



United Nations
Economic Commission for Africa

Policy position paper towards a digital economy policy framework for Africa

Policy paper

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Executive summary

While the digital economy in Africa is currently quite undeveloped, this situation represents an immense opportunity for increasing the well-being of Africans through wealth creation. African States are aware of the benefits of the emerging digital economy, as evidenced by the high-level political, regulatory and operational support in many countries for creating an enabling environment and promoting the digital economy. A wide range of stakeholders in the policy, regulatory, technological, and business spheres are putting in place the basic building blocks of the digital economy. Nevertheless, much work remains to be done to address low adoption and disparities within the region and to promote rapid growth. The present position paper¹ is a contribution by the Economic Commission for Africa – with acknowledgement of the work already done by others – to providing an impetus for rapid growth through synergistic leveraging of mandates and capacities among stakeholders.

It contains a situational analysis of the digital economy landscape in Africa and of the various components that undergird the digital economy: basic digital infrastructure, an enabling framework and the contributions of stakeholders inside and outside Africa. In the present position paper, the progressive journey towards the digital economy of the African Union is highlighted, along with the key supportive measures that the Union has taken in that connection.

The African Union and its institutions have established the framework for an approach coordinated at the regional and national levels. The framework is complemented by and aligned with the work of United Nations institutions and agencies, which continue to make immense contributions from various perspectives. Private sector and non-governmental organizations inside and outside Africa are drivers of the development of digital infrastructure and of other components of the digital economy. Their efforts complement the work of other stakeholders in promoting the growth of the digital economy. A major finding of the present study is that numerous decisions have already been taken by various institutions, agencies, think tanks and others, many of which have yet to be implemented. A second finding is that country diagnostics and assessments in important policy areas relating to the degree of digital economy development continue to be undertaken and could frame spaces for intervention. The lack of official data measuring the digital economy in Africa and of data for other regions that can be used as comparable data to assess the situation in Africa impedes the development of holistic policy intervention strategies. Therefore, a conclusion of the present paper is that, even as African States are developing new positions and decisions, a foundation of decisions already exists, and it is critical that they be implemented.

The definition of the digital economy for Africa is the subject of continuing debate, and there is a desire to have indicators that will ensure the alignment and comparability of the definition with that of other regions. With such indicators, it will be possible to collect data and then to compare the progress within Africa, its subregions and its countries, which will provide clarity on which intervention measures are needed. In the present paper, a definition of the digital economy has been adopted that is broken down into three tiers: core (digital sector and associated technologies), narrow scope (digital services and the platform-based

¹ The paper was prepared by Muriuki Mureithi, Summit Strategies Ltd., Nairobi.

economy) and broad scope (all digitalized sectors), as inspired by the work of Bukht and Heeks (2017) and adopted by the United Nations Conference on Trade and Development (UNCTAD) in its reports on the digital economy (UNCTAD, 2019).

Using this definition, the African digital economy landscape can be shown to be a market that, while growing, remains very small. For example, UNCTAD (2019) estimates the contribution to global gross domestic product (GDP) of the digital economy at between 4.5 per cent (narrow scope) to 15.5 per cent (broad scope). At the 2021 Africa Digital Economy Summit of the United States Chamber of Commerce, the Executive Vice President and Head of International Affairs of the Chamber, Myron Brilliant, estimated that, by 2025, the global digital economy would be worth \$23 trillion, or 25 per cent of global GDP, while that of Africa would amount to \$700 billion by 2050 (Brilliant, 2021). The contribution of Africa is clearly small, a point made in a joint report by Google and the International Finance Corporation (IFC), published in 2020, which indicates that the digital economy represents an opportunity to contribute \$180 billion to the African economy by 2025, rising to \$712 billion by 2050 (Google and IFC, 2020). The data show that the contribution of Africa represents a tiny fraction of the global digital economy. These projections are premised on the assumption that digitalization, policy developments and human resource development will continue at their current rates and that governance and policy structures that are designed to help an expanding African market grow will gradually be developed. There is, therefore, an opportunity for Africa to change course and address challenges that affect the development of the digital economy. This is a call for Africa to increase its stake in the emerging global economy from the current tiny fraction, with a view to achieving a higher share, on a par with the other regions of the world. In African countries and subregions, there is an understanding of what needs to be done, of how it could be done and of the direction to take. It is also clear that political will exists at the highest level. It is time to take action, by implementing the decisions taken by stakeholders in the quest to promote the digital economy.

In the Declaration on Internet Governance and Development of Africa's Digital Economy, which was adopted by the Assembly of Heads of State and Government of the African Union in 2018, a framework for the digital economy was set out. The subsequent policy directives, including the Digital Transformation Strategy for Africa, 2020–2030 (African Union, 2020), provide guidance from the highest level. The African Continental Free Trade Area has provided a necessary boost to trade across Africa and the decision by the African Union to incorporate e-commerce and digital trade, by means of the phase III negotiations, represents an opportunity to create a treaty-level framework for the growth of the digital economy. Once concluded, successful negotiations on phase III of the African Continental Free Trade Area may provide an impetus for the seamless cross-border operations that are critical to realizing an expanding market and to enabling the 1.4 billion people of Africa to harness the digital economy. Several frameworks by African Union organs and institutions, the African Development Bank and regional economic communities on such matters as cross-border data flows, cybersecurity, emerging technologies and digital identification provide inspiration for the rapid digitalization that is a foundation for an expanding digital economy.

In its quest for an expanded digital economy, Africa receives immense support from the World Bank Group, through the Digital Economy for Africa Initiative; from United Nations agencies; from regional and national organizations, including the European Union; from the

Smart Africa Alliance; and, recently, from the Government of the United States of America, among others. The support contributes immensely to the various building blocks of a digital economy. As mentioned, private sector organizations, inside and outside Africa, are essential drivers for realizing the digital economy.

The challenges of the digital transformation to realize the digital economy cannot be overstated. Inadequate digital infrastructure is an obstacle to the development of the digital economy. Currently, Africa has the lowest broadband penetration of all regions of the world: 40 per cent, which is around half the global average (ITU, 2021). It follows, therefore, that Africa is starting off from a disadvantaged position, owing to the inadequacy of its digital infrastructure, which is critical for a digital economy. Nevertheless, efforts continue: international undersea fibre-optic cables are providing immense capacity, offering room for growth, with almost all coastal countries now connected. This represents a chance to engage with and take advantage of global opportunities in the digital economy.

Undersea fibre-optic cable capacity has increased rapidly to 406 terabits per second (Tbps), compared with a used capacity of just 15 Tbps, bringing Africa cheaper connectivity to the other regions of the world. Some issues on which it would be worth reflecting within Africa are that, since the newer cables will not reach all coastal countries, some will miss the benefits of the newer infrastructure; the invested capital is from outside Africa; and the firms installing, owning, using and leasing the undersea fibre-optic cables to other operators are increasingly outside the telecommunications industry. The implications of the new entrants from outside the traditional telecommunications space is not clear at this stage.

The greater challenge, however, is cross-border terrestrial infrastructure across the region. Its development is progressing rapidly, with over 1 million km of fibre-optic cable laid and 20 per cent of the fibre-optic cables terminating in homes and offices where digital economy transactions are initiated. Cellular phone connectivity – via broadband, via third- and fourth-generation cellular networks and now, via the fifth-generation networks currently being installed – continues to enable Internet access and, therefore, the digital economy. The usage gap is high. Approximately 62 per cent of the African population now lives within 25 km of a fibre-optic network node (Hamilton Research, 2022).

In addition to digital infrastructure, the data flows across the region that would facilitate the development of the digital economy are nascent. Important elements to be addressed include the security of the data, the framework for their protection and the digital identities of users. The African Union has endorsed policy frameworks, but they have yet to be implemented. In 2014, African Governments acceded to the African Union Convention on Cyber Security and Personal Data Protection (Malabo Convention), but it still has not come into force, denying Africa the opportunity to benefit from a framework for the secure cross-border data flows that are critical for trade.

