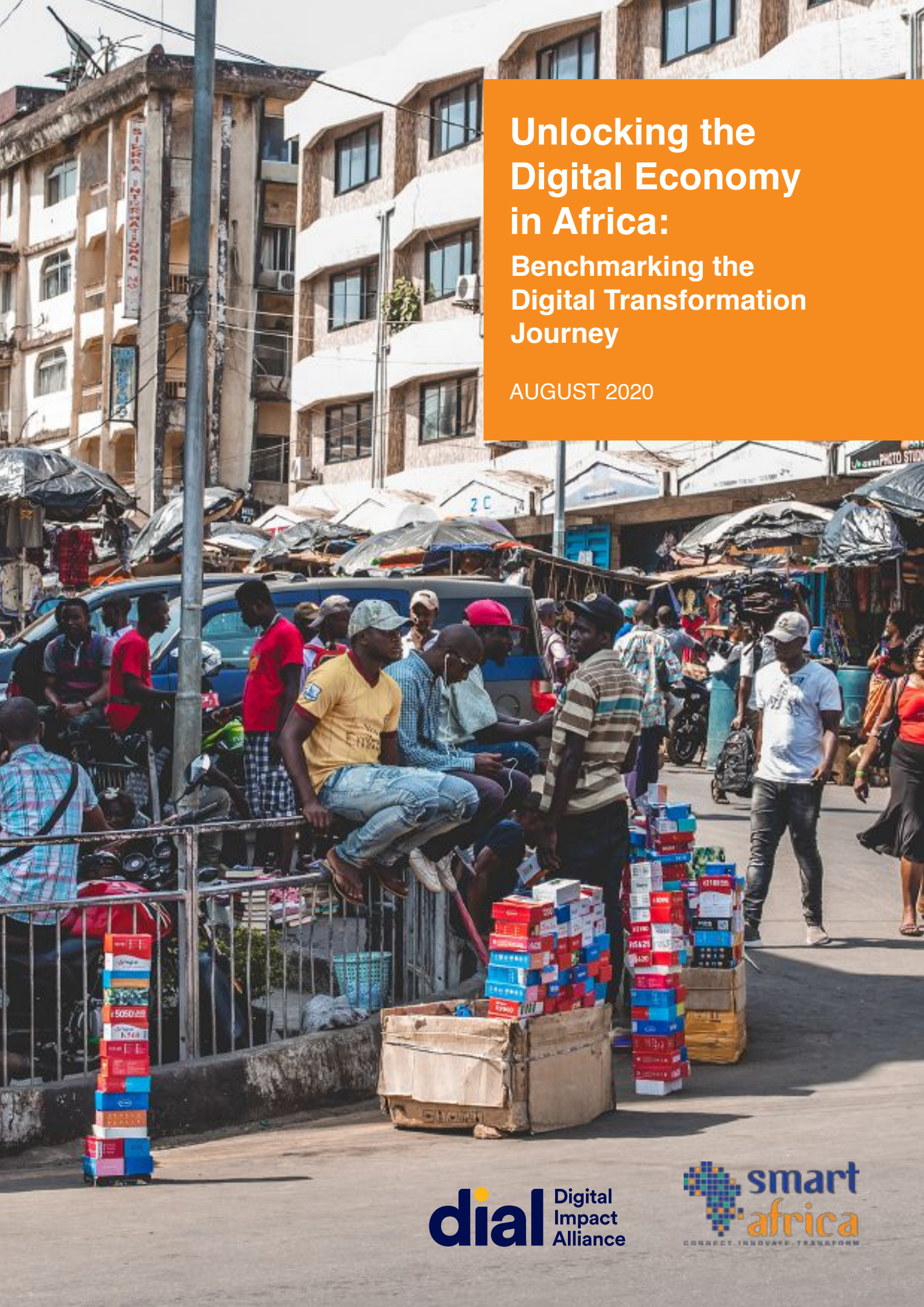

Unlocking the Digital Economy in Africa:

Benchmarking the Digital Transformation Journey

AUGUST 2020

dial Digital Impact Alliance

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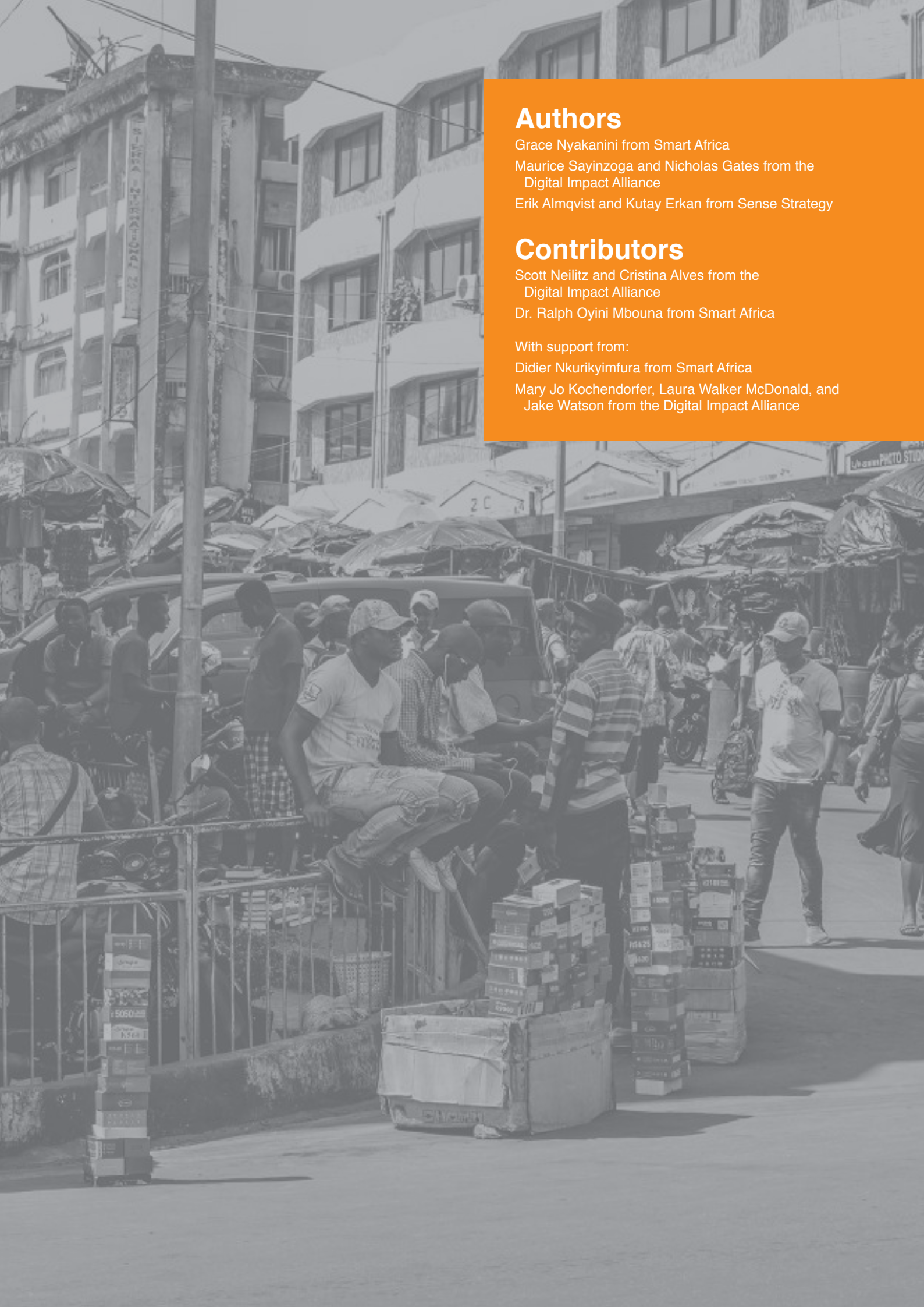

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Acknowledgments

This report is the result of a collaboration among three organisations. Smart Africa and the Digital Impact Alliance (DIAL)—the conveners and facilitators for this study—have provided guidance and secondary data through landscaping efforts, contacts, and funding. Sense Strategy, which acted as a consultant on the study, collected the primary data and summarised it into preliminary report form, which has been iterated upon by the Smart Africa and DIAL teams.

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Finally, and most importantly, we would like to thank the representatives of Angola, Benin, Burkina Faso, Côte d'Ivoire, Gabon, Ghana, Kenya, Niger, Senegal, and Sierra Leone, without whom this report would not have been possible.

Smart Africa is a bold and innovative commitment to accelerate sustainable socio-economic development on the continent and usher Africa into the knowledge economy through affordable access to broadband and use of information and communication technologies (ICTs). The Smart Africa Alliance brings together heads of state who seek to accelerate the digitalisation of the continent and create a common market. Launched in 2013 by seven African heads of state who jointly adopted the Smart Africa Manifesto at the Transform Africa Summit in Kigali, the Alliance now has 30 member countries, representing more than 750 million people. For more information, see: https://smartafrica.org/.

The **Digital Impact Alliance** is an independent global alliance funded by leading development agencies and private foundations. DIAL was established in 2015 as a "think, do, replicate" tank, combining practical research with evidence-based advocacy to advance digital inclusion to achieve the Sustainable Development Goals (SDGs). DIAL identifies barriers to the routine use of digital solutions and data by development actors (countries, NGOs, multilateral institutions); tests ways to remove them; and packages solutions for these actors to use in service delivery efforts. For more information, see: https://www.digitalimpactalliance.org/.

Sense Strategy is a global management consulting firm specialising in the digital economy, digital transformation, and investment advisory. The company actively advises governments, NGOs, leading ICT stakeholders, and investors. The Sense Strategy team has supported more than 160 projects on five continents, including 31 African countries, and pioneered the measurement of the socioeconomic effects of ICT. For more information, see: https://sensestrategy.com/.

Foreword

In the modern era, digital technology is essential to everyday life and has become embedded in every aspect of our lives, including business and government. Like all countries throughout the world, African countries need to adapt to this reality and ensure that technology becomes a central component of people's lives and businesses. Part of this process is the development of a digital economy for countries, within the framework of regional economic integration and the creation of a single digital market on the African continent. Such a market could offer countries and their governments a range of immense possibilities to foster technological inclusion and economic growth for their citizens.

Following the launch of the Digital Economy Blueprint by the Republic of Kenya, Smart Africa commissioned this study to benchmark the progress of its Member States—and by extension Africa's progress—towards unlocking the digital economy. Ten countries were selected for this assessment, including: Angola, Benin, Burkina Faso, Côte d'Ivoire, Gabon, Ghana, Kenya, Niger, Senegal, and Sierra Leone. Supported by the Digital Impact Alliance (DIAL), this report documents these countries' experiences to create actionable knowledge and insights which will inform the development of digital economy strategies. We thank the Honourable Ministers of ICT and delegations from each of these countries for their valuable support and engagement during this process.

The results of the study are encouraging with regards to such progress. Most of the countries surveyed have some degree of strategy in place and are making progress in certain key areas. However, there is significant work that still needs to be done, primarily in developing comprehensive and coherent strategies which improve whole-of-government coordination and planning, but also in ensuring that the five pillars of a digital economy—namely Digital Government, Digital Business, Infrastructure, Innovation-Driven Entrepreneurship, and Digital Values and Skills—are realised to the fullest extent.

In the modern era, digital technology is essential to everyday life and has become embedded in every aspect of our lives, including business and government.

In order for governments and their citizens to access the benefits of participation in a digital economy, countries need to collectively build ecosystems that facilitate digital integration—regionally and continentally, and in collaboration with the private sector and civil society. Towards this end, Smart Africa has begun the journey towards operationalising the Digital Economy Blueprint for use in developing digital economies across the continent, and this study is the first step in helping member states achieve this vision.

Lacina Koné
Director General and CEO
Smart Africa

Kate Wilson
CEO
Digital Impact Alliance

Acronyms and Abbreviations

AfCFTA Africa Continental Free Trade Area

AfDB African Development Bank

AIDI Africa Infrastructure Development Index

AISI African Information Society Initiative

AU African Union

CEMAC Central African Economic and Monetary Community

DER General Delegation for Rapid Entrepreneurship

DIAL Digital Impact Alliance

ECOWAS Economic Community of West African States

EGDI E-Government Development Index

EMIS Education management information systems

GCI Global Competitiveness Index

GII Global Innovation Index

ICT4D ICT for development

ICT Information and communication technology

IoT Internet of things

ITU International Telecommunica-tions Union

KII Key informant interview

KPI Key performance indicator

M&E Monitoring and evaluation

MII Mobile money interoperability

MNO Mobile network operator

NICI National information and communication infrastructure

NIIMS National integrated identity management system

OSI Online service index

PPP Public-private partnership

PWG Project working group

R&D Research and development

SDGs Sustainable Development Goals

SMS Short message service

UN United Nations

UNDESA United Nations Department of Social and Economic Affairs

UNECA UN Economic Commission for Africa

WGA Whole-of-government approach

WEF World Economic Forum

WHO World Health Organization

WSIS World Summit on the Information Society

WURI West Africa Unique Identification for Regional Integration and Inclusion

Executive Summary

Across the African continent, governments are recognising the transformative potential of digital technologies within their countries. They are also recognizing the importance of government in driving movement towards an interconnected, digital economy which harnesses the power of technologies as a driver for economic growth and innovation.[1] That being said, the key to realizing this potential lies in expanding digital adoption and inclusion across the whole-of-society, as well as in improving whole-of-government coordination of digital services extension and delivery.

Smart Africa, in collaboration with the Digital Impact Alliance, organised this study to understand individual country progress, benchmarked against the Digital Economy Blueprint for Africa. This blueprint, endorsed by the member states of the Smart Africa Alliance, is a framework for developing and achieving a digital economy. Pioneered by the government of Kenya, the blueprint highlights five pillars as a foundation for creating a digital economy and underscores the need for countries to adopt user-centric and whole-of-government processes in promoting outcomes for the whole-of-society.

After reaching out to member states within the Smart Africa network, 10 countries responded and expressed formal interest in such a benchmarking assessment. They include Angola, Benin, Burkina Faso, Côte d'Ivoire, Gabon, Ghana, Kenya, Niger, Senegal, and Sierra Leone. The goals of the benchmarking study were to understand the progress these countries have made and the challenges they face in unlocking the digital economy, identify the status of their ICT strategies and plans, provide high-level guidance and recommendations to Smart Africa, and provide conclusions about best practices and common learnings. A specific focus was also put on the role of digital government in driving the transformation of the economy, looking at the various areas of a digital economy endorsed by Smart Africa through the Digital Economy Blueprint.

This report finds that despite promising movement towards the adoption and use of the blueprint and similar approaches in Africa, actual progress towards creating a digital economy is happening at a different pace across African countries. There are variations in how countries define and promote digital transformation and the creation of a digital economy, as well as varying areas of prioritisation and degrees of success in key strategic areas at the country level. It is therefore important to understand the various challenges faced by countries in their digital transformation journeys, as well as the best practices used and lessons they have learned along the way.

The following are some of the key takeaways of this study and where more information can be found within this report:

Key Takeaways

1. **Progress Towards a Digital Economy (Section III):** The benchmarking assessment revealed that there has been significant progress in Africa across all five pillars of the Digital Economy Blueprint, despite weaknesses in areas both unique and common to the countries profiled. The progress measured across these pillars is both in absolute and relative terms, meaning that the gap between Africa and the rest of the world (as proxied by these 10 countries) is shrinking when it comes to digital government services provision and achievement across other areas of digital economy.

2. **Digital Economy Strategic Planning (Section 4.1):** Most countries have ICT strategies or plans in place, though very few are specific to creating a digital economy. Countries have mobilised considerable political will in recent years and pursued global and regional alignment, but efforts to renew these strategies (with a focus on digital economy and whole-of-government coordination) are just beginning. That being said, updating strategies often requires significant resources and time from governments, a challenge that cannot be underestimated.

1 This vision is perhaps best embodied by the recent African Union Digital Transformation Strategy for Africa (2020-2030). For more information, see: African Union, "The Digital Transformation Strategy for Africa (2020-2030)," African Union. Retrieved from: https://au.int/sites/default/files/documents/38507-doc-dts-english.pdf.

3. National Strategic Coordination and Silos (Section 4.2): A majority of countries have been making substantive policy and strategy changes in recent years, improving fragmented digital governance by deploying coordinated ICT strategies and harmonized policy and regulatory frameworks. However, siloed investments and a lack of cooperation between ministries continue to create problems for national and sectoral decision-making, often making it difficult to design and deploy ICT strategies and plans in a coordinated manner.

4. Funding, Affordability, and Procurement (Section 4.3): Across the board, countries have had some success in catalysing the necessary political will and policies to finance digital infrastructure development and other digital economy initiatives. However, limited ICT funding is still a challenge, as is acquiring private-sector and sectoral investments. Some countries also struggle with improving connectivity and digital literacy because of issues of affordability, and challenges in procurement often create negative downstream effects for ICT access, challenging the continued improvement of digital government services.

5. User-Centered Government Services (Section 4.4): Countries across this study are experiencing a paradigm shift towards user-centred government services. They have made progress in this regard because of increased political will and movement towards the digitalisation of government administration, anchored around the needs of businesses and citizens. Still, some countries lack centralised mechanisms for managing change and require clear, holistic digital change management strategies to improve the success of their transformations.

6. ICT Infrastructure and Access (Section 4.5): Most countries in this study have made significant progress in improving access to ICT infrastructure and connectivity in the last decade, with support from public-private partnerships and a renewed focus on last-mile connectivity. However, there are still several challenges, notably in coordinating infrastructure investment and rollout, extending connectivity to low-income and marginalised populations, and creating incentives for private sector infrastructure investments (particularly in rural areas).

7. Emergency Planning and Sectoral Plans (Section 4.6): In light of the COVID-19 pandemic, most countries highlighted the need to have updated ICT strategies for disaster and emergency management in place, in order to improve digital preparedness. Additionally, while this study found that most countries surveyed have existing ICT sectoral plans in key areas like health and education, they often lack sectoral ICT strategies in important areas like commerce, as well as cross-cutting areas like gender and disability. To this end, countries are working hard to create supportive sectoral policies and improve their emergency planning.

8. Digital Skills and Human Capacity (Section 4.7): Countries are taking proactive steps to address gaps in ICT skills and talent development. However, they still face challenges in improving connectivity and creating an enabling ecosystem, which affects the talent pipeline for the government and the private sector. Developing human capacity entails promoting a culture of innovation and entrepreneurship across society, as well as upskilling and improving the capacity of the existing government workforce.

9. Regional Collaboration and Global Alignment (Section 4.8): Regional collaboration has been happening at the nexus of policy frameworks, digital platforms, and peer learning, with particular success in regional policy harmonisation and global alignment. However, progress is still early, and continued cooperation with institutions like Smart Africa, the African Union, and other regional blocs will be critical to promoting knowledge sharing, trade, and digital economic integration across the continent.

Based on these key takeaways, this report proposes a "call-to-action" for member states of the Smart Africa Alliance, focused on the need to renew national ICT strategies and improve government coordination in order to unlock the digital economy. We hope that these recommendations will help countries better understand the learnings from this benchmarking assessment as they move towards unlocking the digital economy.

I.
Introduction

I. Introduction

As noted by the International Telecommunications Union (ITU), information and communication technologies (ICTs) "can help accelerate progress towards every single one of the 17 United Nations Sustainable Development Goals (SDGs)."[2] ICTs have provided a means to deliver goods and services in areas such as health care, education, finance, commerce, governance, and agriculture with unprecedented scale, speed, and accuracy.[3] Such technologies can also have a multiplier effect in the development of social and economic capital and can thereby "… help to reduce poverty and hunger, boost health outcomes, create new jobs, mitigate climate change, improve energy efficiency, and make cities and communities sustainable."[4]

The COVID-19 pandemic has also underscored how widely ICTs have permeated the lives of people around the world, as well as our collective reliance on digital tools and services to function in our personal and professional lives. Nevertheless, many remain unconnected and unable to experience the full benefits of digital transformation,[5] and there remains a huge divide between internet adoption and use in the Global North and that in low- and middle-income countries, with only 19% internet usage in the least-developed countries (LDCs) versus 87% in high-income countries.[6] This divide is particularly acute in Africa, where increasing connectivity is transforming the continent and integrating people into the digital economy.

That being said, the use of ICTs has in recent decades allowed for tremendous growth and expansion in the size and scope of the digital economy.[7] Alongside these rapid technological changes and the ICT-enabled dividends of economic integration has come increasing recognition of the unique role that governments play in promoting an enabling ICT ecosystem for the digital economy (at the national, regional, and global levels). This is particularly true in Africa, where the digitalisation of existing sectors of the economy through ICT has frequently allowed developing countries to leapfrog antiquated and ineffective infrastructure and pursue new opportunities,[8] as well as modernise economies and improve transparency and government accountability.[9]

The adoption and use of ICTs for development (ICT4D) is also happening at different paces and varying degrees across the different countries on the African continent. In order for countries in Africa to cooperate and achieve a vision for a digital and interconnected market,[10] it is important to first recognise the unique role to be played by governments in

The adoption and use of ICTs for development (ICT4D) is happening at different paces and varying degrees across the different countries on the African continent.

2 "ITU's approach to using ICTs to achieve the United Nations Sustainable Development Goals," ITUNews, October 23, 2018: Overview Section. Retrieved from: https://news.itu.int/icts-united-nations-sustainable-development-goals/.
3 Ibid.
4 Ibid.
5 United Nations High-Level Panel on Digital Cooperation, "Report of the Secretary-General: Roadmap for Digital Cooperation," United Nations, June 2020: 2. Retrieved from: https://www.un.org/en/content/digital-cooperation-roadmap/assets/pdf/Roadmap_for_Digital_Cooperation_EN.pdf.
6 Ibid.
7 According to the recent Digital Cooperation Roadmap, achieving universal, affordable, and quality internet access in Africa by 2030 may cost as much as US $100 billion. See: United Nations High-Level Panel on Digital Cooperation, "Report of the Secretary-General: Roadmap for Digital Cooperation," United Nations, June 2020: 7. Retrieved from: https://www.un.org/en/content/digital-cooperation-roadmap/assets/pdf/Roadmap_for_Digital_Cooperation_EN.pdf.
8 This is perhaps particularly true in areas such as mobile penetration and digital identification, but also in adoption and use of frontier technologies like blockchain, small-scale satellite, and the internet of things. For more information on this concept and (in part) its relevance to Africa, see: UNCTAD, "Leapfrogging: Look Before You Leap," *Policy Brief*, no. 71 (December 2018): 3. Retrieved from: https://unctad.org/en/PublicationsLibrary/presspb2018d8_en.pdf.
9 EU-AU Digital Economy Task Force, "New Africa-Europe Digital Economy Partnership: Accelerating the Achievement of the Sustainable Development Goals," *European Commission:* 7. Retrieved from: https://ec.europa.eu/digital-single-market/en/news/new-africa-europe-digital-economy-partnership-report-eu-au-digital-economy-task-force.
10 This vision is expressed in the Africa Continental Free Trade Area (AfCFTA) plan to create a single continental market for goods and services.

promoting and guiding the transformation of the digital economy. By using digital tools and services to transform existing infrastructure and institutions, as well as learn from their neighbors and regional peers, governments can prioritise a paradigm shift in how businesses and citizens engage with the local economy. They can also integrate their economy with that of Africa and the rest of the globe, in the process promoting the inclusion and well-being of their citizens.

Smart Africa Partnership for Digital Economy Strategy and Planning

As countries converge towards the single digital market and a shared digital transformation agenda, harmonising national ICT strategies and regulatory frameworks becomes critical, and governments play a unique role in guiding the digital transformation of their economies. To this end, Smart Africa partnered with the Digital Impact Alliance (DIAL) to understand the importance of digital government in particular, as well as how governments can promote and enact a national digital transformation agenda.

Smart Africa is a commitment from African heads of state and government to accelerate sustainable socioeconomic development, transforming the continent into a knowledge economy through affordable access to broadband internet and the use of ICTs. Their goal is to create a single digital market that enables cross-border collaboration and economic integration across the entire continent,[11] as well as understand how countries can work, learn, and transform together in pursuit of digital economy. Bringing its own expertise, DIAL helped Smart Africa to mobilise governments to participate in this study, as well as document their key learnings and challenges.

This study has sought to not only benchmark countries' progress, but also create actionable insights and recommendations for how to strengthen digital economy planning and development. This report in particular aims to understand the unique role of government in progress towards a digital economy among a subset of Smart Africa member states in areas such as strategy, planning, and implementation.

The specific objectives of the study are summarised below in Figure 1.

