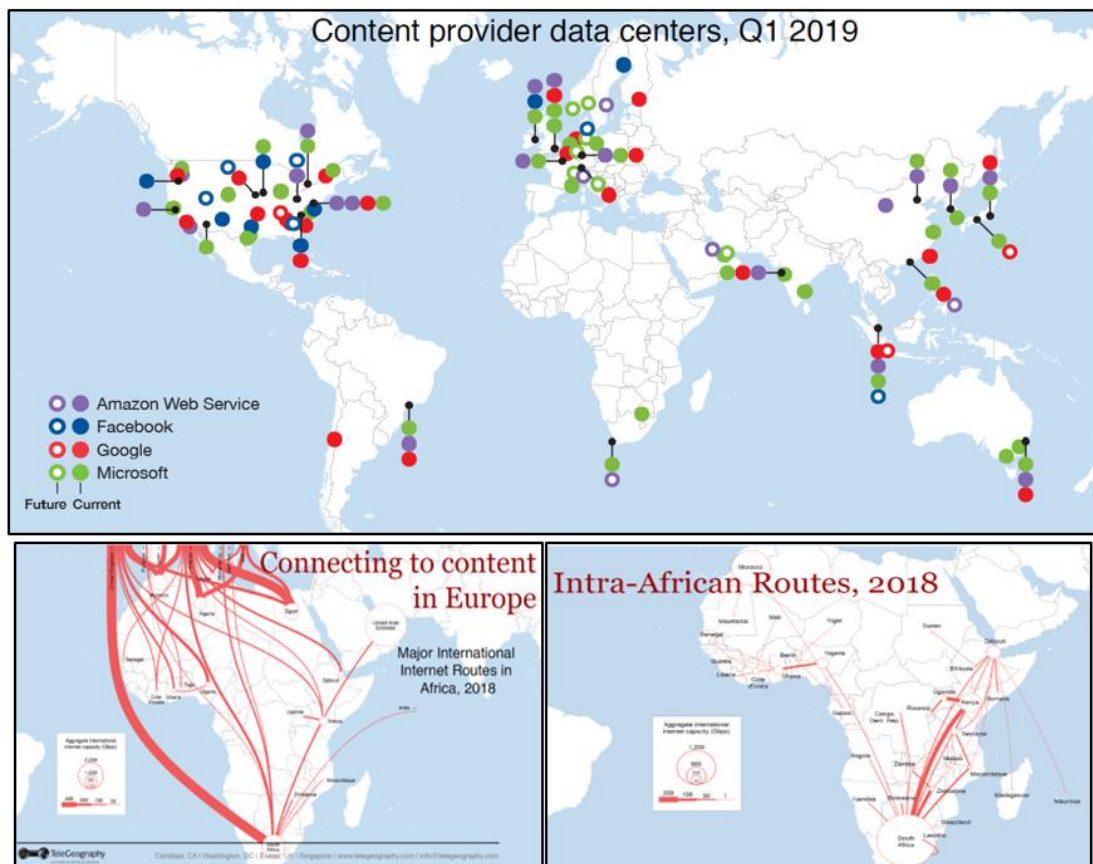
¹⁰ World Bank (2016),

access. Constraints on any of these “miles” could result in costly and disparate networks, as well as poor delivery of services.

First Mile: International Connectivity

Angola’s digital infrastructure or telecommunications network infrastructure is highly developed in terms of the country’s connectivity to international internet bandwidth infrastructure, which could position Angola as a digital hub for the Africa region. International bandwidth is a fundamental wholesale input to mobile and fixed broadband services. Most internet content originates outside Angola and most African internet traffic is exchanged at IXPs in Europe or North America. Growing an IXP hub in Angola, which may present a good development opportunity, nonetheless would also require connectivity with other countries with whom global content must be continuously exchanged. International business communications in Angola also requires international bandwidth. Map 1.1 provides a view of international content hosting and Internet Protocol (IP) transit metrics as of the first quarter of 2019.

Map 1.1: International Content Hosting and Internet Protocol Transit Metrics



Source: Telegeography 2019.

Market participation currently includes numerous suppliers and infrastructure: Angola Cables (West Africa Cable System (WACS) and South Atlantic Cable System (SACS) submarine cables), Angola Telecom (South Atlantic Telecommunications

(SAT-3) submarine cable and satellite), Inframat (inactive after the failed satellite launch of AngoSat-1 but with AngoSat-2 and AngoSat-3 planned), Intelsat (satellite), Eutelsat (satellite), Rascom (satellite), SES Astra (satellite), and Telesat (satellite).

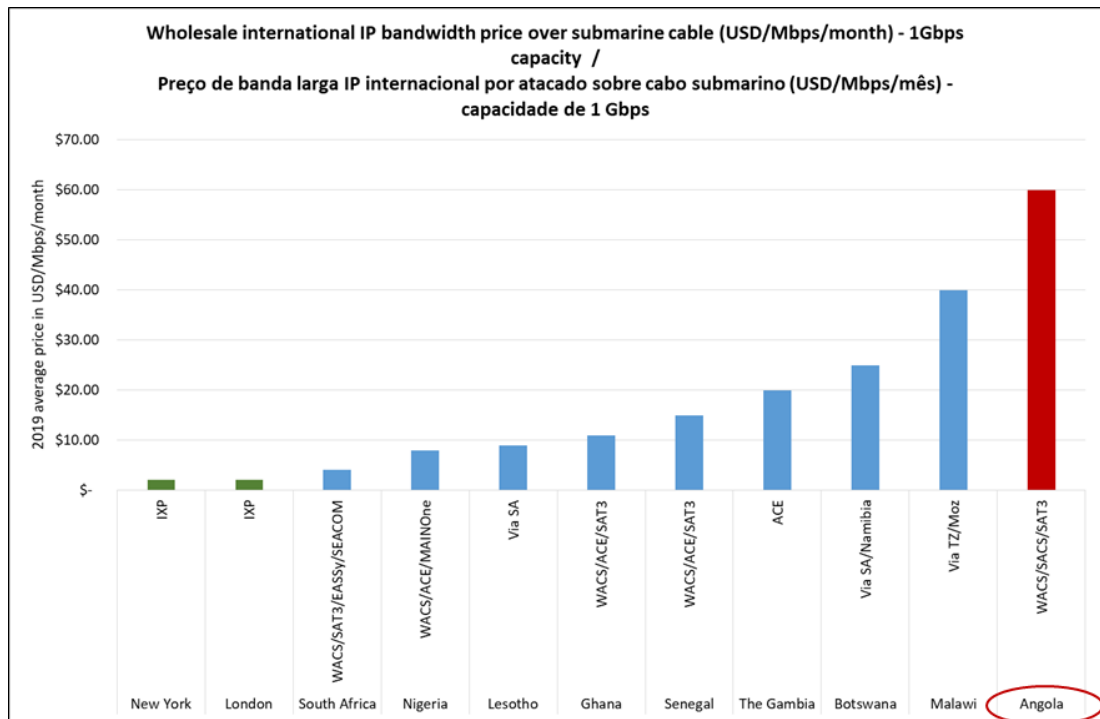
All retail network operators in Angola currently consume international bandwidth, and their demand is expected to continue growing at compounding rates as broadband consumption in the country accelerates. Angola has well-developed, state-of-the-art submarine cable infrastructure, with more than adequate capacity to serve the country's needs for many years.

Satellite is a relatively competitive submarket in Angola. It provides good options for reaching rural and remote regions with relatively low bandwidth use. Satellite also provides good options for certain specialized users. However, satellite is currently not a cost-effective substitute for submarine cables in meeting high capacity needs due to its higher cost, lower capacity, and higher latency.

Angola's submarine cable submarket is a duopoly between Angola Telecom and Angola Cables, with Angola Cables controlling the newer systems. Angola Telecom's SAT-3 services are considered by customers to be inferior to the WACS and SACS services provided by Angola Cables, as the SAT-3 services are near end of life and most useful for providing redundancy. The situation may change, as it was announced in 2021 that the 2Africa submarine cable consortium, added Angola as one of the connection's destinations, which could help increase the competition on the submarine cables market.

Wholesale submarine cable bandwidth from Angola to an IXP in Europe costs about US\$60-US\$90/megabit per second (Mbps)/month for lease or US\$20/Mbps/month for long-term indefeasible right of use. Satellite bandwidth costs US\$300-US\$500/Mbps/month, which is competitive for satellite but prohibitive as a substitute for submarine cable capacity. Angola's wholesale prices for submarine cable transit to an IXP in Europe are 3 to 12 times the prices charged in other WACS or SAT-3 landing countries. Angola submarine cable wholesale prices are also 1.5 to 6 times the prices charged in landlocked countries in East and Southern Africa. Price comparisons are shown in figure 1.12.

Figure 1.12: Wholesale International Internet Protocol Transit Pricing Comparisons



Source: Macmillan Keck 2019.

Angola Cables is owned by a consortium comprising *Angola Telecom* (51 percent), *Unitel* (31 percent), *MS Telecom* (9 percent), *Movicel* (6 percent), and *Startel* (3 percent). The government is the largest shareholder of Angola Cables, holding 68.95 percent direct and indirect equity interest as follows:

Angola Telecom:	100% x 51% =	51.00%
MS Telecom:	100% x 9% =	9.00%
Unitel:	25% x 31% =	7.75%
Movicel:	20% x 6% =	1.20%
Total:		68.95%

WACS (Africa-Europe) was 100 percent equity funded by the Angola Cables shareholders, with the government subsidizing 68.95 percent. However, Angola Cables has subsequently incurred substantial debt in procuring SACS (Angola-Brazil), its interests in MONET (Brazil-United States), a data center in Brazil, and other assets. SACS was funded with a US\$109.7 million loan from the Japan Bank for International Cooperation and Sumitomo Mitsui Banking Corporation backed by Nippon Export and Investment Insurance. The MONET interest was funded with a US\$130 million loan from the Development Bank of Angola (100 percent state-owned) backed by a

government guarantee. Neither the annual debt service on these and other loans nor the financial statements of Angola Cables were provided for the market assessment.

Middle Mile: National Transmission

Backbone

Domestic backhaul capacity is used to carry traffic between network points of presence and interconnection points with other domestic and international networks. As broadband access and use replace voice and other narrowband applications, existing backhaul links require greater capacity and new backhaul links will need to be established.

Terrestrial fiber is increasingly becoming an essential facility in establishing main-line backhaul links for which microwave and satellite cannot provide sufficient capacity. Without adequate backhaul, the access networks would not be able to meet the current and future capacity needs of users. Due to the high cost of fiber backhaul infrastructure, developing a wholesale market in which infrastructure is shared by multiple access network operators is vital to ensure investment efficiency and strengthen downstream competition in retail mobile and fixed markets. This wholesale market is also strategically important for growing regional traffic over the submarine cable systems owned and operated by Angola Cables.

Suppliers in this market include all access network operators, with self-provision microwave and/or fiber backhaul links. Third-party wholesale provisioning is currently limited to Angola Telecom, the electric and rail utilities, and various satellite operators. Entry barriers for self-provisioning operators are the same as in their primary mobile and fixed retail markets. There are high entry barriers for purpose-built, third-party providers such as satellite operators. There are also strong synergies for electric and rail utilities, which provide access to excess capacity on infrastructure developed for core businesses.

Microwave backhaul primarily uses the same towers as mobile and fixed access networks on which separate microwave transmission equipment is installed. Microwave is typically the initial backhaul medium for secondary routes, with operators switching to fiber when traffic exceeds its capacity limits. Fiber is typically the initial backhaul medium on primary routes and later used to replace microwave on secondary routes as traffic increases. Satellite provides backhaul from remote areas using the same infrastructure that is used to provide international bandwidth, but generally satellite has limited application in more densely populated areas due to its inherently higher cost and inferior quality of service.

Angola has significant existing fiber inventory (around 32,000 kilometers (km)), but it has underdeveloped sharing. Reportedly, Angola Telecom is considered an unreliable provider of last resort. Its Angola Domestic Network System coastal cable remains inoperable, due to prohibitive cost of repair. Unitel has 14,000 km of backhaul

fiber and does not offer wholesale service to any other operator even though it has significant excess capacity. The Benguela Railway and the National Electricity Transmission Network are the most reliable third-party providers, but their coverage is limited to the footprints of their rail and electric transmission networks.

Towers (Mobile and Fixed) Submarket

Towers are used to support radio base stations for all mobile and fixed wireless network operators. All operators self-provision at least in part. Wholesale suppliers include (1) tower sharing between retail operators, (2) Antosc (an independent tower wholesale provider), and (3) the Universal Service Fund/Electronic Communications Infrastructure Coordinating Committee (INFRACOM) (universal service fund).

In a market that is largely comprised of self-provisioning, wireless operators have generally designed and built towers that suit their own needs without regard for the potential for tower sharing. Optimal tower size, location, and coverage area vary based on spectrum bands, technology, terrain, built environment, and user density. Each tower requires reliable power supply, a climate-controlled equipment room, and provision for backhaul (microwave antenna space and a very small aperture terminal Earth station or fiber connection). The tower market has now reached some level of maturity in urban markets as coverage by the major mobile and fixed operators has been established. However, infill towers are still required in urban areas as bandwidth growth stretches the capacity of larger cell sites. Rural areas, where coverage is limited, are in a relatively early stage of tower development.

Tower sharing is essential for viably extending rural coverage where demand and economic potential are low. One of the main objectives of the Ministry of Telecommunications, Information Technologies and Social Communication (MINTTICS)

for 2018–22 is to increase infrastructure sharing, and towers promise to be a key infrastructure-sharing target. The government has established INFRACOM to supervise the implementation of an Infrastructure Sharing Regulation that establishes the sharing regime that is applicable to all infrastructures suitable for the accommodation of telecom networks.¹¹ This effort has resulted in the update and amendment of the Telecommunications Infrastructure Sharing Decree, approved in 2022. INFRACOM serves as an independent advisory body that supports the Angolan Institute of Communication (INACOM) in implementing MINTTICS's infrastructure-sharing policies.

The access fiber to the loop (FTTx) submarket includes last-mile or near-last-mile fiber rings and links, such as metro fiber networks, fiber to the tower, fiber to the campus, and fiber to the premises. In Angola, FTTx has been self-provisioned by mobile and fixed network operators. Angola currently has only minimal FTTx sharing, mainly by Angola Telecom, which is currently not considered a strong wholesale

¹¹ See Presidential Decree 166/14 of July 10, 2014.

supplier in terms of reliability and service. No wholesale-only access FTTx providers have entered the market.

Fiber to the X Submarket

FTTx requires very costly infrastructure investments but has a long life cycle (25–30 years or more). FTTx is potentially sharable by multiple operators without sharing equipment due to multi-fiber capacity in each cable. Thus, the same fiber optic cable can support mobile and fixed access networks for multiple operators.

FTTx sharing falls within the scope of the existing initiatives of MINTTISC, INACOM, and INFRACOM. However, there have been no pilot or mainstream projects to date involving last-mile fiber. Experience in other countries suggests that fiber to the tower should be considered for infrastructure-sharing initiatives. It would go hand in hand with tower sharing and, as broadband overtakes narrowband and customer data use grows, backhaul from individual towers must increasingly be upgraded from microwave to fiber.

Although there may be some existing FTTx that could be shared, the main focus from a policy and regulatory perspective will be new fiber installations given the relatively limited scope of existing FTTx in Angola. MINTTISC and INACOM will want to ensure, to the extent they can, that new FTTx deployments to towers are made more viable through prospective sharing arrangements. Asymmetric access regulation after the fact is generally a suboptimal approach and poses significant risk of discouraging investment.

Coaxial Cable and Copper Line Submarket

Coaxial cable (deployed solely by TV Cabo) and copper lines (deployed solely by Angola Telecom) are legacy infrastructures. Both infrastructures have been retrofitted with equipment to provide voice, internet, and video programming. However, these are obsolete investments that will not be replicated and can only provide fixed broadband service to buildings that they currently pass. TV Cabo confirmed its intention not to invest further in coaxial or copper cables because the medium is being superseded by fiber. Therefore, no policy or regulatory interventions in this submarket would be worthwhile.

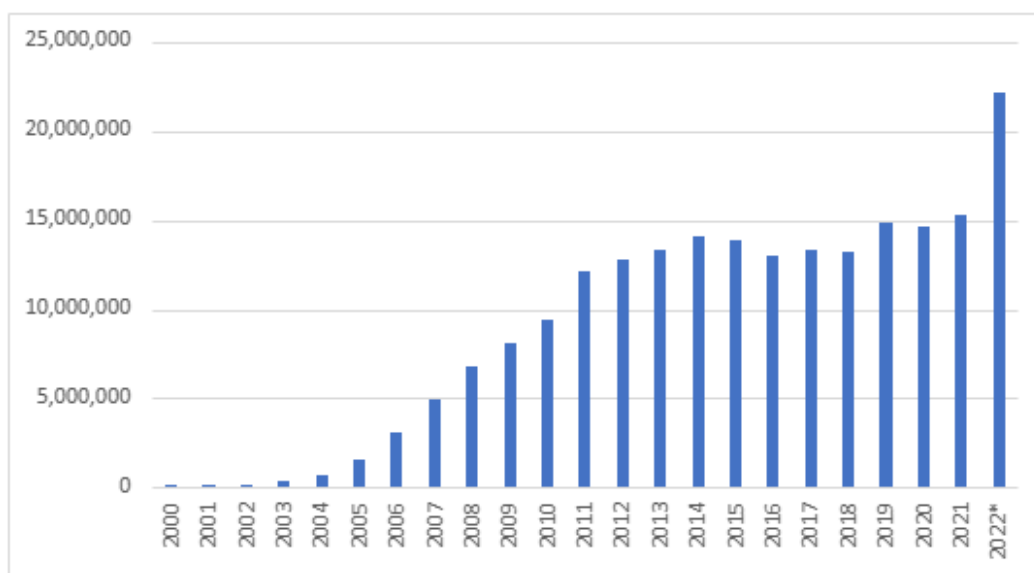
Last Mile: Access to Networks and Services

Mobile Access Networks

Mobile services, including basic voice and SMS services, offer the greatest utility and connectivity for individual consumers. Mobile services are also inherently more affordable than fixed services, bringing them within reach of the entire population. In addition, smartphones and 3G/4G networks can enable broadband access at price points that are becoming increasingly affordable for a growing percentage of Angolans.

In line with global experience, the opening of the mobile market in 2001 led to a period of high growth. The White Paper on the ICT sector (2001) provided the foundations for development of the mobile market, including a technology neutral licensing regime. The Angolan mobile sector was launched with two mobile operators in April 2001, when Unitel launched Global System for Communication (GSM) network services to rival the advanced mobile phone/code-division multiple access services offered by Movitel, a company established by state-run fixed line incumbent Angola Telecom. By 2011, there were a total of 12 million mobile subscriptions in Angola. Last data from the Angola Communications Institute show that with Africell's the number of mobile subscriptions jumped from 15 million in 2021, to 22 million by the end of the third quarter in 2022 (figure 1.13).¹²

Figure 1.13: Evolution of Angolan Mobile Market Subscribers since 2001



*Third Quarter

Sources: Angolan Institute of Communication; .

While the mobile segment of the market has technically been liberalized with four licensed operators, nationwide it currently consists of a duopoly between Unitel and Movitel. Angola Telecom has not yet launched its mobile services and the newest entrant, Africell,¹³ was awarded its license in February 2021, and launched its mobile services just in Luanda, the country's capital, in April 2022. As an early result from Africell's entrance to the sector, Unitel market share has decreased slightly below 80 percent in 2022, and Movitel that is struggling to keep its operations profitable, moved into the third operator, with a market share of little over 6 percent. The last calculated Herfindahl-Hirschman Index (HHI), which is prior to Africell's entrance,

¹² The precipitous decline from 2013 through 2015 reflects implementation of a SIM-card registration requirement that reduced the extent of multi-SIM use. Another factor is said to be the significant population growth during a period when active subscriber numbers were flat or declining.

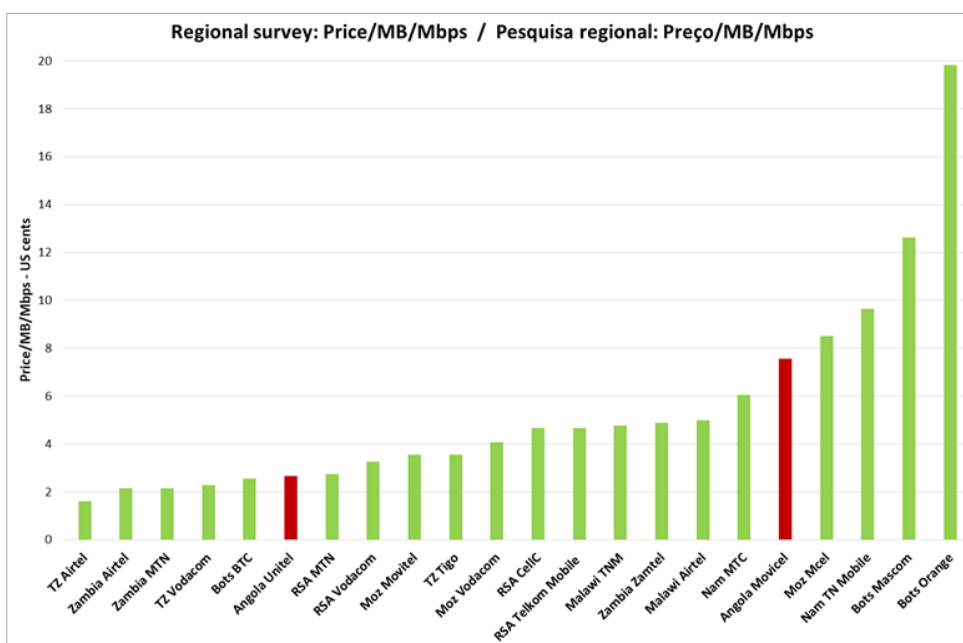
¹³ Other countries in which Africell operates include The Gambia, Sierra Leone, the Democratic Republic of Congo, and Uganda.

for the mobile segment of the market was 6,350,¹⁴ indicating a highly concentrated market.

Key regulatory steps have been initiated by the sector regulator, INACOM, to help ensure network efficiencies and competition. These include update and development of secondary regulation on infrastructure sharing and re-farming of radio spectrum frequency in the lower bands (for example, 700 megahertz (MHz) and 900 MHz bands). Regulations on significant market power to address operator dominance across the telecom market, number portability, and national roaming are currently being developed. However, more needs to be done to ensure a level playing field to allow for multiple mobile operators to compete and thrive. This, in turn, will drive prices down and advance innovation in digital communications.

Movicel is currently not providing a competitive counterbalance to Unitel’s mobile broadband prices due to inability to offer comparable value for money. Both companies offer similar unit prices based on volume, but Unitel offers much higher download speeds. Combining quantity and quality of service and deriving the volume unit price per unit of speed reveals relative value for money as depicted in figure 1.14.

Figure 1.14: Comparison of Price/MB/Mbps for 1GB 30-Day Bundle



Sources: Tariffs published on operator websites; OpenSignal crowdsourced data; Macmillan Keck (2019).

Note: GB = gigabytes; MB = megabytes; Mbps = megabits per second.

Movicel’s infrastructure deficit has grown significantly. It would need to invest an estimated US\$350 million (over three years) to replicate the coverage, capacity, and

¹⁴ The U.S. Department of Justice considers a market with an HHI of less than 1,500 to be a competitive marketplace, an HHI of 1,500 to 2,500 to be a moderately concentrated marketplace, and an HHI of 2,500 or greater to be a highly concentrated marketplace.

quality of Unitel’s network.¹⁵ Movicel’s infrastructure deficit can be seen from the inventory of towers, radio access network sites, and backhaul fiber summarized in table 1.1. Unitel’s deployed infrastructure is far superior to that of Movicel and Angola Telecom on a standalone basis. This inventory thus illustrates how separating Movicel from Angola Telecom’s towers and backhaul fiber exacerbated its infrastructure deficit.

Table 1.1: Infrastructure Inventory for Three Existing Mobile Licensees

MOBILE OPERATOR	Towers			Radio access network			Backhaul fiber(km)		
	Owned	Rented	Total	2G	3G	4G	Owned	Rented	Total
Unitel	1730	70	1730	1800	1800	900	13000	0	13000
Movicel	700	110	700	800	800	400	1000	1000	1000
Angola Telecom (Inactive)	500	0	500	0	0	60	7000	0	7000
Sources: Unitel, Angola Telecom and Other market intelligence by Macmillan Keck(2019)									

The practice in Angola is to regulate retail mobile voice prices. Global best practice is for price regulation for retail services to be employed as a last resort, only when competition is weak or nonexistent and policy and regulatory interventions to strengthen competition are ineffective. Retail price caps have been imposed on mobile voice services by a body other than INACOM that is not specialized in telecommunications or the economics of price regulation. The price caps were initially imposed, and are adjusted every two years, without regard to whether the market is adequately competitive. Unitel’s prices were reportedly below the price caps when they were last set in 2017 and have been creeping up to those levels during the ensuing two years. This stands in stark contrast to most other countries where voice prices have continued to decline over the past two years. The price caps therefore appear to be unintentionally serving as a target for increasing prices rather than as a ceiling for reducing them.

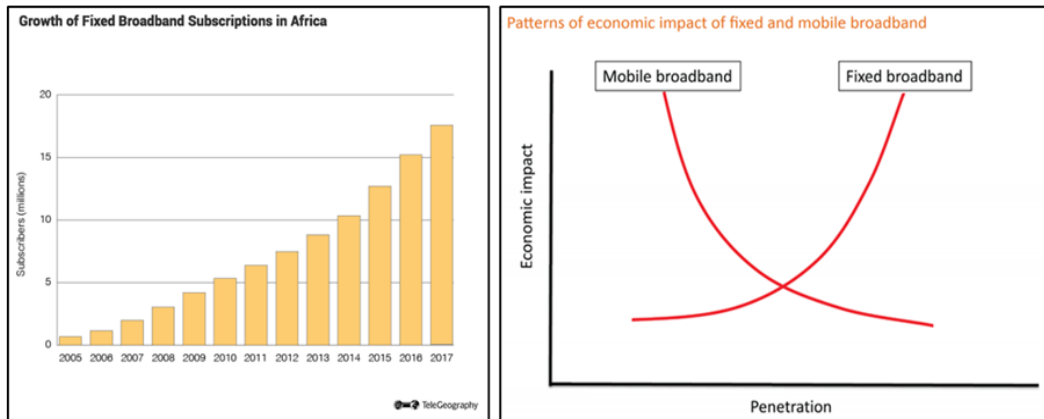
Fixed Access Networks

Enterprises and consumers use fixed broadband for commerce, education, health care, information access, e-government services, and entertainment. Fixed broadband is growing in Africa and has an exponentially greater positive economic impact than mobile broadband as penetration increases, as depicted in figures 1.15 and 1.16. Fixed broadband can also provide some cross-over competition for mobile broadband in supporting customer wireless devices. This is because mobile data usage patterns are more fixed than mobile: (1) 50 percent of the average mobile user’s traffic

¹⁵ World Bank (2020).

relies on only one cell; (2) 80 percent of the average mobile user’s traffic relies on only three cells; and (3) only 20 percent of the mobile user’s traffic is truly mobile.

Figure 1.15: African Fixed Broadband Trends **Figure 1.16: Economic Impact Patterns of Increasing Mobile and Fixed Broadband**



Source: Telegeography.

Source: Katz and Callorda 2017.

Angola currently has several separately licensed fixed service suppliers. These include (1) Angola Comunicações e Sistemas, (2) Angola Telecom, (3) Internet Technologies Angola (ITA), (4) MS Telecom, (5) Multitel, (6) Net One, (7) SNET, (8) Startel, (9) TV Cabo, and (10) Unitel. The customer base predominantly comprises commercial, government, or other enterprise users, but Angola has a small and growing consumer segment for fixed services.

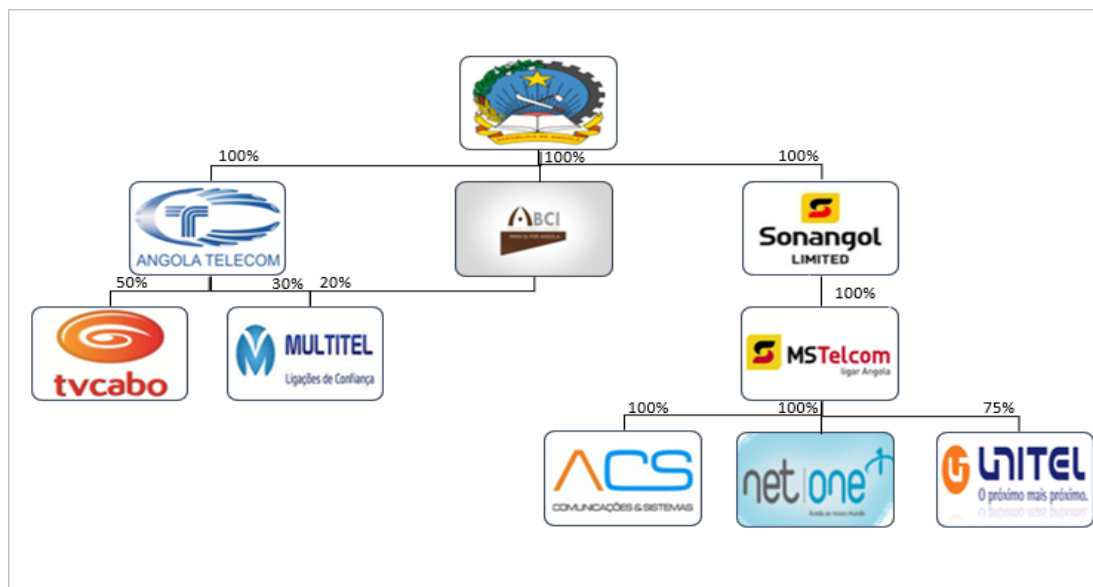
The market structure has a wide variety of suppliers because the fixed services market has lower entry barriers than the mobile services market. The market assessment suggested that ITA is currently the market leader, although Unitel recently entered the fixed market and could emerge as a new market leader.

The government has an ownership interest in seven of the licensees, which are some of the largest operators in the market. ITA, SNET, and Startel are the only active fixed operators without any state ownership. The government owns 100 percent of five fixed operators, 50 percent of one, and 75 percent of another one, as depicted in figure 1.17. This large presence of the state in the supply side of the market is not in line with regional and global trends and experiences, whereby the telecom and broadband market is increasingly led by the private sector. The government’s ownership has a significant adverse impact on the retail fixed market, resulting in (1) weak price competition, (2) underinvestment in infrastructure, (3) suppression of Angolan entrepreneurial activity, and (4) crowding out of private sector investment by Angolans. Partial state ownership also hampers the ability of operators to raise private finance.

In terms of competition, cross-ownership of the telecom companies, as shown in figure 1.17, hinders meaningful competitive behavior. For example, often only one service provider will be operating in a location, without facing competition. In a market

where competitive forces are at play, operators must compete on price, quality, and accessibility. This situation is likely the main reason for the low penetration rates observed in Angola today.

Figure 1.17: State Ownership of Fixed Network Operators in Angola



Source: Compiled by Macmillan Keck from various public sources.

Although the data are limited, the following list summarizes the inventory of fixed network assets by operator in Angola:

Tower and radio sites used or useful for fixed access:

- Unitel: 900 (4G mobile sites that are also used to provide fixed services)
- Angola Telecom: 500 (440 code-division multiple access sites and 60 4G fixed sites)
- Movicol: 400 (4G mobile sites that are not, but could be, used to provide fixed services)
- Startel: 26 (WiMAX sites)
- ITA: 9+ (microwave point-to-point sites)
- Multitel: data not available (4G TD-LTE fixed sites)
- MS Telecom: data not available (microwave sites)
- Net One: data not available (4G/LTE fixed sites in 2,500 MHz band)

Access and metro fiber deployments:

- Angola Telecom: 3,000 km (estimate)
- TV Cabo: 3,000 km
- Unitel: 800 km
- ITA: 500 km
- Multitel: <100 km
- Startel: 47 km
- MS Telecom: data not available.

Invisible Mile: Policies and Regulations

The recent change in the government has placed the country on a path of reforms in several sectors, including the telecommunications sector. The invisible mile refers to the policy and regulatory environment. The recently published National Development Plan highlights the telecommunications sector as a key area for targeted reforms. Specifically, the government has set the following objectives for reforming the sector, among others: (1) ensure access to fixed services, (2) ensure affordable mobile access to Angolans, (3) create the conditions required for internet access with a view toward building an information society for Angola, (4) increase access to broadband through international submarine cables, and (5) promote efficient spectrum management. For Angola to benefit fully from the digital economy, significantly more Angolans—citizens and businesses—will need to have access to affordable and reliable broadband services.

The government has already started to undertake several key reforms and plans to implement several more. Some of the initiatives undertaken and currently under consideration include (1) licensing of a fourth mobile network operator, (2) functional and legal separation of Angola Telecom into a retail company and an infrastructure company (that is, wholesale), (3) partial privatization and/or commercialization of the Angola Telecom entities, (4) implementing a competition law and establishing a competition commission, and (5) undertaking assessments of significant market power to determine operator dominance across the telecom segments and developing the requisite asymmetric regulation. Furthermore, several telecom companies are on the Privatization Program's list for privatization,¹⁶ including Angola Cables, MS Telecom, Net One, TV Cabo, and Multitel.

Institutional Arrangements

MINTTISC oversees the telecom, postal, and IT sectors. MINTTISC was formerly known as the Ministry of Post and Telecoms (Ministerio de Correios e Telecomunicações), which was the successor to the Ministry of Transport and Communications, which dealt with all telecom policy and regulatory issues prior to the establishment of the independent regulator, INACOM. MINTTISC was established in its current form by the restructuring of the Ministry of Post and Telecoms following legislative elections in September 2008. In February 2010, formal rules were issued for the ministry's structure and functioning, in Executive Decree No. 11/03.

The independent regulator, INACOM, was created by Decree No. 12 in June 1999. It operates under decrees updated in Dispatch No. 243/14 in September 2014. Given the challenges faced by the sector, there is an urgent need to strengthen the telecom regulatory framework and enforcement of regulations to ensure that there is a level playing field for the service providers. A statute is in the process of being passed by the National Assembly, which will increase the independence of some government

¹⁶ Angola Telecom was taken off the Privatization Program's list in early 2020.

agencies, including INACOM. INACOM will then require significant capacity-building efforts to strengthen its capacity to oversee an increasingly complex broadband market and expand its oversight to other areas, such as digital government, cybersecurity, and innovative technologies such as IoT and artificial intelligence.

Laws and Decrees

The main Telecommunications Law (Law No. 8 of May 2001) lays out the measures for complete telecommunications liberalization. These were put into regulations by Decree No. 44 of September 2002. Decree No. 45 of the same month also recognized the rights and duties of network operators, service providers, and users. In 2004, Decree No. 3 introduced regulation of interconnection for public telecommunications networks and services, whereas Decree No. 13 imposed the price regulation framework for the provision of relevant services. In August 2016, INACOM approved the much-anticipated Electronic Communications regulation framework, based on a convergent, technology/service-neutral, fixed/mobile licensing regime. The regulatory framework principals were initially postulated by the ICT White Paper (2010–15), which was brought to parliament in June 2011 and moved into the revised Electronic Communications regulations published in December 2011 (Law No. 225). However, it took until March 2016 before the full set of regulations/guidelines/policies received approval by the Council of Ministers, followed by Presidential endorsement in May–June 2016. The new regulations consist of the following:

- The Strategic Plan for Radio Spectrum and Numbering (*Planos Estrategicos de Espectro Radioelectrico e Numeracao*), via Presidential Decree No. 95/16, May 10, 2016
- The new Electronic Communications General Regulation (*Regulamento Geral das Comunicacoes Electronicas*), via Presidential Decree No. 108/16, May 25, 2016
- The Strategic Plan for Licensing Electronic Communications Operators (*Plano Estrategico sobre o Regime de Licenciamento dos operadores de comunicacoes electronicas*), under Presidential Decree No. 122/16, June 9, 2016.

Frequency Spectrum

INACOM is the sole provider of radio spectrum for mobile and fixed access networks. Radio spectrum is a scarce resource and a critical wholesale input to all network operators using wireless access technology. INACOM has been active in managing this spectrum pursuant to its 2017–20 strategic plan. INACOM plans to implement an integrated spectrum and numbering resources management and monitoring system. It is also planning to establish a new national spectrum management and monitoring center, which will require four years from conception to opening. The spectrum management center will provide tools for interference resolution, study the effective use of frequency bands, verify technical characteristics and signals transmitted, and detect and identify illegal transmitters.

INACOM has been proactive in spectrum allocations and assignments. Beginning in 2017, INACOM auctioned the use of digital dividend frequencies in the 791–862 MHz

bands. This process resulted in the assignment of six spectrum bands to five participants. In 2018, INACOM revised the national frequency allocation framework and subsequently undertook a spectrum reframing process to bring existing spectrum assignments and uses in line with the new framework.

In a two-operator mobile market, to enable efficient and effective service provision, regulators typically assign to each mobile operator the minimum bandwidth shown in table 1.2, in the identified bands for the specified technologies.

Table 1.2: Typical Spectrum Assignments for a Two-Operator Mobile Market

TECHNOLOGY	Spectrum band (MHz)	Spectrum band (MHz)
2G/GSM	900	10
	1,800	20
3G	900	Variable
	2,100	15-20
4G/LTE	700	40
	850	
	1,800	
	2,100	
	2,600	

INACOM’s spectrum assignments for 2G/GSM and 3G are consistent with the typical approach. INACOM’s 4G/LTE spectrum allocations are slightly atypical but should be sufficient to meet mobile operator needs for efficient and effective provision. INACOM has allocated the spectrum assignments shown in table 1.3.