Evolving emerging technologies are already present in Africa, contributing to the growth of the digital economy. Artificial intelligence, big data, the Internet of things, three-dimensional printing, drones and distributed ledger technology have all been identified, in a study funded by the African Development Bank, as key emerging technologies with the potential to change growth dynamics on the continent. The foremost of these technologies is the

Internet of things, in which it was projected that capital investments totalling up to \$110 million would be made by 2021, creating a \$12.6 billion market (Technopolis, Research ICT Africa and Tambourine Innovation Ventures, 2019).

With the rapidly evolving nature of emerging technologies, regulation is problematic, not just in Africa, but around the world. The main regulation challenges identified by Deloitte researchers are the pacing problem; disruptive business models; data, digital privacy and security; and artificial intelligence. With a view to creating a regulatory framework, which is critical, the researchers proposed five principles: adaptive regulation, regulatory sandboxes, outcome-based regulation, risk-weighted regulation and collaborative regulation (Eggers, Turley and Kishnani, 2018).

Since they can reduce high cross-border transaction costs, digital currencies and digital assets anchored by distributed ledger technology are increasingly important for cross-border trade. Work by the World Bank shows that the average financial remittance costs in sub-Saharan Africa are twice those of South Asian countries and that the costs can be even higher in some African countries (Making Finance Work for Africa, 2021). Such high costs are an impediment to the development of the digital economy, and cryptocurrencies will continue to be attractive, albeit in an informal way. Governments are therefore looking at central bank digital currencies for rapid payments at the national level and also for the purpose of facilitating cross-border payments. The issue under consideration is whether African States will want to take a cybersecurity-driven approach of converting their national currencies to central bank digital currencies, resulting in a continent with 54 different such digital currencies, the convertibility of which may play into the costs of cross-border payments and the huge costs of currency conversion. According to the secretariat of the African Continental Free Trade Area, the annual conversion costs of the 42 African currencies are \$5 billion, which is a huge cost on trade (Mene, 2021).

In the quest to promote emerging technologies in Africa, the African Union directed the African Union Development Agency-New Partnership for Africa's Development to constitute, in 2016, the High-level Panel on Emerging Technologies. The Panel has since published a framework for drones in precision agriculture and is working, through a stakeholder-driven and consultative process, on frameworks for fifth-generation cellular networks, the Internet of things and three-dimensional printing.

Another area of critical importance is a review of taxation frameworks that impede digital infrastructure growth. The Global System for Mobile Communication Association notes that, in Kenya, taxation of the cellular phone sector is at a rate 2.2 times higher than the sector's contribution to national GDP. This impedes investment in the sector and causes prohibitive service costs, leading to exclusion due to unaffordability (Global System for Mobile Communication Association, 2020), which represents a significant obstacle to participation in the digital economy by the most disadvantaged population groups and by small and medium-sized enterprises.

Stakeholders should take additional action in a number of areas. In taking such action, stakeholders should leverage the Digital Transformation Strategy for Africa, 2020–2030, while keeping in mind the various ongoing activities in support of the Strategy, especially on an

enabling environment and, in particular, on data policy, on a digital identity, on cybersecurity, on electronic payment systems and on harnessing emerging technologies to deepen the digital economy. In addition, while taking such action, stakeholders should also draw inspiration from the ideals of the African Continental Free Trade Area.

The first area for additional action is the measurement of and reporting on the digital economy, which can be broken down into two aspects. First, the term digital economy needs to be defined because many of the stakeholders cited in the present position paper use it interchangeably with such terms as digital trade, e-commerce and Internet economy; in addition, they all emphasize different areas of activity that need to be prioritized for its growth. Of course, the digital economy is still evolving, which represents an opportunity to develop a common definition of the digital economy, which must certainly be aligned with global processes. Such a definition will facilitate the description of which activities are included in the digital economy, the establishment of a clear value chain for its evolution and the setting-out of relevant intervention measures along the value chain. Second, a common framework must be implemented for official data collection on the digital economy in Africa. Alongside the definition of the digital economy, the development of its indicators – within the global community, for compatibility purposes – will enable monitoring and evaluation. This will facilitate data collection at the national and regional levels and will highlight areas that require special intervention. Data collection should be aligned with international standards, in order to ensure comparability. This will highlight any areas in which special intervention measures might be necessary, in order to leave no one behind, in line with the Sustainable Development Goals.

The second area for additional action is the development of a coordinated approach to the digital economy. This will entail establishing a multi-stakeholder platform for constructive collaboration on the development of the digital economy and on the sharing of experiences. The Digital Transformation Strategy for Africa, 2020–2030, illustrates the many building blocks of which a thriving digital economy is comprised, and the present position paper details the numerous stakeholders involved in all those building blocks. An overarching pathway creating linkages will provide a framework for sharing among all stakeholders, whether international, regional or subregional, whether Governments, private businesses, civil society organizations or academic institutions. It will create synergies and ensure that all building blocks are given appropriate support. Governments have well-developed institutional infrastructures for coordination on policy and regulatory action; however, the private sector, as regards realization of the digital economy, and civil society, as regards advocacy, both play essential roles, and their participation needs to be prominent.

The third area for additional action is the establishment of a treaty-level framework for the digital economy, to which end the phase III negotiations on the African Continental Free Trade Area should be fast-tracked and the resulting protocol implemented. The digital economy has many building blocks for which regulatory frameworks spanning multiple jurisdictions need to be agreed in order for them to function. Phase III of the negotiations should address components that are critical for the digital economy in order to ensure cross-border compatibility of systems and enforceable cross-border regulations. When operationalized, the Malabo Convention will provide a seamless framework on personal data-sharing and on

data protection. The goodwill behind the African Continental Free Trade Area can be the driving force in establishing the requisite legal framework for the digital economy.

The final area for additional action is the creation of a pan-African institutional framework for the digital economy, under the African Continental Free Trade Area. As mentioned in section II.A of the present position paper, the current estimate is that the digital economy will account for 25 per cent of global GDP by 2025. Through the many institutions of the African Union, the regional economic communities and Governments have developed and promulgated policy directives, decisions, mandates, initiatives, regulatory frameworks and recommendations to deepen the digital economy, complemented by the work of international organizations, private businesses and civil society organizations; many have not been implemented, for various reasons. Such an institutional infrastructure will bring focus to African efforts to establish the digital economy, will constitute a repository of all those efforts and, importantly, will catalyse the implementation of decisions and avoid repetition.

I. Introduction

The Economic Commission for Africa (ECA) commissioned the present study in order to obtain a comprehensive situational analysis of digital economy policy in Africa in the context of the digital transformation and to explore policy opportunities for rapid growth. The study was commissioned in view of the many stakeholders and ongoing processes involved in digital economy policy and the need to create a framework for the evolution of such policy. Preliminary findings were presented to an expert group meeting that was convened to assess the digital economy policy map of Africa, which was held in Djibouti from 22 to 24 December 2021. The expert comments and suggestions provided during that meeting, combined with secondary research and the review and comments of the ECA focal point for the study, form the foundations of the present report.

A. Background and context

The digital transformation anchors implementation of the 2030 Agenda for Sustainable Development and Agenda 2063: The Africa We Want, of the African Union. Already, the application of digital technologies is driving socioeconomic transformation, making the production and distribution of goods and services more efficient and opening up new markets and opportunities to boost the incomes of millions of people. The opportunity for Africa lies in developing and entrenching a digital economy founded on increased trade between African countries, on expanding the market for digital products and services and on enabling new pan-African business models and value chains to evolve and compete globally. Africa, as a whole, and many African States, individually, are not well equipped to compete in the global digital economy, owing to a number of challenges, as set out in the Digital Transformation Strategy for Africa, 2020–2030, part of Agenda 2063, which continue to affect the rapid growth of the digital economy.

In Africa, donors, international institutions, government agencies, businesses and civil society organizations are actively involved, each with a different approach, in addressing the above-mentioned challenges and in helping the continent to unlock its digital economy. In the present report, a framework is set out for defining and understanding the digital economy in Africa and for gaining a sense of the pace of its evolution in Africa in comparison with the rest of the world. In addition, selected stakeholders in the African digital economy are highlighted in the report, along with the space in which each stakeholder operates, the way in which it operates and its reasons for doing so.