FIGURE 1

Objectives of Benchmarking Assessment

- **To benchmark country progress** towards digital economy in the ten identified member states, as described in the five pillars of the Digital Economy Blueprint
- **To identify the status of ICT strategies** and plans and challenges to their successful implementation, as well as barriers hindering the planning and achievement of digital economy
- **To provide high-level guidance** and recommendations for Smart Africa on digital economy strategic planning through a call-to-action for Smart Africa Member States
- **To provide conclusions**, if possible, about best practices and common learnings, as well as create replicable learning and insights outside the scope of this study

11 Transforming Africa Summit, "The Smart Africa Manifesto," *Endorsed by Heads of State and Government in Kigali*, (October 2013): 3. Retrieved from: http://www.smartafrica.org/new/wp-content/uploads/2019/01/smart_africa_manifesto_2013_-_english_version.pdf.

II.
Methodology for Benchmarking Assessment

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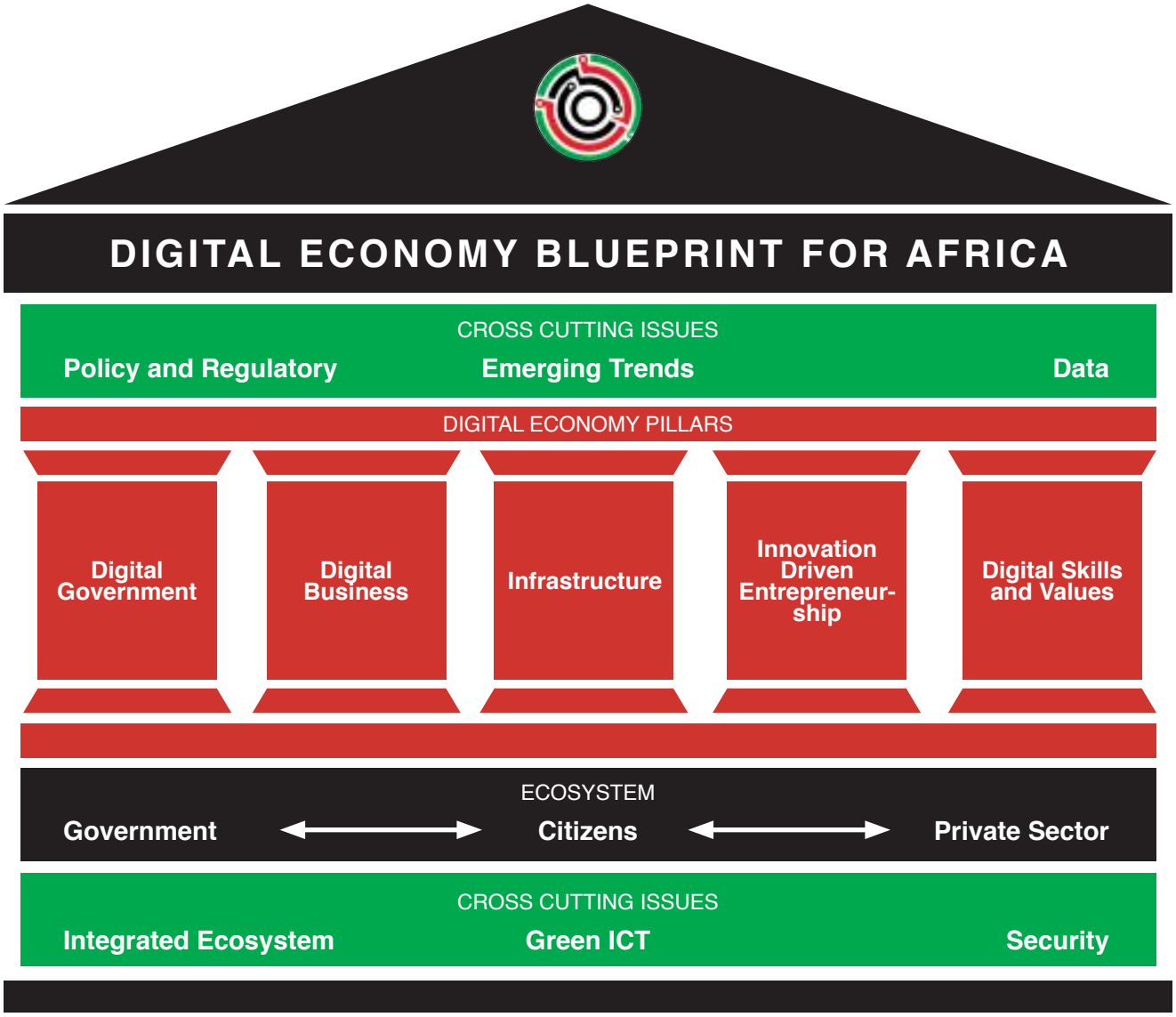


FIGURE 2 [12]

2.1. Framework for Analysis

The figure above outlines the main pillars of the Digital Economy Blueprint.[13] The blueprint was developed by the government of Kenya as its contribution to the Smart Africa Alliance flagship projects[14] and was later adopted by Smart Africa member states as a reference document for developing their own digital economy strategies.[15] Implicit in the Blueprint is the understanding that countries need to be the drivers of their own digital transformation, and that shared learning and insights among member states will help them strengthen regional collaboration and integration while also driving specific and concrete national development objectives.

12 For more information on Figure 2, please see: Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 26-28. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
13 Ibid., 26-28.
14 Ibid., 11.
15 Ibid., 11.

For this study, the five pillars identified in the Digital Economy Blueprint were used as key areas in assessing progress towards creation of a digital economy, with emphasis on the critical role of government. Through its pillars, the blueprint reflects a whole-of-society approach to digital transformation by acknowledging the contributions and roles of diverse actors across many different sectors of the economy. A detailed explanation of the pillars and their relevance to the benchmarking exercise can be found to the right in Figure 3.[16]

In providing for the key role of digital government (Pillar One) as a driver for the digital transformation of the economy, this study has also leveraged previous work done by ITU and DIAL to understand the need for a whole-of-government approach (WGA) to investing in digital transformation.[17] First pioneered in the United Kingdom in the late 1990s,[18] WGA refers to horizontally integrated government which delivers digital services in a more integrated and coordinated manner.[19] With this approach, ministries and other agencies promote collaboration and alignment by cooperating on targeted, cross-cutting services, a model applied successfully by countries as diverse as Estonia and India in developing digital government capacity.[20]

In addition to the benchmarking assessment, the research team also conducted interviews and discussions with country representatives to evaluate the role of government and summarise related successes and challenges. A review of relevant country benchmarking results was used to inform the design of interview questions and guide discussions with countries.

FIGURE 3

Pillars of the Kenya Digital Economy Blueprint

1 **Digital Government:** The presence and use of digital services and platforms to enable public service delivery

2 **Digital Business:** The development of a robust marketplace for digital trade, digital financial services, and digital content

3 **Infrastructure:** The availability of affordable, accessible, resilient, and reliable infrastructure

4 **Innovation-Driven Entrepreneurship:** The presence of an ecosystem that supports homegrown firms to generate world-class products and services that help to widen and deepen digital economic transformation

5 **Digital Skills and Values:** The development of a digitally skilled workforce that is grounded on sound ethical practices and socio-cultural values

16 Ibid., 11.

17 The SDG Digital Investment Framework, developed by ITU and DIAL, takes the WGA principle one step further into the digital investment realm. It helps policymakers identify reusable ICT building blocks (e.g., digital ID, messaging, and payment services) that can deliver priority SDG use cases. See: DIAL and ITU, "SDG Digital Investment Framework: A Whole-of-Government Approach to Investing in Digital Technologies to Achieve the SDGs," *ITU* (2019). Retrieved from: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-DIGITAL.02-2019-PDF-E.pdf.

18 Ling, Tom, "Delivering Joined-Up Government in the UK: Dimensions, Issues and Problems," *Public Administration* 80, no. 4 (December 2002): 615. Retrieved from: https://onlinelibrary.wiley.com/doi/epdf/10.1111/1467-9299.00321.

19 DIAL and ITU, "SDG Digital Investment Framework: A Whole-of-Government Approach to Investing in Digital Technologies to Achieve the SDGs," *ITU* (2019): 11. Retrieved from: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-DIGITAL.02-2019-PDF-E.pdf.

20 OECD, "OECD Public Governance Reviews: Estonia: Fostering Strategic Capacity across Governments and Digital Services across Borders: Summary of Key Findings," *OECD, Paris* (2015): 4-5. Retrieved from: http://www.oecd.org/gov/key-findings-estonia.pdf; Noshir Kaka et al., "Digital India: Technology to transform a connected nation," McKinsey Global Institute, March 2019. Retrieved from: https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/digital-india-technology-to-transform-a-connected-nation.

2.2. Country Selection

Smart Africa issued invitations to participate in this study to all member countries. The study selected the first 10 countries that expressed interest in participating, recognising that all Smart Africa member states would not be able to participate in the study as designed. The 10 countries selected are shown below in Figure 4.

FIGURE 4

Participating Smart Africa Member Countries[21]

21 Disclaimer: The geographic designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Smart Africa Alliance or Digital Impact Alliance/United Nations Foundation concerning the legal status of any country, territory, city or of its authorities, or concerning the delimitation of its frontiers or boundaries.

2.3. Benchmarking Assessment Process

This benchmarking assessment created country profiles using a range of existing indices as proxies for each pillar, supplemented by subsequent qualitative data collection (see Section 3.3). The selection of appropriate indices for each pillar was based on the following criteria:

1. **Reputation and trustworthiness** of the organisation that prepared the index
2. **Global and African recognition** in areas associated with each index
3. **Sub-indicators** that reliably match the pillars of the blueprint
4. **Existence of data** for the associated indices in the 10 selected countries

In accordance with these criteria, a holistic assessment of the digital development ecosystem was carried out, resulting in the selection of the indices listed below in Figure 5. (These indices and their methodologies will be briefly discussed in Section III, while a detailed assessment can be found in Appendix B.)

For an objective analysis of the countries and the current situation, secondary data from various sources was also examined. This literature review included more than 70 publications from reputable sources, such as the UN and World Bank, helping to create a portrait of each country's progress with regards to the digital economy and informing primary data analysis and the study's recommendations.

FIGURE 5

Indices Used for Benchmarking Assessment Using Secondary Data

INDEX	PILLAR	ORGANISATION	MEASURES
Online Service Index (OSI)	Digital Government	UNDESA	Overall level of digital government services
Global Competitiveness Index (GCI) – Business Dynamism	Digital Business	World Economic Forum	Administrative requirements to start and end businesses, and entrepreneurial culture
Africa Infrastructure Development Index (AIDI)	Infrastructure	African Development Bank	ICT, electricity, transportation, water supply and sanitation, etc.
Global Innovation Index (GII)	Innovation-Driven Entrepreneurship	World Intellectual Property Organization, INSEAD, Cornell University	Multidimensional facets of innovation present in a country's innovation ecosystem
Global Competitiveness Index (GCI) – Skills	Digital Skills and Values	World Economic Forum	Years of schooling and skills of both current and future workforce

2.4. Primary Data Collection and Analysis

The data analysis for this project was carried out using a holistic triangulation approach that considered different data collection methods and data sources to provide comprehensive insights. This approach considered both secondary data (collected through literature review and indices) as well as primary data (collected through focus group discussions, a web survey, and semi-structed interviews with country representatives). Assessment of this data used a holistic analysis of the individual datasets, which are enumerated below. (Some country delegations were not able to participate in all data collection activities, as indicated below in Figure 6.)

Focus Group Discussion (Virtual Workshop)

A focus group discussion conducted in a virtual workshop format brought together a wide range of government stakeholders from participating member states to discuss successes and challenges relating to digital economies. This forum allowed the research team to engage respondents and validate information on the state of the digital economy within the selected countries. Country delegations also presented on their successes, challenges, and visions for e-government and a digital economy.[22]

Web Survey

A web survey, which included more than 30 questions on the topics of inquiry, was sent to the delegates. All participants were mid-level government officials tasked with devising and implementing national ICT strategies and plans. The survey, which was administered on the first day of the virtual workshop and used a mix of question styles, largely focused on open-ended response. It was filled out by one to three individual respondents in each country ahead of the key informant interviews.[23]

Key Informant Interviews

After analysing the results of the survey and focus group discussion, the research team developed and implemented semi-structured key informant interviews. These interviews concluded the data collection process and included both general questions for all interviewees and questions targeted to specific country contexts based on findings from previously collected primary and secondary data.

FIGURE 6

Participation of Countries in Primary Data Collection Activities

COUNTRY	WEB SURVEY	COUNTRY PRESENTATION (Focus Group)	KEY INFORMANT INTERVIEW
ANGOLA	YES	YES	YES
BENIN	YES	NO	YES
BURKINA FASO	YES	YES	YES
CÔTE D'IVOIRE	YES	YES	YES
GABON	YES	YES	YES
GHANA	YES	YES	YES
KENYA	YES	YES	YES
NIGER	YES	YES	YES
SENEGAL	NO	YES	YES
SIERRA LEONE	YES	YES	YES

22 The only country unable to make a presentation during this workshop was Benin.
23 The research team did not receive a response to the survey from the delegation of Senegal.

III.

State of the Digital Economy: Benchmarking Progress Against the Digital Economy Pillars

III. State of the Digital Economy: Benchmarking Progress Against the Digital Economy Pillars

Progress across the five pillars of the digital economy is being made, but at differing rates across countries, with countries often having success in different areas. This section will explore this difference by using secondary data to benchmark the current state of the digital economy in the selected countries. As noted in Section II, this analysis uses specific benchmarks—in accordance with selected proxy indices—to measure progress in specific areas or pillars.[24] (Note: The results of this benchmarking analysis for each country can be found in Appendix A.)

3.1. Digital Government

The Digital Government pillar is focused on increasing the quantity and quality of digital government services that are available to citizens and businesses within a country.[25] Digital government plays a key role in unlocking the digital economy. It can lead to an increase in tax and other revenue, an increase in employee productivity, a reduction in service delivery costs, improvements in the ease of doing business, more support for ICT job creation, and the development of local manufacturing of ICT tools and infrastructure, among other things.[26]

The Digital Government was benchmarked using the Online Service Index (OSI), a component index of the 2018 E-Government Development Index (EGDI) indicating the scope and quality of internet services.[27] EGDI is prepared by the United Nations Department of Social and Economic Affairs (UNDESA) and aims to measure the overall level of digital government

Case Study: E-Services Portal in Benin

In 2020, the government of Benin launched a national e-services portal that will be a single point of entry to all government public services. While hosted by the Ministry of Digitisation, the project was coordinated by the Beninese Information Systems and Services Agency (ASSI), with technical support from Cybernetica and Open SI.[28] At the moment, the portal provides information about some 250 public services, and featured information will be added for more services throughout the year.[29]

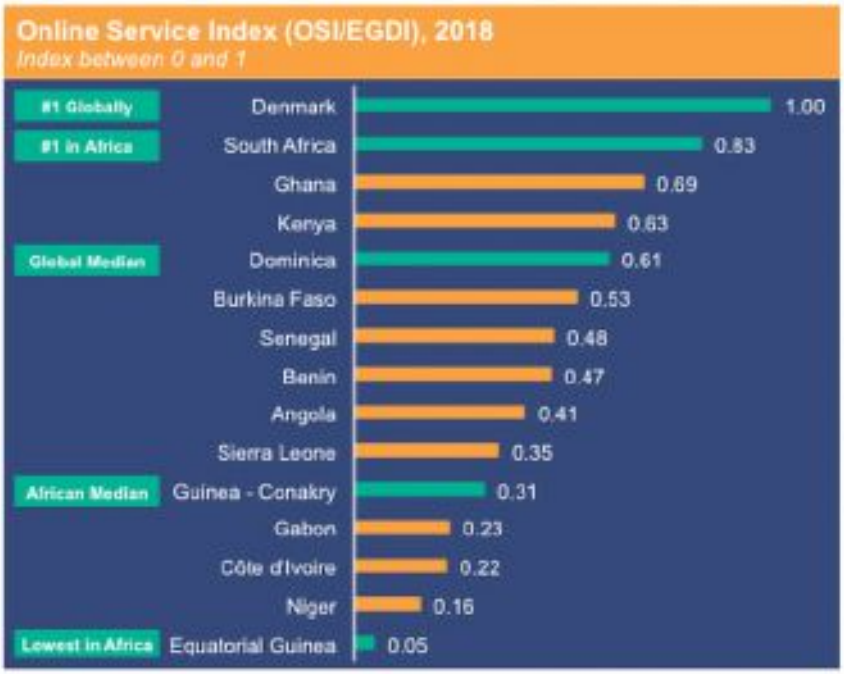
The goal of the project is to digitise public services and promote harmonised public administration across government.[30] This is meant to streamline public services to citizens and businesses and improve government accountability. As highlighted by Beninese officials, the platform was built on top of the Estonian X-Road interoperability platform, with the goal of connecting different systems and databases across sectors[31] and creating a digitally integrated government. This will be supported in the coming years by digital ID and will help lay the foundation for national digital economy platforms and services.

FIGURE 7

24 A full methodology for this chapter can be found in Section III, while the full secondary information on countries can be found in the appendices, which also provide best practices for a digital economy (i.e., achievements and initiatives) across countries.
25 Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 33-34. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
26 Ibid.
27 Some of the 50+ indicators create the basis for the Online Service Index. For more information, please see Appendix B.
28 Ibid.
29 Hankewitz, Sten, "Estonia's e-Governance Academy Helps Deliver Digital Services in Benin and Ukraine," Estonian World, April 16, 2020. Retrieved from: https://estonianworld.com/technology/estonias-e-governance-academy-helps-deliver-digital-services-in-benin-and-ukraine/.
30 Ibid.
31 Sourced from an interview with Beninese officials as part of this study.

FIGURE 8

Comparison of the Digital Government Pillar Among Participating Countries



Country	Global Rank (out of 193 countries)	Africa Rank (out of 54 countries)	Digital ID System
Denmark	1	N/A	Yes
South Africa	38	1	Yes
Ghana	74	5	Yes
Kenya	94	8	Yes
Dominica	97	N/A	Yes
Burkina Faso	109	13	Yes
Senegal	119	17	Yes
Benin	121	19	Yes
Angola	135	23	Yes
Sierra Leone	139	25	Yes
Guinea - Conakry	148	28	Yes
Gabon	165	35	Yes
Côte d'Ivoire	168	36	Yes
Niger	177	43	No
Equatorial Guinea	192	54	No information

services.[32] The OSI was selected as an appropriate metric because it demonstrates an objective assessment of a government's digital presence (e.g., national portal, e-services portal, e-participation portal, websites of related ministries) by researchers who are experts in public administration at UNDESA.

When the progress of the 10 countries towards digital government over the past decade was examined using this benchmark, an interesting picture emerged. As seen above in Figure 8, all 10 countries are trending upwards at a seemingly faster rate than many of the higher-ranked countries in the world. This may mean that the 10 countries are rolling out their digital government services at a significantly faster pace than most developed countries in the world, with the caveat that they were oftentimes starting from lower levels of online services and digital government. However, it also shows that digital government has become a growing priority for African countries, and that growth and development in this area is rapid and ongoing.

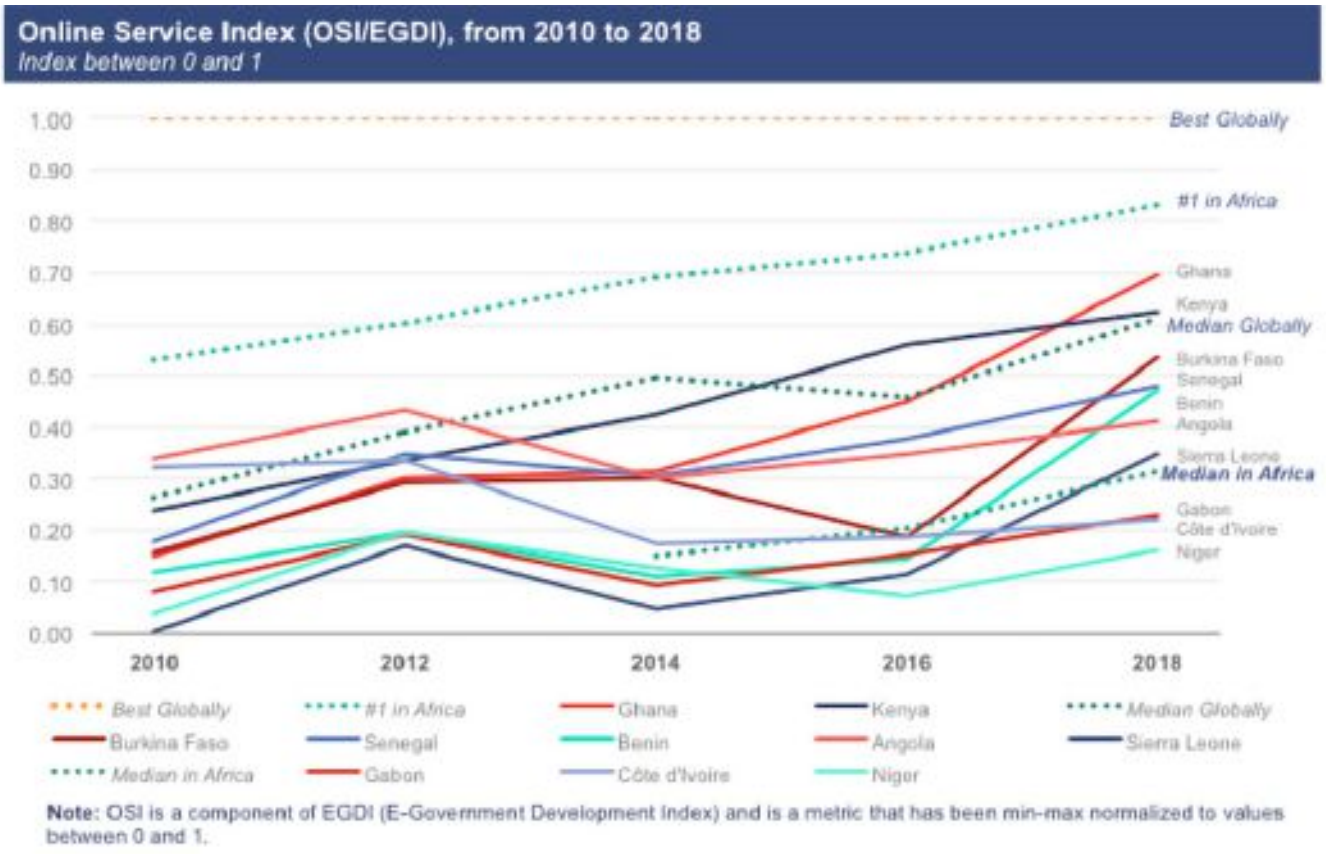
Should this pattern and pace of change for digital government in these countries continue (see Figure 9 on next page), then the majority of the ten countries may soon come close to closing their gaps with more developed countries. This continued expansion and improvement of digital government services would benefit governments by improving the efficiency of services and increasing citizen participation. It would also benefit the citizens and businesses of the ten countries by providing them with more robust, reliable, and secure government services.

All 10 countries are trending upwards at a seemingly faster rate than many of the higher-ranked countries in the world.

32 For more on the methodology of the EGDI as used for this pillar, please see Appendix B. See: United Nations Department of Economic and Social Affairs (UNDESA), "United Nations: E-Government Survey 2018," *United Nations* (2018): 83-124. https://publicadministration.un.org/publications/content/PDFs/UN%20E-Government%20Survey%202018%20English.pdf..

FIGURE 9

Evolution of Digital Government Services From 2010 to 2018



Note: OSI is a component of EGDI (E-Government Development Index) and is a metric that has been min-max normalized to values between 0 and 1.

3.1 Key Takeaways

Progress in Digital Government: While a gap remains between the highest-ranked countries in Africa and the rest of world in terms of digital government, significant progress has been made by these 10 countries. Much of this growth in e-government services is the result of rapid changes in the last 10 years, speaking to increased digitization of government services.

Quality and Availability of Online Services: Seven of the 10 countries in the study score higher than the African median in terms of digital government, and two (Ghana and Kenya) score higher than the global median. This suggests that the quality and availability of online government services was above the African median for most countries in this study.

Proliferation of Digital ID: Another positive sign is the proliferation of digital ID systems in almost all the countries, albeit at different stages of universal rollout. A good example is Kenya, with the deployment of its National Integrated Identity Management System, known as Huduma Namba.