Table 1.3: INACOM’s Spectrum Assignments for 4G/LTE Technology

TECHNOLOGY	Spectrum band (MHz)	Spectrum band (MHz)
4G/LTE	790-862	30
	1,800	20
	2,100	20
	2,100	

INACOM has issued licenses for fixed broadband and voice access in the following bands: 1,400 MHz, 2,300 MHz; 3,400 MHz; 5,200 MHz; 5,700–5,800 MHz; 6,400 MHz; 7,100 MHz; 8,000 MHz; and 18 gigahertz. Fixed access spectrum appears to be readily available to fixed network operators and other licensees.

Numbering

The telephone numbering system, which is managed by INACOM within the international framework established by the ITU, provides operators of the public switched telephone network and their customers a means of addressing and routing calls. A number assignment is an essential input for every customer with a mobile or fixed telephone.

INACOM has been active in updating Angola’s telephone numbering system over the past several years. It has endeavored to scrub previously assigned numbers that are

no longer active, returning them to inventory, and has studied the potential for number portability. INACOM has also developed a new fee structure for number assignments, which is intended to discourage hoarding of unused numbers by operators and encourage the return of abandoned and unused numbers to inventory.

Infrastructure Sharing

Poles, ducts, conduits, and rights of way comprise passive infrastructure, which is primarily useful as a host for new fiber installations. They are often owned or controlled by national, provincial, or municipal governments; electric utilities; railways; and pipeline operators. Angola's primary owners of such facilities include Angola Telecom, Unitel, and the National Electricity Distribution Company (*Empresa Nacional de Distribuição de Electricidade*). Such passive infrastructure is potentially sharable for telecom use by any network operator that wants to install fiber.

Presidential Decree 166/14 of July 10, 2014, which was updated in 2022 by the Presidential Decree 42/22 of February 10, stipulates that operators should determine the price of access through bilateral arrangements. Moreover, operators are not required to publish their offer prices for infrastructure sharing, and the smaller operators have submitted complaints to INACOM that access prices are being set too high. INACOM is currently preparing to start working on secondary regulation instruments (pricing, disputes, dominance), following the update of the 2014 regulation to address the needs of an evolving broadband market and speed up network expansion across the country. Open access interconnection will ensure that existing and future network operators in Angola can enjoy nondiscriminatory access at reasonable, cost-based pricing to the national backbone and other passive infrastructure. This, in turn, is expected to generate additional investment in network facilities and services downstream, such as 3G and 4G networks.

1.3. Digital Infrastructure Recommendations and Next Steps

The telecom or broadband sector is a fast-evolving sector that is continuously providing new leapfrogging opportunities. Angola has made significant strides in bringing international internet capacity to the country and deploying 3G and 4G services. The country now stands at the cusp of the next stage of digital infrastructure development, which will focus on not only the emerging technological advancements (5G, FTTx, spectrum sharing, mesh networks, IoT, and so forth), but also how to make digital infrastructure development more inclusive, whereby more and more Angolans can benefit from these technologies. The following recommendations present possible pathways to the next stage of broadband market development.

R 1.1 Amend the INACOM Organic Law to enable new and expanded roles as sector regulator that would take into consideration the following: (1) provide INACOM full

autonomy and greater transparency for regulatory budgets and regulatory fees to enable greater certainty in planning, (2) require INACOM to set license fees and other regulatory charges at levels intended to enable recovery of regulatory costs without a premium (with exceptions for spectrum), (3) exempt INACOM from civil service regulation to enable hiring and retention of qualified staff in competition with the enterprises it regulates and from public procurement restrictions to enable expedited procurement with a greater emphasis on quality, and (4) transfer licensing authority to INACOM, subject to government policy direction.

R 1.2 Strengthen INACOM's capacity to be a neutral referee in an increasingly complex and dynamic broadband sector. Going forward, INACOM will need to increase its regulatory tools to ensure that there is a level playing field for all service providers, including establishing criteria and procedures for market assessments, determinations of dominance, and imposition of economic regulation; reviewing and updating spectrum allocation to facilitate competition and investment; and assessing the adequacy of land access rights, among other areas.

R 1.3 Develop a forward-looking regulatory project plan for developing and implementing the INACOM-related reforms that are not in the current plan, such as planning for a 5G market, establishing procedures for resolving disputes between network operators, ensuring cybersecurity in digital infrastructure, and providing oversight of advanced technologies (artificial intelligence and IoT). Overall strengthening of data collection, analysis, and monitoring would also help to reinforce the regulator's role.

R 1.4 Conduct tariff assessments across the telecom value chain to identify any bottleneck issues and ensure nondiscriminatory, cost-based access to (1) international bandwidth, including Angola Cables, which is the main provider in this segment; (2) wholesale access to terrestrial fiber, towers, and other passive infrastructure; and to assess appropriate costing; (3) terminating domestic voice calls; and (4) inbound and outbound international voice call practices.

R 1.5 Finalize mobile payment system regulation that is complementary to the regulation developed by the Bank of Angola. A draft Law on the Mobile Payment System is in the final phase of public consultation and is expected to be passed into legislation. In its role as the communications sector regulator in these arrangements, INACOM has already licensed about 10 mobile money operators authorized for the mobile payment ecosystem. INACOM is also working on a mobile payment system regulation. To maximize the benefits associated with this service, the intention is to provide open access partnerships between mobile operators and financial institutions rather than separate financial institution use of communications channels. This operational model is intended to simplify money transfers, ensure efficient resource management, and increase security and loyalty. The government approved this strategy for the implementation of the mobile payment system in April 2017 (see chapter 3 on the Digital Financial Services Pillar).

R 1.6 Update the universal service program as a more holistic, commercially oriented, and sustainable program based on research on underserved areas, with a view to prioritize and group areas together to improve economic viability and sustainability. In consultation with contributing network operators, develop priorities for coverage, technology, rollout, and sustainability. Promote the development of innovative and appropriate technological solutions to stimulate broadband demand in underserved areas. Outsource procurement of new infrastructure and services (such as satellite connectivity) to contributing network operators to take advantage of their volume pricing on inputs and know-how. Establish an equitable framework for allocating responsibility among contributing network operators for developing, managing, and sharing infrastructure that is subsidized with universal service funds or public investment.

R 1.7 Ensure that MINTTISC and the Ministry of Finance continue working under the joint working group under the privatization program for restructuring and divestitures in telecom companies. This cooperation will be critical to ensure that divestment decisions are made to enhance sector development rather than hinder it. For instance, divestment should not further market consolidation, especially in the mobile segment of the market.

R 1.8 Promote Angola as a digital hub for the Southern Africa region and increase cross-border flows of communication services with neighboring countries. The value of a country's digital economy is reinforced and increased when it is connected to the regional and global digital economy. The Southern African Development Community, as a regional organization, is leading the international mobile roaming project. This effort could provide an opportunity to expand connectivity to regional neighbors who could leverage on Angola's international capacity hub.

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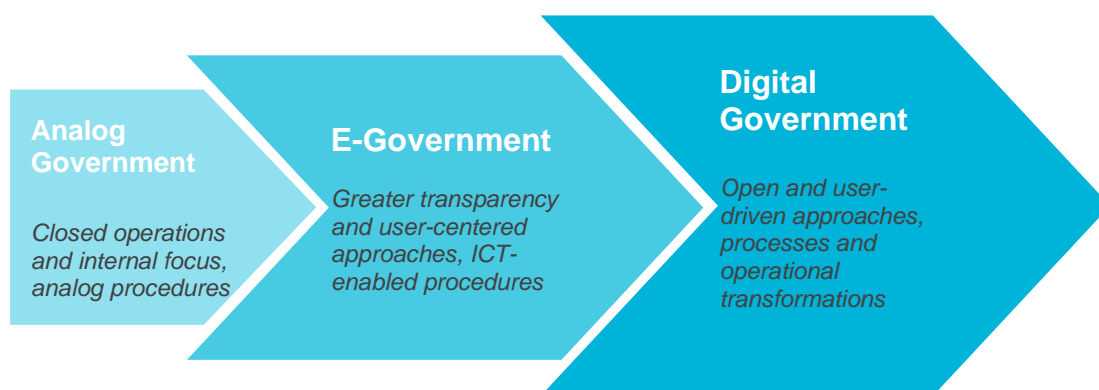
World Bank. 2016. *World Development Report 2016: Digital Dividends*. Washington, DC: World Bank, <https://www.worldbank.org/en/publication/wdr2016>.

World Bank. 2020. *Angola Digital Infrastructure Reform Diagnostic and Roadmap*. Washington, DC: World Bank.

2. Digital Platforms

Digital platforms are the core for the transition from an analog government to a digital government, helping to revolutionize how public service is provided, creating a network structure for interconnectivity among public institutions, through the digitalization of their processes, services, and transactions for a more inclusive society (figure 2.1). These platforms play a major role in the creation of public added value, by allowing for more streamlined, efficient, and transparent service provision to the public in general across sectors (health, education, transport, commerce, tax, finances, and others). The Government of Angola has been transitioning to an e-government structure, with government agencies increasingly using information and communications technology (ICT) solutions and the internet to operate and provide services (that is, the government portal). A lot is still to be done, especially in infrastructure, data exchange, and protection, but the country has launched initiatives to create digital systems for some of the core government functions, such as financial management, taxation, and Citizen Service Centers.

Figure 2.1: Digital Government Transition Stages



Source: Based on OECD 2014.

Digital public platforms should not be perceived as stand-alone solutions but rather as an integrated module of a broader public service delivery inclusive solution. To make this happen, a whole-of-government approach is crucial,¹⁷ which presupposes moving away from isolated silos in public administration and toward a network, as a means to provide consistency of government service delivery and a unified, accessible, and seamless user experience.

This chapter details the diagnostic's findings on the current state of public sector digital platforms in Angola.¹⁸ Section 2.1 discusses the importance of digital public platforms and benchmarks Angola against other countries in terms of global e-

¹⁷ OECD (2014).

¹⁸ Private sector platforms are covered in chapter 4, on Digital Entrepreneurship.

government indicators aside from providing a high assessment of the enabling environment. Section 2.2 details the institutional arrangements, capacity, and coordination, as well data protection and cybersecurity. Section 2.3 outlines the legal and policy framework. Section 2.4 provides an overview of digital public services. Section 2.5 discusses interoperability and shared services. Section 2.6 concludes with recommendations for Angola.

2.1. Background and Importance of Digital Public Platforms

Digital platforms offer significant potential to transform the way the public sector engages with citizens in delivering public services more efficiently and effectively through the use of technology.¹⁹ Digital public platforms are the means through which governments offer services electronically; deliver data and content to public agencies, citizens, and businesses; and run back-office systems. Beyond enabling a shift toward digital service provision, digital public platforms also serve the fundamental role of shifting the public sector away from siloed ICT structures toward a “shared interoperable infrastructure” across policy areas and levels of government,²⁰ integrating data and processes across various systems and databases. In this way, digital public platforms can reduce costs, improve efficiency and innovation of processes and services, and provide a channel through which governments and citizens can engage and share information.

Angola has expanded its use of digital public platforms in recent years with the introduction of various front-end and back-end systems, applications, and services; however, the country still lags its peers, pointing to significant room for improvement. Despite Angola’s achievements, its score on the United Nations E-Government Development Index (EGDI)²¹ has improved only marginally, from 0.31 in 2010 to 0.38 in 2022. Angola’s global ranking has fallen from 132nd to 157th of 193 countries, demonstrating Angola’s slower overall progress compared with peer countries (see figure 2.2). Angola’s marginal improvement in the EGDI is driven mainly by the online service and telecom infrastructure components²² of the index (figure 2.3), reflecting progress in terms of digital and multichannel service delivery and internet users. The human capital component has declined since 2010. Angola’s low ranking

¹⁹ Eaves, Pope, and McGuire (2020).

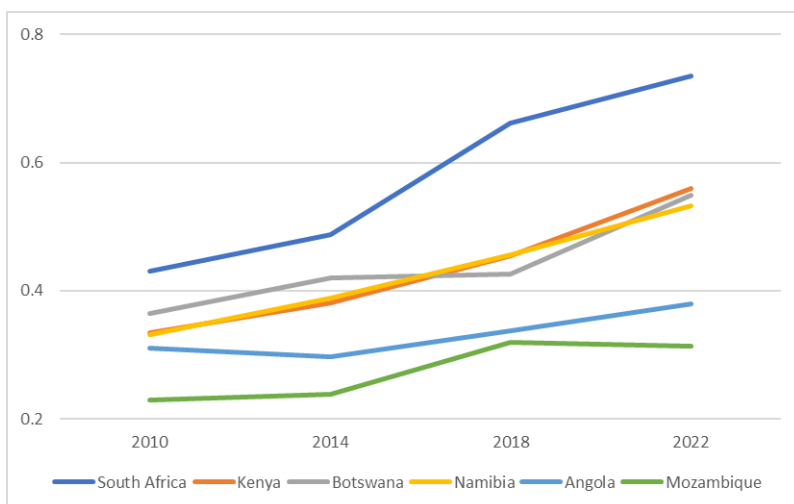
²⁰ OECD (2018).

²¹ The UN E-Government Survey tracks the progress of e-government development and effectiveness. The EGDI is a composite index based on the weighted average of three indices: the Telecommunications Infrastructure Index, Human Capital Index, and Online Service Index.

²² The Online Service Index is based on a survey that “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 ICTs.” The Telecommunications Infrastructure Index measures the number of internet users, main fixed telephone lines, mobile subscribers, and fixed broadband subscriptions (per 100 inhabitants) plus wireless-broadband subscriptions (United Nations 2018).

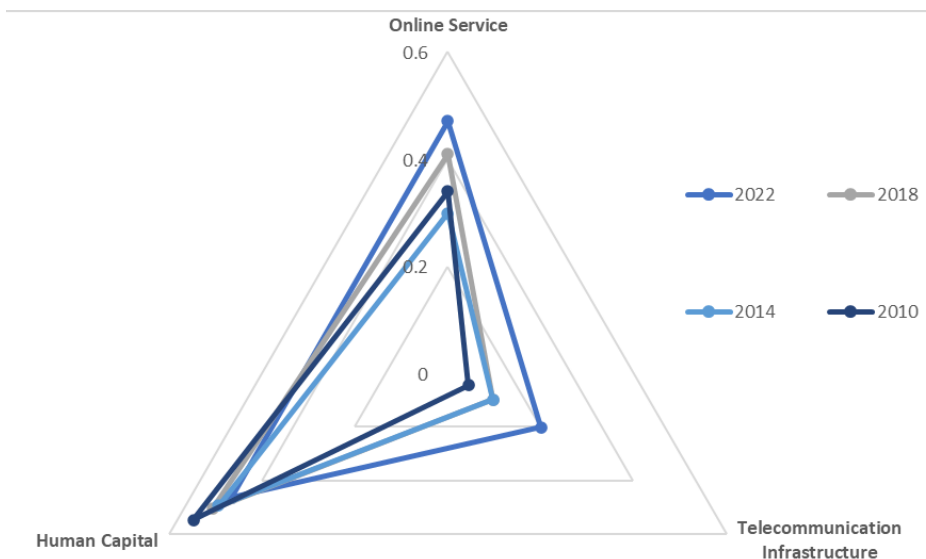
on the United Nations E-Participation Index²³ (168th of 193 countries in 2022) demonstrates significant weaknesses in the provision of information and limited opportunities for citizen consultation and decision making online.

Figure 2.2: E-Government Development Index Scores for Angola and Peer Countries, 2010–2022



Source: UN E-Government Development Index (2010–2022).

Figure 2.3: Components of Angola’s E-Government Development Index, 2014–2022



Source: UN E-Government Development Index (2010–2022).

²³ The E-Participation Index analyzes “e-participation according to three-tiers of participation: 1) e-information – or the provision of information on the Internet; 2) e-consultation – organizing public consultations online; and 3) e-decision-making – involving citizens involved in decision-making processes” (United Nations 2016).

COVID-19 and its socioeconomic implications added extra pressure to Angola's digital public platform systems to perform, requiring key enabling environment aspects to be in place, to ensure systems efficiency and further development. In response to the pandemic, the country issued a set of measures to relieve the economic impacts on companies, families, and the informal sector. The measures involved fiscal waivers and benefits, preferential loans to priority sectors and segments, ensuring workers' salaries and basic conditions, as well the creation of a cross-sector commission to study strategies to shift informal activities to formal.²⁴ An online portal to provide information on the measures being issued and the registration forms to access the available benefits was launched, called Economic Relief.²⁵ This platform could represent a greater advantage if identity documentation (ID) systems were in place to confirm the identity of companies and individuals and their respective credit or risk scores. This would help in performing the first screening, so that data could circulate among the involved institutions, to work as a single entry point; instead, registration was done by e-mail to each specific institution. Furthermore, the portal was deactivated and is no longer functional.

Based on the digital government strategies in South Africa, which ranked 65th, and Mauritius, which ranked 75th in the 2022 EGDI ranking, first and second in Africa, an enabling environment generally covers four key elements: (1) policies and regulatory framework that lead to the digital transition, (2) reliable internet infrastructure and systems to ensure connectivity, (3) routinization of successful standards and protocols, and (4) skills and capacity building.

Angola's major national development plans and public sector reform strategies make reference to the importance of digitalization to improve the way the government operates,²⁶ covering all the aforementioned enabling elements, but the implementation of these plans, strategies, and policies has proved to be inefficient.

The country has set digital transformation as one of the main focuses of the Public Administration Modernization and Reform Strategy, and it is considered in the National Development Plan (2018–22) and the sectoral public administration plan as one of the pillars, the Plan of Action for Territory Administration, implying that there is political will to create an enabling environment for digital governance. Since 2001, the Angolan government has been issuing a book of ICT policy measures, called the ICT White Paper, which is considered by the government as the most important strategic tool for sector development. The book issues the main guidelines for supporting the materialization of strategic goals proposed in the government's medium-to-long-term macro plans (Angola 2025, National Development Plan 2018–22). Angola's regulations in this area are already comprehensive (table 2.1), but there is a need to extend and update the scope of some of the legal instruments and specifications to

²⁴ Presidential Decree 98/20 of April 9, 2020

²⁵ <http://www.alivioeconomico.org/>.

²⁶ OECD (2018).

allow the creation of clear standards and protocols, especially in cybersecurity, cloud computing, data protection, and processing.

Table 2.1: Current Legislation Related to Information and Communications Technology

Regulation	Type	Year
Law 11/02 Access to Documents Held by Public Authorities	Law Decree	2002
Law 22/11 Personal Data Protection	Law Decree	2011
Information Society Services and Technologies Regulation	Presidential Decree	2011
Law 23/11 Electronic Communications and Information Society Services	Law Decree	2011
Electronic Communications Infrastructure Sharing	Presidential Decree	2014
Law 7/17 Network and Computer Systems Protection	Law Decree	2017
Global Architecture National Plan for Interoperability in Local and Central Administration	Presidential Decree	2018
Resolution 33/19 African Union Convention on Cybersecurity and Personal Data Protection	Resolution	2019
Law 2/20 Video Surveillance	Law Decree	2020
Law 11/20 Identification or Mobile Phone Traceability and Electronic Surveillance	Law Decree	2020
Ratification Letter 1/20 African Union Convention on Cybersecurity and Personal Data Protection	Ratification	2020

Sources: Ministry of Telecommunications and Information Technologies; Inacom Angolan Institute of Communication.

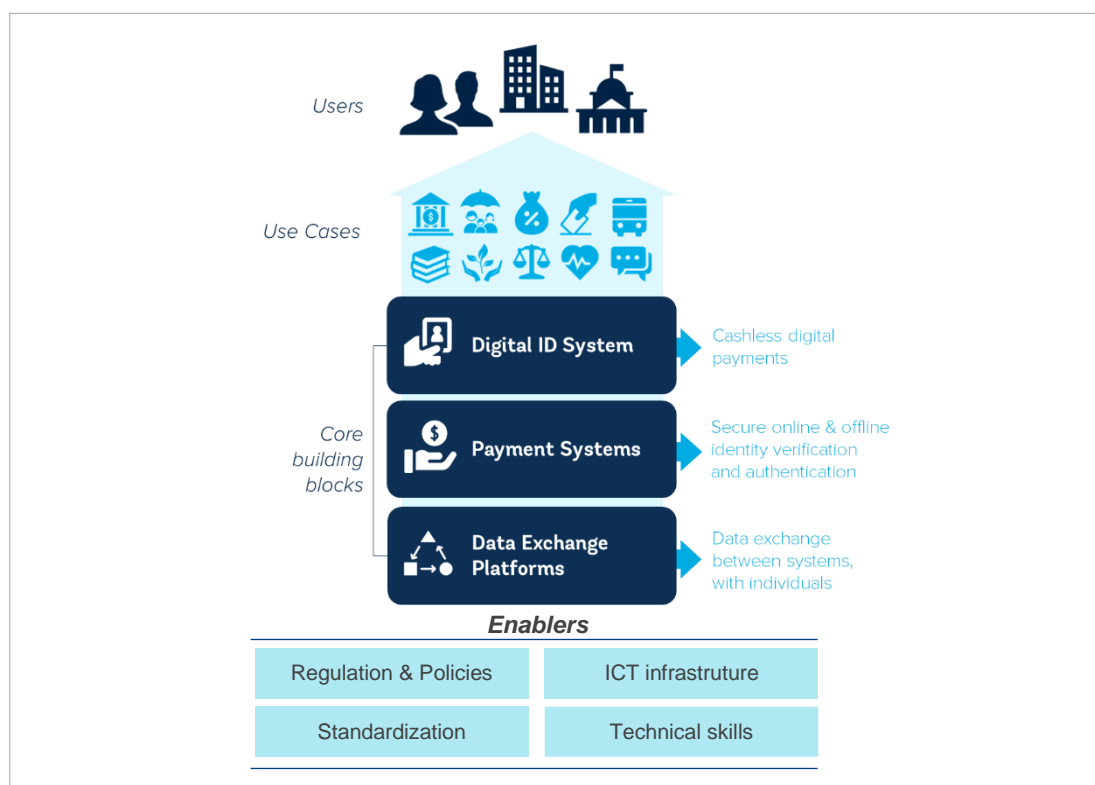
Despite Angola's efforts to provide adequate internet infrastructure to government entities through some of its strategic ICT initiatives, the country is still deprived of reliable, fast, and safe network connectivity throughout the national territory. There is a discrepancy between rural and urban areas, due to challenges in the provision of electricity: the electrification rate is only 50 percent,²⁷ and 3G/4G network coverage is limited to urban areas. Interoperability and infrastructure sharing represent an opportunity to leverage existing information technology (IT) systems and assets by creating synergies. A good example is the Electronic Communications Infrastructure Coordinating Committee's (INFRACOM's) Infrastructure Sharing Committee in the Telecom Sector. Transferring this framework to government agencies could benefit the country and allow the government to cut spending on expanding digital public services. Other challenges related to the enabling environment for the digital

²⁷ Stated by the Minister of Water and Energy at the 10th Ministry Consultation Council 2020.

government transition are connected to social inclusion; the low ID coverage rate, which was around 30 percent in 2020 and extends the regional gap; and the urban-rural, gender, age, and socioeconomic divides.²⁸ Lack of an ID card not only prevents access to public services, but also hinders inclusion and deployment of government social grants, like Project KWENDA, which is intended to be distributed to poor families as a monthly government grant.²⁹

The goals of digital public platforms are to support effective public administration and improve inclusive service delivery and innovation across multiple sectors. As presented in World Bank (2020) on digital platforms, there are three building blocks for inclusive and data protection safe digital service delivery (figure 2.4): digital ID systems, payment systems, and data exchange platforms (interoperability). With the key enablers, these building blocks create a propitious environment for digital development.

Figure 2.4: Core Building Blocks for Digital Service Delivery



Source: World Bank Note on Digital Platforms.

²⁸ World Bank (2020).

²⁹ <https://governo.gov.ao/ao/noticias/kwenda/>.

The core building blocks allow for reliably verifying basic identity information and confirming that a person is exactly who they claim to be. The importance of this resides in a variety of transactions, such as ensuring that the right beneficiaries are receiving social assistance. Digital payment systems enable money to flow between all the players in the economy with greater efficiency, speed, and accountability, enabling significant cost savings, creating new economic opportunities, and allowing transfers to reach remote recipients instantly. In Niger, for instance, delivering social transfers through digital channels instead of cash reduced the variable cost of administering the benefits by 20 percent, while recipients saved 20 hours on average in travel and wait time.³⁰ Interoperability allows digital platforms to serve effectively as “public goods,” enabling new applications and services built on top of the existing infrastructure, while minimizing costs and facilitating the use of automated business processes.

A good example of service delivery with all the enablers and building blocks in place is Estonia’s X-Road data exchange platform. X-Road is a successful case study of the implementation of the core building blocks, as it connects more than 1,000 databases and 1,700 services, which, combined with close to universal access to a digital ID for secure online authentication, has helped save citizens an estimated US\$2.8 million a year by replacing face-to-face interactions with the state with virtual ones.³¹

2.2. Institutions, Leadership, and Coordination

In Angola, the digital sector is led by the Ministry of Telecommunications, Information Technology, and Social Communication (MINTTICS).

Within MINTTICS, the National Institute for Promotion of the Information Society (*Instituto Nacional de Fomento da Sociedade da Informação*) (INFOSI)³² leads the implementation of digital government projects and investments. INFOSI leads several digital government projects and initiatives.³³ INFOSI is also responsible for the definition of standards and guidelines (for example, interoperability), which allows for more coherent digital government development across sectors and levels of government.³⁴ Within INFOSI, the Council for Information Technologies (*Conselho para as Tecnologias da Informação*) has been envisioned as a coordination mechanism (however, it is not known whether this is currently operational). Following the creation of INFOSI, some sectoral ministries (such as the Ministry of Planning and Territorial

³⁰ Aker et al. (2016).

³¹ Vassil (2016).

³² Responsibility for coordination and expansion of ICT initially fell to the National Information Technology Commission (CNTI), which was created in 2002 based on the “Information Technology Development Strategy,” which was approved in 2000. In 2016, responsibility was transferred to INFOSI as a result of the integration of CNTI and the Institute of Administrative Telecommunications.

³³ Projects have included the State Private Network, the National Public Data Center, and Walking with ICT (Andando com as TIC), which makes Wi-Fi and digital training freely available through mobile rotating services in remote areas of the country.

³⁴ OECD (2018).

Development) have sought the guidance of INFOSI before investing in digital technology. In 2019, Presidential Decree 37/19 of January 31 institutionalized the role of INFOSI as coordinator of digital government investments by making it mandatory for all ICT projects to be submitted to INFOSI for approval. However, this mandate has since been transferred, leaving INFOSI with coordination and management of digital infrastructure, such as government datacenters and public network points.

In 2021, the Institute for the Modernization of the Administration (*Instituto de Modernização Administrativa*) (IMA) was created by presidential decree. IMA, which is based within the center of government (under the Chief of Staff's Office) has as its mission the modernization of the public sector through the reengineering of government processes and simplification of procedures and promoting their digital transformation with a view to improving the provision of public service for citizens and businesses.³⁵ It guarantees alignment of policies and projects around a common vision, and it promotes the operationalization of e-government plans and projects

Despite its operational strengths, this model of leadership and supervision of digital government has not yet been able to overcome the challenge of institutional silos.³⁶ While relevant legislation has been enacted on the standardization and implementation of digital services, these efforts are largely disjointed and agency centric. Some sectoral ministries develop their own action plans and systems outside the leadership of MINTTICS and IMA, although this is becoming less common. For example, the Ministry of Finance procures its own ICT equipment and data centers due to a lack of trust in the data center and network run by INFOSI, going against the interoperability standards and procurement policies.³⁷ This has contributed to a lack of coherence and coordination of national dialogue and policy implementation related to digital public platforms. However, the 2019 Presidential Decree mandating INFOSI's approval for all ICT projects may help to curtail this fragmentation of e-government initiatives.

In Angola, an identification card is critical to access even the most basic public and private services, and a birth registration is mandatory to obtain the national ID. Given the limited and unequal coverage of birth registration (around 53 percent) and the national ID (around 30 percent), this creates barriers to inclusive access to services and rights, and thus in participating in local economic development.

Universal ID coverage aspirations are further undermined by significant birth registration disparities based on: (1) regional location (77 percent in Luanda versus 29 percent in Cunene), (2) urban versus rural (68 percent versus 30 percent), (3) age (25 percent for under age 4 versus 66 percent for over age 15), (4) socioeconomic quintile (from 10 to 55 percent for children under age 5), and (5) gender (56 percent of men versus 51 percent of women, with an equal number of registrations).³⁸

³⁵ IMA - Plano Estratégico 2022-2027 (2021).

³⁶ OECD (2018).

³⁷ OECD (2018).

³⁸ World Bank (2020).

In 2020, the Ministry of Justice and Human Rights merged two units—the National Directorate of Civil and Criminal Identification Archives (DNAICC), which managed the national ID system, and the National Directorate of Registries and Notaries (DNRN), which handled birth registration—to create the National Directorate of Identity, Registration, and Notaries (DNIRN). The merger has facilitated the implementation of data-sharing mechanisms between the two services, which should help streamline operational efficiency and simplify access to ID services for the population. The merger presents an interesting momentum to initiate structural reforms in the way the services are managed, operated, and delivered. It also presents an opportunity to develop electronic notary services, since it is the only service in the ministry that is being provided manually.

Digital ID is one of Angola's most ambitious digital government programs to date, given the government's goal of achieving universal digital identification and the low rate of ID coverage (39 percent). The challenges to achieving this goal should be tackled at two levels that are deeply related but should be distinguished, since their scopes are different and the second is highly dependent of the first: (1) issuance of ID cards, which consists of providing the population with a credential they can use to prove their identity and access services, and (2) issuance of a credential for accessing online services.

The Civil and Criminal Integrated Management Platform (*Plataforma de Gestão Integrada da Identificação Civil e Criminal*) (PGIBI) is the new system, and it entails the modernization of the national ID system and centralization of ID card issuance in the capital. The new ID card (*BI Integrado*) integrates a QR code and a contactless chip (see figure 2.5). However, the advanced features of the credentials, in particular the chip, remain to be leveraged to unlock potential benefits in terms of authentication and access to services.

More generally, the country still faces major challenges, such as broadening the coverage of the ID card to the entire population, including the most vulnerable groups and those in the most hard-to-reach areas.

The merger of DNRN and DNAICC has supported a more comprehensive assessment of how unlocking synergies between the two services helps to (1) streamline operational processes to facilitate access to services for the population, or (2) enhance institutional organization to generate savings (sharing of infrastructure, human resources management, common procurement, and so forth), or (3) enhance online access to services and facilitate data exchange between individuals and public and private service providers. Although the intention is to interconnect PGIBI with other identification systems (such as the social security, tax, electoral, and civil registration registers), this has not yet happened in practice (although there are examples of

³⁹ According to the 2014 census, only 22 percent of the population over age five had an ID.

data sharing between systems, such as between the civil ID database and the electoral register).

Figure 2.5: Integrated ID Card (Front and Back)



The rise of the digital economy and the increasing demand for remote, online identity verification solutions during the COVID-19 pandemic has led to a growing number of countries deploying or relying on ID systems. With IDs, people can securely prove their identity for online services and transactions, such as applying for a social assistance program, filing taxes, or registering a business remotely. These features constitute the main challenge for the second level, digital identity.

ID systems are a core digital platform for inclusive development and service delivery and can support the achievement of several sector-specific development objectives, such as access to quality health care, financial inclusion, empowerment of women and girls, and many more.⁴⁰ The Government of Angola needs to study the implementation of a solution for digital ID and authentication systems/mechanisms and other key trust services that are critical for securing digital transactions. At the same time, it is important to follow privacy-by-design and security-by-default principles, combined with legally binding electronic signature mechanisms for online transactions. Working on the collaborative design of a trust framework based on open standards would help to lay the foundation of mutual recognition and trust, which is critical for broadening the adoption of online services by relevant public and private organizations.

Digital ID systems, particularly when they are part of a broader “stack” of public digital platforms, which is the case in Angola, with multiple sectoral solution systems, can support progress in multiple sectors and areas of development. However, there is a certain degree of complexity in implementation. Country experiences to date highlight several important risks and persistent challenges, including (1) exclusion and limited accessibility, (2) low trust and lack of data protection and privacy safeguards, and (3) inappropriate or unsustainable technology choices.

⁴⁰ ID4D Diagnostic 2020

On data protection, in October 2019, the Government of Angola set up the Angolan Data Protection Agency⁴¹ (*Agência Angolana de Protecção de Dados*) (APD) to supervise the collection and treatment of personal data, enforce data protection legislation, and, when needed, impose penalties. The agency employs some 150 professionals and will inspect and control the treatment of personal data by public and private entities. At the inauguration of APD, the president of the agency noted that its initial phase will focus on educating institutions and people, rather than imposing penalties or punishments.⁴² At a later stage, the duties of this agency should include sanctioning noncompliance with the Data Protection Law, promoting the implementation of codes of conduct within the scope of personal data protection, and assessing and commenting on the international transfer of personal data.

Still within data protection, specifically cybersecurity, in June 2020, MINTTICS created the National Directorate for Cybersecurity and Digital Services Policies. This entity is tasked with the design of policies to protect the national cyberspace and evaluate and assess risks to information, as well measures for regulating digital keys and electronic signatures. Statements made by the head of the directorate indicate that it is their intention to materialize the creation of the Center for Response, Study, and Treatment for ICT incidents along with the conception of a strategy for the sector, focusing on network security to guarantee the protection of critical infrastructure and vital information services.⁴³ Of 182 countries, Angola ranks 151st in the International Telecommunication Union's Global Cybersecurity Index. And, according to the Angolan Institute of Communication, the country has recorded the second highest number of cyberattacks in Africa.

The inexistence of a cross-sector ministerial dialogue coordination mechanism, along with IMA's insufficient resources to steer the digital government transformation agenda, undermines Angola's strategic vision of having a joint government⁴⁴ approach in the deployment of digital society. Horizontal and vertical coordination among government institutions and agencies is essential to harmonize digital public service provision across sectors. The flow of data and information through digital public platforms still represents a challenge, as analog processes and procedures are not being redesigned as predicted in the Strategic Plan for Electronic Governance (PEGE); instead, various institutions are digitalizing, creating data silos. This results from the inability of the government to supervise the implementation of the new organic structure for public administration, a finding of the Angolan Macrostructure Public Administration Study⁴⁵ by the Ministry of Public Administration, Labor and Social Security. This situation threatens the administrative rationalization and

⁴¹ The board is composed of a president, two executive directors, and four non-executive directors.

⁴² Antonio (2019).

⁴³ Geto (2020).

⁴⁴ According to the Angola 2025 Long-Term Strategy for Angola rationale to create and promote an Information Society and Knowledge Plan is to have a coordinated joint approach "Programa "Implementar o Sistema nacional de ciencia, tecnologia e inovacao," pages VII–39.

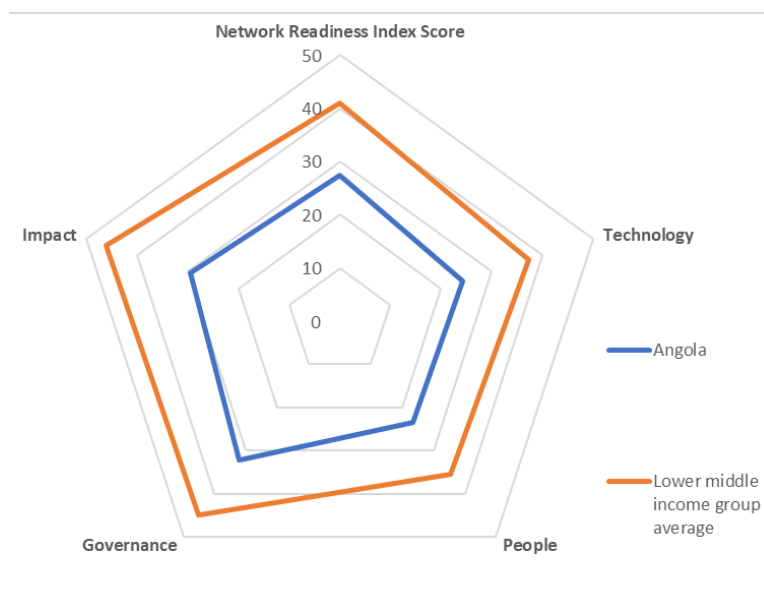
⁴⁵ <https://www.mapts.gov.ao/wp-content/uploads/2019/08/Livro-Estudo-da-Macro-Estrutura-da-Administracao-A7a%CC%83o-Pu%CC%81blica-Angolana-2000-2017.pdf>.

achievement of the preestablished strategic goals. The same study points out that, from 2000 to 2017, each ministerial department separately invested in ICT systems, such as portals, management systems, and physical infrastructure. The impact could have been greater if the departments had made a collective effort, resulting in better rationalization of government budget spending, which constitutes the primary source of funding for state reform and modernization comprising the digital transformation.

A joint government approach can enhance digital government transformation, overcoming challenges such as data duplication submission, outdated information, and human errors, as well as fostering trust, efficiency, and transparency. With this approach, information flows unrestrictedly throughout the government, allowing interoperability of the systems. The greatest concern with this type of government approach is that a whole-of-government solution may not tackle sector-specific issues.

Angola ranks 128th of 131 countries in the Network Readiness Index 2022, a composite index that evaluates the digital readiness of countries' economies through four pillars: technology, people, governance, and impact, which have 12 sub-pillars and 60 indices. The results show that there is a gap between where Angola stands and where it intends to go based on its plans. The country is below average in all the pillars and sub-pillars, even compared with lower-middle-income countries (see figure 2.6). The country must improve its efforts in implementing and monitoring the outcomes of the existing plans and policies, while working to expand enablers throughout the country.