One of the key findings is that policymakers in Africa are very aware of the digital economy and wish to promote its rapid growth, with the result that, while the digital economy is expanding on the continent, it is doing so far more slowly than in the rest of the world.

B. Objectives of the study

The expected outcome of the study is a policy position paper grounded in detailed situational analysis. The present policy position paper is intended to shed light on continuing efforts to promote the digital economy and to set out a policy framework for leveraging multi-stakeholder capacities to achieve rapid growth. The framework has three elements: a platform, which policymakers and key stakeholders will be able to use to collaborate and evaluate progress made in the transformation into a digital economy, with a view to achieving the Sustainable Development Goals and the aspirations under Agenda 2063; a coordination framework for development partners, intergovernmental institutions, the private sector, civil society organizations, African Governments and other stakeholders in the digital economy; and institutional arrangements for creating digital economy synergies with a view to achieving the Sustainable Development Goals and the aspirations under Agenda 2063. This approach brings together stakeholders in the digital economy.

C. Motivations for producing a digital economy policy framework for Africa

A digital economy policy framework for Africa would constitute recognition of a changing operating environment and the role of the digital economy as a driver of the fourth industrial revolution. The policy framework is intended to:

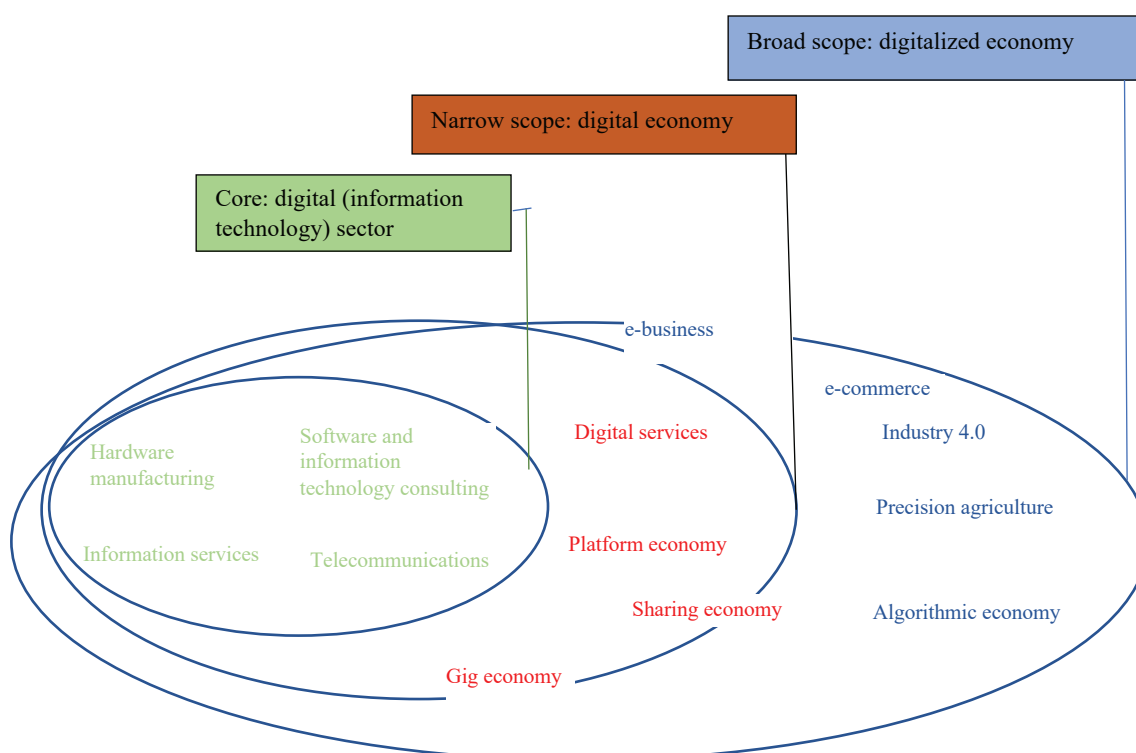
- a. Provide an overarching framework for the policy, regulatory, strategic and operational aspects of the evolution into a digital economy;
- b. Create the necessary linkages for a system of stakeholders that will drive the digital economy;
- c. Provide ownership of the home-grown definition and a cohesive framework for tools to monitor the evolution of the digital economy and mechanisms to intervene when necessary;
- d. Set out clear targets and linkages to the aspirations under Agenda 2063 and to the Sustainable Development Goals;
- e. Create a basis for coordination;
- f. Ensure the incorporation, both at the national level and within the regional economic communities, of the values embodied by the Sustainable Development Goals;
- g. Play a role in the ongoing negotiations relating to the African Continental Free Trade Area, specifically the phase III negotiations on e-commerce and digital trade, which will contribute to a treaty-level framework for the digital economy.

II. Defining a digital economy

The definition of a digital economy, which is an emerging phenomenon, has evolved since its first use by Don Tapscott (1995), reflecting changes in the technologies and in how they are used. Bukht and Heeks examined the existing definitions of a digital economy and subdivided the broader digital economy concept into three nested tiers (see figure I):

- a. Core, which comprises the digital sector and associated core information and communications technology (ICT), such as hardware manufacturing, software development and information technology consulting, information services and telecommunications;
- b. Narrow scope, which comprises digital services and the platform-based economy;
- c. Broad scope, made up of digitalized sectors, such as e-business, e-commerce, advanced manufacturing, precision agriculture, the algorithmic economy, the sharing economy and the gig economy (Bukht and Heeks, 2017), which form the basis of the fourth industrial revolution.

Figure I: Defining a digital economy



Source: Adapted from Bukht and Heeks, 2017.

These subdivisions of the digital economy provide a framework for policymakers to engage in areas that need attention, in order to formulate a pathway towards a robust and sustainable digital economy. They also help with pinpointing areas for enhanced policy interventions, identifying stakeholders and determining which indicators require monitoring and evaluation. Finally, this definition provides mechanisms for determining the geographic evolution of the digital economy and the status of regions or countries, with a view to offering a way

for countries that are lagging behind to learn from others and grow their digital economies sustainably.

A. Current digital economy landscape

The digital economy in Africa is evolving and growing rapidly, although the indicators differ depending on the definitions used. Several studies have demonstrated the growth of the digital economy and have emphasized the following points:

- a. The World Bank (2018) estimates that, in 2016, the global digital economy was worth \$11.5 trillion, or 15.5 per cent of global gross domestic product (GDP), and was expected to reach 25 per cent in less than a decade, with East African countries accounting for only a tiny fraction of that growth;
- b. The United Nations Conference on Trade and Development (UNCTAD) reported in 2019 that estimates of the size of the digital economy ranged from 4.5 per cent (narrow scope) to 15.5 per cent (broad scope) of global GDP;
- c. Manyika and others (2013) reported that, on the back of expanding penetration, the digital economy of Africa could be worth \$300 billion by 2025;
- d. In 2021, the Executive Vice President and Head of International Affairs of the United States Chamber of Commerce, Myron Brilliant, estimated that the worldwide digital economy would be worth \$23 trillion, equivalent to 25 per cent of global GDP, by 2025, while that of Africa would be worth \$700 billion by 2050;
- e. In 2020, Google and the International Finance Corporation (IFC) reported that the digital economy provided an opportunity to contribute \$180 billion to the African economy by 2025, rising to \$712 billion by 2050.

In Africa, the emerging digital economy is growing, but the continent is lagging behind the rest of the world. Political commitment is essential to rapid growth and the digital economy is increasingly being discussed at the highest level of African Governments, with ministers whose portfolios include the digital economy in Benin, Côte d'Ivoire, Kenya, Nigeria and Togo.

In addition to policy commitments, States are developing and implementing strategies for the digital economy. While most of these national strategies have evolved from digital transformation strategies, some States have developed specific digital economy strategies. One example is the *Digital Economy Blueprint: Powering Kenya's Transformation* (Kenya, 2018), which served as one of the inspirations for the Smart Africa Alliance,¹ has been used as a template by the Smart Africa Secretariat and was the model for similar policies now being implemented in 10 other African countries (Oyini Mbouna, 2021).

