SOUTH SUDAN
Digital Economy Assessment
Contents

Digital Economy for Africa (DE4A) 9
Acknowledgements 11
Diagnostic Methodology 12
  Data Collection 12
  Limitations and Data Gaps 13
List of Abbreviations 14
Executive Summary 16
  South Sudan and the Digital Economy 16
  Key Recommendations 19

CHAPTER 1
Introduction 23
  1.1 South Sudan at a Glance 23
  1.2 Structure of this Report 26

CHAPTER 2
Digital Infrastructure 29
  2.1 The Importance of Digital Infrastructure 29
  2.2 The State of Digital Infrastructure 30
    2.2.1 First Mile: International Connectivity 30
    2.2.2 Middle Mile: The National Backbone 33
    2.2.3 The Last Mile 35
    2.2.4 The Invisible Mile 38
  2.3 Recommendations 40
CHAPTER 6

Digital Businesses

6.1 The Importance of Digital Businesses

6.2 The State of Digital Businesses

6.2.1 Strengths and Opportunities of the Digital Business Ecosystem

6.3 Recommendations

IN FOCUS A
Gender and ICT

IN FOCUS B
The State of Cybersecurity, Data Protection and Data Privacy

IN FOCUS C
Opportunities for private sector investment in the digital economy

IN FOCUS D
Regional Digital Integration in East Africa

Conclusion

Annex 1: Financial Analysis of MTN

Annex 2: Taxes, Licenses, and Infrastructure Fees

References
Graphics

Figure 1: Mapping Of Potential International Fiber Connectivity Routes 31
Figure 2: Combined Mobile Network Coverage, Zain, MTN And Digitel. 36
Figure 3: Smartphone Penetration Rate in South Sudan and Select Countries, Q3 2021, GSMA 38
Figure 4: South Sudan’s Ranking on UN E-Government Indices, 2018-2020 45
Figure 5: Dashboard of NRA Backend Portal 46
Figure 6: Coverage of Official Identification and Birth Registration Among Children, 2017 49
Figure 8: South Sudan Education Structure 58
Figure 9: Overall Education Trends 59
Figure 10: Share of adult population who (1) Have an account and (2) made or received digital payments in the year preceding the survey. 67
Figure 11: Number of Mobile Money Agents Per 100,000 Adults in Selected East African Countries, IMF 71
Figure 12: Digital Businesses Bring Opportunities and Risks, DE4A 78
Figure 13: Examples of Digital Businesses in South Sudan 79
Figure 14: Support Needed by The Unemployed to Find Employment 80
Figure 15: Optimal Regional Network for The Horn of Africa 92
Figure 16: MTN South Sudan ARPU in USD 95
Figure 17: MTN’s USD ARPU across Africa for Q4 2021 95

Boxes

Box 1: State of Transport and Electricity networks in South Sudan 34
Box 2: Proposed Digital Government Strategy (2023-29) 45
Box 3: World Bank Public Financial and Institutional Strengthening Project (P176761) 48
Box 4: Indicative Mapping of DigComp 2.1 Digital Skills Framework in South Sudan 57
Box 5: Education Structure in South Sudan 58
Box 6: International Computer Driving License (ICDL) for Teachers 59
Box 7: The GoGirls Initiative 61
Box 8: South Sudan TRAC II 61
Box 9: Key players in the entrepreneurial support ecosystem 81
Box 10: Potential for digitalization within agri-businesses 84
Box 10: Women’s Social and Economic Empowerment Project (SSWSEEP) 86
Tables

Table 1: Summary of recommendations 20
Table 2: Key statistics and locational map 25
Table 3: Impact of 10% higher broadband penetration on GDP growth and taxation for East Africa 30
Table 4: Quality of Service (QoS), South Sudan 31
Table 5: Estimated cost for fiber routes, population coverage 32
Table 6: National Fiber Routes 33
Table 7: Data Center Tier Classification 34
Table 8: Mobile population coverage across states 35
Table 9 Selected Last mile KPI’s 37
Table 10: RAN Site Rollout in South Sudan 37
Table 11 Details on selected KPIs for the Invisible Mile 39
Figure 7: Percentage Of Classrooms by Type, Pupil-Per-Classroom Ratio, 2018 58
Table 12: Access to internet connection for businesses, by town 79
Table 13: Gender Gap in South Sudan, on key select indicators 87
Table 14: Key Performance Indicators for MTN South Sudan 94
Digital Economy for Africa (DE4A)

Digital transformation is rapidly re-shaping our global economy, permeating virtually every sector and aspect of daily life – changing the way we learn, work, trade, socialize, and access public and private services and information. In 2016, the global digital economy was worth some US$11.5 trillion, equivalent to 15.5 percent of the world’s overall Gross Domestic Product (GDP) and expected to reach 25 percent by 2026, quickly outpacing the growth of the overall economy. However, countries like South Sudan are currently capturing only a fraction of this growth potential and need to strategically invest in the foundational elements of their digital economy to avoid being left behind.

The DE4A Initiative forms part of the World Bank Group’s support for the African Union’s Digital Transformation Strategy (DTS) for Africa, aspires to see every African individual, business and government digitally enabled by 2030. As part of the DTS, ambitious, high-level targets have been established, articulated in the DE4A assessment framework, as a way to define and measure success against the overarching goal of the DTS. Many of these targets have in turn been embedded in the World Bank Group’s IDA19 Commitments.

The DE4A is underpinned by five key principles:

1. **Comprehensive**: Taking an ecosystem approach to digital economy development that looks at both supply and demand and defies a narrow, siloed approach in defining the elements and foundations that make up the digital economy.

2. **Transformative**: Aiming at a very different scale of ambition beyond incremental ‘islands’ of success.

3. **Inclusive**: Recognizing that the digital economy is for ‘everyone, in every place, and at all times’ as well as creating equal access to opportunities and dealing with risks of exclusion.

4. **Homegrown**: Supporting solutions anchored in the local context and unleashing the African spirit of enterprise to support more home-grown digital content and solutions.

5. **Collaborative**: Dealing with the digital economy requires a more flexible mindset, including collaboration among countries, across sectors as well as between public and private players.

The overarching analytical framework that shapes this assessment is guided by the premise that five foundational digital elements create the building blocks for unlocking digital transformation in South Sudan, and thus determine the country’s ability to build a robust digital economy:

1. **Digital Infrastructure** that provides the means for people, businesses, and government 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 high-quality, accessible and affordable connectivity services, but also includes the internet of things and data centers, as well as institutions and rules that foster a competitive telecommunications market.

2. **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 critical to ensuring digital inclusion. However, the level of intermediate, advanced and highly specialized digital skills will determine South Sudan’s ability to embrace digital innovation.

3. **Digital Public Platforms** that enable digital transactions and exchange, support new digital businesses and service delivery models. Related systems, applications and services thus have the power to transform the way people, government, businesses and civil society interact with each other in all aspects of life. Digital Public Platforms help create economies of scale and leverage network effects to create value and support productivity gains.

4. **Digital Financial Services** which provide individuals and households with 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 allowing access to finance. 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.

5. **Digital Businesses** that help bring the digital economy to life and accelerate digital transformation – with young ventures and innovators helping to generate new products and services that leverage technologies and digitally-enabled business models, as well as traditional industries adopting related solutions – contributing to net employment, enhanced competitiveness and productivity. Digital businesses help expand products and services on offer and also create new markets.

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

Data Collection

The report is based on the DE4A diagnostic framework which is based on five foundational pillars of the digital economy, namely digital infrastructure, digital platforms, digital skills, digital financial services, and digital business. The report provides a detailed assessment of each of these five pillars, including assessing strengths, opportunities and outlining key recommendations through individual chapter level deep dives. Building on this framework, and leveraging the five pillar analysis, the report provides central recommendations for the digital economy at the country level, which are cross-cutting across the pillars and intended to be comprehensive and holistic. These recommendations are structured around three key themes: (1) Establishing the foundations of connectivity with access to affordable high-speed internet, (2) Building an enabling ICT environment (legal, regulatory, cybersecurity, data protection, ICT governance etc.) and capacity building for the government, and (3) Improving digital service delivery, and digital adoption.

The diagnostic assessment was undertaken in a complex and dynamic political, institutional, economic and social environment, with Covid-19 restrictions posing further challenges. Recognizing South Sudan's fragility, conflict, and violence (FCV) affected context, and the urgency for insights to inform World Bank Group's growing engagement on the ground, the report has used a more condensed process than suggested in the WBG standardized methodology for Digital Economy for Africa (DE4A) diagnostics. Additionally, given the travel restrictions due to the pandemic and security concerns, the diagnostic predominantly draws on existing secondary literature and stakeholder interviews conducted through an in-country mission carried out in February 2022. The team relied heavily on virtual consultations and desk-research, drawing on publicly available documents, as well as data and resources provided by stakeholders from the public and private sector, as well as civil society and development partners.

The following stakeholders were consulted over the duration of the assessment:

- **Public Sector**: Ministry of Information, Communications, Technology and Postal Services (MICT&PS); the National Communication Authority (NCA); Universal Service and Access Fund (USAf); Ministry of Gender, Social Welfare, and Religious Affairs; South Sudan Chamber of Commerce, Industry, and Agriculture; Ministry of Trade and Industry; Ministry of Interior; and others.

- **Telecommunications Sector**: MTN, Zain, Liquid Intelligent Technologies, Digitel, Muya, others.

- **Financial Sector**: Bank of South Sudan (BOSS); Cooperative Bank; Insurance providers such as Britam, and UAP; fintech players including Trinity Technology, Vision Capital, and others.

- **Academia**: Ministry of General Education and Instruction, Ministry of Higher Education, Science, and Technology, University of Juba, and others.

- **Digital Start-ups and Entrepreneur Support Organizations (ESOs)**: Koneta Hub, Foundation for Youth Alliance, Crawford Capital, Agoro, Nileboda, and others.

- **Non-governmental organizations and Development Partners**: UNESCO, UN Women, GIZ, JICA, UNDP, African Development Bank, and others.
Limitations and Data Gaps

The country lacks reliable data across each foundational pillar of the digital economy. Data collection efforts have been impeded in the last five years by political instability, security concerns, and general state fragility. Further, most recently the Covid-19 pandemic also delayed planned national surveys related to information and communication technology access and usage at the household level. The report thus draws heavily on data shared by stakeholders consulted, as well as drawing on past World Bank diagnostic assessments. Where specific data is unavailable, proxy data is used to draw inferences about the state of the digital economy.

These gaps highlight the need to improve related data collection efforts, as a means to both improve policymaking and track progress pertaining to digital economy development. South Sudan currently lacks adequate and reliable time series ICT data on key sectoral indicators including digital infrastructure, information economy, internet, e-commerce, digital government, digital skills or on climate change related adaptation or mitigation strategies in relation to the digital economy. With this lack of data, further analytical efforts are needed to estimate the true contribution of digital to overall economic growth, and to the potential for addressing the climate change–issues which are beyond the scope of this analytical exercise.
List of Abbreviations

2G  Second Generation GSM
3G  Third Generation GSM
4G  Fourth Generation GSM
ADR  Alternative Dispute Resolution
ALP  Alternative Learning Program
API  Application Programming Interface
ARPU  Average Revenue per User
ASSEK  Association of Start-up and SME Enablers
B2B  Business to Business
B2C  Business to Consumer
BAAS  Banking as a service
BIS  Bank of International Settlement
BTS  Base Transceiver Station
BOSS  Bank of South Sudan
CDD  Customer Due Diligence
CERT  Computer Emergency Response Team
CIASA  Credit Information and Scoring Agency
CIPE  Centre for International Private Enterprise
CIT  Corporate Income Tax
CMC  Cybersecurity Capacity Maturity Model
DEP  Digital Entrepreneurship Program
DLT  Distributed Ledger Technologies
DFS  Digital financial services
EBS  Electronic Banking System
ECCH  Electronic Cheques Clearing House
EGDI  E-government Development Index
ESO  Entrepreneur Support Organizations
E-GP  E-government Procurement
E-LS  E-learning Sudan
FPS  Fast Payment System
FSB  Financial Stability Board
FMoH  Federal Ministry of Health
G2B  Government to Business
G2G  Government to Government
GBPS  Giga Byte per second
GCI  Global Cybersecurity Index
GDP  Gross Domestic Product
GCI  Global Enterprise Index
GEM  Global Entrepreneurship Monitor
GII  Gender Inequality Index
GNI  Gross National Income
GoSS  Government of South Sudan
GRM  Grievance Redressal Mechanism
GRP  Government Resource Planning
GSM  Global System for Mobile Communications
HCI  Human Capital Index
HIPPC  Heavily Indebted Poor Country
HP  Hewlett Packard
HRMIS  Human Resource Management Information System
ICDL  International Computer Driving License
ICT  Information and Communications Technology
IDA  International Development Association
IFMIS  Integrated Financial Management Information System
ITES  Information Technology Enabled Sector
ITU  International Telecommunication Union
IXP  Internet Exchange Point
JICA  Japanese International Cooperation Agency
KIEP  Kenya Industry and Entrepreneurship Project
MBPS  Megabyte per second
M&E  Monitoring and Evaluation
MDA  Ministries, Departments and Agencies
MENA  Middle East and North Africa
MGA  Microfinance Guarantee Agency
MFI  Microfinance Institutions
MICT&PS  Ministry of Information, Communication Technology and Postal Services
MIS  Management Information System
MMO  Mobile Money Operators
MNO  Mobile Network Operators
MoE  Ministry of Education
MoFP  Ministry of Finance and Planning
MoI  Ministry of Interior
MoJ  Ministry of Justice
MSMEs  Micro, Small and Medium enterprises
NB-FSP  Non-Banks Financial Service Provider
NCI  National Cybersecurity Index
NCR  National Civil Registry
NEC  National Electricity Corporation
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>NFIS</td>
<td>National Financial Inclusion Strategy</td>
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<tr>
<td>NHBS</td>
<td>National Household Baseline Survey</td>
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<tr>
<td>NHBPS</td>
<td>National Household Budget and Poverty Survey</td>
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<td>NLA</td>
<td>National Learning Assessment</td>
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<tr>
<td>NPS</td>
<td>National Payment System</td>
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<tr>
<td>NPSS</td>
<td>National Payment System Strategy</td>
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<td>NN</td>
<td>National Number</td>
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<tr>
<td>OOSC</td>
<td>Out of School Children</td>
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<td>P2P</td>
<td>Peer to Peer</td>
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<td>P4R</td>
<td>Performance for Results</td>
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<td>PPD</td>
<td>Public Private Dialogue</td>
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<td>PPIAF</td>
<td>Public Private Infrastructure Advisory Facility</td>
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<td>PSP</td>
<td>Payment Service Provider</td>
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<td>RAN</td>
<td>Radio Access Network</td>
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<td>RTGS</td>
<td>Real Time Gross Settlement</td>
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<td>SDD</td>
<td>Simplified Due Diligence</td>
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<td>SSA</td>
<td>Sub-Saharan Africa</td>
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<td>SSIGW</td>
<td>South Sudan International Gate Way</td>
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<td>SSL</td>
<td>Secure Sockets Layer</td>
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<td>SSN</td>
<td>Social Safety Net</td>
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<td>State Sponsor of Terrorism List</td>
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<td>TA</td>
<td>Technical Assistance</td>
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<td>TEA</td>
<td>Total Entrepreneurship Activity</td>
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<td>TIN</td>
<td>Tax Identification Number</td>
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<tr>
<td>TMIS</td>
<td>Tax Management Information System</td>
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<tr>
<td>TPRA</td>
<td>Telecommunication and Post Regulatory Authority</td>
</tr>
<tr>
<td>TSA</td>
<td>Treasury Single Account</td>
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<tr>
<td>TVET</td>
<td>Technical and Vocational Education and Training</td>
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<tr>
<td>WBG</td>
<td>World Bank Group</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNDP</td>
<td>United Nations Development Program</td>
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<tr>
<td>USAF</td>
<td>Universal Service and Access Fund</td>
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South Sudan is a low-income country, dependent on its natural resources, which has inherited a harsh economic environment from decades of war. As a result of decades of war, the country’s per capita GDP, which was US$1,111 in 2014, dropped and was estimated to be around US$385 in 2019. Today, approximately 80 percent of the population is believed to be living in extreme poverty i.e., on less than $1.90 a day. 1/3rd of GDP and over 90 percent of central government revenues are derived from the oil sector, reflecting a high degree of dependency on and vulnerability to the global economy. Periodic shocks that have included flooding in parts of the country, locust infestations, and lower oil prices have exacerbated existing vulnerabilities and humanitarian needs (67 percent of the population is expected to require humanitarian assistance). The country ranks 185/189 on the Human Development Index (HDI).

The signing of a peace agreement in 2018 and subsequent formation of a transitional government has provided a new opportunity for peace and stability. After decades of war for independence from Sudan until 2011, followed by six years of civil war (2013-2018), the signing of the resolution of conflict agreement in 2018 brought with it an opportunity for political stability. The agreement resulted in the formation of the Transitional Government of National Unity (TGoNU), a national legislative assembly, and subnational government structures in 2020 for a period of three years. The government has since defined ambitious plans for economic revival, with renewed support from development partners that had previously suspended operations during the war.

Economic recovery has stalled amid a multitude of shocks. The economy was projected to contract by 2.8 percent in FY2021/22 weighed down by a fourth consecutive year of flooding, lingering impacts of COVID-19 pandemic, intercommunal violence flareups, and higher food prices induced by the war in Ukraine. The FY2022/23 economic outlook is clouded by production bottlenecks in the oil sector with dropping production in the face of limited new investments, which highlight the need for economic diversification. Nevertheless, a mild recovery is expected in FY2022/23 reflecting higher oil revenue, improved domestic revenue mobilization, liberalization of the exchange rate and fiscal consolidation efforts. However, this outlook is likely to be impacted by a degree of uncertainty on account of the persistence of violence, absence of state services, and fluctuations in oil sector prices, all of which could exert negative pressure on the projected recovery.

South Sudan and the Digital Economy

Recent positive socio-economic and ICT sector developments have created an increased momentum in the digital economy. Return of basic political stability, establishment of the first cross-border fiber optic cable bringing high-speed internet to Juba (2021); increasing internet and smartphone usage (doubling of internet penetration to 9 percent and smartphone adoption to 4 percent of the population since 2014, 2019 respectively); growing use of mobile money; and establishment of a government e-services portal and associated ICT contracting have all resulted in creating new activity in the previously relatively dormant digital economy of South Sudan.

The digital economy occupies a small albeit significant share of the economy with the potential to catalyze wide ranging economic benefits. The digital economy notwithstanding recent increasing momentum, remains nascent with ICT sector revenues amounting to approximately US$200 million (2020-21).² It is, however, worth noting that the sector revenues are equivalent to approximately 3 percent of GDP,³ and therefore not insignificant. Development of the digital economy has the
Potential to positively impact economic growth, security, state-building, job creation and inclusion—early signs of which are starting to be seen in South Sudan.

Expansion of Digital Infrastructure through broadband connectivity can positively impact economic growth in South Sudan. An increase in broadband penetration is directly correlated to an increase in economic growth through contributing to enhanced productivity, facilitating information exchange, and improving service delivery across the economy. Early signs of broadband expansion and its spillover impact on the economy can already be witnessed in Juba. The recent (2021) introduction of South Sudan’s first fiber optic connection allowed Juba to be connected to high-speed internet for the first time, albeit contributing to furthering the development of a Juba centric economy.

Digital Public Platforms (G2G, G2C, G2B) are showcasing early potential to strengthen state capacity and contribute to state-building in South Sudan. Establishing G2G portals can help improve efficiency of operations and strengthen state capacity. This has been best seen in the recent (2021) set-up of the e-tax portal which is estimated to have improved revenue collection for the Government of South Sudan by three-fold since switching from the manual to a digital system. G2C and G2B portals, such as the e-services portal (https://eservices.gov.ss) launched by MINICT&PS in 2019, have been aiding in delivering key services (E-visa, e-work permit, e-business registration etc.), and providing a two-way communication channel between government and citizens. In a country where approximately 80 percent of the population lives in rural areas that are hard to access, this can in turn help rebuild public trust, and improve quality of governance.

In a fragile context, Digital Financial Services (DFS) can aid in improving security of payments, cross-border remittances, investments, and other such transactions. South Sudan’s vast size, lack of security, and scarce road and transport network makes dealing in cash disproportionately expensive and inefficient. Here digital technologies, such as mobile payments, can prove particularly useful. Approximately 500,000 citizens have already started using mobile money through key providers such as mGurush and Nilepay. Further, a large diaspora maintaining social and economic links with the home country boosts demand for cross-border payment and investment services (personal remittances are equivalent to about 7 percent of GDP). Digital financial services can facilitate cross-border payments. With a well-developed financial services ecosystem, the government can also use DFS to increase efficiency and accountability in various payment streams, including for the disbursement of social transfers and receipt of tax payments.

Supporting adoption of new Digital Business models and entrepreneurship can contribute to job creation. Globally, a positive correlation has been observed between growth of the ICT industry of a city and job creation. This trend is only beginning to be witnessed in South Sudan where technology-enabled companies are starting to create new sources of employment. For instance, digital ride sharing (e.g., Nileboda), ICT support services (e.g., SasudaTech, Crawford Capital, others) and agribusiness firms using tech-platforms (e.g., The Gezira Young People Agribusiness Trust). With a high share of youth (70 percent of the population is below the age of 30) who have a high propensity to engage in entrepreneurial activities, supporting expansion of self-employment activities can aid in job creation. Here start-ups can be supported with adoption of technology to create new products and services and also reach new markets.

Developing Digital Skills can allow for greater digital inclusion. Evidence reveals how “among the non-users of internet,” the most cited reasons for not adopting technology (i.e., using the internet) was the “lack of skills to use the internet” (27.8%). Further, with increasing digitalization within government (running the e-service platform, use of ICT), the presence of foreign ICT firms, and UN agencies operating in South Sudan, there has been observed an unmet demand for digitally skilled talent that is being met with talent sourced globally and from the region. Investing in digital skills training can allow local talent to benefit from new and upcoming opportunities and bridge the digital divide.

However, increased digitization can also create additional risks. Digital systems often involve the collection and sharing of personal information and data, for instance, collection of information for civil registration or digital IDs, which can raise privacy concerns in the absence of adequate data protection safeguards. South Sudan has developed a draft Data Protection bill which is a step in the direction of creating a safe trust environment. Increasing digitization of government services and systems can also increase their vulnerability to cyber-attacks,
such as viruses, malware, and hacking. These attacks can compromise the security of personal information and data and can result in identity theft and financial loss. South Sudan ranks 169 out of 193 member states on the overall Global Cyber Security Index (GCI). The regulatory and institutional mechanisms for cybersecurity require further strengthening to minimize these risks.

Notwithstanding the aforementioned developments and the potential of digitization, South Sudan’s digital economy remains nascent.

Inaccessible and unaffordable internet is limiting usage. South Sudan remains one of the few African countries without a national fiber backbone and lacks sufficient international redundancy (only one fiber link from Uganda which is prone to disruptions). Mobile broadband coverage (i.e. 3G, 4G and higher) stands at 37 percent of the population (well behind regional peers) with lower levels of coverage in remote, rural areas of Upper Nile (13 percent), Warrap (17 percent), and Jonglei (20 percent). The actual use of the mobile internet (i.e. mobile subscriptions) is even lower at around 9 percent. In addition to the limited broadband coverage, this can be attributed to low affordability, and skills gaps. Broadband is expensive with 1GB of data costing 15 percent of monthly per capita Gross National Income (GNI) (above 2 percent of GNI target). Smartphone penetration is low at 11%. Although the level of digital literacy is not known, lack of basic digital skills is cited as the most common reason for not using the internet.

The lack of an enabling and predictable regulatory environment in the ICT sector is negatively impacting private sector investment. The Ministry of ICT and Postal Services (MICT&PS), and the telecom regulator, the National Communications Authority (NCA) have been in operation for over a decade albeit with limited capacity. For instance, the last ICT strategic plan and regulatory directives were mainly formulated in 2012, when support was available from a Public Private Infrastructure Advisory Facility (PPI-AF)-funded trust fund and are now outdated. Legacy licensing regimes, such as the 2008 inter-government agreement for telecom providers, are still in operation and are not technology or service neutral, limiting further investment from MNOs. The existence of the South Sudan International Gateway (SSIGW) as a single point of entry and departure for voice and SMS traffic limits competition.

The weak macroeconomic environment, fiscal constraints and widespread insecurity further limits investment in the digital economy. Fluctuations in oil prices and years of economic mismanagement coupled with periodic shocks (flooding, locust infestations, Covid-19) have created a high risk of debt distress. The current, limited fiscal capacity is constraining government investment in the digital economy. A high dependence on foreign aid can be seen, although most development partners are providing humanitarian support vs investing in large-scale infrastructure. Given how South Sudan remains a highly fragile country, and beyond the risk appetite of many potential foreign investors, investment from the private sector is unlikely in the absence of gap financing or targeted incentives.

Demand is limited due to a small market with low regional integration. Years of conflict has driven many households into poverty, eroding purchasing power (roughly 80 percent of the population lives below the poverty line). For those employed on payroll, public sector salary arrears and inflation contributing to a decline in real wages and shocks like the onset of Covid-19 have further dampened demand. It should be noted that the UN, NGOs and foreign businesses make a significant contribution to demand (through both procurement and aid workers’ consumption) but this raises concerns of sustainability. The country is yet to fully tap into the regional market. Although already a member of the East African Community (EAC), South Sudan has not yet ratified the African Continental Free Trade Agreement (AfCFTA) which could facilitate access to larger, diversified, and more sophisticated markets.