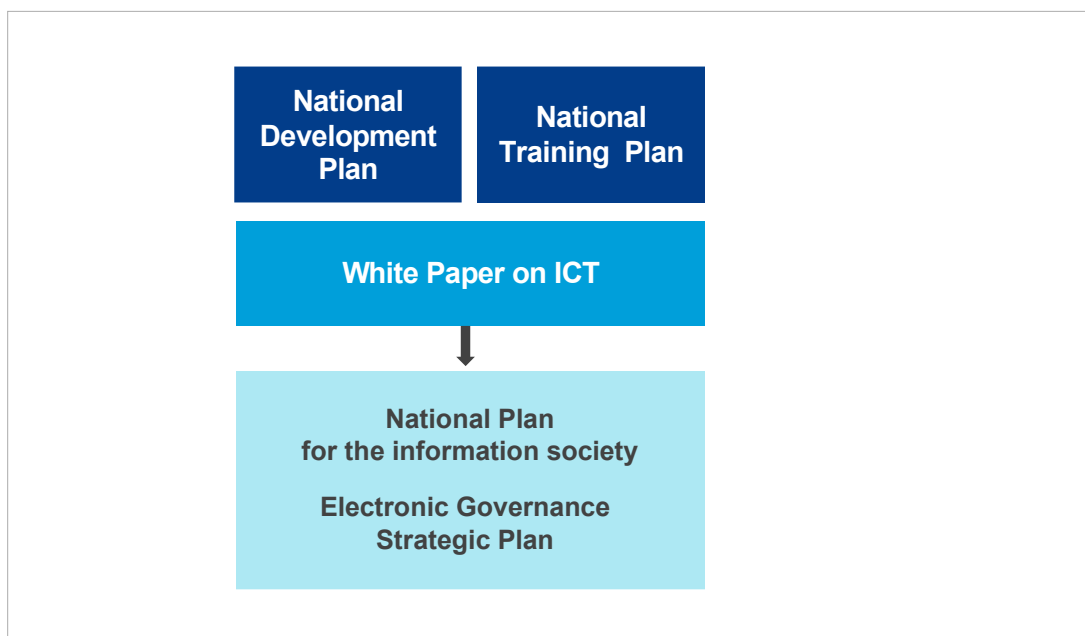
Figure 2.6: Network Readiness Index: Angola



2.3. Legal and Policy Framework

Angola put in place an ambitious e-government strategy within the broader framework of an information society policy, notwithstanding that the strategy has expired. Angola's e-government strategy, PEGE 2013–17, presented the vision for the use of ICT as an instrument for better governance. PEGE was developed as part of the National Plan for the Information Society, which defined the objectives and programs leading to the development of the information society. The plan and was based on the 2011 White Paper on ICT, which laid out the policy guidelines for the ICT sector.⁴⁶ Figure 2.7 depicts the organization of the guiding policy documents for e-government.

Figure 2.7: Guiding Policy Documents for E-Government



Source: Teta 2013.

PEGE combined ambitious targets (such as the use of digital public services by a minimum of 10 percent of the population) with concrete objectives, projects, and programs for modernization (see table 2.3). PEGE also developed an electronic governance model for Angola that encompassed various electronic portals, applications, and systems providing multichannel (digital and non-digital) access and founded on common data and interoperable IT infrastructure (see figure 2.8). Since the initiation of PEGE, the number and use of digital public services have increased significantly.⁴⁷

⁴⁶ According to OECD (2018), “experience has shown that designing strategic plans within the broader context of information society strategies (and national development plans) can enhance coherence with relevant government policy priorities, such as telecommunication, infrastructure, Internet accessibility, digital literacy and digital inclusion.”

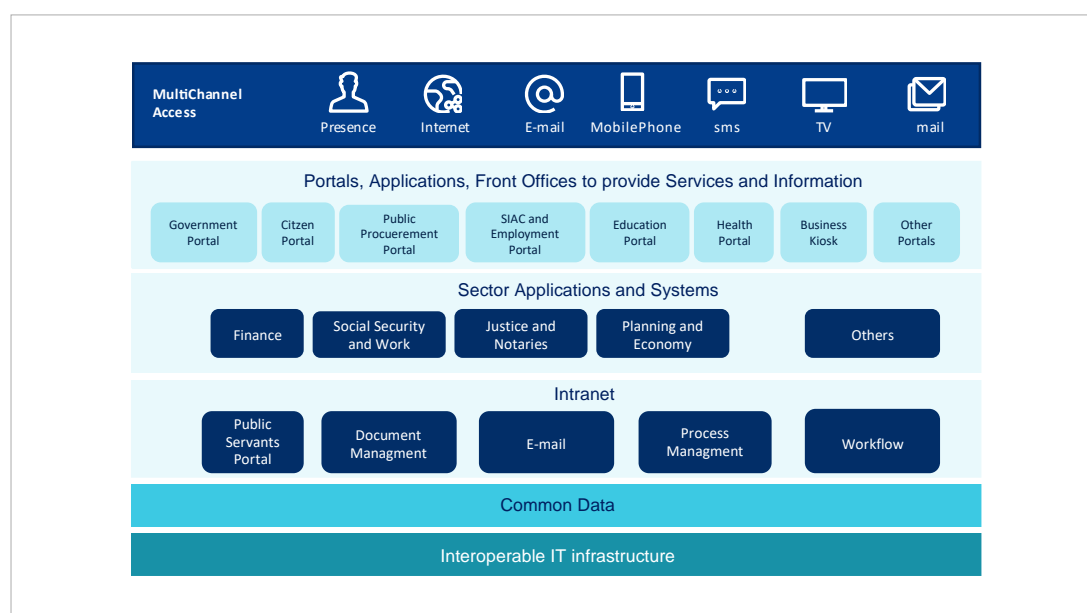
⁴⁷ OECD (2018).

Table 2.3: PEGE’s Main Pillars of Action

Line of action within PEGE	Programs
A - Focus on Delivering Services to Ordinary Citizens	1. Centralization of Services to Citizens 2. Communication and Information to Citizens
B - Improve the Efficiency and Effectiveness of the State	3. Shared Services 4. Modernization of Citizen Support Systems and Processes 5. Systems and Processes for Improving the Internal Functioning of Public Administration
C - Empower Public Officials and Public Institutions	6. Public Employee “Online” 7. Public Administration Mobilization and Training
D - Ensure Modern, Interoperable, and Secure Technological Infrastructures in the Public Sector	8. Interoperability in Public Administration 9. Cybersecurity 10. Infrastructures and Services for Communication between Public Administrations

Source: Government of Angola’s Strategic Plan for Electronic Governance 2013–17.

Figure 2.8: PEGE’s Electronic Governance Model for Angola



Source: Government of Angola Strategic Plan for Electronic Governance 2013–17.

The Government’s ICT White Paper for 2019–22 does not provide a clear action plan for e-government initiatives. It is aligned with the latest National Development Plan 2018–22, among other reform strategies and agendas.⁴⁸ Similar to the previous ICT White Paper, it is intended to establish the government’s policy measures for the ICT

⁴⁸ Including the 2025 Long-Term Strategy for Angola (*Estratégia de Longo Prazo*), the 2020 Agenda Connect, and Agenda 2063 of the African Union.

sector. The pillar for the technological modernization of the public administration lays out several e-government initiatives, including implementation of the government's interoperability system and the concept of a single point of contact, implementation of digital systems for the modernization and administrative simplification of service provision (which defines the characteristics that digital public platforms should have⁴⁹), and development of new digital and shared services by strengthening the adoption of IT services and the use of ICT across various sectors.⁵⁰

Interoperability is identified as a key policy priority for advancing digital government in Angola. The National Plan of Global Architecture for the Interoperability of the Central and Local Administration (*Plano Nacional da Arquitetura Global para a Interoperabilidade da Administração Central e Local do Estado*) (PNAGIA)⁵¹ was approved by Presidential Decree in 2018 to facilitate sharing of data, information, and systems across agencies and to enhance the proximity, diversity, and efficiency of services offered to citizens and businesses. PNAGIA provides for the interconnection of government information systems and calls for an Interoperability platform to provide a technological interface that facilitates secure communication between information systems and serves as a point of access for information across public entities.

Infrastructure sharing is also a key component of Angola's digital government transformation. The country regulates infrastructure sharing by Presidential Decree number 166/14 of July 10, 2014. The law is set primarily to focus on telecom operators' passive and active infrastructure sharing to foster broadband connectivity to rural areas. There is a need to extend the approach, mainly to apply it to other entities and types of digital ICT sharing.

Angola has adopted comprehensive legislation related to data protection and privacy provisions. The Constitution of Angola protects the right to privacy and data protection and recognizes the right to *habeas data*.⁵² Individuals are entitled to access their personal data, to be informed of the intended purposes of processing personal data, and to request personal data to be corrected or updated. Angola is also one of only 17 African countries with a Data Protection Law⁵³ (Law 21/11 of June 17, 2011), which was modeled after the European Data Protection Directive (Directive 95/46/EC). The Law allowed for the creation of the APD to monitor compliance with data protection laws and regulations. Among other positive aspects, the Law contains restrictions on cross-border data transfers to countries without adequate data protection, which

⁴⁹ These include the abilities to: (1) facilitate direct or indirect transactions between information systems and users, and to extract values from those transactions; (2) collect, use, and process large amounts of personal and non-personal data, to optimize the user experience; (3) build networks in which each additional user enhances the experience of all other users; (4) create and shape new operating models in more efficient arrangements, which bring benefits to all users, acting in a disruptive way over traditional models; and (5) organize new forms of social participation based on the collection, processing, alteration, and editing of information.

⁵⁰ Strengthening the use of ICTs was detailed for the following sectors: health, education, agriculture, environment, fisheries, industry, trade, water and energy, construction and public works, and rural development.

⁵¹ PNAGIA was developed based on the principles of integrated services, universal identification, privacy and security, and immutability of government applications.

⁵² *Habeas data* is an individual complaint file before a constitutional court and related to the privacy of personal data.

⁵³ Rich (2015).

require written consent of the individual and authorization from the APD. Although there are no requirements for notifications in the event of a data security breach, this does seem to be required under the Law on Electronic Communications and Information Society Services. Angola also has a cybersecurity law—the Protection of Information Systems and Networks Law (Law 7/17 of February 16, 2017)—although it lacks clarity on its interpretation and scope,⁵⁴ and it includes cybercrime in its Criminal Code. More recently, Angola ratified the African Union Convention on Cybersecurity and Data Protection (approved for ratification by Resolution 33/19). Annex A provides a summary of the relevant legislation and policy provisions.

Despite its strengths, Angola’s data protection legislation is missing some up-to-date international good practices, and enforcement has thus far been limited. The European Union’s General Data Protection Regulation⁵⁵ (GDPR) replaced the European Data Protection Directive in 2018 and significantly changed the European Union’s privacy regulations, including through the incorporation of “data protection by design” (privacy by design⁵⁶) and “data protection by default” requirements. These approaches require that organizations proactively consider privacy in the design and operation of IT systems, and for the default settings related to sharing personal data to be the most privacy friendly. Angola’s data protection legislation lacks these principles. Further, the GDPR introduced the direct responsibility of data processors (in addition to data controllers) for data protection, which has led technological providers, among others, to prioritize privacy and data protection when designing and implementing systems. By contrast, the focus of Angola’s legislation is on data controllers, with the responsibility of data processors, as a rule, governed mainly by the data processing agreement with the controller. Finally, Angola’s relatively new APD, has made limited efforts at enforcement.

Angola has a weak policy framework guaranteeing access to information and data. The Constitution does not provide for the freedom of information. While a Freedom of Information Law (Law 11/02 of August 16, 2002 on Access to Documents held by Public Authorities) was approved in 2002, in practice, there is inconsistent implementation of the law and it remains challenging to access information, particularly given the limited information that is proactively disclosed. Angola does not have a policy foundation for open data, which would establish the right to reuse government data and would define the processes, responsibilities, timelines, resources, and appropriate privacy and data protection safeguards, as well as the institutional mandates for proactive disclosure of government data.⁵⁷ Angola is not a member of the Open Government Partnership, whose members commit to increasing the availability

⁵⁴ Government entities are not expressly covered by the law, although they are highly vulnerable to cyberattack.

⁵⁵ Regulation (EU) 2016/679.

⁵⁶ In the 1990s, Dr. Anne Cavoukian of Ryerson University in Canada coined the term “privacy by design,” which she explained through seven core principles and eleven connected practices, including purpose specification; collection limitation; data minimization; use, retention, and disclosure limitation; security; accountability; and openness.

⁵⁷ [Opendatabarometer.org](https://www.opendatabarometer.org) and World Wide Web Foundation (2017).

of information on government activities, including by publishing data on government spending and performance, as well as publishing data that are accessible, timely, and in formats facilitating reuse by citizens. Angola's status on open data is evident in its ranking of 125 of 187 countries on Open Data Watch's 2020 Open Data Inventory.

2.4. Digital Public Services

The services provided by digital public platforms can be broadly categorized as follows:

1. Government-to-citizen (G2C) and government-to-business (G2B) platforms focus on front-end, client-facing service delivery.
2. Government-to-government (G2G) and other government core systems platforms focus on back-office systems that enhance and streamline internal operations and are essential in managing core public functions and services horizontally and vertically across different levels of government.
3. Citizen-to-government (C2G) platforms enable citizens and governments to connect and exchange information, thus facilitating transparency, citizen engagement, and accountability. C2G also includes platforms that provide open and reusable public sector data.

Government-to-Citizen and Government-to-Business Platforms

Portal for Electronic Public Services (SEPE).⁵⁸ SEPE was launched in January 2019 by MINTTICS together with the Ministry of Economy and Planning to provide a single and centralized platform and access point for government information and services. In this way, SEPE is intended to fulfill the role of the "interoperability platform" referred to in e-government strategies. SEPE aims to address the challenge of fragmentation of government portals and online services by connecting each department or agency's back-office systems across different ministries with a unique front-end; however, as discussed below, most government websites and online services still operate separate from SEPE. By promoting an integrated and systematic approach to digital services, the portal aims to reduce waiting times, simplify processes, speed up public service delivery, and reduce the costs of communication and service delivery.

Currently, SEPE provides access to more than 170 services across 15 government agencies. The services include downloading schoolbooks free of charge, creating a company online, printing Social Security cards, providing tax identification number validation, providing import/export licenses, and obtaining property registration certificates, among others. SEPE can be accessed via the online portal (see figure 2.9) or mobile application (see figure 2.10). The fact that the portal requires a valid

⁵⁸ <https://www.sepe.gov.ao>.

taxpayer number for registration implies that the coverage of the services available on the platform is even lower than the ID coverage rate, which is around 30 percent.

Figure 2.9: Portal for Electronic Public Services-SEPE



Source: www.sepe.gov.ao.

Figure 2.10: SEPE Mobile Application



Source: Google Store.

*Municipal Portal (Portal do Município).*⁵⁹ The Municipal Portal simplifies the payment of fees and charges at the municipal level, thereby boosting the revenue collection capacity of municipal governments. It is integrated with a payment gateway that allows various digital and non-digital payment methods, such as internet banking, mobile banking, automated teller machines (ATMs), and automatic payment terminals (also known as point-of-sale systems). The transaction slip is sent by the bank interchange system and when payments are confirmed by the system, the issuance of the service is confirmed in the portal. To access services, citizens must register and be validated by the portal. The portal has been rolled out to 164 municipalities (and all urban districts) by the Ministry of Finance, with plans to expand to the commune level.

*Taxpayer Portal (Portal do Contribuinte).*⁶⁰ This portal enables registered taxpayers (individuals and organizations) to pay taxes online. Taxpayers can perform the following online services through the portal: registering, filing tax returns, making tax and nontax payments, consulting taxpayer data, generating proof of registration, generating movement status, consulting settlements, settling taxes,⁶¹ accessing the fiscal calendar, and locating tax offices, among others. Citizens and businesses may also submit tax forms through the portal.

Most of the General Tax Administration's (AGT's) services are also available through a mobile application (AGT Mobile), as part of AGT's strategy to ensure greater proximity and convenience to taxpayers in consulting and regularizing their tax situation.

⁵⁹ <https://municipal.minfin.gov.ao/PortalMunicipal/#/>.

⁶⁰ This is the front-end portal connected to the back-end Integrated Tax Administration System, managed by the General Tax Administration (*Administração Geral Tributária*) in the Ministry of Finance, <https://portaldocontribuinte.minfin.gov.ao/>,

⁶¹ The payment is not fully executed by the portal. The portal generates a payment reference for taxpayers, and taxpayers can pay via ATM, bank transfer, portal, or mobile application.

E-Procurement Portal (Compras Públicas).⁶² The portal allows government institutions to engage with bidders online. For businesses to bid, they must first register in the portal and provide their proposals through the portal. The portal allows for electronic auctions. By digitalizing public procurement, the portal is intended to reduce the cost of goods and services purchased by the state, promote competition and transparency, combat corruption, reduce bureaucracy, and contribute to the state's reform program. Paper and electronic bidding will coexist until full implementation.

Social Security Portal (Portal do INSS).⁶³ The National Institute of Social Security (INSS) portal provides information related to Social Security contributions (including of the self-employed), as well as information to pensioners about when payments are scheduled and available at the bank. Other digital services that are currently available include accessing and printing Social Security cards (*Cartão de Segurado*) and submitting complaints and questions. The portal links the INSS application to facilitate and expedite registration as well as submission of the remuneration sheet. A direct online communication channel between citizens, companies, and INSS⁶⁴ and a direct payment option through the portal are under development.

Investor Portal (Portal do Investidor).⁶⁵ The portal enables the sale of Treasury bonds to Individuals and organizations online. To invest in Treasury bonds, it is necessary to have an international bank account number, active bank account, e-mail, and valid tax identification number.

Single Kiosk for Businesses (Guichet Único da Empresa) (GUE).⁶⁶ The GUE provides an online, one-stop service for company registration. Online, the GUE is available through SEPE as well as its own independent website. The GUE is seen to reduce bureaucracy and administrative processes involved in setting up a business, to improve Angola's Ease of Doing Business ranking. According to the government, currently it takes just two days to start a business in Angola.

In addition to online service platforms, several government websites provide information on the menu of services offered by a specific agency or department and how to access them. These are mostly descriptive, although in some cases users can directly access documents, forms, legislation, and procedures and view the status of their requests. Examples of these are the Government Portal,⁶⁷ the Ministry of Justice and Human Rights Portal,⁶⁸ the Integrated Citizen's Services (*Serviço Integrado de*

⁶² This is the client-facing component of the Electronic Public Procurement System, <https://compraspublicas.minfin.gov.ao/ComprasPublicas/#!/>.

⁶³ www.inss.gov.ao.

⁶⁴ The INSS has a register of 142,817 taxpayers (companies), 1,849,583 insured (registered workers), and 142,817 beneficiaries. It paid 2,088,939 installments, representing an operating expense of Kz 205,6 Billion (or approximately US\$813 million) (Source: *Jornal de Angola* cited in SIAC news, March 7th, 2020).

⁶⁵ <https://portaldoinvestidor.minfin.gov.ao/PortalInvestidor/#!/>.

⁶⁶ <https://www.gue.gov.ao/ao/>.

⁶⁷ The Government Portal (*Portal do Governo Angolano*) (<http://www.governo.gov.ao/>) allows navigation from a central repository. From this portal, it is possible to access all other government portals/websites, which are standardized to provide a consistent and similar interface.

⁶⁸ Informs citizens and businesses of the procedures and locations to obtain services and documents, such as property registration, civil registration, automobile registration, and criminal certificates, among others (<http://www.servicos.minjusdh.gov.ao/outros-servicos-ao-cidadao>).

atendimento ao cidadão) (SIAC)⁶⁹ website, and the ID Card Public Information System.⁷⁰

Government-to-Government and Other Core Government Systems

Civil and Criminal Identification Integrated Management Platform (Plataforma de Gestão Integrada da Identificação Civil e Criminal) (PGIBI). In Angola, identification is critical for accessing public services and facilitating inclusion and participation in local economic development. Therefore, identification is one of the main challenges to reversing the current low rates of coverage in birth registration and ID. One of the initiatives to reverse this is PGIBI, which was launched in 2017 with the production of the new ID card (*bilhete de identidade*) and updated in 2019 to the integrated ID card (*BI Integrado*). Along with updating the ID card, the Ministry of Justice and Human Rights (Minjusdh) launched the Birth Promotion Registration and ID card Issuance Project (*Projecto de Massificação do Registo Civil e Atribuição do Bilhete de Identidade*),⁷¹ which has projected that it will register 12 million people by 2022.

Civil registration system. According to the 2014 Census, only 53 percent of the population have their births registered. The Program for the Modernization, Simplification and Computerization of Registry and Notary Services was launched in 2006 to modernize civil registration services, including by aiming to digitalize all civil registration offices. Despite these ambitions, the results have thus far been limited, with most civil registration offices maintaining paper-based records.

For the minority of offices with digital services, there are two independent IT systems—PROMOREN and SIRC—that are currently used for civil registration and the issuance of related documents, including birth certificates. PROMOREN is a web-based solution with a centralized database and biometric collection mechanisms (digital printing and photography). It is only used in two interconnected offices in Luanda. SIRC is also a web-based solution but without a central database or connection between the civil registration units using the system. Each unit must have its own technological infrastructure and at least one computer technician to operate SIRC and store data.

Integrated Financial Management Information System (SIGFE). The central government and all subnational bodies use SIGFE to manage the budget preparation and execution processes.⁷² SIGFE currently has about 30,000 users and is installed in all central and provincial bodies. It has been rolled out to 164 municipal administrations.

⁶⁹ SIAC is another government initiative to improve public service provision. There are 13 SIAC offices throughout the country. SIAC's website (<http://www.siac.gv.ao/pt/>) publishes information on procedures for obtaining documents and the status of applications (for example, users can query the status of their ID card, car registration, Social Security card, or property certificate). Citizens can also make appointments for specific consultations but must be registered for this purpose.

⁷⁰ Allows users to access information on the requirements for obtaining an ID card and track the status of their applications. However, citizens are still required to apply for and pick up ID cards in person at an ID office (<https://bi.minjusdh.gov.ao/#/home>).

⁷¹ <https://governo.gov.ao/ao/noticias/brigadas-de-registo-civil-atingem-todos-municipios/>.

⁷² SIGFE is comprised of several subsystems, namely budget preparation, accounting, fixed assets, internal control, Treasury, salaries, and reporting.

Nonetheless, about 40 percent of the municipalities do not have consistent access to the internet and need to go to their provincial capital to carry out transactions.

Integrated Public Investment Management System (SIPIP). SIPIP supports management of the public investments program life cycle, including submission, screening, approval of project proposals, and allocation and execution of the capital budget. The system has yet to be transferred from the Ministry of Economy and Planning, although the Public Investment Department was transferred to the Ministry of Finance two years ago. Currently, SIPIP is not functional, which has a detrimental effect on the project selection process, and it remains disconnected from SIGFE, resulting in a lack of coordination between plans and budgets.

Integrated Tax Management System (SIGT). SIGT is intended to automate the tax collection and tax debt management and audit functions. It covers the taxpayer register, submission of declarative obligations, settlement and payment of taxes, and collection and classification of revenues for the Single Treasury Account.

Implementation began in 2017 by the AGT, to ensure the dematerialization of tax procedures and processes. The system is already implemented in more than 84 tax agencies nationwide, which corresponds to 99 percent coverage of the country. It is also implemented in 50 branches of commercial banks and more than 17 municipal administrations, and institutions that started to carry out liquidations on behalf of AGT. SIGT has been deployed, but it is not yet fully automated to support collection and tax debt management and audit functions, and it is not fully integrated with other government agencies. Although electronic payments are still not possible through the system, it provides a payment reference for processing payments through ATMs and online banking applications and portals.

Integrated Procurement System (SNCPE). SNCPE was created in 2017 as the basic tool for executing procurement processes in public procurement units. It aims to cover the entire procurement cycle, from procurement planning to invoice settlement, allowing buyers and sellers to perform transactions electronically. The system allows for (1) insertion of needs by contracting entities, (2) technical specifications, (3) publication of notices, (4) submission of bids, (5) opening and evaluation of bids, (6) reverse auction, and (7) contract award. The contract itself is drawn up outside the system; however, the platform is being updated to integrate the contract into the system through a contract management module as well as a three-way match functionality.⁷³ All bidders must be registered with the Ministry of Finance's supplier's database. SNCPE was piloted in 2018 to assess the potential savings and how to adapt the system to the realities of Angolan procurement units.

SNCPE has so far held more than 12 electronic auctions and processed a total of 15 public tenders, which involved the Ministries of Education, Health, and Public Works

⁷³ The "three-way match" concept refers to matching three documents—the invoice, the purchase order, and the receiving report—to ensure that a payment should be made. If the three-way match reveals that the supplier invoice is in good order, then the accounts payable staff processes the invoice for payment.

and a wide range of suppliers and bid products. As of March 2020, the total amount of savings was more than Kz 99.4 billion (approximately US\$171.5 million),⁷⁴ corresponding to 38 percent of the initial estimated amount planned by the procurement units.

Angolan Land Information Management System (SAGIT). SAGIT provides a consolidated database infrastructure that enables a better relationship between land and owner(s) by improving the transparency of tenure rights and simplifying the integration of international standards associated with the Land Administration Domain Model (International Organization for Standardization 19152).

SAGIT supports the Ministry of Public Works and Territorial Planning through the Geographical and Cadastral Institute of Angola, with land management and land administration functions. The functions include maintenance of the National Land Cadaster related to current land use, occupation rights, claims, and conflicts and street addressing and zoning, among other functions. SAGIT was built and customized by the Angola Terra Project (2015–17) to facilitate the governance of tenure by promoting not just secure tenure rights, but also equitable access to land, fisheries, and forest as a means of eradicating hunger and poverty while supporting sustainable development and enhancing the environment.

Integrated ICT Monitoring System (SIMTIC). SIMTIC was developed to monitor the performance of e-government implementation strategies under MINTTICS. The system has two modules, one for monitoring projects and another for monitoring ICT indicators. With SIMTIC, MINTTICS will automate the collection of information necessary for the annual production and dissemination of the Yearbook on the State of IT in Angola.⁷⁵

Health Information System (Sistema de Informação Sanitária Municipal-Versão 2). The Health Information System is an open-source platform that is operational in health offices at the central and subnational levels. Each month, health centers and municipal hospitals transmit paper-based reports to municipal offices (*Repartição Municipal da Saude*) that combine and send them electronically to the provinces, which further consolidate and enter the data into the online database.

The effectiveness of the system is currently constrained by the following factors: (1) poor and unreliable data quality, considering the process for data collection is partially paper based; (2) weak overall technological capacity and telecommunications infrastructure, as the files at the municipal level are physically sent and communication with the provinces is poor; and (3) limited public information disclosure.

⁷⁴ Conversion rate of US\$1 = Kz 579.43.

⁷⁵ International Business Publications (2017) and National Plan for the Information Society 2013–17.

Education Information Management System (Sistema de Informação e Gestão da Educação) (SIGE). SIGE was developed and is managed by the FORDESI Company. SIGE collects and manages data online or offline and serves to monitor and streamline the process of collecting school data across all educational establishments in the country. The data produced by SIGE are not publicly available. All the raw data are stored in databases owned by the company, which then makes the aggregated data available to the Ministry of Education. The system does not currently enable G2G services, and the raw data are not available on the digital platform.

Citizen-to-Government

There are few examples of C2G platforms that enable citizen feedback and exchange of information with citizens. Growth in Angola's online services is primarily G2C, G2B, and G2G. There are some examples of platforms that enable citizens to interact with the government, mainly to submit a complaint or ask a question. However, most platforms do not allow for deeper interaction, for example by enabling citizens to rate government services or performance or participate in the elaboration of their municipality's budget.

SEPE has begun to enable interactions with citizens, by allowing citizens to register complaints and police incidents, such as thefts, or request support from customer service providers (*provedor do consumidor*); however, these efforts are still nascent. The ICT White Paper states that functionalities that promote citizen participation will be added to institutional websites, including a feedback channel, a Citizen Information Service to forward and monitor requests for access to information, an Executive Transparency Portal (the details of which are not specified), and a portal for the publication and debate of public policies with society.

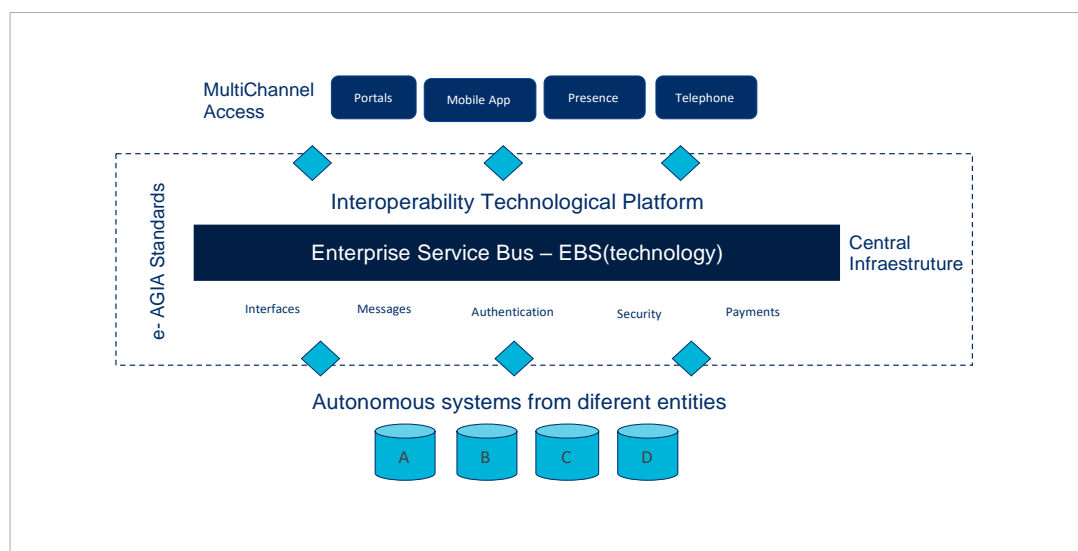
2.5. Interoperability and Shared Services

Interoperability is the ability of different databases, systems, and devices—within and across organizations—to communicate with and understand each other, including via wired connections, application programming interfaces, and web-based and cloud services, among others. Interoperability is crucial for implementing shared systems and services, reducing duplicate data collection, and automating business processes.

The Government of Angola recognizes that interoperability is essential for its digital transformation and has therefore developed an interoperability framework captured by the PNAGIA. The definition of the e-government interoperability architecture (Quadro Governamental de Interoperabilidade) (e-AGIA) provides technical and technological guidelines allowing different systems to exchange information securely (figure 2.11). It also provides a set of regulations and institutional

arrangements governing access to information among participating entities, promoting a coordinated approach to reducing the digital fragmentation that currently exists in the provision of public services. The e-AGIA recognizes the importance of multichannel provision of services, a central technological infrastructure (also known as the Interoperability Platform), and interconnected databases across government systems as key components of interoperability.

Figure 2.11: Angola’s E-Government Interoperability Architecture



Source: Government of Angola’s National Plan of Global Architecture for the Interoperability of the Central and Local Administration, 2017.

A first step toward achieving greater interoperability and service sharing was the development of the government’s private network (Rede Privativa do Estado), an intranet service that “connects government agencies and provides a common infrastructure for shared digital services across the public sector.”⁷⁶ Based on the G2G model, this network brings together ministerial departments and provincial, municipal, and communal government agencies and enables greater interaction between them through a “standard system of email addresses, video-conferencing and data and service sharing,” thereby reducing infrastructure costs; however, the reliability of this network has decreased with time, forcing government entities to turn to the private sector for their connectivity needs.

A second step toward interoperability was the creation of SEPE, an interoperability digital platform. SEPE provides integrated and shared services to all government agencies to optimize the use of existing technologies. The shared services that are (or will be) offered through this platform include the following:

- Authentication of identity with reference to the national ID database—this is still a challenge and not always available.

⁷⁶ OECD (2018).

- Centralized hosting services.
- End-to-end electronic payment (still in development)—currently services cannot entirely be paid electronically; instead, applicants receive a reference number and with that they pay via ATM or an online banking platform provided by respective banks.
- Single sign-on capability (still in development)—this will allow citizens to log in only once using a single set of credentials to access several government systems, instead of requiring different sets of credentials and multiple log-in prompts for each system.
- Public key infrastructure (still in development) to implement digital signatures (the platform intends to use digital signatures to provide some paperless services to businesses, for example, the constitution of a business entity⁷⁷).

Interoperability is not limited to digital systems and IT architecture interconnection; it also includes legal, semantic, and organizational processes across government agencies.⁷⁸ In a country where public administration is centered on the local citizen, a common service-level agreement by the government must be created to ensure inclusive and efficient service provision everywhere. For that to happen, the regulatory and legal instruments of different institutions must be able to coexist, to allow institutions to set the same experience throughout the government, allowing for alignment of due dates for services and communication with public workers.

Furthermore, there are several examples of interoperability permitting data sharing and interconnectivity across certain government systems and databases. Data are exchanged between the taxpayer register and the national identification database for the generation of the Unique Tax Number (NIF). The ID and NIF are used by several other government back-office systems, such as SIGFE, the Investor Portal, INSS, and the e-procurement portal. The NIF is also made available by AGT to the National Bank of Angola, financial institutions, and other entities such as the Ministry of Commerce, which also integrates this information with the import licensing system. Voter ID numbers that have been suspended or terminated are apparently shared with some entities.

2.6. Recommendations and Next Steps

To achieve the vision of digital transformation Angola has laid out in its e-government strategies and National Development Plan, key recommendations for digital public platforms include the following.

⁷⁷ Reforma do Licenciamento Comercial em Angola: Reduzindo a Burocracia para Facilitar a Actividade Comercial. Projecto de reforma do ambiente de negócios (P163713).

⁷⁸ World Bank, 2020. ID4D Practitioners Guide.

Institutional Arrangements and Coordination

R 2.1 Strengthen IMA’s capacity as an enforcer of standards and guidelines to ensure a coherent approach to the development of digital government. IMA should have a stronger role in monitoring and evaluating the development of all e-government initiatives, as well as assessing ministries’ compliance with the established guidelines. Activities should include taking stock of the available digital services, monitoring their status, and measuring progress in terms of the number of users and transactions, efficiency, cost-effectiveness, interoperability, data protection, and meeting citizens’ needs for information and services. This should be aligned with an updated e-government strategy that lays out concrete objectives, results, and projects. SIMTIC (the IT system that monitors progress on e-government strategies) should be upgraded to support these functions. This calls for a significant boost in resources as well as serious investments in IMA’s institutional, technical, human, and leadership capacities.

R 2.2 Establish IMA’s Council for Information Technologies to create an ICT coordination mechanism among cross-sector government ministries to create a platform to disseminate and update ICT standards and guidelines, monitoring the deployment of the digital transformation strategic actions, while creating a space to foster and nurture synergies.

Legal and Policy Framework

R 2.3 Update data protection legislation in line with international good practices. In particular, review the alignment between Angola’s Data Protection Law and the European Union’s GDPR and consider how “privacy by design” requirements could be incorporated into the legal framework.

R 2.4 Develop a whole-of-government digital transformation strategy. The previous e-government strategic plan ended in 2017. Although the 2019–22 ICT White Paper has updated the government’s vision as it relates to modernizing public administration, it is missing the detailed objectives, results, programs, and projects that are needed to achieve this.

R 2.5 Develop a cybersecurity strategy to build government capacity. This should include an updated legal and regulatory framework on cybersecurity, a dedicated budget for cybersecurity, the creation of a government agency responsible for cybersecurity—separate from the role and functions of the APD—and capacity building and awareness raising on the importance of and regulations around cybersecurity.

Digital Services

R 2.6 Improve ICT infrastructure and internet connectivity. As Angola advances in its digital transformation and decentralization agenda, extending the operationalization of online service platforms to all levels (from central to provincial, municipal, and communal) will prove challenging, particularly given unreliable or inexistent

connectivity throughout the country, especially in smaller and more rural municipalities, which could undermine the potential benefits of decentralizing government functions through interoperable systems.

R 2.7 Reinforce the digital authentication layer for e-government services. Considering that the government has launched a portal for electronic public services (SEPE), it is important that users (citizens and companies) are able to access digital government services securely. To this effect, it is important to ensure that secure and user-friendly authentication mechanisms are available. It is recommended that the mechanism integrates (1) the use of multi-factor authentication; (2) adequate security mapping and authentication levels based on the risk induced by fraudulent access to services; (3) the deployment of relevant security technologies to enable the highest levels of assurance and thus provide access to all services, including those that demand the highest level of security; and (4) adequate cybersecurity infrastructure. Communication campaigns and promotion activities should be encouraged.

R 2.8 Adopt a new IT system for civil registration that can be scaled up and enables the creation of a centralized civil registration database. It is essential to have a secure, reliable, and centralized civil registration database that records all vital life events (from birth to death) and allows for interoperability between the civil registration and ID systems. A cornerstone of any civil registration system is the technology framework upon which it is built. The two IT systems currently used for civil registration—PROMOREN and SIRC—have proven inefficient and challenging to scale up nationwide. This results in separate databases (and in places with paper-based records, no database) that are managed at different civil registration offices. Therefore, a new computerized system should be acquired that can consolidate information from computerized and noncomputerized offices, allowing for manual and automated data entry. Multiple aspects of technology need to be considered, including hardware and software quality, and standards for hardware, biometric capture and storage, authentication methods, and structuring of unique ID numbers. Technology and vendor lock-in (that is, being restricted to certain types of technologies, software, or hardware from a particular vendor) hamper interoperability and the flexibility to accommodate change over time, and they can be more expensive in the long term. Robust ICT procurement guidelines must be in place to facilitate competition and innovation and prevent possible technology lock-in.

R 2.9 Prioritize citizen-centric digital services and adopt the once-only principle between agencies to reduce document requirements. Refocus the development of digital services on meeting citizens' needs for information and services, including by engaging citizens during the design and development stages for digital public platforms, and seeking their feedback during implementation, while improving the quality-of-service monitoring capabilities. Furthermore, all the e-government initiatives should be developed based on the adoption of the once-only principle, which

ensures citizens and businesses supply the same information only once when accessing public services.

Interoperability and Shared Services

R 2.10 Ensure the adoption of e-AGIA to overcome inefficiencies such as fragmented procurement and systems development practices. Adoption of e-AGIA and its service reference model based on a citizen-centered approach should allow greater synergies, avoid the repetition of unnecessary platforms and portals, reduce waste and redundancies, improve the investment schedule and accurately measure returns, as well as ensure and contribute to digital inclusion and availability of assisted digital services.