¹ A membership alliance of 30 African States and organizations that share the same vision, interests and goals, set out in the Smart Africa Manifesto; the Smart Africa Secretariat is its implementation arm.

B. Stakeholders in the transformation towards a digital economy and their activities

1. African stakeholders and processes

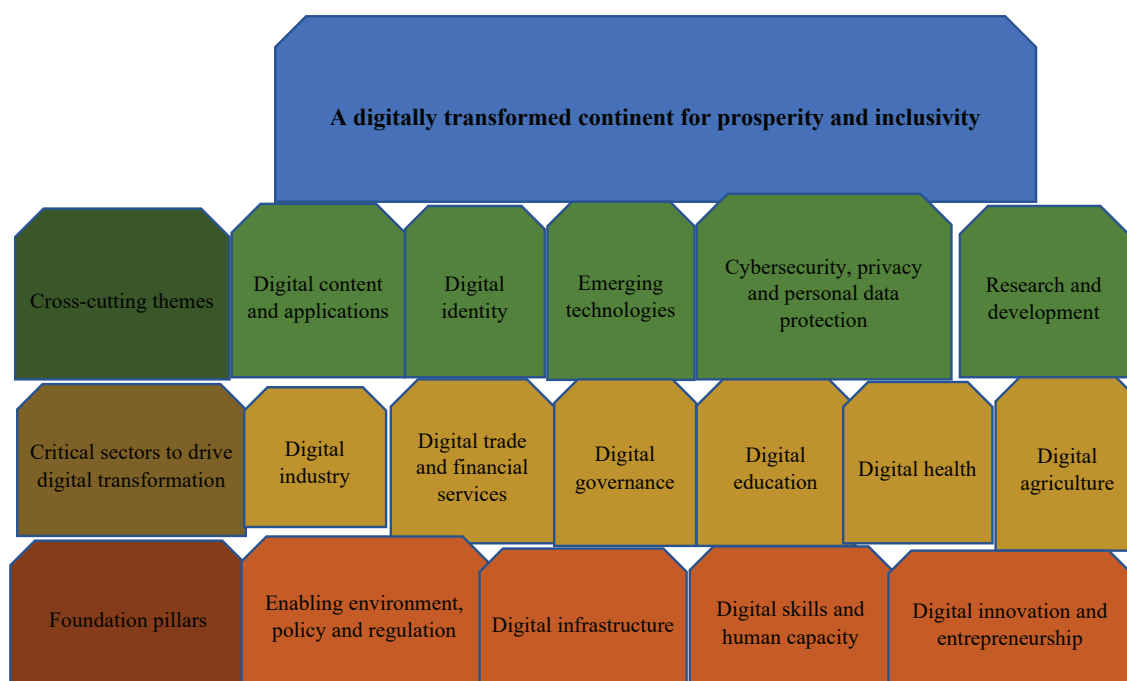
At the regional level, stakeholders that are engaged in digital economy development include the African Union Commission, the African Development Bank, the Smart Africa Secretariat and the regional economic communities. The Commission has taken the lead by setting out its long-term development strategy for the continent, in the shape of Agenda 2063, which provides a road map towards improved quality of life for Africans. Among its 10 flagship projects is the African Continental Free Trade Area, the launch of which, in July 2019, made African countries into members of the world's largest free trade area, bringing together the 55 States members of the African Union and the eight regional economic communities (African Union, 2023a); as at April 2023, the Agreement Establishing the African Continental Free Trade Area had been ratified by 46 States Parties (Secretariat of the African Continental Free Trade Area, 2023). The digital economy now comes under the umbrella of the African Continental Free Trade Area and the States parties to the Agreement governing it are negotiating a protocol on e-commerce and digital trade. Once in force, the protocol will provide a legally enforceable framework for continent-wide digital trade (African Union, 2023b). This will address regulatory bottlenecks that hold up cross-border initiatives on the digital economy. Start-ups, for example, in their quest to expand their markets and scale up, have had to operate within multiple different regulatory frameworks, impeding their rapid growth.

In 2018, the Declaration on Internet Governance and Development of Africa's Digital Economy established a framework for the digital economy. In the Declaration, the signatory States committed to ensuring a legal and regulatory environment that enables the growth of the digital economy on the continent through innovative applications and services and to requesting that the African Union Commission work with other stakeholders to assess the digital economy of Africa and determine areas for intervention. In the Declaration, Internet infrastructure, Internet governance and ratification of the African Union Convention on Cyber Security and Personal Data Protection (Malabo Convention) are highlighted as being critical.

a) Digital Transformation Strategy for Africa, 2020–2030

The Digital Transformation Strategy for Africa, 2020–2030, lays the foundations for digitalization, with a view to the rapid growth of a digital economy in Africa. The vision set out in the Strategy is that of an integrated and inclusive digital society and economy that improve the quality of life of the population of Africa, strengthening the existing economic sector, enabling its diversification and development and ensuring African ownership, with the people of the continent as producers and not just consumers in the global digital economy. One specific objective of the Strategy is to contribute to a growing digital economy by means of building, by 2030, a secure single digital market in Africa, in which free movement of people, services and capital is ensured and in which individuals and businesses can seamlessly access and engage in online economic activities, in line with the Agreement Establishing the African Continental Free Trade Area. As shown in figure II, the Strategy is multilayered,

Figure II: Conceptual framework for the digital transformation



Source: African Union, 2020.

with pillars, critical sectors and cross-cutting themes set out, with a view to realizing a digital transformation for prosperity and inclusivity.

The specific objective of the Digital Transformation Strategy for Africa, 2020–2030, is to drive the digital transformation in Africa and propel industrialization on the continent that contributes to the digital economy and supports the African Continental Free Trade Area. With a view to increasing prosperity and inclusivity on the continent by realizing its digital transformation, the African digital economy, using the broadest of the definitions given in figure I, has been included in the Strategy as a cross-cutting issue. The conceptual framework set out in figure II shows the four foundation pillars of the digital transformation: enabling environment, policy and regulation; digital infrastructure; digital skills and human capacity; and digital innovation and entrepreneurship. The Strategy includes detailed policy guidance for rapid development of the foundation pillars.

Also highlighted in the conceptual framework are the cross-cutting themes in increasing prosperity and inclusivity on the continent through its digital transformation: digital content and applications; a digital identity; emerging technologies; cybersecurity, privacy and personal data protection; and research and development. The cross-cutting themes provide the enabling soft infrastructure for anchoring vertical industries, which are identified in the conceptual framework as critical sectors for driving digital transformation. The critical sectors highlighted are: digital industry; digital trade and financial services; digital governance; digital education; digital health; and digital agriculture.

In line with the definitions adopted for the present report, cited in figure I, digital industry is equivalent to the core and narrow-scope components – the latter including digital trade and financial services – of the digital economy. The broad scope encompasses all the other

critical sectors cited, along with others not included in the conceptual framework. The digital economy is, therefore, a key aspect of a digital transformation and the pathway to establishing such an economy is the cross-cutting themes built on the foundation pillars in a synergistic interplay between the critical sectors, some of which are illustrated in the conceptual framework.

In the Strategy, the following strategic enablers are highlighted: political commitments, strengthening of the implementation framework, financing and investments, private sector and civil society engagement with the strategy, regional and international cooperation on implementing the Strategy, capacity development for officials driving the Strategy, advocacy and awareness among targeted groups and a monitoring and evaluation framework. The Strategy comprises multiple moving parts, each involving unique processes and challenges. To guide its implementation, the African Union Commission envisages an institutional architectural framework and the strengthening of digital economy coordination structures in its member States, the regional economic communities and the Commission itself.

As an illustration of the moving parts and of the challenges to be addressed, the development of a single digital market was built on the foundations of a framework for trust and security developed previously by the African Union: the Malabo Convention, adopted in 2014. In the Convention, the scope of the digital economy is defined, structures for secure personal data are established and a digital framework for trust is laid out. Under the Convention, States Parties are obliged to establish policy, legislative and regulatory measures to promote cybersecurity governance and to mitigate cybercrime, with a view to promoting regional cyberstability. The Malabo Convention provides a framework for personal data protection, cross-border data transfers and cybersecurity, all of which are critical for a digital economy to thrive.