Insufficient ICT infrastructure (e-platforms, software, hardware) limit full digitization. Lack of digitized back-end systems, manual processing of data and limited access to ICT hardware and software has contributed to government data existing in silos with no interoperability. Absence of platforms such as an electronic clearing and settlement system in the Bank of South Sudan (BOSS) has resulted in payment instructions being issued on paper. As a result, government operations suffer from poor budget planning, protracted expenditure arrears and limited e-service offerings.
The Government of South Sudan has an opportunity to kickstart the country’s digital transformation by prioritizing, first, building the foundations of digital connectivity infrastructure.

While building the foundations of connectivity infrastructure, it would be important to take an integrated approach to infrastructure development. As Africa’s youngest nation in the process of recovery and reconstruction, South Sudan is starting to build new infrastructure such as in transport, energy and digital connectivity. Rather than implementing multiple, fragmented interventions in infrastructure, a coordinated, complementary, and phased approach is needed while focusing on the foundations with targeted actions that are feasible to implement in the FCV context. This could be facilitated by conducting a geospatial analysis across the infrastructure sectors and coordinating phasing of investments. (Refer to Box 1: State of Transport and Electricity networks in South Sudan)

In would also be critical to build resilient connectivity infrastructure and create stronger market linkages through greater regional integration. For a landlocked country dependent on only one fiber link, additional cross-border terrestrial fiber links with neighboring countries can create redundancy and build greater resilience. Establishing market linkages with other countries through regional economic communities (RECs) such as East African Community (EAC), or Intergovernmental Authority on Development (IGAD, of which South Sudan is a member) will help expand on the small domestic demand and allow access to additional markets, resources and trade. In this endeavor, the GoSS, with support from the World Bank, is currently preparing an investment operation - East Africa Regional Digital Integration Project (EA-RDIP) to advance regional digital integration by establishing cross-border connectivity and market linkages. (Refer to “In Fous D: Regional Digital Integration in East Africa”).

Given limited fiscal capacity, investment support from the private sector and development partners will be critical. Private investors, particularly telecom providers, exhibit appetite and interest in the ICT sector, mainly in expanding telecom and fiber connectivity in South Sudan, albeit with caution given security and fragility concerns in the country. Incentives can be designed to encourage greater private investment through forging strong and transparent public-private partnerships, targeted subsidies to reduce risks, improved protection of investors, enabling ICT policy and regulatory environment, and development projects embedding private capital mobilization. Development partners can play a role here through provision of gap financing, technical assistance, capacity building efforts and facilitating dialogue with international investors. (Refer to In Fous C: Opportunities for private sector investment in the digital economy).

Recommendations. This report proposes a set of recommendations for prioritizing support including investments under three themes: (1) Establishing the foundations of connectivity infrastructure; (2) Building an enabling ICT environment (legal, regulatory, governance) and capacity building for the government, and (3) Improving digital service delivery, and digital adoption (Table 1). These recommendations have been prioritized as short (0-2 years), medium (0-4 years), and long term (0-6 years) based on feasibility. They suggest a phased approach. All recommendations are described in more detail under individual chapters of the report.
<table>
<thead>
<tr>
<th>Pillar</th>
<th>Recommendations</th>
<th>Time frame</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Establishing foundations of connectivity with access to affordable high-speed internet</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Infrastructure</td>
<td>Regional integration for the first mile: Incentivizing the private sector to invest in first mile internet connectivity by establishing additional prioritized cross-border terrestrial routes, connecting South Sudan to Kenya and Sudan</td>
<td>Short-Medium</td>
</tr>
<tr>
<td></td>
<td>Middle mile: Incentivizing the private sector to invest in middle mile infrastructure by establishing a national fiber backbone connecting areas of high population density, including refugee camps and host communities</td>
<td>Short-Medium</td>
</tr>
<tr>
<td></td>
<td>Last mile: Investing in expanded last mile internet connectivity for key public sector institutions and higher education campuses</td>
<td>Short-Medium</td>
</tr>
<tr>
<td></td>
<td>Investing in carrier neutral data centers using cloud services, internet exchange points (IXPs) to allow for reducing latency and improving QoS</td>
<td>Short-Medium</td>
</tr>
<tr>
<td></td>
<td>First mile: Expanding first mile connectivity to build additional redundancy through connecting links to CAR, DRC, Uganda and Ethiopia</td>
<td>Long</td>
</tr>
<tr>
<td>Digital Public Platforms</td>
<td>Equipping MDAs with adequate ICT infrastructure (hardware, software), data storage capacity to enable uptake of connectivity</td>
<td>Long</td>
</tr>
<tr>
<td><strong>2. Building an enabling ICT Environment (legal, regulatory, governance)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Infrastructure</td>
<td>Regional harmonization of ICT regulations through introduction of service and technologically neutral universal licensing regime, light-touch regulation for infrastructure projects, transport sector rollout with fiber ducts rollout, rationalization of fees and taxes in line with international standards</td>
<td>Short</td>
</tr>
<tr>
<td>Digital Businesses</td>
<td>Regional trade facilitation Expanding market access through active participation in regional dialogues and initiatives via participation in regional trade agreements such as AfCTA, and regional harmonization on ICT policies, data sharing</td>
<td>Short</td>
</tr>
<tr>
<td>Cross-cutting</td>
<td>Creating a strong Data Protection and Cybersecurity framework through requisite legal safeguards and operationalizing the National CERT</td>
<td>Short</td>
</tr>
<tr>
<td>Digital Skills</td>
<td>Establishing a competency based national framework for digital skills, including defining digital literacy</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Financial Services</td>
<td>Creating a befitting legal, regulatory and policy enabling environment for the financial services sector through developing a blueprint for retail payments infrastructure, enacting the National Payment System law and accompanying regulations, finalizing the National Payment System Strategy, strengthening digital finance oversight</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Businesses</td>
<td>Creating a National ICT Policy including a focus on digital businesses that includes Instituting building blocks for creating a safe online market</td>
<td>Long</td>
</tr>
<tr>
<td>Digital Businesses</td>
<td>Building greater awareness of and confidence in the digital businesses Ecosystem through creating a mechanism to coordinate (donor) funding of digital businesses, hosting and partaking in investment promotion events, conferences, and meetings</td>
<td>Long</td>
</tr>
<tr>
<td>Pillar</td>
<td>Recommendations</td>
<td>Time frame</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>3. Improving digital service delivery, and digital adoption</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Skills</td>
<td>Regional research and education networks (RENs); Equipping educational institutes with the requisite infrastructure and IT equipment through strengthening/establishing National Research and Education Networks (NRENs), modernizing campus networks by leveraging REN networks</td>
<td>Short-Medium</td>
</tr>
<tr>
<td>Digital Financial Services</td>
<td>Developing a Credit bureau and Moveable Collateral Registry. Operationalizing the Real-Time Gross Settlement System (RTGS), and the Automated Clearinghouse (ACH), with key functionalities through expediting the implementation of the RTGS and ACH and integrating government payments infrastructure and processes with the RTGS and the ACH, fully digitizing the process of foreign currency auctions</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Financial Services</td>
<td>Supporting financial literacy initiatives through designing financial literacy curricula, materials and outreach initiatives</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Public Platforms</td>
<td>Expanding the e-service offerings, through prioritization of high impact services in key sectors</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Public Platforms</td>
<td>Strengthening back end G2G platforms through establishing interoperable systems</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Public Platforms</td>
<td>Encouraging digitalization of the National ID system to create a secure unique identifier system to aid in service delivery</td>
<td>Medium</td>
</tr>
<tr>
<td>Digital Skills</td>
<td>Refining the digital skills curricula and introducing ICT courses beginning at the primary level</td>
<td>Long</td>
</tr>
<tr>
<td>Cross-cutting</td>
<td>Strengthening Data collection including through a periodic census, sector specific surveys, participation in international and third-party statistical studies to inform about the status of digitalization, key gaps and needs</td>
<td>Long</td>
</tr>
</tbody>
</table>
**1.1 South Sudan at a Glance**

South Sudan is a low-income country that is natural resource dependent with a predominantly young population. The country is landlocked and endowed with the 3rd highest oil reserves in Sub-Saharan Africa, although a majority of these remain untapped. The population (around 13.3 million) is predominantly young (over 70 percent below the age of 30 years) and rural (20 percent urban rate). With a per capita GDP of US $385 in FY 2019/2020, South Sudan is a low-income country, and among the least developed in the world.

Africa’s newest state gained independence from the Republic of Sudan in 2011 after years of conflict but relapsed into civil war soon after independence. Decades of war paved the way for a hard-earned independence from Sudan in 2011. However, these gains were short lived, as the country descended into conflict when a civil war broke out between ethnic groups in December 2013. Consequently, estimates indicate the country suffered an accumulated loss of GDP equivalent to US$ 81.1 billion. The security situation impacted humanitarian operations and forced development partners, including the World Bank, to suspend support operations in the country.

After a six-year civil war, the signing of the Revitalized Agreement for the Resolution of Conflict (R-ARCSS) has provided an opportunity for peace and stability. After the signing of the peace agreement (2018), the country took a significant step forward with the formation of the three-year Transitional Government of National Unity (TGoNU) in February 2020. A power-sharing agreement between the Sudan People’s Liberation Movement (SPLM) and the main opposition, including the Sudan People’s Liberation Movement In-Opposition (SPLM-IO) was outlined, bringing in an opportunity for political stability. The transitional government has ambitious plans for economic revival, and early steps have been taken towards realizing these goals.

The Transitional Government has, however, inherited a difficult economic environment. Major imbalances linked to the global fluctuations in oil prices continue to weigh on an economy where the oil sector accounts for one-third of GDP and 90 percent of central government revenue. A legacy of economic mismanagement, persistence of civil conflict and recurring shocks have left South Sudan at high risk of debt distress. South Sudan’s total public debt was estimated at 60 percent of GDP in FY2020/21. Periodic monetary expansion to finance the fiscal deficit conflict induced disruption of supply chains, and the pass-through of import prices to domestic prices have contributed to chronically high inflation (40 percent annualized inflation in 2020). Issues of entrenched
Corruption, weak governance, resource competition, and high fiduciary risks persist. Consequently, South Sudan remains a highly fragile country, and beyond the risk appetite of many potential foreign investors.

Covid-19 further exacerbated the ongoing economic crisis and negatively impacted living conditions. Covid-19 effects were transmitted through lower oil prices, increase in prices of basic commodities due to trade disruptions, lower remittances receipts, and restrictions on humanitarian operations. Although the government responded with a national Covid-19 Preparedness and Response Plan, the pandemic worsened economic prospects, hampered key services, delayed political reforms, and impacted public trust in government capacity. The economy had picked up strongly before the Covid-19 pandemic, but a contraction of 5.1 percent was seen in FY2020/21.

The country continues to be affected by periodic shocks and ranks at the bottom end on human development indicators. Periodic shocks have included flooding in parts of the country, locust infestations, and lower oil prices that have exacerbated existing vulnerabilities and humanitarian needs. South Sudan remains one of the poorest countries in the world with some 82 percent of the people living in poverty in 2021. Women and girls face a disproportionate burden of poverty, poor access to services and insecurity. The country ranks in the bottom (185/189 countries) on the Human Development Index, with low scores across the three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living.

Dependency on UN bodies and NGOs, which helps to sustain demand in the economy (through both procurement and aid workers’ consumption), has created high vulnerability. UN agencies and NGOs play an important role as employers (22 percent of all employment, with an estimated 15,000 jobs). While no comparative wage data is available, it may be reasonable to assume that UN and NGO workers on average have higher incomes than those working for many for-profit businesses. Therefore, agency workers are often key sources of demand for goods and services. Large procurement contracts and the majority of payments processed by banks are for UN agencies, creating a high level of dependency in the absence of domestic demand. This high dependence on foreign aid has made South Sudan highly vulnerable to global economic fluctuations, restrictions, and movements raising concerns of sustainability of businesses that primarily depend on this market.

The economy had started recovering following the 2018 peace deal, but recent shocks, including the COVID-19 pandemic, subnational conflict, and flooding have stalled progress. In FY2021/22, South Sudan’s economy is projected to have contracted by 2.8 percent despite higher oil prices, reflecting dwindling oil production and persistence of the impacts of various shocks. The overall FY2020/21 budget deficit is estimated to have narrowed to about 6.9 percent of GDP from 9.8 percent in FY2019/20 owing to higher-than-projected oil revenue, improved domestic revenue mobilization, and fiscal consolidation efforts. The exchange rate and inflation have stabilized following the gradual liberalization of the official exchange starting in April 2021 and the commitment to abstain from monetizing the fiscal deficit.

The private sector and donor partners are exhibiting confidence in a positive revival for the near future. Among all businesses surveyed in 2019, a large majority (70 percent and above) expected the security situation to improve, its negative impact on their business to subside and demand for their goods and services to increase in the coming three years. New foreign owned ICT businesses such as Crawford Capital, Sasudatech and others have started setting up operations in South Sudan in the last few years, which may be reflective of their confidence in doing forward-looking business in the country. Donor partners and NGOs have also started to invest more in supporting entrepreneurs, entrepreneur support organizations and skill building initiatives - which may be indicative of a slow, albeit increasing, shift in donor engagement from humanitarian support to more private sector development.

Recent developments in the ICT sector point to its potential to become a significant contributor to the economy. ICT sector revenues rose to around US$200 million during 2020-21, (i.e., equivalent to approximately 3 percent of GDP) owing to several recent developments in the sector. The deployment of the Juba-Uganda cross-border fiber optic cable in 2021 connected South Sudan to high-speed international internet for the first time, leading to an increase in internet, smartphone, and mobile money usage, which has created momentum for further broadband adoption. A government e-services portal has been established for key services such as e-visa, e-tax, and others. Institutional governance is in place, with the Ministry of ICT and Postal Services (MICT&PS), and the National Communications Authority (NCA) spearheading the ICT Agenda.
Digitization has the potential to transform key sectors through improving efficiency and creating new markets. South Sudan's economy is largely agrarian and dependent on climatic conditions. Here weather prediction and monitoring technologies, using satellites and internet-connected weather stations, can be used to help farmers to better understand and predict weather patterns (such as flooding of the

Table 2: Key statistics and locational map

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (2020)</td>
<td>13.3 Mn</td>
</tr>
<tr>
<td>Nominal GDP (2020/21 Est)</td>
<td>$5 Bn</td>
</tr>
<tr>
<td>GDP Per capita (Current US$, FY2019/20)</td>
<td>$385</td>
</tr>
<tr>
<td>Real GDP growth (% FY2021/22, proj)</td>
<td>1.2%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>-1.3%</td>
</tr>
<tr>
<td>Non-oil industry and services</td>
<td>4.4%</td>
</tr>
<tr>
<td>Oil</td>
<td>-2.5%</td>
</tr>
<tr>
<td>Public Debt (% of GDP, FY2021/22, est)</td>
<td>59.5%</td>
</tr>
<tr>
<td>Life expectancy (2020)</td>
<td>58 years</td>
</tr>
<tr>
<td>Poverty Headcount Ratio ($1.9 a day in 2011 PPP), 2016</td>
<td>~77%</td>
</tr>
<tr>
<td>Human Development Index (Rank, 2019)</td>
<td>185/189</td>
</tr>
</tbody>
</table>
Nile). Mobile apps and online platforms can be used to connect farmers with buyers and market information, which can help to improve access to markets and increase income. Early signs of this can be seen in the country. Similarly, mobile payments (such as M-Gurush) or online payment platforms can further financial inclusion in a country where access to traditional banking infrastructure is limited. Technology can also aid in delivering traditional services such as health and education more effectively, especially in times of emergencies or lockdowns.

1.2 Structure of this Report

The South Sudan DE4A Diagnostic assessment offers a holistic view of how South Sudan can develop its digital economy. The following chapters present in-depth diagnostics of each of the five foundational pillars of South Sudan’s digital economy, highlighting challenges and opportunities for growth. Chapter one examines the current state of access, quality, and usage of digital infrastructure in South Sudan, as well as the availability and affordability of connectivity. Chapter two analyzes the current use of digital platforms in the public sector. The third chapter assesses the state of digital financial services involving the public sector, businesses and individuals, identifying challenges and opportunities to increase uptake; and chapter four discusses the digital skills gaps and existing ICT training opportunities at primary, secondary, and tertiary levels, and identifies digital skills training programs led by public sector agencies, private firms, and civil society organizations. Chapter five looks at risks and opportunities for digital businesses, and the state of the growing youth-led innovation ecosystem in major cities in South Sudan. In Focus sections provide a brief overview of cross cutting themes including cybersecurity and data protection, gender in ICT, and related areas.

The report concludes with a discussion of next steps and recommendations. These recommendations are intended for a wider audience, including government, the private sector and development partners. Findings may also inform ongoing and future World Bank interventions in South Sudan and in the Horn of Africa region.
Notes

1. See: Huawei and Oxford Economics, ‘The Digital Spillover, measuring the true impact of the digital economy’, 2017. The Digital Economy is believed to encompass economic and social activities that directly use digital technology, as well as a ‘digital spillover’ effect which includes indirect gains of productivity, efficiency, and innovation arising from investments in digital technologies.

2. ICT sector revenue was conservatively estimated based on annual revenues submitted to the National Communication Authority (NCA) and the Universal Service and Access Fund (USAF) by two Mobile Network Operators (MNT and Zain) and eight internet service providers for the FY 2021/21. The NCA and USAF used this information to calculate mandatory fees and levies as stipulated in the National Communication Act 2012.


6. African Centre for Research and Management Consultants Ltd, (2021). Assessment of access and usage of communication service in South Sudan. Universal service and access fund, republic of South Sudan (USAF)


9. The power sharing agreement outlines the reinstatement of the former First Vice President and sharing of several key positions as well as new security arrangements among different groups.

10. The Government has pledged to take forward comprehensive economic, governance, and PFM reforms as outlined in Chapter IV of the 2018 R-ARCSS agreement. Recent efforts have already been taken by the Government, for example, to establish the Public Financial Management Reform Strategy (PFMRS) and its governance structures.


12. The country faces high levels of corruption and lack of accountability – ranking 179 out of 180 on Transparency International’s 2019 Corruption Perceptions Index

13. The projected poverty rate at $1.90 per person per day was almost 82 percent in 2021, making 4 in 5 South Sudanese poor, Macro Poverty Outlook, Fall 2020, World Bank staff estimates.


• South Sudan has one of the lowest broadband penetration rates in the world at 9%, owing primarily to a low level of mobile broadband coverage (37%). Issues of affordability of data and gaps in digital skills further impact use of internet.

• Large infrastructure gaps remain in connectivity infrastructure in the absence of sufficient cross-border terrestrial fiber connectivity, a national backbone and last mile networks.

• The telecom market remains dominated by two players, MTN and Zain — although new players such as Digitel have recently entered the market.

• The government would need to incentivize the private sector to make investments in establishing connectivity infrastructure, with potential support from development partners, including the WBG, and also in ways that can maximize private capital mobilized. An integrated infrastructure deployment approach (with transport, and energy sectors) would be required to maximize gains.

• An enabling ICT regulatory and institutional environment would need to be developed through creating a transparent technology and service neutral licensing regime and harmonizing fees, and taxes.

• Adopting an approach of regional digital integration can help in building more resilient infrastructure and achieve economies of scale through building greater redundancy with cross-border terrestrial fiber links, and market linkages within the region.

2.1 The Importance of Digital Infrastructure

An increase in broadband penetration appears firmly correlated with an increase in economic growth. Improved mobile broadband penetration is largely suggested by the economic literature to be associated with substantial socioeconomic benefits, contributing to enhanced productivity, facilitating information exchange, and improving service delivery across the economy.¹ A range of studies point to the correlation between mobile broadband penetration and economic growth indicating that a 10 percent increase in broadband penetration leads to a 2.46 percentage increase in GDP growth.² In the case of fixed broadband network, a statistically significant positive effect of broadband penetration on economic growth also emerges, however, only when the 10 percent threshold is passed.³

Although only at the beginning of the curve, South Sudan stands to reap large economic gains from broadband expansion. The country starts from a low base where fixed broadband levels are near zero.
(owing to the legacy of war destroying or damaging most infrastructure links), and mobile broadband penetration sits at 9 percent (which is below the minimum 10 percent threshold for fixed line broadband to have an impact on economic growth). This places South Sudan at the beginning of the curve where investments could potentially reap large returns. An increase in mobile broadband penetration in South Sudan of 10 percent could lead to approximately USD 123 million in additional GDP, and USD 4.9 million in additional tax revenue per year (Table 3).

### 2.2 The State of Digital Infrastructure

This section provides diagnostic findings on the state of development of high-speed Internet in South Sudan. The key constraints along the broadband value chain are analyzed based on the integrated framework of the World Development Report 2016: Digital Dividends (World Bank 2016), starting from the first mile (the point where the internet connects a country to international networks) through the middle mile (national backbone and intercity network, including Internet Exchange Points -IXPs) to the last mile (reaching the end-user through local access networks). The framework also identifies an invisible mile (the enabling policy, legal and regulatory environment facilitating the intangible parts of the network, such as spectrum, licensing, taxation, competition, cybersecurity, etc.), which could constrain or promote broadband access. Finally, an assessment of the market structure and composition including key, active MNOs are discussed.

#### 2.2.1 First Mile: International Connectivity

South Sudan has recently benefitted from the establishment of its first international fiber optic route. In 2020, the NCA and Liquid Intelligent Technologies signed an agreement for the construction of South Sudan’s first fiber-optic backbone network. Liquid Intelligent Technologies has successfully established a fiber-optic route into Juba (approximately 200kms) along the road from Uganda, connecting with Uganda’s regional network and adding a significant amount of terrestrial capacity as an alternative to previously limited satellite connectivity in the country. Muya Fiber Construction also operates a fiber route along the same route as Liquid. The two fiber links have enabled operators to offer faster and better internet services to their customers, though the route has experienced frequent network disruptions. The average download and upload speeds more than doubled and latencies were reduced by 70 percent between Q1 of 2019 and Q1 of 2022 (Table 4).

However, the country lacks redundancy in international connectivity creating a risky dependency. The existence of a single cross border fiber route connecting Juba to Uganda, that has also been prone to disruptions, has created a risky dependency. There is a need to establish additional alternate routes of cross-border connectivity to build in redundancy. These could include routes to Kenya and Sudan, and in the longer term also the DRC, Ethiopia and CAR. (Figure 1).

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**Table 3: Impact of 10% higher broadband penetration on GDP growth and taxation for East Africa**

<table>
<thead>
<tr>
<th>Country</th>
<th>Additional GDP USD million</th>
<th>Tax to GDP Ratio %</th>
<th>Additional Tax USD million</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Sudan</td>
<td>123</td>
<td>4</td>
<td>4.9</td>
</tr>
<tr>
<td>Sudan</td>
<td>642</td>
<td>8</td>
<td>51.4</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>2,648</td>
<td>6.7</td>
<td>176.4</td>
</tr>
<tr>
<td>Kenya</td>
<td>2,432</td>
<td>15.9</td>
<td>385.9</td>
</tr>
<tr>
<td>Uganda</td>
<td>919</td>
<td>12.3</td>
<td>113.1</td>
</tr>
</tbody>
</table>

Sources: Calculation based on ITU 2020, Most recent available WDI 2022, Calculation.
Establishing additional international connectivity routes would help to expand broadband coverage for the population. Investing in international fiber routes would contribute to building out the national backbone for South Sudan. This roll-out would improve the ability to provide fast Internet in the south of the country immediately and improve regional connectivity. Table 5 provides estimates for the increase in broadband population coverage based on the assumption that 2G only Radio Access Network (RAN) sites within a 50km buffer around new fiber routes would be upgraded to 3G or 4G. While the routes to Ethiopia go through sparsely populated areas, the routes to Kenya, the DRC and

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**Table 4: Quality of Service (QoS), South Sudan**

<table>
<thead>
<tr>
<th>Description</th>
<th>2019 Q1</th>
<th>2022 Q1</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average download speed in Mbps</td>
<td>2.3</td>
<td>7.8</td>
<td>237.7%</td>
</tr>
<tr>
<td>Average upload speed in Mbps</td>
<td>2.0</td>
<td>5.8</td>
<td>189.7%</td>
</tr>
<tr>
<td>Latency in milliseconds</td>
<td>706.2</td>
<td>220.3</td>
<td>-68.8%</td>
</tr>
<tr>
<td><strong>Mobile</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average download speed in Mbps</td>
<td>2.8</td>
<td>15.8</td>
<td>465.2%</td>
</tr>
<tr>
<td>Average upload speed in Mbps</td>
<td>1.4</td>
<td>6.0</td>
<td>344.2%</td>
</tr>
<tr>
<td>Latency in milliseconds</td>
<td>270.9</td>
<td>82.2</td>
<td>-69.6%</td>
</tr>
</tbody>
</table>

Source: Ookla

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**Figure 1: Mapping Of Potential International Fiber Connectivity Routes**

---
CAR would considerably increase broadband penetration by providing wider coverage and faster speeds. Additional international connectivity is likely to lower the wholesale costs of international connectivity. The route to Kenya would, for example, connect directly to submarine cables landing in Kenya instead of having to go through Uganda. Re-establishing the link to Sudan would provide access to several submarine cable systems from Asia to the Port of Sudan.