R 2.11 Prioritize interoperability between the civil registration and ID systems following the creation of a centralized civil registration database. Interoperability across all government systems is ambitious; it would therefore be helpful for the Government of Angola to target certain systems and data sets to begin the process, considering the priority services to be delivered. Given the interdependency between the civil registration and ID systems, and their centrality for citizens to access most public services, focusing on building the interoperability of these systems would be central to modernization of government. Following this, the interoperability of the civil registration and ID systems with the following systems and databases should be considered: (1) a national demographics system at the National Statistical Institute (Instituto Nacional de Estatística) to maintain up-to-date statistics, (2) a taxpayer register for better monitoring of fiscal revenues, (3) an electoral register to facilitate voter registration and eliminate ghost voters, (4) a social register (Cadastro Social Unico) to facilitate targeting social programs and fight fraud, (5) a health information system to enhance the birth and death notification systems and the functioning of the civil registration system, and (6) an education information management system to facilitate school enrollment.

R 2.12 Consider establishing a unique ID number (UIN) to be leveraged across institutions to enable data sharing and interoperability. A UIN would be assigned to each citizen from birth to death. When leveraged across sectors, a UIN can enhance administrative efficiency, contribute to reducing fraud, improve social targeting, and enhance the user experience of service delivery. The UIN must be inclusive (that is, cover the entire population), trusted (reliable, secure, and accountable), and designed to add value for people and institutions. All the different identification numbers (ID, tax, voter, and so forth) should be gradually phased out so that a single number is used across government, building on the ID number. It is recommended that the government assess the costs and benefits of introducing a UIN for increasing ID coverage and inclusivity and improving access to service delivery.

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3. Digital Financial Services

Digital financial services (DFS) are considered one of the avenues through which financial inclusion can be enhanced. DFS offer great potential to meet the financial needs of poor and unbanked consumers and traditionally more vulnerable groups such as women and people in rural areas. DFS providers (banks and nonbanks) can offer financial services profitably in areas where bank branches and automated teller machines (ATMs) are not available to consumers who have historically been unprofitable to serve. Infrastructure and technology do not simply provide the required connectivity, but also the means for effectively providing in-depth financial outreach in remote areas. With mobile usage reaching 64 percent of the population, Angola has great potential to expand the use of DFS and the government has taken steps to develop a modern digital payment ecosystem. Additionally, given the big gap in access to services, including financial services between urban and rural areas, DFS can help to expand access to finance in rural areas.

FinTech firms are digitizing paper-based transaction data to identify potential demand for financial services such as credit, savings, and insurance. Secure, reliable information and communications technology (ICT)/telecommunications infrastructure and the skills to use such infrastructure, applications, content, and services are core to the success of financial inclusion and the development of other sectors that together form the basis of the digital economy. Through the Payment System Innovation Laboratory (LISPA), the Central Bank of Angola (BNA) has taken small steps to nurture a group of digital entrepreneurs with the potential to develop FinTech solutions. This initiative is part of BNA's long-term strategy to modernize the country's payment system and develop local capacity.

The World Bank, through the Universal Financial Access (UFA 2020) initiative, has vowed to reduce the number of financially excluded people, globally estimated at 1.7 billion today. Furthermore, the Bali Fintech Agenda, which was launched in October 2018 by the World Bank and the International Monetary Fund (IMF), proposes a framework on high-level FinTech issues that countries should consider in their domestic policy discussions. Beyond policy matters, innovative infrastructure models are emerging issues that countries are looking at, particularly in Sub-Saharan Africa where 57 percent of adults (15 years and older) are still excluded from financial services, compared with the global average of 31.5 percent. Nevertheless, with a population of some 1.2 billion people across 54 countries, estimates from the Global Findex 2017 data indicate some progress has been made since 2011, with adults with a financial institution account increasing from 34 to 43 percent. In Angola, 48.8 percent of adults had a financial account in 2019, an increase from 29.3 percent in 2014.⁷⁹

⁷⁹ World Bank (2020).

In the past decade, mobile money has become a global story. Sub-Saharan Africa has been a major driver of this success, playing host to almost half of all mobile money deployments worldwide, as well as almost half of all countries where mobile money is available. Building on the Digital Economy for Africa (DE4A) assessment tool, the Digital Economy Country Assessment on Angola will focus on an overview of DFS market development, a description of the regulatory and policy framework of DFS, and recommendations on improving usage of DFS in the context of digital economy.

According to the National Development Plan 2018–22, an increase in financial inclusion levels is one of the pillars of the Angolan government’s program to develop the financial system and therefore improve the business environment. One of the pillars of the government’s Financial Sector Development Strategy (2018–22) is financial inclusion, with a focus on promoting DFS. BNA has recently prepared an Instant Payment Strategy with a clear roadmap for promoting mobile payments and system interoperability. Consistent with these national commitments, the government has prepared the legal frameworks for secured transactions and insolvency, which are expected to increase the level of access to credit.

Furthermore, the new payment systems law and related regulations will allow for the introduction of innovative financial instruments and facilitate the delivery of financial services to rural and remote areas. Moreover, the current improvement in public governance, measures against corruption and inefficiencies, and the expressed desire by the government to open the national economy to competition and innovation—namely in the public sector, banking and finance, and communications—together with the ongoing legal and regulatory reform, will hopefully lead to the entrance in the market of new players, a regulatory level playing field, and an increase in the offer of safe, secure, and affordable digital financial services that will contribute to promote financial inclusion in the country.

3.1 Diagnostic Findings: The Current State of Digital Financial Services

Angola’s banking sector is relatively large, with 25 banking financial institutions authorized to operate at the end of 2022. This includes four state-owned banks, 15 majority domestically owned private banks, five subsidiaries of foreign banks, and one foreign branch. Of the nonbank financial institutions, as of January 2023, 99 were authorized, of which 34 were currency exchange offices, 20 non-deposit-taking microcredit companies, 27 remittance service companies, two credit unions, one financial leasing company, sixteen payment service providers, and one credit cooperative. Nonetheless, the financial sector remains heavily concentrated in the banks, which account for more than 90 percent of system assets.

The financial sector regulatory framework provides BNA the authority to supervise banking and credit institutions. BNA has supervision responsibility for all banks and nonbank credit financial institutions (such as microfinance, registered cooperatives, and leasing companies). Two autonomous agencies under the Ministry of Finance (MoF) regulate capital markets and the insurance and pensions sectors. The Capital Markets Commission (CMC) regulates the capital markets. The Agency for Regulation of Insurance and Pensions (Agência Reguladora de Supervisão de Seguros) (ARSEG) regulates the insurance and pensions sectors. CMC and ARSEG report to the Minister of Finance but have their own autonomous structure and boards of directors.

In recent years, BNA has adopted a restrictive monetary policy and reforms to respond to the economic crisis caused by the drop in oil prices. The Angolan economy was in recession between 2016 and 2020—driven by the reduction of oil prices and the impact of the Covid-19 crisis—but has recovered since with the increase in oil prices. Prior to the crisis, and in response to the prolonged slump in oil prices that started 2014, the government delivered on several key reforms since taking office in 2017. BNA adopted a tight monetary policy to anchor inflation and offset the impact of the exchange rate devaluation (such tight stance was relaxed somewhat in 2019). To address the financial sector vulnerabilities, BNA increased the minimum capital requirements for banks, which led to the closure of three banks. Nonperforming loans (NPLs) decreased steadily throughout 2020, mainly due to the write-off of NPLs by Banco de Poupança e Crédito (BPC), the largest public bank, and their transfer to Recredit (a public asset management company), although they remain elevated and NPL provisions exceed capital.

The COVID-19 pandemic and the associated global economic disruptions put at risk Angola's achievements of macroeconomic stabilization and transition to a more sustainable and inclusive growth model. Prior to the COVID-19 shock, macroeconomic stability had been largely restored and maintained through a more flexible exchange rate regime, restrictive monetary policy, and fiscal consolidation. However, previous shocks, especially the steep decline of the oil price, threatened to overwhelm Angola's policy buffers and macro stability, which risked derailing the microeconomic reform agenda. Prior to the COVID-19 shock, Angola was expected to emerge from a four-year recession that followed the oil price adjustment in 2014. Instead, the recession deepened due to a renewed reduction in oil production, negative spillovers to the non-oil sector, and the impact of the fiscal and monetary tightening that is required to maintain macro stability in the face of this shock. Therefore, securing financing to cover large short-term fiscal and external needs is essential to safeguard the medium-term prospects for a more sustainable and inclusive economy.

Economic crisis, slowdown in government and private spending, shortage of foreign currency, and the authorities' measures led to a decline in banking activity in recent years. The number of institutions, lending, and deposits decreased, resulting in lack of growth of access points and availability of financial services (table 3.1 and 3.2).

Indeed, private sector credit to GDP has decreased considerably from a high of 25 percent in 2015 to 13.3 percent in 2018 and 8 percent in 2021. The BNA Asset Quality Review (conducted in 2019) concluded that the banking sector is largely robust and well capitalized. However, in the current context, the bank's exposure to government securities and the oil sector will impact profitability, stability, and intermediation. Lower oil prices will increase government bond yields, which may result in losses for banks. Furthermore, as economic conditions deteriorate, NPLs will continue to increase, which will also contribute to a reduction in profitability.⁸⁰

Table 3.1: Angola: Key Financial Access Survey Indicators

INDICATOR	2016	2017	2018
Number of ATMs per 100,000 adults	19.06	19.13	18.92
Number of commercial bank branches per 100,000 adults	10.29	10.29	9.49
Number of borrowers with commercial banks per 1,000 adults	18.17	22.76	20.06
Outstanding deposits with commercial banks (% of GDP)	42.44	36.17	35.14
Outstanding loans from commercial banks (% of GDP)	21.87	17.85	15.53
Outstanding SME loans from commercial banks (% of GDP)		3.00	2.84
Number of registered mobile money agent outlets per 1,000 square kilometers	0.12	0.33	0.46
Number of registered mobile money accounts per 1,000 adults	0.06	8.35	9.23
Value of mobile money transactions (during the reference year) (% of GDP)	0.00	0.02	0.10

Source: IMF Financial Access Survey Database, 2018.

Note: Data after 2018 are not currently available, but the downward trend can be expected to continue as three banks were put under resolution, including Banco Postal, which was an early pioneer of bank-based mobile payment services. ATMs = automated teller machines; GDP = gross domestic product; SME = small and medium-size enterprise.

⁸⁰ NPLs reached a high of 35.7 percent as of February 2020 (although nearly 90 percent of NPLs is accounted by two banks—Savings and Credit Bank (*Banco de Pounce e Crdito*) and Banco Economico, the successor bank to the BESA bank, which was put under administration in 2014.

Table 3.2: Evolution of Access Points and Payment Instruments

INDICATOR	2016	2017	2018
Number of ATMs	2,911	3,026	3,101
Number of registered mobile money agent outlets	152	412	572
Number debit cards	5,451,073	5,860,369	6,309,610
Number of credit cards	62,476	53,329	56,365

Source: IMF Financial Access Survey Database, 2018.

Banking activity in the 34 million-person country is heavily concentrated in Luanda province, which is home to Angola’s capital city, which accounts for more than a quarter of the population. The majority of the country’s commercial bank branches, ATMs, and point-of-sale (POS) systems are located in the capital city and other large urban areas, while the rural population is mainly served by agents or left unbanked. According to the Interbank Services Company (EMIS), the distribution of access points is highly unbalanced in the country. For example, there are 40 ATMs per 100,000 inhabitants in the capital city against only two per 100,000 inhabitants in the province of Bie.

Commercial banks typically serve a highly urban and better-off segment and are increasingly offering online services. In the past years, internet and mobile banking via app, offered by the main players, are seen to be an essential and ubiquitous part of the customer value proposition. Usage of internet and mobile banking services is undertaken by 33 percent of bank account owners. Use is higher among rural account owners (41 percent) than those in urban areas (32 percent). When also considering non-account owners, 12 percent of the rural population use e-banking services and use among urban residents drops to 19 percent.⁸¹

According to the World Bank’s 2019 Financial Inclusion and Capability Survey, only 49 percent of the adult population in Angola has access to a bank account.⁸² This is low by regional standards when compared with 80.63 percent in Namibia, 69.218 percent in South Africa, and 41.67 percent in Mozambique.⁸³ Additionally, the gender gap is very high: account ownership among men (55.15 percent) is 33 percent greater than that among women (41.43 percent). Such a low number is due to severe

⁸¹ World Bank (2020).

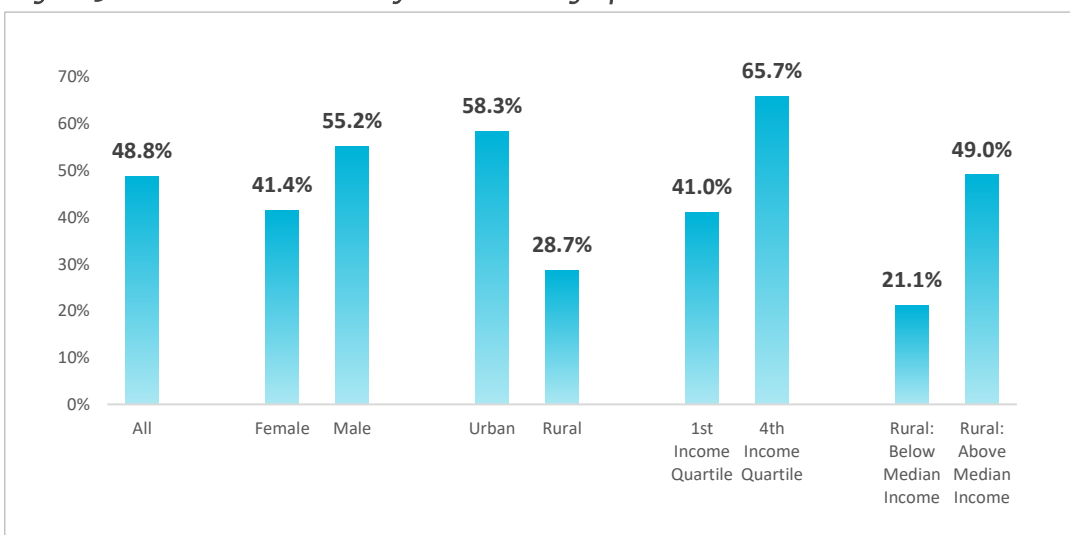
⁸² The World Bank Global Financial Inclusion Database registered the value of 29.38 percent for 2014 (account ownership at a financial institution or with a mobile money service provider, among the population ages 15+). BNA estimates that 53 percent of the adult population has access to a bank account based on available supply-side data.

⁸³ World Bank Global Financial Inclusion Database.

limitations in terms of points of access to financial services, an inadequate card payment infrastructure, a limited number of alternatives in terms of payment accounts, and a low level of financial literacy, especially in rural areas. Other problems faced by the Angolan authorities and market participants are the inadequacy and lack of trustworthiness of national identity documents, and inefficiency in terms of electricity, information technology (IT), and communications infrastructures.

As banks are highly concentrated in the urban centers, traditional financial institutions have not been able to reach low-income customers, especially in remote areas. The World Bank’s 2019 Financial Inclusion and Capability survey also revealed that only 29 percent of people in rural areas had access to an account, compared with almost 60 percent of those living in urban locations (figure 3.1). The largest gap exists between the richest and poorest segments of the population, with account ownership rates of 66 and 41 percent, respectively.

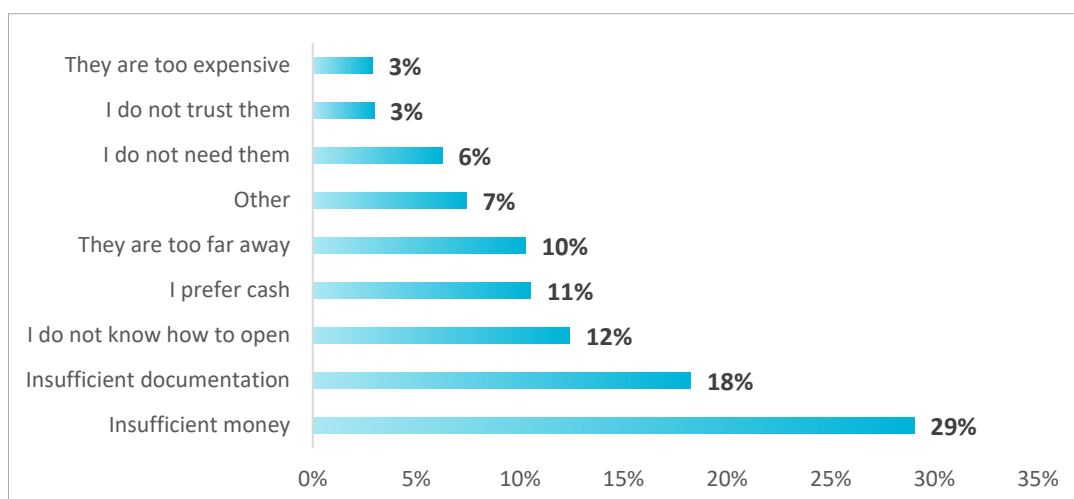
Figure 3.1: Financial Inclusion by Socio-Demographic and Income Characteristics



Source: World Bank Financial Capability Survey, Angola, 2019.

The most common reason cited by Angolans for not owning a transactional account is that they do not have enough money to acquire one (figure 3.2). More rural than urban dwellers identified as their main barriers to account ownership the lack of necessary documents (20 percent) as well as too great a distance to a branch (14 percent). The development of digital financial services is therefore considered an essential opportunity for deeper financial inclusion in Angola given its potential to lower the costs by maximizing economies of scale and allowing for more tailored financial services for the unbanked and underbanked segments of the population, including women, those living in remote areas, and those with low incomes.

Figure 3.2: Reasons for the Unbanked Not to Open a Bank Account



Source: World Bank Group Financial Capability Survey, Angola, 2019.

Banks have not yet seized the opportunity represented by agent banking to increase outreach to a nontraditional segment. Service delivery in rural areas is hampered by lack of appropriate infrastructure, insecurity, high costs, and technical limitations on the availability of mobile network operators (MNOs). Although a specific agent banking regulation has been in force since August 2012, banks, not perceiving the opportunity and due to lack of strong competition by nonbanks, have not enhanced their network—the closure of branches was not compensated with new agents. The banking network is currently insufficient to attend to the population’s financial needs, and several areas of the country lack access to financial services. Such access is somehow being addressed by small and local microfinance institutions.

The new financial sector law enacted in 2021 sets proportionality as a guiding principle for the regulation and supervision of financial providers. It regulates new types of non-bank financial institutions such as e-money issuers, saving and credit associations, payment services providers, microfinance, and microcredit providers. E-money issuers are adequately regulated, with clear responsibilities to safeguard customer funds. The legal framework allows the provision of credit by PSPs, but it’s not clear regarding mechanisms to manage credit risks, or the additional prudential requirements these institutions must follow. Several bank-led mobile payment services have been launched in recent years, including Xikila Money, which was a mobile money product launched by Banco Postal, addressed specifically to underserved and unbanked segments of the population. However, Banco Postal ceased its operations in 2019 after failing to meet the prudential requirements established by the Central Bank. In mid-2018, after only 18 months of existence, Xikila had around 200 access points (branches and agents), was accepted by more than 1,600 merchants, and had more than 200,000 active users. Xikila’s services also contributed to an increase in the number of mobile money accounts and the value of mobile banking transactions

between 2017 and 2018 (table 3.3). Facing the drawbacks described above, Angola's bank-led model has yet to tackle financial inclusion and improve access to DFS..

Today, and after the end of Xikila, there has been a considerable increase in the number of registered mobile payment providers in Angola. However, the majority of non-bank PSPs has not launched their digital payments platforms as they await for the launch of the National Instant Payments Platform (Kwik). Existing mobile money products that are available to clients, such as Unitel Money and bank led products such as BNIX from Banco de Negócios Internacionais (BNI) and e-Kwanza from Banco Angolano de Investimentos (BAI), and Multicaixa Express from EMIS have had mixed results as customers adapt to these new services. Unfortunately, these bank systems are independent of each other (closed-loop schemes), noninteroperable among them and with the other payment systems due to the lack of a mobile payment switch, which is expected to be launched in 2023. Although the two bank-led schemes have very limited scope and usage, Multicaixa Express has expanded rapidly, with 500,000+ installs⁸⁴ since its introduction in April 2019.

Recourse to formal savings and borrowing is still scarce, and innovative services such as digital credit have yet to appear. Based on the IMF Financial Access Survey (FAS) database, the total number of adults borrowing from commercial banks decreased from 360,000 in 2017 to slightly fewer than 330,000 in 2018. The number of small and medium-size enterprises (SMEs) obtaining loans from commercial banks increased from roughly 4,500 to more than 5,000 during the same period. Borrowers from deposit-taking microfinance institutions have been relatively stable since 2013, fluctuating between 2,652 in 2015 and 2,144 in 2017. Borrowers from non-deposit-taking institutions decreased by more than 30 percent between 2016 and 2017 (table 3.4), mainly driven by a decrease in loan disbursements by the Angolan Development Bank due to an increase in NPLs and a deterioration of the country's economic indicators. According to the World Bank Angola Financial Capability and Inclusion Survey, 38 percent of the population was accessing some form of credit, with a greater reliance on credit from a formal institution over informal sources of credit. This same survey found a significant reliance on informal saving instruments: 55 percent of the population utilized some form of informal savings (rotating self-help groups known locally as kixiquila, and money kept at home), while 31 percent saved at commercial banks. Only 17 percent of Angolans use the money transfer services that are available in the country (Moneygram and Western Union), with no gender split. Use of money transfer services in urban areas exceeds that in rural areas by nearly double (20.0 versus 11.5 percent).

⁸⁴ <https://play.google.com/store/apps/details?id=com.sibsint.mcxwallet&hl=en&gl=US>.

Table 3.3: Mobile Money and Internet Banking

INDICATOR	2015	2016	2017	2018
Number of mobile and internet banking transactions				5,583,895
Value of mobile and internet banking transactions (US\$ Millions)				251,501
Number of registered mobile money accounts	2,078	893	132,117	151,220
Value of mobile money transactions (US\$ Millions)	88.80242	39.00128	3,475.919	25,735.83
Number of mobile money transactions	34,091	34,128	635,952	2,689,262

Source: International Monetary Fund, Financial Access Survey Database, 2018.

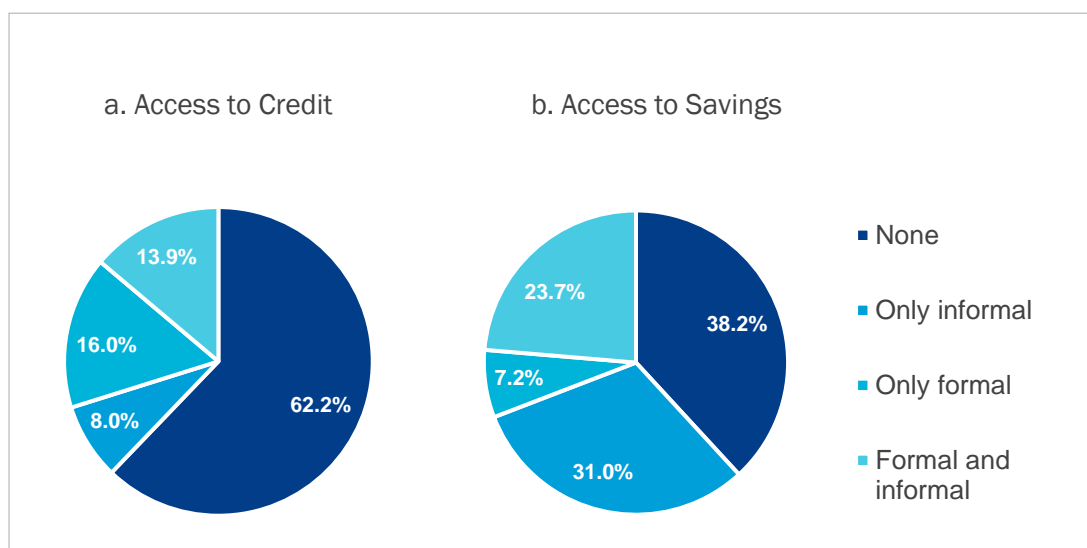
Note: The data on mobile money refer to the mobile payment products in the country (Xikila, BNIX, and e-Kawanza), which are provided by banks.

Table 3.4: Credit and Savings

INDICATOR	2015	2016	2017	2018
Borrowers from commercial banks	247,659	277,516	360,033	328,790
Borrowers from commercial banks (SMEs)			4,562	5,239.96
Borrowers from deposit-taking microfinance institutions	2,652	2,347	2,144	2,284
Borrowers from non-deposit-taking microfinance institutions	23,276	39,594	26,643	
Loan accounts with commercial banks	267,163	294,650	423,317	394,290
Outstanding loans from commercial banks	3,593,307	3,619,771	3,617,642	4,151,892
Outstanding loans from deposit-taking microfinance institutions	5,495.055	497.8718	739.4464	
Outstanding loans from non-deposit-taking microfinance institutions	2,595.05	3,952.73	3,825.121	1,204,000

Source: International Monetary Fund, Financial Access Survey Database, 2018.

Figure 3.3: Access to Credit and Savings in Angola



Source: World Bank and National Bank of Angola 2020.

The potentiality of digital services in Angola is high. According to the Angolan Institute of Communication (INACOM), mobile phone coverage is already available in all the country’s municipalities, while approximately 47 percent of the population owns a mobile phone (around 13 million people), of which one-third (or around 4.5 million people) have access to mobile internet services. Unitel, Angola’s largest operator, with a market share of approximately 70 percent, reports that around 40 percent of its clients own a smartphone. This figure has remained relatively constant (probably due to the country’s financial crisis, decrease in real income, and increase in the cost of imported products due to the currency devaluation, such as smartphones).⁸⁵

Policy and Regulation: Market Entry (and Strengths)

In 2018, the Council of Ministers approved Angola’s Financial Sector Development Strategy (PDSF), which has financial inclusion as one of its pillars. Following the PDSF, BNA is planning to develop a detailed Financial Inclusion Action Plan. Indeed, the Angolan authorities, especially BNA, are taking gradual steps toward financial inclusion, and in particular for digital financial services.

BNA has been actively working on the reform and upgrading of the national payment infrastructure over the past decade or so. It established the EMIS⁸⁶ under the current National Payment System Law, to operate the Multicaixa,⁸⁷ credit transfer, cheque clearing, and direct debit systems and act as clearing house for those systems. BNA’s activities on the national payment system are framed under BNA’s 2013 Oversight

⁸⁵ The increase in the cost of exports and the foreign exchange restrictions imposed by the authorities are also affecting other areas of the industry, such as the ability of market players to acquire and update ATMs and POS systems.

⁸⁶ BNA is still EMIS’s main shareholder, with 35 percent of the shares, down from 51 percent initially.

⁸⁷ Angola’s card interbank system.

Policy, which, despite being under review, is a comprehensive document that incorporates in Angola's regulatory framework the Committee on Payments and Market Infrastructures–International Organization of Securities Commissions Principles for Financial Market Infrastructures.

Building on several successful regional experiences, Angola conducted an analysis on the adoption of a mobile payment system. This resulted in Presidential Decree no. 77/2017, which approves the implementation strategy for the Angola Mobile Payment System, attributing specific competences on this matter to BNA and INACOM. BNA is also working closely with INACOM to encourage payment providers to offer innovative products.

From a regulatory perspective, BNA has been especially active since 2017, having issued several regulations covering the classification of systems; oversight, issuance, acceptance, and usage of cards; and provision of payment services. This effort is being continued with the work on the new National Payment System Law, which will represent a significant overhaul of the entire framework.

The new National Payment System Law establishes a framework for electronic money and the provision of payment services by agents, and it allows opening the sector to nonbank institutions, such as companies that provide payment services⁸⁸ and electronic money institutions. Developed with World Bank support, the draft law—which is available on BNA's website (www.bna.ao)⁸⁹—has already been approved by the Council of Ministers and submitted to the General Assembly for consideration.⁹⁰ And with World Bank support, BNA has prepared an Instant and Mobile Payment Strategy. A Fintech Innovation Lab has also been established by BNA to provide a “sandbox environment” for testing digital financial solutions pending passage of the law's related regulations.

The overhaul of the entire legal and regulatory framework will further align Angola with international best practices and in particular the Committee on Payments and Market Infrastructures–International Organization of Securities Commissions Principles for Financial Market Infrastructures. The new framework, comprising not only the new National Payment System Law (NPSL), but also the new Law on Financial Institutions, will be complemented by several BNA regulations covering, inter alia, payment systems, oversight, electronic money, incorporation and supervision of payment service providers, and system operators.

In particular, the new NPSL (and complementary regulations) will allow, in a clear manner and despite that currently BNA's regulations already foresee nonbanking payment institutions, for the entrance of new market players and provide a solid framework for the provision of electronic money services. The draft published by BNA

⁸⁸ In Portuguese “Sociedades Prestadoras de Serviços de Pagamento.”

⁸⁹ https://www.bna.ao/Conteudos/Artigos/lista_artigos_medias.aspx?idc=143&idsc=16471&idl=1.

⁹⁰ This law encompasses systems (infrastructures), actors (payment service providers and system operators), and services (including means of payment and instruments), as well as provisions on consumer protection.

on its website allows for nonbanking entities (licensed financial companies for the provision of payment services and even non-financial companies⁹¹ insofar as they are duly authorized) to request BNA's authorization for the issuance of electronic money, thus addressing the questions raised by telecom operators and other stakeholders. The new NPSL and subsidiary regulations will hopefully enable the appearance of DFS by establishing a supporting framework. It is expected that the new NPSL will provide the conditions under which nonbank entities can provide payment services to the unbanked and underbanked, promoting competition in the market and between different services.

The new NPSL clarifies the roles and responsibilities of BNA in terms of supervision and oversight. BNA will be the body regulating, controlling, and monitoring electronic money issuing activities. It also distinguishes the requirements applicable to the legal regime of payment instruments from those relating to payment services (activities) and the providers empowered to exercise them (payment service providers). The new Law favors an inclusive approach of regulating payment services activities, including the issuance and management of electronic money. It further distinguishes and avoids confusion between electronic money and payment accounts. The new Law also clarifies the conditions for authorization of financial and nonfinancial institutions for payment service activities. There are two categories of institutions exclusively providing payment services—payment services provider companies and e-money institutions. Lastly, the new text aims to clarify the regime for the protection of customers' funds, as well as the requirements for agents. The minimum capital for the provision of payment services, including the issuance of electronic money, is to be defined by regulation of the BNA as per article 25 of the new Law. The regulation of electronic money institutions—which can be nonfinancial institutions—was left to BNA.

There is no clear legal regime for FinTech. The new NPSL as well as the current NPSL do not address FinTech as a specific category of providers. Furthermore, there seems to be an excessive concentration of market power in EMIS, which, being a monopolist (by law) in its role as system operator and clearing house, impairs the banks' ability to promote and introduce new services and products. Although banks are responsible for the acquisition and maintenance of software, ATMs, and POS systems, they have to do so with the few companies that are currently certified by EMIS.

The lack of market-driven interoperability is a weakness of the regulatory framework. On innovative payment instruments, and in particular mobile payments, it will be critical that BNA continues to exert its leadership, in collaboration with the relevant stakeholders and government entities and steers the process toward a cooperative approach between all relevant actors and interoperability in the market while promoting competition and the safety of the systems. Recently, BNA opened a

⁹¹ These are authorized as e-money institutions, a type of nonfinancial institution.

procurement process to set up the system that will allow a broad range of payment system providers to offer their digital payment services efficiently.

At the regional level, there is limited interoperability of digital financial services today. However, BNA has embarked on an important and strategic regional integration project in the framework of the Southern African Development Community (SADC), which has the potential to provide for the interoperability of national payment systems, payment services, and digital financial services; increase competition and innovation; and substantially decrease the cost of remittance flows within SADC.⁹² BNA is also aware of the interoperability issues in the national context and has determined to allow transactions between any individual schemes, instruments, and digital devices to be interoperable (mobile wallets, online accounts, bank and prepaid cards, and so forth). This will be done via enhancements in the national infrastructure and the adoption of a mobile payment system.

Know-your-customer (KYC) requirements are unfavorable in a context with continued limited availability of identification documents (IDs). There are no provisions for tiered KYC for low-value accounts at the moment. Anti-money laundering regulation requires presentation of identification at the point of account opening. The magnitude of the problem is considerable: birth registration and ID rates remain stubbornly low, with only 53.5 percent of the population having their births registered, according to the 2014 Census; however, this percentage varies widely across provinces and only 29.6 percent of the rural population is registered. Rates of individuals with IDs are even lower: of the entire population of Angolans age six years or older, only 21.8 percent possess an ID card. The recently concluded National Risk Assessment proposed a risk-based approach to KYC requirements, including simplified procedures in the case of low-risk transactions in line with the Financial Action Task Force (FATF) standards, which point the way for this.

There is a low level of digitalization of government payments: Angola stands at below the upper-middle-income country average of 55 percent receiving government payments, but this could be improved given the potential represented by civil servants, students, social beneficiaries, and retirees. The digital transformation of the Angolan administration can significantly reduce its operating cost and limit the capacity for fraud and corruption of public officials.

Government bureaucracy, lack of infrastructure, and foreign exchange restrictions pose a risk for the attraction of new players and the development of FinTech. The ability of EMIS⁹³ (which operates Multicaixa,⁹⁴ credit transfers, cheque clearing, and direct debit systems), banks, and other actors to acquire as well improve, upgrade,

⁹² BNA has been encouraging the relevant banks to participate in the SADC SIRESS system, which facilitates the efficient settlement of cross-border payments. But for the moment, few banks are participating, and the process will take time to materialize.

⁹³ In Portuguese: Empresa Interbancária de Serviços.

⁹⁴ This is Angola's card interbank system.

and maintain the current infrastructure and equipment is also seriously compromised.

Managing the Risks of Digital Finance

Cybersecurity and cybercrime around DFS pose a threat that must be addressed in Angola. The recent cyberattack of Sonangol's⁹⁵ servers is an example of the urgent need to implement a cybersecurity strategy to safeguard the country's critical IT infrastructure. BNA has acknowledged the urgent need to implement a modern strategy to safeguard the internal systems of the institution and prevent fraud. For that purpose, in April 2020, the Central Bank enacted a new regulation establishing the rules for a policy on cybersecurity and cloud storage,⁹⁶ which are applicable to all financial institutions that are authorized by BNA. According to estimates in the Serianu 2017 Africa Cyber Security Report, cybercrime in mobile-based transactions costs businesses US\$140 million per year in Africa. A risk-based approach to monitor suspicious transactions should also be implemented based on the outcome of the anti-money laundering/combating the financing of terrorism National Risk Assessment. Other aspects, such as liberalization of the DFS market, may also increase transparency, foster competition, and guarantee that firms introduce best practices that promote consumer protection and protect data privacy. The government should consider these as it develops e-money regulations in the future.

The BNA Department of Market Conduct Supervision has undertaken several initiatives to strengthen the framework for and practice of consumer protection in the industry. The department monitors and promotes transparent and efficient functioning of financial institutions by reviewing procedures for the licensing and marketing of financial products and services; safeguarding contractual aspects, including the rights and obligations of consumers; and conducting regular onsite and offsite supervision to ensure that regulations relating to product transparency, marketing, and dispute resolution are being followed. The department also oversees the BNA portal for financial services consumers, which provides information about financial products, consumer rights, and the latest market information, including interest rates, and provides a link for consumers to make complaints. Although they are not explicitly aimed at DFS, these initiatives can be adapted and broadened to include DFS awareness raising and consumer protection.

Financial Infrastructure: Retail Payment Infrastructure

Angola's retail payment infrastructure is governed, regulated, and subject to oversight by BNA. The infrastructure is composed of a real-time gross settlement system

⁹⁵ www.angop.ao/en/Oil-company-Sonangol-targeted-cyber-attack.html and www.novojornal.co.ao/sonangol-atacada-por-piratas-ciberneticos.html.

⁹⁶ Aviso no. 8/2020, applicable to all financial institutions, followed by Instrutivo no. 10/2020 of May 29, 2020 on the reporting requirements applicable to cybersecurity incidents.

(managed by BNA) and five subsystems⁹⁷—checks, direct debits, credit transfers, cards (Multicaixa), and Instant payments (Kwik)—all managed by EMIS, which also acts as a clearing house for those systems. The systems are mostly⁹⁸ compliant with international standards and best practices. The future implementation of the Angola Mobile Payment System will allow mobile money providers to join the system directly.

Financial Infrastructure: Credit Infrastructure

Access to finance is hampered by weak credit infrastructure, which blocks the development of the private sector. Domestic credit to the private sector is low, at 13.3 percent of GDP in Angola. According to business surveys, access to finance is identified as a major constraint by firms operating in the region, with the value of the collateral needed for a loan being very high. This is the result of multiple factors, including weak collateral and insolvency frameworks. The majority of individuals and businesses in the country do not have a credit history to apply for loans at competitive interest rates. Insolvency frameworks are ineffective because of the limited capacity of the court system. Work is ongoing with World Bank support to develop the legal framework for secured transactions and corporate insolvency. Support from the International Finance Corporation is planned for the modernization and expansion of the current public credit registry, with the aim to move toward a hybrid credit registry/credit bureau public-private model. These initiatives along with broader efforts to improve and simplify the enabling environment for the private sector can help in promoting access to finance, including DFS, for SMEs.

Private Sector Market Drivers

The telecommunications market is dominated by a single player, Unitel. According to statistics from INACOM, Angola accounted for 14 million mobile telephony subscriptions, with a penetration rate of 46.9 percent, in the second quarter of 2019. These statistics also revealed that the country has registered six million internet users for an estimated population of 30 million inhabitants. This is an internet penetration rate of 20 percent. Unitel has retained its leadership with around 70 percent of its share against 30 percent for its main rival, Movitel (a third license was recently granted to Angola Telecom, and a tender for a fourth license is expected to be launched soon). Additional competition in the telecommunications sector could encourage greater access and affordability of services.