In support of the Digital Transformation Strategy for Africa, 2020–2030, the African Development Bank, the Smart Africa Alliance, the World Bank Group, the European Union and the United States of America have launched initiatives targeting different but complementary elements of promoting the growth of the digital economy in Africa.

b) African Development Bank and the fourth industrial revolution

In 2019, the African Development Bank commissioned a study, in which the implications of emerging technologies were explored, alongside the ways in which they have been exploited to expand the digital economy towards the fourth industrial revolution, a progression premised on the fusion of physical, digital and biological technologies. First proposed in 2014, by Klaus Schwab, Founder and Executive Chairman of the World Economic Forum (Schwab, 2016), the fourth industrial revolution is bringing numerous benefits to society by means of technologies based on accessing and processing huge volumes of data, including artificial intelligence, big data, the Internet of things, cloud computing, high-speed connectivity on the fifth generation of cellular networks and distributed ledger technology, specifically blockchain. These technologies are applied in areas such as robotics and uncrewed autonomous vehicles. African Governments are seeking, not only to align themselves with one another, but also to take advantage of the emerging fourth industrial revolution. In that connection, States have launched initiatives and strategies to define how to leverage distributed ledger

technology and artificial intelligence for development. Kenya, South Africa and Uganda are setting out national fourth industrial revolution strategies; Ghana, Rwanda, South Africa and Tunisia have all developed national artificial intelligence strategies.

In the study commissioned by the African Development Bank, emerging technologies with the potential to change growth dynamics were identified, including artificial intelligence, the Internet of things, cloud technologies, connectivity on the fifth generation of cellular networks and distributed ledger technology, specifically blockchain. The African Development Bank has committed to focusing its development efforts on the market applications and potential uses of some emerging technologies in selected domains, namely agriculture, energy, industry, regional integration and health. In the study, recommendations are made to African policymakers and regulators to develop a united and coordinated vision to seize the opportunities presented by the African Continental Free Trade Area and, in the longer term, Agenda 2063 (Technopolis, Research ICT Africa and Tambourine Innovation Ventures, 2019).

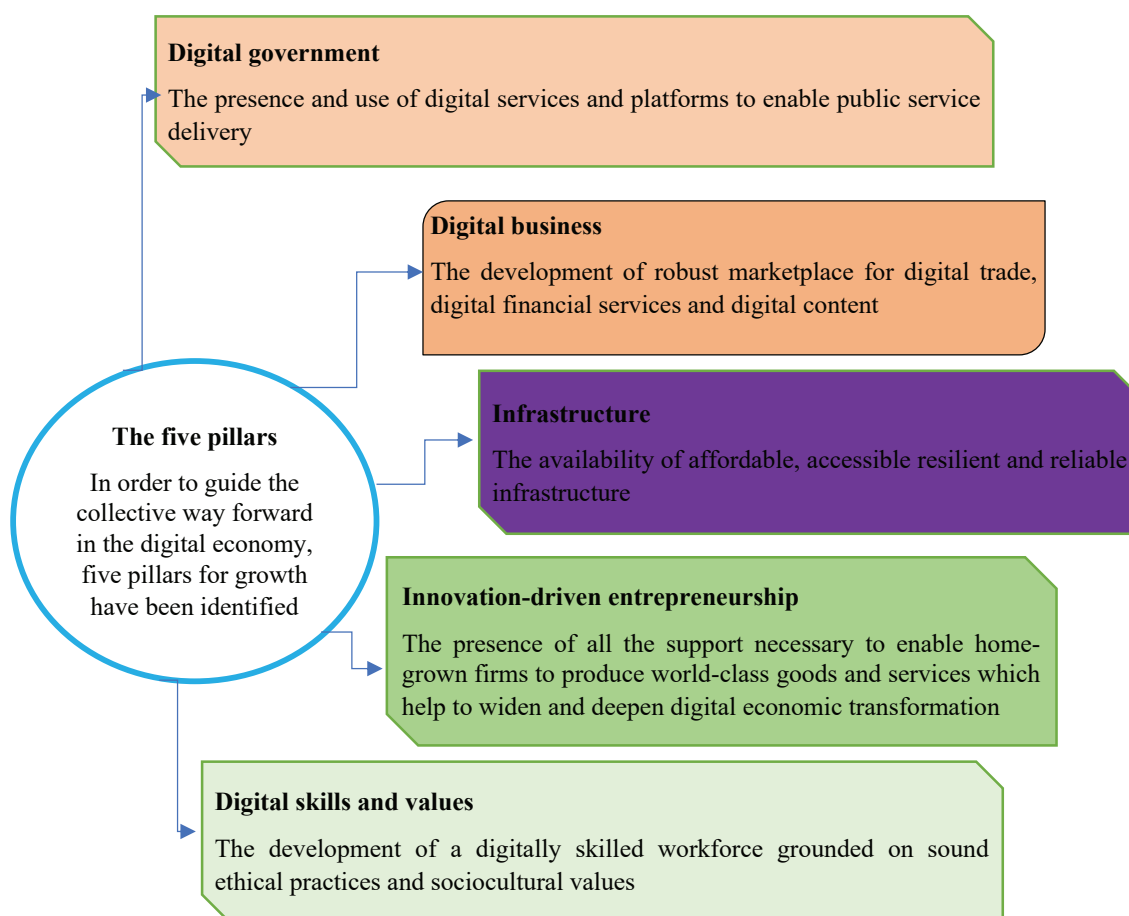
c) Smart Africa Alliance

The Smart Africa Alliance has set out a vision for realizing a digitally interconnected Africa as the foundations of digital economy. From this perspective, the Smart Africa Secretariat has developed blueprints for interconnected digital broadband infrastructure (Smart Africa Secretariat, 2020f), an e-trust framework, electronic identification (Smart Africa Secretariat, 2020c) and e-payments for the facilitation of digital trade across Africa (Smart Africa Secretariat, 2020b). In addition, a blueprint for artificial intelligence for Africa (Smart Africa Secretariat, 2020a) and ongoing collaborative work with regional and international organizations are further indicators of the commitment of the Smart Africa Secretariat to the digitalization vision.

SMART Broadband 2025 is an initiative aimed at delivering increased affordability of and access to broadband connectivity to Africa by 2025 and unleashing the opportunities of the emerging digital economy. The intention is to achieve this goal by enhancing broadband interconnectivity in Africa and by breaking down the cross-border barriers to building a deep and seamlessly integrated single digital market, with broadband as its underlying infrastructure, by 2030 (Smart Africa Secretariat, 2020e).

At the invitation of the Smart Africa Alliance, the Government of Kenya took the lead in relation to the digital economy by developing a reference framework for African countries, called Digital Economy Blueprint: Powering Kenya's Transformation (Kenya, 2018). Launched in Kigali in 2018, it is designed as a blueprint for realization of the digital economy at the national level across Africa, with the aim of having a wide-ranging impact, from rural areas to urban centres, from farmers to traders. The intention is to move the country towards a situation in which every person, enterprise and organization has digital broadband access and the ability to participate and thrive in the digital economy. As shown in figure III, the digital economy is supported by five pillars: digital government, digital business, infrastructure, innovation-driven entrepreneurship and digital skills and values.

Figure III: Pillars of the digital economy in Kenya



Source: Kenya, 2018.

The blueprint is forward-looking and was developed as a template for Africa, in order to encourage the move towards a future digital economy. It reinforces the four foundation pillars of the Digital Transformation Strategy for Africa, 2020–2030: enabling environment, policy and regulation; digital infrastructure; digital skills and human capacity; and digital innovation and entrepreneurship. It also reinforces one of the critical sectors set out in the Strategy: digital trade and financial services. The Smart Africa Secretariat is helping eight Africa countries to implement the blueprint.