3.2. Digital Business

The Digital Business pillar refers to the level of business activities that are either related to the digital economy or take place in a digital medium. Examples include digital payment systems, digital financial services, and legal frameworks to enforce contracts and protect consumers.[33] This pillar not only emphasises the development of a robust consumer marketplace using digital technologies, but also calls for e-commerce platforms to expand beyond national borders and integrate with the rest of Africa.[34]

The Digital Business pillar was benchmarked using the Business Dynamism component of the Global Competitiveness Index (GCI) from 2019.[35] GCI is a comprehensive index that takes into account various aspects of a country's competitiveness, and it was prepared by the World Economic Forum (WEF) as part of the Global Competitiveness Report.[36] The Business Dynamism component is comprised of two indicators—administrative requirements and entrepreneurial culture—and was used exclusively to proxy this pillar. This component of the GCI was selected because it provides a close approximation of the digitalisation level of the business operations taking place in a country.[37]

The Digital Business pillar was benchmarked using the Business Dynamism component of the Global Competitiveness Index (GCI) from 2019.

A comparison between digital government and business dynamism (the latter of which is shown below in Figure 10) does not show a direct

FIGURE 10

Comparison of the Digital Business Pillar Among Participating Countries

Country	Global Rank (out of 141 countries)	Africa Rank (out of 38 countries)	IP Addresses per capita
USA	1	N/A	4.854
Mauritius	38	1	4.603
Kenya	51	3	0.121
Morocco	71	6	0.340
Côte d'Ivoire	84	10	0.067
Senegal	99	15	0.026
Ghana	102	16	0.077
Benin	105	18	0.015
Tanzania	107	20	0.019
Burkina Faso	122	28	0.017
Gabon	128	31	0.253
Angola	138	37	0.042
Chad	139	38	0.002
Niger	N/A	N/A	0.002
Sierra Leone	N/A	N/A	0.016

33 Ibid., 38.
34 Ibid., 39.
35 For more on the methodology of the Business Dynamism component of the GCI as used for this pillar, please see Ok good. See also: Schwab, Klaus, ed., "The Global Competitiveness Report 2019," *World Economic Forum* (2019): 623-624. Retrieved from: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.
36 Ibid.
37 Since there is a 2019 iteration, the GCI Business Dynamism component also supports analysis on the current state of digital business operations in the countries.
38 OECD, "Productivity Growth in the Digital Age," *OECD, Paris* (2019): 3-6. Retrieved from: https://www.oecd.org/going-digital/productivity-growth-in-the-digital-age.pdf.

relationship. This suggests that there is a more complex story to be told about the relationship between business dynamism and the provision of online services.[38] In other words, the provision of online services—either as part of government or the private sector—does not tell the full story of business dynamism in a digital economy.

Some studies have indicated a bidirectional, reciprocal relationship between e-government deployment (digital government) and the digitalisation of the economy (digital economy),[39] but there are also studies that suggest the relationship is stronger for wealthier countries.[40] This could indicate that there are likely more factors to consider in evaluating the strong relationship between digital government and areas like digital business (and innovation-driven entrepreneurship) in a region like Africa than in countries with higher levels of per capita income.[41] Despite this, the benchmarking assessment of this pillar also noted that there is a wide range of positive success stories in many countries (see Appendix C for selected best practices).

In the context of this study, the fact that countries at a wide range of income levels have had relative success in this pillar—and across various levels of digitalisation and digital government deployment—suggests an equally if not more important role to be played by other aspects of digital business, such as legal frameworks, developed regional markets, and private-sector digitalisation. By focusing on providing open payment systems and digital financial service opportunities as part of a digital transformation agenda, many of the countries profiled in this study may soon come close to closing the gap with some of the high-income countries most advanced in business dynamism.

Case Study:
Mobile Money Interoperability in Ghana

The Mobile Money Interoperability platform was launched by the government of Ghana in May 2018 to enable cross-network mobile money transactions.[42] The project was the result of a joint collaboration between the Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), the Bank of Ghana, FinTech firms, and other telecommunications companies.[43]

The objective of the platform is to boost access to and improve the efficiency of financial services,[44] while also promoting digital financial inclusion and cashless transactions for Ghanaian citizens.[45] This project laid the foundation for creating a digital economy in Ghana by making it easier to transfer funds across wallets on different networks, enabling businesses to accept payments from a wider range of accounts, and increasing the volume of mobile transactions.[46] As noted by Ghanaian officials, the platform has had some success, reducing the siloing of telecom operators and allowing banks and operators to work together.[47]

FIGURE 11

39 Zhao, Fang, et al., "E-government Development and the Digital Economy: A Reciprocal Relationship," *Internet Research*, 25, no. 5 (2015): 734-766. Retrieved from: https://doi.org/10.1108/IntR-02-2014-0055.
40 Oliveira Almeida, Gustavo de and Moraes Zouain, Deborah, "E-Government Impact on the Doing Business Rankings and New Business Ownership Rate: An Analysis of the Dynamics Based on Countries' Income From 2008 to 2014," *IADIS International Journal*, 13, no. 1 (2015): 40. Retrieved from: http://www.iadisportal.org/ijwi/papers/2015131103.pdf.
41 Ibid.
42 "Ghana's First Mobile Money Interoperability System Deepens Financial Inclusion and Promotes Cashless Agenda," *AFI Global*, May 16, 2018. Retrieved from: https://www.afi-global.org/news/2018/05/ghanas-first-mobile-money-interoperability-system-deepens-financial-inclusion.
43 "Ghana Advances on Mobile Money Interoperability," *ITWeb*, December 5, 2018. Retrieved from: https://itweb.africa/content/GxwQD71ZEXaMlPVo.
44 "Interoperability Between Fintech Providers in Ghana," *Oradian* (accessed on July 15, 2020). Retrieved from: https://oradian.com/interoperability-between-fintech-providers-in-ghana/.
45 "Ghana's First Mobile Money Interoperability System Deepens Financial Inclusion and Promotes Cashless Agenda," *AFI Global*, May 16, 2018. Retrieved from: https://www.afi-global.org/news/2018/05/ghanas-first-mobile-money-interoperability-system-deepens-financial-inclusion.
46 "Mobile Money Interoperability up by Over 350% in First Quarter," *Joy Online*, April 28. 2020. Retrieved from: https://www.myjoyonline.com/business/finance/mobile-money-interoperability-up-by-over-350-in-first-quarter/.
47 Sourced from an interview with Ghanaian officials as part of this study.

3.2 Key Takeaways

- **Progress Towards Business Dynamism Increasing:** Five countries (Kenya, Cote d'Ivoire, Senegal, Ghana, and Benin) are above the African median in this index, with one (Kenya) scoring above the global median.[48] This perhaps speaks to the strengths countries have experienced in the mobile economy in recent years, through increases in the adoption of smartphones and the proliferation of digital financial services.

- **Range and Distribution of Scores:** There is a wide range and distribution of scores and rankings in this pillar, and there does not seem to be a close relationship to digital government (as measured by OSI proxy). For example, countries at similar levels in the OSI for the Digital Government pillar—Gabon and Cote d'Ivoire – have huge variations in their levels of business dynamism.

3.3. Infrastructure

The Infrastructure pillar is one of the most critical pillars to the Digital Economy Blueprint since it cross-cuts many of the others and offers some of the greatest opportunities for expanding the digital economy. This pillar not only encompasses the development of digital infrastructure and reliable broadband connectivity, but also focuses on logistical infrastructure (e.g., road, rail, air, etc.) and energy (e.g., electricity connections and affordability).[49] Overall, an improvement in infrastructure (often generated by investment from both private-sector operators and government initiatives) can yield benefits for all stakeholders of a digital economy and mean the difference between a stagnant and a thriving digital economy.[50]

The Infrastructure pillar was benchmarked using the African Infrastructure Development Index (AIDI) from 2019. The AIDI is computed from four sub-indices—Transportation Composite Index, Electricity Index, ICT Composite Index, and Water Supply and Sanitation Index—and was used to compare the infrastructure of the 10 countries in this study. AIDI is produced by the African Development Bank and aims to measure the progress of infrastructure development across Africa.[51] It was selected as a proxy for this pillar because it provides a reliable source of information regarding infrastructure development in African countries.

There are many positive success stories of physical and digital infrastructure expansion and rollout among the countries in this study. Since this index looks more broadly at physical infrastructure, it is also important to note that some countries may lack the enabling utilities to support the rollout and sustainability of the digital economy, such as well-developed road networks and a stable electrical grid.[52] In terms of digital infrastructure (as opposed to infrastructure more broadly), much work remains to be done, both within the selected countries and across Africa. The greatest constraints for continued development of ICT infrastructure for a majority of the 10 countries include the limited availability of investment

There are many positive success stories of physical and digital infrastructure expansion and rollout among the countries in this study.

48 Please note that there are two countries—Niger and Sierra Leone—for which data was not available.
49 Ibid., 45.
50 Abid Hussain, Ali, et al., "Unlocking Private-Sector Financing in Emerging-Markets Infrastructure," *McKinsey & Company*, October 10, 2019: 1-7. Retrieved from: https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/unlocking-private-sector-financing-in-emerging-markets-infrastructure.
51 For more on the methodology of AIDI as used for this pillar, please see Appendix B. See: "The Africa Infrastructure Development Index 2018," *African Development Bank*, July 2018: 17. Retrieved from: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Economic_Brief_-_The_Africa_Infrastructure_Development_Index.pdf.
52 Ibid., 45.
53 Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 46. https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.

Case Study:
Broadband Fibre-Optic Network in Gabon

Since 2012, the Government of Gabon has invested extensively in the construction of a broadband fibre-optic network—some 1,100 km as of 2018.[54] This was possible because of a migration of equipment and infrastructure, formerly connected to the SAT3 submarine cable to tie down with the ACE cable.[55] Another 26 cities are expected to be connected to the Central African Backbone (CAB) network in 2020.[56] The Gabonese expansion has been supported at various times by organisations like the African Development Bank[57] and the World Bank.[58]

This project was intended to improve regional integration[59] through communications infrastructure in Central African countries, supporting connection with the Republic of Congo in particular.[60] As noted by officials from Gabon, this has improved the speed of the country's international communications and made them significantly more dynamic and fluid.[61] Moreover, it has huge and continued benefits for the growth of the digital economy and inclusion in the country.

FIGURE 12

funds and the high costs associated with constructing digital infrastructure (for more on this, see Section 4.3).[53]

Notably, as seen from a comparison of Figures 9 and 12, there is not a clear relationship between infrastructure (in the broad sense of the term) and the deployment of digital government services. That being said, governments at a range of wealth and levels of infrastructure and digitalisation are having success in expanding digital connectivity, particularly in rural areas. For example, some countries in Africa are investing in Smart Villages that are powered by solar energy and other cost-effective energy sources,[62] while others are funding the creation of smart cities that will lead the way in addressing sustainable development.[63]

Countries must take responsibility in spearheading the push towards a more connected society that use initiatives and incentives to support a digitised economy. To improve progress in terms of infrastructure, governments should pursue partnerships with the private sector and civil society that generate investment opportunities, as well as incentivise not only broadband infrastructure but physical infrastructure (like electricity). Indeed, governments may need to pursue well-targeted investments, such as in green energy sources, to support the development of their digital economy.[64]

54 "Congo-Gabon: Toward Regional Digital Integration," *The World Bank*, April 9, 2018. Retrieved from: https://www.worldbank.org/en/news/feature/2018/04/09/congo-gabon-toward-regional-digital-integration.
55 International Evaluation Group (IEG) and The World Bank, "Internet and Mobile Connectivity: Central African Backbone Program (APL 1A and APL 2)," *The World Bank Group*, Report no. 126034 (June 4, 2018): 14. Retrieved from: https://documents.worldbank.org/en/publication/documents-reports/documentdetail/668111530296585544/cameroon-chad-central-african-republic-sao-tome-and-principe-internet-and-mobile-connectivity-central-african-backbone-program-apl-1a-and-apl-2.
56 "Gabon to Link Twenty-Six Cities to the Central Africa Backbone (CAB) Fibre Optic Network," *TechAfrica*, March 9, 2020. Retrieved from: https://www.techafricanews.com/2020/03/09/gabon-to-link-twenty-six-cities-to-the-central-africa-backbone-cab-fibre-optic-network/.
57 "African Development Bank Supports Gabon's Optic Fiber Backbone Project," *African Development Bank*, February 23, 2018. Retrieved from: https://www.afdb.org/en/news-and-events/african-development-bank-supports-gabons-optic-fiber-backbone-project-17873.
58 Adepoju, Paul, "Congo, Gabon Launch Interconnected Fibre Optic Network," *ITWeb*, April 13, 2020. Retrieved from: https://itweb.africa/content/DZQ587VPxLlqzXy2.
59 African Development Bank, "Central Africa Regional Integration Strategy Paper 2019-2025," *African Development Bank Group*, (June 2019): 12. Retrieved from: https://www.afdb.org/sites/default/files/documents/strategy-documents/central_africa_risp_2019-_english_version_020619_final_version.pdf.
60 "Congo-Gabon: Toward Regional Digital Integration," *The World Bank*, April 9, 2018. Retrieved from: https://www.worldbank.org/en/news/feature/2018/04/09/congo-gabon-toward-regional-digital-integration.
61 Sourced from an interview with Gabonese officials as part of this study.
62 Hatim, Yahia, "Morocco Builds First Solar-Powered Village in Africa," *Morocco World News*, October 23, 2019. Retrieved from: https://www.moroccoworldnews.com/2019/10/285212/morocco-builds-first-solar-powered-village-in-africa/; Nikurunziza, Michel, "Smart Villages: Empowering Rural Communities in 'Niger 2.0'," *ITUNews*, January 10, 2019. Retrieved from: https://news.itu.int/smart-villages-empowering-rural-communities-in-niger-2-0/.
63 Benin's International Knowledge and Innovation City (IKIC) is a great example, since it will focus on higher education, research, and business incubation, but will also lead with carbon-neutral policies that prioritise green spaces, renewable energy, and zero-emissions transport. For more information, see: Presidency of the Republic of Benin, "Government Action Programme 2016-2021: Flagship Projects," *Revealing Benin: New Momentum* (2016): 60. Retrieved from: http://revealingbenin.com/wp-content/uploads/2017/03/The-project-sheets.pdf.
64 "Building Tomorrow's Africa Today: West Africa Digital Entrepreneurship Program (WADEP)," *The World Bank* (2017). Retrieved from: http://documents1.worldbank.org/curated/pt/963641556793151009/pdf/West-Africa-Digital-Entrepreneurship-Program-An-Initiative-of-the-Digital-Economy-for-Africa-DE4A.pdf.

3.3 Key Takeaways

Progress in Infrastructure Lagging: The countries with the highest infrastructure scores include Gabon, Senegal, and Ghana. However, these countries still fall significantly below the highest-ranked country in Africa (Seychelles). The 10 countries are split equally above and below the African median, which speaks to the wide net cast by this study in terms of country selection.

Digital vs. Physical Infrastructure: It is more difficult to generalise about this pillar because it includes a range of infrastructure developments necessary for a digital economy but is not specifically focused on digital infrastructure. Furthermore, there is not a clear relationship between development in infrastructure and digital government or some of the other pillars, perhaps because of differences between general infrastructure and digital infrastructure development.

3.4. Innovation-Driven Entrepreneurship

The Innovation-Driven Entrepreneurship pillar refers to the level of innovation in a country, and involves building an inclusive and collaborative ecosystem that supports digital businesses as they craft innovative products and services.[65] This pillar is specifically focused on strengthening innovation capacity, creating an enabling environment for entrepreneurs and businesses, and developing a support system for innovation through partnerships and collaborations.[66] A higher level of innovation enables opportunities that yield many positive benefits, such as microeconomic growth, improvements in quality of life, and a supportive entrepreneurial environment.[67]

The Innovation-Driven Entrepreneurship pillar was benchmarked using the Global Innovation Index (GII) from 2019, which was used to measure innovation and entrepreneurship in a country. GII is prepared annually by the World Intellectual Property Organization, INSEAD, and Cornell University to rank countries in terms of their innovation input and output.[68] The GII was selected as an appropriate metric because

Case Study: Digital Entrepreneurship in Senegal

Launched in 2018 by the government of Senegal, the General Delegation for Rapid Entrepreneurship (DER)[69] fund of US $50 million[70] has supported small financing, incubation funding, equity financing, and low-interest loans within the country. The DER fund has also significantly catalysed entrepreneurship in the country, specifically for women and youth, and expanded opportunities for employment creation.[71]

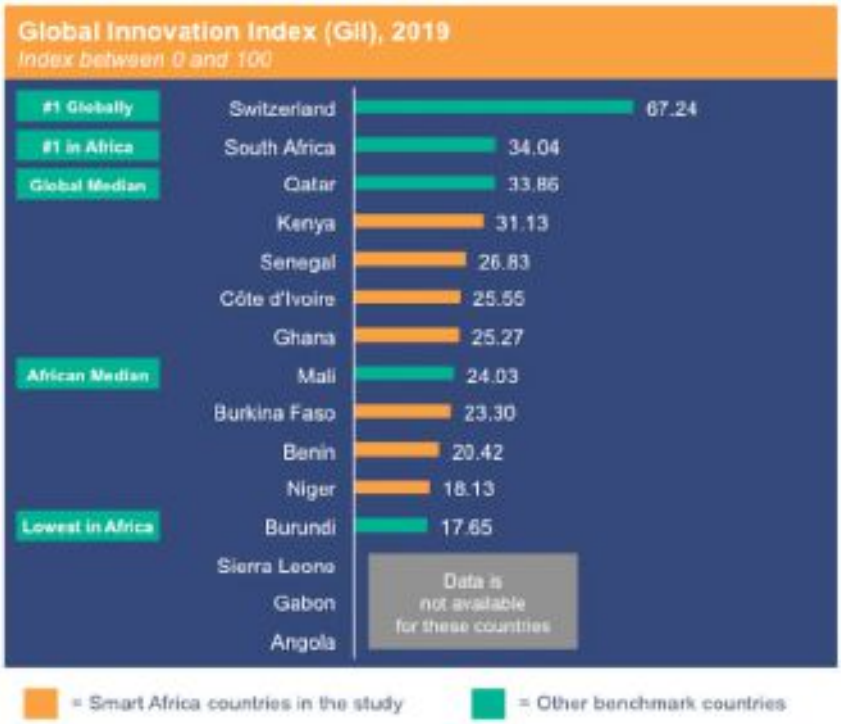
The goal of the fund is to allow for innovation in Senegal by enabling creators to think for the future, investing in financial inclusion and small and medium-sized enterprises. Notably, the fund also adopts a hybrid public-private model, focusing on a range of activities necessary for an innovation economy.[72] As noted by Senegalese officials, this project will hopefully empower women and young people, as well as allow for the inclusion of other marginalised groups in innovation-driven entrepreneurship.[73]

FIGURE 13

65 Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 56. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
66 Ibid., 56.
67 Ibid., 56.
68 For more on the methodology of GII as used for this pillar, please see Appendix B. See: Dutta, Soumitra; Lavin, Bruno; and Wunsch-Vincent, Sacha, eds., "The Global Innovation Index (GII) 2019: Creating Healthy Lives – The Future of Medical Innovation," Cornell University, INSTEAD, and the *World Intellectual Property Organization*, (2019): 205-210. Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf.
69 "La Délégation Générale à l'Entreprenariat Rapide," *Government of Senegal*, accessed July 15, 2020. Retrieved from: https://der.sn.
70 "DER Senegal: Innovative Government Funding for African Entrepreneurship," *ICT Works*, December 19, 2019. Retrieved from: https://www.ictworks.org/der-senegal-government-innovation/#.Xw8_AihKhPY.
71 Ibid.
72 Ibid.
73 Sourced from an interview with Senegalese officials as part of this study.

FIGURE 14

Comparison of the Innovation-Driven Entrepreneurship Pillar Among Participating Countries



Country	Global Rank (out of 129 countries)	Africa Rank (out of 29 countries)
Switzerland	1	Not applicable
South Africa	63	1
Qatar	65	Not applicable
Kenya	77	4
Senegal	96	9
Côte d'Ivoire	103	12
Ghana	106	13
Mali	112	15
Burkina Faso	117	19
Benin	123	24
Niger	127	28
Burundi	128	29
Sierra Leone	Not available	Not available
Gabon	Not available	Not available
Angola	Not available	Not available

it encapsulates many indicators related to innovation, research and development (R&D), business environment, entrepreneurship, etc.

In benchmarking this pillar, it is worth noting that the top country globally (Switzerland) still scores only about 67% of the total possible score, while the top country in Africa (South Africa) scores only half of that. This is noteworthy because while there is a closer relationship to the Digital Business pillar in terms of country ranking, the absolute level of progress in the Innovation-Driven Entrepreneurship pillar seems to be much lower than with the Digital Business pillar (at least as proxied by these different indices). While there is still significant room for incentivising entrepreneurship and potential for innovation across all countries, the gap between the countries in this study and wealthier, more developed countries is far from insurmountable. Should progress continue at its current rate, the majority of the 10 countries may soon come close to closing the gap and surpassing the global median.

Some studies have found that digitally intensive sectors of the economy are more dynamic,[74] but this does not necessarily correlate to innovation and entrepreneurship, as there are a number of other innovative sectors that can make use of ICTs and other technologies to integrate entrepreneurs into the digital economy.[75] It is evident that countries will need policies and regulations to help promote a thriving innovation and start-up culture, even in the more advanced countries featured in this study (such as Senegal and Kenya).[76]

Furthermore, the digitalisation of government itself does not appear to be closely related

74 Calvino, Flavio and Criscuolo, Chiara, "Business Dynamics and Digitalization," *OECD Science, Technology and Innovation: Policy Papers*, no. 62 (2019): 22-33. Retrieved from: https://doi.org/10.1787/6e0b011a-en.
75 Ibid.
76 ITU, "ICT Centric Innovation Ecosystem – Kenya: Country Review," *ITU*, 2019: xvi. Retrieved from: https://www.itu.int/en/ITU-D/Innovation/Documents/Publications/Kenya%20Country%20Review%20-%20ICT%20centric%20Innovation%202019.pdf.

to success in innovation. Even with the right vision, champions, and engagement, the successful facilitation of an innovation culture takes time, and governments have a huge role to play in this process (notably by promoting digital skills and values). A successful innovation-driven entrepreneurship ecosystem entails investments in R&D, lowering barriers to international innovation networks and knowledge flows, and investment in science and technology education. These types of investments could help the 10 countries realise the full potential of digital transformation, supporting the advancement of startups, SMEs, and other technology companies.[77]

3.4 Key Takeaways

- **Slower Progress Towards This Pillar:** Four countries (Kenya, Senegal, Cote d'Ivoire, and Ghana) are above the African median, with none scoring above the global median. Kenya ranked highest among the African countries and is remarkably close to the global median, consonant with its booming start-up scene and some of its progress on digital economy in recent years.

- **Incomplete Picture of Innovation Economy:** There are three countries (Sierra Leone, Gabon, and Angola) for which data is not available. Therefore, the story of innovation-driven entrepreneurship in these countries will have to be investigated through primary data and other sources.

3.5. Digital Skills and Values

The Digital Skills and Values pillar refers to the development of digital skills, for both government and citizens alike, as being crucial in realising the full potential of digital transformation.[78] Digital skills for public sector officials allow for improved decision-making around digital strategy, and subsequently increase the potential for successfully navigating digital strategy implementation.[79] Such skills also allow for greater engagement in the use and creation of digital technologies. As countries build their visions for a digital economy, they emphasise educational opportunities and training as a means of achieving the skills and competencies required to excel in a digital economy.[80]

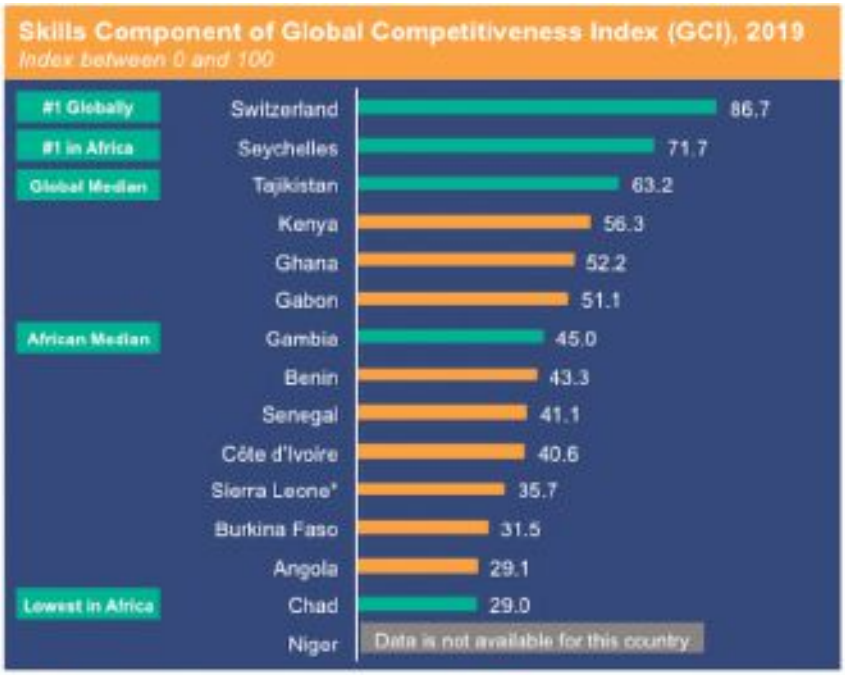
Digital skills for public sector officials allow for improved decision-making around digital strategy.