Findings from stakeholder consultations and recent studies conducted point to prioritization for deployment of key routes. The route to Kenya (A-B figure 1) would provide South Sudan with a direct route to the submarine cables landing in Kenya, compared to the current indirect route to Kenya via Uganda. This is likely to reduce the cost of international connectivity and create redundancies. The Kenyan segment of this route is already established by the National Optic Fibre Network Backbone Infrastructure (NOFBI). The route to Sudan (A-C, Figure 1) which formerly existed could also be revived. Re-establishing this link would give South Sudan access to the submarine cables landing in the Port of Sudan and allow MTN and Zain to benefit from group arrangements for international connectivity through their operations in Sudan. Reviving or re-establishing the link may require negotiations with Sudatel or the NEC in Sudan. The routes to the DRC and CAR would allow South Sudan to generate revenues for IP transit and provide broadband end

<table>
<thead>
<tr>
<th>Country destination</th>
<th>Route</th>
<th>KMs</th>
<th>Low $8/m</th>
<th>Medium $15/m</th>
<th>High $24/m</th>
<th>Number of 2G only RAN sites assumed to be upgraded to 3G or 4G</th>
<th>Additional people living under broadband coverage through fiber routes (% of population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kenya (A-B on map)</td>
<td>Juba to Kenya (A-B)</td>
<td>361</td>
<td>2.9</td>
<td>5.4</td>
<td>8.7</td>
<td>16</td>
<td>239,154 (2%)</td>
</tr>
<tr>
<td>National (potentially connecting to Sudan)</td>
<td>Juba to Abbeit/ Renk (A-C)</td>
<td>883</td>
<td>7.1</td>
<td>13.2</td>
<td>21.2</td>
<td>57</td>
<td>520,626 (5%)</td>
</tr>
<tr>
<td>(A-C, A-D)</td>
<td>Juba to Wau (A-1)</td>
<td>613</td>
<td>4.9</td>
<td>9.2</td>
<td>14.7</td>
<td>35</td>
<td>80,455 (1%)</td>
</tr>
<tr>
<td>A-D, A-E on map)</td>
<td>Wau to Inorol (1-D)</td>
<td>217</td>
<td>1.7</td>
<td>3.3</td>
<td>5.2</td>
<td>16</td>
<td>149,847 (1%)</td>
</tr>
<tr>
<td>A-E on map)</td>
<td>Tonj to Bentiu (2-E)</td>
<td>357</td>
<td>2.9</td>
<td>5.4</td>
<td>8.6</td>
<td>19</td>
<td>252,436 (2%)</td>
</tr>
<tr>
<td>DRC</td>
<td>Juba to DRC</td>
<td>284</td>
<td>2.3</td>
<td>4.3</td>
<td>6.8</td>
<td>7</td>
<td>18,168 (1%)</td>
</tr>
<tr>
<td>CAR</td>
<td>PoP close to Amadi to CAR</td>
<td>545</td>
<td>4.4</td>
<td>8.2</td>
<td>13.1</td>
<td>18</td>
<td>150,738 (1%)</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Bor to Pochala</td>
<td>444</td>
<td>3.6</td>
<td>6.7</td>
<td>10.7</td>
<td>6</td>
<td>108,098 (1%)</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Narus to Meinit</td>
<td>526</td>
<td>4.2</td>
<td>7.9</td>
<td>12.6</td>
<td>1</td>
<td>14,661 (1%)</td>
</tr>
<tr>
<td>Total</td>
<td>4,230</td>
<td>33.8</td>
<td>63.5</td>
<td>101.5</td>
<td>139</td>
<td>1,425,725 (11%)</td>
<td></td>
</tr>
</tbody>
</table>

user access along the way to fairly densely populated areas. The routes to Ethiopia are unlikely to be commercially or economically viable at the current stage. South Sudan has recently signed an agreement with Djibouti to benefit from the latter’s access to submarine cable routes.

Significant investment will be required for deploying fiber routes, and a multi-stakeholder approach will be needed for financing the deployment. The total investment required will depend on topography, existing RAN sites, security considerations, climate variations throughout the year and other factors. Table 6 provides cost estimates for the routes based on consultation with the private sector and regional benchmarking. Given fiscal constraints, a multi-stakeholder approach will be needed to finance the deployments, including leveraging capital from the private sector, and support from development partners. There is a high interest in and appetite for investment by the private sector for the identified fiber routes. However, given the lack of commercial viability of certain routes and ongoing security concerns, these investments would require de-risking. De-risking support can be provided by the government with support from development partners in the form of targeted subsidies via reverse auctions, a Public-Private Partnership (PPP), a Special Purpose Vehicle (SPV), or other models. Detailed studies would need to be carried out to determine the modalities of investment, which is beyond the scope of this analysis. (Refer to “In Focus D: Opportunities for private sector investment in the digital economy” for details).

### 2.2.2 Middle Mile: The National Backbone

South Sudan does not currently have a national fiber backbone. The mobile networks of Zain and MTN are mostly backhauled by microwave and satellite. In the absence of available licensing for fiber roll-out, and lack of a viable investment environment, existing mobile network operators (MNOs) have been unable to build fiber networks. Liquid Intelligent Technologies and Muya Fiber have existing licenses for fiber deployments, but their networks are mostly confined to Juba and its surroundings. Only 7 percent of South Sudan’s population lives within 50 Km of a fibre node and only 4 percent within 10 Km (Table 6).

Expanding the fiber backbone network would involve adopting an integrated infrastructure approach with transport and energy networks. The RAN site locations and coverage of Zain and MTN mostly follows the road network (Figure 1 on proposed fiber routes). Fiber network deployment could therefore follow the expansion and maintenance of the road network. Fiber optic cable should be laid in conduits along the roads which are currently being built or in planning. This would require

### Table 6: National Fiber Routes

<table>
<thead>
<tr>
<th>Country</th>
<th>Population in million</th>
<th>Area in 1,000 Sqkm</th>
<th>Operational fiber routes</th>
<th>Population within reach of a fiber node</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Km per 1,000 Sqkm per million inhabitants</td>
<td>% within 10 Km % within 25 Km % within 50 Km</td>
</tr>
<tr>
<td>Kenya</td>
<td>52.6</td>
<td>569.1</td>
<td>29,287 51 557</td>
<td>41% 81% 96%</td>
</tr>
<tr>
<td>Egypt</td>
<td>100.4</td>
<td>995.5</td>
<td>33,177 33 330</td>
<td>40% 82% 98%</td>
</tr>
<tr>
<td>Uganda</td>
<td>44.3</td>
<td>200.5</td>
<td>15,096 75 341</td>
<td>31% 65% 93%</td>
</tr>
<tr>
<td>Sudan</td>
<td>42.8</td>
<td>1,886.0</td>
<td>23,660 13 553</td>
<td>20% 38% 62%</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>112.1</td>
<td>1,129.3</td>
<td>21,178 19 189</td>
<td>18% 53% 88%</td>
</tr>
<tr>
<td>South Sudan</td>
<td>11.1</td>
<td>619.8</td>
<td>300 0.48 27</td>
<td>4% 4% 7%</td>
</tr>
</tbody>
</table>

**Box 1: State of Transport and Electricity networks in South Sudan**

South Sudan’s road density is the lowest in Africa with 15 km of road per 1,000 square km of arable land. Of the estimated 12,642 kms of roads in South Sudan in 2013, about two percent were paved and only about 4,000 kms had been rehabilitated (UNOPS 2016, World Bank 2019). While some roads were rehabilitated during the period from 2007 to 2012, the ensuing conflict that began in 2013, combined with heavy rains, increased levels of traffic, overloaded trucks and lack of maintenance, have damaged the network.

The country lacks a national electric grid, and the majority of the regions rely on decentralized, off-grid energy generation. South Sudan faces one of the lowest energy access rates in Sub-Saharan Africa. It is estimated that only about 7 percent of the population has access to electricity, most of which is concentrated in the capital city, Juba, which has the country’s only large-scale functional distribution network. While some cities used to be partially served by isolated grids, most of this was destroyed during the civil conflict and subsequent conflict and is largely nonoperational. Many households and commercial and public institutions rely on diesel-powered generators, which are expensive to operate and require imported fuel and spare parts.

The World Bank Group is providing support to map the gaps in the transport and energy sectors and subsequently provide targeted financing support in the coming years. The ongoing *South Sudan transport infrastructure assessment* (P177582) assessment aims to provide a comprehensive study to help identify infrastructure gaps and assess benefits and risks of regional corridors. Similarly, a diagnostic assessment in the energy sector was completed recently and the pipeline operation *South Sudan Energy Access Project* (P178891) aims to provide financing support towards building energy access in the country.

**Table 7: Data Center Tier Classification**

<table>
<thead>
<tr>
<th>Data Centre tiers</th>
<th>Expected Up time</th>
<th>Down Time per year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1 Single path for power and cooling and few, if any, redundant and backup components.</td>
<td>99.671%</td>
<td>28.8 hours</td>
</tr>
<tr>
<td>Tier 2 Single path for power and cooling and some redundant and backup components.</td>
<td>99.741%</td>
<td>22 hours</td>
</tr>
<tr>
<td>Tier 3 Multiple paths for power and cooling and systems in place to update and maintain it without taking it offline.</td>
<td>99.982%</td>
<td>1.6 hours</td>
</tr>
<tr>
<td>Tier 4 Built to be completely fault tolerant and has redundancy for every component.</td>
<td>99.995%</td>
<td>26.3 minutes</td>
</tr>
</tbody>
</table>

 Deploying fiber alongside other linear infrastructure, such as planned power grids or oil pipelines, can also be considered. Power transmission lines can carry optical ground wire (OPGW), which provides a communications path for internal as well as third party communications.

Rolling out the national fiber backbone could be the priority intervention for the Universal Service and Access Fund (USAF). The USAF was established in 2020 as a secretariat of the NCA (Ministerial Order No. 8/ 2020). The report on Interim Standard Operating and Implementing Procedures 2020 - 2024 and the six-month report are publicly available. The fund collects 2 percent of the revenue of ICT licensees. However, no USAF implementation agency has yet been set up. Such an agency could be responsible for implementing universal access and service projects, including the fiber backbone rollout.

The quality of the internet and international connectivity can be improved through carrier-neutral data centers that also function as Internet Exchange Points (IXP). South Sudan does not currently have a fully functional carrier-neutral data center or an Internet Exchange Point (IXP). MNOs are not interconnected through IXPs for broadband, and data traffic is leaving the country creating additional hops impacting quality of service for data. Establishing a carrier neutral, private sector owned or managed data center that also functions as an IXP in Juba would attract caches of global content providers such as Akamai, Google and Meta. This would increase the quality of broadband and reduce international internet traffic hops.

### 2.2.3 The Last Mile

With a national broadband coverage of 37%, South Sudan lags behind peers with wide regional disparities in coverage. Kenya’s 4G population coverage stands at 77 percent and Rwanda’s at 98 percent. In total, seven million South Sudanese or 63 percent of the population lives without broadband coverage. Notably, remote and rural areas have less coverage, for instance Upper Nile has a coverage of only 13%, Warrap 17%, Unity and Jonglei 20 percent respectively. Higher coverage is seen in more developed regions such as Central Equatoria at 59%, and Western Bahar El Gazal at 63%. Table 8 displays population coverage per state and shows the unevenness in mobile broadband penetration.

#### Table 8: Mobile population coverage across states

<table>
<thead>
<tr>
<th>Population Coverage</th>
<th>2G</th>
<th>3G</th>
<th>4G</th>
<th>3G+4G (Broadband)</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Sudan</td>
<td>89.8%</td>
<td>32.1%</td>
<td>20.9%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Central Equatoria</td>
<td>98.0%</td>
<td>45.8%</td>
<td>46.8%</td>
<td>59.1%</td>
</tr>
<tr>
<td>Eastern Equatoria</td>
<td>90.4%</td>
<td>37.2%</td>
<td>24.2%</td>
<td>45.2%</td>
</tr>
<tr>
<td>Jonglei</td>
<td>72.7%</td>
<td>20.0%</td>
<td>12.6%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Lakes</td>
<td>99.0%</td>
<td>58.8%</td>
<td>31.6%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Northern Bahr El Ghazal</td>
<td>92.5%</td>
<td>28.6%</td>
<td>5.8%</td>
<td>28.6%</td>
</tr>
<tr>
<td>Unity</td>
<td>91.0%</td>
<td>19.1%</td>
<td>10.9%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Upper Nile</td>
<td>87.0%</td>
<td>13.4%</td>
<td>0.0%</td>
<td>13.4%</td>
</tr>
<tr>
<td>Warrap</td>
<td>96.5%</td>
<td>17.3%</td>
<td>5.2%</td>
<td>17.4%</td>
</tr>
<tr>
<td>Western Bahr El Ghazal</td>
<td>95.2%</td>
<td>63.1%</td>
<td>60.3%</td>
<td>63.2%</td>
</tr>
<tr>
<td>Western Equatoria</td>
<td>90.7%</td>
<td>37.4%</td>
<td>25.4%</td>
<td>50.9%</td>
</tr>
</tbody>
</table>
Notwithstanding the low broadband coverage of 37%, broadband penetration is only 9%. Some 52 countries in Africa have a higher active SIM card penetration that South Sudan. Internet penetration is very low with a unique mobile broadband subscription rate estimated at 9 percent. Fixed line networks are almost non-existent as legacy fixed networks were destroyed during the civil war, and the former fixed-line operator, Sudatel, withdrew from the market in 2012. The gap between broadband coverage at 37 percent and broadband penetration at 9 percent indicates an affordability and/or skills gap. Broadband is expensive with 1GB of data costing 15 percent of Gross National Income (GNI) per capita, far above the UN Broadband Commission objective of 2 percent of GNI per capita for 1GB per month. A detailed demand side study would need to be conducted to identify the specific factors limiting adoption of broadband in South Sudan. Table 10 details key performance indicators (KPIs) for the Last Mile.

Leveraging gains from the new fiber optic connectivity, telecom providers are expanding and upgrading their RAN networks. Additional 2G, 3G and a higher number of 4G RAN sites were rolled out in 2020 and 2021. ZAIN and MTN share RAN sites in many locations. Digitel currently operates 40 RAN sites that offer 2G, 3G and 4G (Table 10). Digitel planned to roll-out 39 more RAN sites by the end of 2022. MTN discovered, while resolving congestion issues on its core network in 2019, that there were a sufficient number of 4G capable handsets on its network to justify rolling out 4G, but this remains underutilized. Rolling out 4G became a viable investment on account of the newly established fiber route from Uganda. Prior to the fiber route, MTN was relying entirely on satellite routes which came at a high cost, as well as through-put and latency which could not support 4G rollout.

Smartphone penetration remains relatively low, with lower usage of mobile broadband. Smartphone penetration is relatively lower in South Sudan when compared to other countries in the Horn of Africa region (HoA). While exact reasons for low ownership are not known, a study for the World Bank of the mobile money ecosystem in South Sudan points to...
Table 9 Selected Last mile KPI’s

<table>
<thead>
<tr>
<th>Last Mile Indicators</th>
<th>South Sudan</th>
<th>South Sudan’s Rank in Africa</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price of 300MB data use per month*</td>
<td>USD</td>
<td>3.30</td>
<td>36</td>
</tr>
<tr>
<td>% GNI per capita per month</td>
<td></td>
<td>3.6%</td>
<td>44</td>
</tr>
<tr>
<td>Price of 1GB data use per month*</td>
<td>USD</td>
<td>13.47</td>
<td>50</td>
</tr>
<tr>
<td>% GNI per capita per month</td>
<td></td>
<td>14.8%</td>
<td>51</td>
</tr>
<tr>
<td>Price of 20GB data use per month*</td>
<td>USD</td>
<td>171.28</td>
<td>53</td>
</tr>
<tr>
<td>% GNI per capita per month</td>
<td></td>
<td>189%</td>
<td>53</td>
</tr>
<tr>
<td><strong>Adoption</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIM per 100 inhabitants**</td>
<td></td>
<td>12.0%</td>
<td>53</td>
</tr>
<tr>
<td>Mobile broadband SIM</td>
<td></td>
<td>9.0%</td>
<td>48</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3G Population Coverage**</td>
<td></td>
<td>15%</td>
<td>43</td>
</tr>
<tr>
<td>Average Mobile download speed (Mbps)****</td>
<td></td>
<td>1.40</td>
<td>49</td>
</tr>
</tbody>
</table>

Table 10: RAN Site Rollout in South Sudan

<table>
<thead>
<tr>
<th>Mobile Network Operator</th>
<th>Technology</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTN South Sudan Ltd</td>
<td>2G</td>
<td>290</td>
<td>355</td>
<td>394</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>3G</td>
<td>177</td>
<td>259</td>
<td>350</td>
<td>98%</td>
</tr>
<tr>
<td></td>
<td>4G</td>
<td>94</td>
<td>165</td>
<td></td>
<td>76%</td>
</tr>
<tr>
<td>ZAIN South Sudan Ltd</td>
<td>2G</td>
<td>179</td>
<td>240</td>
<td>265</td>
<td>48%</td>
</tr>
<tr>
<td></td>
<td>3G</td>
<td>64</td>
<td>80</td>
<td>121</td>
<td>89%</td>
</tr>
<tr>
<td></td>
<td>4G</td>
<td></td>
<td>73</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>DIGITEL South Sudan Ltd</td>
<td>2G</td>
<td>40</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>3G</td>
<td>40</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>4G</td>
<td>40</td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
</tbody>
</table>
import taxes on mobile phones that are as high as 20 percent resulting in high costs for devices as one reason. The mobile broadband penetration rate is even lower, highlighting how even those with broadband enabled smartphones are not necessarily using broadband. This can be largely attributed to low incomes, and high costs of data highlighted above.

### 2.2.4 The Invisible Mile

#### Market Structure

The telecom market is dominated by two major providers MTN and Zain. When it attained independence in 2011, South Sudan had several active mobile operators (Vivacell, Niletel, MTN, Zain, others). Subsequently, the number of competing operators contracted to only two, Zain and MTN. Vivacell was shut down in 2018, allegedly for failure to pay USD 66 million in license fees and taxes, leaving 900,000 subscribers without service, and the regulator forced it to halt its service. State-owned Niletel was issued a mobile license in 2017 but has not commenced service. Multiple forced exits during the conflict period further reduced the market to two active operators. MTN is currently the market leader, with 62 percent market share and Zain holds 38 percent market share. This is reflected in the network infrastructure. MTN has twice as many 3G and 4G RAN sites as Zain (table 10). In December 2020, Digitel, a new wireless operator, entered the market; it launched commercial 2G, 3G, and 4G services in July 2021. Currently, Digitel only provides services in Juba. With 120,000 subscribers at the end of 2021, it holds a market share of 3.4%.

#### ICT Legal, Regulatory and Governance Environment

The licensing for telecom services still operates under the dated 2008 intergovernmental arrangement. A memorandum of understanding (MoU) between Sudan and South Sudan in 2008 was designed to facilitate mobile development in South Sudan after the 2005 peace agreement (prior to independence of South Sudan). According to the MoU, Zain and MTN were to continue to provide nationwide services under their existing licenses, including in South Sudan. Although the 2012 National Communication Act set out the basic framework for licensing and regulation of a competitive mobile market, it did not set out a clear framework for the transition of previously issued licenses. Today, both MTN and Zain continue to operate under the 2008 intergovernmental arrangement which is valid only until 2023. There is no clarity on the status of renewal of these licenses or issuing of new licenses.

The licensing regime limits investment in fiber broadband infrastructure. Limits on deployment of national fiber backbone infrastructure appear to be currently in place. Around 2017, the Ministry of ICT and Postal Services (MICT&PS) adopted a policy to limit the rights of legacy providers’ (currently MTN South Sudan and Zain South Sudan) to deploy fiber backbone infrastructure in South Sudan. The NCA subsequently entered into an agreement with Liquid Telecom and Muya Fiber to deploy a national fiber backbone in the country. The government reportedly appears to have an informal policy to limit the number of licenses/authorizations it will grant to deploy national fiber backbone infrastructure in South Sudan as well as to use existing fiber for cross-border connectivity. Reportedly, four licenses were assigned over the past four years to deploy national fiber networks, some of which may have been revoked for noncompliance.

Sector specific taxes and fees have created an unfavorable environment for the private sector. Since the global decline in oil prices and the onset of civil war, the government has struggled to meet its financial commitments and has sought to increase taxes. The tax law was amended in 2017 to increase the corporate income tax to 25 percent, and an 18 percent sales tax was applied to imported goods. As one of the few formal sectors other than oil, the telecom sector has been targeted for increased fiscal contributions. The telecom sales tax rate was

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**Figure 3: Smartphone Penetration Rate in South Sudan and Select Countries, Q3 2021, GSMA**

<table>
<thead>
<tr>
<th>Country</th>
<th>Smartphone ownership (% of subscribers to broadband capable connections)</th>
<th>Unique mobile broadband subscribers (% of the population)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Djibouti</td>
<td>70</td>
<td>19</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>40</td>
<td>23</td>
</tr>
<tr>
<td>Somalia</td>
<td>89</td>
<td>14</td>
</tr>
<tr>
<td>South Sudan</td>
<td>53</td>
<td>9%</td>
</tr>
</tbody>
</table>
increased to 18 percent in the 2019–20 Finance Act. Further, import taxes on mobile devices are as high as 20 percent, and several other fees charged such as on annual license fees, fees for manufacturing, assembly and VSAT all contribute towards an increased burden on the sector (Refer to Annexure 2 for details on types of fees and taxes charged in the ICT sector).

The South Sudan International Gateway (SSIGW) was established in 2019 as a single point of entry and departure for international voice and SMS traffic. Limits have been imposed on the deployment of international gateway facilities for voice and SMS traffic. In 2019, the government-owned South Sudan International Gateway (SSIGW) established a facility in association with MGI (a Swiss company focused on deployment of international gateways). Existing licensees (MTN and Zain) were required to forego their rights to provide international service to renew their operating licenses, so they are now prohibited from directly exchanging cross-border traffic and instead must route international traffic through SSIGW. While this arrangement might initially have provided some cash to the state, it is likely to decline over time as international traffic is increasingly being replaced by Over the Top (OTT) applications that allow communication via the public internet. As OTT traffic is generally untaxed, the net impact on state tax revenues is negative. The gateway introduces an artificial monopoly and limits the commercial freedom of mobile operators in utilizing group arrangements, leading to higher international calling and SMS prices which has triggered a faster transition to OTT use for international communications.

The telecom regulator National Communication Authority (NCA) has been operational since 2014 although it lacks full regulatory independence. The NCA is answerable to the President of the Republic of South Sudan and is under the direct supervision of the Ministry of Information, Communication Technology and Postal Services. The board of the NCA and its Director General (DG) are appointed by

| Table 11 Details on selected KPIs for the Invisible Mile |
|----------------------------------|---------------------------------------------------------------|
| **Area**                        | **Description**                                                |
| Infrastructure sharing          | Infrastructure sharing is foreseen in section 53(2) of NATIONAL COMMUNICATION ACT, 2012 but is not currently enforced. However, MNOs seem to be sharing infrastructure already and stated that enforcement would not be required currently. |
| International voice and SMS gateway | The gateway created an artificial monopoly and limits the commercial freedom of mobile operators in utilizing group arrangements, leading to higher international calling and SMS prices. |
| Market Study                    | A market study has not yet been done and dominant operators have not been declared. However, a regulation curbing the abuse of dominance (infrastructure sharing, termination rates, etc.) is unlikely to be necessary in the foreseeable future, except for the SSIGW. |
| Licenses                        | Licenses are not service and technology neutral. Specific licences or permissions are required for fiber routes |
| Taxes and License fees          | Taxes and licence fees appear to be higher than regional or global standards and are regarded as detrimental for private sector investment (Refer to annex table X for details on fees and licenses). |
| Universal Service and Access Fund (USAF) | Established in 2020; performance reports are publicly available. However, the USAF has no implementation capability. |
| Spectrum                        | While a spectrum table is not publicly available, none of the MNOs and ISPs raised spectrum as a stumbling block to infrastructure roll out. A frequency regulation was issued in 2016 and spectrum fees are public. |
| Cybersecurity                   | Legal framework for cybersecurity still needs to be developed. South Sudan ranks 160th on the National Cyber Security Index / 169th on the Global Cybersecurity Index. |
the president upon recommendation of the minister. The NCA is funded through appropriations by Government as well as licenses and other fees. An alternative institutional arrangement could have been the appointment by Parliament of the Board, that then appoints the DG and ensures the financial independence of the NCA.

2.3 Recommendations

**R1: Investment in expanding ICT infrastructure**

**R1.1:** Build cross-border terrestrial connectivity to create redundancy and further regional integration. Incentivizing the private sector to invest in first mile internet connectivity by establishing additional prioritized cross-border terrestrial routes. Key routes identified, such as connecting with Sudan and Kenya, can be prioritized in the short run, and others such as those connecting to DRC, CAR, Uganda, or Ethiopia can be planned for long-run deployments.

**R1.2:** Build middle mile connectivity by incentivizing the private sector to invest in middle mile infrastructure by establishing a national fiber backbone connecting areas of high population density, including refugee camps and host communities.

**R1.3:** Create last mile connectivity by incentivizing the private sector to connect last mile users, including public institutions, commercial centers, marketplaces, and population centers in rural, remote areas.

**R1.4:** Finance deployment of infrastructure through mobilizing greater support from the private sector. Gap financing support can be provided by the government, and with support from development partners through targeted subsidies such as via reverse auctions, or creating PPP or SPV models across first, middle, and last mile connectivity.