In addition, the Smart Africa Secretariat, in collaboration with the Digital Impact Alliance, engaged Sense Strategy to carry out a benchmarking study to investigate the status of digital economies among States members of the Smart Africa Alliance between March and May 2020. The study was conducted in Angola, Benin, Burkina Faso, Côte d’Ivoire, Gabon, Ghana, Kenya, the Niger, Senegal and Sierra Leone, and the conclusion was that, while the countries had made progress with their digital transformations, they still faced notable challenges that needed to be addressed (Digital Impact Alliance and Smart Africa Alliance, 2020). For the purposes of monitoring the evolution of the digital economy in Africa, the Smart Africa Secretariat (2020e) is developing a digital economy index and virtualization dashboard. Lastly, since emerging start-ups are the driving force of the digital economy, the Smart Africa Alliance has cemented its central role in the digital economy by developing a blueprint for engaging start-ups in African development (Smart Africa Secretariat, 2020d).

d) Regional economic communities

The regional economic communities are actively promoting the evolution of the digital economy in several ways. One example is that the Economic Community of West African States (ECOWAS), with support from UNCTAD, is developing a regional e-commerce strategy, by means of an interactive and collaborative process. The intended outcome is a framework for using technology to accelerate structural change and development, with a view to fostering regional integration through economic diversification. The project will provide a vision and road map for the emergence of e-commerce and for the deepening of the digital economy across the region (UNCTAD, n.d.b). The project builds upon UNCTAD diagnostic e-trade readiness assessments, among them those for Cabo Verde, the Gambia, Guinea-Bissau, Nigeria and ECOWAS itself. As part of its wider mandate, UNCTAD is also leading discussions on measurement of e-commerce and the digital economy. Such measurement is a valuable tool for building the capacities of countries to produce official statistics on e-commerce and the digital economy (UNCTAD, n.d.a). The resulting data will help stakeholders to monitor and evaluate the deepening digital economy and areas for intervention.

In July 2018, the Common Market for Eastern and Southern Africa (COMESA) launched its digital free trade area, an online platform for trade facilitation, comprising e-trade, e-logistics and e-legislation. The intention is that, by means of overcoming physical barriers to trade within the Common Market, the e-trade aspect will promote e-commerce, by providing a platform for traders in COMESA to conduct business online (Business Daily, 2018).

The countries of the East African Community, with the support of the World Bank Group, are driving forward a single digital market for the subregion. The single digital market initiative, launched in 2018, supports the subregion becoming a more integrated and dynamic hub for digital investment, innovation and growth. This is in recognition that, in isolation, the countries of the subregion are too small to succeed in the digital economy. Under the initiative, a framework of a single connectivity market, a single data market and a single online market have been proposed for the six States members of the Community. The expected impact following its launch was a GDP boost of up to \$2.6 billion, 4.5 million new jobs and benefits for the most disadvantaged population segments (World Bank, 2018). While the initiative was intended to help to bring the subregion into the global digital economy, the single digital market has not, as at 2022, taken off.

A common feature of the initiatives of the regional economic communities is recognition of the importance of digital infrastructure, the Internet, cross-border data flows, cybersecurity, digital identification of those involved in digital economic processes, innovation and talent. Another feature is data as a factor of production that needs to be harnessed in the emerging digital economy. The regional economic communities are committed to enhancing these components through a supportive policy and regulatory framework.

2. Global actors and processes

Africa is not alone in the world and global multilateral agencies and regional agencies are working on the continent in support of the Digital Transformation Strategy for Africa, 2020–2030. The United Nations and organizations within the wider United Nations system

– for instance, the World Bank Group, ECA, UNCTAD and the International Telecommunications Union (ITU) – are deeply engaged, with each contributing its capacities and mandate in various spaces within the digital economy. In addition, regional organizations, including the European Union, and Governments, including the Government of the United States, are working collaboratively with African States to break down barriers and promote the digital economy.

a) World Bank Group

The World Bank Group launched the Digital Economy for Africa Initiative in 2019. Under the Initiative, in order to digitally enable every African individual, business and Government by 2030, the World Bank Group has identified five pillars to guide its collaborative work on growing the digital economy on the continent: digital infrastructure, digital financial services, digital platforms, digital entrepreneurship and digital skills. In its report *Connecting Africa through Broadband: a Strategy for Doubling Connectivity by 2021 and Reaching Universal Access by 2030* (Gallegos and others, 2019), the World Bank Group indicates that, in order to achieve this objective, Africa requires a \$100 billion fund. In view of the estimated infrastructure gap to 2025, which is in the range of \$50 billion, the intention is to lay an additional 125,000 km of fibre-optic cable and build 125,000 cellular base stations, including satellite services, in addition to demand-side programmes. This called for collaboration among multiple partners from Governments, the private sector and multilateral agencies.

The measures included in the Digital Economy for Africa Initiative support the Digital Transformation Strategy for Africa, 2020–2030, and reinforce the foundation pillars of the Strategy – enabling environment, policy and regulation; digital infrastructure; digital skills and human capacity; and digital innovation and entrepreneurship – and the digital trade and financial services critical sector. The Digital Economy for Africa Initiative incorporates recognition that the digital economy can help to accelerate achievement of the Sustainable Development Goals. To this end, the World Bank Group has, since 2019, been undertaking country diagnostic studies on the status of each of its five pillars of the digital economy. The country diagnostics are intended to provide an assessment of the status of the key levers that drive the development of the digital economy and of opportunities for intervention to deepen the digital economy. As at June 2023, the World Bank Group had produced country diagnostics on 31 States and country economic updates with a specific focus on the digital economy on 13 States. Country diagnostics provide insight into country-level evolution of the digital economy.

b) United Nations

At the global level, leave no one behind is a universal value and call to action by the United Nations to lift the most disadvantaged people out of poverty, discrimination and exclusion through achievement of the Sustainable Development Goals; it shapes the development activities of United Nations agencies. In the report of the Secretary-General dated 29 May 2020 (A/74/821), a framework is laid out for all stakeholders to play a role in advancing a safer, more equitable digital world that will lead to a brighter and more prosperous future for all. The equitable digital world is a prerequisite for a thriving digital economy.

c) United Nations Conference on Trade and Development

UNCTAD continues to collaboratively deepen the digital economy of Africa. In 2018, under the banner of Africa eCommerce Week, co-organized with the African Union and the European Union, UNCTAD issued the Nairobi Manifesto on the Digital Economy and Inclusive Development in Africa. The Nairobi Manifesto incorporated specific recommendations relating to seven policy areas of relevance to strengthening the readiness of African countries to engage in and benefit from e-commerce and the digital economy. The policy areas are: e-commerce readiness assessment and strategy formulation; ICT infrastructure and services; payment solutions; trade logistics, including transport and trade facilitation; legal and regulatory frameworks; e-commerce skills development; and access to financing. In its contribution under the Nairobi Manifesto, UNCTAD has undertaken rapid e-trade readiness assessments to provide basic analyses of digital systems in African countries, including Benin, Burkina Faso, Côte d'Ivoire, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, the Niger, Senegal, Togo, Tunisia, Uganda, the United Republic of Tanzania and Zambia. In addition, UNCTAD has undertaken a subregional rapid e-trade readiness assessment for ECOWAS. Such an assessment can help with the development of a continent-wide understanding of key barriers and with the proposing of solutions for deepening the digital economy.

d) International Telecommunication Union

ITU is active in Africa, where it has been working on the development of telecommunication policy and strategies to ensure connectivity and growth of digital infrastructure. The Union has developed digital society indicators, which are critical for the monitoring of digital infrastructure growth.

e) European Union

The European Union engages with the African digital economy on several fronts. A major initiative is working with the African Union to launch the European Union-African Union Digital Economy Task Force. The Task Force has set out a policy and long-term engagement strategy and European Union institutions, such as the European Investment Bank, have also established programmes of support for institutions in Africa. In addition, the Task Force has developed a framework for engagement with the African Union Commission and is channelling support into the following areas: universal access to affordable broadband, essential skills to enable the public to thrive in a digital age, an improved business environment to boost digitally enabled entrepreneurship and accelerated adoption of e-services (European Union-African Union Digital Economy Task Force, 2019).