The Digital Skills and Values pillar was benchmarked using the Skills component of the Global Competitiveness Index (GCI) from 2019, which focuses on the education and skills of the current workforce and future workforce.[81] The GCI is a comprehensive index prepared as part of the Global Competitiveness Report by the World Economic Forum.[82] The skills component of the GCI was selected as an appropriate

77 "Building Tomorrow's Africa Today: West Africa Digital Entrepreneurship Program (WADEP)," *The World Bank*, 2017. Retrieved from: http://documents1.worldbank.org/curated/pt/963641556793151009/pdf/West-Africa-Digital-Entrepreneurship-Program-An-Initiative-of-the-Digital-Economy-for-Africa-DE4A.pdf.
78 Eggers, William D. and Bellman, Joel, "The Journey to Government's Digital Transformation," *Deloitte Digital* (2015): 4-11. Retrieved from: https://www2.deloitte.com/content/dam/insights/us/articles/digital-transformation-in-government/DUP_1081_Journey-to-govt-digital-future_MASTER.pdf.
79 Ibid., 7.
80 Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 60. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
81 For more on the methodology of the skills component of the GCI as used for this pillar, please see Appendix B. See: Schwab, Klaus, ed., "The Global Competitiveness Report 2019," *World Economic Forum* (2019): 612. Retrieved from: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.
82 Ibid.

FIGURE 15

Comparison of the Digital Skills and Values Pillar Among Participating Countries



Country	Global Rank (out of 141 countries)	Africa Rank (out of 38 countries)
Switzerland	1	Not applicable
Seychelles	36	1
Tajikistan	71	Not applicable
Kenya	97	7
Ghana	102	12
Gabon	105	13
Gambia	118	19
Benin	119	20
Senegal	124	23
Côte d'Ivoire	127	25
Sierra Leone*	130-140	25-35
Burkina Faso	138	35
Angola	140	37
Chad	141	38
Niger	Not available	Not available

*The data for Sierra Leone is from 2016

proxy because it encompasses may different aspects of the education and overall skill level of a country's citizens. GCI is also prepared by a reputable organisation, and since there is a 2019 iteration, it allows for an analysis of the current state of skills in the countries.[83]

While there appears to be a lot of progress among countries that are further along in the provision of digital government services (namely, Ghana and Kenya), this is not necessarily causal; it could be that those countries had a strong pool of human capital to begin with. Future progress to improve the digital skills of citizens may come in the form of adaptive education policies and training programmes, while also creating strategies that take into consideration the realities and local contexts within each country. Examples include the Digischool and Youth Empowerment Centres in Kenya, which are referenced above in Figure 16.

As with innovation and entrepreneurship, the role of government as a driver of inclusive digital skills and values depends on policy and regulation, particularly around subsidies for procurement and connectivity for marginalised groups and underserved populations. The development of digital skills—including those that go beyond technical capacity, such as business acumen, willingness to work collaboratively, and an entrepreneurial spirit—is crucial to ensuring a truly successful digital transformation of the economy.[84]

While there appears to be a lot of progress among countries that are further along in the provision of digital government services (namely, Ghana and Kenya), this is not necessarily causal.

83 Please note that data for Sierra Leone is from 2016, and data for Niger is missing.
84 Eggers, William D. and Bellman, Joel, "The Journey to Government's Digital Transformation," *Deloitte Digital* (2015): 9-10. Retrieved from: https://www2.deloitte.com/content/dam/insights/us/articles/digital-transformation-in-government/DUP_1081_Journey-to-govt-digital-future_MASTER.pdf.

Case Study:
DigiSchool in Kenya

DigiSchool, the brand name for the Digital Literacy Programme (DLP), was launched in 2016 by the government of Kenya to improve digital skills and values in the country.[85] The programme was started to ensure children are prepared for today's digital world and to transform learning in Kenya into a 21st century education system.[86] The programme is executed through a multi-stakeholder approach led by the Ministry of ICT and the ICT Authority.[87]

The project's goal is to integrate ICT infrastructure and digital technologies into the learning process and education system.[88] It aims to improve access to quality education in a cost-effective manner, working to embed digital skills and education within the future workforce of the digital economy. This project holds the promise of transformative change for the educational system and talent pipeline in Kenya, thus helping to promote a thriving digital economy.

FIGURE 16

To move ahead in this pillar, a strong emphasis should be placed on the development and retention of foundational skills and digital literacy. Governments will need to promote not only technical but cross-functional skills, as well as drive the creation of an innovation ecosystem, in order to keep pace with public and private-sector demand for human and technical capacity. Countries should also continue to focus on expanding mobile internet coverage and bringing high-speed internet to schools, specifically in more remote or rural areas. Even with advanced ICT infrastructure and affordable and reliable connectivity, countries with a lower level of education and digital skills will face hardships as they journey towards a fully digitised society and economy.[89]

3.5 Key Takeaways

- **Some Progress Towards Pillar:** Three countries (Kenya, Ghana, and Gabon) score higher than the African median, with all three coming relatively close to the global median despite existing disadvantages, such as accessibility and affordability of ICT.
- **Wide Variation Across Countries:** There are three countries above the African median and six below it, and there seems to be a wide range in levels of digital skills and values among the selected countries. This suggests that there is a lot of progress still to be made in this area, even as some countries have improved greatly in recent years.[90]

85 "About: Digital Literacy Trust," *Digital Literacy Trust (DLT)* (accessed on July 15, 2020). Retrieved from: https://www.digitalliteracytrust.org/index.php/about/.
86 Ogolla, Kennedy, "Digital Literacy Programme in Kenya; Developing IT Skills in Children to Align Them to the Digital World and Changing Nature of Work-Briefing Note," *The World Bank* (accessed on July 15, 2020): 1-2. Retrieved from: http://pubdocs.worldbank.org/en/967221540488971590/Kennedy-Ogola-Entry-Digital-Literacy-Kenya.pdf.
87 "What Is DigiSchool?" *Government of Kenya* (accessed on July 15, 2020). Retrieved from: http://www.icta.go.ke/digischool/about-digischool/.
88 Ogolla, Kennedy, "Digital Literacy Programme in Kenya; Developing IT Skills in Children to Align Them to the Digital World and Changing Nature of Work-Briefing Note," *The World Bank* (accessed on July 15, 2020): 1-2. Retrieved from: http://pubdocs.worldbank.org/en/967221540488971590/Kennedy-Ogola-Entry-Digital-Literacy-Kenya.pdf.
89 Republic of Kenya, "Digital Economy Blueprint: Powering Kenya's Transformation," *Government of the Republic of Kenya* (2019): 60. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
90 Please note that data for Niger, in particular, is missing in this index.

IV.
The Role of Government in Unlocking the Digital Economy

IV. The Role of Government in Unlocking the Digital Economy

This section details the findings of the primary data collection activities, informed by the results of the benchmarking assessment of secondary data documented in Section III. Before launching into a thematic analysis of our findings with regards to the digital economy, we will first look at the history of digital economy planning, policy, and development.

4.1. Digital Economy Planning: Strategy, Policy, and Implementation

When asked in the survey about their country's progress regarding ICT policy and strategic plans, most government officials stated that their country has a national ICT policy, strategy, or strategic plan. Based on additional qualitative assessment, it was found that five countries have strategies that are more than five years old and are in immediate need of updating. Three countries had strategies less than five years old, while one country was in the process of drafting its strategy and one country did not respond.

When asked in the survey whether they are looking to develop or renew their ICT strategies in the next one to two years, six of the nine countries said they are. This is in line with findings from the interviews, signaling that representatives believe there is momentum and political will to change or update strategies. During the interviews, several country officials also expressed a need for support in developing and updating strategies for ICT and the creation of a digital economy, and several expressed a need for specific technical support.

Another clear takeaway is that many strategies lack a timetable for actions and key performance indicators (KPIs), which can help countries increase their chances for accountability and successful implementation. Only two countries stated in the survey that they had broken down KPIs or targets, though some stated they are in the process of developing KPIs. The qualitative assessment indicated that very few countries had them in their strategies.[91] While many countries had either a timetable or KPIs, only one country had both, and that country had updated its strategy in the last five years. These findings demonstrate that there is a long way to go in adapting and updating ICT strategic planning for digital economy, a need clearly articulated by officials from a range of countries.

4.1 Key Takeaways

- **Strategic Implementation Requires Coordinated Planning:** In the last 10 years, most countries have made substantive changes to their national ICT strategies and planning, though strategies frequently lack timetables and KPIs.
- **Need to Update or Renew Strategies:** Many strategies need to be updated or renewed, and countries require strategic and technical support in doing so.
- **Call-to-Action:** Update national ICT strategies and plans with timetables and KPIs for delivery of key outcomes across strategic issue areas.

91 This can be seen for a few participant countries that have national strategic plans providing context about their ICT goals, but they do not detail specific actions to be taken since they lack timetables and KPIs. One challenge that arose was slow progress in the development of a robust and resilient telecommunications infrastructure and technologies capable of connecting and covering the entire national territory, especially unserved and underserved communities.

4.2. Strategic Coordination and Silos Across Government

Countries have experienced significant growth in the depth and breadth of digital government services and automation in recent years, and this progress is only expected to continue as countries collaborate and share best practices in digital economy planning. Nevertheless, the continued expansion of digital government requires addressing outstanding challenges in national strategic coordination and the existence of silos across government. Coordination and horizontal integration are important elements of digital government, so addressing these issues is critical in delivering a whole-of-government approach to ICT adoption and use, as well as promoting and investing in the digital economy.

Strategic Coordination

Coordination was a key element of responses in the interviews. Government officials often focused on the important role of national ICT strategies and the need for strategic frameworks and cross-government collaboration. In the survey, the respondents were asked whether their government was working towards the use of a WGA in the digital transformation of their economy and government services.[92] All representatives responded that their governments were, though it was clear from subsequent interviews that for many this was more of an aspiration or ongoing project rather than a fully executed reality.

Asked about where their country's ICT strategy was in terms of its development, a majority of the officials interviewed indicated that the strategy was being implemented. Only a small number indicated that the strategy had been largely implemented already, and only one country responding indicated that they believed their strategy was well-coordinated across ministries.

When asked more directly through the interviews, many mentioned a challenge in coordinating digital strategies across government branches. More than half of the countries' officials also responded that they lacked either leadership or a coordination mechanism (a key driver of intragovernmental coordination) and many said they experienced challenges related to stakeholder commitment and integration of common approaches.

Nearly all officials demonstrated an acute awareness of these challenges in their own governments. In the interviews, they referenced the specific difficulties in coordination that they had encountered, including sectoral planning, silos, and procurement, as well as the steps they were taking to address these issues. The interviews also demonstrated that political will among government officials participating in the study was high, and there was a clear desire for improved coordination and change management across government.

> "If we do not translate how ICT is going to affect specific development objectives, [government] will have difficulty disbursing the necessary budget…. Some say that digital is a luxury because their priority is agriculture, health, roads etc. But this is an issue of digital practitioners who do not make the connection between the tech and real-life problems such as reducing poverty, improving health."

Another key finding in this regard was that there are challenges in the coordination of national policy and regulation for ICT and the digital economy, though countries are taking steps to address them. Many indicated that there are difficulties with aligning national policy and regulation with that of state and regional governments, particularly around e-government and data protection policies. Some countries are also still working to

92 For clarity of responses from the interview informants, they were told that whole of government refers to coordination and resource-sharing across government ministries and agencies with the intent of achieving ICT policy/strategy objectives.

address the balance between affordability and the need to self-fund the development of ICT infrastructure through taxation.

Silos Across Government

Silos occur when there is a lack of horizontal integration within governments and public authorities.[93] Many country officials said that silos were an issue for their government, but they were also becoming more proactive in addressing them.

In particular, governments are beginning to address silos in governance, ICT platforms, and funding, particularly in areas like sectoral planning, interoperability, and investment. Countries with more advanced strategic planning, specifically around the provision of e-government services, had the most success in breaking down sectoral silos. Additionally, countries that had succeeded in digitising a greater proportion of government services also frequently demonstrated stronger coordination in their governments, pointing to the centrality of cross-government coordination to digital government.

Another issue was that sectoral silos led to challenges in investment. One country's officials noted that sectoral contracts for ICT ministries would often bring requests to the government for funding projects, without coordinating with other ministries as part of a larger strategic framework. Another country's officials noted that national actors or officials in the ICT ministry were sometimes unaware of what was in the sectoral plans of other ministries with regards to the use of ICT and digital technologies, and that little effort was made to coordinate nationally or across the government. Together, these issues speak to an acute need to remedy intra-governmental coordination by not only improving high-level leadership and planning, but by breaking down the existing silos that have developed in these areas.

> "Projects are started, but because [they are] siloed and governance has not adapted, it is difficult to execute [them]. So even if digital economy was led today by the Minister of Digital Economy […] would not have influence over projects developed in other sectors."

4.2 Key Takeaways

- **Need for WGA:** Country officials increasingly recognise siloed investments and duplicative efforts by ICT development partners as a problem, and they also recognise issues in coordination between ICT ministries and promoting a whole-of-government approach.
- **Increased Coordination of Policy and Regulation:** In recent years, some countries have made substantive policy and strategy changes, specifically moving away from siloed approaches to digital strategy implementation and towards coordinated national policy and regulatory frameworks.
- **Lack of Coordination and Silos:** Country progress is sometimes undermined by a lack of coordination and silos across government.
- **Call-to-Action:** Improve policies and alignment across government to reduce silos in governance, improve funding, and increase platform interoperability.

93 Crawford Urban, Michael, "Abandoning Silos: How Innovative Governments Are Collaborating Horizontally to Solve Complex Problems," *Mowat Center for Policy Innovation* (2018): 3. Retrieved from: https://munkschool.utoronto.ca/mowatcentre/wp-content/uploads/publications/178_abandoning_silos.pdf.

4.3. Resource Mobilisation: Funding, Affordability, and Procurement

The issue of coordination is not only related to challenges in design and implementation, but also investment in and procurement of infrastructure, government services, common frameworks, and data platforms. To this end, government officials participating in this study were clear on the significance of resource mobilisation for the creation of a digital economy, but also spoke to related issues in funding, affordability, and procurement.

Funding the Digital Economy

Survey respondents designated funding as the second biggest challenge in realising digital transformation, and officials in interviews often perceived it as the biggest challenge in realising their country's vision for a digital government. When asked about the main funding-related barriers to implementing digital projects, insufficient funding and insufficient private-sector investments were the main impediments, with siloed sectoral investments being third.

Countries were most visibly making strides in investment and financing for ICT infrastructure, often through partnerships and capital from the private sector. However, many officials said that funding in other areas was still a persistent challenge and there was a continued need to secure funding for physical infrastructure using global and regional partnerships. Some digital infrastructure investments seemed to be possible using existing government resources, but funding for other government-backed ICT initiatives, such as digital architecture or national programmes, often required additional funding sources (in the form of loans, grants, or public-private partnerships).

Notably, some countries had made progress in breaking down interoperability silos in their governments by centralising investment. One country's officials noted that while there was wide variation in the quality and integration of IT systems, they had aligned financing to centralise national data and web hosting.[94] Despite some success in centralising investment, however, most countries' officials reported experiencing challenges in aligning investments for infrastructure projects, whether across government or in collaboration with the private sector. Even those governments that were most successful in rolling out physical and digital infrastructure had some challenges in mobilising resources and securing investment. One country's officials identified the need to extend investment in physical infrastructure to e-government and data protection activities, though they also acknowledged that there were challenges in governance and regulation that would need to be addressed before they could do so.

> "Financial support is a key component as several countries… have ambitions to develop initiatives relating to our strategies but are often challenged by limited resources, particularly when local resources aren't enough to deal with related ambitions."

Many officials pointed to the silos that sometimes emerged in funding for government-backed projects, often because of a lack of coordination between ministries and/or agencies. Some of the many challenges that country officials reported as having created funding silos were non-adaptive governance, IT procurement process across ministries, disproportionate investment in strategic sectors by multilateral organisations, and difficulty coordinating investment and use of funding for e-government. Challenges in sectoral investments also touch on other challenges such as coordination and governance, financing and procurement, and partnerships. Two countries' officials specifically mentioned that they were interested in resolving these

94 The goal of this project was to engage a standard mechanism for systems and services to improve the problem of siloed government architecture and reduce wastage of funding.

challenges using a WGA, a potential solution for not only cross-government coordination but funding and investment as well.

Affordability of Digital Infrastructure, Tools, and Services

The affordability of infrastructure, tools, and services was a significant issue for governments, as it was an enabler of improved outreach to citizens and businesses, required substantial levels of cross-government coordination, and improved the ability to invest in the digital economy. About half of the countries in the study were below the African median for infrastructure development, and many officials spoke to the need for continued capital and partnerships to make infrastructure and other ICT expenditures affordable. Interviewees also indicated that countries understood the value of and need for universal and last-mile connectivity through various mechanisms aimed at reaching low-income and rural populations. However, they sometimes expressed difficulty in reaching out to and aligning their objectives with those of the private sector and civil society, particularly when faced with a lack of investment for a project or initiative.

One country official noted that challenges in affordability also created challenges in promoting digital literacy and innovation, while another noted the specific need to create standards for the affordability of mobile networks for citizens to extend coverage (e.g., spending no more than 2% of income on mobile and broadband network access). Some countries were still struggling with the affordability of ICT tools and equipment in areas like education and enterprise, often having to subsidise and buy these products through national schemes to help promote local access, though this was often a short-term solution. In this way, the affordability of infrastructure and related systems and services was still a challenge, though many countries were taking steps in different areas to begin addressing these issues.

Government Procurement of Digital Technologies

Most countries in the survey seemed to have unique issues in identifying and procuring technology, and while there are tailored solutions depending on the country, government officials showed some desire for increased centre-led procurement of digital technologies. When the delegates were asked about their main challenges in identifying and procuring new technology from external vendors, the two main issues mentioned were a lack of a coordinated procurement strategy and policy (including taxation) and limited skills to operate and maintain new equipment. Other issues mentioned were funding and donor alignment, equipment quality concerns, lack of maintenance support, integration with legacy systems, technology transfer, licence management issues, vendor lock-in, and unexpected operational costs that are not identified during the procurement process. Officials from three of the countries stated in the survey that they have no challenges in this area, though there is some reason to believe that these are common challenges across most countries based on the study.

While study participants believed that their countries generally have adequate technical expertise to meet the requirements for implementing their ICT strategies, there is still progress to be made in streamlining and improving procurement of ICT hardware and services, whether for government or sectoral projects. Some of the interviewees raised

> “There is also the problem across the government of low investment in ICT, which we have seen in terms of resources to buy equipment, set up of IT systems and platforms. This creates challenges which can spillover deep into the development and implementation of IT systems by the government.”

concerns about incidences where those in charge of procuring technology or evaluating an investment lacked necessary technical expertise.

This might be the result of a lack of skills or simply an absence of coordination around procurement between the branches of government. It is worth noting that some countries prioritised local sourcing of technology products for all government-related procurement, while others were more open to global goods. At least two officials interviewed noted challenges around whether to adopt and use open source technologies, though this seemed more prevalent among countries that were further developed in the deployment of e-government services and interoperable government architecture.

4.3 Key Takeaways

- **Funding for Digital Economy and Infrastructure:** Countries have made important strides in establishing partnerships and catalysing political will to fund digital economy development and initiatives, with some success in aligning investment for digital infrastructure.
- **Difficulties Investing in Physical Infrastructure:** Governments continue to be challenged by the need to invest in physical infrastructure, whether through internal or external sources.
- **Need for Resource Mobilisation and Coordinated Investment:** Difficulties in resource mobilisation and a lack of coordination in investment are hindering the digital transformation of financing. Governments, however, are moving to address these difficulties through the adoption of more centralised or coordinated approaches.
- **Need to Coordinate Financing, Procurement, and Affordability for Digital Tools and Services:** Such centralised or coordinated approaches may have downstream effects for financing, procurement, and affordability of digital tools and services, as government ministries often seem to have widely different experiences across individual ministries and agencies.
- **Call-to-Action:** Strengthen the coordination of financing, affordability, and procurement for ICT tools and digital services.

4.4. Digital Change Management: User-Centred Government Services for Businesses and Citizens

While planning, coordination, and funding are central for the creation of a digital economy, they sometimes mean little if countries do not also have strong procedures in place for digital change management. Indeed, implementation of a clear and holistic digital change management strategy is something governments continue to have challenges with, even as they have had great success in prioritising a paradigm-shift towards user-centred services for businesses and citizens.

Digital Change Management Within Government

Across the board, survey respondents did not have an explicit ICT change management plan or strategy in place, though the national strategies reviewed often discuss this need. This does not necessarily mean that change management practices are not taking place in these countries, though it indicates an absence of a centralised, formal approach to managing change. Nevertheless, officials commented that change had taken place explicitly because of senior leadership. Many officials in the interviews were optimistic that political buy-in was increasing, though often not fast enough because of challenges in communication and governance.

Either way, while it is clear that political will for change exists (often from leaders within key ministries or agencies), it is actually high-level political leadership from officials such as the president or prime minister which is necessary to help catalyse change. This type of leadership and support is critical as governments navigate a paradigm shift away from a government-centred approach to a seamless user-centric approach focused on the needs of businesses and citizens. To this point, several officials responding indicated that responsible ICT ministries often need high-level support to enact a clear change management strategy.

User-Centred Services for Businesses

In terms of the economy, this paradigm shift is happening in areas such as capacity building, infrastructure, and tools and services. Many countries have parts of their national ICT strategies and plans focusing specifically on issues related to digital business, namely platform development, digital services and delivery channels, and e-government services for businesses. According to survey respondents, some of the many issues of importance included mobile money interoperability, codes of conduct for e-commerce, growth in e-registration, support for startups, and expansion of registration and monitoring for businesses.

Some government officials identified the provision of digital content for digital government services as an important part of their vision to reach businesses and build a digital economy. In this regard, governments seemed to be making great strides in providing digital content and developing a platform economy, as evidenced by analysis of the Digital Business pillar and the interviews with government officials. However, some countries continue to struggle with digitising government and deploying digital government services for businesses. For example, even as some countries were benchmarked as being advanced in terms of digital government and business dynamism, there were countries above the African median for digital government that were below it for digital business (and vice-versa).

Regarding other key areas of the digital economy—like digital trade and digital financial services—the story was a bit more mixed. Many countries identified digital identification as a missing foundational element of government architecture, though one that was frequently being worked on. Without this, it was more difficult for businesses to tap into a centralised institution and verify identity. That being said, it was clear from the interviews that governments saw many businesses coming online, as well as finding alternative ways of doing mobile payments through channels such as short message service (SMS). Many countries were also continuing to work with the private sector, including mobile network operators (MNOs) and banks, to begin addressing the issue of mobile payments.[95]

> “There are three strategy orientations for e-government: (1) to improve the effectiveness and synergies within public administration, (2) accelerate the digitalization of administrative procedures for businesses and citizens, such as filing for taxes and (3) to improve citizen participation.”

User-Centred Services for Citizens

Digital inclusion was an increasingly important part of the paradigm shift towards user-centered digital government services. In presenting their vision for digital government and digital economy during the workshop, several countries presenting focused on digital infrastructure and paperless administration and services, while others focused on issues of accessibility. These

95 One country was advanced enough in terms of digital ID to begin thinking about the integration of national payment systems into a single window, which would help standardise systems and processes for many businesses across the economy.

visions converged on a "user-centred" approach to public service provision where the citizen's experience is at the center of how public services are provided. Additionally, many countries mentioned that they had begun the process of moving towards national schemes for digital identification, an important foundational element in the movement towards digital government.

Some of the most commonly identified areas for digital inclusion that countries were working on included e-payment, ICT for gender, financial inclusion, and ICT for disability. In interviews, they often underscored this by mentioning the need to develop digital identification and electronic signature technologies to make these activities secure and accessible. Furthermore, several countries were having success in their shift towards e-government services, and many more were actively in the process of redeveloping their digital strategies and focusing on this paradigm shift more clearly. Some of the most common areas of success included the development of digital identification and national databases, though some countries still struggled with the issue of interoperability for government services.