**R1.5:** Develop an integrated infrastructure approach between transport, energy, and digital development. This could be facilitated through conducting a geospatial analysis to map infrastructure across the three sectors and identify synergies for infrastructure deployment such as leveraging existing or upcoming road constructions by embedding ducts for fiber cables or leveraging optical ground wire (OPGW) for transmission of fiber cable along electricity lines. This could also be facilitated by coordinating ongoing efforts being carried out by development partners, such as investments in connectivity, transport, and energy by the World Bank Group.

**R1.6:** Supporting development of carrier neutral data centers, and IXPs to enable more efficient data transfer and storage and reduce latency.

**R2: Improving the regulatory and governance environment for ICT.**

**R2.1:** Formulate a transparent universal licensing regime. Convert all operating licenses into technology and service neutral licenses and define transparent mechanisms for awarding licenses. Universal licenses would allow MNOs to connect their RAN sites to the new national backbone and have the option to use fiber themselves, increasing fiber investment and improving last mile connectivity.

**R2.2:** Type approvals could be based on other jurisdictions, like Kenya or the EU. The National Bureau of Standards (NBS) charges 25 percent of device value for type approval. This contributes to a higher smartphone price. Accepting type approval from jurisdictions and investing in necessary resources to test and evaluate equipment will aid in lowering the cost of ICT equipment for end users.

**R2.3:** Streamline and reduce the permit requirements for infrastructure as well as associated fees (such as VSAT, RAN sites, fiber route fees) in line with international standards. Simplifying the licensing process and reducing or removing overlapping fees will increase investment into digital infrastructure throughout South Sudan.
Notes


2 ITU Publications; How broadband, digitization and ICT regulation impact the global economy. Global econometric modelling; November 2020

3 Czernich et al. 2009

4 Horn of Africa (HoA), Missing Links Study, World Bank, 2022

5 The increase in population coverage was based on the assumption that 2G only RAN sites within 50km of a new fibre route would be upgraded to 4G with a 12km radius. The resulting coverage map was combined with a population map of people not currently covered by broadband. The number of people currently covered by broadband was established by using RAN site locations provided by the NCA and generating a coverage map based on the assumptions that 2G coverage has a 30km radius, 3G coverage a 10km radius in rural areas and a 5km radius in urban areas and that 4G coverage has a 12km radius in rural areas and a 6km radius in urban areas. Note that these additional cross-border connections would only bring benefits if there was also investment on the neighboring side.

6 World Bank report on Identification of Missing Broadband Links in the Horn of Africa Region from February 7, 2022

7 Point C in Figure 1 is location called Renk, which is about 20km from the border with Sudan and has dark fiber cable from Sudatel, which was laid before South Sudan split from Sudan. Renk is a safe location with electricity provided from Sudan.

8 Reverse auction is a bidding process which designates targeted geographical areas (in clusters and by lots) where interested operators are invited to bid competitively for the lowest amount required to upgrade and/or provide new services (of defined quality parameters) in each designated area, subject to a maximum allowable contribution per area.

9 Dig Once policies provide ready-made, buried conduits, enabling future providers to more easily and cheaply install fiber by threading it through existing conduits. Installing empty conduit, which is relatively inexpensive during construction projects, supports future expansion by substantially lowering the expense of digging for providers. https://www.ncbroadband.gov/technical-assistance/playbook/policy-broadband/dig-once-policies

10 See Grizend and Stanton (2016), The use of subfluvial optical cables for broadband digital inclusion in Amazonia


13 https://www.itu.int/en/mediacentre/Pages/2018-PR01.aspx

14 The coverage map is based on the RAN site locations provided by the NCA. The network coverage uses for 2G coverage a 30km radius, for 3G a 10km radius in rural areas and a 5km radius in urban areas and for 4G a 12km radius in rural areas and a 6km radius in urban areas.


21 For instance, in Kenya, the Education Network (KENET) leases dark fiber from the Kenya Electricity Transmission Company (KETRACO) or In Ethiopia, of EthioTelecom’s 22,000km of fiber, 5,000km is leased from the Ethiopia Electric Power (EEP) company.
Digital Public Platforms

3.1 The role of digital public platforms

Strengthening governance in South Sudan will be key to delivering and sustaining the Revitalized Peace Agreement (R-ARCSS). South Sudan’s institutions are young, having only been established ten years ago with the inception of the country. Prior to the Comprehensive Peace Agreement (CPA) in 2005, South Sudan had no formal institutions or history of self-governance. The past decade of independence has been marked by two civil conflicts which plagued the country with instability, corruption, and weak rule of law. The R-ARCSS, which came into effect in 2018, pledged to reverse these trends through a series of comprehensive economic and governance reforms to help rebuild the economy and strengthen the government. However, years of economic mismanagement, persistence of civil conflict, recurring climatic shocks and attendant displacement, lack of physical infrastructure, weak social and economic institutions, and more recently, the impact of COVID-19, have hindered development progress and left South Sudan economically vulnerable.

Digital public platforms can contribute to state-building in South Sudan, in particular enhancing state capacity for effective service delivery. Digital public platforms are often understood as Information and communications technology (ICT) systems that facilitate communications,
transactions, and service delivery for government, people, and business through digital channels. Interoperable government-to-government platforms can support the management of resources and budget execution, while government-to-citizen platforms can facilitate the delivery of e-services and provide a two-way communication channel between governments and citizens. Adopting digital platforms for the delivery of at-scale e-services to citizens is especially important for South Sudan, as roughly 80 percent of the population lives in rural areas that are difficult to reach due to infrastructure deficits. Moreover, institutionalizing government-to-citizen platforms that allow for two-way feedback whereby citizens can communicate with governments to raise grievances or provide feedback on public policies can support the GoSS to foster collaborative governance between government and citizenry. This can in turn help rebuild public trust by overcoming divides between decision makers and citizens. However, it is imperative for the platforms to be part of a wider whole-of-government digital transformation approach.1 This would enable the upholding of the principles of transparency, accountability, and efficiency, which are critical for South Sudan as it embarks on a growth journey aiming to safeguard against civil and political conflict.

### 3.2 At a glance: Stock-taking of digital public platforms in South Sudan

South Sudan is in the early stages of drafting a Digital Government Strategy. The Government launched an e-government strategy in 2012 (focused on the use of ICT-enabled procedures to deliver government services), but limited resources and technical capacity combined with the 2013 civil war that followed halted implementation. Recently, The National Communication Authority (NCA) and the MICT&PS in partnership with the DT Global International Europe, and funded by the European Union (EU), launched an exercise to formulate a Digital Government Strategy –2023-2029 (Refer to Box 1), expecting to launch the strategy in 2023. The absence of a consolidated digital government strategy has thus far led to a scattered and siloed understanding of digital development amongst MDAs, most highlighting that they were not aware of how digital public platforms can be integrated within their respective MDA.

Since the peace agreement, and over the period of 2018-2020, South Sudan’s ranking on UN e-government indices has fallen. The country has moved down by two places (191 to 193) on the United Nations E-Government Development from 2018-2020 (more recent data is not available), making it the lowest ranked country in the world on the index. Similarly, it has moved down by four places on the UN E-participation index, from 188 to 192 over the same time, ranking second to last on the index, behind Eritrea. One factor that might have influenced the movement is the lack of fiscal bandwidth to invest in digitalizing government operations. Over the past three years, around 40 percent of the GoSS’s budget has been dedicated to the security sector to sustain the peace agreement, leaving limited resources to invest in institutional strengthening and service delivery. Additionally, the onset of the pandemic and the global recession that followed hindered the government’s ability to fundraise for activities beyond core services like healthcare, education, and social protection. Some countries in the Horn of Africa have faced similar down sliding over the same timeframe, though South Sudan remains amongst the lowest performers on both indices, as shown in Figure 4 below.

Some efforts have been made towards establishing new digital public platforms over the past three years. In 2019, MICT&PS launched an e-service portal (https://eservices.gov.ss/) to provide e-visa and e-work permit services to foreigners, and an e-business registration service to South Sudanese entrepreneurs. Plans were underway to expand the platform to provide e-customs, e-passport, e-birth certification, e-National Identity (ID) card, and e-payment services by 2022. A separate e-tax and TIN platform exist, and there were plans to integrate the two platforms within the e-service platform also by the end of 2022. While the front-facing e-service platform has been designed, the government has been facing issues with limited interoperability of back-end systems, and the absence of a centralized data management system in the country renders data hosting on the platform difficult. Back-end government-to-government (G2G) systems are scarce, as South Sudan currently only has an Integrated Financial Management System (IFMIS), that is limited in scope. Other G2G platforms like an e-procurement or a Human Resource Management Information System (HRMIS) system or an e-payroll system do not exist at time of writing.
Lack of connectivity in government offices has resulted in a high dependence on analog, manual systems, limiting the use of digital platforms. Today, most MDAs rely on manual systems to manage their data, with a few noting that they rely on excel sheets or outdated software that is not licensed. High reliance on manual systems is often attributed to connectivity constraints in government offices, as almost all MDAs except for the Ministry of Petroleum and MICT&PS do not have an active internet connection in their office and those that do, often have very old computers that require maintenance, making the use of digital platforms difficult.

**Box 2: Proposed Digital Government Strategy (2023-29)**

MICT&PS is developing a Digital Government Strategy with support from the European Union (EU). This aims to create a digitally empowered and integrated government that provides responsive and transparent online citizen-centered services for a globally competitive South Sudan. The Strategy remains in draft stages with an expected launch in 2023, though it is envisioned to be rolled out in phases. The initial phase resembles an E-government strategy and is meant to serve as a blueprint for the integration and usage of ICT for government operations and service delivery and sets a framework for general deployment of digital services within the public administration. Subsequent phases will prioritize adopting a whole-of-government approach to the use of digital systems in public administrations, through focusing on interoperability of systems, shared services, and fostering a culture of transparency and innovation within public employees.

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**Figure 4: South Sudan’s Ranking on UN E-Government Indices, 2018-2020**

<table>
<thead>
<tr>
<th>Country</th>
<th>2018</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somalia</td>
<td>0.1</td>
<td>0.2</td>
</tr>
<tr>
<td>South Sudan</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Sudan</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>Uganda</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Kenya</td>
<td>0.6</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**A. Government-to-Government (G2G) Systems**

**A1. Current and planned government fiscal management platforms**

The establishment of the National Revenue Authority (NRA) has paved the way for improving revenue collection systems in South Sudan. Sustaining the peace agreement and accelerating recovery hinges on the government’s ability to collect and effectively manage resources to enhance state capacity and deliver social services. Central to this has been the establishment of the NRA which was provided...
for in the National Revenue Authority Act, 2016 to consolidate fiscal responsibilities under the oversight of the Ministry of Finance and Planning (MoFP). Currently, non-oil revenue administration is split between the Directorate of Taxation at the MoFP (responsible for collecting corporate income tax, personal income tax, excise tax, sales tax, etc.) and the Customs Directorate at the Ministry of Interior (MoI) for the collection of import duties. After years of attempting to address loopholes in the physical revenue collection processes and revenue leakages, in 2021, the NRA opted to digitize the revenue collection process through an e-tax platform to address these issues. The platform is meant to address the historic challenges that taxpayers in South Sudan have faced in meeting their tax obligation due to previous reliance on a semi-manual and semi-excel tax administration system that was prone to human error and required taxpayers to physically visit tax authority branches.

In partnership with Crawford Capital as the solution provider through a PPP agreement, the Authority launched an e-tax portal (https://etax.nra.gov.ss/) in 2021 to consolidate revenue collection by enabling citizens, businesses, and non-profit organizations to issue a Tax Identification Number (TIN) and file their taxes remotely.2 The new portal allows citizens and businesses to make tax payments, declare and file returns, and apply for a tax compliance certificate and is connected to all banks in Juba to allow for real-time payments (Figure 5 below).3 Citizens who prefer to file their taxes physically can go to their local tax offices where a tax officer will input their data via the e-tax system, and as noted by Crawford Capital,4 all tax collection offices have fully switched to the digital system. Efforts to improve the digitization of the NRA already translated into improvement for tax collection prior to COVID-19, as by the third quarter of FY 2019/2020, personal income tax collections were at 86 percent of the government’s target, sales tax was at 84.5 percent and business profit tax was at 131 percent (31 percent above target). Crawford Capital notes that the Government has been able to improve revenue collection by three-fold since switching from the manual to the digital system.

The customs management platform was launched in March 2021 to consolidate customs tax collection and reduce leakages. The MoI also commissioned Crawford Capital to digitize the customs management system, as the manual system was prone to perverse incentives and corruption. In designing and implementing the platform, the Ministry faced several challenges including difficulty integrating it with international customs systems in Kenya and Tanzania to facilitate cross-border data, primarily due to the complexity of systems integrations across borders. The Ministry also faced resistance by customs officers who were not keen on digitizing the process in fear of their jobs and loss of decision-making.

![Figure 5: Dashboard of NRA Backend Portal](https://etax.nra.gov.ss/)

Chapter 3 | Digital Public Platforms

South Sudan: Digital Economy Assessment

46
powers. The latter required numerous in-person visits by Ministry officials and the Minister of Interior to help build awareness about the platform and address any concerns the customs officials were having. The customs portal is planned to be implemented in all customs offices, and the system interfaces with the national business registration (managed by the Ministry of Justice) and the e-tax system to validate businesses and authorize the issuance of TIN numbers for new agents. The portal has only been live for one month at the time of writing, rendering it difficult to assess its effectiveness and impact. However, the government remains hopeful that the new system can improve customs collection, which prior to the launch of the platform, stood at 49 percent of the government target.

**Noting recent developments, the government is facing critical shortcomings in public financial management (PFM) due to capacity and systems deficits.** The MoFP maintains Free-Balance, an Integrated Financial Management Information System (IFMIS) to issue payments, though the system does not track monthly revenue, and arrears. The expenditure controls are not fully utilized at present and the bank reconciliation module is yet to be implemented. Most expenditures are recorded but some ad-hoc and extra budgetary expenditures have been noted to exist outside the IFMIS, and in turn, impacts budget mobilization and undermines broader accountability mechanisms. While the system tracks budget outturn (i.e., budget allocation vs. expenditure), the cash management unit is not fully operational, making budget planning and implementation more difficult. For example, the process for the approval of the FY2021/2022 budget was delayed by around eight months due to capacity constraints and unreliable information regarding government’s revenue and budget needs. The IFMIS system is further weakened by suboptimal hardware and a degraded server network which requires maintenance (the main server has not been upgraded in over ten years).³ As such, states have been noted to submit their expenditure reports using excel templates and as the state-level IFMIS system collapsed after the conflict, leading to credibility concerns from the public and donors regarding the government’s macro-fiscal framework. Moreover, the government does not currently have a Treasury Single Account (TSA) to effectively manage the budget by consolidating all the public funds into one account at the central bank.⁴ TSAs are often a foundational element of an effective and reliable PFM system, though today, government cash holdings are estimated to be spread across 603 different accounts in the Bank of South Sudan (data does not exist about the extent to which they are connected).

**The absence of shared digital macro-fiscal management platforms has led to poor budget planning and protracted expenditure arrears.** Reliance on manual data management systems that are not interoperable across MDAs has manifested into mounting outstanding obligations, which at the end of FY 2019/2020, amounted to roughly 108 percent of GDP (excluding salaries).⁷ It is estimated that actual debt owed exceeds the reported value, as the government has limited information about debt obligations due to the absence of reconciliation procedures in the IFMIS. USAID is currently funding a project to assist the government to carry out a stock taking of arrears with the aim of developing an arrears strategy. In parallel, fragmentation of the manual systems has led to information silos across MDAs, resulting in unrealistic budget allocations and unreliable cashflows. As such, South Sudan’s budget processes (planning, transparency, and implementation) require strengthening to ensure comprehensive information about the government’s fiscal stance to support with budget planning and implementation. The weakened PFM systems are further undermined by the absence of a e-procurement system which renders the public procurement opaque, as processes and data regarding contract awards is manually recorded, posing accountability risks that the digital systems often minimize. The World Bank is currently supporting the preparation of regulations and standard procurement documents through the State and Peace Building Trust Fund (SPF) grant, though the government needs a regulatory body to ensure compliance with public law.

**Inefficient PFM management has led to significant delays in salary payments.** As of February 2022, the government had accumulated three months of salary arrears for civil servants and state transfers, four months for organized defense forces and seven months for universities. The public sector in South Sudan accounts for around 90 percent of formal employment. As such, the labor market dynamics in the country are predominately shaped by the government, and public employment is key to sustaining the demand for goods and services in the economy. The Ministry of Public Service is mandated to manage all aspects of the civil service and the payroll (excluding the security sector), though they rely on a semi-digitized system to manage roughly 449,343
public sector employees. Line ministries submit civil service information (e.g., size of workforce, newly hired employees, retirees, etc.) using excel sheets to the MoPS, and employees at MoPS input the relevant information in their digital payroll system. The payroll system was developed in 2012 with the support of the Intergovernmental Authority for Development (IGAD), though the hardware and software have not been maintained since their deployment in 2012 due to budget constraints. Similarly, the payroll server was also procured a decade ago and has not been upgraded since (though the maximum lifespan of a standard payroll server is five years). Earlier in 2021, the server stopped working for an extended time, leading the ministry to accumulate around SSP 21.7 billion in salary arrears, roughly equating to 2 percent of GDP.

MoPS has been temporarily relying on the pension fund’s connectivity to keep the payroll system running, while the World Bank Public Financial and Institutional Strengthening Project (Box 3) aims to provide a sustainable solution to address the connectivity deficits. The Ministry has limited experience in paying civil servants in central ministries directly through their bank accounts; instead, payroll is transferred to the bank accounts of the MDAs. Some MDAs prepare a schedule of bank transfers to pay the salaries directly to employees’ bank accounts while others pay salaries in cash. This quasi-digital payroll management method creates inefficiencies in resource management as unpaid salaries are not returned to the Treasury, further hampering compliance with PFM principles. Moreover, human resource management is done manually which also leads to ineffective data management and undermines the government’s ability to pay salaries and plan for pensions, as data regarding the number of employees, new hires, and retirees is not reliably captured leading to a high number of ghost employees in the system. Today, the MoPS does not have an accurate representation of the size of the civil service workforce, and often relies on physical headcounts through line ministries to take stock of the number of civil servants. The Ministry then sends the data to the

**Box 3: World Bank Public Financial and Institutional Strengthening Project (P176761)**

The World Bank Public Financial Management and Institutional Strengthening Project (US$ 34m, 2022-2026) aims to improve and build capacity for budget preparation and implementation. The project will support the development of a Public Financial Management Reform Strategy and the development of foundational PFM processes, while also providing technical assistance and capacity building to improve budget outcomes and transparency at the central level. In doing so, the project is expected to improve timely and accurate budget preparations to the Council of Ministers which in turn, is envisioned to improve predictably and timeliness of payment to central government salaries and state transfers for better service delivery. The increased capacity of budget preparation and implementation will contribute to building trust between citizens and the GoSS. The project follows three components:

**Component 1: Strengthening Budget Preparation Processes (US$4 million equivalent):** through the establishment of PFM structures and processes to support budget preparation and resource allocation to ensure spending is prioritized to service delivery and payment or salaries, among other identified priorities.

**Component 2: Strengthening the Transparency and Predictability of Budget Implementation and Procurement for Priority Spending Areas (US$21.5 million equivalent):** through streamlining processes and upgrading systems and procedures, including public procurement, to strengthen the government’s ability to make timely payments and transfers.

**Component 3: Supporting Institutions, Capacity Development and Facilitating Change for Public Financial Management Reform (US$4.5 million equivalent):** through enhancing the foundation of PFM reforms, including capacity building for civil servants in the MoFP and line ministries while also improving communication channels within the government.
Pension Fund, which maintains a digital pension database to issue pension payments (though the database’s features, scope, and integrity are not known). However, the pension database is not connected to the MoFP for budget planning and reconciliation, creating communication gaps between the two ministries and reducing the line of sight regarding who will be qualified for pension, which limits the government’s ability to fiscally plan for the wage bill.

A2. Civil registry and foundational ID systems

World Bank estimates suggest that half of South Sudan’s citizens have a national ID card, though no data exists on the rural versus urban coverage or gender divide. According to the WB ID4D dataset, coverage of official identification stood at 46 percent, per latest 2017 figures, placing South Sudan well behind its Horn of Africa neighbors as shown in Figure 6. Since the country’s establishment, the government has focused on strengthening the Directorate of Nationality, Passport, and Immigration under the MoI, which is mandated to issue citizens ID documentation and manage the civil registry, in hopes that formalizing the South Sudanese identity through citizenship can unify the divided nation. As of 2019, the Government passed a civil registry bill that mandates every South Sudanese adult to have a national ID card. The cards contain a unique 14-digit alphanumeric personal identification number, which is also used as the unique reference in other ID documents including passports and driver licenses to support identity validation. The national ID card displays a photo, basic biographic information, and how the citizen obtained the South Sudanese nationality on the front of the card. On the back, the card has a thumbprint image, a 2D barcode that encodes biographic data, and an International Civil Aviation Organization (ICAO)-compliant machine-readable zone.

The IDs and passports are issued and managed by the German company Muhlbauer, which has been working with MoI since 2011. The company is also responsible for co-managing the civil registry with the Directorate though the extent of its involvement and the division of roles and responsibilities remains unclear. The Directorate has 170 registration devices in 13 MoI offices spread across the country where citizens can go to register for a national ID, though the physical ID is printed in Juba and sent back to the respective offices. Given South Sudan’s vast rural area and its underdeveloped road system, citizens outside of Juba face difficulty reaching the limited number of MoI offices. Those that can access the office find it costly to obtain a national ID, as they must pay around SSP 250 for a national ID and SSP 2,500 for a passport.

More recently, MoI entered into a partnership agreement with Crawford to digitize 10 types of certificates, including alien registration, origin card, birth certificate, marriage certificate, and death certificate. Up to today, the manual birth registration process has led to at least one in five children under five years old not possessing a birth certificate, and more than half are unregistered.

Figure 6: Coverage of Official Identification and Birth Registration Among Children, 2017
B. Government-to-citizen (G2C) platforms

An e-service platform was launched in 2019, and except for business registration, services provided are mainly geared towards foreigners. The country’s e-service portal (https://eservices.gov.ss/) was launched by MICT&PS in partnership with Crawford Capital in 2019. The partnership arrangement is structured so that Crawford Capital charges a convenience fee of 75 percent of revenues from the e-services while MICT&PS keeps 25 percent. The e-service portal aims to ultimately enable a single window access to all government services, though to date its offerings are quite limited; apart from South Sudanese entrepreneurs being able to register their business via the portal, the live services are geared towards foreigners wishing to remotely apply for a visa or a work permit.

Limited information is available on the usage of e-services, and no feedback from users is currently being recorded. Since the launch of the e-visa portal, Crawford Capital notes that 14,554 users have submitted an e-visa application, though no information exists on the monthly average and whether the usage in the past year has increased or decreased. Strengthening service delivery is especially important in the context of South Sudan as the country consolidates peace and works towards reconstruction and rehabilitation. An e-service platform can support the scaling and delivery of necessary e-services including healthcare, education, and social protection to ensure they reach the intended citizens, irrespective of geographic location. However, digital connectivity, digital skills, and awareness about the use of such platforms are critical for uptake. While fiscally challenging, the Ministry noted that investing in public awareness campaigns regarding the platform can support uptake of e-services, but as today, due to budget constraints on marketing, citizens mainly learn about the platform by physically visiting government offices that then refer them to the e-portal. No formal e-participation, open data, or civic-tech platforms exist, though plans are underway to include a chat function in the e-service portal to gather citizen feedback on the e-services.

The lack of back-end interoperability, data center hosting and an e-payment system is limiting the scope of the e-service portal. Crawford Capital noted that the main challenges to enriching the portal with more services have been housing the back-end data (as the government does not have a data center) and limited connectivity of government offices. However, it is note that MICT&PS is working on establishing an IXP to support the creation of a back-office to host government data and enable shared services. In terms of interoperability of data, Ministry of Labour (MoL’s) and MoI’s databases do not interface to keep track of visas and work permits issues, primarily due to the reliance on manual systems which renders it difficult for one ministry to integrate with another. The platform’s e-payment system has yet to be set up to streamline payments and help reduce revenue leakages, resulting in citizens having to pay service-fees physically. (Plans are underway however to introduce a financial e-payment system to connect all banks to the e-service platform).

Low digital skills and operational experience in the government is further limiting digitalization of public platforms. Similar to a number of other countries, no data exists on the digital skills profile of public employees in South Sudan. Initiatives to upskill public employees have taken a backseat amidst more pressing peace and security priorities that have demanded most the government’s scarce resources. For instance, an ICT institute exists within the MICT&PS with the mandate to provide digital skills training to public sector employees, but it lacks capacity and resources. As such, the e-service platform for management of the civil registry and issuance of IDs was designed and implemented using a PPP structure with private companies (Crawford Capital and Mulbaur).13 While a PPP approach provides limited opportunities for knowledge sharing, outsourcing the core service delivery operations to one private company limits the potential for broader design and iterative learning by MDAs, which hinders their ability to develop their institutional capacity for future sustainability and expansion of e-services.

Other than the e-service platform, other G2C platforms are limited and G2B platforms are non-existent. In addition to the e-service portal, G2C platforms include a unified COVID-19 certificate platform, where the Ministry of Health has also worked with Crawford Capital to develop a system for unifying the COVID-19 certificate throughout the eight testing labs in Juba (no labs exist outside of Juba). Information on uptake and performance of this platform is limited. Government-to-business (G2B) platforms are underdeveloped in South Sudan, partly due to a nascent private sector which accounts for less roughly 2 percent of economic activities. South Sudan does not have a one-stop-shop to facilitate
the establishment and doing business processes for entrepreneurs.