f) United States Digital Transformation with Africa initiative

Launched in December 2022, the Digital Transformation with Africa initiative gives concrete expression to an aspect of the United States Strategy toward Sub-Saharan Africa, released by the Government in August 2022. Under the Strategy, the Government commits to working with sub-Saharan African States to drive digital transformation by fostering the establishment of digital infrastructure built on open, reliable, interoperable and secure Internet and ICT across the region (United States, White House, 2022). With the Digital Transformation

with Africa initiative, the Government of the United States will work with partners to ensure affordable access to the Internet, increasing data transfer rates while advocating open technology platforms, such as open radio access networks. The proposal is that, under the Digital Transformation with Africa initiative, \$350 million will be invested and more than \$450 million in financing provided, in line with the African Union Digital Transformation Strategy for Africa, 2020–2030. The initiative encompasses nine objectives, grouped into three pillars: digital economy and infrastructure, human capital development and the digital enabling environment. The United States Department of Commerce will co-lead inter-agency efforts on the digital economy and infrastructure, jointly with the United States Trade and Development Agency. The initiative is a whole-of-government effort that harnesses the diverse tools and capabilities of the Government of the United States.

g) Private sector

The private sector is, by its very nature, an efficient and sustainable vehicle for mobilizing resources and introducing innovative solutions. This should be the preferred model, with Governments facilitating an enabling and predictable operating environment. The private sector is profit-driven and, therefore, will avoid roll-out in areas deemed to be unprofitable. The capacity of the private sector can be harnessed and complemented, however, under a supportive enabling environment. The private sector operates along the whole value chain, developing digital infrastructure, information infrastructure and digital solutions that address development needs. These operations are at the national, subregional and international levels.

Global businesses in Africa include Google, Huawei and Meta, all of which are involved in digital infrastructure, talent development and services. At the 2021 Africa Digital Economy Summit, Google announced its commitment to the digital transformation in Africa, undertaking to invest \$1 billion in the region over a five-year period, in support of the digital transformation in four areas:

- a. Enabling affordable access and building products for every African user;
- b. Helping businesses with their transformations;
- c. Investing in entrepreneurs and entrepreneurship, in order to spur next-generation technology;
- d. Supporting non-profit organizations that are working to improve lives in Africa.

The undertaking by Google was in recognition of the fact that connectivity in Africa was low, with 300 million people online and 800 million unconnected; the company has sought to work with partners to address that situation. In addition, Africa-based companies – such as MTN Group, Vodacom and Liquid Intelligent Technologies – have evolved, with major players in the digital economy now operating in the field of digital infrastructure and services.

III. Challenges and issues for the digital economy in Africa

Despite the immense efforts undertaken by stakeholders working in various areas to create an enabling environment and build the requisite hard and soft infrastructure, there is a long way to go to establish the digital economy. Multiple challenges on the supply and demand sides impede growth. Challenges include digital infrastructure roadblocks, regulation of emerging technologies, unsupportive taxation frameworks, exclusion and the unique case of small and medium-sized enterprises.

A. Digital infrastructure roadblocks

The digital infrastructure of Africa is inadequate and unevenly distributed, with less than half of the population connected and the connections that do exist often failing the meaningful connectivity test, owing to a lack of appropriate devices, quality of service, connectivity speeds and affordability limitations. A digital access disparity between countries exists and studies have demonstrated that a certain critical mass of the population needs to be online before Internet use can become pervasive: as the Smart Africa Secretariat showed in *Smart Broadband 2025: a Transformative Broadband Strategy to Single Digital Market*, broadband penetration greater than 20 per cent is necessary before a thriving national digital economy can be created. At the time when the present report was produced, 46 countries had over 20 per cent broadband penetration, while 9 were below that threshold (Smart Africa Secretariat, 2020); the latter countries need intervention.

Demand-side capacity is a significant barrier to digital access. Sub-Saharan Africa, for example, has a 44 per cent usage gap, meaning the population with coverage but still unconnected, and a 16 per cent coverage gap, meaning the population without coverage. Device affordability, service costs and digital illiteracy may partially explain the demand-side challenges. In addition, a 37 per cent cellular phone Internet gender gap exists, with women in the region now 30 per cent less likely than men to own a smartphone. This locks a significant segment of society out of participating in the digital economy (Global System for Mobile Communication Association, 2022).

1. Investment in telecommunications infrastructure

The digital economy will require well-developed ICT infrastructure, both across Africa and linking the continent with the rest of the world. In the case of undersea cables, growth has been phenomenal: with 31 undersea cables, all coastal countries, with the exception of Eritrea, now have a connection to international fibre-optic cables. The implication is immense bandwidth capacity for Africa. Hamilton Research reports that, by 2021, the bandwidth capacity available to Africa was 406.500 Tbps, with just 15.255 Tbps used. This capacity will increase in 2023, when additional undersea fibre-optic cables have been laid, giving Africa more room for growth (Hamilton Research, 2022). The challenges relate to those countries that lack a fibre-optic connection to an undersea cable, to the fact that the fibre-optic cables that will soon be installed will not reach some countries, thus jeopardizing their access

to additional bandwidth, and to the implications of the increasing share of bandwidth now accounted for by organizations other than the telecommunications operators that previously dominated (Song, 2023). In relation to undersea fibre-optic cables, competition has reduced tariffs and enhanced the integration of Africa into the global digital economy. One point on which African leaders should reflect is that, increasingly, little or none of the capital invested in the undersea fibre-optic cables reaching Africa originates on the continent, although this has not yet had any adverse effects on African interests.

On the terrestrial infrastructure, Africa-based operators have built fibre-optic cables across the continent and across countries. According to Hamilton Research, over 1 million km of fibre-optic cable had been laid, as at June 2022. That figure includes cross-border, national and metropolitan area fibre-optic cables. Metropolitan areas account for 20 per cent of this total, illustrating the growing importance of broadband for homes and offices. Overall, once projects proposed for 2022 are complete, 62.3 per cent of the African population is expected to be within 25 km of an operational fibre-optic network node (Hamilton Research, 2022). Despite the high growth in connectivity, even more investment is required in this area, in order to increase the access of traders across the region to fibre-optic broadband and, therefore, to adequate bandwidth for the digital economy.

In Africa, most domestic and business users access the Internet through cellular networks, second- to fifth-generation. As at 2022, the majority of the African population is connected via a third- or fourth-generation network – 58 per cent and 20 per cent, respectively – with an insignificant proportion connected on a fifth-generation network (Global System for Mobile Communication Association, 2022). According to ITU (2021), this means that Africa has 41 per cent broadband connectivity, the lowest level of any region of the world and less than half the world average broadband penetration of 83 per cent. The penetration level needs to be increased in order for African countries and Africa as a whole to be able to reach the critical mass required for a sustainable digital economy in the region. This requires increased investment in broadband in the coming years, in order to bring broadband coverage into line with the rest of the global digital economy. The Global System for Mobile Communication Association (2020) projects that African capital expenditure investment in emerging fifth-generation cellular networks across sub-Saharan Africa will reach \$15 billion, representing 52 per cent of total cellular network infrastructure investments, by 2025.

Even as States explore investing in the latest connectivity technologies, it is vital to reflect on existing investments and ensure that they are fully utilized. There are cases in which fibre-optic broadband is not fully utilized, as in the case of Cameroon with fibre-optic cables (World Bank, 2020) and Rwanda with fourth-generation cellular networks (Rwanda, Utilities Regulatory Authority, 2022).² This may be addressed by a combination of liberalization and changes of policy as regards management of the ICT sector, both to increase competition and to empower consumers and businesses to use the infrastructure already in place. Even as States forge ahead with new technologies, however, adoption of fifth-generation cellular tools and devices in the region is inadequate and limited.

² Although the whole country has fourth-generation cellular network coverage, adoption is low, at 2 per cent.