Overall, a complete paradigm shift towards government-to-citizen services—consonant with a WGA for digital government—was still a challenge for many governments. Some countries had challenges not only in extending infrastructure to rural areas but getting citizens to adopt and use digital platforms and services once they were connected to the internet. This was related to the issue of affordability; while it was difficult to make mobile and broadband internet services affordable for urban populations, it was even harder to do so for people in rural areas. One country struggled with the highly diffuse nature of its population and the many regional languages spoken, making it challenging to centralise and translate national e-government services to include the whole population.

4.4 Key Takeaways

- **User-Centred Government Services Paradigm:** Countries are experiencing a paradigm shift from government-centred service provision to a user-centred approach, with a focus on the needs and experience of users (i.e., businesses and citizens).
- **Prioritising Accessibility and Inclusion:** By anchoring government as a procurer and user of digital tools and services, governments are increasingly prioritising accessibility and inclusion for businesses and citizens in the digital economy and taking concrete steps to enact such changes.
- **Challenges in Rallying Political Will for Change:** Governments are still facing challenges in reliably rallying political will for digital change management across government ministries and implementing affordable IT solutions.
- **Difficulties in Creating an Enabling Business Environment:** Governments are also having some trouble creating the type of business environment needed for enterprises to succeed in the digital economy, mainly because of challenges in innovation and digital skills across society.
- **Call-to-Action:** Develop clear change management procedures and policies to ensure political will and coordinated implementation of ICT planning.

4.5. ICT Infrastructure: Private-Sector Collaboration and Last-Mile Connectivity

One of the areas where the themes mentioned so far have most commonly intersected is digital infrastructure, as well as the corresponding need for access and connectivity using private-sector collaboration and last-mile extension. As a result, countries are working with great success towards securing investment and support for digital infrastructure, though they continue to work towards improved collaboration and the extension of last-mile connectivity.

Private-Sector Collaboration for Digital Infrastructure

Digital infrastructure encompasses a number of critical areas for a digital economy—including broadband, telecommunications, fibre optics, etc—as well as a number of critical areas for digital government, namely interoperable platforms and national databases. Digital infrastructure is also key for a number of emerging technologies, including the internet of things (IoT), machine learning, drones, and smart cars.[96] Furthermore, in expanding access to the digital economy, it is important to close the digital divide by ensuring adequate access to communication infrastructure by low-income, rural, and marginalized communities.[97]

To this last point, officials in this study said public-private partnerships (PPPs)—partnerships between governments and the private sector—were key to their success in investing in and constructing physical and digital infrastructure, particularly in the case of last-mile connectivity. That being said, coordination with the private sector on investment was also a common challenge that several countries were working proactively to address. When asked about the implementation of the national ICT strategy, country officials said that while the implementation had started, coordination was a significant issue, particularly with industries. This points to the need for a common framework for better coordination between the government branches, as well as between the government and the private sector.

When asked about the main stakeholders for digital transformation within their country, more than half of country officials responded that the private sector was one of the top two or three most important stakeholder groups. This finding is consistent with the results of the interviews, as officials from governments with varying levels of digital infrastructure and availability of digital government services frequently expressed the need for increased collaboration with the private sector. Some of the common areas in which a need for private sector collaboration was indicated was around physical infrastructure, technical capacity, data and cloud infrastructure, and interoperable systems (e.g., mobile telecommunications and digital government services).

> “The other [pressing] issue is about digital adoption. In other words, how can we ensure that rural communities are using the internet once the infrastructure is there. We know that private operators are not necessarily interested in rural areas. Hence, we need to work so that we ensure that rural areas have access as well, maybe through certain incentives to mobile operators.”

The two most common areas for government collaboration with the private sector involved infrastructure rollout and government architecture, particularly in areas such as investment and capacity building. It was clear that governments frequently viewed the private sector as bringing necessary knowledge, leadership, and technical

96 Republic of Kenya, “Digital Economy Blueprint: Powering Kenya’s Transformation,” *Government of the Republic of Kenya* (2019): 44. Retrieved from: https://ca.go.ke/wp-content/uploads/2019/05/Kenyas-Digital-Economy-Blueprint.pdf.
97 OECD, “Enhancing Access and Connectivity to Harness Digital Transformation,” *OECD, Paris* (2019): 4. Retrieved from: https://www.oecd.org/going-digital/enhancing-access-digital-transformation.pdf.

expertise that the public sector in their country was sometimes lacking. Some mentioned that public-private partnerships would be necessary to promote a culture of innovation and entrepreneurship.

Last-Mile Connectivity for Rural Areas

A unifying theme of this work on infrastructure was the idea of last-mile connectivity, based around the need to extend ICT infrastructure to rural and remote areas through innovative partnerships and solutions. As noted by ITU, universal connectivity—underpinned by broadband connectivity and last-mile access—is key to enabling the digital transformation of economies across the globe.[98]

For many countries in this study, digital infrastructure was a prerequisite for digital transformation and the expansion of the digital economy, one which superseded the development of harmonised strategic planning or inter-government planning. Several countries that were still in the early stages of their national digital economy transformation were focused intently on infrastructure and connectivity. This was particularly true in areas like the expansion of broadband and fibre optics, provision of ICT equipment for education and digital skills and values, increasing bandwidth and expanding coverage for MNOs, and extending government services to citizens in rural areas. Closely related to the need for improving digital skills and values in rural areas was inclusion and access, which were often core themes of the infrastructure extension and connectivity issues mentioned by officials in their responses.

Countries in the study have made great progress in improving the conditions of their infrastructure in the last two decades, with a greater rate of change in the African Infrastructure Development Index (AIDI) used in the benchmarking (see Figure 14). Country responses supported these developments and changes seen in the index for this pillar.[99]

4.5 Key Takeaways

- **Public-Private Partnerships for Last-Mile Connectivity:** Countries understand the value and need for last-mile connectivity aimed at reaching low-income and rural populations, and increasingly recognise public-private partnerships as necessary to extend digital access, particularly in rural areas.
- **Difficulties Aligning and Coordinating Infrastructure Rollout:** While countries have made progress in investment and partnerships for infrastructure and connectivity during the last 10 years, there is progress still to be made in aligning and coordinating investment and implementation in this area.
- **Challenges in Aligning Objectives with Non-Government Actors:** Governments sometimes face challenges in reaching out to and aligning their objectives with the private sector and civil society.
- **Call-to-Action:** Enable the sustainable rollout of ICT infrastructure and last-mile connectivity through public-private partnerships and innovative financing.

98 ITU, "The Last-Mile Internet Connectivity Toolkit: Solutions to Connect the Unconnected in Developing Countries," (Draft, ITU, January 20, 2020): 5. Retrieved from: https://www.itu.int/en/ITU-D/Technology/Documents/RuralCommunications/20200120%20-%20ITU%20Last-Mile%20Internet%20Connectivity%20Toolkit%20-%20DraftContent.pdf.

99 The great volume of projects around connectivity and digital infrastructure can be seen in Appendices B and C.

4.6. Emergency Planning and Sectoral Plans for Digital Government

Considering the COVID-19 pandemic,[100] many governments are having to redo their future planning, particularly around emergency management and the creation of strong, harmonised ICT sectoral plans. As such, governments are increasingly attempting to use ICT policies and services to plan for the future, with some success in areas like digital health. That being said, sectoral silos continue to impede harmonisation of planning across government, and the downstream effects of this lack of coordination are particularly evident during emergencies like the recent pandemic.

> "[There is a] need to do work on public awareness and education, investing in channels to improve awareness and use of digital systems. When COVID began, people were against electronic systems for emergency response, for instance, but now [there] is more awareness of the need for these types of [digital] systems."

Emergency Planning and Management

Across the board, officials expressed a clear need to create coordinated ICT strategies for disaster and emergency management, as well as integrate emergency planning into other sectors, particularly in light of the COVID-19 pandemic. That said, only a third of countries surveyed had an updated ICT strategy for disaster and emergency management in place. Governments with robust digital health strategies were able to take advantage of the most ubiquitous technologies, such as mobile telephony, radio, and television to disseminate critical messages. Many officials who had experience with health outbreaks had clearly prioritised the use of digital technologies in health and emergency response for COVID-19. Those governments were using mobile channels (e.g., voice, SMS, USSD, IVR) to trace the contacts of infected persons, and they had often developed more resilient health information systems.

Several officials spoke to the importance of government support for digital platforms and services in allowing individuals to keep in touch with relatives and friends during the pandemic. Those with smartphones were able to access social media platforms and messaging applications for relevant information, as well as national dashboards for case counts and updated information and guidance, among other uses. These benefits were also seen in the digital economy itself: small-business owners enabled online shopping, restaurants enabled citizens to easily access their services from home, and religious gatherings offered their services virtually.

While many officials spoke to the importance of mobile payments and smartphone penetration in improving their preparedness for COVID-19, the lack of emergency planning on the whole was a shock to the existing digital infrastructure. Countries reported that they often experienced challenges with high demand due to increased use during confinements. Furthermore, many interviewees noted that not all people were able to take advantage of digital services because of a lack of reliable technology infrastructure and low levels of ICT adoption, particularly in remote and rural communities where ICT infrastructure is limited or nonexistent. Some survey respondents mentioned that they were working with MNOs to increase bandwidth and set up free or reduced-cost access points in rural communities during this time.

Sectoral Plans for Digital Government

This study sought to capture progress with regards to country development of key sectoral plans, which can help coordination across the whole of government and promotion of

100 Primary data collection for this study took place during April and May of 2020, when the COVID-19 pandemic was hitting the peak of its first wave in locations across the globe, including Africa.

key strategic areas like health, education, and agriculture. Sectoral plans can help governments develop specific goals for implementing ICT tools and services and engaging stakeholders for the sector, improving better implementation of ICT strategy across government.

Many officials in this study demonstrated a focus on the three major sectors of the economy; namely, health, education, and agriculture. As indicated in the survey, digital health strategies were frequently the most developed of all the sectoral ICT strategies, followed by digital education and agriculture strategies. This was not especially surprising, given the historical importance of these sectors to both governments and the donor community.

Digital health response was also frequently mentioned as a priority for governments, particularly in response to COVID-19. Digital health has long been prioritised by governments and is an area that has been prolific in its access to funding and resources.[101]

Planning in key sectors like health sometimes also seemed to come at the expense of sectoral planning in other important areas. For example, e-commerce plans—an important area for digital economy—were notably absent in many countries,[102] and cross-cutting strategies for disability and gender in digital activities were frequently missing as well. Only one-third of surveyed countries had an ICT sectoral plan for other important areas besides education, health, and agriculture. Putting such strategies in place could help ensure a framework for a more equitable and inclusive digital transformation while addressing disparities in the adoption and use of digital technology among marginalised populations.

4.6 Key Takeaways

- **Range of Existing Sectoral Plans:** Most countries have existing digital sectoral plans in at least some key strategic areas, notably digital health, as well as e-government, digital economy, and education.
- **Need for Updated Sectoral Plans:** Countries are interested in new sectoral plans since existing ones have often proved insufficient during emergencies, and other key sectors like agriculture and tourism are underrepresented in their availability.
- **Need to Harmonise Sectoral Policies Across Government:** Some countries also face challenges in harmonising policies and in creating coordinated and adaptive governance around their national and sectoral strategies.
- **Call-to-Action:** Ensure harmonisation of sectoral policies in collaboration with the national ICT ministry and other supporting agencies.

101 The World Health Organization and ITU have both recognised the importance of collaboration for e-Health in their governing body resolutions, and developing a digital health strategy that provides clear direction to health system stakeholders is a key recommendation emphasised by the AU Digital Transformation Strategy for Africa. For more information, see: WHO and ITU, "National eHealth Strategy Toolkit," *WHO and ITU* (2012): 1-14. Retrieved from: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-E_HEALTH.05-2012-PDF-E.pdf; and African Union, "The Digital Transformation Strategy for Africa (2020-2030)," African Union. Retrieved from: https://au.int/sites/default/files/documents/38507-doc-dts-english.pdf.

102 As countries prepare for increased cross-border movement of goods and services through the Africa Continental Free Trade Area (AfCFTA), developing an e-commerce strategy, particularly addressing secure online payments, will be critical for countries seeking to capitalise on one of the world's single largest markets.

4.7. Digital Skills and Capacity for Governments and Citizens

Countries recognise that human capacity development and a human-centered transformation are key enablers of successful digital transformation. As a result, they are taking proactive steps in this direction, with particular success in addressing issues related to literacy, connectivity, and inclusion.

Upskilling of Civil Servants

Digital skills and values and digital government are interrelated, as human capacity fuels digital government and the digital economy at large. Among the countries surveyed, many were steadily moving towards building out their own vision for human capacity and skills development, as well as creating a culture of innovation and entrepreneurship. However, it was clear that these issues also need to be addressed alongside related enablers, such as infrastructure and connectivity. Not only that, it was evident that governments themselves had insufficient understanding and awareness of ICT, and the coordination and use of digital technologies across government meant little if ICT skills and awareness were not mainstreamed into the training and duties of civil servants.

Despite progress in recent years, this is the area in which the countries surveyed still needed to make the most progress. The benchmarking assessment of the Digital Skills and Values pillar found that all of the countries in the study were below the global median and many country scores were ranked low in the index. As indicated by officials from multiple countries, this was often a result of low levels of digital literacy, insufficient adoption of digital tools and services, and the need to improve local content creation. Several countries highlighted examples of expert panel discussions, short-term training, and peer learning sessions within or across countries that could provide opportunities for government employees to refresh ICT skills and learn about emerging technologies, including 5G, data analytics, cyber security, and distributed ledgers.

Digital skills and values and digital government are interrelated, as human capacity fuels digital government and the digital economy at large.

To their credit, several countries have government agencies that are specifically in charge of assessing the skills gap among civil servants, as well as organising training opportunities and coordinating skills development across government. That being said, ICT skills for government employees was an area that seemed to require significant time and resources that governments often did not immediately have. Additionally, to address the need for cross-functional capabilities rather than technical expertise on its own, governments expressed some movement toward whole-of-government processes in managing human and technical capacity, though this was in its early stages.

Fixing the Talent Pipeline

Government talent is a subset of the national pool of talent, therefore it is important to not only address the immediate needs for human and technical capacity in government, but also to promote ICT and STEM education more broadly. The benchmarking assessment and interviews highlighted a need for more comprehensive assessment of digital skills, ranging from basic literacy to advanced ICT skills in such fields as artificial intelligence, data analytics, and robotics. While countries were clearly aware of this need, it was one of the areas in which countries had to make the most progress.

Countries frequently related the challenge of change management to a lack of technical capacity across government, often due to a lack of awareness around the value and need for ICT. This had downstream challenges in terms of change management and the mainstreaming of policies, as well as developing and maintaining government architecture and interoperable systems.

Not only that, but countries also frequently reiterated these problems as being closely related to issues in ICT access and connectivity. In other words, the barriers to human capacity for governments reflected broader challenges in the ability of government to access and reach people across society using digital technologies.

This study also identified significant issues around content development, the digitisation and translation of existing learning content, and the need for improved and expanded digital platforms and systems to be put in place across government and on behalf of society. Countries were aware of these issues and highlighted many positive successes in dealing with them in recent years. Several country officials said they had developed or were developing national institutes for technology to help prioritise ICT skills and education, with the hope of increasing the pool of talent available to the public and private sectors. Notably, some governments had also made it a priority to address the need to promote STEM education for young girls and introduce them to careers involving ICT.

This study highlighted key issues relating to digital skills and capacity, including the following:

- **Development of Learning Infrastructure:** This includes the digitisation of content and learning curricula, as well as improving connectivity in schools to provide things like distance learning and access to computers. For example, Angola has digitised primary school books for its student population, and Côte d'Ivoire implemented a subsidy for the acquisition of computers for students. Countries such as Côte d'Ivoire, Ghana, and Senegal have also been participating in the second phase (from 2020 to 2023) of the Transforming Education in Africa project, which seeks to scale up an "e-school" model by supporting ICT in education policy development.[103]
- **Enabling Education Policy:** This includes universal access to education as well as the revision of related school curricula. Countries need to not only subsidise ICT education, training, and equipment, but mainstream it into education curricula. For example, Sierra Leone is devoting 21% of its national budget to achieve universal and free education.[104]
- **Fostering a Technology and Innovation Culture:** Governments play a significant role in creating incentives and fostering a culture that is more receptive to ICT use and adoption. This can be done through automating government processes such as e-taxation, business registration, and digitisation of other government services. More ICT adoption within government can have a positive ripple effect in the economy as governments become responsible for creating key ICT building blocks such as digital ID, employing a significant number of the local workforce, and having extensive transactions with private-sector actors and citizens on a daily basis.
- **Reinforcing ICT Entrepreneurship and the School-to-Work Transition:** The pace of ICT innovation is constantly evolving, and education policy and curricula take a long time to change and implement. Therefore, there is a need to encourage ICT-related entrepreneurship activity as well as partner with the private sector to create an enabling ecosystem. Moreover, apprenticeship and internship opportunities should be encouraged for the recruitment of talent and to foster collaboration and exchange between the government and learning institutions. For example, several countries in this study—such as Sierra Leone, Niger, and Gabon—have established a network of national and regional mentoring and incubation centres to develop the next generation of innovators and entrepreneurs.

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103 The ICT Transforming Education in Africa project is supported by the UNESCO and Korean Funds-in-Trust (KFIT) contribution by the Republic of Korea. Mozambique, Rwanda, and Zimbabwe were participants in Phase 1 of the project from 2016 to 2019, and Côte d'Ivoire will be part of Phase II, alongside Ghana and Senegal. For more information, see: "ICT Transforming Education in Africa," *UNESCO*, accessed July 16, 2020. Retrieved from: https://en.unesco.org/themes/ict-education/kfit.

104 Prisco, Joanna, "Sierra Leone Launches Program to Give 1.5 Million Children Free Education," *Global Citizen*, August 23, 2018. Retrieved from: https://www.globalcitizen.org/en/content/sierra-leone-children-free-education/.

4.7 Key Takeaways

- **Defining a Vision for Digital Skills and Values:** Countries are working on defining the terms of their own unique vision for digital skills and capacity in their digital economy journey.
- **Focus on Human-Centred Digital Transformation:** Connectivity, inclusion, and digital literacy, as well as a culture of innovation and entrepreneurship, are increasingly being seen as important foundational elements of an agenda for human-centred digital transformation.
- **Holistic Vision for Digital Skills and Values:** The extension of citizen inclusion and access in these areas is often closely related to demand for infrastructure, connectivity, and education at both the national and local levels. It is also imperative that digital inclusion be in line with local priotrities and cultural values, including customs and traditions.
- **Upskilling Civil Servants and Fixing the Talent Pipeline:** There is still considerable progress to be made in upskilling civil servants and fixing the talent pipeline for both government and the private sector.
- **Call-to-Action:** Strengthen digital skills and commit to policies that promote digital adoption, literacy, and inclusion, in line with local values.

4.8. Regional Collaboration and Global Alignment: Policy, Platforms, and Peer Learning

Countries across Africa are recognising the value of digital cooperation and are working to align national digital strategies, regulations, and infrastructure with regional frameworks and initiatives, with the goal of improving national and shared regional outcomes. However, some countries have had more success than others in promoting key regional policies and objectives, and many countries still struggle in pursuing global alignment and investment related to digital cooperation.

Policy and Regulatory Frameworks

This study clearly showed that most countries have been working to some extent towards harmonising their ICT policy frameworks through regional institutions, as well as providing for some sort of strategic alignment on national strategies.[105] Participating officials also noted that while there was progress to be made in aligning national policies and regulations, they were interested in the premise of this study because it offered an opportunity for cooperation and peer learning on policy and regulation, and having access to more knowledge and understanding of the challenges and best practices. Several officials noted that increased cooperation in these areas would be a key input for ICT and digital economy planning.

By cooperating through such regional bodies, countries have begun to promote common understanding around the legal and policy frameworks for responsible and sustainable digital transformation. Most countries also recognised the need for global alignment and partnerships, sometimes in requests for support and funding, though it is notable that the knowledge and capacity created by regional cooperation was more at the forefront

> “We want to work with regional partners such as Smart Africa as we develop our own national ICT strategy to create alignment with regional frameworks.”

105 This is clearly the case with regards to support for the Digital Economy Blueprint, which has developed in recent years.

in discussions and interviews. Regional economic communities (RECs) like the Economic Community of West African States (ECOWAS) have been important to progress in these countries and have frequently supported countries in the promotion of harmonised regulatory frameworks in ICT (e.g., e-commerce and cyber security).[106] Countries in this study were also increasingly becoming aware of and participating in such RECS and frameworks alongside their peers, and most officials demonstrated considerable knowledge of past and present contributions of their governments to such alliances.

All countries reiterated the value of the collaboration and best practices sharing they experienced through regional networks, and not just the Smart Africa network. The importance of collaboration was most evident in areas that required significant legal and regulatory work (and sometimes a high level of political risk), including e-government, digital identity, data privacy and protection, and cybersecurity. Several countries noted the importance of regional support in allowing ICT ministers and officials to seek and secure high-level political support within their own governments. These findings are not surprising but speak to the high levels of sophistication and risk that come with rolling out digital government services, particularly around safeguarding privacy.

Regional Platforms and Infrastructure

Increased regional cooperation has been incredibly important in catalysing digital economy planning, but the need for digital cooperation at the regional level is often most accelerated by demand for initiatives like infrastructure, which have shared value for bordering countries. To this end, regional networks are one of the best forums for countries to find alignment on such objectives. They are also a less burdensome way to share best practices and technical capacity, as well as pursue global alignment through funding and partnerships. While countries are experiencing challenges in standardising their objectives in this area, it is clear that demand for shared knowledge and capacity around infrastructure (and secondarily interoperable platforms and systems between countries) is key to accelerating change in regional economic integration.

This was most evident in the peer learning countries shared during the workshop, as well as the follow-up interviews. Officials said their governments were prioritising domestic and regional ICT infrastructure and platforms, laying the foundation for more regional integration and trade, and many were working on regional e-commerce and mobile interoperability. Several country officials also mentioned infrastructure demand in relation to the need for innovation and entrepreneurship, as well as the importance of strategies in helping to coordinate infrastructure rollout.

> “The sharing of experience, capacity building and the sharing of best practices will allow—not only collaboration on our strategy for the digital economy but […] to help us take charge of managing network equipment—the platforms, applications that we will soon install. We want to learn what techniques others have used as we develop our own systems…”

Best practices from neighbouring countries, as well as the rest of Africa, were critical to the improvement of government architecture and the creation of domestic technology platforms, particularly in countries that were not as far along in terms of local hosting and digital services. A case in point is the West Africa Unique Identification for Regional Integration and Inclusion (WURI) Program,

106 UNECA, “Review of the Legal and Regulatory Frameworks in the Information and Communications Technology Sector in a Subset of African Countries,” *Economic Commission for Africa* (2017): 4. Retrieved from: https://www.uneca.org/publications/review-legal-and-regulatory-frameworks-information-and-communications-technology-sector.

aimed at providing countries of ECOWAS with a foundational building block of digital ID to support better delivery of social protection, health, and financial inclusion.[107] Four of the countries in this study (Côte d'Ivoire, Benin, Burkina Faso, and Niger) are part of this initiative, and some spoke to its benefits.

Countries demonstrated cooperation around supervising regional ICT broadband and mobile infrastructure, and sometimes even in beginning to develop critical ICT building blocks such as digital ID and electronic payments. Such interoperable and reusable technology can help governments lay the foundation for digital government services while also being critical for regional integration, tourism, and trade, a reality that many officials recognised. Furthermore, collaboration and coordination with global actors such as donors, the private sector, and civil society were also recognised as being important in laying the foundation for regional integrations, particularly with regards to the technical capacity necessary for building and sustaining ICT platforms. Such collaboration can yield benefits for citizens living in that region, including lowering costs of mobile communication, as in the case of the Central African Economic and Monetary Community (CEMAC), of which Gabon is a member.[108]

Peer Learning Across Africa

Another main finding of this study was that countries are at different levels in their journey towards digital transformation. Using the Digital Economy Blueprint as a reference, countries scored differently on measures of digital governance, infrastructure development, ICT skills, and innovation. Countries can share their successes, challenges, and knowledge through studies such as this one, as well as participate in networks that support accelerated action in areas of digital economy in which they might not be as strong.

Another main finding of this study was that countries are at different levels in their journey towards digital transformation.

Several of the countries in this study were taking an important lead on flagship projects within the Smart Africa network. Notable examples include high-tech parks from Angola, innovation and knowledge cities from Benin, the Smart Africa Scholarship Fund from Burkina Faso, cybersecurity from Cote d'Ivoire, ICT industry development from Gabon, smart e-payments from Ghana, digital economy from Kenya, smart villages from Niger, and broadband access and the green economy from Senegal.[109] While these projects were often at different levels of progress, officials indicated that they played an important role in catalysing political will within the government, and some said that they had provided them a meaningful opportunity to learn from their peers.