While leveraging private contracting in the provision of e-services and digital IDs has been beneficial, this has also created a risk to sustainability in the absence of a transition plan. The e-service platform, management of the civil registry and issuance of IDs have been designed and implemented using a PPP structure with private companies (Crawford Capital and Mulbaur) which has allowed speedy implementation. However, these contracts are believed to have been drafted without competitive tendering, through sole sourcing and with fixed period arrangements without a plan for transition to government operations. This creates a high risk to the sustainability of providing government services in the long run.

### 3.3 Recommendations

**R1:** Expand on The Digital Government Strategy to include an institutional mandate across MDAs and focus on "creating shared platforms."

**R1.1:** The Digital Government Transformation strategy can outline an institutional mandate and coordination within government. Integrating MDAs in the design and development of the Strategy can support buy-in and operationalization, potentially off-loading time and resources that would have otherwise been spent on dissemination and awareness-building post-launch. It will be important to design phased fundraising and financing streams within the wider strategy given the government’s scarce resources, and the role that the local and international private sector can play to address key gaps and support with solution delivery, while also ensuring that capacity building and knowledge transfer mechanisms are institutionalized to benefit public sector employees.

**R1.2:** Focus on implementation of shared platforms, modernization of the core systems, and their interoperability. To reap economies of scale and reduce fragmentation through standardizing and re-using of the public sector digital platforms and solutions, it would be important to implement a "shared platforms" concept and approach. To be efficient, the government will need to set up shared platforms and solutions to be used across the sectors for some repetitive functionalities such as reporting, archiving, documents management, authentication, notification etc. Shared platforms help remove duplication of resources, and redundancy of cost and effort, across disparate parts of the government.

**R2:** Strengthen back-end G2G platforms to expand e-service delivery.

**R3.1:** Develop platforms for public procurement. Key platforms that need to be developed include an e-GP and a HRMIS platform to transparently manage public procurement and support effective management of public employees. In parallel, technical assistance can be provided to build the capacity of MDAs to deploy reliable data management practices, including data collection, data storage, and data-sharing across government, as most data is currently stored manually or in Excel sheets. Central to this is the development of cybersecurity and data sharing provisions and policies to ensure safeguards are in place to protect personal and government data.

**R3.2:** Development of the GovTech Enterprise Architecture. The GovTech Enterprise Architecture should be used as a comprehensive instrument for planning, aligning, and implementing all digital initiatives, that should help define building blocks, interdependencies, design principles, and standards to allow proper interoperability and reusability of digital solutions avoiding duplications and inefficient investment.

**R3.3:** Enhance digital transformation fundamentals such as electronic identification, digital documents, and digital signature. To allow citizens and businesses to benefit from the upcoming digital developments it is important to equip them with necessary tools to properly access and use digital resources and services. Electronically signed documents should become legally binding and should be recognized as equal to paper-based ones. This can serve as a first step for implementation of paperless processes.
Notes

1 World Bank defines whole-of-government as an approach that “promotes systems thinking and development of integrated approaches to policymaking and service delivery for accessible, transparent and efficient government. While this might be aspirational, the objective is to create a shared vision for effective use of digital platforms and data that are interoperable and secure, fundamentally changing the way government operates and provides administrative services.” GovTech: The New Frontier in Digital Government Transformation. World Bank. 2020.

2 Given South Sudan’s wider digital economy context where connectivity, digital literacy skills, and public awareness about e-services are low, the government follows a dual digital tax system that allows citizens to manage their taxes physically and digitally, with some reverting to the manual process while others choose to use the full scope of the e-tax portal.

3 NRA made it a condition for all banks in South Sudan to integrate with the e-tax system to facilitate digital transactions and allow for real-time transfer to the government account.

4 Crawford Capital (https://crawfordcapital.africa/) is a private solution provider for the GoSS. The company is incorporated in South Sudan and has been working with the government on G2G, G2B, and G2C services for at least three years. The company has experience working with the Government of Kenya on civil registry and e-services projects, and aims to replicate their success in South Sudan.

5 World Bank Public Financial Management (PFM) and Institutional Strengthening Project (PFMISP) (P176761) Project Appraisal Document

6 TSA helps prevent the accumulation of large idle balances across multiple commercial accounts that are not within the control of the Treasury or MOFP. Hashim et al. (2020). Ensuring Better PFM Outcomes with


8 Ibid.

9 In 2015, the introduction of national ID cards replaced the paper-based cards. The ID cards are only issued to adults (including refugee and immigrants) above the age of 16 years.

10 No information has been made available on the contracting process or scope of responsibilities.

11 The government has cited that this is due to security reasons.

12 The cost of the National ID and Passport translate to USD 85 and USD 845 at the 2015 official exchange rate. But the South Sudanese Pound increasingly depreciating against the United States dollars – the costs of National ID and Passport at the 2022 official exchange rate amount to only about USD 0.5 and USD 5.50.

13 It is worth noting that the process by which Mulbeur was contracted remains unknown. Crawford did not undergo a competitive selection process, they were single-sourced based on a presentation they provided to MICT&PS that highlights their portfolio in digitizing government services in Kenya, and their interest in replicating a similar model in South Sudan.
While 34.5 percent of the population is literate, digital literacy levels are believed to be much lower, although no formal national statistics or digital competency levels exist to measure the levels of digital capabilities.

Demand for digital skills is growing (primarily basic digital skills) driven primarily by the public sector (with key MDAs adopting digital platforms), and from private sector ICT companies.

Supply of digital skills (at all levels - basic, intermediate, advanced) is limited on account of (i) Lack of connectivity ICT infrastructure, and trained teachers in educational institutes, (ii) Lack of training for public sector employees, (iii) Lack of digital skills in curriculums of institutes at an early primary level, (iv) absence of a national and research educational network (NREN).

Non-traditional mechanisms such as training courses offered by private digital training providers, donor partners, or NGOs remain limited in scale and reach.

Support is required to tabulate the level of digital literacy, establish a digital competency framework, establish an NREN and run targeted programs to address the supply-demand mismatch in digital skills, particularly in basic digital skills.

### 4.1 The Importance of Digital Skills

Digital skills are a central foundation for a digital economy as they relate to the skills and knowledge of the country’s citizens and its workforce. There is growing evidence that digital skills are key to sustainable growth in today’s economies as they lead to job creation and increased incomes.\(^1\) Demand for digital skills in jobs in Sub-Saharan Africa is also rapidly increasing, with over 230 million jobs estimated to require digital skills by 2030.\(^2\)

Interaction with technology takes place via different platforms, and for different purposes, which require varying levels of digital skills. Digital skills\(^3\) represent a continuum from basic to intermediate to advanced and highly specialized skills and can also be distinguished according to functional needs: for citizen engagements, for a wide range of occupations that use digital technologies, or for everyday use of ICT. A digitally skilled citizenry is likewise critical to creating the consumer base for new digital products and services created by local entrepreneurs.
4.2 The State of Digital Skills

Interaction with technology takes place via different platforms, and for different purposes, which require varying levels of digital skills. Digital skills represent a continuum from basic to intermediate to advanced and highly specialized skills and can also be distinguished according to functional needs: for citizen engagements, for a wide range of occupations that use digital technologies, or for everyday use of ICT. A digitally skilled citizenry is likewise critical to creating the consumer base for new digital products and services created by local entrepreneurs.

Only about 34.5 percent of the population is considered literate, among the lowest in the region. Levels of digital literacy are believed to be much lower. Currently, data or indicators on digital skills are not being systematically collected or tracked. Absence of a Digital Skills Framework makes it hard to assess the levels of digital skills such as basic, intermediate, and advanced digital skills in the country. This is in part due to an absence of a clear definition of digital skills or digital skills framework in the country. (An indicative mapping of Digital Skills in South Sudan to the Digi Comp Framework has been created, See Box 3). Stakeholder consultations revealed how digital literacy levels are generally much lower than the recorded literacy levels.

Evidence reveals that a lack of basic digital skills is limiting individuals from using the internet. Among the non-users of the internet, the most cited reasons for not using the internet were the “lack of skills to use the internet” (27.8%), no computer or connection (24%), a lack of knowledge of the internet all together (19.2%), and costliness of the service (14.6%).

The GoSS with support from development partners, has begun formulating key policies to focus on Digital Skills. In 2021, The Ministry of General Education and Instruction (MoGEI) developed a policy for digitalization of general education. Most recently, in 2022, the Ministry of Higher Education, Science and Technology (MoHEST) launched the science and information technology policy. This has been possible through support from development partners such as UNESCO and UNDP, which are playing a key role in terms of digitalization policy formulation and in providing capacity building training at the MoGEI.

4.2.1 Supply of Digital Skills

Limited access to Infrastructure

The majority of schools lack basic infrastructure, including ICT, thereby limiting teaching of digital skills. South Sudan has a total of 5,382 public schools with 11 percent in pre-primary, 71 percent in primary, 6 percent in secondary and 12 percent in Alternative Education Schools (AES). Half of the classrooms reported having only a roof, tent or being in the open air, and 1/3 of schools were reported to be damaged or destroyed (Figure 7). Many classrooms lack equipment such as desks, chairs, and blackboards. Stakeholder consultations reveal how most schools have problems offering basic services such as electricity, and water. In addition to a lack of basic infrastructure, ICT is also missing. Insufficient number of computer labs and a lack of connectivity at both primary and secondary school level limits provision of digital skills.

Covid-19 induced school closures, and revealed how distance learning is yet to be widely adopted. South Sudan closed schools across the country between March - October 2020. While distance learning programs were offered, less than one third of children who attended schools before the pandemic were engaged in distance learning activities. Only 20 percent of those in rural areas continued learning activities, and 30 percent in urban areas. The most common learning activity taking place during school shutdowns was listening to classes on the radio. Only approximately 5 percent of learners engaged in learning activities through “using mobile learning apps” or “watching classes on TV,” which may be indicative of lack of ICT connectivity or access in households.

Most universities remain unconnected, and South Sudan is the only country in the HoA that lacks a National Research and Education Network (NREN). As per the Ministry of Higher Education, Science and Technology, there are approximately 30 universities and TVETs in the country, with 10 private universities and 10 public (including – 5 public universities, 1 technical college and 3 polytechnics) and other publicly run TVETs. Most public universities are not connected to the internet, and/or lack ICT equipment. South Sudan remains the only country without a NREN. An NREN is a high-capacity, high-speed networking and communication infrastructure that is specifically designed to support the needs of the research and education community. NRENs provide a range of services to universities, research institutions, and other organizations that are involved
Box 4: Indicative Mapping of DigComp 2.1 Digital Skills Framework in South Sudan

DigComp 2.1 Digital Skills Framework provides a broad framework for understanding digital skills in a country. According to this framework, digital skills can be broken down into four general proficiency levels.

i) Foundational Digital Skills are typically taught at primary and lower secondary school level, and involve the foundational digital literacy needed to use basic digital devices, tools, and applications.

ii) Intermediate Digital Skills which should be provided to students in upper secondary school, technology programs at TVET institutions, and undergraduate students in courses that apply technology. Intermediate level proficiency would typically be required in middle-level occupations. However, moving forward, intermediate digital skills are expected to be a ubiquitous requirement for all formal employment.

iii) Advanced Digital Skills which are primarily developed through core engineering programs, especially electrical and computer engineering, and science programs. Advanced level proficiency is typically required of occupations with a high level of ICT intensity, involving the application of digital technologies, including IT engineers and, increasingly, finance professionals.

iv) Highly Specialized Technical Skills are typically provided at the postgraduate (masters and doctorate) level, focusing on advanced computer science and engineering, as well as applied mathematics and related fields. Highly specialized digital skills are considered a requirement for scientific and advanced ICT professional occupations, which involve the development of new digital technologies, products, and services.

The DigComp framework has been used to create a preliminary map of digital skills in South Sudan. Withstanding data constraints, ICT curriculum has started to be introduced at secondary education to provide basic digital skills, but this is not available at TVET centers and most secondary schools, and it is theoretical with no presentation of practical aspects primarily due to the lack of ICT infrastructure at most schools. Introduction of intermediate and advanced proficiency level is provided in most universities, but highly specialized level is not provided across the country.

<table>
<thead>
<tr>
<th>Level of proficiency in the Education system</th>
<th>Foundational</th>
<th>Intermediate</th>
<th>Advanced</th>
<th>Highly specialized</th>
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<tbody>
<tr>
<td>Primary and lower secondary grades</td>
<td>Upper secondary grades</td>
<td>BA programs</td>
<td>Postgraduate</td>
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<td>TVET</td>
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**Box 5: Education Structure in South Sudan**

South Sudan has a system of formal and Alternative Education Systems (AES). The formal education ladder is an 8-4-4 system — that is, 8 years of primary education, 4 years of secondary education, and 4 years of higher education (See figure 8 below). The AES consists of 6 different programs, including Accelerated Learning Program (ALP) and Community Girls School (CGS) among others, and offers flexible entry and exit points for children, youth, and adults.11

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**Figure 8: South Sudan Education Structure**

<table>
<thead>
<tr>
<th>Year</th>
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<td>7</td>
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<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

* Pre-service teacher training lasts three (3) years for P8 leavers and two (2) years for secondary leavers
4.2.2 Shortfall of trained teachers

While student enrollment is increasing, the share of trained teachers has decreased over time. Between 2011 and 2018 (latest annual school census available) – the number of students enrolled in preprimary, primary or secondary levels more than doubled (Figure 9). However, the share of trained teachers decreased over time and teacher absenteeism was common. “delay in payment of salaries” was cited as the major hindrance in availability and presence of qualified teachers in schools. The teacher to pupil ratio was very high at 1:106, which is believed to be limiting teaching quality in the classrooms.

Training on digital skills is absent within the national teacher training curriculum, and many teachers remain untrained. Seventy percent of all teachers have had no formal training and 40 percent are volunteers or part-time teachers. The Government struggles to cover the costs needed to run the country’s eight teacher-training institutes half of which are abandoned. Further, it is reported that approximately 42 percent of teachers do not have full access to textbooks and materials required for teaching, thereby impacting quality of teaching. Targeted digital skills teacher training is needed to train teachers on basic level skills. Lessons can be learnt from successful teacher training initiatives around the world (See Box 6).

Limited ICT course offerings

There are no ICT courses at the primary level, and basic computer science courses are taught at the Secondary level although these remain theoretical in nature. The current primary level covering (8 years) which comprises 4 years of lower level of primary education (ages 6-9 years) and 4 years of upper level (ages 10-13 years) does not include provision of ICT skills. ICT courses are introduced at the secondary level through basic courses in computer sciences. But in most schools, especially in rural areas, this course remains only theoretical because of a shortage of qualified teachers, lack of electricity, computer labs and connectivity (as highlighted above).

Box 6: International Computer Driving License (ICDL) for Teachers

ICDL Foundation is a global social enterprise which focuses on raising digital competence standards in the workforce. Certain training programs target teachers with the aim of improving teachers’ ICT proficiency at three levels: ICT skills, pedagogical skills, and curriculum training. This training enables teachers with little to no experience in the basic mechanics of working with computers. This model has been running in over 100 countries around the world including in countries in Africa such as Rwanda, Uganda, Tanzania, Kenya, and others. Source: ICDL Africa
At the tertiary level, advanced ICT courses are offered, but highly specialized digital skills programs are limited. Universities provide computer literacy certificates, diplomas, and bachelor’s degrees in IT/ICT/Computer Science, but provision of highly specialized digital skills programs (deep theoretical knowledge, high analytical skills, ability to create) across the country is limited. While some universities (e.g., University of Juba, Kampala University South Sudan) have access to internet and ICT infrastructure, these are outliers and the majority of universities still lack sufficient computers, lecture halls and ICT labs.

Demand for Digital Skills

The public sector is seeing a shortfall in talent that is skilled in basic digital skills. There is a growing demand in the public sector for digitally skilled talent with competences involving use of digital platforms (websites, applications, computers, software), ICT technology support services, and the ability to creatively use digital tools, as well as computational thinking. For instance, Ministry of Justice (MoJ), Ministry of Labor (MoL), Ministry of Interior (MoI) and others are key MDAs that use digital tools and platforms, specifically for provision of e-services such as e-passport, IDs, and others. They require digitally adept talent to manage and operate these platforms. It is worth noting that several government institutions requires only basic digital skills.

New opportunities for digitally skilled labour (basic, intermediate, and advanced) have emerged in the ICT and related sectors. Globally, a positive correlation has been observed between growth of the ICT industry of a city and job creation.\(^1\) This trend is only beginning to be witnessed in South Sudan where technology-enabled start-ups are starting to create new sources of employment. For instance, Ministry of Justice (MoJ), Ministry of Labor (MoL), Ministry of Interior (MoI) and others are key MDAs that use digital tools and platforms, specifically for provision of e-services such as e-passport, IDs, and others. They require digitally adept talent to manage and operate these platforms. It is worth noting that several government institutions requires only basic digital skills.

Role of the private sector and development partners

Few private digital training providers or donor partners are offering basic or specialized digital skills courses. Some private training providers are offering digital skills training without charge. Most of these are mainly located in and around Juba, with limited presence in the other regions. For example, Koneta Hub provides training programs on basic digital skills (using Microsoft office, Word, Excel, PowerPoint, etc.) and more advanced courses called “community of developer” programs teaching intermediate and advanced digital skills. NGOs such as Whitaker Peace and Development Initiative (WPDI)\(^7\) are providing “community learning centers” offering internet access and computers. Donor partners such as UNESCO, UNDP along with NGO Defy Hate Now\(^8\) run The Peacebuilding and Literacy programs, training youth on ICT devices, application development and other related skills.\(^9\) Donor partners such as UNICEF have been supporting distance learning through distributing solar powered radios.\(^10\)

Private digital training providers are struggling with creating sustainable models and are limited with high donor dependency and poor reach. Most private sector skills providers rely heavily on donor grants for operations. These providers do not have viable economic and financial models in the absence of high donor dependence for funds. With limited student and institutional financing facilities, private providers have only been able to reach a small scale and are unlikely to expand without incentives.

4.3 Recommendations

R1: Establish a competency-based national framework for digital skills, and periodically assess the level of digital literacy. The framework should clearly define each of the digital skills and competency levels, sensitive to variables such as sector, region, gender, labour force component skills, etc. The framework should as well detail existing and projected labor market demand to inform which sectors act as digital skills bottlenecks. Against this framework, digital skills can be measured regularly. Reliable and timely data that provides an accurate picture of present and future labor-market demand for digital skills, and the related supply (both in terms
of quantity and quality), can help policymakers evaluate and decide on how to develop South Sudan’s digital skills base.

**R2: Refine the digital skills curricula and introduce ICT courses beginning at the primary level.** Introduction of a computer science curriculum for basic/foundational digital skills from the primary education level could enable early learning of ICT. Further, the existing curricula could be expanded to include areas such as digital literacy, digital entrepreneurship, and an introduction to digital media. Complementary soft skills such as creative thinking, problem solving, and teamwork also need to be included in the curriculum. Best practices in the form of benchmarking curricula with courses of international institutions providing similar courses, relevant to South Sudan’s context, can promote improved outcomes and bridge the labor market gap in digital skills.

**R3: Establish a National Research and Education Network (NREN) to equip educational institutes with connectivity and educational resources.** NRENs provide high-capacity, high-speed networking and communication services to universities, research institutions, and other organizations that are involved in research and education. National Research and Education Networks (NRENs) in Kenya and Uganda provide key platforms for expanding access to broadband internet connectivity, exchange of online educational resources and regional collaboration on training to universities and TVETs. Through such regional collaboration, these networks can have an even larger impact.

**Box 7: The GoGirls Initiative**

GoGirls is a non-profit ICT-focused institute launched in 2014 by the Ministry of Education, Science and Technology, in partnership with the United Nations Development Programme (UNDP) and other development partner organizations. It aims to promote the use of technology among girls and young women in the country, through carrying out (i) Computer training in internet use and the use of software applications to girls and young women in South Sudan, delivered in a range of settings, including schools, universities, and community centers, (ii) ICT clubs in schools across South Sudan. These clubs provide girls and young women with a safe and supportive environment to learn about and explore technology. The clubs also offer a range of activities and resources, including training in computer skills, internet use, and software applications, as well as opportunities to participate in competitions and other events, and (iii) Support for entrepreneurship and employment through providing access to business training, mentorship, and financial support, as well as connecting girls and young women with potential employers.

**Box 8: South Sudan TRAC II**

The UNDP TRAC II Project aims to transform the University of Juba and Rumbek University for Science and Technology (RUST) into Spaces for Innovation, Experimentation and Accelerated Learning. The project will offer accelerated learning for students and talented youth at the two institutions to address community challenges through practice. This will build on existing partnership on innovation with both universities. Project outputs:

- **Output 1:** Equipped laboratories for learning and experimentation in the two universities.
- **Output 2:** Graduates and continuing education students are connected to the private sector, entrepreneurs, other innovators and creators, and opportunities globally.
- **Output 3:** Makerspaces are created for innovation and accelerated learning in Juba University and RUST.
Notes

1. Sharafat & Lehr. 2017
2. International Finance Corporation, 2019
7. UNICEF, October - December 2021, education in South Sudan, briefing notes
12. Ibid
15. ICDL Africa: https://icdlafrica.org/
17. See: https://www.wpdi.org/
18. See: https://21lcheck.org/about-us/
22. Digital skills: The Why, the what, the how - DE4A Methodological Guidebook 2021
23. In Eastern Africa, six countries—Kenya, Burundi, Ethiopia, Uganda, Rwanda, and Tanzania—have existing NRENs. These are a part of the regional alliance of NRENs known as UbuntuNet-East, which has helped reduce the costs of connectivity to the higher education sector through regional cooperation. “The Role and Status of NRENs in Africa,” World Bank, Washington, DC (2016).
24. See: https://gogirlsitc.org/
Digital Financial Services in South Sudan are at a very early stage: the number of products and providers is low, the usage is limited, and the supporting infrastructure and legal and regulatory frameworks—almost nonexistent.

Account ownership is very low, and credit, except for short-term trade finance, is not available. Mobile money is the only digital finance with significant market adoption (~500,000 customers), but it is still very low compared to other countries in the region. Digital savings and digital credit are not present.

Enactment of missing laws and expedited implementation of financial infrastructure investments such as the National Payment System project will be critical for bridging those gaps. The authorities should also reform government payment processes, invest in financial inclusion and literacy, and leverage public-private partnerships.

5.1 Importance of Digital Financial Services

Digital Financial Services (DFS) comprise a large and diverse group of financial products and services, such as payments, savings, credit, transaction banking, investment, and insurance. What they have in common is the delivery channel: banks and other financial institutions provide them by leveraging digital technologies, from the relatively simpler ones, such as mobile telephony, to more advanced ones, such as artificial intelligence. By doing so, they reduce the costs of reaching customers, increase the speed of delivering their services, boost security and create new products that would not have been possible in a non-digital environment.

Digital Financial Services are critical for the modern economy. Together with “hard” infrastructure, such as telecommunications networks, which are described elsewhere in this report, they are the arteries of the digital economy, without which digital platforms or digital businesses—such as e-commerce—would have been difficult to conceive. This makes them important to every country, but there are factors that make them even more relevant to South Sudan. For example, the country’s vast size and scarce road and transport network makes dealing in cash disproportionately expensive and inefficient. A large diaspora maintaining social
and economic links with the home country boosts demand for cross-border payment and investment services. The low level of development of the country’s financial sector is a challenge, but it also presents an opportunity for leapfrogging initiatives.

5.2 Current State of Digital Financial Services

Digital finance is still a marginal part of South Sudan’s economy. Payment services—predominantly mobile money—are the only digital financial products available in the market, but even in their case the range of providers and the actual usage are very limited. Financial inclusion is minimal—according to the 2021 Global Findex, only approx. 6 percent of adults had access to an account—94 percent of the population were effectively financially excluded. Many factors contribute to this situation: the low level of development of the financial sector in general, legal, and regulatory gaps, high degree of informality, and the lack of trust in financial institutions. At the same time, the push to digitize driven by the COVID-19 crisis has also affected financial services, with the government, the central bank, and the private sector expressing their support for boosting the role of DFS.

5.2.1 Market Participants and Key Stakeholders

There are 29 commercial banks operating in South Sudan. Seven of them are South Sudanese subsidiaries or branches of foreign banks from Kenya, Ethiopia, and Qatar, while the remainder includes privately-owned and state-owned institutions. The range of financial products offered is limited, and most of the banks concentrate on short-term trade financing and transaction banking, which mainly involves foreign currency intermediation.

With respect to DFS, there are gaps in capacity, technology, and skills between foreign and domestic commercial banks. Most foreign banks have access to online and mobile banking technology developed by their head offices; they also benefit from good relationships with vendors and card payment schemes. Nonetheless, several domestic banks have been working on boosting their DFS capacity.

The mobile money market has been boosted by the launch of financial services by MTN, the first network operator granted the relevant license. MTN’s service, which opened to the public in June 2022, joined two other mobile money providers—mGurush and NilePay—which provided wallets to customers of Zain, but were not themselves affiliated with any MNOs. Altogether, they have managed to open approximately 500,000 wallets. Holders of mobile wallets can make use of cash-in and cash-out services at agent locations and person-to-person money transfers. They can also use the wallets to pay bills or pay for their shopping at merchant locations. However, wallet providers do not support interoperability with one another.