The development of mobile payment has not been taken up, mostly due to lack of interest on the part of the dominant telecom player. Despite several attempts by BNA

⁹⁷ “Subsystem” is an Angolan particularity, which is used to designate any payment, clearing, and/or settlement system under the National Payment System; this terminology may change in the new National Payment System Law.

⁹⁸ The National Payment System Law and BNA’s Oversight Policy are currently under review to assure full compliance.

and even EMIS,⁹⁹ MNOs—especially Unitel—are still skeptical about entering the electronic money business. (It is important to highlight that Unitel owns relevant stakes in some of the most important national banks as well as several of its shareholders—such cross-shareholdings can create an impediment for Unitel to compete with the banks.) Nevertheless, Angola’s good mobile and internet penetration rates and the success of the mobile payment products Xikila from Banco Postal (whose license has been withdrawn by BNA due to nonadherence to prudential norms), E-Kwanza from BAI, and BNIX from BNI (despite the lack of interoperability between them and with the other payment systems due to a lack of a mobile payment switch) are a clear indicator of the potential of the market and the consumers’ need and appetite for these types of products.

Additional matters, such as market dominance, interoperability, access to the network, and others, should be carefully addressed. With the promotion of electronic money and mobile payment, and the foreseeable entrance in the market of new players, it is necessary to assure the existence of effective coordination between BNA and INACOM. This will be important for the eventual presence of MNOs in the payment sector and the provision of infrastructure to the payment service providers.

Financial Literacy

BNA has a long-standing financial education program, which aims to increase financial literacy and promote financial inclusion, particularly of the poor and vulnerable, with the flagship adoption of simplified bank accounts called “Conta Bankita à Ordem” (Bankita current account) and “Conta Bankita a Crescer,” (Bankita growth account) which offer simplified procedures for opening bank accounts. Since the launch of Bankita in 2011 through June 2019, 710,095 accounts were opened. The BNA Financial Education Department has coordinated media campaigns, national and regional workshops, and consumer awareness-raising, including financial education as a curriculum. Several ongoing initiatives are promoting financial education in addition to that of BNA, by other regulators (CMC, ARSEG, and the National Institute for Consumer Protection of the Ministry of Commerce). BNA’s ongoing campaigns for financial education, consumer protection, and simplified accounts can be easily built on and adapted for DFS.

⁹⁹ In 2012, EMIS tried to launch a mobile payment service (based on an e-money wallet), but it was unable to convince the two MNOs.

3.2. Recommendations and Next Steps

The ongoing regulatory reforms as well as recent market initiatives are promising for greater uptake of DFS. To foster the development of DFS, the government could consider the following recommendations.

Policy and Regulation

R 3.1 Support should be provided to BNA, based on the new NPSL, to finalize regulations for the new payment service providers and improve access to the market by new players. Further to the conclusion of the review of the legal and regulatory framework, steps must be taken to assure an effective implementation of the new rules and a level playing field—including the intervention of INACOM, together with the BNA, to tackle issues around communications infrastructure, pricing, and access. In addition, it is recommended that BNA should build on the FinTech Innovation Lab to explore sandbox approaches (for example, as in Sierra Leone and Mexico), to promote the development of stable FinTech, based on the "Bali Fintech Agenda."

R 3.2 Support Angola in enhancing the consumer protection framework. As it is considering the rollout of DFS, BNA should assess whether the existing legal and regulatory provisions follow international best practices. BNA should require banks and other financial institutions to disclose all pre-contractual and contractual disclosure documents, detailed information on the right to lodge complaints, the manner in which complaints may be filed, as well as the mechanisms for how complaints are handled (including contact information of the person or division within the institution that is authorized to receive and respond to complaints and time limits). To ensure that adequate mechanisms are in place to handle complaints fairly in-house, BNA should consider reviewing and assessing whether minimum standards for complaint handling within banks and nonbank providers (for DFS and financial services more broadly) could be established or further enhanced by setting more specific rules.

R 3.3 Design and adopt a national financial inclusion action plan (including financial education). The development of a detailed national financial inclusion strategy can promote the development of DFS. Having a clear financial inclusion strategy or roadmap can help define the priority areas to tackle based on a preliminary diagnostic on access to finance. To increase access to transaction accounts, Angola will need to set a clear vision and objective by a specific year. The action plan could build on the findings of the recently concluded Financial Inclusion and Capability Survey, which provides a baseline and high-level recommendations related to financial inclusion, consumer protection, and financial education.

Market-Level Support

R 3.4 Support effective implementation of interoperability. With around 30 institutions and three MNOs in the country, BNA will need support in effectively and efficiently rolling out the process. BNA has already launched a selection process for new IT solutions that would promote mobile interoperability, and the model is based on a public-private partnership. This IT investment should be accompanied by a robust public-private dialogue and communication campaign to be led by the recently reactivated National Payments Council, which includes the membership of BNA as well as the telecom regulator, telecom companies, and financial institutions.

R 3.5 Provide advisory services to DFS stakeholders. Product innovation and FinTech can be propelled only if knowledge and benchmarks are provided to DFS providers. Another advisory area would be on pricing and transparency, as well as the current update of the regulatory framework. The World Bank could help to obtain market insights to ensure that BNA incorporates providers' needs while preserving risks. Another area of advocacy would relate to the digitalization of government payments.

R 3.6 Support bill payment aggregation and FinTech development. To reduce fragmentation of the bill payment process, which is the case in Angola, the World Bank could work with utility companies to create a common aggregator that will help facilitate bill processing, improve speed, and reduce cost.

References

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World Bank and National Bank of Angola. 2020. Enhancing Financial Capability and Inclusion in Angola. Washington, DC: World Bank.

4. Digital Entrepreneurship

4.1 Importance of Digital Entrepreneurship

A nurtured digital business environment is a key element to unlock economic opportunities in the digital economy. Digital businesses can be divided into two distinct categories: (1) digital startups,¹⁰⁰ and (2) established digital businesses.¹⁰¹ For African economies, the entrance of new digital businesses in the market will generate new job opportunities, especially among the youth. For the local small medium-size enterprises (SMEs), the adoption of digital technologies and digital platforms can remove inefficiencies related to the high costs of operations, assist the informal economy in formalizing its activities, and help SMEs upgrade the quality of their products/services and better comply with sector-specific standards. As for financial inclusion, the digitalization of payments can offer opportunities to participate in the economy for excluded segments, for example, people living in rural areas or working in the informal sector. The objective of the Digital Economy for Africa (DE4A) report on Angola is to assist the government in building strong digital business support through regulations and policy interventions. Such initiatives can contribute to increasing the numbers of digital startups, platform-based or data-driven firms, and firms using digital technologies and business models.

The National Development Plan 2018–22 highlighted the importance of digital entrepreneurship programs as one of the drivers for economic and social development. The plan recognized that a stronger entrepreneurial ecosystem driven by innovative solutions will lead to improvements in poverty levels, inclusion of minority groups, more competitive firms, and therefore employment opportunities. Youth unemployment rates in Angola reached 56.5 percent in January 2020.¹⁰² The plan identified seven government institutions¹⁰³ to implement entrepreneurship and innovation programs supporting firms, women, and youth cooperatives across the country. Some of the programs include the formalization of businesses, entrepreneurship training, creation of business incubators (including technology focused), and access to micro credit.

¹⁰⁰ Digital startups refer to early-stage ventures that create new digital solutions or business models as part of their core products or services.

¹⁰¹ Established digital businesses are mainly large, platform-based and data-driven firms that have passed the initial startup stage, having acquired suppliers, contractors, and consumers rapidly.

¹⁰² Instituto Nacional de Estatística, Angola. 2018 – 2020. “Angola Youth Unemployment.” Tradingeconomics.Com. <https://tradingeconomics.com/angola/youth-unemployment-rate>.

¹⁰³ Guiche Unico, Instituto Angolano da Juventude, Institute for the Development of Micro, Small and Medium-Size Enterprises (Instituto Nacional de Apoio às MPMEs), Agronomic Research Institute (Instituto de Investigação Agronómica), National Institute for Technology and Innovation (Instituto Nacional de Tecnologias e Inovação), Ministry of Higher Education, Science, Technology and Innovation (Ministério do Ensino Superior Ciência Tecnologia e Inovação), Ministry of Public Administration, Employment, and Social Security (Ministério da Administração Pública, Trabalho e Segurança Social).

Given the need for diversification of the economy, digital businesses have the potential to transform Angola's economy. The diversification of the Angolan economy into non-oil sectors requires measures to support the development of small and medium-size local businesses, so that SMEs can connect with international markets and become globally competitive. The implementation of a digital economic agenda in Angola will help the country to diversify its economy beyond the export of oil and raw materials. Digital entrepreneurship plays a key role in this diversification, as e-trade can assist SMEs in improving production and competitiveness. In addition, innovative solutions generated by local digital businesses can help tackle some of social disparities in the country by offering products/services that target unmet needs.

4.2 Diagnostic Findings: The State of Digital Entrepreneurship and E-Commerce in Angola¹⁰⁴

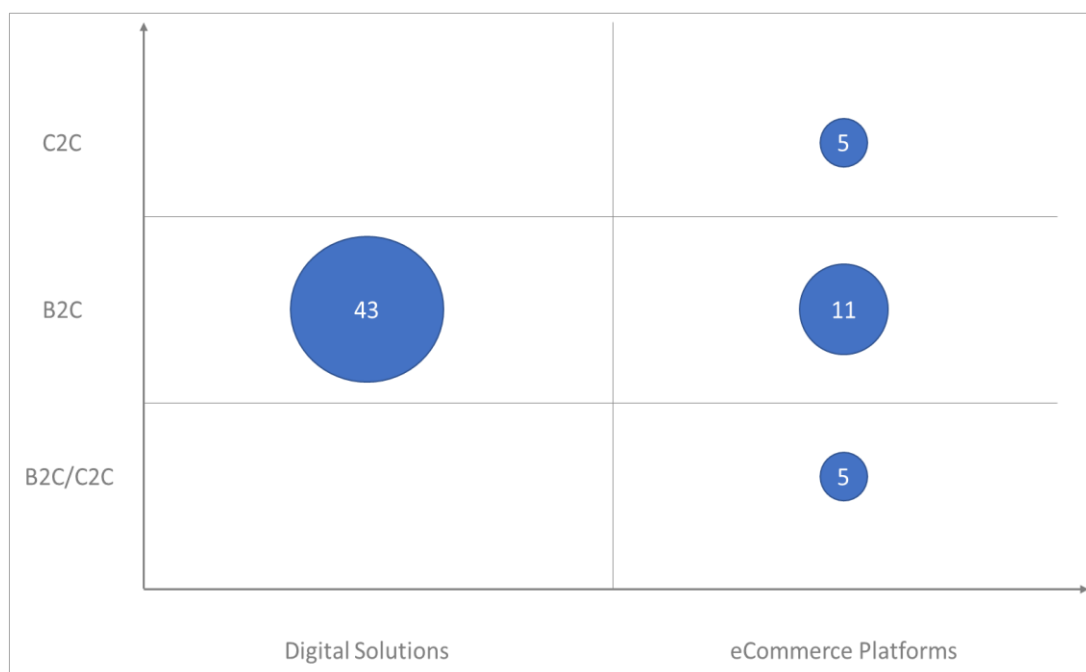
Angola's digital entrepreneurship ecosystem is nascent and yet young and dynamic. Compared with other countries in Sub-Saharan Africa with lower gross domestic product (GDP) per capita, such as Nigeria or Kenya, Angola's ecosystem is small. However, it has been growing in recent years, with several support initiatives, digital startups, and platforms emerging across different industries. Based on the findings of studies available at the time of preparing this study,¹⁰⁵ Angola's digital entrepreneurship comprised more than 50 digital businesses (figure 4.1). The majority of those businesses were focused on delivering digital products/service solutions in a business-to-consumer (B2C) business model. The remaining (approximately 22 businesses) were e-commerce platforms that work as a marketplace for B2C commerce (11 of 22), consumer-to-consumer (C2C) commerce (5), and a mixed model B2C/C2C (5). These digital businesses counted on the support of nine startup-focused hubs (accelerators/incubators) and global events such as Seedstars, Startupper of the year Challenge by TotalEnergies, TEDx, and the Global Entrepreneurship Week. The ecosystem also included around 28 organizations that provide financial services, including services specifically targeting digital businesses and services for any type of entrepreneurial activity (see annexes C and D for additional information on the support organizations). The entrepreneurs behind the digital businesses in Angola were on average young and male (average age 30 years). Most of the digital startups active in the ecosystem were still in the early stage of development (around 60 percent).¹⁰⁶

¹⁰⁴ This report is based on desk research and interviews with a group of ecosystem stakeholders (including representatives from the government, academia, and the private sector) conducted in person in Luanda as well as via videoconference.

¹⁰⁵ Recent studies have found at least 150 digital start-ups operating in Angola which is an indicative of a growing ecosystem; IFC (forthcoming) Assessment of Angola start-up ecosystem; Governo de Angola (2022) Estudo sobre o ecossistema de empreendedorismo e startups de Angola,

¹⁰⁶ U.S. Embassy in Angola (2019).

Figure 4.1: Classification of Digital Businesses in Angola



Source: World Bank staff.

On the Intellectual Property Organization’s 2022 Global Innovation Index, on innovation capacity, Angola (13.9) received a lower score than South Africa (29.8), Namibia (20.6) and Mozambique (15.0). Angola’s weak research and development (R&D) is one of three structural conditions that are hindering the development of entrepreneurship in the country.¹⁰⁷ According to the United Nations Educational, Scientific and Cultural Organization’s (UNESCO’s) most updated information, in 2016, Angola had only 19 R&D researchers per million inhabitants.¹⁰⁸ This is significantly low compared with peer countries such as South Africa in 2019 (4,84), Malaysia in 2018 (2,185), and Brazil in 2014 (888).

The country’s digital businesses and support infrastructure are highly concentrated in the capital, Luanda, creating a divide between the capital and the rest of the country. The digital entrepreneurship ecosystem in Luanda, although nascent, is more developed than in the rest of the country. The uptake of digital products and services in the capital is higher due to the higher level of digital knowledge and access to mobile phones and internet. Some of the digital startups operating in Luanda have plans to expand to other provinces in the country—mainly startups operating in the agriculture sector.

The recent increase in promising digital businesses in Angola highlights the country’s digital potential. In recent years, the number of companies, mainly startups,

¹⁰⁷ Sociedade Portuguesa de Inovação, Centro de Estudos e Investigação Científica da Universidade Católica de Angola, Banco de Fomento Angola and Global Entrepreneurship Monitor (2019).

¹⁰⁸UNESCO Institute for Statistics (UIS). UIS.Stat Bulk Data Download Service. Accessed October 24, 2022. api-portal.uis.unesco.org/bdds

operating and succeeding in Angola has increased. These are distributed among different sectors, mainly in the areas of transport (for example, Kubinga), HealthTech (Appy Saude), e-commerce (Roque Online), and food delivery (Tupuca). For instance, Kubinga is a digital transportation app founded in 2017. It offers person-to-person (P2P) ride-sharing and delivery services at more affordable rates for clients than traditional taxis. Another notable digital business is the startup Appy Saude, which allows customers to access free information on health facilities throughout Angola and compare prices between medical services/products (see annex E for detailed case studies of Kubinga, Appy Saude, and Roque Online). Recently, digital startups have been entering more challenging verticals, including agriculture (AgriTech). An example is Kepy, a platform that aims to increase the social inclusion of Angolan farmers by facilitating the marketing of their products.

Markets

As one of the largest economies in Sub-Saharan Africa, with a largely urban, fast-growing population of more than 34.5 million people,¹⁰⁹ Angola provides several opportunities for local and international firms. However, for digital businesses, internet access (including penetration rates and cost) is a key metric to consider as they evaluate the business case for products and services. Improvements in the information and communications technology (ICT) infrastructure are required for further expansion of digital businesses. Key factors, such as high prices of telecom services, low penetration rates throughout the country, and poor reliability of connectivity services and power (internet and electricity), pose a threat for digital enterprises aiming at expanding operations beyond Luanda.

With an estimated mobile penetration rate of 67 percent, Angola is one of the least connected countries in the region, and it is well below the 82 percent average for Sub-Saharan Africa (see section 1.2.1, in chapter 1, on the Digital Infrastructure Pillar). Internet users, mobile subscriptions, and affordability are improving, but usage is still concentrated in urban areas given the higher price and weaker quality of connectivity in rural regions.¹¹⁰ Representatives of digital businesses who were interviewed for the study consider that the internet is mostly accessed via mobile phones rather than home computers as a part of their business model. According to one estimate, the realistic domestic consumer market potential is currently less than 7 percent of the population, or about two million people.

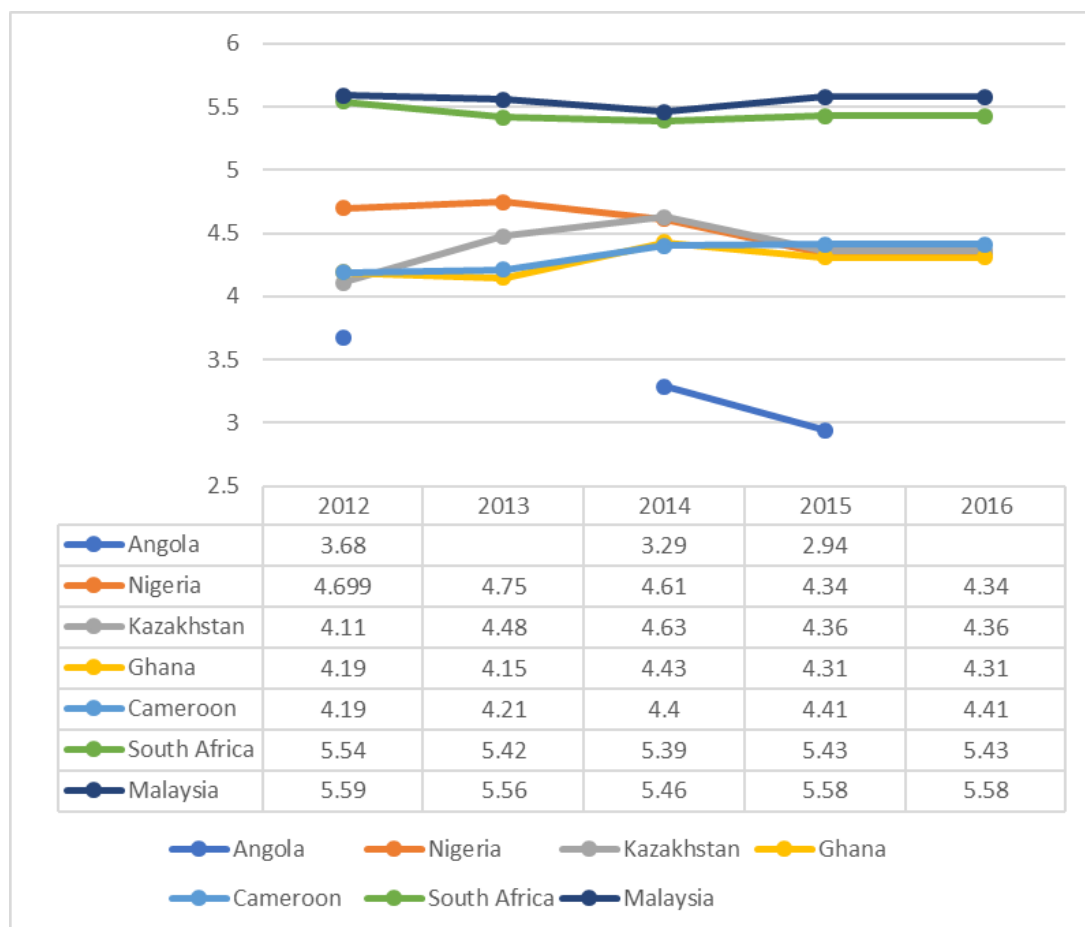
There is a need for more current and detailed data on the digital technology adoption rate among businesses and the digitalization rates of various industries. The latest technology adoption-related indicators in the World Bank's Enterprise Surveys are

¹⁰⁹ World Bank, 2018, "Population, total – Angola," <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=AO>.

¹¹⁰ Freedom House (2018).

over 10 years old now,¹¹¹ but the World Economic Forum’s firm-level technology absorption values indicate that Angolan firms compare poorly against peers (figure 4.2).

Figure 4.2: Comparing Firm-Level Technology Absorption Values, Index 1-7 (Best)
Sources: Data from World Economic Forum Global Information Technology Reports;



Baller, Dutta, and Lanvin 2016; World Bank TCdata360 Firm-Level Technology Absorption, https://tcdata360.worldbank.org/indicators/tech.absorb?country=AGO&indicator=3437&countries=CMR,GHA,NGA,MYS,KAZ,ZAF&viz=line_chart&years=2012,2016&indicators=944.

Digital platforms, and in particular e-commerce, are gaining ground mostly with local startups addressing local demand. Although Angola only ranked 123rd of 152 countries in the United Nations Conference on Trade and Development’s (UNCTAD’s) 2019 B2C E-Commerce Index, it was an improvement from the country’s position of 131st in 2018 (table 4.1). Although international digital platforms, such as Uber or Jumia, are growing their presence in various African countries, few have entered Angola. Aside from Netflix and Airbnb, global e-commerce platforms such as Alibaba, Amazon, and eBay are only used by wealthier consumers and a limited number of

¹¹¹ A new World Bank Enterprise Survey for Angola is expected in 2023.

Angolan businesses.¹¹² The most popular local e-commerce players are BayQj, Otchitanda, O Soba e-store, and Roque Online.¹¹³ Annex E in chapter 7 includes a list of selected e-commerce and other digital platform providers.

Table 4.1: Comparing E-Commerce Country Rank and Index Value (0–100), UNCTAD B2C E-Commerce Index

Country	Country rank, 2019	Share of individuals using the internet, 2018 or latest	Share of individuals with an account (age 15+), 2017	Secure internet servers (normalized), 2018	Universal Postal Union (UPI) postal reliability score, 2018 or latest	Index value, 2019	Index value change, 2017–18	Index rank, 2018
Malaysia	34	81	85	75	86	81.9	-0.8	34
Kazakhstan	57	79	59	64	72	68.5	-2.3	53
South Africa	76	56	69	81	11	54.4	0.8	77
Nigeria	79	42	40	48	83	53.2	-5.5	75
Ghana	97	39	58	31	43	42.8	-10.6	85
Cameroon	117	23	35	20	50	32.0	-14.6	101
Angola	123	14	29	26	52	30.4	0.1	131

Source: UNCTAD 2019a.

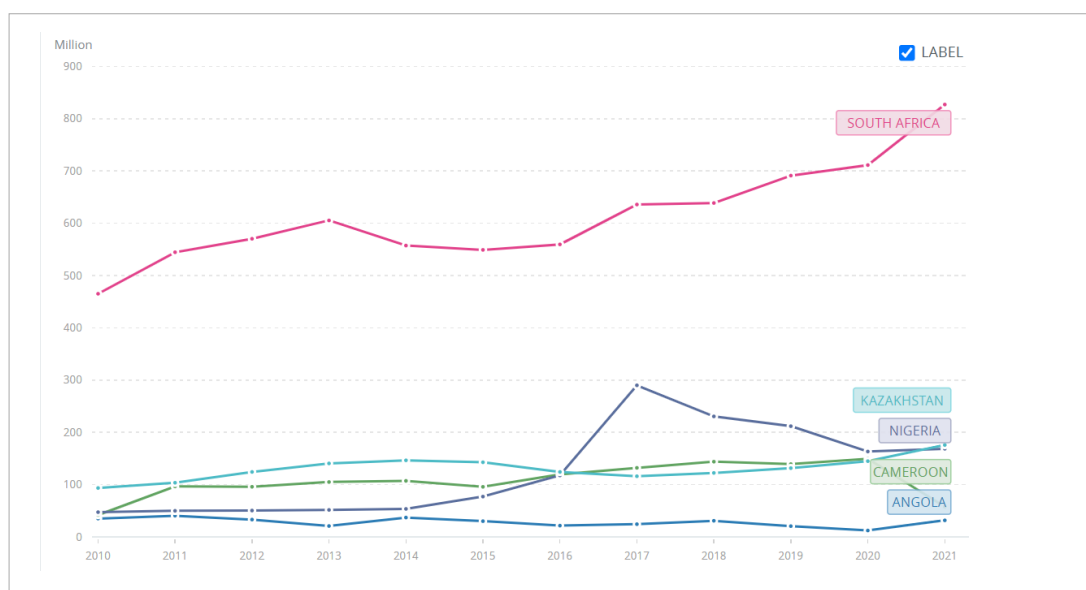
ICT service exports have seen a downward trend since 2014, and many digital businesses are focusing on establishing a strong market position locally. As shown in figure 4.3, between 2017 and 2019, Angola’s ICT service exports dropped from US\$35.12 million to US\$24.47 million but the year of 2021 saw signs of recovery with ICT service exports rising to US\$ 31, 756, 270. Even so, these exports are still below comparator countries. Although starting a digital business faces low barriers to entry, expanding to foreign markets typically requires substantial capital, which is scarce. However, e-commerce businesses such as Roque Online are actively marketing their services in key markets such as the Middle East. Many use global delivery firms with local

¹¹²Societegenerale, “Angolan Market: E-Commerce,” <https://import-export.societegenerale.fr/en/country/angola/ecommerce>.

¹¹³ Export Gov.2019, “Angola – eCommerce,” <https://www.export.gov/apex/article2?id=Angola-eCommerce>.

presence in Angola for shipping (including DHL, FedEx, and UPS), but to scale fast they still rely on well-known platforms such as Amazon.

Figure 4.3: Comparing ICT Service Exports Values (BoP, current US\$)



Sources: Data from International Monetary Fund, Balance of Payments Statistics Yearbook and data files; Diagram from World Bank Open Data website, World Bank.” ICT Service Exports (BoP, current US\$),” <https://data.worldbank.org/indicator/BX.GSR.CCIS.CD?contextual=default&end=2021&locations=AO-CM-NG-ZA-KZ&start=2010>.

Note: BoP = Balance of Payments; ICT = information and communications technology.

The scale and impact of digital businesses in Angola are not known due to lack of data. There are no official numbers, such as revenue for the sector, but the private platform companies that were interviewed during preparation of this study reported growth, which accelerated during the COVID-19 pandemic to some extent. Nevertheless, the reported numbers of users and transactions were still nominal, with up to 55,000 users (of a population of about 30 million) reported by one of the interviewed local marketplaces (and others below the 50,000 mark). Another estimate from the interviews was that the reach for the most popular applications outside messaging or social media providers (such as Facebook and WhatsApp) was less than 300,000 users. Given that local digital companies are still young, the growth rate is promising. In addition to introducing online access to services such as Appy Saude’s health care offering, these platforms are also providing market access and employment opportunities to the rural and urban poor, including opportunities for women and farmers as well as the informal economy to connect with the formal one. In addition, platforms such as Roque Online provide informal market vendors a venue to sell their products to global markets, serving the Angolan diaspora, but also foreign clients in the Middle East, the United Kingdom, France, Canada, and Australia. As the number of users grows,

additional analysis would be beneficial to make conclusions about the role and impact of private platforms.

Services provided by digital businesses, including e-commerce, are concentrated around urban areas, mainly around Luanda, Benguela and Huambo (as these are profitable areas). The service providers noted their intentions to expand their geographical scope as internet penetration, infrastructure, and logistics systems improve, helping to lower operating costs. In an interview, a digital startup also noted that partnerships with telecom providers (such as Unitel) are emerging where the data usage is free to users (such as farmers), which has been an important factor to help to grow usage in rural areas as well as among low-income beneficiaries such as informal traders.

Digital businesses, and in particular platform providers, highlight the low adoption of financial services and in particular the lack of digital payment solutions as the main obstacle to growth. With only 49 percent of the adult population having a bank account,¹¹⁴ the limited number of credit cards, and only 3 percent of the population having made online purchases/payments in 2021,¹¹⁵ digital financial services adoption is still low. And due to lack of FinTech solutions in the market, e-commerce merchants and platform providers reported high operating costs derived from payments (for example, for a small payment equivalent to US\$10, additional fees for the platform provider can be as high as 7.6 percent). There has been some progress in solving this issue for example, Appy Saude and TUPUCA integrated mobile confirmation to debit card payments with the Interbank Services Company (EMIS) Multi Caixa express. But firms like Kubinga had to innovate horizontally and start the development of their own digital payment solution as a part of their digital services.

Digital businesses consider weak digital skills another significant obstacle limiting growth and inclusion of underserved populations. As access to devices improves and internet usage grows, the interviewed entrepreneurs highlighted a significant demand for digital education, so that users are able to take advantage of digital services. Companies reported investing resources to train their users and service providers, but basic digital literacy is something that should be acquired through formal education.

Improvements in local logistics services are required before digital platforms and e-commerce can reach their potential outside urban areas. Poor logistics performance is a well-known issue and discussed in detail in the World Bank Group's 2019 Country Private Sector Diagnostic,¹¹⁶ but the limited availability and high cost of logistics services were highlighted by all the interviewees as one of the key factors that limit their

¹¹⁴ World Bank Group (2019b).

¹¹⁵ INE (2021) Cybersecurity report, https://www.ine.gov.ao/Arquivos/arquivosCarregados//Carregados/Publicacao_638143506802949387.pdf

¹¹⁶ International Finance Corporation (2019).

operations outside Luanda. Some firms rely on expensive courier services to deliver orders, as the mail delivery system is unreliable.

Culture/Talent

Entrepreneurship in Angola still displays typical signs from the distortionary effects of an oil dependent economy—a mindset shift for entrepreneurs from risk averse to risk ready is crucial. Although social media has played an important role in diminishing the stigma around entrepreneurship, the country still holds onto the belief that entrepreneurship does not generate enough profits, is a failed career path, and is not socially embraced.

Gender inequality persists, particularly in digital businesses. Despite that women play an active role in Angola's labor force, this segment is more likely to be employed by the informal sector and in low-skilled jobs such as agriculture. The lack of access to education still plays a significant role in women's access to formal employment.¹¹⁷ According to national statistics, about 58 percent of Angolan women are literate—a low percentage compared with men (83 percent).¹¹⁸ This gender gap in skills is also noticeable in the entrepreneurship ecosystem, where the tech startups are predominantly founded by men.¹¹⁹ However, some initiatives are emerging to change this unbalanced scenario by exposing women to digital technologies. For instance, Angola's main telecom company, Unitel, runs a scholarship program for women to study technology and innovation, called "Women for the Future." Other examples include a networking platform (Clube das Empresárias), a business association (Federação de Mulheres Empreendedoras de Angola), and several gender-focused events (for example, Women's Entrepreneurship Day, Feira do Empreendedorismo Feminino and Fórum do Empreendedorismo Feminino).

The education system emphasizes theoretical knowledge and provides only limited opportunities to learn about entrepreneurship. The curriculum in Angolan universities emphasizes theory over practice. Only a few institutions offer practical training or business training courses, including entrepreneurship training. The same applies to current technical and vocational education and training programs in Angola. According to a report by the European Union,¹²⁰ public-led institutions lack focus on market orientation, and teaching staff have limited training and skills to teach entrepreneurship even in the largest public university (Universidade Augustinho Neto), which has more than 15,000 students).

The availability of skilled professionals for digital businesses remains limited. Digital human capital is constrained due to the low number of specialized professionals. For

¹¹⁷ UNCTAD (2019b).

¹¹⁸ Government of Angola (2017), https://www.ine.gov.ao/Arquivos/arquivosCarregados//Carregados/Publicacao_637494434197630178.pdf

¹¹⁹ U.S. Embassy in Angola (2019).

European Union (2020) Relatório Final do Estudo de Base do RETFOP, <https://europa.eu/capacity4dev/projetoretfop/documents/relatorio-final-do-estudo-de-base-do-retfopSpeeckaert> (forthcoming).

example, by 2014, Angola had only 596 graduates in information technology.¹²¹ The government has developed an initiative, led by the National Institute for Innovation and Industrial Technologies, to address this gap. The Advanced Technology Industrial Center (Centro Industrial de Tecnologia Avançada) will be an industrial tech center in the special economic zone (Luanda/Bengo) and will have the capacity to train 2,000 technicians annually in the fields of automation, robotics, mechanics, industrial maintenance, and many others.¹²²

Similar to other markets, Angolan startups are reporting the shortage of qualified software developers and engineers as one of their key challenges.¹²³ In addition, talent acquisition and retainment of highly experienced staff are a struggle for digital startups as skilled young people in Angola tend to prefer large corporations (for example, large oil companies) because of contract benefits (subsidies, salary partially in foreign currency, and so forth). This has increased the cost of local talent, and some digital entrepreneurs have had to outsource technical tasks outside the country (mainly in Eastern Europe and India).

Networks and events that expose youth to entrepreneurship and digital technologies are emerging in Angola. To build awareness and share information around entrepreneurship, the ecosystem has several publications,¹²⁴ including four that have a particular focus on innovation and technology: *Minuto Digital*, *Elite ++*, and *Conversas 4.0* podcasts, and the website *ABC Do Empreendedorismo*, which offers free digital services related to events, services, and spaces, information on access to credit, and other useful information for entrepreneurs. Even with these publications, the interviewees recognized a need to showcase successful digital entrepreneurs who can inspire a new generation of entrepreneurs. Other notable skills-focused initiatives are the Angolan Developer Programming Marathon (the first hackathon in Angola for developers took place in 2017) and the Coding Dojo Angola (a weekly workshop for software developers in Luanda). In addition to the local initiatives, Angola has hosted prestigious international events and competitions that help develop and encourage a more entrepreneurial culture in the country. These include events such as the TechStars startup weekend in Luanda, Global Entrepreneurship Week, the Chivas Venture, and Seedstars World.

Access to Finance

Access to finance remains one of the key challenges for entrepreneurs in Angola, particularly for digital entrepreneurs. Availability of credit for the private sector in Angola is overall low and characterized by negative real interest rates (annual average of -4 percent between 2017-2022). In June 2022, domestic credit to the private sector

¹²¹ UNESCO, "Angola Education and Literacy," <http://uis.unesco.org/country/AO>.

¹²² Ver Angola (2021) País prevê criar centro industrial tecnológico. Available at: <https://www.verangola.net/va/pt/082021/Construcao/26638/Constru%C3%A7%C3%A3o-do-Centro-de-Tecnologia-Avan%C3%A7ada-Industrial-avan%C3%A7a-em-dois-meses.htm>

¹²³ International Finance Cooperation (2023) Assessment of the Angola Startup Ecosystem. Internal document

¹²⁴ U.S. Embassy in Angola (2019).

was estimated at about 7 percent of GDP, lower than in 2021 (9 percent) and the 2018–2020 average (13 percent of GDP). This compares with the levels of credit in Nigeria but is much lower than in Kenya and the average in Sub-Saharan Africa. At the time of preparing this study, several financial institutions provided credit and other financial services for micro, small, and medium-size enterprises (MSMEs).¹²⁵ However, access to credit is scarce, and most Angolan entrepreneurs rely on informal sources of finance, such as borrowing money from family and friends. A 2019 study conducted by the U.S. Embassy in Angola¹²⁶ showed that only 12 percent of the entrepreneurs who were interviewed received financial support through formal channels such as commercial banks. The remaining 88 percent claimed that they faced several constraints when attempting to access financial services in Angola. Moreover, of the 88 percent who did not have access to credit, 68 percent were not even aware of any financial products available for them. According to that same study and interviews conducted for this report, collateral requirements, high interest rates, and the lack of a credit information systems were the main reasons why digital entrepreneurs do not generally consider financial institutions for their needs.

Angola has a shortage of local and foreign early-stage investors, and no investments have been reported in recent Africa-wide studies. In general, access to seed capital remains a challenge in developing digital entrepreneurship in Sub-Saharan Africa. Investors have focused their funding on specific destinations across the continent, mainly Kenya, Nigeria, and South Africa. In 2022, tech enterprises from these three countries alone raised US\$2.8 billion from investors.¹²⁷ Based on a study by Briter Bridges, which uses different criteria, in 2019, the continent received a total of US\$1.3 billion in startup funding, mainly for the FinTech, cleantech, HealthTech, and AgriTech sectors. Again, Nigeria and Kenya jointly accounted for 81.5 percent of the investment.¹²⁸ Neither of the studies reported any investments in Angola.

At the time of preparing this study, at least 10 local active players were providing early-stage finance to entrepreneurs in Angola. The main players are angel investors such as Bantu Makers, Evaya Group, JLCR Investments, Ok investimentos, Pramod Asija (an investor in the food delivery startup Tupuca), the TGI group, and a venture capital fund called Angola Capital Partners. As for other types of funding sources, a crowdfunding startup called Deya emerged in the ecosystem to help young firms access credit. Angola is a small finance source ecosystem compared with countries such as Nigeria, which has more than 40 institutional investors.¹²⁹ Moreover, Angola has not recorded any foreign investment or deals made in the country. Despite improvements in the legal framework for investment, foreign investment flows were for years

¹²⁵ For example, Banco Millenium Atlântico, Angolan Development Bank (Banco de Desenvolvimento de Angola), Savings and Credit Bank (Banco de Poupança e Crédito), Banco Sol, Banco Angolano de Investimentos (BAI), Standard Bank, and Banco de Comércio e Indústria.

¹²⁶ U.S. Embassy in Angola (2019).

¹²⁷ Partech Africa Team (2023) 2022 Africa Tech Venture Capital Report.

¹²⁸ Briter Bridges (2019a).

¹²⁹ World Bank Group (2019c).

constrained by difficulties in repatriating profits, and this may discourage investment in digital enterprises.

There are public funding programs in Angola, but they do not have a specific focus on digital businesses. The government developed programs supporting access to finance for MSMEs, such as ProJovem or Projecto de Apoio ao Crédito (PAC). The PAC program was developed in 2019 by the Angolan government, the Angolan Development Bank, the Credit Guarantee Fund, and Angolan commercial banks¹³⁰ to provide credit lines for SMEs in the 54 productive sectors that are considered priorities for accelerating import substitution or exports. However, given the high-risk profile of digital businesses, most do not qualify to receive this support.