Some country officials noted that more effort might be needed to mobilise resources and allow countries to effectively implement digital economy strategies. While there was clearly political will both within countries and from Smart Africa to update or renew strategies, many members had a lot to do to begin this process and indicated that they need regional and global support to catalyse change and channel necessary resources. And while this study can in some ways be seen as a critical step in doing this, the need for investment and partnership demonstrates that many countries are still just beginning their journeys with digital transformation. A lot of work was still underway in securing the necessary capital and knowledge through global and regional partnerships.

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107 This project is supported through financing from the World Bank. For more information, see: "Togo, Benin, Burkina Faso and Niger Join West Africa Regional Identification Program to Help Millions of People Access Services," *The World Bank*, April 28, 2020. Retrieved from: https://www.worldbank.org/en/news/press-release/2020/04/28/togo-benin-burkina-faso-and-niger-join-west-africa-regional-identification-program-to-help-millions-of-people-access-services.

108 This regional community worked with MNOs in the region to establish a free roaming zone across member countries. For more information, see: Betu, Alain, "CEMAC Workshop on Free Roaming," *GSMA Sub Saharan Africa*, January 17, 2020. Retrieved from: https://www.gsma.com/subsaharanafrica/cemac-workshop-on-free-roaming.

109 For more information on some of the projects highlighted by countries, see Appendices B and C.

In recent years, regional bodies and membership organisations have taken on the role of convener for peer-learning initiatives, both through hosting technical working groups around digital economy and through flagship projects that provide proof of concept on certain ICT-related initiatives before they are scaled and adopted by other countries.

Respondents expressed a lot of enthusiasm about these opportunities to share lessons and recognise their value both as a source of technical expertise and capacity building. They also offer the advocacy and leadership support necessary for successful ICT strategy implementation, a milieu this study has sought to situate itself in.

4.8 Key Takeaways

- **Policies, Platforms, and Peer Learning:** Regional collaboration has been happening at the nexus of policy, platforms, and peer learning, often with a focus on digital economic integration and cross-border trade.
- **Increased Global Alignment:** These developments in regional collaboration and economic integration are taking place in tandem with increased global alignment with donors, NGOs, and multilateral institutions.
- **Challenges in Adoption and Implementation of Harmonised Approaches:** Progress is still early, and some countries face uphill challenges in adoption and implementation of harmonised policy and regulatory approaches.
- **Need for Continued Partnership and Capacity Building:** Countries continue to experience issues in capacity building and aligning their objectives with those of the private sector and civil society.
- **Call-to-Action:** Reinforce global and regional partnerships to promote common goals, including regional integration and trade.

4.9. Benchmarking the Digital Transformation Journey: Key Themes and Takeaways

Significant progress has been made in the last decade with regards to digital transformation in these countries, but the responses from participating countries have revealed challenges that need to be addressed if countries are to be successful in unlocking the digital economy. This section will look at the many ways in which the different findings highlighted in the benchmarking assessment and thematic analysis have intersected. It will also examine how progress made can be sustained and how issues identified can be addressed as countries move forward on their digital transformation journeys.

A Paradigm Shift in Digital Government

As highlighted in section 4.4, this study showed that there is a paradigm shift happening as governments continue to move service delivery away from a government-centred approach towards a user-centric approach.[110] The shift towards user-centred government services is happening in different regions in Africa and includes such things as e-registration for businesses and e-citizen services. It is significant that this paradigm shift is happening during the COVID-19 pandemic, a time when governments are

110 While this is not necessarily a new idea, it is somewhat new in Africa given the move towards digital government in the last 20 years. For more on the idea of user-centred government, see: Data-Smart City Solutions. "Is User-Centered Government Really Attainable?" *Government Technology*, May 2, 2018. Retrieved from: https://www.govtech.com/data/Is-User-Centered-Government-Really-Attainable.html.

realising they have not gone far enough in digitally transforming the way people live and work in their countries.[111]

The pandemic is also forcing governments to rethink their vision for digital societies. Government officials participating in this study frequently referred to the COVID-19 pandemic as an inflection point that was challenging many sectors and systems (as documented in section 4.6). They said they knew how devastating emergencies can be for businesses and citizens without necessary planning and mitigation and were looking to use the emergency as an opportunity to adapt to an increasingly digital future.

A Coordinated and Intentional Approach to Government Planning

The challenges in adapting to COVID-19 also point to broader challenges in how the government plans, implements, and regulates its own vision for digital economy within its country. As documented in section 4.4, such planning may indeed warrant a more coordinated and intentional approach by governments to address not only the technological aspect of this process, but also the underlying organisational work cultures. Such an approach could help effectively manage the disruptions caused by the deployment of ICTs and promote the acceptance of new electronic ways of doing business and living life, as well as help grow the digital economy.

This study showed that such approaches were only successful as long as governments took responsibility and ownership for coordinating their implementation (see section 4.2). Despite rapid growth and expansion of digital government, many governments struggled to sustain digital government and provide digital services to all parts of society. Countries need new business models, management cultures, technologies, and processes to improve the relationship between different drivers of the economy. This will be critical in driving infrastructure rollout and last-mile connectivity (section 4.5), as well as promoting a dynamic and thriving business culture that prioritises technological innovation (section 4.7).

Renewed Focus on Digital Economy Planning and Buy-In

These challenges speak to a need for more or updated strategic planning for creating a digital economy (see section 4.1). Officials often expressed difficulty in drafting and executing strategies, and several expressed interest in designing new ICT roadmaps and strategic plans from the ground up. There was a clear desire for the types of coordinated and intentional processes that have been mentioned before, including a WGA.[112] While most governments appear to be taking steps towards WGA, issues like procurement, coordination, and policy alignment were creating problems across the economy (see sections 4.2. and 4.3).

However, in order for a national roadmap to succeed, countries need supporting documents that are both visionary and based on current facts and realities. These documents should be anchored by high-level support, developed in consultation with public and private stakeholders, and be easily understandable and communicable. A clear vision for a digital economy would be a strategy that includes timetables and key performance indicators (as was done in Senegal), as well as a strategic plan outlining a clear, holistic digital change management strategy (see section 4.4.)

Countries need new business models, management cultures, technologies, and processes to improve the relationship between different drivers of the economy.

111 This study was finalised in August of 2020.
112 While most respondents acknowledged the need for a WGA implicitly, two respondents indicated it explicitly. Other countries mentioned the need for a WGA in reference to centralising procurement and coordinating investment across government.

Inclusive and Human-Centred Digital Transformation

As shown in section 4.7, human capacity for digital transformation will be especially critical in sustaining political will for change, as well as creating the technical capacity needed to digitally transform government and the economy. The aim of human capacity development for governments is ultimately to improve the pool of talent available to the public sector as well as the private sector and small businesses. But fixing the talent pipeline can also extend ICT access, connectivity, and inclusion to people across society and ensure that individuals and families meaningfully reap the benefits of their participation in the digital economy.

As countries move towards a digital economy, it will also be key to ensure that underprivileged populations are not left behind. In this regard, countries have launched several initiatives to expand last-mile connectivity, such as the Smart Villages initiative in Niger.[113] The extension of services in rural areas requires addressing the demand for infrastructure and last-mile connectivity (see section 4.5), but also the need to create inclusive policies in education and promote outreach that helps train and include people from across society (see section 4.7).

Achieving this goal requires stronger and more harmonised sectoral plans, particularly for e-education but also in key areas such as disability and gender (see section 4.7). This is critical because it not only allows countries to fix the talent pipeline for the next generation, it ensures that the benefits of connectivity are being actively used by targeted populations. In this regard, regional collaboration and global alignment are also important, as is harmonising national digital strategies and regulation frameworks (see section 4.8).

113 This project is specifically geared towards improving rural connectivity, not only with regards to ICT infrastructure, but also other elements of access, such as availability of content in the local language and in various formats.

V.

Call-to-Action: Unlocking the Digital Economy Through Sustainable and Inclusive Digital Transformation

V. Call-to-Action: Unlocking the Digital Economy Through Sustainable and Inclusive Digital Transformation

The benchmarking report highlights that countries have made significant progress in developing their digital economy as they work towards the local and regional goals of creating a single digital market in Africa, developing local talent, and promoting digital sovereignty. Continued progress will enable African countries to take more ownership of their digital transformation journey and avoid over-reliance on external resources.

The benchmarking report also notes that a number of barriers and challenges still exist and outlines a set of actions to address them. The following recommendations were echoed by other regional initiatives and frameworks, including the AU's Digital Transformation Strategy for Africa 2020 – 2030,[114] and offer governments a roadmap for how to update their digital economy strategies and plans.

FIGURE 17

Call-to-Action: Unlocking the Digital Economy Through Sustainable and Inclusive Digital Transformation

Each action item in the figure above is detailed below:

1. Update national ICT strategies and plans with KPIs for delivery of key outcomes across strategic issue areas: In order to be successful in coordinating the adoption and use of technologies across society, countries need clear roadmaps and visions that identify relevant issue areas and paths to addressing them. This study found that only a few of the countries have up-to-date national ICT strategies with focus areas, and few of them included timetables and KPIs. To address this, governments need to document strategic planning, produce a timeline for achievement of their objectives, and develop KPIs to support monitoring and evaluation of progress towards a digital economy.

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2. Improve policies and alignment across government to reduce silos in governance, improve funding, and increase platform interoperability: Synchronising ICT investments across government requires innovative approaches in governance, funding, and interoperability, so as to avoid siloed planning, investment, and systems. This may entail the adoption of centralised procurement, deployment of enterprise architecture frameworks for interoperable systems, harmonisation of IT systems and authorities, and the introduction of cost-efficient measures for IT resources across government. Such coordinated and centralised approaches would need to be across the whole of government and be accompanied by supporting policies so as to provide for more efficient and sustainable institutions, platforms, and governance.

3. Strengthen the coordination of financing, affordability, and procurement for ICT tools and digital services: Financing and procurement of ICT infrastructure and services are still major issues for governments. To overcome them, governments need to devise innovative financing models that promote the efficient use of existing resources on the one hand, and investment incentives for the private sector and other development partners on the other. This includes putting in place centralised procurement mechanisms and other processes that provide better value for the money and encouraging public-private partnerships in developing ICT infrastructure and reducing the cost of access.

4. Develop clear change management procedures and policies to ensure political will and coordinated implementation of ICT planning: The digital transformation of the economy, as well as the further development of digital government, necessitates top-level anchoring, including political will and change management for digital investment, planning, and implementation. In discussing these issues, countries repeatedly raised the need for an update of the institutional frameworks, models of governance, and operational processes underpinning public service delivery. Anchoring from the highest levels of government, namely the president or prime minister's office, can help build momentum for new procedures and policies for digital change management.

5. Enable the sustainable rollout of ICT infrastructure and last-mile connectivity through public-private partnerships and innovative financing: Countries in this study were at different stages of infrastructure development, with different levels of connectivity and internet penetration. Problems relating to infrastructure development, digital access, and inclusion remain significant. Ensuring the sustainable rollout of ICT infrastructure requires governments to secure funding, particularly for core ICT infrastructure and platforms such as digital identity, which are catalysts for digital inclusion and connectivity, and create an enabling policy and regulatory environment that incentivises different stakeholders (e.g., private-sector and other funders) to invest in infrastructure development and maintenance.

6. Ensure harmonisation of sectoral policies in collaboration with the national ICT ministry and other supporting agencies: The COVID-19 pandemic has brought to the fore the continued problem of siloed sectoral planning in government, as well as related challenges in emergency response management. While countries in this study often demonstrated successful strategies in areas like digital health, education, and agriculture, there is still a need to strengthen the coordination of digital deployment across different government ministries. Addressing these issues requires updating and harmonising sectoral plans with the national ICT strategy, creating a coordinating institution, and promoting policies that make government more proactive and adaptive in the use of digital technology for emergency planning and response.

7. Strengthen the digital skills and values of citizens by committing to policies to promote connectivity, inclusion, and digital literacy: Countries still face challenges around digital literacy as well as adaptability and availability of ICT services in local languages and contexts. Improving the digital skills and values of citizens and local content creation necessitates working with the private sector, civil society, and local creators to improve access to education, particularly for marginalised and low-income communities; encourage digital literacy and upskilling; and promote a culture of innovation and entrepreneurship.

8. Reinforce African partnerships and integration with regional and continental institutions that promote collaboration and trade: Regional and continental collaboration is key to promoting economic integration in Africa and pursuing global alignment and partnerships. This study showed that countries have made great gains by working together, but there is a continued need to pursue joint initiatives that will help achieve regional and global alignment with donors and partners. Countries stand to benefit from regional collaboration through harmonising digital economy policies and plans, collaborating on platforms and infrastructure development, and participating in peer learning networks alongside other governments.

VI.
Conclusion

VI. Conclusion

This report sought not only to highlight the differences within countries with regards to the Digital Economy Blueprint, but also to learn from successful initiatives that can be replicated by peers and help countries collectively move forward towards a stronger digital economy. By benchmarking the performance of countries according to the blueprint, we hoped to underscore the importance of our analysis for the planning of digital economy strategies. By improving their strategies as outlined in the thematic analysis and call-to-action, governments can continue towards transforming the digital economy in their countries.

The 10 countries participating in this study have all made significant progress in building their digital economies. In recent years, they have had particular success in improving the capacity and performance of digital government, as evidenced by the benchmarking assessment of the Digital Government pillar in Section 3.1. This study also highlights positive development across the board in terms of the five pillars. The strong political commitment of all countries and the progress observed over the last decade will be important to sustain for more countries to rise above the global median across all five pillars of the Digital Economy Blueprint, as well as to mainstream key takeaways and recommendations featured in the thematic analysis and call-to-action.

To ensure that positive developments do not lose pace, continued collaboration, as well as informed choices and concrete actions, are needed. As highlighted in the call-to-action, this includes sustaining strong political will for ICT strategies and planning at the highest levels of government, as well as improving coordination and change management. It will also be important for countries to address issues such as financing, infrastructure, sectoral planning, digital skills and values, and regional integration. This can be strengthened through a focus on digital government and user-centric services provision, as supported by common foundational elements like digital ID and payment systems, as well as related laws, policies, and regulations.

In support of these aims, DIAL and Smart Africa together believe that there is an important role to be played by government in promoting and sustaining the benefits of digital transformation. To this end, we urge all Smart Africa member states and their partners to read this report and embrace this call-to-action. It is only through continued peer learning and regional support that countries across Africa will be successful in building inclusive digital economies, achieving the UN Sustainable Development Goals, and transforming of Africa into a single digital market by 2030.

In support of these aims, DIAL and Smart Africa together believe that there is an important role to be played by government in promoting and sustaining the benefits of digital transformation. To this end, we urge all Smart Africa member states and their partners to read this report and embrace this call-to-action. It is only through continued peer learning and regional support that countries across Africa will be successful in building inclusive digital economies, achieving the UN Sustainable Development Goals, and transforming Africa into a single digital market by 2030.

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Appendices

A. Country Profiles: Benchmarking Progress Towards Digital Economy

The following appendix contains profiles of each country featured in this study, as mapped against the five pillars of the Digital Economy Blueprint. Each figure shows their progress against African and global medians for the pillars in question, as well as their individual positions in African and global rankings. A detailed methodology of benchmarking indices is provided in Appendix B.

Angola

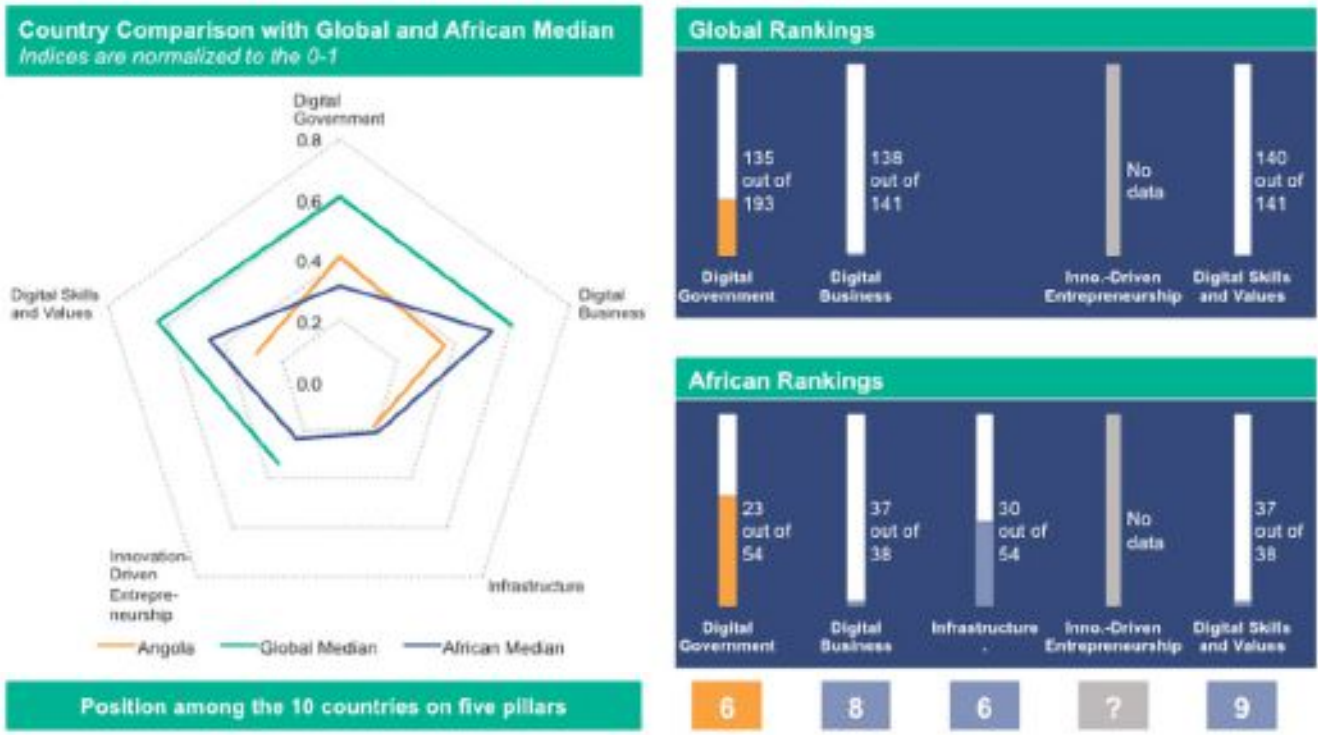

FIGURE 18: Country Profile of Angola in Terms of the Five Pillars of the Digital Economy Blueprint

Benin

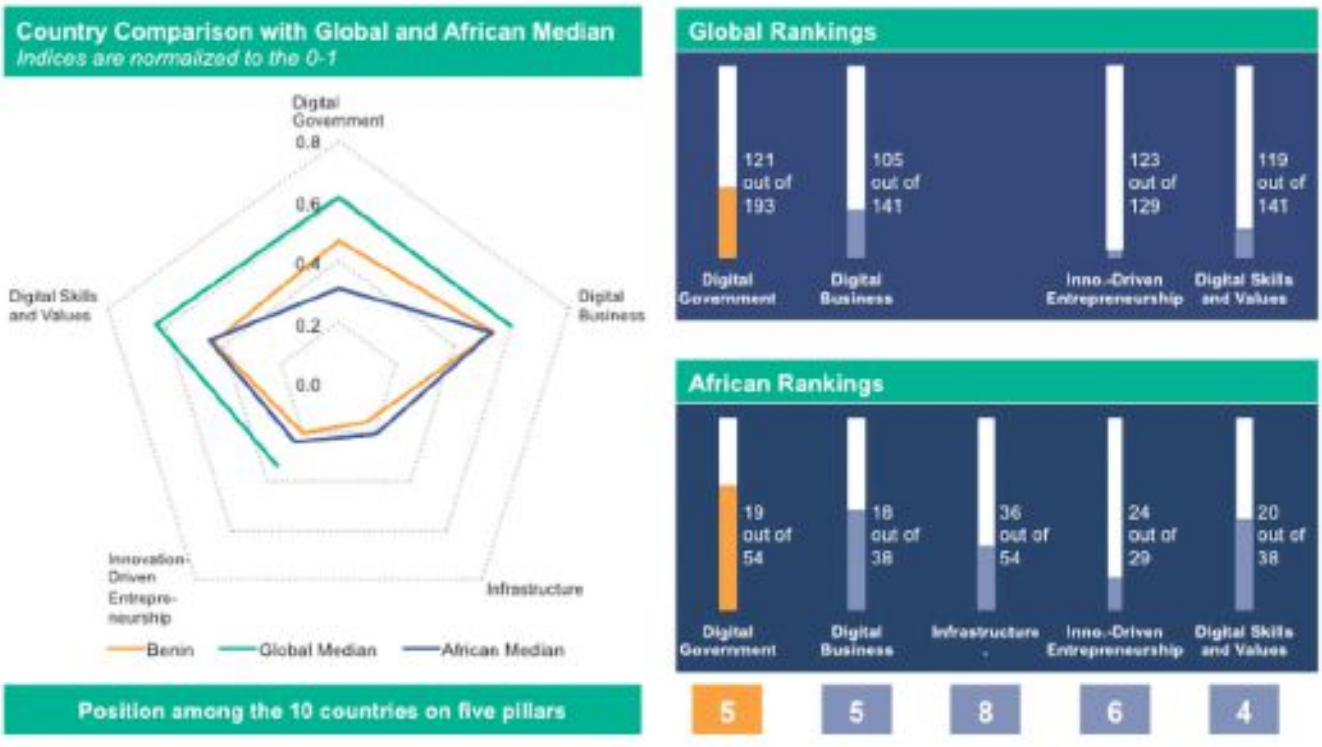

FIGURE 19: Country Profile of Benin in Terms of the Five Pillars of the Digital Economy Blueprint

Burkina Faso

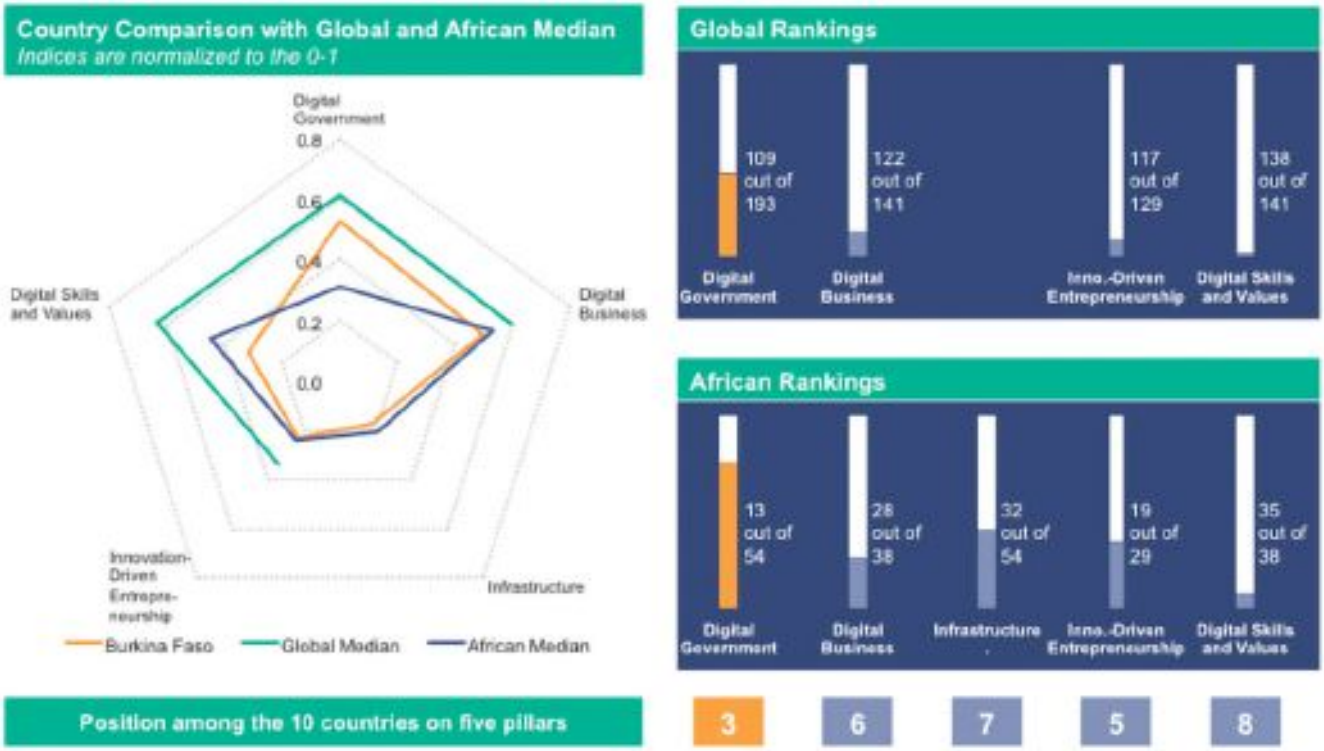

FIGURE 20: Country Profile of Burkina Faso in Terms of the Five Pillars of the Digital Economy Blueprint