Aside from the two mobile money providers, there are a few other businesses engaged in providing payment services. The most notable of them, CapitalPay, is a licensed e-money provider and a subsidiary of Crawford Capital, an IT services company. The firm concentrates on processing payments for the government. Based upon a private-public partnership arrangement with the Ministry of ICT, Crawford Capital develops and maintains IT systems underpinning the delivery of multiple government e-services, such as online tax assessment, visa application, car registration and driving license application. In return, it collects commissions on the processed person-to-government and business-to-government payments. Other companies, such as LinksPay, focus on managing agent networks for mobile money providers and commercial banks.

There are 11 microfinance providers with approximately 30,000 clients. The sector plays a limited role in the provision of credit and has not been expanding. This is partially caused by the fact that larger international microfinance NGOs left South Sudan at the onset of the civil war and have not returned after its end. Microfinance institutions tend to rely on manual processes and none of them have implemented any digital products or delivery channels. Given that, their impact on the adoption of DFS is likely to be low. On the other hand, mobile money or payment service providers may eventually explore the prospect of obtaining microfinance institution (MFI) licenses for their subsidiaries as a relatively low-risk and low-cost way of entering the lending business.

The Bank of South Sudan (BOSS) is the main regulator responsible for the financial sector. It licenses and supervises banks, exchange bureaus
and electronic money institutions. The South Sudan Insurance and Re-Insurance Company acts as the apex body for the insurance sector; it is in the process of transformation into a full-fledged regulator. The Government of South Sudan plays a major role in the financial system, especially with respect to payments. It is the country’s largest employer, with the expenditure on public sector salaries and wages approaching 5 percent of GDP. BOSS acts as the government’s fiscal agent and makes payment on its behalf. Large payment volumes are also generated by subnational government units at the state and the local level. Moreover, because of the humanitarian and development challenges the country faces, an important role is played by United Nations agencies and international NGOs, which are responsible for delivering a large share of social safety net payments.

South Sudan has a large diaspora and personal remittances, equal to almost 7 percent of the GDP, are an important source of foreign exchange. Remittance service providers, however, are not regulated as a distinct category of institutions. International money transfer operators (MTOs) that can be used to send money to a South Sudan recipient often use local commercial banks as their local agents. For example, Western Union services are only available at the branches of Kenya Commercial Bank (KCB).

The insurance sector in South Sudan is at a very nascent stage. There are 10 life and non-life insurance providers in the country, offering a range of insurance products. Third-party liability insurance is compulsory for motorists, but compliance with that provision is poor. None of the insurance providers uses mobile or digital channels to sell policies, onboard customers, or process claims.

5.2.2 Financial Inclusion, Access to Finance and Financial Literacy

At 9 percent of the adult population, financial account ownership (bank, mobile money, etc.) in South Sudan is one of the lowest in the world. It is much lower than the average for Sub-Saharan Africa (43 percent), yet even lower when compared to the results of South Sudan’s East African neighbors: Tanzania (47 percent), Rwanda (50 percent), Uganda (59 percent) and Kenya (82 percent). The gap between men (13 percent having an account) and women (only 5 percent) is substantial. Only 2 percent of adults have a debit card. While over a fourth of adults send or receive domestic remittances, only 4 percent do so through an account with a financial institution. Only one percent uses an account to pay bills, while only 2 percent of adults (and 18 percent of wage earners) received their salaries and wages into an account. Finally, only 7 percent of adults made or received at least one digital payment per year.

In a similar way, businesses’ access to finance is curtailed by a large degree of informality and the low level of financial sector development. The available data is limited: the 2019 Integrated Business Establishments Survey (IBES) was conducted only in twelve urban areas (Juba, Wau, Rumbek, Aweil, Yambio, Torit, Nimule, Maridi, Renk, Bor, Kuajok and Tonj) and, accordingly, is only representative of businesses based in cities. Nonetheless, even there, only 55 percent of businesses had access to a bank account.

Just 6 percent of businesses access formal or informal lending services. However, even within that narrow group, there are notable differences between large, medium, small, and micro enterprises. Large and medium enterprises that borrow money do so through commercial banks (out of large businesses
with outstanding loans, 64 percent obtained them from banks; the share for medium businesses was 60 percent). Borrowers belonging to the group of small businesses are almost evenly split between those that make use of banks (51 percent) and those using other sources such as friends (33 percent) and family (9 percent). On the other hand, if microentrepreneurs borrow money, they end up financed by friends (59 percent) or informal money lenders (16 percent). The average loan size in 2019 amounted to SSP 5.3 million (USD 33,500), although loans of this size are granted almost exclusively to the service industry, or more precisely to businesses involved in cross-border trade. By comparison, the average loan size in the agricultural sector was SSP 191,000 (USD 1,200). 9

**Financial literacy is a major challenge for South Sudan.** While the country does not systematically collect nationally representative financial literacy data, local surveys and qualitative studies point to low levels of awareness and understanding of financial services. For example, while 47 percent of adults interviewed in Juba knew about digital payments, only 16 percent of adult residents of Malakal—the capital of Upper Nile State—were familiar with the concept. Awareness of digital finance technologies is even lower outside urban areas. 10 This is not limited to digital finance: for example, in a survey conducted in nine counties across South Sudan 43 percent of respondents indicated that they do not track their expenses. 11

**Gaps in education and basic literacy affect the understanding of financial concepts.** As of 2018, only 35 percent of South Sudanese adults were literate. While the situation is slowly improving with respect to young people—44 percent of males and 47 percent of females aged 15–24 could read and write—it leaves a significant share of the population excluded. 12 Numeracy skills may be even more important, as making financial decisions requires performing simple mental calculations. However, a survey conducted before the civil war on participants in a youth startup business grant program discovered that only 58 percent of respondents were proficient in mathematics, which was defined as correctly evaluating division problems. 20 percent of women and 9 percent of men were not able to correctly count group of items. 13 It is possible that the years of armed conflict and the disruption in schooling they caused have resulted in a further erosion of basic numeracy skills.

Accordingly, there are few programs devoted to financial literacy as such. On the other hand, financial literacy components can be found in social safety net or microfinance programs sponsored by international organizations and NGOs. For example, the South Sudan Safety Net Project (SSSNP), implemented by the UN Office for Project Services (UNOPS) with World Bank funding has been providing financial literacy messaging that accompanied its direct cash support for poor South Sudanese, focusing on skills such as financial planning and budgeting. Nonetheless, even in this case those initiatives were affected by the high prevalence of illiteracy in the country: there was only so much that could have been conveyed through pictorial materials and storyboards. As a result, while 99 percent of benefit recipients reported having plans for how their cash would be spent, 66 percent admitted that they had not followed through on such plans. 14

**The most effective financial literacy initiatives in South Sudan appear to be aimed at entrepreneurs.** A large share of them have been run by the UNDP South Sudan Accelerator Lab, the youth entrepreneurship and employment-focused chapter of the global “accelerator lab” network. Several factors distinguish the programs of the Accelerator Lab and make them potentially worthy of replicating and scaling up. Firstly, many of them are delivered in partnership with financial institutions, such as EcoBank. This allows the participants to immediately apply their newly obtained skills in a real-life situation; it also allows financial institutions to benefit from insights into consumer behavior and contribute to the development of better financial products. Secondly, they focus on high-impact sectors of the economy and segments of the population, such as young entrepreneurs and cross-border trade. Finally, they attempt to connect modern financial products and digital technologies with traditional customs and institutions, such as the “Sanduk” savings scheme.

**5.2.3 Financial Infrastructures**

**Payment systems and other financial market infrastructures**

At present, South Sudan lacks most foundational financial market infrastructures. It is one of the few countries in the world without a functioning electronic clearing and settlement system at the central bank. The Bank of South Sudan (BOSS) maintains reserve (settlement) accounts for commercial banks operating in the country, but interbank transfers are processed manually. This includes interbank cheque
clearing, which is conducted by BOSS daily. The central bank collects paper cheque documents, sorts them according to the originating bank, semi-manually calculates the net positions of each institution, and updates the settlement account balances in its core banking system. As a result, up to a week may elapse between cheque presentment and crediting of funds to the account of the recipient with the beneficiary bank. Consequently, the cheque clearing facility at BOSS is seldom used—usually no more than 50 transactions are processed in a day. Moreover, the core banking system operated by the central bank is utilizes outdated technologies, while a central securities depository (CSD) system purchased after the independence of South Sudan in 2011 has never been fully operational.

The lack of essential payment systems and market infrastructures in the country will be rectified by the implementation of a real-time gross settlement system (RTGS) and an automated clearinghouse (ACH), financed through an African Development Bank project in cooperation with the East African Community (EAC). Upon its successful implementation, BOSS will operate a modern interbank clearing and settlement system, allowing for automated fund transfers between all commercial banks operating in the country. Unfortunately, the progress of the project has been slowed down because of the COVID-19 crisis; the procurement of the critical systems has not yet started, and thus its initial completion date—2023—may have to be postponed.

In the absence of a modern domestic payment infrastructure, many payments between South Sudanese banks are effectively processed overseas. This is especially the case for foreign-owned institutions, which have access to clearing facilities of their head offices overseas. That phenomenon is only reinforced by the effective dollarization of the South Sudanese banking system: loans denominated in foreign currency (chiefly US dollars) make up almost 98 percent of the total value of outstanding loans, and almost 80 percent of deposits by value. This is especially the case for foreign-owned institutions, which have access to clearing facilities of their head offices overseas. That phenomenon is only reinforced by the effective dollarization of the South Sudanese banking system: loans denominated in foreign currency (chiefly US dollars) make up almost 98 percent of the total value of outstanding loans, and almost 80 percent of deposits by value.17

Retail payments infrastructure is also limited. As mentioned before, mobile money services are not interoperable with one another, although their providers have concluded agreements with several commercial banks that facilitate transfer of funds between bank accounts and mobile money wallets. There is no domestic card switch, and most debit cards issued by banks are proprietary brands which can only be used in ATMs of the issuer bank. A small number of ATMs and POS terminals accept international card brands (Visa, Mastercard, Verve), but payments made at such locations are made in US dollars and are processed, cleared, and settled outside South Sudan. Their acceptance costs are high, and they are mostly geared towards overseas visitors.

Credit infrastructure

Credit infrastructure is nearly non-existent. South Sudan lacks a secured lending system and a centralized and functional collateral registry. Attempts to create the Credit Reference Bureau (CRB) at BOSS have never come to fruition, even though the central bank’s regulation for the Establishment and Operation of the Bank of South Sudan Credit Reference Bureau was issued and some credit reporting software has been purchased. There is no movable collateral registry, and land registries are managed in a decentralized manner at the state level. As a result, less than 50 percent of privately held land is identifiable in any of the deed registries. Moreover, the missing infrastructure effectively prevents the development of digital credit products. Financial service providers have expressed interest in alternative credit scoring models. However, their deployment in South Sudan is a challenge because of more limited availability of data (for example, the low usage of digital payments makes transaction-level data difficult to obtain), as well as capacity constraints among banks and other financial institutions, which lack IT systems that could support alternative credit scoring, and experience shortages of qualified staff familiar with such mechanisms.

5.2.4 Policy and Regulation

While South Sudan has put in place some of the building blocks of a legal and regulatory environment for digital finance, there are very significant gaps. The Bank of South Sudan is the apex regulator of the financial system, operating based on the Bank
of South Sudan Act 2011, which bestows upon it the power to “oversee the development and sound functioning of the payment systems;” as well as to “regulate and supervise banks and such other regulated entities as shall be submitted to its oversight in accordance with relevant legislation.” The law covers the most important aspects of central bank operations, although it does contain certain ambiguities. For example, the power to regulate securities settlement systems seems to be limited only to securities issued by the government or the central bank, while the provision on the supervision of “other regulated entities” is unclear with respect to the central bank’s powers to regulate non-banks—such as certain fintechs—not mentioned in any separate “relevant legislation.”

The absence of a payment system law is a major gap. Such legislation, which is present in nearly all jurisdictions of the East Africa region, would define key legal concepts required to operate payment and settlement systems (payment, clearing, settlement), provide for important legal protection (such as bankruptcy, remoteness of collateral, and protections on trust accounts of electronic money issuers), as well as the powers of the central bank to license, regulate and oversee various entities participating in the national payment system, such as payment system operators, payment service providers or critical service providers.

The Electronic Money Regulation, issued by BOSS in 2017, is the most important regulatory instrument relevant for digital finance. It forms the legal basis for the licensing of mobile money providers and is in line with global and regional good practices, for example specifying the requirements for trust accounts at commercial banks, arrangements for agents and the range of data that providers need to report. Until recently, the capacity of the central bank to monitor providers’ compliance was limited: there were few qualified staff, and they did not have access to clear standards that electronic money issuers could be assessed against. This has now been addressed by the development of a draft payment system oversight framework and the establishment of an oversight division within BOSS.

There is no officially adopted strategy guiding the actions of the government and the private sector with respect to digital finance, although several such documents are under preparation. The African Development Bank has been supporting the preparation of the National Payment System strategy, which would include some recommendations pertaining to financial inclusion, although a full-fledged National Financial Inclusion Strategy (NFIS) has not been prepared. The World Bank, on the other hand, has been supporting the preparation of a Retail Payments Strategy, which is awaiting adoption. There has not been any strategic work focused on financial literacy or financial consumer protection.

The COVID-19 pandemic has brought attention to the issue of government payments digitization; however, there is no single whole-of-government approach to payment processing. In its capacity as the fiscal agent of the government, BOSS processes payments originating from the central government and state governments. Payment instructions are issued on paper and manually entered by BOSS staff into their core banking system, which increases the cost of payments processing and may cause processing delays. With respect to collection of fees and taxes, several payment streams have been digitized through a public-private partnership with Crawford Capital, a private IT company. The company developed billing systems for government agencies such as the National Revenue Authority (NRA). The systems include customer-facing e-services portals and are connected through an application programming interface (API) with the national ID database, as well as with systems used by commercial banks. In the case of tax assessments, the taxpayer generates an electronic tax return using the e-services portal, presents it in a bank branch, and pays the tax bill using cash, cheque, or bank transfer. The bank branch staff accesses the billing system and marks the bill as paid; the funds are periodically “swept” to the Treasury account with the central bank. For several services, such as visa issuance by embassies and the immigration department, fees can also be paid by debit or with credit cards; those payments are handled by an overseas processor. The billing system operates on a cost-sharing basis, where a transaction fee is charged for every payment, with the receipts shared between the system developer (Crawford Capital) and the Ministry of Information, Communication Technology and Postal Services.

### 5.2.5 Financial Access Points, Access Channels and Product Design

The physical footprint of the financial sector in South Sudan has been minimal. The number of commercial bank branches per 100,000 adults—1.45—is one of the lowest in the world, as is the number of
ATMs per 100,000 adults—0.70. While the data on mobile money agents is not systematically collected, according to the data received from the providers, there are approximately 10,000 mobile money agents in the country. This translates into approximately 150 agents per 100,000 adults. Even though such coverage is orders of magnitude higher compared to bank branches or ATMs, it remains much lower than in the neighboring countries of East Africa. Furthermore, all access points—branches, ATMs, agent- and merchant locations—are disproportionately concentrated in Juba.

As the first movers in the digital financial services space in South Sudan, mobile money providers led in product and delivery channel innovation. While person-to-person payments and humanitarian assistance disbursements are still the mainstay of the business of the leading provider, mGurush, it has invested in building a network of more than 5,000 merchants accepting mobile money payments; it has also provided payroll services for more than 200 organizations and launched bill payment services, starting with electricity bills. Finally, the provider has been expanding beyond USSD- and SMS-based services by developing smartphone apps. However, out of more than 300,000 mobile wallet holders, only about 10,000 downloaded the Android app. In addition to that, special apps for agents and merchants accepting mGurush payments have been developed, but each of them have been downloaded by only approximately 1,000 users.

On the other hand, for commercial banks, physical branches still form the primary delivery channel. As of 2022, only four banks offered online banking services. Most of them were South Sudanese branches or subsidiaries of international banks, which had such applications already developed for their home markets. Some banks are working on developing their own smartphone apps; others, such as the Cooperative Bank, have also launched simplified mobile banking services allowing customers to access their accounts through short codes (USSD). Based on ad-hoc approvals from the central bank, four banks—KCB, Equity Bank, Kush Bank, and the Cooperative Bank—provide agent banking services. However, banking agents are rarely present outside major cities.

5.2.6 Managing Risks of Digital Finance

Even though South Sudan’s low level of digital financial services development could, paradoxically, make it relatively less vulnerable to cybersecurity risks, these cannot be ignored. It is true that the reliance on cash and paper-based processes across the financial sector made cybercrime in South Sudan less profitable. However, this is changing—both with the increasing interest of individual institutions in digital finance, but also with the upcoming implementation of new electronic payment systems, such as the RTGS and the ACH. At the same time, confronting cybersecurity in the financial sector has been negatively affected by the lack of qualified staff and by outdated infrastructure. For example, many commercial banks have utilized core banking systems that are no longer supported by their vendors and may include security vulnerabilities. As the leading agency in charge of cybersecurity, the National Communication Authority (NCA) has been involved in raising awareness of cybersecurity issues, developing cybersecurity standards for government agencies, and setting up the national Computer Emergency Response Team (CERT). However, few activities focus specifically on cybersecurity in the financial sector (Refer to In Focus: Cyber Security and Data Protection for more details).
While the country enacted the Anti-Money Laundering and Counter Terrorist Financing (AML/CTF) Act in 2012, the Financial Intelligence Unit has not been fully operationalized. The national ID system and business registries are not integrated with AML/CTF systems, and beneficial ownership information is difficult to obtain. Gaps in financial integrity make it more difficult to launch digital financial services that rely on remote onboarding or a simplified customer due diligence (CDD) process.

Issues related to AML/CFT and the perception of South Sudan as a high-risk jurisdiction affect the approach of foreign correspondent banks. South Sudanese commercial banks reported challenges related to opening and retaining nostro accounts with foreign correspondents. Out of all the commercial banks in the country, fewer than ten have any foreign correspondent relationships. This affects speed and reliability of cross-border transactions, including remittances and payments related to trade financing.

5.2.6 Constraints limiting development of Digital Financial Services

Many of the constraints that account for the low level of DFS development are not specific to the financial sector. For example, the lack of reliable network connectivity was named by almost all financial sector stakeholders as the main obstacle, well ahead of any financial sector policies. Similarly, gaps in national ID coverage have outsized impact on the feasibility of digital finance. Equally important are macroeconomic factors: inflation, dollarization of the economy and its dependence on oil exports have all contributed to the underdevelopment of the financial sector and a more limited scope for innovative digital financial products.

Nonetheless, financial sector-specific policies are also of significance. It will be easier for DFS to flourish in South Sudan if they are supported by adequate financial infrastructure, such as payment systems and collateral registries. Modernization of the legal and regulatory framework will result in decreased risk, greater openness to new business models and increased interest and confidence from local and international investors. The government’s own use of financial services—such as payments—has so far been entrenching the domination of slow and inefficient paper-based processes but has the potential to act as a catalyst for a wider digital transformation. This chapter concludes with a list of recommended actions for the central bank and other authorities that are most instrumental in accelerating DFS development and adoption. It should be kept in mind, however, that given the fast pace of DFS innovation, the list may have to be revisited and updated or extended. What should not change is the authorities’ commitment to fostering digital finance as well as their open, transparent, and frequent communication with public and private sector stakeholders.

5.3 Recommendations

R1: Creating a befitting legal, regulatory and policy enabling environment

R1.1: Develop a blueprint for retail payments infrastructure. Considering the draft retail payments strategy, BOSS should lead the development of plans for a national payment switch or an instant payment system. Given the low penetration of debit and credit cards, consideration should be given to the development of switching infrastructure that would also support the interoperability of other kinds of transactions, such as mobile money transfers. At the same time, it is important that any publicly funded infrastructure projects do not duplicate and crowd out private investment in that sphere; for that reason, the participation of the private sector in the funding and governance of a future payment switch will be very important.

R1.2: Enact the National Payment System law and accompanying regulations. BOSS should cooperate with the Ministry of Finance, the Ministry of Justice, and other relevant ministries, agencies, and departments to expedite the enactment of the law. BOSS and development partners may consider engaging the legislative branch and individual MPs to sensitize them to the critical importance of that piece of legislation. Upon its adoption, BOSS should revise the Electronic Money Regulations and enact other regulations (such as those on payment system oversight, electronic fund transfers, consumer protection and outsourcing and critical service providers) to ensure that all requirements of the law are complied with and implemented through relevant regulatory provisions.
R1.3: Finalize and implement the National Payment System Strategy and the associated strategic documents. This should include the Retail Payments Strategy, as well as developing strategies pertaining to financial inclusion, financial literacy, and consumer protection. To ensure stakeholders’ alignment and minimize administrative burdens, some of those documents could be merged with one another and enhanced with provisions pertaining to services other than payments, such as digital credit or digital savings.

R1.4: Develop access models to financial infrastructures—including payment systems—for non-banks. BOSS should develop policies with respect to direct and indirect access to RTGS, ACH, card and mobile money switches by non-banks, such as fintechs, mobile money providers and microfinance institutions. This is of critical importance, as the footprint of non-bank financial institutions in the country vastly exceeds that of banks. Possible participation criteria should be risk-based and informed by international standards, such as the Principles for Financial Market Infrastructures (PFMI).

R1.: Strengthen digital finance oversight. BOSS should strengthen the capacity of its oversight staff, develop robust reporting and data analysis tools, and collaborate with development partners, regional central banks, and other government agencies to ensure that the oversight of digital financial services—payment systems in particular—is risk-based and informed by global best practices.

R1.6: Encourage extension of access point networks through mobile money and agent banking regulations. South Sudan’s challenging geography and gaps in infrastructure mean that expansion of financial services will have to happen through non-traditional delivery channels: mobile money agents or agency banking. Bringing them to South Sudanese communities will require close coordination between the central government and local authorities, NGOs, businesses, and other stakeholders. The central bank will need to finalize the agent banking regulations, while the government and its development partners will have to consider how extending the reach of agents can be incentivized.

R2: Operationalizing the RTGS, ACH with key functionalities

R2.1: Expedite the implementation of the Real-Time Gross Settlement System (RTGS) and the Automated Clearinghouse (ACH). BOSS should ensure that the procurement process for the RTGS and the ACH is expedited, taking into accounts the needs and priorities of the central bank and commercial banks. If needed, the central bank should make use of technical assistance from development partners to ensure that the procurement and implementation of the system remains on track. The presence of a domestic interbank settlement system is crucial for most other digital finance initiatives; delays in the launch of the RTGS and the ACH will therefore put them on hold.

R2.2: Integrate government payments infrastructure and processes with the RTGS and the ACH. BOSS and the Ministry of Finance should ensure that the modernized payments infrastructure is utilized to streamline government payment processes. In that context, changes to regulations and operating procedures of both entities may be required. Furthermore, such an integration may also require infrastructural investments, such as the upgrade of Financial Management Information Systems at the Ministry of Finance and the replacement of the core banking software at BOSS.

R2.3: Fully digitize the process of foreign currency auctions. Foreign currency auctions conducted by BOSS and targeted at commercial banks and exchange bureaus are considered a critical price discovery mechanism instrumental in determining the market exchange rate for the South Sudanese pound. Developing an end-to-end IT system handling the auctions, connected to the RTGS system that will be implemented by the central bank, will positively impact transparency in the foreign exchange market, as well as minimize settlement risk.

R3: Develop a Credit bureau and Moveable Collateral Registry

Develop a plan for the implementation of a credit bureau and a moveable collateral registry. BOSS should examine the lessons learned from the previous attempts to establish a credit information bureau and leverage them to ensure that the bureau’s services respond to the needs of financial institutions, and that its business model is sustainable. The authorities should also
implement a modern collateral registry that covers all types of movable property commonly used in South Sudan. Finally, BOSS and the Ministry of Finance should cooperate with state governments and judicial authorities to promote the modernization and digitization of land deeds, and to ensure legal enforcement of claims on collateral.

R4: Support financial literacy initiatives. Even before enacting a full-fledged financial literacy strategy—possibly as part of the National Financial Inclusion Strategy—BOSS and financial services providers should work together on designing financial literacy curricula, materials, and outreach initiatives. It would be beneficial to involve local academic institutions—to boost financial literacy and awareness among young people, but also to contribute to the development of talent pipeline for digital financial services jobs.

R5: Commit to regular and comprehensive data collection on financial inclusion and financial infrastructure. BOSS and the National Bureau of Statistics (NBS) should cooperate on developing and executing a plan for comprehensive data collection in areas such as account ownership, presence of bank branches and mobile money agents, digital transaction statistics, as well as domestic and international remittances. Proper channels for data reporting, sharing and verification should be established.
Notes


2. International Monetary Fund, Republic of South Sudan: First Review under the Staff-Monitored Program-Press Release; and Staff Report (Washington, DC, November 15, 2021 2021).


4. International Monetary Fund, Republic of South Sudan: First Review under the Staff-Monitored Program-Press Release; and Staff Report.

5. Ibid


11. Ibid


15. The “sanduk,” or saving box is an arrangement under which each member of a group of women contributes a small amount of money monthly, collected by the group’s treasurer. All the cash is given to one member of the group each month. The same exercise is repeated the following month for a different group member. It continues until the last person is reached, and then it starts all over again. The saving from the “Sanduk” are used by members to buy common household items including foods and other basic necessities, making it possible for many women with meager financial resources to buy household items they would have never been able to obtain otherwise.

16. BOSS transaction statistics

17. International Monetary Fund, Republic of South Sudan: First Review under the Staff-Monitored Program-Press Release; and Staff Report.


Digital Businesses

- Digital Businesses occupy a very small part of the economy in South Sudan, estimated to account for less than 1 percent of all businesses, comprising mainly technology start-ups or foreign owned large technology companies with a missing middle.