Gaps in financial skills are an additional constraint for digital businesses to access financial support. There are few programs that help entrepreneurs improve their financial management, including the skills to prepare financial statements and more advanced financial models and forecasts. The Standard Bank, for example, is one of the few support organizations planning to address this gap by providing training and mentorship programs for startups.

Policy

To boost entrepreneurship in Angola, the regulatory environment and policy framework should encourage entrepreneurs to start a business, innovate, take risks, and spend the least time possible on administrative processes. As part of a broad reform agenda, Angola is taking steps to improve the general business environment. The entrepreneurs who were interviewed noted that in addition to the regulatory requirements with which all firms need to comply, they did not see regulations specifically aimed at digital business models as a major constraint. Mostly, limitations are related to the sector-specific environment, such as businesses that are innovating and trying to digitalize traditional business models, for example in health care. Further, the interviewees said the government is not emphasizing digital businesses, and there is no specific entity driving the sector nor significant programs that support the creation and growth of digital businesses. These actions, complemented with a more coordinated public effort and consultative approach, would be necessary if the government decides to prioritize digital businesses in the future.

The government has taken several steps to reform the legal and institutional framework for businesses, such as reform to the private investment law and a competition law. The National Development Plan 2018–22 (Plano de Desenvolvimento Nacional) included programs to improve the business environment, foster entrepreneurship activities, and support young entrepreneurs across the country. And, in the specific case of Digital business, authorities signaled in December 2022 their intent to begin the process of creating a draft for an Angolan startup Act.¹³¹ But despite the ongoing

¹³⁰ Banco BIC Angola, Banco Angolano de Investimentos, Banco Fomento Angola, Standard Bank, Millenium Atlântico, Banco de Negócios Internacionais, Banco Comercial do Huambo, and Banco de Comércio e Indústria.

¹³¹ International Finance Cooperation. 2023. Assessment of Angola start-up ecosystem. Forthcoming.

reform efforts, Angola's regulatory environment for businesses has room for improvement, as illustrated by Angola's ranking of 136th of 141 countries in the Global Competitiveness Index 2019 (which was a slight improvement over 2018, when Angola ranked 137 of 140 countries). Based on the interviews, weak institutional capacity and lack of coordination are behind the slow progress in improving the business environment

A scan of the current regulatory framework identified regulations that apply to all businesses but that can be particularly important for innovative and digital businesses. These include regulatory frameworks that deal with investments and ownership, intellectual property, and taxation (see annex F for details).

Intellectual property capacity needs to be strengthened to meet the demands of digital businesses. According to the Angolan entrepreneurs, local institutions remain weak in patent enforcement, and even something like the process for registering a trademark can take five years.

Digital businesses operate under the same tax framework as other businesses. The value-added tax rate is 14 percent and it is also levied on digital services,¹³² while the headline corporate income tax rate is 30 percent on the profits deriving from business activities carried out in Angola (this includes resident and nonresident entities with a permanent establishment). Individuals carrying out business on self-account, as is the case of some digital start-ups in Angola, are subject to the 10.5 percent personal income tax. For potential and existing digital startups, including those that may be loss-making for the first few years, the lack of tax exclusions or incentives seen in some other countries can signal that the government considers the sector as a low priority. In fact, as there is no law governing digital businesses in Angola, the only tax benefits are from the SME law, which only gives breaks depending on geographic location of the business (i.e., SMEs founded in Luanda have a 50 percent reduction of tax rate above the normal 25 percent rate for the first 5 years after incorporation).¹³³

Following the establishment of the Competition Regulatory Authority, Angola joined other African countries with an active competition agency, but capacity could be developed around potential issues related to digital business models such as pricing algorithms or exploiting data as a source of market power. The Competition Regulatory Authority supervises competition in markets. The Law prohibits certain anti-competitive horizontal and vertical agreements as well as the abuse of a dominant position. The Law and applies to all economic activities carried out or having an effect in Angola by private enterprises, cooperatives, and state-owned companies, and reflects the main tenets of international good practices in competition regulation.

¹³² The value-added tax was introduced on October 1, 2019. The threshold is annual turnover above US\$250,000. There was a transitory regime at a reduced rate of 3 percent for SMEs above that threshold but below large taxpayers until December 30, 2020.

¹³³ International Finance Cooperation. 2023. Assessment of Angola start-up ecosystem. Forthcoming.

Digital entrepreneurs highlighted that regulations related to digital financial services and data protection need to be reformed. Regulatory barriers were believed to be one of the main reasons for the slow adoption of digital financial services. In terms of data protection, the 2011 Law established a Data Protection Agency and describes data processing principles, standards, and procedures related to international data transfers, among other aspects of data protection. However, the law reportedly does not sufficiently consider the disruption caused by digital technology adoption. For example, many businesses are using cloud storage solutions that can offer efficiency, affordability, and greater resilience compared with earlier solutions. However, the Data Protection Law requires physical access to servers where data are stored, a requirement that cannot be met by distributed cloud solutions.

Digital startups and businesses would like regulatory processes and reforms to become more transparent and consultative. Regulations that deal more directly with digital business, as well as the revision of existing laws and regulations that limit the innovation and adoption of digital business models, would benefit from more participatory and agile processes. Compared with countries like Rwanda, the interviewed entrepreneurs seemed to have limited interactions with government agencies. There have been some positive steps. For example, the Central Bank of Angola (BNA) and the Ministry of Higher Education, Science, Technology and Innovation created a regulatory sandbox related to FinTech solutions. The LISPA Fintech Lab (Laboratório de Inovação do Sistema de Pagamentos de Angola¹³⁴) was launched in 2019 and includes startups that have a better channel to voice their concerns while developing and experimenting with innovative business models in a customized regulatory environment. The COVID-19 crisis exposed how regulation can limit service delivery in the health sector, for example. The World Trade Organization reported spikes in global B2C sales, including online sales of medical supplies.¹³⁵ However, the health sector legislation in Angola does not allow prescription drugs to be delivered outside pharmacies, therefore inhibiting digital solutions to provide home delivery.

As digital business models are being introduced in traditional sectors, like transportation, the enforcement of regulations should be done fairly, without limiting innovation. The digital platform companies that were interviewed are capturing a wide range of data and metrics related to their operations, including transaction numbers, thus making formal reporting and monitoring easier than it is for less digital businesses. While there are questions related to the sector-specific requirements with which these platforms may need to comply, digital entrepreneurs also raised concerns that their businesses are scrutinized by government officials to a greater extent than traditional businesses are, for example, on formal reporting and tax compliance. Without sufficiently understanding how markets are disrupted by digital business models, there is a risk that decisions on far-reaching and complex regulatory and

¹³⁴ LISPA, “Laboratório de inovação do sistema de pagamentos em angola,” <https://lispa.ao/>.

¹³⁵ WTO (2020).

policy issues are being made in a vacuum. The entrepreneurs suggested that the government agencies responsible for regulating various sectors should invest more time in observing, collecting, and analyzing insights and data (which can be done in collaboration with businesses operating in the sector) on how the adoption of digital business models by various sectors is impacting the market, before making long-term policy decisions. Combined with participatory processes with the industry, the government could introduce regulatory reforms gradually while promoting innovation.

Angola could adopt consumer protection laws to cover the main areas of e-commerce legislation. There is no specific law to regulate e-commerce, although the Ministry of Commerce is currently reviewing the existing regulatory framework. UNCTAD's Global Cyberlaw Tracker tracks the state of e-commerce legislation in four areas—e-transactions, consumer protection, data protection/privacy, and cybercrime. Angola has adopted legislation or has draft law pending adoption in all the areas except consumer protection. In comparison, 11 of the 54 African countries already covered all four areas in 2020, including Ghana and South Africa. Cameroon and Nigeria have also adopted legislation in three of the four areas.¹³⁶

Customs for e-commerce businesses that trade goods across borders and the process of importing and exporting goods remain time consuming and costly.¹³⁷ Angola has taken steps to automate customs procedures and is planning to implement a single window for trade that integrates the different entities involved in the import/export process.¹³⁸ In addition, other trade facilitation measures and infrastructure investments are expected to reduce logistics costs.

The nascent state of the digital entrepreneurship ecosystem means that there is no institutional champion actively pursuing sector development. The Institute for the Development of Small, Medium-Size, and Micro Enterprises (Instituto Nacional de Apoio as Micro, Pequenas e Medias Empresas) (INAPEM) is the government institution that has a clear mandate to implement policies and strategies for capacity building and financing of MSMEs. However, with more than 25,000 registered companies in its database and few technical programs such as an incubator center, INAPEM's mandate is broader than just digital business. Without a government entity/department with a mandate to catalyze the growth of digital business, it is challenging to develop a coherent vision and strategy for the sector, as well as the necessary framework to monitor progress and evaluate economic and social impacts.

As with the regulatory environment, the interviewees reported a lack of intergovernmental coordination and limited cooperation between the state and the private sector when programs are being prepared. The government does not have an established process for consulting digital businesses that can help various government

¹³⁶UNCTAD (2020).

¹³⁷ World Bank (2020).

¹³⁸ Macau Hub (2020).

institutions to understand the priorities and needs of innovative businesses. Unfortunately, this means that prior programs have been a mismatch between the program goals/aims and the actual needs of entrepreneurs. There have been occasions when different government entities seemed to have overlapping agendas. This is a typical challenge as digital issues are often horizontal and relevant to all key sectors. Having a government champion that can coordinate the government's approach to digital businesses would help to streamline efforts.

Box 4.1: Government Programs Supporting Entrepreneurship in Angola

Although various activities have not promoted digital business models in particular, multiple government institutions have implemented programs to support small and medium-size enterprises, entrepreneurship, and innovation more generally. Notable examples include the following:

Access to credit and finance. Angola Investe (which was canceled in 2018 but had the objective of financing national productive sectors), Balcao Unico do Empreendedor, Programa de Apoio ao Pequeno Negócio, Programa de Empreendedorismo na Comunidade, Geração Futuro, ProJovem, Crédito Jovem, Payment System Innovation Laboratory, and subsidized credit programs such as ProJovem and Credito Jovem specifically targeting support to around 6,200 companies and youth entrepreneurs with their businesses.

Business environment. The creation of the a one-stop shop for starting a business in Angola (Giché Único da Empresa, GUE)—and later in 2019 its online version—aims at facilitating the process of setting up, altering, and terminating a company.

Youth entrepreneurship. The *Programa de Empreendedorismo na Comunidade*, from the Ministry of Public Administration, Labour and Social Security and implemented by the National Institute for Employment and Professional Qualification, aimed to build the capacity of 10,000 people in the communities.

Sector/industry specific. Programs such as PRODESI were developed to promote national businesses in priority sectors defined by the government. The government also prepared a web portal where producers of agricultural products can register and market their business.

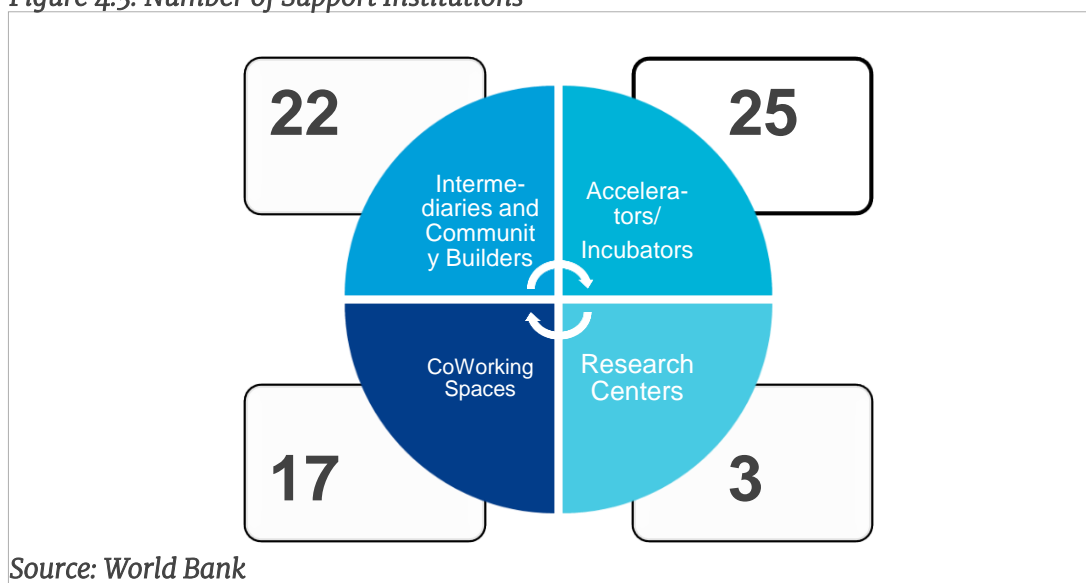
Outside Luanda, the government has developed entrepreneurship initiatives toward the development of rural commerce, tourism, self-employment, and capacity building.

Ecosystem Support and Infrastructure

Access to business support services and infrastructure is growing throughout the country, with some programs targeting digital businesses. Various events are

exposing young people to digital trends and helping to create linkages and form a community, which is often seen as the foundation of any well-functioning entrepreneurship ecosystem. To support this community of aspiring and existing entrepreneurs, the Angolan entrepreneurship ecosystem consisted of more than 50 organizations at the time of preparing this study, the majority of which based in Luanda.¹³⁹ These organizations, predominantly led by the private sector, included 17 co-working spaces (for example, Acelera Angola, Kianda Hub, and TGI), 22 business intermediaries¹⁴⁰ (for example, Unitel apps, Seedstars, and ABC do empreendedor), 25 incubators/accelerators (for example, INAPEM, and Disruption Lab), and three research centers (Yetu Lab, Laboratório de Engenharia, and Laboratório de pesquisa de solos e Agrícola) (figure 4.3). Global organizations and programs also included Angolan entrepreneurs, for example, Seedstars World, Founder Institute, Orange Corners, and the United Nations Development Programme acceleration Lab. Purely digital or technology-focused initiatives are starting to emerge in the ecosystem, including LISPA (an innovation lab focused on FinTech), Unitel Apps (a competition to identify the best apps and developers in the country), and JE dos Santos University (which hosts the only agro incubator in the country).¹⁴¹

Figure 4.3: Number of Support Institutions



Large domestic and international corporations have started supporting the digital entrepreneurship ecosystem. Financial institutions, telecom providers, and even multinational oil companies are offering support for digital businesses to emerge and grow. The Banco Millennium Atlântico launched an incubator focusing on digital and business-oriented innovations, including FinTech solutions (Disruption Lab). Unitel,

¹³⁹ U.S. Embassy in Angola (2019).

¹⁴⁰ Business intermediaries include mentors, experts, and community builders.

¹⁴¹ A forthcoming study from IFC assessing the status of Angola's entrepreneurship ecosystem should provide more insights and updated information.

the largest telecom company in the country, has been running a startup competition since 2016. And Total and BAI developed a pre-acceleration program for startups.

Public-led support initiatives are still limited and generally lack capacity to support digital businesses with the right infrastructure and market linkages. There are three main public institutions across the country focusing on entrepreneurship: IN-APEM¹⁴²; the Ministry of Higher Education, Science, Technology and Innovation¹⁴³; and the Ministry of Public Administration, Employment, and Social Security.¹⁴⁴ According to the U.S. Embassy study¹⁴⁵ and stakeholder interviews, (1) some of the hubs operated by those institutions lack qualified mentors, ICT equipment (basic software function and access to the internet), and monitoring and evaluation systems, and (2) some programs could be better tailored to link digital entrepreneurs to academia or other relevant players within and beyond Angola. The 2019 Global Entrepreneurship Monitor (GEM) and the U.S. Embassy report assessed the quality and quantity of local support¹⁴⁶ available for entrepreneurs. They concluded that Angola's entrepreneurship ecosystem generally provides a valuable support structure for new and growing businesses.¹⁴⁷ However, most of the existing hubs that were measured are led by the private sector. The well-regarded hubs in Angola include Acelera Angola, Orange Corners, Founder Institute, Kianda Hub, and Bantu Makers.

Women entrepreneurs can access emerging gender-focused support structures and initiatives. Notable new initiatives that help women to establish and manage digital businesses include networking events (for example, International Women's Day), women-focused global events and programs (for example, Women Techmakers), and business acceleration programs for women (for example, FemTech). In addition, women are taking more responsibility as facilitators of the entrepreneurship ecosystem. For instance, the founder of Bantu Makers (Vanda Oliveira) and the former regional manager of Seedstars World (Claudia Makadrsto) are among the young generation of successful Angolan women entrepreneurs. While such initiatives are positively impacting the role of female entrepreneurship in Angola, there is still a gap in female representation in digital businesses.

Professional services are perceived as costly by entrepreneurs. Services run by qualified experts (such as lawyers and accountants) are rarely accessed by digital entrepreneurs due to their high costs.¹⁴⁸ Digital entrepreneurs need several rounds of accounting and legal support to qualify for credit, for example, which consequently can turn into a costly overhead expense.

¹⁴² Instituto Nacional de Apoio a Pequena e Medias Empresas.

¹⁴³ Ministerio Do Ensino Superior, Ciencia, Tecnologia e Inovacao.

¹⁴⁴ Ministerio da Admnistracao Publica, Trabalho e Seguranca Social.

¹⁴⁵ U.S. Embassy in Angola (2019).

¹⁴⁶ Local support includes infrastructure, public institutions, and technical support such as accounting services.

¹⁴⁷ Sociedade Portuguesa de Inovacao, Centro de Estudos e Investigacao Cientifica da Universidade Catolica de Angola, Banco de Fomento Angola and Global Entrepreneurship Monitor (2019).

¹⁴⁸ U.S. Embassy in Angola (2019).

4.3 Recommendations and Next Steps

Strengthen the Government Policy Framework

Entrepreneurship ecosystems take years to build and require a long-term commitment and policy efforts toward enhancing the local business environment, investments in R&D, and a culture shift. To give a serious boost to this journey, it is necessary to change the mindsets across stakeholder groups, and the highest levels of government need to demonstrate the importance of the agenda. Preparing and communicating a clear vision to the nation has been seen as a foundation in countries like Singapore¹⁴⁹ and Israel. It is equally important that this high-level commitment translates into focus on policy implementation. The National Development Plan 2018–22 already emphasized innovation and entrepreneurship as important goals for achieving Angola’s development objectives of sustainable and inclusive growth. Attention from the high level of the government to delivering on commitments around the entrepreneurship and digital agendas would help mobilize support for implementation.

R 4.1 The government could consider nominating an internal champion with the mandate to promote the digital sector and digitalization agenda and facilitate better coordination among government agencies and departments that are responsible for various areas of private sector development, innovation, and ICT. The body would be responsible for preparing relevant strategies, in consultation with private sector actors, as well as guiding their implementation. It could also assess the regulatory environment and recommend the adoption of enabling regulation in relevant industries.

R 4.2 Sector policy-related information for digital businesses could be consolidated online for easy access by stakeholders. A digital business knowledge portal should include relevant information on various support schemes, events, regulation (existing frameworks as well as plans for updates and revisions that are expected), and links to relevant studies and important stakeholders.¹⁵⁰

Build digital business-related capacity and knowledge among policy makers and regulators through training and knowledge exchanges. In addition to regulatory oversight (as highlighted in the Country Private Sector Diagnostic),¹⁵¹ capacity-building efforts are needed to keep policy makers informed about the trends related to digital disruption, to guide informed policy making. The topics can include the issues highlighted in this report (including digital business models, data for agile and effective policy making, participatory processes and agile regulation, and so forth) among other priority areas that have been identified in existing strategies and activities.

¹⁴⁹ Yew, Lee Kuan (2002).

¹⁵⁰ For example, the website of Infocomm Media Development Authority provides comprehensive and well-structured information to the infocomm and media sectors under its mandate (<https://www.imda.gov.sg/>).

¹⁵¹ International Finance Corporation (2019).

Digital Business Ecosystem and Markets

R 4.3 Strengthen the capacity of entrepreneurship support organizations (with an emphasis on incubators and accelerators) in developing their individual business models toward operational sustainability, expansion, and increased quality of services provided. Given the large number of entrepreneurship organizations compared with the limited number of success stories, government support should focus on organizations with the highest potential for impact. Support can include organizational assessments to identify metrics for improvements, as well as financial support (for example, via results-based contracts).

R 4.4 To boost the digitalization of key industries (such as agriculture), the government could consider developing programs to accelerate the adoption of digital technologies. The design could be informed by conducting a digital technology adoption survey for a systematic assessment of sector- and firm-level barriers, and it could include managerial training, business advisory services, and provision of matching grants or other incentives to competitively selected SMEs.

R 4.5 The government can consider increasing the scope and market access of digital platforms through supplier development programs. Platforms can help increase market access for SMEs, but often these firms lack sufficient knowledge about the benefits of participating or access to credit to upgrade their products and practices to qualify to participate. Interventions could support the identification of suppliers, capacity building and training, as well as potential financial components (such as concessional loans, credit facilities, input financing, and matching grants).

R 4.6 The Government of Angola should consider a program that facilitates interactions and innovation activities between innovative entrepreneurs, medium-size and large firms in traditional industry, and academics. These platforms can boost open innovation and help students to develop practical skills. Successful examples, where different stakeholders have been brought together, include global networks like Demola¹⁵² and Design Factory.¹⁵³

R 4.7 Increase efforts that target gender parity in the sector and boost female participation in digital businesses. As a first step, there is a need to assess the specific constraints that women face (which include availability at specific times of the day, perceptions about gender roles, and so forth), followed by programs with specific incentives that respond to these constraints. In addition, government programs should include gender targets to guide program execution.

¹⁵² Demola, "About Us – What Is Demola?" <https://www.demola.net/>.

¹⁵³ DFGN, "Design Factory Global Network," <https://dfgn.org/>.

Expand Access to Finance

R 4.8 Strengthen the foundations for early and growth stage investments by fostering interactions and increasing the capacity of entrepreneurs and investors and developing and sharing sectoral data. The government could collaborate with organizations such as the African Business Angel Network to design programs that address the investment readiness of digital entrepreneurs complemented with fostering the creation of investor communities (such as local business angel networks) and investor training programs (similar to the Fund Manager Training Program by the Southern African Venture Capital and Private Investment Association¹⁵⁴). In addition, by developing and providing access to public sector data, private investors would be able to analyze and identify investment opportunities more easily.

R 4.9 Assess the feasibility of risk-sharing mechanisms to encourage financial institutions to lend to riskier ventures. Based on the assessment, potential programs could include a public credit guarantee scheme, to be complemented with access to training and business development services that help digital businesses to become eligible for the scheme.

Further Strengthen Entrepreneurship and Digital Technology Skills

R 4.10 Encourage the integration of technology entrepreneurship courses at all levels of education. At early levels of education such as elementary school, the curriculum could be designed to include courses that stimulate entrepreneurial mindset and aptitude (for instance, courses that develop personal initiative skills for entrepreneurship, such as creativity, problem solving, risk taking, self-efficacy, and so forth). At higher levels, consider applied entrepreneurship classes, such as Lean Launchpad,¹⁵⁵ which combines theory and experiential learning. Alongside entrepreneurial courses, universities could promote innovation challenges and competitions with the goal of actual business creation.

R 4.11 Partner with the private sector to enhance the supply of the advanced technical skills that are needed to fuel the growth of digital businesses. To address the gap between the training provided by higher education institutions and the needs of the private sector, governments are finding ways to partner with technology companies and training providers. For example, Rwanda turned to Andela,¹⁵⁶ while Bahrain,¹⁵⁷ Northern Virginia,¹⁵⁸ and Louisiana¹⁵⁹ have partnered with AWS, as an example of a multinational company providing training through partnerships. With the right partners, the scope of the training programs could be extended outside urban areas where access to training and skills is still limited.

¹⁵⁴ Savca, "Fund Manager Development Programme," <https://savca.co.za/the-savca-fund-manager-development-programme/>.

¹⁵⁵ Steve Blank (2019).

¹⁵⁶ Mwai (2019).

¹⁵⁷ AWS Public Sector Blog Team (2019c).

¹⁵⁸ AWS Public Sector Blog Team (2019a).

¹⁵⁹ AWS Public Sector Blog Team (2019b).

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5. Digital Skills

5.1 Importance of Digital Skills in Angola

The transition to a digital economy, is not only about introducing technology into the economy and society, it is also about increasing digital skills capacity among the population so that people can fully benefit from those technologies. Similar to the digital entrepreneurship pillar, the digital skills pillar focuses on the foundational aspects of strengthening a country's human capital, equipping people with the necessary skills so that they can apply digital solutions in their daily lives whether at school, work or out on a farm. Nurturing digital skills in the creation of the technologies, computer engineering and software application for example, will also be important to ensure continued technological innovation and evolution in the country to be in-line -- or to start leading -- global trends in technology. This pillar could be considered as the most important or catalytic pillar out of the five covered in this report, as without a digitally literate population, the true potential and benefits of the technology would not be materialized.

Increasing digital literacy and skills will be a critical step for economic diversification and to address unemployment and informality in Angola, including among the youth entering the workforce. A recent World Bank report¹⁶⁰ suggests that in Sub-Saharan Africa, new technologies will help tackle the high unemployment rates in African countries, and assist new and existing firms to boost productivity and become more competitive.. However, with technological transformation in Africa's main industries -- agriculture and farming, health care, banking and finance, marketing and retails sector and manufacturing sector -- there is a strong need for human capital that possess digital skills, particularly young people entering the labor market. Albeit the potential that a young population demographic dividend represent for the economic growth of the country, Angola youth have the highest unemployment rates in the country. Between the age of 15-24, 55.87% of young people are unemployed, while people aged 55-64 years old present the least unemployment rate (7.73%)¹⁶¹. The same high rates is observed in the informal sector, where young people are more likely to be working in the informal compared to the population aged 45-54 years (93.87% and 64.92% respectively)¹⁶². According to the study conducted by the African Development in 2021, the high rates of unemployment and informality within young people is associated with low levels of literacy amongst youth. Participation in education remains low across the country. According to Unesco, pre-primary

¹⁶⁰ World Bank. 2021. Africa Pulse,, Volume 23. COVID-19 and the Future of Work in Africa: Emerging Trends in Digital Technology Adoption. World Bank Group

¹⁶¹ African Development Bank. 2021. "Os impactos da pandemia do COVID-19 no mercado de trabalho de Angola". Luanda. African Development Bank

¹⁶² African Development Bank. 2021. "Os impactos da pandemia do COVID-19 no mercado de trabalho de Angola". Luanda. African Development Bank

education gross enrollment ratio was of 40% (2016), primary education was 113.48 (2015) and secondary education was 50.67(2016). Level of literacy of young people, aged 15–24, is estimated at 79.85%. Low levels of literacy is a critical factor that continues to inhibit young people in Angola from developing digital literacy and skills, which in turn, continues to increase their capacity to obtain high skilled jobs in the labor market. Meanwhile, digital companies in Angola are currently turning to skilled talent from abroad to fulfill its needs.

Furthermore, digitalization of the education sector itself could help improve overall quality of education and allow for a more inclusive system. As the COVID-19 pandemic has revealed, broadband internet coupled with remote learning programs have helped the continuation of education for millions of students around the world. This experience has likely altered the way in which education is delivered, with remote learning becoming increasingly accessible, and providing opportunities for local education systems to international networks.

This section examines the current state of digital skills in Angola. The analysis of this section draws from publicly available data as well as interviews with stakeholders in the education sector. One of the findings is the limited data collected for this sector. The first section 5.2.2. provides an overview on three levels that compose the education system in Angola (primary, secondary and tertiary). The section 5.2.3 presents the different ministerial institutions with ICT related mandates, and the different ICT policies implemented throughout the years (since 2001). Section 5.2.4 outlines the government led programs for digital skills development. Section 5.2.5. maps the private sector funded initiatives for digital skills development. Section 5.3. discusses the different challenges that inhibit the develop of digital skills in Angola, this includes i) the weak stability of the governmental led programs, ii) the lack of collaboration between the different stakeholders within the private sector and public sector, iii) the weak infrastructure which continues to affect the cost and quality of internet in the country, iv) the gender inequality on access to basic education and digital skills, v) the disparities in access to internet between urban and rural areas, as well as public and private schools, vi) the weak school infrastructure and vii) the low quality and quantity of TVET courses focused on digital skills development.

5.2. Current State of Digital Skills in Angola

5.2.1 Organization of the Education System in Angola

The general education system in Angola consists of three different levels of education: primary, secondary and tertiary (figure 37). The Ministry of Education (Ministério da Educação) is responsible for developing and implementing national policies at the primary and secondary level; and the Ministry of Higher Education, Science, Technology and Education (MHESTE) is responsible for tertiary-level education. The first six grades of primary education are compulsory and basic information and

communication technology (ICT) courses have been introduced to the curriculum providing students to acquire basic knowledge on the usage of a computer and the internet. Secondary education offers a choice of either general or vocational education. The general education consists of the first and second cycle, which in total comprise six years of education. The vocational education consists of three to four-year cycle which is non-compulsory or treated as vocational/technical schooling. At the secondary teacher education ICT skills are further enhanced by the introduction of ICT labs that deliver courses on the subject of “Computer and Multimedia Engineering”. These labs are not present in all secondary schools across the country.

Table 5.1: Education System in Angola

Education	School/Level	Grades	Age	Years	Enrollment (% gross)
Primary	Primary	1-6	6-10	6	113.4 (2015)
Secondary (General)	First Cycle	7-9	11-14	3	50.6 (2016)
Secondary (General)	Second Cycle	10-12	14-17	3	
Secondary (Vocational education)	Vocational/ Technical	-	-	4	-
Tertiary	Bachelors	-	-	3	9.3 (2016)
Tertiary	Licentiate	-	-	2-5	
Tertiary	Master	-	-	1-3	
Tertiary	Doctorate	-	-	4-5	

Source: *InfoDev Country Report on ICT and Education – Angola, 2012*

At the vocational/technical level, information and communications technology (ICT) courses are basic and up to four years in duration, usually held at specialized vocational training centers. These technical and vocational education and training (TVET) centers are located across the country, in urban and rural areas. In 2012, there were 192 technical schools (98 public and 94 private), 106,200 students enrolled, and 3,700 teachers.¹⁶³ By 2021, among the technical schools across the country, the

¹⁶³ European Union (2014).

centers that were most in demand for hosting technical courses were privately held, accounting for 58.20 percent of the total demand.¹⁶⁴ Around 4.81 percent of the Angolan population has attended or is currently attending a vocational training course, of which 51.8 percent are young people ages 15–24 years.¹⁶⁵ Table 5.1 presents the available data on the number of technicians trained in ICT, namely in computing, hardware, and electronics at vocational training centers in Angola during 2009–11. The most recent study conducted by the African Development Bank (2021) notes that computer courses are among the most in demand courses at TVET centers, with 30.57 percent of all TVET students.

Table 5.2: ICT Technical Professional Graduates, 2009–11

Courses	2009			2010			2011		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Computing	16,505	8,965	25,473	16,016	8,444	24,460	9,828	6,536	16,364
Hardware	1,140	119	259	1,214	473	1,687	834	298	1,132
Electronics	447	23	470	405	58	463	278	61	339

Source: Ministry of Public Administration, Labor and Social Security.

Tertiary education is for three years, and in 2016, it accounted for 9.3 percent of gross school enrollment.¹⁶⁶ Angola has one state university, Universidade Agostinho Neto, which was founded soon after independence in 1974. The remaining universities, which are dispersed throughout the country, are private and religious universities that are sometimes linked to international institutions for a list of the universities in Angola). Although there is limited information available on the number of ICT graduates at the tertiary level, it is evident that the number of institutions with ICT courses has increased over the years. Table 5.2 lists some of the universities in Angola that offer ICT courses, mainly private universities.

¹⁶⁴ African Development Bank (2021).

¹⁶⁵ African Development Bank (2021).

¹⁶⁶ World Bank, “School Enrolment, Tertiary (% Gross) – Angola,” <https://data.worldbank.org/indicator/SE.TER.ENRR?locations=AO-NG>.

Table 5.3: Universities Offering ICT Courses in Angola

University	Subjects	Type
Universidade Agostinho Neto	Electronic and Telecommunications; Science and Communications; and Telecommunications Engineering	Public
Universidade Católica de Angola	Computer Engineering	Private
Universidade Jean Piaget de Angola	Business; Economics, Management Informatics, Law, Medicine, Psychology and Sociology, Engineering	Private
Universidade Lusíada de Angola	Accounting, Business, Economics, Law, Computer engineering	Private
Universidade Independente de Angola	Computer Engineering; Electronics; and Telecommunications Engineering	Private
Universidade Metodista de Angola	Computer Engineering	Private
Instituto Superior Politécnico de Angola	Electronics and Telecommunications Engineering; and Computer Science	Private
Universidade Gregório Semedo	Computer Engineering	Private
Universidade Técnica de Angola	Computer Engineering; and Electronics and Telecommunications Engineering	Private
Universidade Óscar Ribas	Electronic Engineering and Telecommunications	Private

Source: World Bank database.

Policies Guiding the Development of Digital Skills in Angola

Although many policies highlight the need for ICT (and more recently digital) skills development in public and private services institutions, they do not include implementation strategies to guide action (table 5.3). The National Development Plan (2018–22), as a guiding strategic document, presents guidance in some areas, including intellectual, infrastructure, human resources, and economic areas. In cross-cutting issues, there are pillars linked to improvement of the education sector, new ICTs, employment, and the economy. However, there is limited emphasis on the role digital skills play in these fields today. One of the objectives contained in the plan, concerning ICT skills, includes “1.2.7 Improving the Quality of Higher Education and

Developing Scientific and Technological Research.” This program aims to develop the national human, scientific, and technological potential by consolidating the National Science and Technology System, building the capacity of researchers, promoting and linking scientific research institutions and higher education institutions, and creating the Angola Academy of Sciences.

ICT-related mandates and projects are currently spread across four separate ministries¹⁶⁷:

- The Ministry of Education¹⁶⁸ is responsible for the primary and secondary education system, as well as the formal TVET system.
- The Ministry of Public Administration, Labor and Social Security is also responsible for the non-formal TVET system to ensure linkages between training and the labor market.
- The Ministry of Higher Education, Science, Technology and Innovation¹⁶⁹ is responsible for coordinating and evaluating the higher education curriculum. In addition, this ministerial body is responsible for scientific and technological education, including ICT.
- The Ministry of IT and Telecommunications (MINTTISC)¹⁷⁰ has provided support to the other ministries in the past by equipping schools with computers and the internet.¹⁷¹

In April 2020, the Ministry of Education (Ministério da Educação) of Angola prepared a contingency plan for the education sector in collaboration with the World Bank, the United Nations Educational, Scientific and Cultural Organization (UNESCO), and the United Nations International Children’s Emergency Fund (UNICEF) with the aim to minimize the impact of the lockdown during the COVID-19 pandemic on Angolan students. The plan includes ICT solutions for distance education with lessons broadcasted through TV and radio. An online platform is planned to enable students, parents, and teachers to access and share educational material.¹⁷² The online platform will also support online training for teachers on safety measures when schools start to reopen and to accelerate learning.

Table 5.4: Most Prominent Policies Guiding Digital Skills Development

Year(s)	Ministry	Policy
2002	Ministry of Science and Technology (Ministério da Ciência e Tecnologia)	National Commission for Information Technology (Comissão Nacional das Tecnologias de Informação)

¹⁶⁷ UNCTAD (2008).

¹⁶⁸ Ministério da Educação.

¹⁶⁹ Ministério do Ensino Superior, Ciência, Tecnologia e Inovação.

¹⁷⁰ Ministério das Telecomunicações e Tecnologias de Informação.

¹⁷¹ República de Angola (2019).

¹⁷² Ministério da Educação de Angola (2020).

2005	Ministry of Telecommunications and Information Technologies (Ministério das Telecomunicações e Tecnologias da Informação)	Strategic Plan for Electronic Governance (Plano Estratégico para a Governacao Eletronica)
2005	-	National Information Society Plan (Plano Nacional da Sociedade da Informacao)
2011	Ministry of Higher Education, Science and Technology (Ministério do Ensino Superior, Ciência e Tecnologia)	Presidential Decree No. 201/11: National Policy for Science, Technology and Innovation (Decreto Presidencial No. 201/101: Política Nacional para Ciencia, Tecnologia e Inovacao)
2001–10	Ministry of Telecommunications and Information Technologies (Ministério das Telecomunicações e Tecnologias da Informação)	ICT White Paper (Livro branco das telecomunicações)
2013–17	-	Strategic Plan for Electronic Governance (Plano Estratégico para a Governacao Eletronica)
2013–17	-	Strategic Plan for Eletronic Governance (updated) (Plano Estratégico para a Governacao Eletronica)
2018–22	Ministry of Education (Ministério da Educação)	National Development Plan: Education Policy and Higher Education (Plano Nacional de Desenvolvimento: Política de Educação e Ensino Superior)
2019–22	Ministry of Telecommunications and Information Technologies (Ministério das Telecomunicações e Tecnologias da Informação)	ICT - White Paper on Information and Communication Technologies (TIC - Livro branco das tecnologias de informação e comunicação)
2016–21	Ministry of Higher Education, Science and Technology and Innovation (Ministério do Ensino Superior, Ciência, Tecnologia e Inovação)	Project for the Development of Science and Technology (Projecto de Desenvolvimento da Ciência e Tecnologia)
2020	Ministry of Education (Ministério da Educação)	Education Sector Emergency Plan as a Response to the COVID-19 Pandemic (Plano de emergencia do sector da educação para a resposta a pandemia da covid-19)

Source: World Bank staff.