Côte d'Ivoire

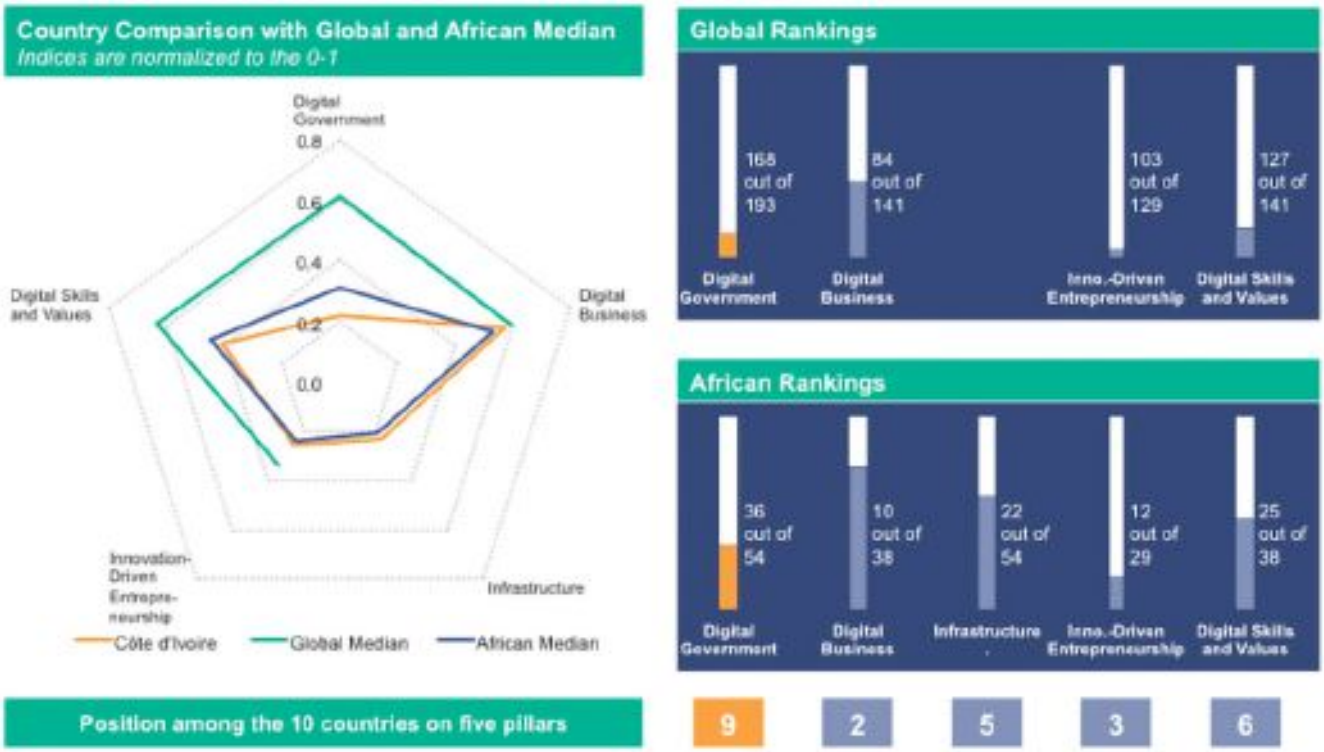

FIGURE 21: Country Profile of Côte d'Ivoire in Terms of the Five Pillars of the Digital Economy Blueprint

Gabon

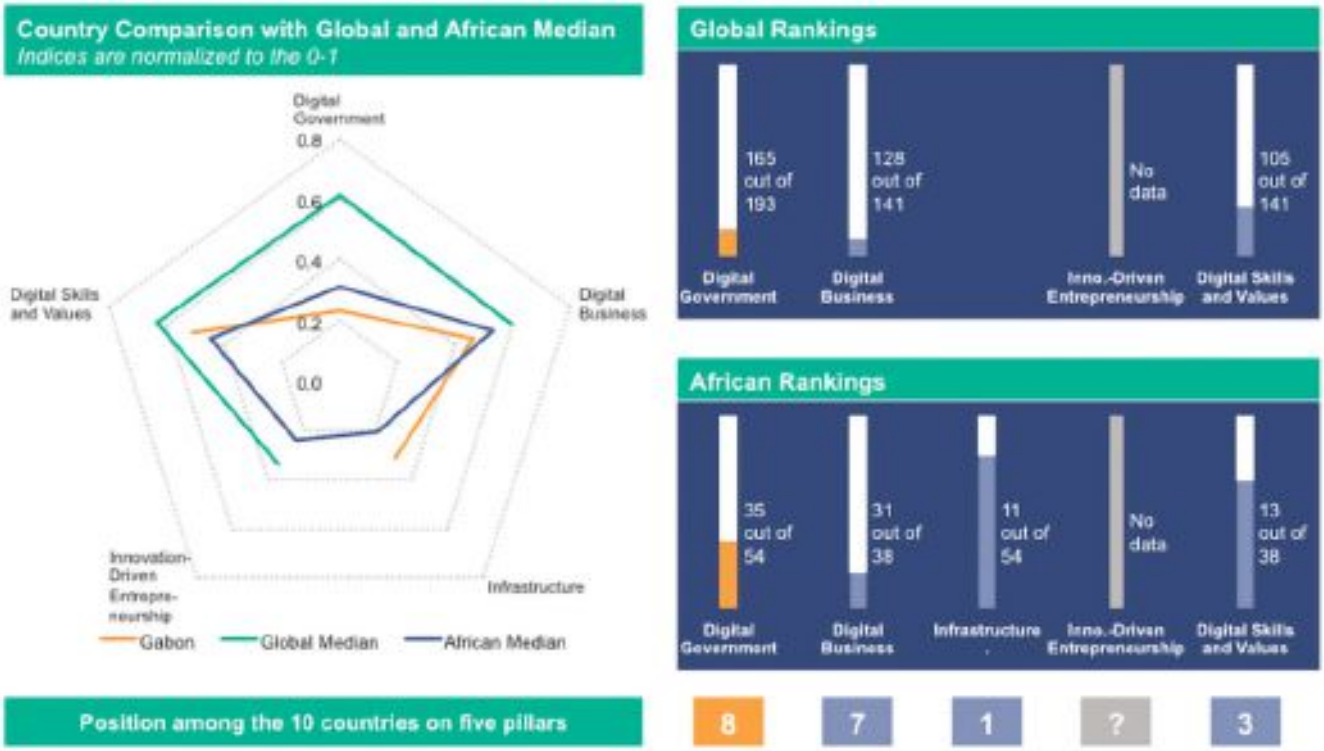

FIGURE 22: Country Profile of Gabon in Terms of the Five Pillars of the Digital Economy Blueprint

Ghana

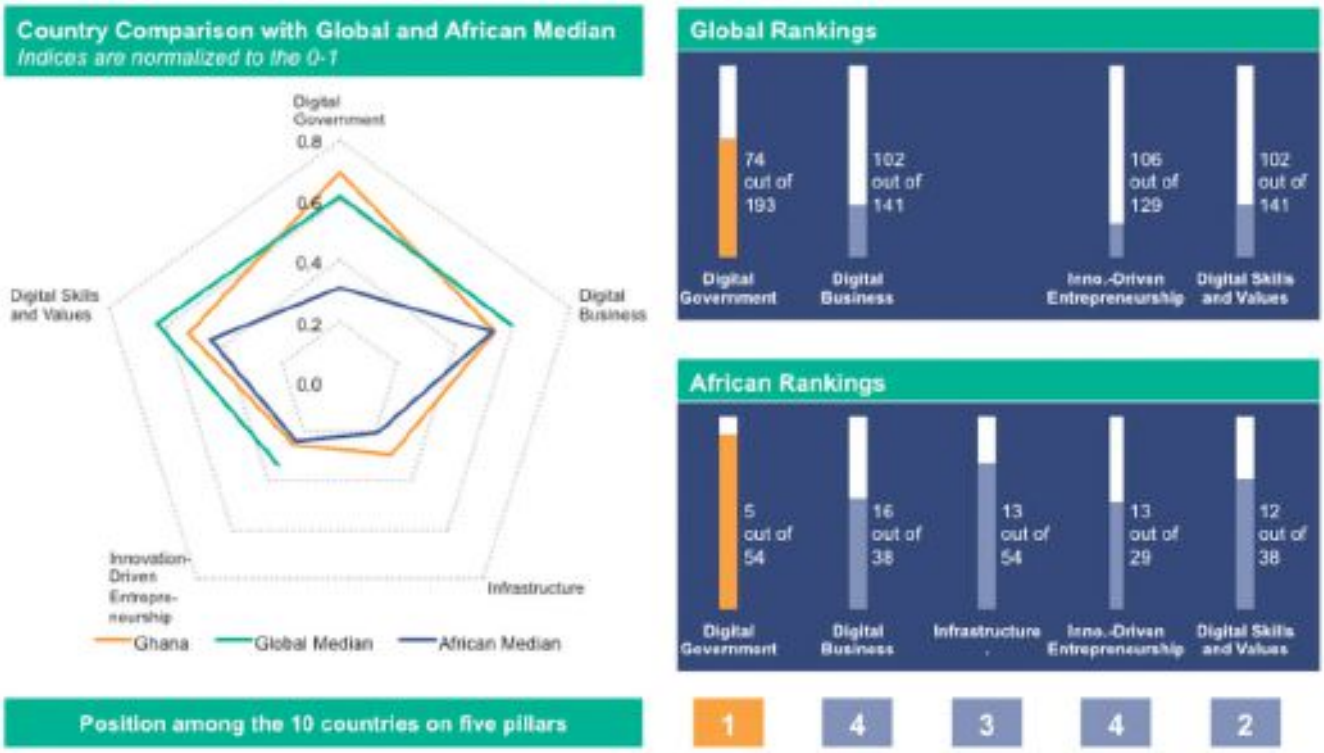

FIGURE 23: Country Profile of Ghana in Terms of the Five Pillars of the Digital Economy Blueprint

Kenya

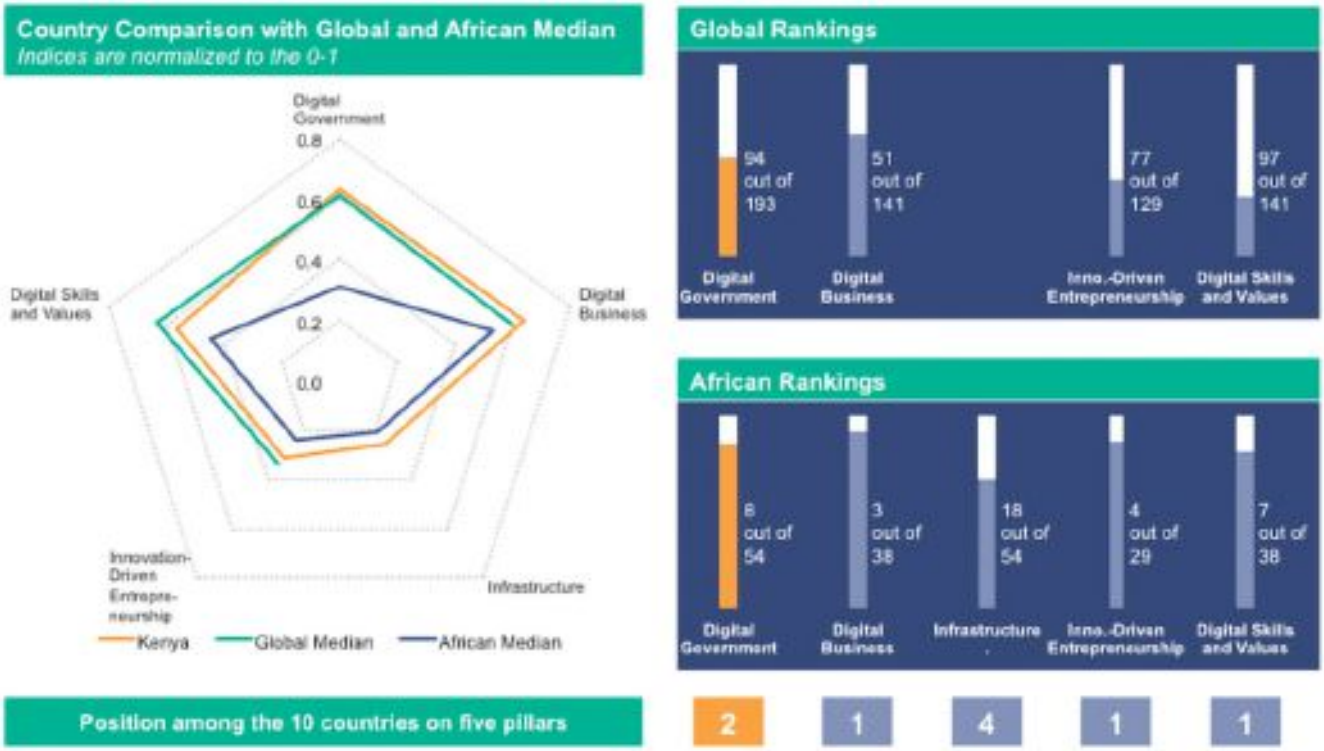

FIGURE 24: Country Profile of Kenya in Terms of the Five Pillars of the Digital Economy Blueprint

Niger

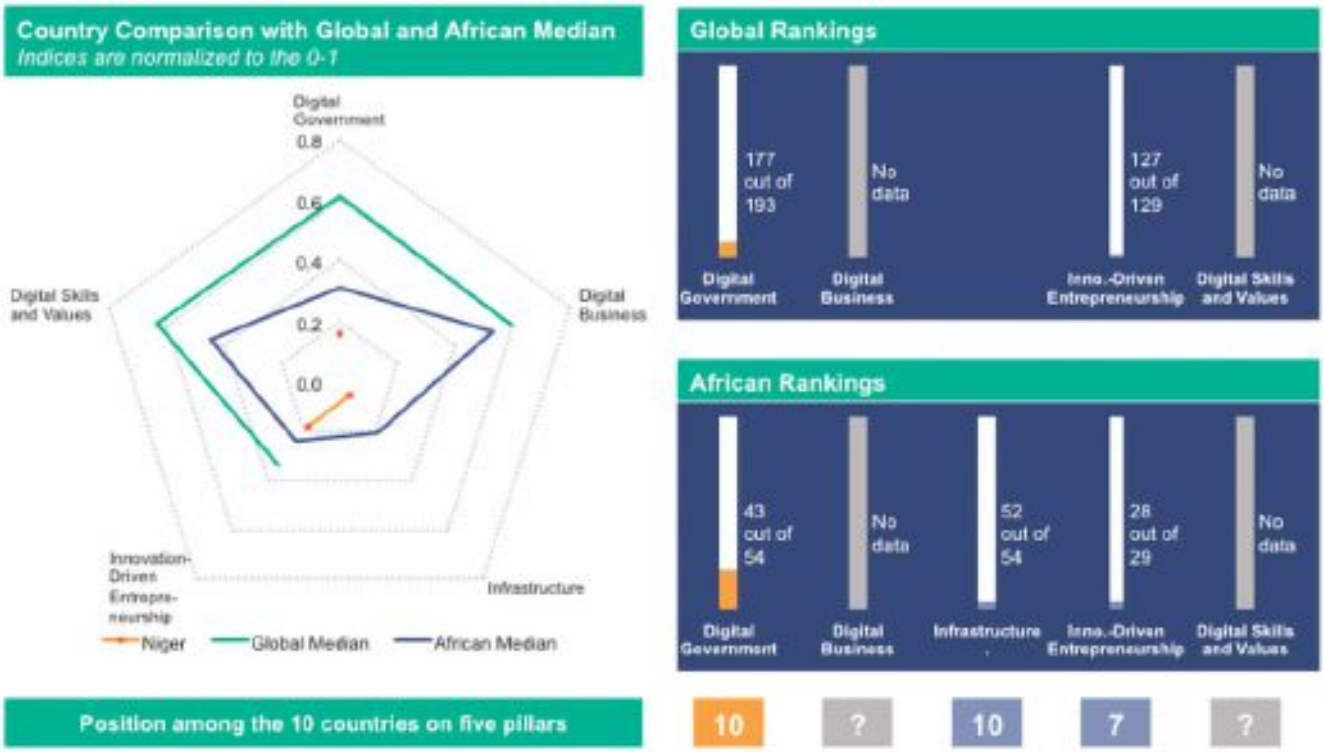

FIGURE 25: Country Profile of Niger in Terms of the Five Pillars of the Digital Economy Blueprint

Senegal

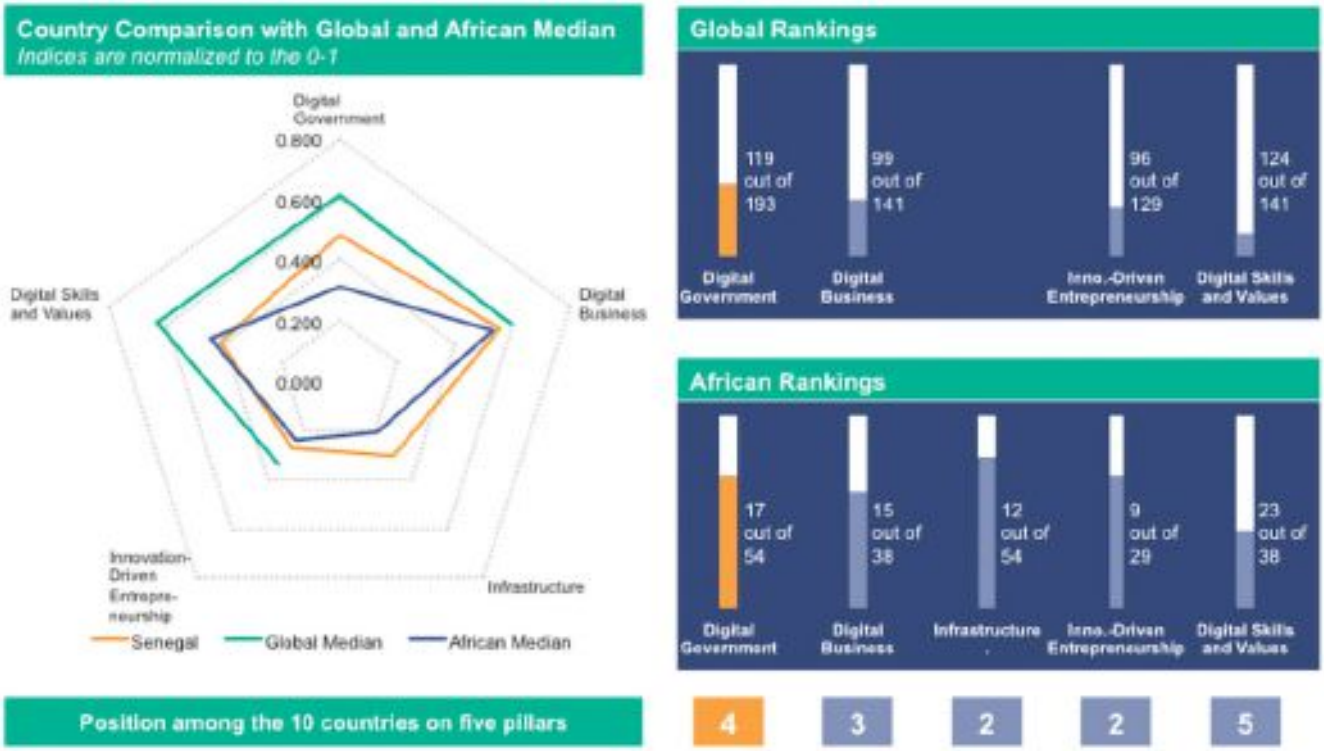

FIGURE 26: Country Profile of Senegal in Terms of the Five Pillars of the Digital Economy Blueprint

Sierra Leone

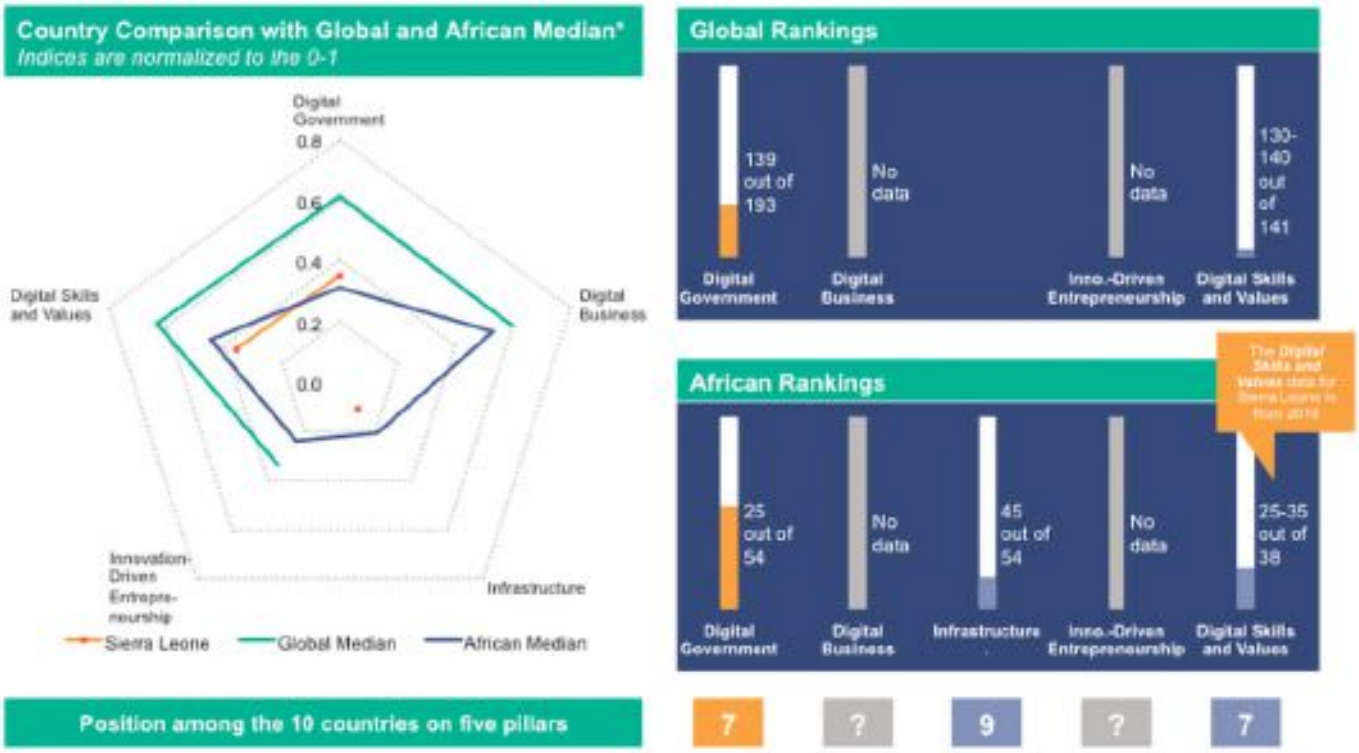

FIGURE 27: Country Profile of Sierra Leone in Terms of the Five Pillars of the Digital Economy Blueprint

B. Detailed Methodology of Benchmarking Indices

Digital Government: Online Service Index

The Online Service Index (OSI) is considered an appropriate proxy for the Digital Government pillar of the Digital Economy Blueprint, as it demonstrates an objective assessment of the government's digital presence (e.g., national portal, e-services portal, e-participation portal, websites of related ministries) by researchers who are experts in public administration. The E-Participation Index was also considered as a proxy for Digital Government, but its more limited scope led to Online Service Index being used.