- Last five years has seen emergence of a handful of new digital businesses on account of recent positive socio-economic developments such as restoration of peace, expansion of the internet, donors engaging in more private sector development and establishment of incubators, bootcamps in an environment of high levels of entrepreneurial activity and the large share of youth in the population.

- However, several challenges remain, on the supply side lack of an enabling macroeconomic environment, transport, energy and ICT infrastructure and availability and access to capital. On the demand side, market size is small and access to nationwide or regional markets remains limited.

- To reap digital dividends, the government needs to facilitate the growth of digital businesses by creating a befitting legal, regulatory, and institutional framework, easing the business environment, facilitating business linkages both nationally and in international markets, providing active support to developing markets and demand, and building confidence in the South Sudanese digital business ecosystem.

6.1 The Importance of Digital Businesses

Digital Businesses can offer opportunities for inclusive growth and efficiency and have positive spillover impacts on the rest of the economy. Digital businesses,1 which encompass both digital start-ups and established digital businesses, represent a unique opportunity for economies to generate more innovation-oriented jobs, promote integration of lagging regions, and increase efficiency in the offline economy (Figure 12).2 They can also serve as a critical foundation to enable traditional offline businesses to adopt new digital business models and digital technologies, creating positive spillover effects in the rest of the economy. Digital businesses have the potential to create high-quality jobs and enhance firm productivity benefits by adopting digital solutions. Digital technologies and portals can also aid in peacebuilding through enhancing communication and mobility during conflict in fragile contexts such as South Sudan.3

However, the healthy creation, adoption, and proliferation of Digital Businesses requires balancing the opportunities they offer, with risks like market distortion and potential job displacement. Large platforms and data firms have the tendency to create market concentration due to network effects and economy of scale and may engage in
exclusionary and collusive practices, increasing market concentration or misuse of data. Job displacement or digital exclusion stemming from the change in the skills demanded could also occur. For this reason, it is essential for government policies to not only support the development of digital businesses, but also safeguard against risks of anti-competitive behavior, lack of data security or the deepening of a digital divide. For example, for technology products and platforms to be inclusive, a South Sudanese citizen would need to have minimum basic digital skills and access to ICT infrastructure to use local mobile payment platforms like M-Gurush or the e-service portal.

6.2 The State of Digital Businesses

In the absence of recent national statistics and a robust business registry, limited information is available on the size and nature of Digital Businesses in South Sudan. The available national level statistics (Statistical Yearbook for Southern Sudan 2010, The South Sudan Census 2008) are quite dated, and the country has not participated in the most recent international surveys (last participation in WB enterprise survey was 2014). The national business registry data sits with the Ministry of Justice (MoJ), but this is maintained manually and is not readily accessible. To this analysis, the recently completed Integrated Business Establishment Survey 2019 has been used to understand the broader business environment, complemented with findings from stakeholder consultations which shed light specifically on the landscape of digital businesses.

There are only a few Digital Businesses in South Sudan, including small technology start-ups and large, mainly foreign owned technology companies exhibiting a “missing middle.” The IBES 2019 survey identifies 1.6 percent of all businesses under the “Information and Communication” industry classification. A key albeit small constituent of this industry classification is the “information technology activities,” which could potentially point to activities engaging digital businesses. Leveraging this survey and in the absence of other recent evidence, along with confirmation from stakeholder consultations, it may be extrapolated that digital businesses are likely to comprise less than 1 percent of all businesses. These digital businesses mainly constitute a handful of technology enabled start-ups and more established technology companies with a missing middle of medium-sized organizations (See examples of digital businesses in South Sudan Figure 13). Start-ups include online aggregators, ridesharing service providers and small ICT product and service providers. The large technology companies, which have recently entered South Sudan in the last five years, are categorized as foreign-subsidized technology initiatives based in Juba. These are providing technology platforms, software and other ICT services to
the government, UN bodies, NGOs, and larger businesses in the country. This distribution of firm sizes is quite typical of low-income fragile contexts. It speaks to the proliferation of small, subsistence-oriented business activities with the prominent role of a small number of very large businesses, and a “missing middle” of firms. The IBES 2019 survey confirms this trend within the broader business landscape as well, where 72 percent of companies are microenterprises (no more than three workers, including potentially the owner) and the second highest share is in large established businesses.

There is a high concentration of businesses in Juba, and within these the majority have internet access, potentially indicating the existence of a higher number of digital businesses in the capital. Although internet access by businesses has increased (2 percent) since 2010, this remains low with only 16 percent of businesses having access to the internet in 2019. A look at business establishments with/without access to internet connection by towns reveals how it is only in Juba that most businesses have internet access (Table 12). Stakeholder consultations point to how Digital Businesses are primarily located in Juba, indicating how availability of internet access could be a key contributing factor for the location of these businesses.

**Table 12: Access to internet connection for businesses, by town**

<table>
<thead>
<tr>
<th>Town</th>
<th>Internet access by the establishment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tuba</td>
<td>74.8</td>
<td>46.7</td>
</tr>
<tr>
<td>Maridi</td>
<td>1.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Tonj</td>
<td>0.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Renk</td>
<td>1.5</td>
<td>3.6</td>
</tr>
<tr>
<td>Wau</td>
<td>6.5</td>
<td>12.8</td>
</tr>
<tr>
<td>Rumbek</td>
<td>3.9</td>
<td>8.0</td>
</tr>
<tr>
<td>Aweil</td>
<td>3.0</td>
<td>9.5</td>
</tr>
<tr>
<td>Yambio</td>
<td>0.8</td>
<td>4.7</td>
</tr>
<tr>
<td>Bor</td>
<td>5.1</td>
<td>4.3</td>
</tr>
<tr>
<td>Torit</td>
<td>1.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Nimule</td>
<td>1.2</td>
<td>2.7</td>
</tr>
<tr>
<td>Kuajok</td>
<td>0.1</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
6.2.1 Strengths and Opportunities of the Digital Business Ecosystem

Key Strengths

Recent positive socio-economic and ICT sector developments have contributed to the establishment of new Digital Businesses in the last five years. Return of basic political stability; internet usage expansion to 8 percent of the population – twice the number who did in 2014 (3.8%); more active diaspora, the majority of whom use mobile money payments for foreign remittances; and increasing government contracting for ICT such as for the e-service portal, the creation of a national telecommunication company, Digitel, and others are likely to have contributed to the establishment of new (although still few) digital businesses. As a result, there are signs of increased momentum in digital business activity. For instance, South Sudan’s first mobile money platform, M-Gurush, was launched in 2018. Agoro, South Sudan’s e-commerce platform currently offering 50,000+ products, was started in 2019 with support from donor funding. Nileboda, a transport company, was started in 2019 and began to leverage digital portals capitalizing on the new connectivity in Juba. Global technology software solutions firms such as Sasudatech have started operations in South Sudan over the last two years, and technology firms such as Crawford Capital have begun work with the government on providing technology solutions such as support on the new e-visa portal. Even more broadly, among all businesses surveyed in 2019 (beyond digital businesses), a large majority (70 percent and above) expected the security situation to improve, its negative impact on their business to subside and demand for their goods and services to increase in the coming three years.

A high share of young population in a market of limited existing job opportunities encourages entrepreneurship. Almost 70 percent of the population in South Sudan is young (below age of 30). Studies have shown that younger generations have more propensity to be involved in entrepreneurship than older generations. Entrepreneurship in South Sudan is more “necessity” driven entrepreneurship, in line with similar trends seen in other low-income economies. Low-income economies are likely to have fewer alternative sources of earnings, and therefore going into entrepreneurship is a necessity to create opportunities. The level of necessity motivation drops as economic development level increases. Among low-income economies, an average of 35 percent of entrepreneurs identify necessity motives, and this declines to 28 percent for middle-income economies, and then 18 percent among high-income economies. It is therefore not surprising that the most common form of employment in South Sudan is self-employment (46 percent of types of jobs in urban areas is those of “self-employed business activity”). Further, a significant share of those unemployed identify ‘start-up’ training as one area of support needed to be gainfully employed, indicating a latent interest in starting entrepreneurial ventures, and demand for support in the same (See Figure 14). This increasing level of interest in entrepreneurship has the potential to translate to digital businesses if new entrepreneurs can access and utilize digitalization opportunities.

The emergence of a nascent entrepreneurial support ecosystem, comprising mainly incubators and bootcamps, led primarily by donor partners, has begun to provide support to start-ups. A well-developed entrepreneurial ecosystem comprises incubators, accelerators, bootcamps, co-working spaces

Figure 14: Support Needed by The Unemployed to Find Employment

Refugee

IDP

Urban

% of unemployed population

Complete education

Technical/Vocational Training

Start-up training

Loan/grant for business

Connection to employers

Documentation

Land/livestock/tools for agriculture

Other
and related support structures, collectively often referred to as Entrepreneur Support Organization (ESOs), with sufficient intra- and international linkages. The entrepreneurial ecosystem in South Sudan is still very nascent. The number of ESOs in South Sudan is relatively small (1-5), mainly incubators, and mainly concentrated in Juba with limited intra- or international linkages. It is worth noting that these ESOs are being increasingly funded by NGOs or donor partners. This may be indicative of a slow, albeit increasing, shift in donor engagement from humanitarian support to more private sector development assistance. The programs support a range of businesses from startups to operational digital businesses even though data and information on their successes and lessons from their experiences have not been available. These programs provide a much-needed support in an underdeveloped digital ecosystem and most of them are oversubscribed, indicating a growing demand for entrepreneur and business support services.

Key constraints

Unfavorable Legal, Regulatory and Macroeconomic Environment

South Sudan lacks a single strategic vision or an enabling ecosystem for Digital Businesses. The Ministry of Trade and Investment is the apex body tasked with the private sector development agenda including support for Digital Business ecosystem, but it is struggling with outdated strategies and lack of sufficient capacity. The last Private Sector Development (PSD) strategy was formulated in 2013 and requires update; a draft competition policy was prepared but has been pending internal approval. No specific national strategy on digital businesses (including for instance, support for entrepreneurship, developing the online market, taxation, or procurement benefits for digital businesses) currently exists. Although the newly established e-services portal allows for registering businesses online, stakeholder consultations reveal how the process to register a business still requires some manual steps and is lengthy and complex, involving visiting multiple MDAs. A One-Stop Shop Investment Centre (OSSIC) was established in 2012 but this remains to be operationalized. A private business association (South Sudan Chamber of Commerce) provides support for business registration for all businesses including digital businesses and provides business development services but charges a membership fee which is high for small digital start-ups.

MDAs are carrying out programs to support Digital Businesses in an ad-hoc manner, that remain limited in reach or are yet to be fully operationalized. A few recent efforts have been undertaken, such as establishing access to a finance facility for MSMEs (Ministry of Trade and Investment), or the provision of free web hosting services for technology firms by the National Communications Authority (NCA). However, most digital businesses express that they

Box 9: Key players in the entrepreneurial support ecosystem

National NGO run incubation programs. Whitaker Peace and Development Initiative (WPDI) provides business bootcamp services for entrepreneurs and has incubated 129 businesses over two years. WPDI has also set-up 8 community learning centers offering internet access and computers across the country, mainly in remote rural areas, serving over 200,000 citizens. Similarly, South Sudan based Foundation for Youth Alliance (Supported by United States African Development Foundation) runs its Enterprise Development Program providing training and technical assistance to farmer cooperatives, youth-led enterprises, and grassroots associations. Training covers the topics of financial management system, good governance, financial reporting system and enterprises development. Assistance is also provided to entrepreneurs in the development of business plans, brand development and marketing strategies, along with offering seed funding to start-ups.

UN-run bootcamps. UNDP runs a Business Accelerator Program and organizes Meet and Greet Programs for entrepreneurs. UNESCO, UNDP along with NGO Defy Hate Now run The Peacebuilding and Literacy through Tech Innovation Bootcamp, engaging youth to develop mobile applications to facilitate peacebuilding. These programs offer incubation support such as mentoring, training, digital literacy, support on business plan writing and seed funding primarily through grants (up to $250k USD).
lack information about existing government programs and upcoming policies. There are defined plans in the pipeline such as for the creation of enterprise development funds, which would work through private sector associations to ease access to financing, or setting up an e-commerce directorate tasked with supporting the online market, but these remain to be operationalized.

There is an absence of laws and regulations that support trustworthiness in digital markets, e.g., personal data protection and online consumer protection. A digital economy can only thrive if people trust in online transactions and know that their personal data are protected, and their welfare is safeguarded. However, South Sudan does not have a legal framework that explicitly ensures data protection or would penalize privacy violations. A draft Data Protection law has been formulated by the NCA and is pending parliamentary approval. However, the bill does not yet look at the need to set up an office of data protection or create adequate safeguards to build trust in the online market. Laws or guidelines in relation to e-transactions are absent.

Insecurity on account of fear of conflict and increasing inflation is negatively impacting investment. South Sudan is currently beyond the risk appetite of many potential foreign investors. Security concerns due to sporadic community militia-based violence, and a lack of confidence in the security of investments due to a history of government instability are limiting business activity. In addition, evidence reveals how foreign owned businesses, local market traders, and more established businesses alike view the rapid price escalation as a serious problem, and that they are likely to reduce or stop their activities because of the difficulty of coping with inflation. Stakeholder consultations specifically with digital businesses reveal similar challenges faced.

Lack of Availability and Access to Capital

Firms face low availability of capital on account of limited financial intermediation. There are 30 commercial banks operating, five of them foreign owned. Many of these domestic banks are undercapitalized. Capital markets do not exist, and channels of risk capital (VC, Angel investing, seed funding, equity investments, others) which are essential for growth-oriented digital start-ups and businesses are absent. The limited lending banks provide are to businesses with well documented contracts with international organizations and personal loans to government employees. A Surveys of businesses indicate the level of uptake of bank loans by small businesses is low (only 3 percent of all businesses surveyed took bank loans) over the past three years, and even among large businesses, this share is only six percent.

Poor access to capital is a problem for all start-ups in South Sudan and is more burdensome for digital start-ups and firms that rely on informal networks or grants for capital. Startups typically struggle to receive formal financing given their lack of historical financial records, negative cash flows for a prolonged period, insufficient collateral, and high uncertainty of business success. Digital startups face additional constraints due to the intangible nature of their business and lack of brick-and-mortar assets that can be used as collateral for loans. This means digital startups rely on informal funding such as family and friends, or grants/gifts/donations before accessing more formal funding sources such as debt or equity financing. In South Sudan, digital start-ups mainly leverage informal financing or/and depend on donor grants and programs. For instance, nearly all digital businesses consulted (e.g. Agoro, NileBoda, KonetaHub, others) indicated having been supported by donor partners or NGOs in financing. Strict banking rules regarding collateral are a further barrier for banks to support the entrepreneurship ecosystem.

Limited Market Size

Digital Businesses struggle with small market size due to low purchasing power and poor digital literacy among the population. Years of conflict has driven many households into poverty, eroding purchasing power (approximately 80 percent of the population lives below the poverty line). For those employed on payroll, salaries are often undermined by inflation and real wages have been declining steadily. Public sector salary arrears have limited the contribution the government payroll makes to demand for goods and services. The Covid-19 pandemic induced further low demand; 73 percent of private sector businesses surveyed revealed how demand for their products declined, and half (52 percent) stated that it dropped by half or more. Further, consultations with digital businesses like e-commerce providers Agoro, ridesharing apps NileBoda and others reveal how customers struggle with using basic digital platforms like websites or mobile apps and businesses must invest in physical
customer help service centers to train customers on usage of ICT devices and platforms, resulting in additional costs. Digital businesses are particularly sensitive to market size as there is a need for critical mass and volume for network-based models to make business sense.

The UN, NGOs, and foreign businesses constitute key demand (through both procurement and aid workers’ consumption), raising concerns of sustainability. UN agencies and NGOs play an important role as employers (22 percent of all employment, estimated 15,000 jobs65). While no comparative wage data is available, it may be reasonable to assume that UN and NGO workers on average have higher incomes than those working for many for-profit organizations. Therefore, agency workers are an important source of demand for goods and services. Foreign-owned businesses (including more established digital businesses) have proliferated, catering in part to this international presence. Foreign businesses and NGOs contribute significantly to demand for digital businesses, largely through procurement contracts. However, this high dependence on foreign aid and business makes South Sudan highly vulnerable to global economic fluctuations, restrictions, and movements raising concerns of sustainability of businesses that primarily depend on this market.

Poor Market Access

Access to the national market is limited by poor transport, energy, and ICT infrastructure. South Sudan does not have motorable all-weather roads, especially beyond cities like Juba which is a key factor limiting businesses, including digital businesses, from expanding beyond the city. Only one in seven rural residents live within 2km of an all-season road.66 Consultations with businesses reveal the physical dangers they face on the road, including roadside ambuses and flooding of roads pointing to the difficulty of moving goods and services to access markets across the country. For digital businesses, electricity, internet connectivity and ICT infrastructure are critical inputs which are not easily available. 36 percent of all businesses surveyed cited electricity as a serious obstacle. Similarly, unavailability of quality high-speed internet (only 15 percent of all businesses have access to internet) in most areas and lack of access to ICT devices (computers, mobile phones) represent a sizable constraint for the operations of digital businesses (refer to Digital Infrastructure pillar).

South Sudan is yet to fully tap into the regional market. While the country is already a member of the East African Community (EAC), it has not ratified the African Continental Free Trade Area (AfCFTA)67 which could facilitate access to larger, diversified, and more sophisticated markets.68 As a landlocked country, South Sudan can reap benefits from greater regional digital integration through establishing first-mile connectivity via landing stations at the borders and opportunities to access regional markets including with Sudan, Ethiopia, Kenya. However, this remains to be explored.

Isolation from the international technology community is further limiting Digital Business expansion. Although nearly all sanctions have now been lifted against the Republic of South Sudan (albeit sanctions on specific individuals, and an arms embargo remains69) the lifting of sanctions has not been fully internalized by the international community, particularly within the technology sector which is hesitant to do business with South Sudanese players. Stakeholder consultations revealed challenges around access to some tech tools such as Facebook advertisements and WhatsApp business account tools within the international community with recognizing South Sudan as independent state from Sudan. Businesses registered in the Republic of South Sudan are still struggling to be recognized abroad as many international institutions, companies and portals have not yet updated their system to reflect the new state.70

6.3 Recommendations

R1: Strengthening the legal and regulatory environment for digital businesses

R1.1: Create a National ICT Policy including a focus on Digital Businesses that defines digital businesses as a separate category of MSMEs, simplifying business registration and exit, and providing targeted support for digital start-ups and other related areas. Other countries’ experience may provide relevant insights for South Sudan. Kenya, for example, identified digital businesses as a key pillar for government support in its Digital Economy Strategy 2019,71 or Rwanda’s Smart Rwanda Master Plan, which focuses on business and innovation and sets targets for the
number of home-grown companies and private investment in ICT. 52

R1.2: Institute building blocks for creating a safe online market. South Sudan may consider using international good practices such as the OECD’s Principles of Online Consumer Protection as a reference. These principles protect consumers before, during and after transactions, for example by mandating sufficient information about the seller (e.g., name, address, phone number), disclosure of information about goods and services (e.g., key functionality and interoperability features, guidance on health and safety aspects) and clarity on the conditions after a purchase (e.g., returns, refunds, warranties, etc.). 53 Introducing basic online consumer and supplier protection may lead to increased levels of trust and uptake of digital products and service offerings by consumers in South Sudan. 54 55 56

Box 10: Potential for digitalization within agri-businesses
Activities in the agriculture market, particularly for aggregators, could offer a key opportunity to improve productivity. Conflict has severely impacted market-linked agriculture. For farmers, taking goods to market is not only dangerous, but also costly, and it offers uncertain rewards. Given low market demand, this becomes a risky proposition. In this context, farmers in some towns express a distinct desire for aggregators to resume their work, and aggregators in principle believe that their business has the potential for considerable margin. 55

Digitalization in the agriculture sector is negligible, although some cooperative societies are beginning to adopt digital platforms to offer aggregation services and sell processed agricultural products to wider markets. Only few agri-business players, mainly cooperatives, are beginning to adopt digital technologies to expand access to markets. For example, The Gezira Young People Agribusiness Trust Co. Ltd (GYPAT) 56 formed in 2012 by 135 South Sudanese youth, is today a market linkage provider connecting farmers to markets in primarily fruit processing and cash crops. The business has a digital presence (Website, Facebook) which they use to access potential customers and suppliers. Kajo Keji Lulu Works Multipurpose Cooperative Society has become a global manufacturer and exporter of Nilotica Shea butter, selling on online platforms such as Zola Collective. 57 Early consultations suggest connecting more cooperatives to the internet may encourage further digital adoption.

R2: Support for expanding market demand and access

R2.1 Expand access to the market through active participation in regional dialogues and initiatives. For a small landlocked country like South Sudan, actively engaging with neighbors and the region more broadly will be beneficial to not only expand access to markets but also allow for transfer of knowledge, goods, and services for mutual benefit. Participation in regional trade agreements like AfCTA, and efforts on expanding regional road and internet connectivity is recommended. The country’s recent request to participate in the World Bank’s Regional Digital Integration Project (P176181) is a positive step in this direction.

R2.2: Strengthen the national market through more active support to Digital Businesses especially in critical sectors such as agriculture. Given the absence of adequate finance and weak financial intermediation, grant funding is likely to be more viable at the early stages than support for access to credit 57 to support the growth and expansion of digital businesses that play a critical role in connecting markets. The grants can be structured to be conditional on meeting certain targets or performance indicators to ensure a return on financial support but also to encourage market and demand-based solutions.

R3: Building greater awareness of and confidence in the Digital Businesses Ecosystem of South Sudan

R3.1: Create an ICT sector working group among development partners and the government. Stakeholder consultations with international partners, including UNDP, AfDB, JICA, EU and several NGOs showed that many partners are interested in investing in the digital economy in South Sudan. It would be beneficial if these support
measures were consolidated to ensure resources are used most cost-effectively and without duplication. This can be facilitated through creating a forum for periodic coordination and interaction. Best practices from other countries in the region include ICT Donor coordination groups e.g., Rwanda ICT donor coordination monthly meeting, Kenya ICT donor group.

**R3.2:** Host and partake in investment promotion events or setting up dedicated associations to interact with the international technology community. Foreign investors are either reluctant or cautious about the business environment in the country owing to a legacy of sanctions, conflict, and lack of full information on recent developments. There is a need for targeted investment promotion to attract investment and partnership with regional and global technology firms. This should be complemented with communication campaigns and events to highlight business opportunities in South Sudan. Another approach could be to set-up dedicated associations to facilitate interaction with the international community such as the Association for Start-ups and SME Enablers (ASSEK) in Kenya or the Center for International Private Enterprise (CIPE) in Sudan which set up monthly private sector forums to help build partnership and collaboration between the business community, international organizations, and foreign aid agencies.

**R3.3:** Partake in international surveys and data collection efforts to bridge information gaps. Businesses require timely, granular, relevant, and easy to access datasets for strategic business planning, including data for benchmarking growth and market sizing, sector-specific information to identify new customers, optimize transportation routes, and plan production schedules more efficiently. However, data sources in South Sudan are scarce and outdated. Stakeholder consultations reveal that the limited datasets that do exist are held in silos within certain ministries and can be accessed solely through personal connections and by physically visiting government offices. Furthermore, South Sudan has not actively participated in 3rd party data collection efforts, or international surveys such as the World Bank enterprise survey, ITU (International Telecommunications Union) data collection exercises or those by UNCTAD (United Nations Conference on Trade and Development). Resultingly, most international sources only reflect the state of the South Sudanese economy prior to 2013 which is an inaccurate representation of the current reality. Lack of information can limit foreign investors and new businesses from investing or expanding operations in the country. The National Bureau of Statistics, along with the NCA would need to work closely with international organizations to partake in data collection efforts, and periodically share and publish data on key portals such as the country’s own national statistics portal as well as on ITU dashboard, GSMA Intelligence and others.
Gender disparities and inequalities are staggering in South Sudan, and stakeholder consultations reveal similar gender gaps within the ICT sector in the country. The country ranks in the bottom third of all countries worldwide for the “life-course gender gap” on the Human Development Index. Although very limited detailed gendered statistics in the ICT sector are collected or tracked (see Table 13 below), stakeholder consultations confirm the existence of a gender gap.

The Ministry of Gender has a focus on ICT but lacks adequate capacity. The Ministry of Gender, Child, and Social Welfare (MGCSW) is primarily responsible for the formulation and implementation of policies for promotion of gender equality and women empowerment but is limited in capacity and resources. For instance, MGCSW has drafted the legal documents required to establish a fund to benefit female entrepreneurs, but this remains to be operationalized. ICT training units have been set-up but remain largely unfunded, and there are no monitoring and evaluation mechanisms in place to track results of these trainings.

A few promising private sector initiatives for women in ICT exist although they remain heavily donor dependent and limited in scale. A few targeted private sector initiatives exist; South Sudan Women Finance, a nonprofit organization founded in 2021, provides women access to microfinance through organizing community self-help groups. The GoGirls ICT Initiative provides ICT trainings for girls in schools, teacher training, sponsorship schemes to encourage female intake in ICT courses, counseling, and mentoring programs for women. The South Sudan Women Entrepreneurs Association which has a national presence with over 70,000 women as members provides support with start-up kits, business registration, trainings and facilitating access to capital. These and similar programs are heavily supported by development partners such as UN Women, UNDP, and others, raising concerns of sustainability and potential for scale.