Current Government ICT Programs Available for the Development of Digital Skills

Over the past decade, programs and initiatives led by large international organizations, such as UNICEF, UNESCO, the United Nations Development Programme, and the Angolan Sovereign Fund (Fundo Soberano de Angola) have been implemented to support the improvement and in some cases the digitalization of the education system. During 2005–08, UNICEF implemented the “Quality Primary Education Project,” which aimed to improve teacher training, school infrastructure, and student attendance rates at the primary level. The Angolan Sovereign Fund program implemented the “Kamba Dyami” program in 2013–15, which aimed to incentivize

computer-based learning by providing laptops to students. The project targeted schools located in the most deprived areas in five provinces: Bengo, Benguela, Cabinda, Kwanza Norte, and Luanda. By the end of the project, 1,200 laptops had been distributed and more than 2,400 children benefited from computer-based learning.¹⁷³

More recently, government-led programs and projects aiming at strengthening Angola's human capital in the areas of science, technology, and innovation have emerged under the current National Development Plan. Some of these education projects incorporate components for ICT implementation. For example, in 2019, the Ministry of Higher Education, Science, Technology and Innovation launched a national doctoral training program, which will train 160 researchers in the following areas: (1) environment, (2) water, (3) energy, (4) digital technologies, (5) life sciences, and (6) natural resources management and marine resources management. This is a US\$50 million project in collaboration with UNESCO.¹⁷⁴ In the area of improving digital literacy within the basic education system, there is a project led by MINTTICS called "Ngola Digital." This project aims to increase digital literacy by equipping schools with "internet connection rooms." The project plans to install internet connections in 81 primary schools across the country and provide training to schoolteachers in partnership with the Telecommunications Institute of Luanda, so that teachers can manage ICT-led courses.¹⁷⁵ Some of the major governmental ICT-related initiatives to strengthen digital skills are listed in table 5.4.

Table 5.5: Selected Current Government Programs for Digital Skills Development

Ministry	Program	Objective
Ministry of Higher Education, Science, Technology and Innovation	Project for the Development of Science and Technology (PDCT)	<ul style="list-style-type: none"> • Building and equipping a science and technology park • Financing scholarships and research projects • Integrating women in science, technology, and innovation activities • Supporting skills development in secondary education • Supporting the management of intellectual property
Ministry of Industry and Commerce	Centre for Advanced Industrial Technology	Annually will train about 2,000 technicians in areas such as automation, robotics, general and automotive mechanics, industrial maintenance, and others, to help micro, small, and medium-size companies improve the quality of their products and make them more competitive

¹⁷³ Fundo Soberano de Angola (2018).

¹⁷⁴ UNESCO (2019).

¹⁷⁵ Ver Angola (2020).

Ministry of IT and Telecommunications	Ngola Digital	Trains technicians to respond to the need in the education sector in the areas of telecommunications, information technology, and communication; in 2020, it also equipped schools with internet connected rooms to increase digital literacy
	Technological and Scientific Park of Luanda	Incubator for development, innovation, and knowledge transfer of tech startups
	Media Library Network of Angola (Rede de Mediatecas de Angola)	Aims to provide the country infrastructure to support the population in education, technology, science, culture, and art
	AngoTic ICT Forum 2019	A global information and communications technology event during which digital skills have been highlighted

Source: World Bank.

Private Sector Initiatives for Digital Skills Development

Over the past years, several small-scale private sector initiatives have been underway, aimed at complementing the public sector initiatives. For example, in 2020, Unitel partnered with Huawei to provide free internet access for public schools across the country. The objective is to supply equipment and provide internet and connectivity to primary and secondary schools. By the end of 2021, the project is expected to reach 480 children, distribute 480 tablets for students and 50 computers for teachers, as well as install 50 projectors in classrooms. Additionally, the project aims to provide computer training for teachers.¹⁷⁶ Huawei is also building its headquarters in Luanda, which will include a training and innovation center.

Another example is the “ProFuturo” program, one of the largest international digital education programs sponsored by Fundacion la Caixa and Fundacion Telefonica in Spain. Present in around 38 countries across the globe, this project aims to provide training to teachers, at the technological and pedagogical levels, and access to digital classrooms by distributing tablets, computers, and projectors. In Angola, this project was launched in 2015 with the Catholic Church and the Ministry of Education of Angola. By 2018, the program had targeted 124 schools and benefited around 100,000 children and 1,323 teachers across multiple provinces (namely, Malange, Uige, Moxico, Lunda-Norte, Lunda-Sul, Luanda, Benguela, Huambo, and Bengo).¹⁷⁷ Additionally, a few private initiatives provide peer learning and training in coding. For example, “The Coding Dojo Angola” is a space where those interested in software development can gather to learn and teach programming, to seek information about job openings in ICT, and for companies to find Angolan talent.

Educational technology (EdTech) has also been slowly emerging in the African continent (see map 5.1). EdTech is described as the usage of technology, as a substitute

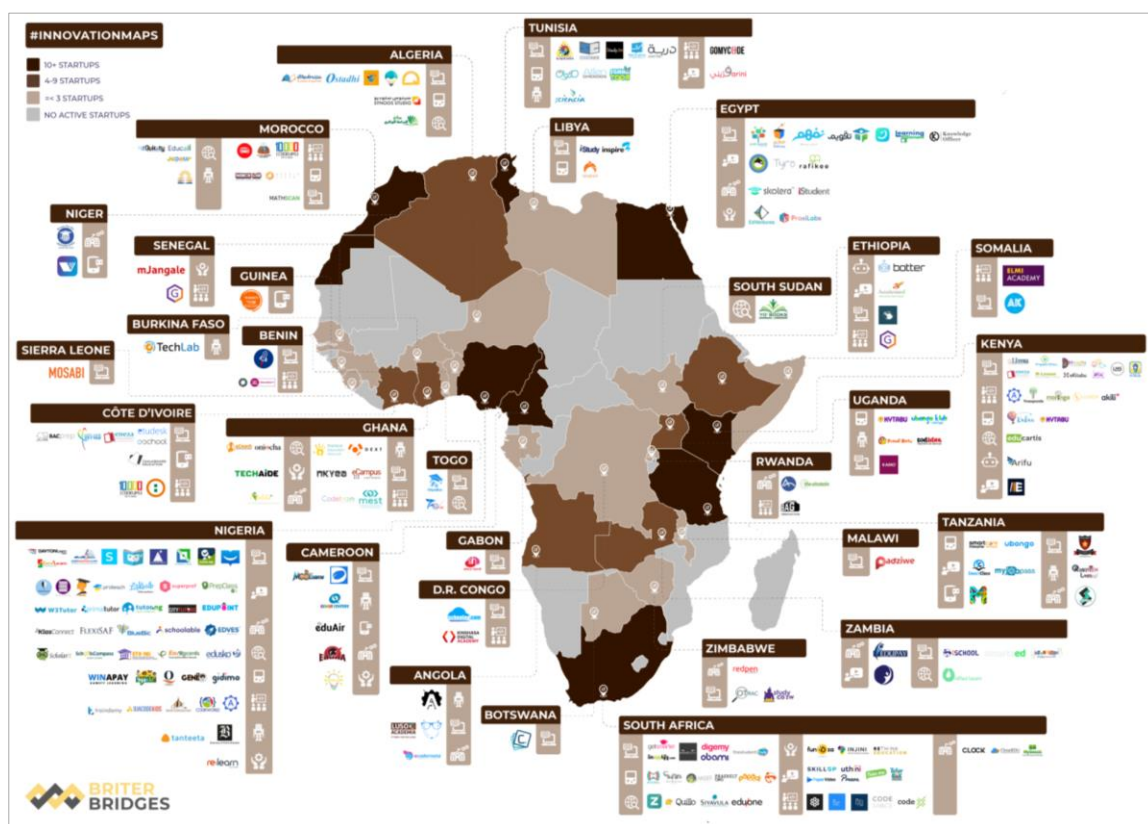
¹⁷⁶ AllAfrica (2020).

¹⁷⁷ NovaAfrica (2021).

for traditional in-person teaching, to deliver knowledge and facilitate learning. EdTech companies create educational technology.¹⁷⁸ This can come in a form of (1) e-learning platforms; (2) offline and SMS-based learning; (3) school management and finance; (4) educational entertainment; (5) bots; (6) directory and search engines; (7) robotics, electronics, and hardware; (8) tutoring platforms; and (9) information technology (IT) training and work experience.¹⁷⁹ EdTech platforms can help Angolans to make better use of digital technology for teaching and learning. They can also serve as a platform to support teachers in acquiring certain skills and qualifications easily online and, overall, help people to familiarize themselves with basic digital skills by taking IT courses on online platforms (which are often cheaper than in-person courses).

In Angola, some EdTech initiatives have emerged in the ecosystem. For instance, “Luso Academia” is an online platform where teachers/educators provide free-of-charge academic material for students in secondary and higher education. “eCader-neta” is a school management platform that substitutes students’ paper-based registration books. This platform helps parents and educators to exchange real-time information on the school calendar, extracurricular activities, student evaluations and performance, and other information on the children’s school routine.

Map 5.1: Africa's Education Ventures: EdTech Companies in Africa, 2020



¹⁷⁸ Woo (2017).

¹⁷⁹ Briter Bridges (2020).

Source: *Briter Bridges*.

5.3 Challenges and Opportunities

National Vision for Modernizing the Education System

Angola lacks a comprehensive national vision to modernize the education system that would fully leverage digital technologies and provide the necessary digital skills curriculum. Although several national policies recognize the need for digital skills development, there is a need to develop a specific roadmap to embed digital skills in the curricula at each level of education. The current agenda focuses on building schools, acquiring desks, training teachers in specific subject matter (other than digital), and promoting greater participation in the education system. Modern digital skills courses are often offered by the private sector to supplement employees' education, or they are based on ad hoc demand, rather than a comprehensive strategy.

Past government programs did not reach the necessary scale to have meaningful traction, and the lack of coordination between programs often led to only incremental progress. Most projects were implemented on a pilot basis, covering a fraction of the schools and without a strategy for scaling up, often ending after the pilot's duration of two to five years. This points to lack of coordination among government and donor-funded programs, which subsequently led to missed opportunities to ensure that programs complemented and built on each other. Furthermore, several projects were discontinued due to lack of available financial resources and specialized technicians capable of handling the equipment and teaching the students. Going forward, strategies for modernization should include costing and identification of operating budget needs to ensure the sustainability of the projects.

Collaboration mechanisms between different ministerial bodies, the private sector, and civil society remain insufficient to address the gap in digital skills. The private sector has sponsored some initiatives in the education sector, but these also are on a pilot basis and still far from addressing the significant needs facing the sector. From interviewing key stakeholders and reviewing various documents, there are five initiatives, three of which are linked exclusively to the private sector, one to a public-private partnership, and one to the Catholic Church. However, none of the initiatives is permanent over the medium and long term, due to problems of financial sustainability. For example, there is an aerospace program coordinated by the Ministry of Communication and Information Technology at the government level; programs linked to public and private universities, where computer courses are administered; and hardware, software, and network installation in engineering colleges and coordinated by the Ministry of Higher Education, Science, and Technology and Innovation (MESCTI). In addition, there is little cooperation between the Ministry of Education, which currently does not hold a specific agenda for digital development in

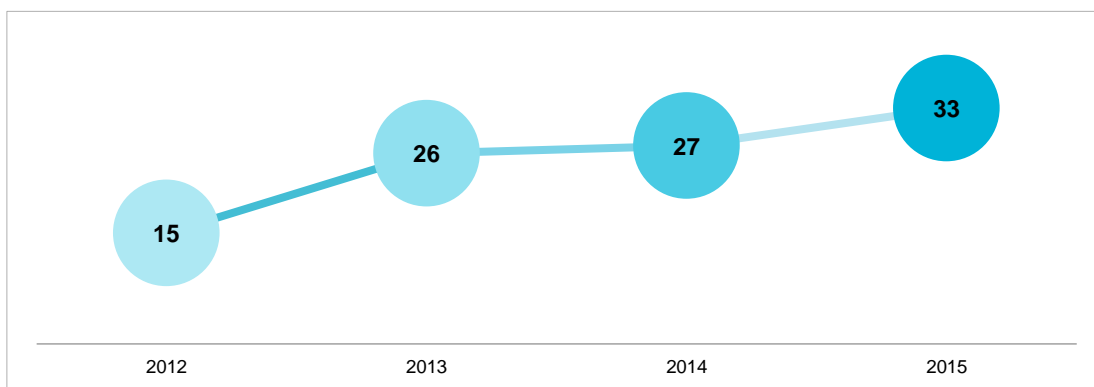
schools, and the ministries in charge of developing and executing digital solutions for Angola (for example, MINTTISC and MESCTI).

There is not much data or information available on the achievement of digital skills implementation at the education level. To date, programs and initiatives have made some progress in raising public awareness of the important role of science, technology, and innovation in nation-building and enhancing the contribution of scientific research to socioeconomic development. Under the Education Sector Emergency Plan in Response to the COVID-19 Pandemic (Plano de Emergência do sector da educação para resposta à pandemia da covid-19), there are new efforts to gather data on education. For example, under the plan, a survey is planned, which will use the web and text messages to evaluate the digital competencies of teachers as well as what they need to do their work. The survey is expected to cover the entire country. Moreover, as part of a partnership between the Ministry of Education and UNICEF,¹⁸⁰ a digital application has been created to collect and georeference school statistics. This initiative aims to collect data on school features, statistics, quality, and performance, to inform future programs. Still, a more systematic approach to data collection and analysis would help Angola stay on the course of education improvement, as data not only help to uncover the challenges and gaps, but also systematic updates of the data will help monitor progress and encourage stakeholders to keep moving forward. There is also need for more data at the tertiary level, for example, data on enrollment in and graduation from IT-related courses.

Without affordable and quality broadband services, overall digital skills development in and out of schools will be hindered. Access to fast and reliable internet is a fundamental, underlying factor for implementing sustainable and efficient ICT projects in schools (for more on this, see chapter 1, on digital infrastructure). Despite the steady increase in internet service subscribers per 100 inhabitants, from 15 in 2012 to 33 in 2015 (see figure 5.1), the overall number remains low. This is even more significant when comparing Angola with its peer countries, where Angola scores the lowest percentage rate (see figure 5.2). By 2019, only 14 percent of Angolan individuals used the internet, while in Tanzania the figure was 35 percent; in Namibia, 51 percent; and South Africa, 56 percent. Furthermore, unreliable power supply remains a big challenge in Angola, limiting people's ability to access the internet and use mobile devices.

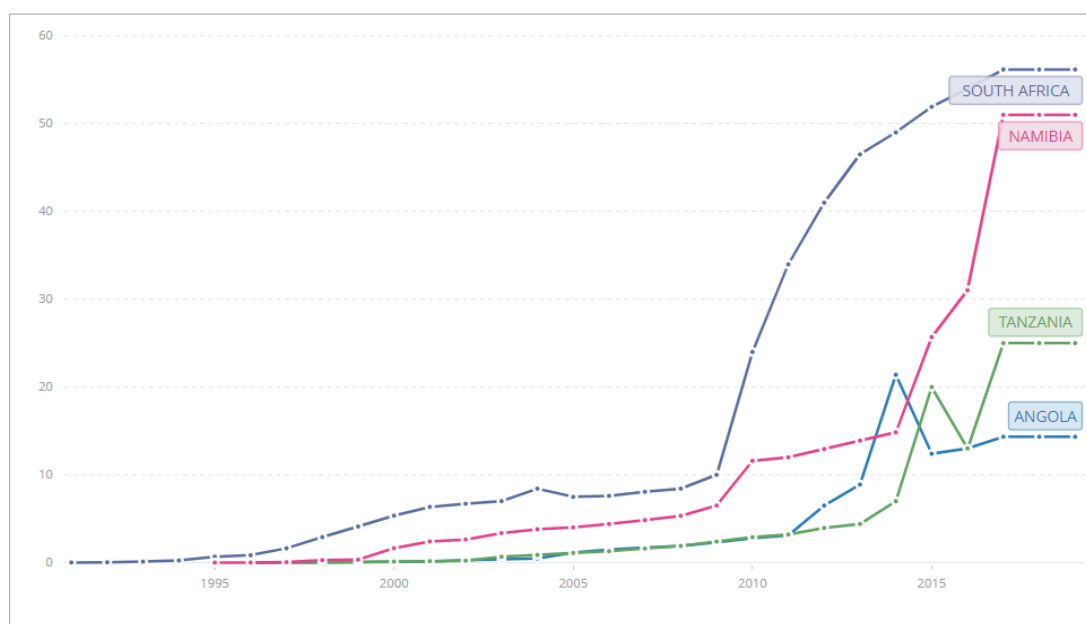
¹⁸⁰ UNICEF (2017).

Figure 5.1: Progress of Internet Service Subscribers per 100 Inhabitants Ages 15+ Years, 2012–15



Source: Ministry of Telecommunications and Technology (Ministério de Telecomunicações e Tecnologia).

Figure 5.2: Individuals Using the Internet: Angola, Tanzania, South Africa, and Namibia (% of population)



Sources: World Bank; International Telecommunication Union; World Telecommunication/ICT Indicators Database.

Ensuring Digital Inclusion in Schools

Education programs should include empowering women and girls with digital skills. Although no data on women’s access to ICT were found, the digital divide between women and men is expected to be as significant as the broader education divide, if not greater. Overall, enrollment in primary and secondary schools in Angola remains

a challenge for progress in education. The disparity between the genders is especially evident in attendance at the secondary school level. In Angola, only the first four years of primary school are considered compulsory. As shown in figure 5.3, after girls complete primary school, their school enrollment rates drop significantly compared with boys. Although there has been some progress in girls attending school (see figure 5.4), with the assistance of international organizations such as UNICEF, women’s low literacy rates remain a challenge for making progress in acquiring digital skills. This is confirmed by the report on the Sustainable Development Goals baseline indicators and based on data from the Multiple Indicators and Health Survey (IIMS) conducted by the National Institute of Statistics (Instituto Nacional de Estatística) (INE) in 2015. The survey shows that only 18 percent of women have basic skills in ICT in Angola (figure 5.5).¹⁸¹

Figure 5.3: School Enrollment, Primary and Secondary, by Gender, Angola (% gross)

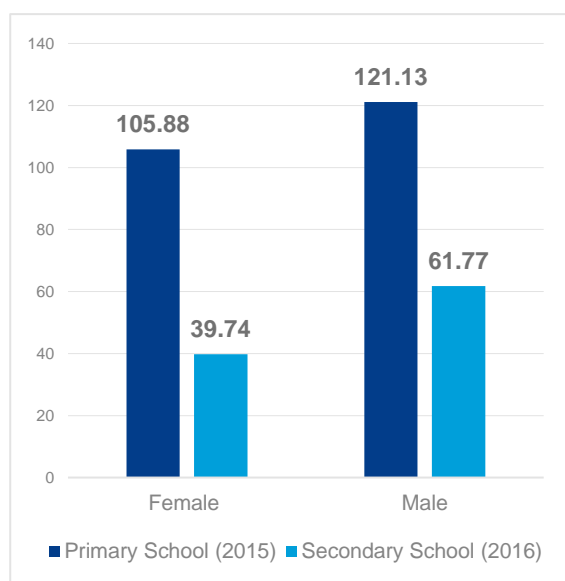
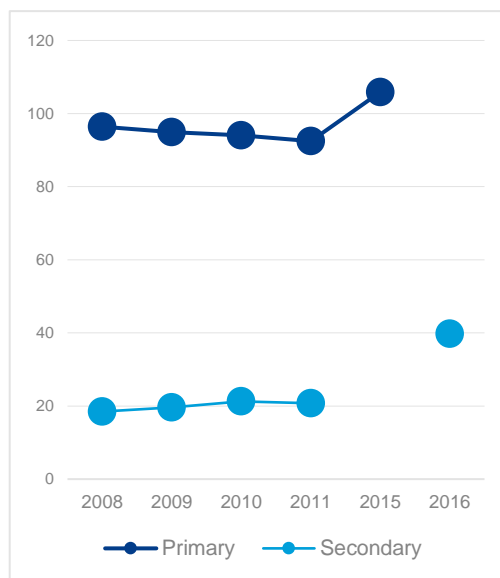


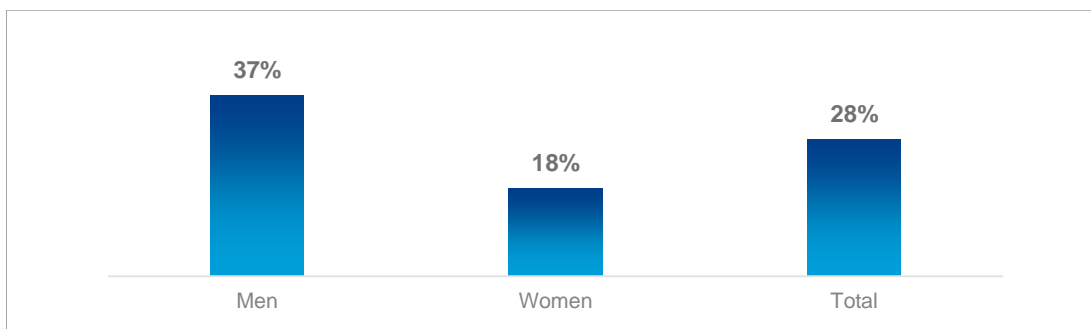
Figure 5.4: School Enrollment, Primary and Secondary, Female, 2008–16 (% gross)



Sources: World Bank; UNESCO Institute for Statistics.

¹⁸¹ According to the Sustainable Development Goals, basic skills in ICT include the effective use of a computer in a given period (in the past three or 12 months). A computer refers to a desktop, laptop, or tablet. It does not include equipment with some built-in computing skills or mobile phones.

Figure 5.5: Proportion of Youth and Adults with Basic Skills in Information and Communications Technologies

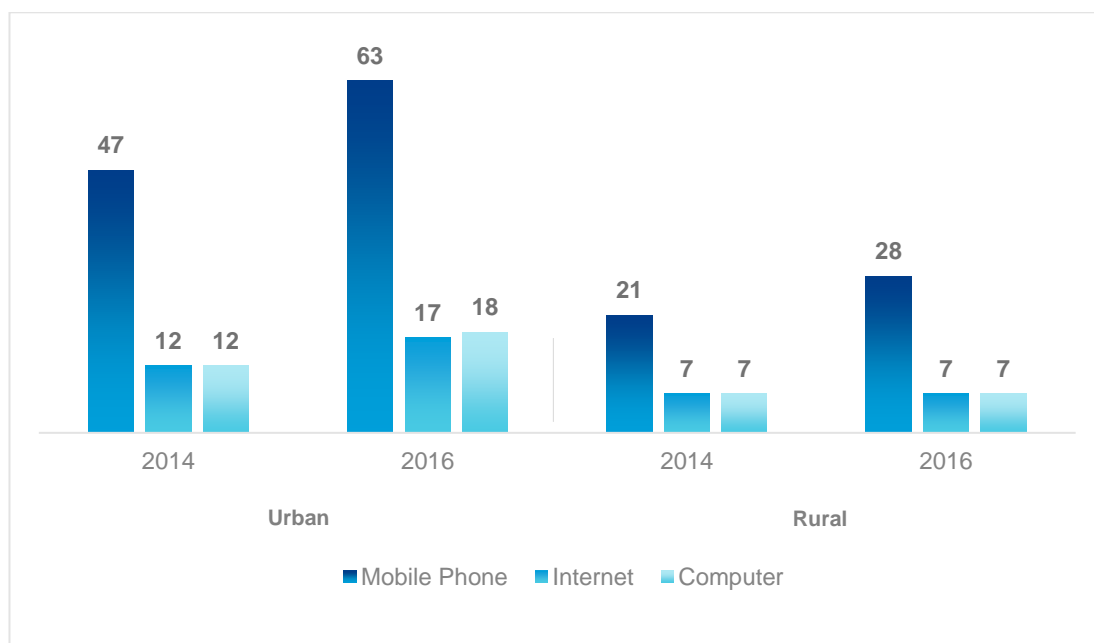


Source: National Institute of Statistics – Multiple Indicators and Health Survey (Inquérito de Indicadores Múltiplos e de Saúde), 2015–16.

Regional disparities in the population's access to new technologies are still low, but there is strong inequality between urban and rural areas. In 2014 and 2016, the use of various means of communication was greater in urban areas than in rural areas (figure 5.6).¹⁸² Use of the internet and computers in rural areas remained at 7 percent, while in urban areas had a growth rate of about 6 percent in the period. At the same time, the growth in use of mobile phones has been remarkable, especially in urban areas, at 16 percentage points, increasing from 47 to 63 percent. In the rural areas, the increase was only 7 percent (from 21 to 28 percent) – see figure 5.6. Recent efforts to reduce the digital inequalities between urban and rural areas, including a specific action plan in the National Development Plan to expand internet access in rural areas, are being implemented by the Government of Angola in an effort to reduce the disparities.

¹⁸² INE (2014, 2016).

Figure 5.6: Population Ages 15+ and Use of Various Means of Communications over the Past 12 Months (%)



Source: National Institute of Statistics, *General Population and Housing Census, 2014 (RGPH - 2014)* and *Multiple Indicators and Health Survey 2015–16 (IIMS 2015–16)*.

There is a large difference in access to computers and the internet between private and public schools. Moreover, in November 2020, the Council of Ministers approved a bill that recognizes distance learning in primary and secondary schools. However, the approval of the bill was insufficient to tackle the needs of students attending public schools. The disparity between the public and private education systems was even more evident during the pandemic, when the implementation of distance learning became a necessity for education. With the closure of schools and higher education, as a pandemic prevention measure, private and public school students had to resort to distance learning to continue the school year.¹⁸³ Private school students did not have any interruption in learning time, because the transition to distance learning was easier due to the financial power to access the internet and electronic equipment. By contrast, most public school students do not have access to technology at home, and they do not have access to the internet due to its high cost.

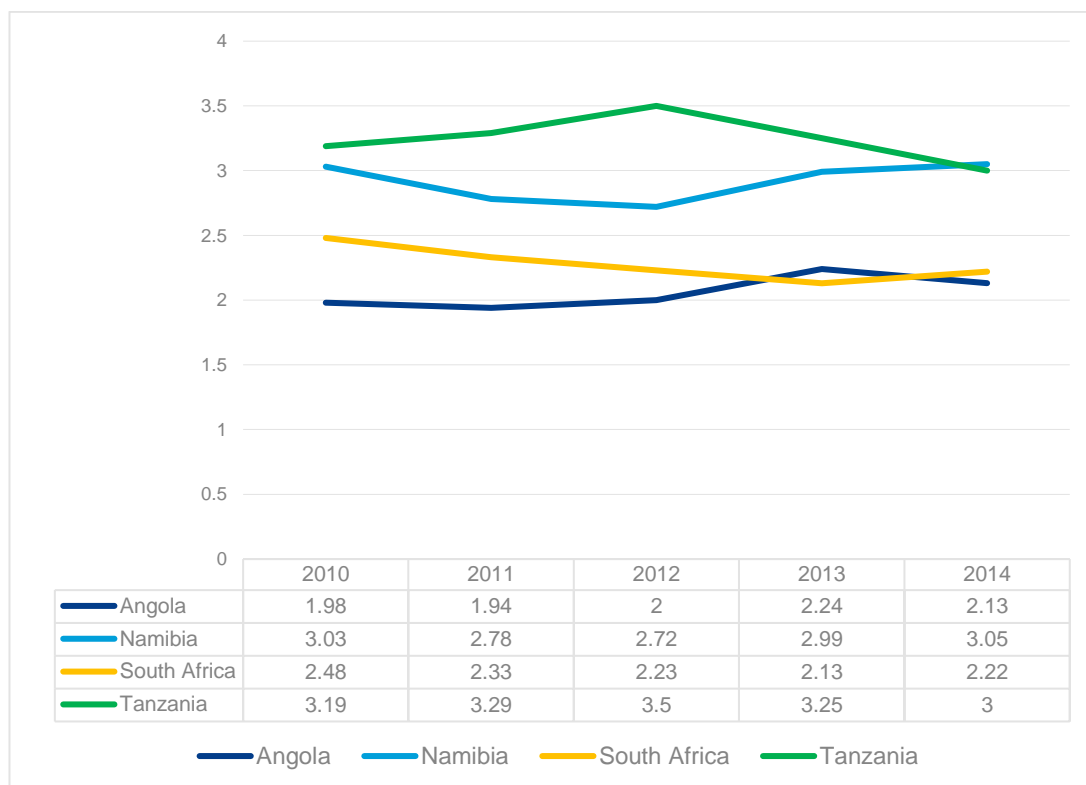
Basic Education as a Foundation for Digital Skills

Basic education, such as literacy, is still the foundation for increasing the capacity for developing digital skills. Therefore, programs for digital skills development will continue to be undermined by low levels of basic literacy and numeracy skills. And digital skills programs may not be enough to offset the incremental improvements in the quality of education, particularly in public schools, coupled with the growing population. According to the 2014 Census, around 1.8 million students ages 5–17 were out

¹⁸³ Nova Africa (2020).

of school. The rate was even higher for girls, as about 34 percent of adolescent girls dropped out of school, and 22 percent of women had zero years of schooling. Although these data are from 2014, the situation is not expected to have improved in recent years. Examining data available from the World Economic forum Global Competitiveness Index indicator on “Quality of the Education System”, Angola has limited year-on-year average growth rate (-3.35%) compared to peer countries such as South Africa, Namibia and Tanzania (see figure 5.7).

Figure 5.7: Quality of the Education System, Angola and Peer Countries Index(1–7 Best)



Source: World Economic Forum Global Competitiveness Index.

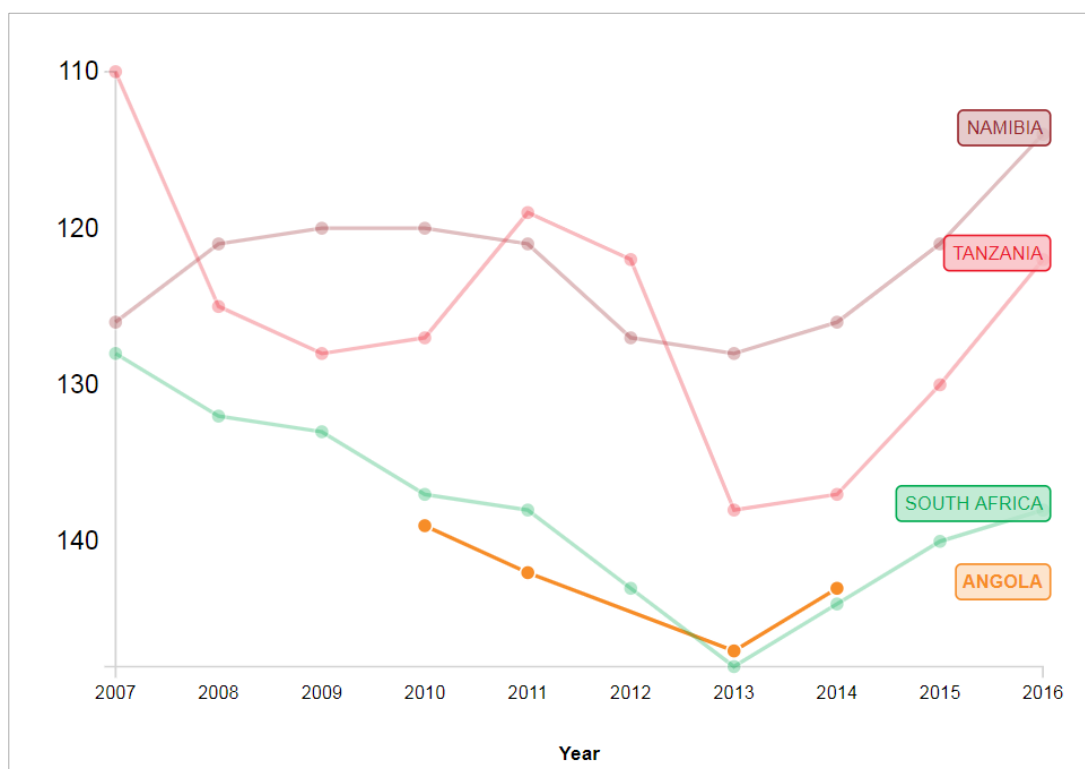
The schools have a limited capacity to integrate new digital technologies into the curriculum. Most schools have not been sufficiently prepared for incorporating computers and the internet into classrooms and teaching. The reasons for this include lack of investments in computer equipment and access to the internet, limited or no training of teachers in technology, and outdated curriculum that is out of step with the rapid changes in this sector. Teacher training remains an overarching problem in the public education system. According to UNESCO’s Institute for Statistics, only 47.4 percent of Angolan teachers have received training in primary education (this is the latest available data).¹⁸⁴

A particular challenge is the limited availability of classroom space for students. As classrooms remain overcrowded and infrastructure is limited, in some places the

¹⁸⁴ World Bank, “Trained Teachers in Primary Education (% of Total Teachers) – Angola, Tanzania, Namibia, and South Africa,” <https://data.worldbank.org/indicator/SE.PRM.TCAQ.ZS?end=2016&locations=AO-TZ-NA-ZA&start=1998&view=chart>.

alternative is to transfer students to open air spaces, such as studying under a tree. Of the 109,000 classrooms in the country, around 20,000 are open air classrooms for about 1.1 million students.¹⁸⁵ Additional factors are the decline in the number of teachers joining the system, high teacher absenteeism, as well as teachers' capacity to deliver quality content in class. Between 2014 and 2018, there was a shortage of teachers, and the education system faced a challenge in replacing teachers who left the system. Moreover, teacher absence from classrooms can be close to 30 percent of the time, according to the 2016 Service Delivery Indicator. Additionally, teachers scored on average below 20 percent when tested for content in math, language, and other subjects.¹⁸⁶ On the quality of math and science education, in 2014,¹⁸⁷ Angola ranked 141 of 151 countries covered by the World Economic Forum study (figure 5.8), lower than Tanzania (137) and Namibia (126). In addition, the percentage of graduates from science, technology, engineering, and mathematics programs in tertiary education programs was 12 percent in Angola in 2015.¹⁸⁸

Figure 5.8: Quality of Math and Science Education in Angola and Peer Countries (Index)



Source: World Economic Forum Global Competitiveness Index.

Computer and internet access in schools also remains low, and the scale of projects underway is very small, involving only a few schools. Considering that digital skills are defined as a range of abilities to use digital devices, communication applications,

¹⁸⁵ World Bank (2019).

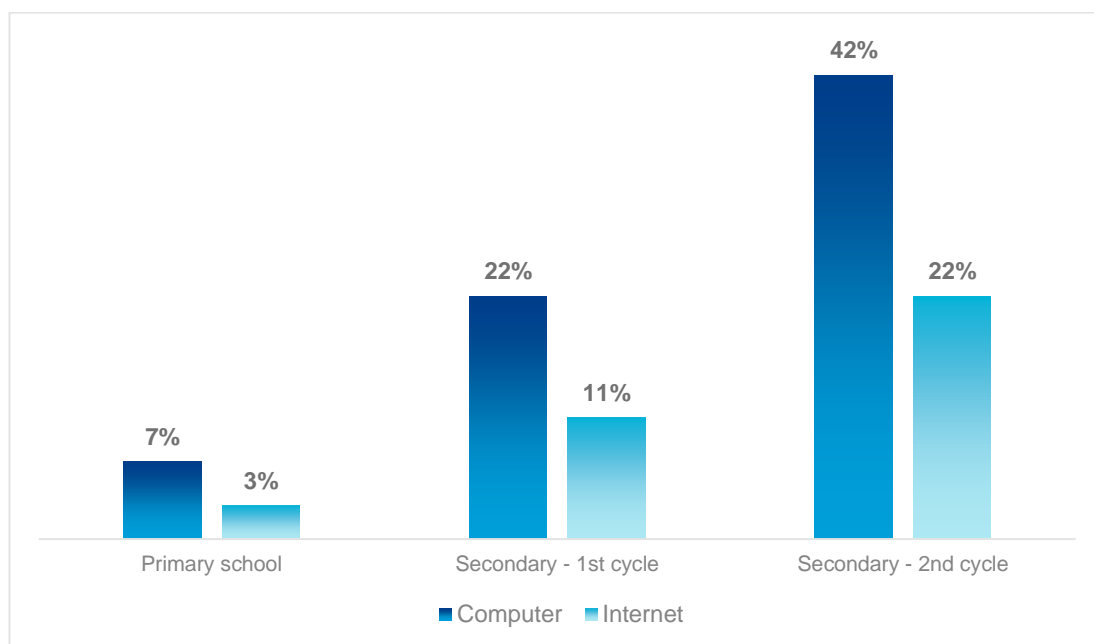
¹⁸⁶ World Bank (2019).

¹⁸⁷ Data for Angola end in 2014.

¹⁸⁸ World Bank, "Education Statistics – Angola, [https://databank.worldbank.org/US-STEM-\(ISCED-and-Tertiary\)/id/cd77ac48](https://databank.worldbank.org/US-STEM-(ISCED-and-Tertiary)/id/cd77ac48).

and networks to access and manage information,¹⁸⁹ one of the main factors underlying the poor digital skills development in Angola is access to computers and the internet at basic levels of education. By 2016, only 7 percent of primary schools had access to computers and 3 percent had internet access for teaching purposes (figure 5.9).¹⁹⁰ In secondary education, in the first cycle, 22 percent of schools had access to computers for teaching purposes and just 11 percent were connected to the internet. Although the figures are still low, they increase to 42 percent of schools with computers for teaching purposes and 22 percent connected to the Internet in the second cycle of secondary education.

Figure 5.9: Proportion of Schools with Access to Computers and the Internet for Teaching Purposes



Source: Ministry of Education – Administrative Data 2016.

Digital Skills as Part of Continuing Education

Basic conditions need to be created to improve the quality of and attendance in science and technology courses in the higher education system. The curriculum of Angola’s universities tends to emphasize theory over practice, which decreases the quality of ICT courses (which tend to be more practical). Yet, basic computer courses with practical classes in the computer lab are part of the curricula of all the courses in higher education. In terms of specific science, technology, engineering, and mathematics courses, there are already some public and private universities offering learning experiences and digital skills geared toward the labor market in the country. Examples range from the publicly funded and only state university, Universidade Agostinho Neto, to the private universities such as the Catholic University of

¹⁸⁹ UNESCO (2018).

¹⁹⁰ INE (2014).