The following information and description are taken directly from the description for the E-Government Survey 2018:[115]

> *The Online Service Index (OSI) is a composite normalized score derived on the basis on an Online Service Questionnaire. The 2018 Online Service Questionnaire (OSQ) consists of a list of 140 questions. Each question calls for a binary response. Every positive answer generates "more in-depth question" inside and across the patterns. The outcome is an enhanced quantitative survey with a wider range of point distributions reflecting the differences in the levels of e-government development among Member States.*
>
> *To arrive at a set of Online Service Index (OSI) values for 2018, a total of 206 online United Nations Volunteer (UNV) researchers from 89 countries covering 66 languages, assessed each country's national website in the native language, including the national portal, e-services portal and e-participation portal, as well as the websites of the related ministries of education, labor, social services, health, finance and environment, as applicable. The UNVs included qualified graduate students and volunteers from universities in the field of public administration.*
>
> *To ensure consistency of assessments, all the researchers were provided with a rigorous training by e-government and online service delivery experts with years of experience in conducting the assessments and guided by Data Team Coordinators who provided support throughout the assessment period. Researchers were instructed and trained to assume the mind-set of an average citizen user in assessing sites. Thus, responses were generally based on whether the relevant features could be found and accessed easily, not whether they in fact exist but are hidden somewhere in the site(s). The key point is that the average user needs to find information and features quickly and intuitively for a site to be "usable" with content readily discoverable by the intended beneficiaries.*[116]

Some of the 50+ indicators of the Online Service Index are as follows:

- Existence of support for authentication or digital ID
- Existence of up-to-date information on the portal
- Existence of an open government data policy online
- Information about citizens' rights to access government information
- Existence of an outcome of an e-consultation resulting in new policy decisions
- Existence of support for all official languages

Digital Business: Global Competitiveness Index (Business Dynamism Component)

The Business Dynamism component of the Global Competitiveness Index (GCI) is considered an appropriate proxy for the Digital Business pillar of this study, as it provides a close approximation of the digitalisation level of the business operations taking place in a country. The GCI is prepared by the World Economic Forum, and it is possible to use the 2019 iteration in this study. While the Business sub-index of the Digital Adoption Index (DAI) by the World Bank was also considered, its underlying indicators are much more limited compared to the selected index in terms of representing the level of Digital Business in a country.

115 United Nations Department of Economic and Social Affairs (UNDESA), "United Nations: E-Government Survey 2018," *United Nations* (2018): 83-124; 204-205. Retrieved from: https://publicadministration.un.org/egovkb/en-us/Reports/UN-E-Government-Survey-2018#:~:text=The%20United%20Nations%20E-Government,launched%20on%20July%2019%202018.&text=The%20disparity%20in%20e-government,both%20Africa%20and%20Oceania%20regions.
116 Ibid., 204-205.

The following information is taken from the description for the Global Competitiveness Report:[117]

> *The GCI is a "composite indicator"; its computation is based on successive aggregations of scores, from the indicator level (the most disaggregated level) to the overall score (the highest level). At every aggregation level, each measure is computed by taking the average of the scores of its components. The overall GCI score is the average of the scores of the 12 pillars. In total, there are 103 indicators distributed across the 12 pillars. Indicators are sourced from international organizations, academic institutions, and non-governmental organizations.*[118]

The sub-indices and indicators of the Business Dynamism component of the GCI are as follows:

- Administrative requirements (50%)
  - Cost of starting a business
  - Time to start a business
  - Insolvency recovery rate
  - Insolvency regulatory framework
- Entrepreneurial culture (50%)
  - Attitudes towards entrepreneurial risk
  - Willingness to delegate authority
  - Growth of innovative companies
  - Companies embracing disruptive ideas

Infrastructure: Africa Infrastructure Development Index

The Africa Infrastructure Development Index (AIDI) is considered an appropriate proxy for the Infrastructure pillar of this study, as it provides a reliable source of information regarding the infrastructure of African countries. The AIDI also has a 2019 iteration, which means the current state of the infrastructure of the countries is represented. The Tele-communication Infrastructure Index (TII) was also considered, but its sub-indicators are limited in scope regarding infrastructure, which led to the selection of AIDI. While the AIDI does not focus simply on digital infrastructure, this is consistent with the blueprint, which is inclusive to a wider range of infrastructure requirements for a digital economy.

The following information is taken from the description for the AIDI 2018:[119]

> *The following three steps are used in calculating AIDI (the Sub-regional AIDI calculation procedure is not included here for brevity):*
>
> ***Step 1:** Normalization Procedure. Since the components of the AIDI are originally measured in different units, the observations are "standardized" or "normalized" to permit averaging, with the average regarded as a composite index. The normalization procedure used is the min–max formula applied to all observed values of each component during the period 2000–2010. This procedure adjusts the "normalized component" to take values between 0 and 100 over the indicated period.*
>
> ***Step 2:** Calculate a Composite Index for each Component. The composite index is calculated as a weighted average of indicators for each component that comprise more than one indicator. The weights are based on the inverse of the standard deviation of each normalized component yt= (σtot/σx)*xt; where σtot is given by 1/σtot=Σx (1/σx) and σx is the standard deviation of the normalized component x. The rationale for step 2 is to reduce the impact of the most volatile components on the composite index and consequently the volatility of the rankings.*
>
> ***Step 3:** Generate the AIDI Composite Index: The AIDI composite Index is computed using the sub-indices of the four components and using the same method described in step 2.*[120]

The sub-indices and indicators of the AIDI are as follows:

- Transport Composite Index
  - Total paved roads (km per 10,000 inhabitants)
  - Total road network (km per km2 of exploitable land area)
- Electricity Index
  - Total electricity production (kWh per inhabitant)
- ICT Composite Index
  - Total phone subscriptions (per 100 inhabitants)

117 Schwab, Klaus, ed., "The Global Competitiveness Report 2019," *World Economic Forum* (2019): 623-624. Retrieved from: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.
118 Ibid., 2.
119 "The Africa Infrastructure Development Index 2018," *African Development Bank*, July 2018. Retrieved from: https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Economic_Brief_-_The_Africa_Infrastructure_Development_Index.pdf.
120 Ibid., 17.

- Number of internet users (per 100 inhabitants)
- Fixed broadband internet subscribers (per 100 inhabitants)
- International internet bandwidth (Mbps)

- Water Supply and Sanitation Composite Index (WSS)
  - Improved water source (% of population with access)
  - Improved sanitation facilities (% of population with access)

Innovation-Driven Entrepreneurship: Global Innovation Index

The Global Innovation Index (GII) is considered an appropriate proxy for the Innovation-Driven Entrepreneurship pillar of this study, as it captures many indicators in the subjects of innovation, R&D, business environment, entrepreneurship, and more. The GII has a 2019 iteration, which strengthens its selection for current trends in innovation culture. The ICT Development Index (IDI) was also considered, but it did not include several of the 10 countries and measures only a small part of the total level of innovation.

The following information is based on the Global Innovation Index 2018[121]:

> *This year GII provides detailed innovation metrics for 129 economies. All economies covered represent 91.8% of the world's population and 96.8% of the world's GDP [in purchasing power parity current international dollars].*[122]
>
> *The GII relies on two sub-indices—the Innovation Input Sub-Index and the Innovation Output Sub-Index—each built around pillars. It is comprised of seven pillars, each divided into three sub-pillars, which include two to five individual indicators. Sub-pillar scores are calculated using the weighted average of its individual indicators. The number of indicators reached a total of eighty this year. The pillar scores are calculated using the weighted average of its sub-pillar scores.*[123]

The Global Innovation Index (GII) is the average of the Innovation Input and Output Sub-Indices, which are as follows:

- The Innovation Input Sub-Index is the average of the following five pillar scores:
  - Institutions
  - Human Capital and Research
  - Infrastructure
  - Market Sophistication
  - Business Sophistication
- The Innovation Output Sub-Index is the average of the following two pillar scores:
  - Knowledge and Technology Outputs
  - Creative Outputs

Digital Skills and Values: Global Competitiveness Index (Skills Component)

The Skills Component of the Global Competitiveness Index (GCI) is considered an appropriate proxy for the Innovation-Driven Entrepreneurship pillar of this study, as it includes many different aspects of the education level and overall skill level of a country's citizens. The GCI is prepared by the World Economic Forum (WEF), and it is possible to use the 2019 iteration in this study. Another alternative was the Human Capital Index, a component of the EGDI that incorporates four indicators and is more limited in scope.

The following information is based on the Global Competitiveness Report 2019:[124]

> *The GCI is a "composite indicator"; its computation is based on successive aggregations of scores, from the indicator level (the most disaggregated level) to the overall score (the highest level). At every aggregation level, each measure is computed by taking the average of the scores of its components. The overall GCI score is the average of the scores of the 12 pillars. In total, there are 103 indicators distributed across the 12 pillars. Indicators are sourced from international organizations, academic institutions, and non-governmental organizations.*[125]

121 Dutta, Soumitra; Lavin, Bruno; and Wunsch-Vincent, Sacha, eds., "The Global Innovation Index (GII) 2019: Creating Healthy Lives – The Future of Medical Innovation," *Cornell University, INSTEAD, and the World Intellectual Property Organization*, (2019). Retrieved from: https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2019.pdf.
122 Ibid., 9.
123 Ibid., 9.
124 Schwab, Klaus, ed., "The Global Competitiveness Report 2019," *World Economic Forum* (2019): 612. Retrieved from: http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf.
125 Ibid., 2.

The sub-indices and indicators of the Skills component of the GCI are as follows:

- Current workforce (50%)
  - Education of current workforce (50%)
    - Mean years of schooling
  - Skills of current workforce (50%)
    - Extent of staff training
    - Quality of vocational training
    - Skillset of graduates
    - Digital skills among active population
    - Ease of finding skilled employees
- Future workforce (50%)
  - Education of future workforce (50%)
    - School life expectancy
  - Skills of future workforce (50%)
    - Critical thinking in teaching
    - Pupil-to-teacher ratio in primary education

C. Selected Best Practices for a Digital Economy

Below are some of the many identified best practices being put forth by countries in areas relevant to the Digital Economy Blueprint. Where no reference is cited, the source is primary data collection activities identified in Section II of this report.

Digital Government

The rapid development in digital government is evidenced most clearly in various initiatives that have been undertaken in these countries in recent years. Some notable examples include:

- Ghana – The successful rollout of the e-Parliament system to allow a paperless flow of information within its parliament.[126]
- Kenya – The implementation of Huduma, a national e-citizen portal that will enable more effective delivery of all government services.[127]
- Benin – The development of a national e-services portal that will be a single point of entry to all public services provided by the government.[128]
- Burkina Faso – The establishment of the e-Burkina Project, which improves the capacity and use of ICT by public and private administrations through e-services.[129]

Digital Business

While there is a gap between the best countries in the world and Africa with regards to digital business (i.e., the United States and Mauritius), as well as this study's selected countries, progress is being made. Some notable examples include:

- Kenya – The creation of iTax, an online platform where users can file taxes and request tax compliance certificates, has enhanced revenue collection in Kenya.[130]
- Ghana – The Mobile Money Interoperability (MII) system was launched in 2018 to enable cross-mobile money transactions. The MII will deepen financial inclusion in the country.[131]
- Sierra Leone – The use of blockchain, in partnership with the UN and Kiva.org, is helping the unbanked in Sierra Leone build credit histories, aiming to increase extension and inclusion of digital financial services within the country.[132]
- Burkina Faso – The development of the G-Cloud project, in collaboration with Alcatel Lucent, aims to be a cloud platform for the benefit of administration, businesses, and citizens.[133]

126 Ahiabenu, Kwami, "e-Parliament: Bringing Citizens Closer to Parliament," *Graphic Online*, July 20, 2016. Retrieved from: https://www.graphic.com.gh/features/opinion/e-parliament-bringing-citizens-closer-to-parliament.html.
127 "Huduma Centres to Be Rollout in All Counties," *The Standard*, April 29, 2014. Retrieved from: https://www.standardmedia.co.ke/business/article/2000110484/huduma-centres-to-be-rollout-in-all-counties.
128 Hankewitz, Sten, "Estonia's e-Governance Academy Helps Deliver Digital Services in Benin and Ukraine," *Estonian World*, April 16, 2020. Retrieved from: https://estonianworld.com/technology/estonias-e-governance-academy-helps-deliver-digital-services-in-benin-and-ukraine/.
129 "Project Appraisal Document on a Proposed Credit in the Amount of EUR 18.8 Million to Burkina Faso for the eBurkina Project," *The World Bank* (2016). Retrieved from: http://documents.worldbank.org/curated/en/297631484073715323/pdf/eBurkina-PAD-P155645-12292016.pdf.
130 Kamau, Stephen, "ITAX KRA Website Kenya Manual: Registration, Returns, Compliance Certificate, Pin Checker," *TUKO*, 2019. Retrieved from: https://www.tuko.co.ke/269092-itax-kra-website-kenya-manual-registration-returns-compliance-certificate-pin-checker.html.
131 "Ghana's First Mobile Money Interoperability System Deepens Financial Inclusion and Promotes Cashless Agenda," *AFI Global*, May 16, 201. Retrieved from: https://www.afi-global.org/news/2018/05/ghanas-first-mobile-money-interoperability-system-deepens-financial-inclusion.
132 Huang, Roger, "Sierra Leone to Credit Score the Unbanked with Blockchain," *Forbes*, January 23, 2019. Retrieved from: https://www.forbes.com/sites/rogerhuang/2019/01/23/kiva-partners-with-un-and-sierra-leone-to-credit-score-the-unbanked-with-blockchain/.
133 "G-Cloud: Burkina Faso Entrusts Its Cloud Services to Alcatel Lucent," *VueTel*, February 3, 2016. Retrieved from: https://www.vuetel.com/en/g-cloud-burkina-faso-entrusts-its-cloud-services-to-alcatel-lucent/.

Infrastructure

While there is some gap between the countries in this study and countries in the rest of Africa, let alone the rest of the world, progress is being made. Some notable examples include:

- Gabon – Large investments have been made since 2012 in the construction of a broadband fibre optic network, which is intended to improve the communications infrastructure between other countries in the Central African sub-region.[134]
- Senegal – The construction of Digital Centres in each of its 45 departments, which will enable numerous administrative services to be made available to citizens by 2025. This project is part of the ongoing Administrative Services Digitalisation and Computation Programme.[135]
- Kenya – The implementation of a National Optical Fibre Backbone Infrastructure (NOFBI) that will grow the fibre network to 50,000 km.[136]
- Benin – The establishment of a project, in collaboration with the Alliance for Affordable Internet (A4AI), that will improve digital connectivity and usage in the country.[137]

Innovation-Driven Entrepreneurship

While a gap remains between the highest-ranked countries in the world (especially Switzerland) and this study's selected countries in terms of innovation-driven entrepreneurship, there are markers of progress. Some notable examples include:

- Cote d'Ivoire – The establishment of the Digital Youth Foundation to incubate and support innovative startups.[138]
- Ghana – The development of Accra Digital Centre, a technology park designed to create an ecosystem for digital innovation and entrepreneurship.[139]
- Kenya – The creation of iHub, a tech incubator that provides a co-working space for developers and entrepreneurs to connect.[140]
- Senegal – The establishment of the General Delegation for Rapid Entrepreneurship (DER) to catalyse entrepreneurship, specifically for women and youth.[141]
- Gabon – The existence of a network of incubators, innovation entrepreneurship, and NGOs. For example: JB Gabon, a member of Junior Achievement Worldwide, that instructs youth on entrepreneurship, financial literacy, and work readiness.[142]

Digital Skills and Values

While there is a gap between the highest-ranked countries in the world and this study's selected countries regarding digital skills and values, efforts are being made by countries to change the current situation. For instance:

- Kenya – The creation of the Digital Literacy Programme, known as Digischool, to ensure that every student is prepared to thrive in a global digital world,[143] and the establishment of Youth Empowerment Centres across the country with broadband access to facilitate digital skills and allow young people to search for work.[144]

134 These countries include Cameroon, the Central African Republic, Chad, Sao Tome and Principe, and the Democratic Republic of the Congo (DRC). For more information, see: "Gabon: Leading ICT-Connected Country in Central and Western Africa Thanks to Judicious Investments," *The World Bank*, June 15, 2018. Retrieved from: https://www.worldbank.org/en/news/feature/2018/06/25/gabon-leading-ict-connected-country-in-central-and-western-africa-thanks-to-judicious-investments.
135 "Senegal: Government Announces Construction of Digital Centers in All Departments," *Ecofin Agency*, July 23, 2019. Retrieved from: https://www.ecofinagency.com/telecom/2307-40344-senegal-government-announces-construction-of-digital-centers-in-all-departments.
136 Republic of Kenya, "The National Broadband Strategy: A Vision 2030 Flagship Project," *Government of the Republic of Kenya* (2013): 41. Retrieved from: http://icta.go.ke/pdf/The_National_Broadband_Strategy.pdf.
137 "Benin and A4AI Join Forces to Accelerate Progress on Affordable, Universal Broadband Access," *Alliance for Affordable Internet (A4AI)*, October 18, 2019. Retrieved from: https://a4ai.org/benin-and-a4ai-join-forces-to-accelerate-progress-on-affordable-universal-broadband-access/.
138 "Fondation Jeunesse Numerique – Accompanying Innovative Digital Projects From Young Ivorians," *ITU* (accessed on July 13, 2020). Retrieved from: https://www.itu.int/net4/wsis/archive/stocktaking/Project/Details?projectId=1488301393.
139 "Accra Digital Centre," *Government of Ghana* (accessed on July 14, 2020). Retrieved from: http://adc.gov.gh/.
140 Delex, Niyongabo, "iHub, Kenyan Tech Incubator Becomes Africa's First to Digitize All Assets," *Region Week*, November 8, 2018. Retrieved from: https://regionweek.com/kenya-tech-incubator-ihub-becomes-first2-digitize-assets/.
141 "DER Senegal: Innovative Government Funding for African Entrepreneurship," *ICT Works*, December 19, 2018. Retrieved from: https://www.ictworks.org/der-senegal-government-innovation/#.Xup5-kBFxPY.
142 "Radia Garrigues: CEO of an Incubator Providing Gabon's Youth With Skills for the Future," *The World Bank*, March 8, 2019. Retrieved from: https://www.worldbank.org/en/news/feature/2019/03/08/radia-garrigues-ceo-of-an-incubator-providing-gabons-youth-with-skills-for-the-future.
143 "Digischool," *Government of Kenya* (accessed on July 14, 2020). Retrieved from: http://icta.go.ke/digischool/.
144 "Gov't to Establish Youth Empowerment Centers in Sub Counties," *Kenya's Watching*, August 12, 2019. Retrieved from: https://www.kbc.co.ke/govt-to-establish-youth-empowerment-centers-in-sub-counties/.

- Gabon – With heavy investments made in infrastructure, the cost of internet access has fallen since 2010 and the number of internet subscribers has grown, providing people with access to distance learning and governments with the ability to collect data to help formulate development policies.[145]
- Senegal – The country is making efforts to develop an Education Management Information System (EMIS) to help monitor performance in its education system.[146]

D. Smart Africa Initiatives for a Digital Economy

Smart Africa has several initiatives that aim for the harmonisation of ICT policy, legal and regulatory frameworks, and standards.

Smart Broadband Strategy

The goal of this project is to create a smart broadband strategy document that addresses the issue of broadband and internet infrastructure in Africa. It also involves developing a central database for all information related to broadband and internet infrastructure in Africa.

The Intra-African Connectivity Project

The goal of this project is to create a connected Africa that will make internet and broadband accessible and affordable. It involves the use of voice, SMS, and data traffic generated and destined for Africa, which will stay within the boundaries of the continent, as well as a data protection framework that will be outlined to protect businesses and individuals.

Bulk Purchase of Wholesale Submarine and Satellite Internet Bandwidth

Smart Africa has launched an initiative that aims to make broadband affordable for its member states by working to secure an agreement with international broadband providers for long-term bulk submarine and/or satellite bandwidth. The goal of this project is to reduce the cost of broadband internet for Africa to an average of $2 per 1GB.

The One Africa Network Project

OAN aims to make intra-African communication secure and affordable, supporting millions of Africans in Smart Africa member states. The expected results of this project are affordable roaming costs for the average African, as well as keeping the intra-African traffic within the boundaries of the continent.

Cloud and Data Centres for Africa

The goal of this project is to reduce the dependency on infrastructure located outside of Africa through faster download and upload speeds, as well as local hosting of content and services.

The Startup Acts

Following the release of the Africa Blueprint for Startups and ICT Ecosystems as part of the flagship project led by Tunisia, the Smart Africa Secretariat is now working on the dissemination of the best practices of the blueprint through the following:

1. Providing technical assistance for the development of Startup Acts for member states
2. Supporting the implementation of the recommendations of the blueprint
3. Activating the Smart Africa working group to coordinate all activities related to startups and innovation ecosystem development

Blueprint on ICT Skills Development and Capacity

The goal of this project is the development of a comprehensive blueprint guide for the member states of Smart Africa. It will enable them to effectively identify the ICT skill development and capacity-building needs towards an African digital market and economy.

145 "Gabon: Leading ICT-Connected Country in Central and Western Africa Thanks to Judicious Investments," *The World Bank*, June 25, 2018. Retrieved from: https://www.worldbank.org/en/news/feature/2018/06/25/gabon-leading-ict-connected-country-in-central-and-western-africa-thanks-to-judicious-investments.
146 "EDUPAC: Simplifying Education Management," *Management and ERP Portal* (accessed on July 14, 2020). Retrieved from: https://emis.africa/landing/index.php?country=sn.

E. Strategic Development: Designing Digital Economy Plans

In 1996, the Economic Commission for Africa (ECA) Council of Ministers adopted the African Information Society Initiative (AISI) Resolution as an ICT for Development framework.[147] This declaration was a thorough, regional ICT4D framework that built on the work of the UN Economic Commission for Africa (UNECA) and broadly articulated the foundation and building blocks for regional digital cooperation in Africa. Subsequent declarations followed from the World Summit on the Information Society (WSIS), a two-phase, UN-sponsored global summit between 2003 and 2005.

Around the same time period, UNECA launched a framework named the National Information and Communication Infrastructure (NICI) Initiative in 2004 and developed a blueprint for ICT for development strategies in Africa,[148] one of the first steps in ICT for development policy and planning in Africa. More recently, the AU adopted its own Digital Transformation Strategy for Africa,[149] a key element in achieving the common agenda of promoting regional economic integration by 2030.[150]

The following are key steps in the digital economy planning and strategic development process promoted by Smart Africa in particular.[151]

Step 1: Determining the National Development Priorities

The national ICT policy and plan should be developed within the national planning framework and consequently contribute to the national development priorities. A country's national development plan comprises broad goals and aspirations for the economy and offers a long-term perspective. It should identify the role that different sectors of society need to play in reaching those goals, as well as a shared long-term strategic framework for how more detailed, cross-cutting planning can take place across government while also including different sectors and stakeholder groups within society.

Step 2: Development of the National ICT Policy Framework

The journey towards a fully developed digital economy may typically start with the development of a national ICT strategy or roadmap. These national ICT documents should provide the visionary direction of a country's ambition in developing a digital economy and how it plans to pursue a digital transformation agenda in the coming years. They should also outline the vision of elevating the digital economy, bringing citizens out of poverty, and meeting the Sustainable Development Goals.

Governments and other institutions create policies to provide the necessary conceptual and institutional framework for the coordination and integration of technical and social interventions by all stakeholders, ranging from government to civil society to the private sector. This coherence among the actions of various public, private, and civil entities avoids contradictions in the implementation of projects.

Step 3: ICT Programme Implementation

Implementation of an ICT strategy and/or strategic plan should reaffirm national political will to meet the objectives and goals set out and thereby contribute to the achievement of the overall national vision. A key component of implementation is a dedicated office at the ministry or agency level to carry out monitoring and evaluation activities that monitor progress and implementation of the plan. Implementation should also help establish a credible and flexible institutional framework to implement and manage the policy, including an overall responsible ministry for coordinating ICT activity and projects, as well as policy-level and technical implementation organs, namely, ICT implementation and regulatory agencies. Additionally, an ICT strategic implementation plan should break down KPIs with target dates, providing goals and objectives for how the vision can be achieved.

147 UNECA, "The African Information Society Initiative (AISI): A Decade's Perspective," *Economic Commission for Africa* (2008): 1-10. Retrieved from: https://repository.uneca.org/handle/10855/14949.
148 Ibid., 13-22.
149 African Union, "The Digital Transformation Strategy for Africa (2020-2030)," *African Union* (accessed on July 16, 2020). Retrieved from: https://au.int/sites/default/files/documents/38507-doc-dts-english.pdf.
150 The DTS was developed in collaboration with other partners and builds on initiatives and frameworks, including the Policy and Regulatory Initiative for Digital Africa (PRIDA). PRIDA is a joint initiative of the AU, EU, and ITU that aims to enable Africa to reap the benefits of digitalisation. For more information, see: "Policy and Regulatory Initiative for Digital Africa (PRIDA)," *ITU* (accessed on July 14, 2020). Retrieved from: https://www.itu.int/en/ITU-D/Projects/ITU-EC-ACP/PRIDA/Pages/default.aspx.
151 These steps have been sourced from conversations and material shared between DIAL and the Smart Africa Alliance.


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