**Box 10: Women’s Social and Economic Empowerment Project (SSWISEEP)**

World Bank’s ongoing support through the SWISEEP (P176900) aims to increase girls’ and women’s access to livelihood, entrepreneurial and gender-based violence (GBV) services and to strengthen the government’s capacity to provide these services. The project is centered around four components including provision of (a) community-based Socio–Economic Empowerment Support to Women through establishing Women’s Economic Community Centers (WECCs); (b) establishing a Women’s Entrepreneurial Opportunity Facility (WEOF) to support women in business; (c) providing services for survivors of GBV; and (d) Institutional Strengthening and Project Management support for the Ministry of Gender, Child, and Social Welfare (MGCSW).

Approximately 43,000 women and girls are expected to benefit from the project, either from the services offered through the WECCs, from the training programs, or from the increased access to finance. Participating in training, gaining knowledge of how to produce and sell products, linking to markets through use of digital technology, benefiting from mentoring, or being part of enhanced business networks have been shown in other countries to increase lifetime income for people who benefit from such opportunities.
Table 13: Gender Gap in South Sudan, on key select indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>South Sudan</th>
<th>Sub-Saharan Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td><strong>Education Attainment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literacy (%)</td>
<td>28.9</td>
<td>40.3</td>
</tr>
<tr>
<td>Gross Enrolment in primary education (%)</td>
<td>60.4</td>
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<tr>
<td>Gross Enrolment in secondary education (%)</td>
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<td>14.3</td>
</tr>
<tr>
<td>Gross Enrolment in tertiary education (%)</td>
<td>0.3</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Economic Participation and Opportunity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor Force Participation (%)</td>
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</tr>
<tr>
<td>Unemployment (%)</td>
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<tr>
<td>Employment in Industry (%)</td>
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<td>23.7</td>
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<tr>
<td><strong>Digital Gender Gap</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile Ownership (%)</td>
<td>22</td>
<td>31</td>
</tr>
<tr>
<td>Made or received digital payments (%)</td>
<td>4.0</td>
<td>10.7</td>
</tr>
<tr>
<td>Use Mobile phone or the internet to access an account (%)</td>
<td>0.3</td>
<td>0.7</td>
</tr>
</tbody>
</table>

The State of Cybersecurity, Data Protection and Data Privacy

South Sudan is lagging behind peers and in global benchmarks, ranking 169 out of 193 member states on the overall Global Cyber Security Index (GCI). South Sudan is in the early stages of setting-up institutional and regulatory governance mechanisms for cybersecurity. The cybersecurity mandate is currently under the telecom regulator, the National Communication Authority (NCA). While no national strategy on cybersecurity has been formulated at the time of this assessment, a provisional presidential order on “Cybercrimes and Computer Misuse” was enacted in May 2021. This order has been formulated based on the ITU guidelines and aims to “prevent any crimes committed through computer, computer system, Internet or any related activities.” Although useful, the limited scope of the current provisional presidential order is limited in addressing and managing the ever-growing frequency and sophistication in cyber risks, data protection, and privacy. The government is also setting up a Computer Emergency Response Team (CERT) and requires technical and financial resources to ensure that the body can be fully functional. Some efforts on raising awareness on the issues of cybersecurity are conducted by the NCA such as the “Cyber Security Month,” during which information on safe use of the internet is disseminated via social media platforms and outreach events for citizens, although this remains limited in scale.

Data protection and data privacy have been guaranteed in international and regional instruments to which South Sudan is a signatory, but their operationalization is limited in South Sudan. Articles 22 and 25 of South Sudan’s transitional constitution grant all individuals the right to privacy and prohibit unreasonable disclosure of personal information. The African Union Convention on Cyber Security and Data Protection, of which the Republic of South Sudan is a signatory, lays down a general legal framework of protection for users of ICT in trade and investment. However, no national data protection law has been passed yet (it is noted that a draft data protection law has been formulated and is pending parliament approval at the time of writing), and relatedly no operational resources such as an entity or office of data protection has been designated to manage the data protection agenda.
Recent developments in the digital economy have created an increased momentum generating interest from the private sector. Return of basic political stability, increasing internet and smartphone usage, growing use of mobile money and establishment of a government e-services portal and associated ICT contracting have all resulted in creating new activity in the previously more dormant digital economy of South Sudan. These developments have contributed to increased interest from the private sector. Among all businesses surveyed in 2019, a large majority (70% and above) expected the security situation to improve, its negative impact on their business to subside and demand for their goods and services to increase in the coming three years.

Private sector investments are being made in key areas of broadband infrastructure, e-services, and digital financial services, with potential for expansion in other sectors. In 2020, the country’s only fiber optic cable (from Uganda to Juba) was financed and deployed by an international MNO, Liquid Telecom. Resultingly, Juba is now connected to broadband and spillover benefits of ICT services are visible. There is also both interest and financial appetite in the private sector for further investment in expanding digital infrastructure. In 2021, under a PPP agreement, private sector company Crawford Capital made financial investments to establish and manage the e-tax, and e-service portals that the government in running. In early 2022, local mobile money providers such as mGurush and Nilepay launched their services; they have expanded to over 500,000 wallets today. Other sectors, such as agriculture, could benefit from increased investment in digitalization in such areas as connecting nationwide agricultural cooperatives, and monitoring weather patterns, among other things.

Encouraging greater private sector investments would require creating an enabling regulatory and institutional environment and providing targeted incentives to stimulate demand. Most of the ICT sector regulations pertaining primarily to fees or taxes are dated from 2012, and the country lacks a single sector strategy. Legacy licensing regimes, such as the 2008 inter-government agreement for telecom providers, are still in operation and are not technology or service neutral. Stakeholder consultations reveal how these are limiting further investment from MNOs. Here, creating an enabling regulatory and institutional environment characterized by a transparent licensing regime and open procurement could aid in unlocking further investment from the private sector. Foreign investors are also either reluctant or cautious about the business environment in the country owing to lack of full information on recent developments. Investment promotion events and participation in global forums can aid in information dissemination. Along with the suggested reforms, it would be important to address the challenges of a small market, and lack of commercial viability for investment in rural areas characterized by low purchasing power and the lack of connectivity. Here the role of the government and support from development partners in providing targeted incentives through subsidies or gap financing for businesses or grants to stimulate demand would be valuable.

With efforts towards maximizing private capital investment, it would also be critical to minimize associated risks. Recent private sector investments in expanding broadband infrastructure, government e-services and digital payments have proven to be valuable in an environment of limited government fiscal availability. These have, however, created risks...
of their own. Lack of open competition in awarding contracts and licenses has created a high dependency on few players with the risk of monopolization. Outsourcing almost entirely the running and management of core government functions such as e-services has created a challenge of capacity building within the government. Long-term contracts with fixed revenue sharing arrangements have not necessarily factored in building sustainability. Defining open and clear procurement and licensing arrangements to encourage wider competition, along with investing in knowledge transfer to build government capacity and reducing dependency is recommended.
Regional Digital Integration in East Africa

The East Africa region has pronounced disparities in terms of broadband infrastructure access and adoption, driven by affordability and quality of service constraints. The East Africa region is home to countries with varying levels of connectivity infrastructure. For instance, Kenya and Somalia have submarine cables landing on their shores while landlocked countries like South Sudan rely on their coastal neighbors to access this capacity. For South Sudan, access to this capacity is further constrained by missing segments of terrestrial infrastructure that limit cross-border connectivity linkages (Figure 15). South Sudan currently has only one cross-border link which creates a risky dependency and vulnerability. South Sudan also pays a higher premium to access international bandwidth provided through international cable landings on the coast of neighboring countries. The price of 2 Gb data packages in coastal versus landlocked countries thus ranges from US$4.64 in Kenya to US$21.06 in South Sudan. Creating an integrated regional connectivity market could help build redundancy, expand access to connectivity and reduce existing price and quality differentials.

Most countries in the region still lack the necessary data infrastructure to enable data exchange both within and beyond the region and, as well, lack adequate safeguards. In terms of data governance, South Sudan scores significantly lower than Kenya or Rwanda in terms of enablers in the Global Data Regulation Diagnostic Survey of 2020-2021. The country also scores lower than other African peers in terms of their data safeguards such as data protection, and is among the bottom 15 countries in global cybersecurity capacity rankings. Many countries including South Sudan depend on overseas facilities requiring them to transfer and store large amounts of data internationally, adding transit costs and causing latency issues. Introduction of green data infrastructure and cloud capabilities in parallel to introduction of robust data governance and data protection frameworks is needed ensure safe and efficient storage, as well as encouraging cross-border data flows.

The proposed East Africa Regional Digital Integration Project (EA-RDIP), 2023-2028 is a $172 million World Bank financing operation with the aim to advance regional digital integration. The operation aims to establish the foundations for regional digital market integration in the East Africa region by increasing access to affordable cross-border broadband services and strengthening the enabling environment for cross-border digital services. It will provide support to South Sudan, Somalia and two regional economic communities (RECs) – East African Community (EAC), and the Intergovernmental Authority on Development (IGAD). Specifically for South Sudan, the operation will support, primarily, establishing the foundations for connectivity infrastructure through expanding cross-border and national fiber optic connectivity and providing technical assistance to create an enabling legal and institutional ICT environment. In addition, the operation will also help establish market linkages through furthering cross-border data flows and trade by supporting data storage and exchange infrastructure and the regulatory environment. Finally, the operation will also support developing digital skills by establishing a NREN and advancing digital skills training in higher educational institutes.
Figure 15: Optimal Regional Network for The Horn of Africa
Conclusion

The digital economy is increasingly becoming a larger share and important driver of global economic growth, with a similar promise for South Sudan. The contribution of the digital economy is expected to grow from 15.5 percent to a quarter of global GDP between 2016 and 2026. Specifically in South Sudan, with the ICT sector revenues totaling approximately 3% of GDP, the digital economy already occupies a significant, if still small, position. Expansion of broadband can aid in increasing the pace of economic growth. Expanding public portals (e.g. e-service platform) can help improve efficiency of operations and strengthen state capacity. Use of mobile money is likely to improve security of payments, cross-border remittances, investments, and other such transactions. Finally, growth of new digital businesses in ICT (e.g. ridesharing and ICT repair centers in Juba, others) can support job creation.

Findings from this diagnostic show how the potential of digital transformation remains to be fully utilized in South Sudan, primarily on account of missing connectivity infrastructure, among other gaps. While there is increasing momentum in the digital economy with the recent deployment of the country’s first fiber optic cable, establishment of an e-service portal, and expanding use of mobile money – the lack of affordable and accessible high-speed internet remains a key barrier. With broadband internet adoption by only 9%, among the lowest in the world, the country lags behind peers and faces a threat of digital exclusion. Relatedly, and perhaps on account of a lack of connectivity, which acts as a foundation, other dimensions of the digital economy such as digital financial services, digital platforms, and digital business remain limited. The supply of digital skills is low, affecting the ability of individuals and businesses to leverage existing digital platforms and products.

As a first foundational step, it would be crucial to close the connectivity infrastructure gap in South Sudan, followed by supporting the expansion of the digital economy. Given the low connectivity coverage and penetration base in South Sudan, focusing on the fundamentals of establishing affordable and accessible high-speed internet connectivity would be a first step. This would contribute to economic growth studies estimate that an increase in 10% mobile broadband penetration could lead to USD million 123 in additional GDP. Down the road, building on basic connectivity through supporting digital public platforms, financial products, business, and investing in digital skills will allow for large spillovers in the development of new products, services, and markets.

In closing the connectivity infrastructure gap, an integrated infrastructure approach with the aim to create resilient infrastructure and a regionally integrated digital market would be critical.
Annex 1: Financial Analysis of MTN

MTN reported a rapidly increasing average revenue per user (ARPU) until Q1 2021, the highest for all its operations in Africa (Figure 16). Typically, ARPU declines as networks expand. This is because mobile operators cover first the more lucrative areas or because less affluent subscribers join a network at a later point as prices fall and handsets become cheaper. The increasing ARPUs are the result of removing core network congestion and the 4G rollout which added another revenue stream. While MTN’s ARPU fell again in 2021, likely due to competition from ZAIN and Digital, they remain among the highest of all MTN operations in Africa (Figure 17).

The investment in South Sudan has paid off for telecom providers such as MTN. Revenues doubled while operating expenses increased by 15%, leading to an Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) margin of 52.8%. Doubling the subscriber base coupled with increasing data use and minutes of use is the reason behind this success. The average data use per active subscriber increased from 633 MB per month in 2019 to nearly 2GB in 2021. The average traffic per active SIM card increased also from 180 minutes to 210 minutes per month. The increase in average voice use per subscriber is similarly unusual and is most likely also due to the unclogging of the core network. (See Annexure 1 for details on MTN’s key financial metrics).

### Table 14: Key Performance Indicators for MTN South Sudan

<table>
<thead>
<tr>
<th></th>
<th>MTN South Sudan</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Subscribers (Q4)</td>
<td>('000)</td>
<td>1,016</td>
<td>1,694</td>
<td>2,062</td>
<td>103%</td>
</tr>
<tr>
<td>Active Data Subscribers (Q4)</td>
<td>('000)</td>
<td>229</td>
<td>430</td>
<td>588</td>
<td>157%</td>
</tr>
<tr>
<td>Population (World Bank data 2021 set at 2020 value) (m)</td>
<td></td>
<td>11.1</td>
<td>11.2</td>
<td>11.2</td>
<td></td>
</tr>
<tr>
<td>Market share</td>
<td>(%)</td>
<td>62%</td>
<td>58%</td>
<td>59%</td>
<td>-4%</td>
</tr>
<tr>
<td>Implied mobile penetration South Sudan (%)</td>
<td></td>
<td>14.7%</td>
<td>26.2%</td>
<td>31.3%</td>
<td>17%</td>
</tr>
<tr>
<td>Implied active data subscriber penetration South Sudan (%)</td>
<td></td>
<td>3.3%</td>
<td>6.6%</td>
<td>8.9%</td>
<td>6%</td>
</tr>
<tr>
<td>Implied smartphone penetration South Sudan (%)</td>
<td></td>
<td>2.1%</td>
<td>4.5%</td>
<td>10.5%</td>
<td>8%</td>
</tr>
<tr>
<td>Average outgoing minutes of use</td>
<td>minutes</td>
<td>180</td>
<td>209</td>
<td>210</td>
<td>17%</td>
</tr>
<tr>
<td>Smartphones ('000)</td>
<td></td>
<td>144</td>
<td>289</td>
<td>691</td>
<td>380%</td>
</tr>
<tr>
<td>MB/active user</td>
<td>MB</td>
<td>633</td>
<td>1,127</td>
<td>1,903</td>
<td>201%</td>
</tr>
<tr>
<td>Revenue</td>
<td>R(m)</td>
<td>1,497</td>
<td>3,085</td>
<td>2,998</td>
<td>100%</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>R(m)</td>
<td>1,216</td>
<td>1,515</td>
<td>1,400</td>
<td>15%</td>
</tr>
<tr>
<td>EBITDA Margin (SSP)</td>
<td>%</td>
<td>16.9%</td>
<td>50.7%</td>
<td>52.8%</td>
<td>36%</td>
</tr>
</tbody>
</table>
Figure 16: MTN South Sudan ARPU in USD

Figure 17: MTN's USD ARPU across Africa for Q4 2021
# Annex 2: Taxes, Licenses, and Infrastructure Fees

<table>
<thead>
<tr>
<th>Tax/ Fee</th>
<th>Regulatory comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Business Profit Tax (BPT)</strong></td>
<td>The lower business tax incentivises investment</td>
</tr>
<tr>
<td>20% for Telecommunication Companies (25% in general)</td>
<td></td>
</tr>
<tr>
<td><strong>Sales tax</strong></td>
<td>Best practice is to use VAT instead of sales tax to avoid multi-stage build-up of tax burden to consumer.</td>
</tr>
<tr>
<td>Telecommunication rate service or call tax: 18% (same as for other sectors)</td>
<td></td>
</tr>
<tr>
<td><strong>National Bureau of Standards (NBS)</strong></td>
<td>Affordability can be improved by waiving type approval for a period of 5 years and to simply accept type approval of other jurisdictions (such as Kenya or the EU)</td>
</tr>
<tr>
<td>Telecommunication Devices: 25%</td>
<td></td>
</tr>
<tr>
<td><strong>Operating licenses</strong></td>
<td>In line with regional average</td>
</tr>
<tr>
<td>Annual operating licence fee: 1.5% of total audited annual revenue</td>
<td></td>
</tr>
<tr>
<td><strong>License fee VAS</strong></td>
<td>Is relatively low and reduces admin expenses for NCA.</td>
</tr>
<tr>
<td>USD 4000</td>
<td></td>
</tr>
<tr>
<td><strong>Annual License fees for spectrum bands for (GSM-CDMA-Wifi, Wi-Max)</strong></td>
<td>Spectrum fees are reasonable according to MTN, ZAIN and Digitel</td>
</tr>
<tr>
<td>USD 130,000 for each application</td>
<td></td>
</tr>
<tr>
<td>USD 9,000 per 200KHz duplex in 800/900 MHz bands for the first 5 MHZ, USD 11,000 for 2nd and USD 14,000 for third 5 MHZ. USD 4,000 per 200KHz duplex in other bands USD 2,000 per 200 KHz simplex in other bands. For WIMAX TDD in 2.5, 3.3, 3.5 GHz Bands. USD 4,000 per200 KHz for WIMAX FDD in 2.5, 3.3, 3.5 GHz USD 5,000 per200 KHz for LTE</td>
<td></td>
</tr>
<tr>
<td>USD 90 for 3.5 MHz: 1 to 10 GHz. USD 220 for 3.5 MHz 10+GHz. USD 1,519 for P2P link</td>
<td>The fees impact infrastructure (microwave backhauling) negatively. In the absence of a fiber backbone MNOs must use microwave for backhauling. While the microwave spectrum fees are not high, suspending them for 5 years would lower the cost of providing rural broadband connectivity.</td>
</tr>
<tr>
<td>USD 4,000 per 200 KHz for WIMAX FDD in 2.5, 3.3, 3.5 GHz</td>
<td></td>
</tr>
<tr>
<td>USD 5,000 per 200 KHz for LTE</td>
<td></td>
</tr>
</tbody>
</table>
### Taxes and Fees

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
<th>Regulatory comment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VSAT for private networks for in-country use and not through licensed operators.</strong></td>
<td>USD 379,747 per year per HUB USD 9,494 Per year per terminal</td>
<td>The fees impact infrastructure negatively. In the absence of a fiber backbone, satellite and VSAT is often the only choice for rural schools, clinics, and local authorities. Satellite can also be used to provide international connectivity to areas that the microwave network does not reach.</td>
</tr>
<tr>
<td><strong>VSAT for private networks for in-country use through licensed operators.</strong></td>
<td>USD 949 for Urban Area per year. USD 500 for Rural Areas per year</td>
<td></td>
</tr>
<tr>
<td><strong>Satellite station used as network HUB for licensed public operators.</strong></td>
<td>USD 94,937 per year</td>
<td></td>
</tr>
<tr>
<td><strong>Satellite station used as network Gateway for licensed public operators.</strong></td>
<td>USD 379,747 for each gateway</td>
<td></td>
</tr>
<tr>
<td><strong>Remote satellite station used in Backbone networks for licensed public operators.</strong></td>
<td>USD 949 per station.</td>
<td></td>
</tr>
<tr>
<td><strong>Fees for Licensing/Renewal of Licensing of Private Telecommunication Network.</strong></td>
<td>1% of Total Capital cost in the submitted study.</td>
<td>May not be needed for regulatory purposes.</td>
</tr>
<tr>
<td><strong>License Fees for manufacturing and assembly.</strong></td>
<td>5% of total capital cost in the submitted study.</td>
<td>May not be needed for regulatory purposes and provides a disincentive for local ICT manufacturing and assembly.</td>
</tr>
<tr>
<td><strong>Renewal of License Fees for manufacturing and assembly.</strong></td>
<td>3% of audited net profit, or initial Fees in case of loss.</td>
<td></td>
</tr>
</tbody>
</table>

References


Digital2021, report for South Sudan https://datareportal.com/reports/digital-2021-south-sudan


Education Briefing Note_2021.


OECD (2019) shows approximately one in ten 15-year old students in OECD countries was not able to distinguish between facts and opinions.


UNICEF, October - December 2021, education in South Sudan, briefing notes


Notes

1 Digital businesses include: 1) Digital start-ups refer to early-stage ventures that create new digital solutions or business models as part of their core products or services. Digital start-ups include firms that develop both routine technology solutions (e.g., software development), or more disruptive ones (e.g., platform-based, and data-driven solutions) and 2) Established digital businesses are mainly large platform-based and data-driven firms that have passed the initial start-up stage, having acquired suppliers, contractors, and consumers rapidly. E.g., Commercial digital platforms and data-driven technology firms e.g., telecom provider starts providing e-payment services or e-commerce platforms providing digital loans; DE4A Methodology, World Bank

2 DE4A Methodology, World Bank

3 Conflict and Connectivity in South Sudan, Defy Hate Now, and Center for Strategic and Policy Studies, August 2021

4 DE4A Methodology, World Bank

5 Ibid

6 IBES 2019, National Bureau of Statistics, South Sudan

7 Classification is based on the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4, which includes publishing activities including software publishing, motion picture and sound recording activities radio and TV broadcasting and programming activities, telecommunications activities and information technology activities and other information service activities.

8 South Sudan and Technology in 2050, Better Aid Forum Briefing Paper, Conflict Sensitivity Resource Facility, 2019


10 IBES 2019, National Bureau of Statistics, South Sudan

11 IBES 2019, National Bureau of Statistics, South Sudan

12 After a six-year civil war and the signing of the Revitalized Agreement for the Resolution of Conflict in South Sudan (R–ARCSS), the country took a significant step with the formation of the three-year Transitional Government of National Unity (R–TGaNU) in February 2020, restoring political stability.


14 DE4A Stakeholder Consultations, February 2022

15 Launch of M-Gurush; See: https://venturesafrica.com/south-sudan-gets-first-mobile-money-service-mgurush/

16 Agoro E-commerce Portal; See: https://www.agoro.co/

17 Nileboda, Ridesharing technology portal; See: https://www.nileboda.com/

18 Sasudatech, ICT service provider; See: https://www.sosudatech.com/

19 Crawford Capital, ICT service provider; See: https://crawfordcapital.africa/#!-%3E-%3E-text=Born%20in%20South%20Sudan%2C%20nurtured%20by%20the%20people%20they%20serve


22 Global Entrepreneurship Monitor, Global Insights, 2020-21


25 Ibid

26 ESO ecosystem in South Sudan is small in relation to the region and continent; other ESO ecosystems in Africa have 40+ ESOs (Kenya, South Africa), 20+ in Sudan compared to 1-5 in South Sudan

27 DE4A Stakeholder Consultations, February 2022

28 On the State of Business, Trade, Entrepreneurship and Real Economic Governance in South Sudan, Graduate School of Social Sciences, 2014

29 DE4A Stakeholder Consultations, World Bank, February 2022

30 See: https://www.wpdi.org/

31 See: https://fysouthsudan.org/


33 See: https://211check.org/about-us/

34 See: https://reliefweb.int/report/south-sudan/peacebuilding-and-literacy-through-tech-innovation-bootcamp-south-sudan-youth

35 DE4A Stakeholder consultations, World Bank, February 2022

36 The ministries that handle company registration include the Ministry of Trade and Industry, Ministry of Investment, Ministry of Finance, and Ministry of Justice, DE4A Stakeholder Consultations, February 2022

37 There is no website or advertised physical office

38 DE4A Stakeholder Consultations, World Bank, February 2022
39 DE4A South Sudan Consultations, World Bank, February 2022
40 The revitalized agreement on the resolution of conflict (R-ARCSS) envisages creation of enterprise development funds
41 DE4A consultations South Sudan, February 2022
43 By May 2019, civil service salaries were in arrears of four months, transfers to states were in arrears of 5 months, and foreign diplomatic missions were in arrears of up to 14 months
47 As of January 2023, South Sudan was one of few African countries that had not yet ratified the protocol for the establishment of the AfCFTA
50 DE4A Stakeholder Consultations, World Bank, February 2022
55 See: http://www.gypat.com/
58 UNDP Human Development Index, https://www.hdr.undp.org/en/countries/profiles/SSD. The life-course gender gap of the Human Development Index compiles 12 indicators that analyze gender gaps in choices and opportunities across the lifespan, including education, labor and work, political representation, time use, and social protection. The women's empowerment dashboard of the index compiles 13 woman-specific empowerment indicators in three categories – reproductive health and family planning, violence against women and girls, and socioeconomic.
59 International Telecommunication Union 2020
60 Interest has been determined based early conversations with private sector telecom providers, evaluation of existing private sector investments in backbone infrastructure (for example, Liquid Telecom’s investment in fiber backbone), and a review of the history of public-private investments in backbone networks (for example, attempts toward creating a joint venture in South Sudan). Appetite for private sector investment is evaluated through looking at the total telecommunications sector revenue in the country and determining the percentage that may be available for investment in the broadband backbone networks. The total telecommunications sector revenue is tabulated through estimating the sector’s contribution to GDP. Industry investment standards are estimated to be approximately 15-20 percent of the sector’s total revenues. It is further assumed that a majority of investment is likely to go toward access networks, that is, 50-70 percent, and the remainder (up to 30 percent) will be open for investing in backbone networks. Based on this analysis, and with sector revenues of up to US$200 million for South Sudan, the financial appetite is tabulated. Sources; TMG analysis, DE4A, Stakeholder consultations, internal assessments.