Angola, Lusíada University, Jean Piaget University of Angola, New University of Angola, and Private Superior Institute of Angola. Yet, figures on enrollment and graduation indicate that courses in science and engineering are not particularly attractive to university students, compared with other courses (for example, humanities, law, and business¹⁹¹).

Despite the efforts to reform the TVET system, the quality and quantity of available training remains inadequate, particularly for training in ICT. Since 2001, with the reform policy, “Reform of Vocational and Technical Training,” significant improvements have been made to increase the quantity of infrastructure, laboratory equipment, and training workshops; the quality of the curriculum, by including ICT courses; and the quality of the system of training the trainers.¹⁹² The usage of computers in TVET has been extended to all areas of training. In the area of computer training, there are computer courses; training for multimedia technicians, computer systems management technicians, and computer technicians; and computer use is mandatory from the first year. Other courses in the different training areas also use the computer as one of the tools, although not as intensely as in the areas mentioned above. Yet, the overall system remains weak due to (1) lack of involvement of the private sector, which leads to mismatching of skill demand in the economy; (2) lack of coordination with the education system; (3) lack of coordination between the public and private TVET initiatives; (4) lack of available data on TVET indicators; (5) lack of skilled trainers; and (6) the low level of basic education, which limits students’ capacity to take advantage of ICT education. Furthermore, attendance in TVET courses continues to be influenced by regional and gender factors. Urban youth are 3 percent more likely to attend professional training than youth living in rural areas, and male youth are 2 percent more likely compared with female youth.¹⁹³

There has been an increase in demand for basic digital skills, particularly to assist the growth of digital enterprises. With the steady increase in the number of digital firms in Angola (see chapter 4, on digital entrepreneurship), there is greater demand for basic digital skills. Although there is little accurate evidence of the size of the ICT workforce, it was estimated that 10,000–15,000 people were directly employed in the ICT sector (data from 2015).¹⁹⁴ Indirect ICT jobs were estimated to employ 40,000–60,000 people. This number is expected to have grown by now, as is evident from the digital skills data presented in the figure 5.10, which shows an index of Angola’s growth from 2.20 (2018) to 2.49 (2019) in terms of active population possessing sufficient digital skills (such as computer skills, basic coding, and digital reading). Despite this growth, the result remains lower compared with peer countries and the high market demand for individuals with digital skills. The digital entrepreneurs interviewed for the digital entrepreneurship chapter of this study (chapter 4)

¹⁹¹ UNCTAD (2008).

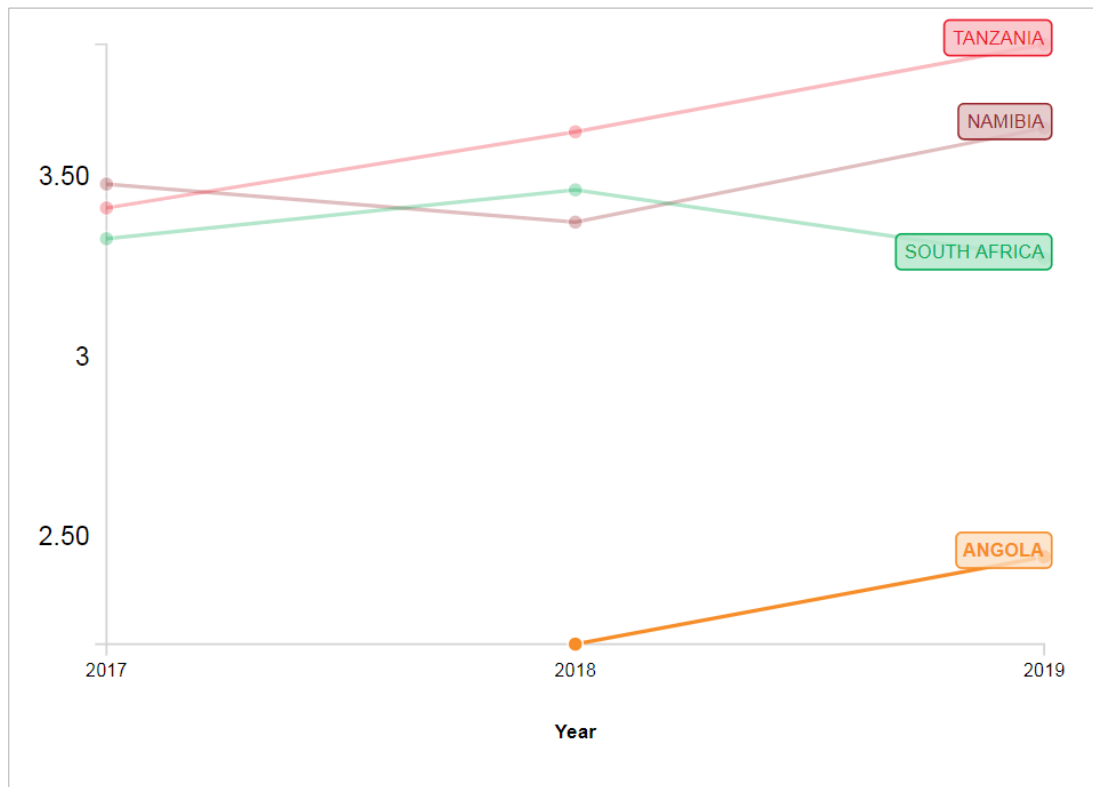
¹⁹² European Union (2014).

¹⁹³ African Development Bank (2021).

¹⁹⁴ ElioPlus (2015).

acknowledged that the country lacks skilled individuals with advanced digital skills to assist them in building their digital businesses (for example, software developers); therefore, the digitalization process of businesses is outsourced to other countries (see chapter 4). For this study, only two local companies, Digital Factory and Digital Angola, employ qualified IT software developers and offer quality digital solutions for digital entrepreneurs.

Figure 5.10: Digital Skills among Population, 1–7 (Best)



Source: World Bank.

5.4 Recommendations and Next Steps

R.5.1. Continue to address the digital infrastructure challenges and low levels of literacy. The ICT market has shown very rapid growth in several countries, and Angola does not escape the rule. Investments in ICTs in Angola are "flourishing" at an encouraging pace, according to experts. However, despite the government's efforts and initiatives, several problems and situations hinder the progress of these technologies and consequently their full use and promotion of digital skills. For the long-term solution, it will be important to address challenges such as the provision of basic infrastructure (access to reliable energy and internet access) throughout the country, the cost of internet access and improve access to digital solutions in the education system (including internet and ICT equipment) (see chapter 1, on digital infrastructure). It is

also crucial for the government to continue to address the low level of education through increasing enrollment, particularly after primary school.

R.5.2. In the short term, incorporate a more specific digital skills development agenda into the Education Development Plan. The current government programs and initiatives have been developed through the National Development Plan to promote digitalization in the country. These efforts are mainly led by MINTTISC and MESCTI, with little cooperation with the Ministry of Education. The development of a specific digital skills plan that is mainly led by the Ministry of Education, with strong cooperation with other ministries, would ensure the incorporation of specific knowledge, skill quality, and coherence of policies in the short- and long-term vision of digital skills in the National Development Plan.

R.5.3. Continue to encourage public-private partnerships in the development of digital solutions for schools. Although some projects are incorporating digital solutions in the education system in Angola, led by private companies such as Huawei, ITA, and Unitel, among others, these projects generally do not have a medium-term duration that could contribute to the improvement of the digital skills of young people. The solution could be to strengthen these partnerships through: (1) more active participation of the government in the projects, through funding or monitoring; (2) participation of more private sector companies for cost sharing; (3) introduction of monitoring and evaluation mechanisms to measure project performance and impact on students; and (4) collaboration between the investor companies and skilled students at higher levels of education (for example, offering unpaid internships sponsored by the government).

R.5.4. Adopt a national digital skills framework at all levels of education. It takes changes and increased investment in education to raise the rate of access to new technologies. Providing schools computer equipment and materials and connecting these schools to the internet network is not enough to foster digital education. A massive and programmed investment program in ICT content in the short, medium, and long term, covering schools at all levels of education, appears to be one of the priorities for providing young people basic ICT tools, raising their qualifications, and thus positively impacting their performance in this area in middle and higher education. Recommendations spread across three levels of skills proficiency:

Basic and intermediate skills courses. Such courses could be implemented at the curriculum level (secondary and TVET) or through government-led programs to target out-of-school young people, formal and informal enterprises, and people with low or no experience with the internet. The idea behind the courses is to offer young people and professionals training in basic digital skills (including internet browsing, email management, Microsoft Office processing, and others) through online or in-person training, which would include an assessment test and a digital literacy certificate. Examples of such courses are the International Computer Driver's License, IC-

3 Digital Literacy Certification, and Microsoft Digital Literacy Certification (the last one is free and open source).

Intermediate and advanced skills courses. Such courses would require students to have a more advanced knowledge of digital skills and could be introduced at the TVET level of education. The courses could target those seeking work in tech-led industry/manufacturing. The courses could include subjects such as 3D printing and smart factories. Examples are the Mechatronic Systems Certification Program led by Siemens, Predictive Maintenance in Smart Factories, and MakertBot (a 3D printing course¹⁹⁵).

Advanced and high-skills courses. Such courses could be implemented at the higher education curriculum level (universities) or through government programs in cooperation with the private sector. Cooperation with the private sector is highly relevant for matching professional skills and industry needs, and it would allow both to grow simultaneously, considering that Angola does not have many companies using highly skilled technologies. Some examples of courses could be artificial intelligence, machine learning, robotics, and the internet of things.

R.5.5. Create a digital competence assessment. Provide an online platform for digital skills assessment, for any citizen who aims to increase their level of digital skills, and match people's skills with those required by the job market. This platform could follow similar successful models already developed in Europe (for example, the Ikanos model; PIX in France; and Compass in Italy, France, Romania, and Ireland).¹⁹⁶ The platform could allow people to create a profile, take adaptive tests that automatically assess their level of digital skills, and, based on the results, recommend and offer learning courses, provide certification of digital skills level, and match the professional digital profile to possible employers. This project could be led by MESCTI in close cooperation with public and private stakeholders to facilitate funding and networking.

R.5.6. Improve the mechanisms for monitoring and assessing educational data. The process of developing, aligning, testing, training, and implementing new formal curricula (in schools and post-school institutions) is too lengthy to be responsive to the fast-changing demand. Innovative ways of collecting, monitoring, and assessing educational data throughout the country should be considered to help meet this need. During the investigations for this assessment, it was evident that data on the quality of education, and particularly digital education, are relatively few or even nonexistent. Updated educational data, at all educational levels, is particularly important for assessing risks, identifying curriculum gaps, and addressing some of the upcoming digital trends. A possible solution could involve upscaling the project introduced by UNICEF in Angola in 2005, which supported the Quality Primary Education Project and incorporated the establishment of an Education Management Information

¹⁹⁵ Garcia (2019).

¹⁹⁶ EdTechTeam, "Digital Skills – Compendium of Assessment and Certification."

System. The aim was to improve data collection, analysis, and reporting in the education sector, including on special education, pre-school education, the quality of life-skills education, and education for migrating and nomadic populations.¹⁹⁷ The project resulted in three research reports and a draft policy recommendation for the government. There is no evidence that this project is still ongoing. However, it would be an opportunity for the government to improve monitoring and assessment mechanisms in the country.

R.5.7. Develop a professional development program and guidance on classroom management for teachers. Technology adoption in the classroom is a challenge, but also an opportunity for students and teachers to improve professional competence. Use of technology in the classroom can leverage new teaching and learning activities, improving assessments, grading, feedback, course content, and even student participation. In the case of Angola, at all levels of education, the use of technology for teacher support and classroom management can assist in improving the quality of education and school attendance. As part of the teaching assistance already in place to support the training of teachers, delivered by the Ministry of Education, the following tools could be inserted into the support program to teach teachers to use digital tools for deployment of class content¹⁹⁸: (1) visual tools to generate interactive learning experiences in the classroom, for example, videos, images, polls, and others; (2) video recording of lectures, particularly for higher education students, to enable access to content outside the classroom; and (3) videoconferencing tools that would allow students to attend online classes remotely, as well as engage students with conferences abroad and interact with guest speakers. Going beyond showing teachers how technology works, partnerships with educational technology consultants and closer collaboration with teacher training centers and universities are required, to align formal teacher education with the technological revolution envisioned for schools.

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¹⁹⁷ UNICEF (2016).

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6. Conclusion

The digital economy has become an important driver of economic growth, innovation, and improved service delivery across the world. Digitalization is rapidly changing the fundamental patterns of economic and social activity: how people learn, work, do business, and communicate with one another. The number of internet users worldwide grew from one billion in 2005 to around four billion by 2018. The contribution of the digital economy is expected to grow from 15.5 to 25 percent of global gross domestic product between 2016 and 2026. It is estimated that every dollar invested in information and communications technology infrastructure between 2016 and 2018 could yield US\$5 by 2025. Closing the infrastructure gap in Africa, complemented by strengthening other foundational pillars, can yield clear economic benefits, and it can create much-needed jobs and lead to better services for consumers.

The digital diagnostic findings in Angola show that this potential is still very much underutilized. Although Angola has expanded access to digital infrastructure and services, only part of the population is currently benefitting from the digital economy. Angola's telecommunications infrastructure provides a strong foundation and start, but regulations could be strengthened. And more effective enforcement of the regulations would promote greater competition and subsequently reach more Angolans. This report puts forward several recommendations to this end, to advance affordability, promote infrastructure sharing, and increase consumer demand.

A holistic approach to development of the digital economy is necessary to maximize Angola's chance for attaining its digital potential. Rather than implementing multiple, fragmented interventions, a coordinated and high-level cross-boundary approach that maximizes complementarities is needed. To advance toward an inclusive digital economy that can foster Angola's potential, recommendations are proposed with actions aimed at solving the challenges identified across the digital economy foundations.

Digital government platforms could drive demand for internet access as well as enable a more efficient and citizen-centric public sector, but lack of coordination and capacity hamper the government's efforts in this area. A strategic, governmentwide approach is needed, combined with improved focus on the quality, accessibility, and interoperability of existing systems. Steps toward a more data-driven and citizen-centric approach are recommended.

Private digital platforms have not yet found a proper footing in Angola, and very few locally developed, platform-based business models exist. Digital businesses and entrepreneurship are still nascent in Angola and could be helped by raising the quality of support organizations, improving access to funding, and leveraging regional networks for access to expertise and markets.

Mobile money has successfully driven financial inclusion in Angola, but the enabling environment is still quite rigid to support further innovation in digital financial services. The government could demonstrate leadership in this area by moving to the use and acceptance of electronic payments. While promoting innovation, focus should also be on improving interoperability and consumer protection.

Digital skills constitute a clear bottleneck for Angola and an area where policy and institutional reforms are needed. Measures to improve digital skills need to be backed by a strategic focus and improved data. Many of the key challenges relate to the formal education system and require a renewed focus on learning infrastructure, curricula, pedagogy, and upgrading of teachers' competencies. Partnerships with the private sector could be advanced to promote innovation in digital skills development.

This assessment takes a snapshot of where Angola is, on its path towards the digital economy. Angola has key foundations in place that could provide a springboard for digitalization and modernization of government, the productive and social sector. However, this will require strong collaboration and coordination between government agencies, productive sectors and civil society. With this collaborative spirit, digital transformation could be accelerated in Angola and more importantly advance the agenda in an inclusive manner to benefit all Angolans.

7. Annexes

Annex A: Digital Public Platforms: Relevant Legislation and Policy Frameworks

E-Government	
White Book on Information and Communication Technologies 2011, updated 2019–22199 (approved by Presidential Dispatch 129/19 of July 22)	<p>Published by the Ministry of Industry and Information Technology in 2011, this presents the government’s policy aspirations for the use of information and communications technology (ICT) in public administration. This is focused on ensuring “quality and competitiveness of public services for citizens and businesses” and “interoperability between services, security, and information privacy.”</p> <p>The 2019–20 ICT White Book addresses key public infrastructure for electronic signatures and time stamps. References are also made to expanding access to and use of ICTs, through promoting the acquisition of computers and smartphones, extending access through public access points such as libraries and tele centers, building the ICT capacity of citizens, and reducing user fees for electronic services. This also refers to the creation of a Unique Point of Contact through the Portal for Electronic Public Services (SEPE).</p>
Regulation on Technologies and Information Society Services (approved by Presidential Decree 202/11 of July 22)	<p>Defines measures to promote the provision of digital public services, and the standards and interoperability mechanisms to allow communication between information systems. The heads of each ministerial department are tasked with drawing up specific strategic plans for the promotion and implementation of e-government for their agency.</p>
National Plan for the Information Society 2013–17	<p>Updates the Action Plan for the Information Society developed in 2005, with an aim to increase the impact of ICT on economic and social development.</p>
Strategic Plan for Electronic Governance (PEGE) 2013–17 (part of the National Plan for the Information Society)	<p>Updates the Action Plan for Electronic Governance developed in 2005. Presents the government’s vision and approach to using ICTs to improve governance in Angola by “developing more oriented, relevant and accessible public services to citizens and businesses.”²⁰⁰</p> <p>PEGE outlined the following focus areas: (1) focusing government services on citizen needs, (2) improving public sector effectiveness and efficiency, (3) developing capacities of public employees and institutions, and (4) ensuring interoperability and security of digital technologies in the public sector.</p>
National Plan of Global Architecture for the Interoperability of the Central and Local Administration (PNAGIA) (approved by Presidential Decree 46/18)	<p>PNAGIA aims to ensure the integration of systems to facilitate the provision of digital services to citizens and that information is always available to whomever needs it in accordance with their authorization levels.</p> <p>Among its goals are ensuring the reuse of data, systems, and services across government; reduction of risk and costs; and security through defining standards and developing secure authentication mechanisms, guaranteed by key public infrastructure. In addition, a future Interoperability Technological Platform (<i>Plataforma Tecnológica de Interoperabilidade</i>) is foreseen as the central technological infrastructure (now embodied by SEPE).</p>

¹⁹⁹ <https://www.sepe.gov.ao/ao/livro-branco-das-tic/>.

²⁰⁰ OECD, 2018.

Data Protection, Privacy, and Cybersecurity	
Angolan Constitution	Includes the right to privacy and habeas data (Article 69), which grants to the data subject the right to be informed of any data about them included in files, archives, and computerized records, as well as the purposes for which the personal data are processed and to request that such data be updated and corrected.
Law on Electronic Communications (2017)	The 2017 Electronic Communications Law "aims to ensure that ICTs in Angola are developed to play a fundamental role in ensuring citizens' universal access to information, transparency in the public sector, and participatory democracy." ²⁰¹ It also gives legal status to digital signatures in Angola.
Law on Electronic Communications and Information Society Services (Law no. 23/11 of June 20, 2011)	Legislation protecting citizens' rights to privacy and security online by establishing mechanisms for reporting incidents and cyberattacks.
Data Protection Law (Law No. 22/2011)	Provides the right for data subjects to "access, object to, rectify, update and delete their personal data." Failure to comply with the law by data controllers based or operating in Angola can draw a fine of up to US\$150,000. ²⁰²
Presidential Decree 214/16, of October 10, 2016	Establishes the rules governing the structure and functioning of the Data Protection Agency.
Protection of Information Systems and Networks Law (Law no. 7/17 of February 16, 2017)	Provides a set of procedures and norms and the criminalization of acts committed in the national cyberspace.
Criminal Code	Defines a criminal framework for cybercrime that includes punishment for illegally accessing information systems. According to Freedom House, a special investigative police unit for cybercrimes (<i>Unidade de Combate aos Crimes Informáticos do Serviço de Investigação Criminal, SIC</i>) is reportedly being established.

²⁰¹ Freedom House (2019), Freedom on the Net 2019: Angola. <https://freedomhouse.org/country/angola/freedom-net/2019>

²⁰² Freedom House (2019).

Annex B: Indicators for Digital Financial Services

Assessment dimensions and measures/indicators	Data source
4 Digital Financial Services	
4.1 Uptake & Usage of Digital Financial Services	
4.1.1. Adults with a store-of-value transaction account: 49%	Angola Financial Inclusion and Capability survey (2019)
4.1.2 Firms with a store-of-value transaction account: 86.4%	Enterprise Survey (2010)
4.1.3 Adults using the internet or a mobile phone to access a transaction account: 0%	Global Findex (2014)
4.1.4 Adults making or receiving a digital payment in the past 12 months: 2.42%	National Bank of Angola (2019)
4.1.5 Adults who used the internet to pay bills or buy something online in the past year: 1%	Global Findex (2014)
4.1.6 Agricultural payments made via digital channels: 0%	Global Findex (2014)
4.1.7 Domestic remittance senders/receivers using digital channels: 0%	Global Findex (2014)
4.1.8 Wage earners receiving wage payments via digital channels: 0%	Global Findex (2014)
4.1.9 Firms accepting digital payments (%)	
4.1.10 Number of retail electronic/digital transactions per capita	
4.1.11 Volume of electronic/digital transactions per capita (Angolan kwanzas – Kz)	
4.2 Policy and Regulation	
4.2.1 Market Entry	
4.2.1.1 Retail electronic/digital transactions per capita facilitated by nonbanks (%)	
4.2.2 Delivery Channel and Product Innovation	
4.2.2.1 Government-to-citizen social transfers disbursed via digital channels (%)	
4.2.2.2 Number of non-branch access points per 100,000 adults (agents, point-of-sale systems, automatic teller machines)	
4.2.2.3 Accounts opened via remote channels (%)	
4.2.3 Managing Risks of Digital Finance	
4.2.3.1 Consumer complaints linked to digital financial services (%)	
4.3 Financial Infrastructure	
4.3.1 Retail Payment Systems	
4.3.1.1 Volume of transactions processed by retail payment systems: Kz 227,906,918 <?>	National Bank of Angola (2019)
4.3.1.2 Value of transactions processed by retail payment systems: Kz 11.699 million	National Bank of Angola (2019)
4.3.2 Credit Reporting Systems/Secured Transactions	
4.3.2.1 1 Strength of legal rights index (selected components)	Doing Business (2020)
4.3.2.2 0 Depth of credit information index (selected components)	Doing Business (2020)
4.3.2.3 Credit registry coverage (% of adults): 1.5%	Doing Business (2020)
4.3.2.4 Credit bureau coverage (% of adults): 0%	Doing Business (2020)

Annex C: Select Incubators and Accelerators operating in Angola (Digital Businesses)

Hub	Description
Acelera Angola	Incubator and co-working space for startups in Luanda, founded in 2016
Associação Startup Angola	Created with the aim of promoting digital entrepreneurship in Angola and the development of startup companies
Bantu Makers	A startup studio located in Luanda, the goal of which is to build companies using their own ideas and resources
Disruption Lab	The main objective is to promote an ecosystem of entrepreneurship and digital innovation in Angola, through the aggregation of skills originated in StarTech, universities, and financial institutions, national and international
Founder Institute	An acceleration program based in Luanda but originally created in Silicon Valley
INAPEM (Incubadora TIC's)	An incubator created by Angola's public agency responsible for promotion of small and medium-size enterprises
IEMP(Incubadora de Empresas)	An incubator and Coworking space created in 2016, by the Government of Angola with the support the United Nations Development Programme and the oil company Chevron
Incubadora do INEFOP/CLESE	A network of incubators created by the Ministry Public Administration, Labor and Social Security, with the collaboration of provincial governments
Incuba Angola	A mixed-type incubator, supporting the development of technology-based companies and companies developing businesses in traditional sectors
Incubadora da Universidade Católica de Angola	An integrated ecosystem of technological and traditional business development (InHub of the Catholic University of Angola)
Kianda Hub	A co-working space for startups, network of mentors, linkages, and training of mentors
Orange Corners	An incubator/accelerator program created by the Dutch Embassy in Angola and sponsored by private companies

Source: US Embassy in Angola (2019): "QQSE- Luanda entrepreneurial ecosystem mapping report" and World Bank staff.

Note: CLESE "Centro Local de Empreendedorismo e Serviços de Emprego"/Center for Local Entrepreneurs; IEMP = business incubator; INAPEM = Institute for the Development of Small, Medium-Size, and Micro Enterprises; INEFOP "Instituto Nacional de Emprego e Formação Profissional"/ National Employment and Professional Development Program.

Annex D: Support Institutions (Digital Businesses)

Co Working Spaces	Incubators / Accelerators	Intermediaries
ACELERA ANGOLA KIANDA HUB 244 LABS ADRA Angola CoWorker CPPE (Centro de Empresas e Projectos Prestigio) DB Skenter Gesprin Coworking Launchpad LCF NetCenter/Netone Office4You President Business Center Regus SoftCenter By NetOne TGI Tripalus Coworking Pub WorkinLuanda Zeid Coworking	INAPEM Orange corners Founder Institute Bantu Makers UOR Rede Angola Commercial Platform IEMP Disruption Lab/ Banco Atlantico Chamber of Commerce Standard Bank In Hub UCAN LISPA I-beta start (collaboration with BAI AND Total and Accelera Angola) Lispa + Sandbox regulatoria (collaboration with BNA) Acceleration LAB (PNUD) Associacao Start-up Angola IEMP(incubadora de empresas) Incubadora INEFOP/CLESE Incuba Angola	Women Techmakers Unitel Apps Seedstars World Total Startupper Google Developers Group Coding Dojo Angola (CdA) Programa Angola Investe Commodity exchange (Prodesi) FemTech Pequenos negocios mais lucrativos ABC do empreendedor Ambula Cantinho do empreendedor Centro Empreender Transforma Digital Factory FAJE Inene Santos Kamba Rico Kusokwela Gas Mario Chuva Mentulia Uniigest
Research Centers		
Yetu Lab - Agostinho Neto Laboratorio de Engenharia Laboratorio de pesquisa de solos e agricola Co Working Spaces		

Source: US Embassy in Angola (2019): "QQSE- Luanda entrepreneurial ecosystem mapping report" and World Bank staff.

Annex E: Angola Digital Platforms Case Studies (from Stakeholder Interviews on Digital Businesses)

Kubinga

Name of company	Kubinga
Product/service	<p>Kubinga is a digital transportation app founded in 2017. The word “Kubinga” means “ride” in the local Kimbundu language. This online platform offers person-to-person ride-sharing services and delivery services in Angola.</p> <p>Kubinga’s business model consists of three sub-models:</p> <ol style="list-style-type: none"> 1. Taxi drivers use their own cars when providing taxi services and Kubinga gets 25% of the payment as a commission and offers the other 75% to the car owner/agent. 2. The owner of the car lends it to a taxi driver, the latter uses the car to do the rides, and the commission is split between the two. 3. The owner of the car uses the car during the day, to commute to work for example, and for the remaining time allows the driver/someone else to use the car for rides. <p>KUBINGA is responsible for maintaining the platform online, accounting, and ride reports. Agents are responsible for maintaining their vehicles in excellent clean and mechanical condition and providing ride services.</p>
Number of staff	293 drivers and 202 cars available
Location	Luanda, Angola
Funding sources and amount raised	Self-funding its own growth
Growth angle	<p>Kubinga’s innovative business model helps to address the high unemployment rates in Angola, the expensive taxi services, informality on travel business, and inexistence of tax contribution of the transportation sector.</p> <p>The startup integrates unemployed people to drive third-party cars and provide ride-hailing services. By doing so and due to the low information technology literacy in the Angolan communities, Kubinga provides training on how to use the application, customer care skills, and safe driving instruction. In addition, Kubinga provides a platform for agents to gain advantage by integrating their cars into the ecosystem/applications so they can provide rides. Kubinga also interacts with formal institutions like banks, car shops, and insurance companies to create the necessary bridge to promote economic growth for all stakeholders.</p>
Socioeconomic impact	<ul style="list-style-type: none"> - Kubinga has more than 4,300 downloads of its platform services - More than 4,500 paid rides - Addresses unemployment - Tackles Angola’s expensive private transport sector - Is moving into four other provinces in the country: Huila, Huambo, Benguela, and Namibe to address the lack of transport facilities in those areas - Integration of the informal market
Current and target customer market	Kubinga’s clients include e-commerce companies and private customers
Key value proposition	Kubinga’s solution provides large and small e-commerce companies in South Africa a completely outsourced and remote logistics and fulfilment system, which is an efficient, affordable solution
Competitive-advantage	Kubinga does not own the cars

Appy Saude

Name of company	Appy Saude
Product/service	<p>Appy Saude is a digital startup that was launched in 2017 and aims to tackle the lack of information on the health system in Angola.</p> <p>The digital health platform offered by the startup allows customers to access free information on health facilities throughout Angola and compare prices between medical services/products.</p>
Number of staff	They have 11 full-time employees.
Location	Based in Luanda, Angola
Funding sources and amount raised	The first investment came from a local partner.
Growth angle	Currently, Appy Saude operates in four provinces: Luanda, Huambo, Huila, and Benguela. The plan is to become a regional platform.
Socioeconomic impact	<p>Appy Saude tackles the lack of crucial information on the health sector in Angola, which is often a life or death situation.</p> <p>Before the app, people relied on the community to obtain information such as where to go for a quick malaria test, find specialized doctors, or even find the nearest pharmacy available.</p>
Current and target customer market	<p>The app has 55,000 downloads and 25,000 active users in Luanda and other provinces.</p> <p>Customers are mainly concentrated in Luanda.</p> <p>In total, the company is collaborating with more than 10 pharmacies, 22 health clinics, and some of the big health insurance plans in the country (for example, ENSA).</p>
Key value proposition	<p>It is the only app in Angola that offers exclusive and updated health information, including the health facilities that are available around the user.</p> <p>In addition, the user can digitally access services that previously would have been available only in person. The app also offers an offline function, so users can still access the most important data in the app even when disconnected from the internet.</p>
Competitive advantage	By providing health information that is reliable and enabling services and products to be purchased through the platform, Appy Saude offers value to the entire sector.

Roque Online

Name of company	Roque Online
Product/service	It is an e-commerce platform, created in 2018, which enables informal traders to sell, by providing users a set of business and e-commerce services.
Number of staff	N/A
Location	The headquarters is in Angola.
Funding sources and amount raised	N/A
Growth angle	Although Angola remains the focus market, the app is already operating with a global reach (including the United States, Canada, France, Saudi Arabia, and others).
Socioeconomic impact	<p>The idea of the app is to connect vendors in the informal market, small business owners or large distributors, to consumers that ordinarily would not connect.</p> <p>As an example, a full three-story building was built by fully sourcing the vendors from the informal sector through the platform.</p>
Current and target customer market	The app has more than 10,000 vendors on a daily basis and brings more than 1,000 farmers from the provinces to trade their goods online.
Key value proposition	There is a vast selection of products for the end customer and a more structured value chain for producers.
Competitive advantage	<p>The company's competitive advantages are</p> <p>Its technology—a digital platform—which enables traders from every part of the country to trade locally and globally, and it enables buyers to compare prices between products before making the decision to buy.</p> <p>It is an organized supply and distribution chain for vendors.</p>

Annex F: Selected Government Agencies, Regulations, and Laws (Digital Businesses)

CATEGORY	RELEVANT REGULATORS, DEPARTMENTS, AND AGENCIES	RELEVANT REGULATIONS AND LAWS
1. INNOVATION AND FIRM GROWTH		
Accelerated incorporation and registration changes (for example, mergers, acquisitions, and listings)	Banco Nacional de Angola	Foreign Exchange act (Law 5/97, of June 27, 1997) Financial Institutions Basis Law (Law 12/15, of June 17, 2015)
	Ministério das Finanças	
	Ministério da Indústria	
	Ministério do Comércio	
	Agência de Investimento Privado e Promoção das Exportações de Angola (AIPEX)	
		Securities Code (Law 22/15, of August 31, 2015)
		Companies Act (Law 1/04, of February 13)
	Ministry of Economy and Planning	Law 10/18 of June 26, 2018 Law of Private Investment
		Public-Private Partnerships Acts (Law 11/2019, of May 14, 2019)
		Public-Private Partnerships Regulation (Law 316/19, of October 28, 2019)
		Basic Law on State-Owned Enterprises (Law 11/13, of September 3, 2013)
	UTIP (Unidade Técnica para o Investimento Privado) Technical public service that assists the government in the preparation, management, assessment, and negotiation of investment projects.	
Ability to attract global expertise and the use of gig workers (that is, contractors and e-labor)		General Labor Law (7/15, of June 15, 2015)
	Ministry of Public Administration, Employment and Social Security	Visa Law (2/2007, of August 31, 2007)
Ability to raise capital and repatriate foreign investments effectively	Banco Nacional de Angola (BNA)	
	Agência de Investimento Privado e Promoção das Exportações de Angola (AIPEX)	
	Angola's Regulatory Competition Agency (Autoridade Reguladora da Concorrência, or ARC)	Anti-Trust Law

Access to agile regulation, such as sandboxes to enable testing of the business model (FinTech example)	Banco Nacional de Angola (BNA)	
Trust in intellectual property rights (including intermediate liability and fair use)	Angolan Institute of Industrial Property (IAPI) - Ministry of Industry	Patent: Law No. 3/92 on Industrial Property of February 28, 1992
		Trademark: Law No. 3/92 on Industrial Property of February 28, 1992
		Design: Law No. 3/92 on Industrial Property of February 28, 1992
		Copyright: Law No. 4/90 of March 10, 1990 on Authors' Rights
		Industrial Models: Law No. 3/92 on Industrial Property of February 28, 1992
Access to shared services and re-usable public sector data	n/a	
Fair competition (market dominance, anti-trust, and interoperability)	Competition Regulatory Authority (CRA).	Competition Law (Law 5/10, of October 12, 2018)
Taxation	Administracao Geral Tributaria (AGT)	

CATEGORY	RELEVANT REGULATORS, DEPARTMENTS, AND AGENCIES	RELEVANT REGULATIONS AND LAWS
2. DOING BUSINESS DIGITALLY		
Connectivity: universal access, internet connectivity, domain name registration, spectrum management, and computing infrastructure	Internet Technologies Angola (ITA)	Data center in Angola
Data privacy and security: rights of data subjects, cross-border data transfers, data security and enforcement	Data Protection Agency (DPA)	Law 22/11 on the Protection of Personal Data
		Law 23/11, of June 20, 2011 on Electronic Communications and Information Society Services
Payment: licensing of payment service provider, payment authorization, and processing	Banco Nacional de Angola (BNA)	Law 16/2010, of June 15, 2010 on the National Bank of Angola
		Law 5/97 of June 27, 1997 on Exchange Law
		Law 12/2015, of June 17, 2015 on Financial Institutions Law

	Angola Security Market Commission	Law 22/2015, of April 21, 2015 on Securities and Derivates Investment Services
	Agencia Angolana de Regulacao e Supervisao de Seguros (ARSEG)	Insurance Mediation
Logistics: connecting online transactions to offline production and customs processes (cross-border e-commerce)	Angolan Institute of Standardization and Quality (IANORQ)	Regulates the standardization and quality
	Angola Institute of Accreditation (IAAC)	Create regulations and inspects laboratory activities related to standardization and quality analysis
	Administracao Geral Tributaria (AGT)	Duties and tax exemption agency
	Conselho Nacional dos Carregadores Angolanos (CNC)	Issues the CNCA document, pre-inspection of cargo no longer mandatory
Digital market regulations: electronic documents and signatures, consumer protection, and intermediary liability		Law 7/17 of February 16, 2017, Measures to Protect IT Networks and Systems
	Ministerio das Telecomunicacoes e Tecnologias de Informacao	Information Society Technologies and Services Regulation, Presidential Decree 202/11 of July 22, 2011 (deals with the legal effectiveness of electronic signatures and cryptography and electronic documents, intellectual property rights and protection of software and databases, domain names, and liability of information society service providers)
		Electronic Communication General Regulation
		Technologies and Information Society Services Regulations
	Ministry of High Education Science and Technology	ICT White Paper
	Ministerio das Telecomunicacoes e Tecnologias de Informacao	
	Ministry of Commerce	Law 15/03 of July 22, Consumer Protection Law

CATEGORY	RELEVANT REGULATORS, DEPARTMENTS, AND AGENCIES	RELEVANT REGULATIONS AND LAWS
3. SECTOR AND INDUSTRY		
Technical regulation for digital business in e-commerce	Ministry of Commerce	Retail Commerce Organisation, Execution and Functioning Regulation, Decree 263/10 of November 25, 2011 (deals with licensing of distance sales, the minimum information to be provided prior to the conclusion of any contract, and the right of withdrawal (seven days, counting from the day of delivery)).

Annex G: List of Selected Private Platform Companies Operating in Angola (Digital Businesses)

Industry	Name of company	Local/global	Type	Notes
Health/safety	Appy Saude	Local	B2C	
	GruupUp	Local	B2C	
Mobility/transportation	Kubinga	Local	B2C	
	T'Leva	Local	B2C	Includes electric cars
Food delivery	Tupuca	Local	B2C	
FinTech	Kamba	Local	B2C	
	AKI	Local	B2C	
	E-Kwanza	Local	B2C	
	Kwanza online	Local	B2C	
	e-Kwanza	Local	B2C	
	Proxypay	Global	B2C	
E-commerce	Socia	Local	B2C	
	Soba Store	Local	B2C & B2B	
	Bilhetes Online	Local	B2C	
	Roque Online	Local	B2C & B2B	
	BayQi	Local	B2C	
	Ingresso pratico	Local	B2C	
	Airbnb	Global	B2C	
	Amazon	Global	B2C, B2B & B2B2C	
	ASOS	Global	B2C	
	NCR	Local	B2C & B2B	First e-commerce platform in Angola
	eBay	Global	B2B & B2C, B2B2C	
	Otchitanda	Local	B2B2C	
News/media/entertainment	Alibaba	Global	B2B	
	Soba Music	Local	B2C	
	Manifexto	Local	B2C	Online newspaper
	Netflix	Global	B2C	
Communication	Tellas	Local	B2C	Netflix version
	WiConnect	Local	B2C B2B	
Services	Jobartis	Local	B2B B2C	Employment platform
	Salo	Local	B2B B2C	Employment platform
Environment and waste management	Menos Lixo	Local	B2B	A platform that connects all environmental care ecosystem agents to waste producers
Agri tech	Kepya	Local	B2C B2B	

Note: B2B = business to business; B2C = business to consumer.