2. Data infrastructure

A data policy for a data-driven digital economy is a valuable tool for engagement with the emerging cyberspace domain. This is in recognition of the fact that data are a means of production in the digital sphere, in terms both of the data economy itself and of cross-border data-sharing for regional trade. The approach adopted in the data protection legislation being enacted in Africa is viewed as data localization; the benefits of such an approach need to be weighed against its impact on the digital economy and, in particular, on cross-border data flows. Cross-border trade is intrinsically linked with the ease with which data flow, which runs counter to the requirements of data localization and sovereignty that inform current data protection policy. A framework to address this challenge is critical if digital trade is to be catalysed and will be of significant interest as a component of the phase III negotiations on the African Continental Free Trade Area, which will be on the subject of digital trade. Another challenge is posed by government data storage policies for data centres and cloud computing, which define deliberations on how to support ongoing digitalization initiatives and on the immense volume of invisible data available in African countries, as well as calling for tier 4 data centres. With slightly over 100 data centres, constituting less than 1 per cent of the global total (European Investment Bank, 2021), Africa has a long way to go in that regard. Still another challenge is represented by the harmonization of and interoperability standards for data-sharing frameworks at the regional and global levels, as the digital economy expands to address challenges in relation to data-sharing, harmonization and data interfaces, in order to facilitate data-sharing in support of digital economy. In addition to data policy, content generation is yet another challenge, specifically the development of specific content for such sectors as e-government, e-commerce, e-learning, e-health, the Internet of things and robotics, in both manufacturing and support platforms.

As at June 2021, 32 African States had established data protection authorities since the first on the continent had been founded in Burkina Faso in 2007 (Babalola and Sesan, 2021). The rules enacted in these data protection authorities differ from one country to the next and, therefore, can hinder cross-border data flows. The Network of Data Protection Authorities is working with the African Union to develop harmonized data protection rules, which will also include standardization (Adusei-Poku, 2021). One issue that needs to be addressed is the unusual fact that 32 African States had established data protection authorities by June 2021, yet only 13 had acceded to Malabo Convention (African Union, 2023c). While the Malabo Convention provides an initial framework, it may no longer be adequate, owing to the lack of awareness of the Convention and to the merging of the issues of data protection and cybersecurity therein. Efforts by the Network of Data Protection Authorities to harmonize data protection rules may require the repeal of the Malabo Convention, which could be an enormous task, if the slow pace of its ratification can be taken as a guide. Such talks on the Malabo Convention should form part of the phase III negotiations on the African Continental Free Trade Area, on e-commerce and digital trade.

In February 2022, the Executive Council of the African Union endorsed the African Union Data Policy Framework, in which attempts are made to address data policy concerns. The Framework includes a call for the African Union Commission, the regional economic communities and regional institutions to, among other things, promote and facilitate data flows between its member States by developing a mechanism for cross-border data flows

that takes into account the different levels of digital readiness and data maturity in a given country and of its legal and regulatory environment. The Framework also includes a call for facilitation of data circulation between sectors and across borders, by means of developing a common framework for data categorization and data-sharing that considers the broad types of data and associated levels of privacy and security (African Union, 2022). Implementation of the framework will enable Africa to harness data as a means of production in an expanding digital economy.

B. Regulation of emerging technologies

Owing to the constantly evolving nature of emerging technologies, States have yet to develop regulatory frameworks for them. There is ongoing debate within institutions and between scholars on the regulation question. At issue is how to regulate these technologies, some of which are disruptive and the social implications of which are not fully understood because of the speed with which they change. Regulation is, however, imperative. Eggers, Turley and Kishnani (2018), in a study produced for Deloitte, identified four challenges that must be taken into account when regulating emerging technologies:

- a. The pacing problem;
- b. Disruptive business models;
- c. Data, digital privacy and security;
- d. Challenges arising from the application of artificial intelligence in the digital economy.

The pacing problem relates to the slow process whereby regulatory structures are adapted to changing societal and economic circumstances, conducted by regulatory agencies that are generally risk-averse. The pacing problem now urgently needs to be solved: modern innovations that scale rapidly need to be regulated, yet the policy cycle can take from 5 to 20 years. In order to harness the emerging technologies, then, Governments will need to explore ways to develop frameworks swiftly enough that such technologies can be harnessed and, at the same time, users safeguarded.

In the past, technological change was incremental, building on past developments. While incremental development is still prevalent, some emerging technologies are disruptive and render current services as we know them obsolete. They introduce a new product, the regulation of which may need to be the responsibility of multiple different traditional regulators, requiring a great deal of consultation across existing regulatory boundaries.

Data constitute the oil of the digitalization process and massive amounts of data are being produced daily from digital tools, for instance smartphones and the Internet of things. Questions that need to be addressed include data ownership, the responsibility of intermediaries and the role of the data producer. This is an ongoing challenge. In the report of the Secretary-General dated 29 May 2020 (A/74/821), the United Nations is promoting the concept of the digital public good. Also, the World Bank has presented a detailed review promoting data for better lives (World Bank, 2021). In addition, the African Union Commission, in its

data policy framework, acknowledges the data challenge and recommends data management structures, but does not delve into ownership issues (African Union, 2022).

The evolution of artificial intelligence comes with challenges, in particular the fact that the developers of artificial intelligence systems might not be familiar with the specific data used to train the system or, when they are familiar with the data, they might be contractually barred from sharing details of proprietary system features. This has implications for the public's use of artificial intelligence and exposure to it in day-to-day life. Algorithms making critical decisions that affect the digital economy may introduce bias, to the detriment of some population segments.

In response to the challenges they set out, Eggers, Turley and Kishnani (2018) recommended five principles to be applied to the regulation of emerging technologies: adaptive regulation, regulatory sandboxes, outcome-based regulation, risk-weighted regulation and collaborative regulation. In Africa, poverty, inadequate infrastructure, a lack of skills, and weak governance and regulatory systems compound the challenges; therefore, the recommendations must be adapted to fit the unique situation on the continent.

Emerging technologies represent a cross-cutting theme in the Digital Transformation Strategy for Africa, 2020–2030. In an attempt to promote emerging technologies in Africa, the African Union, in 2016, directed the African Union Development Agency-New Partnership for Africa's Development to constitute the High-level Panel on Emerging Technologies. The members of the Panel are drawn from diverse professional backgrounds and are mandated to provide evidence-based analysis and recommendations, in order to guide continental- and national-level policy on the utilization of existing and emerging technologies. One area of priority interest for the Panel has been the use of drones in precision agriculture, on which it has commissioned a study and published a report. In the report, recommendations are set out that a continental regulatory framework should be developed for the use of uncrewed aerial vehicles in Africa and that policies should be harmonized across all African Union countries and regional economic communities (African Union High-level Panel on Emerging Technologies, 2018). One further piece of upcoming work is a study on fifth-generation cellular networks and the Internet of things, commissioned in late 2022, alongside another piece of work on three-dimensional printing in Africa. The results will be used to promote dialogue on how Africa develops or better harnesses those emerging technologies. Like the previous study on drones in precision agriculture, the upcoming work on fifth-generation cellular networks, the Internet of things and three-dimensional printing will be stakeholder-driven and, therefore, stakeholders will be engaged in drafting, reviewing and finalizing reports, expected to be launched in the second quarter of 2023 (African Union Development Agency-New Partnership for Africa's Development, 2022). The Panel has a unique mandate to harmonize regulatory frameworks for emerging technologies across Africa, including the regional economic communities, and these projects should inspire a harmonized framework to support digital economy.

One other emerging technology that has a profound impact on the digital economy is distributed ledger technology, specifically blockchain, which is the cornerstone of all cryptocurrencies. Large amounts of money are paid in cryptocurrency and, while it is not an official medium of exchange in many countries (Reuters, 2022), Africa is a major player in

cryptocurrencies. With this means of payment emerging into the mainstream, the impact on the banking sector and national currencies has nudged central banks into taking action. In line with the global trend, African central banks are at various stages of trialling central bank digital currency as a response to the widespread use of cryptocurrencies (Wladawsky-Berger, 2021). In November 2022, representatives of 13 central banks and regional banks met in Nairobi to discuss initiatives to enhance cross-border payments in the region, including the potential use of central bank digital currencies for such payments. The participants in the meeting included representatives of the central banks of Ghana, Nigeria, South Africa, Uganda, the United Republic of Tanzania and Zambia, with representatives of Burundi, the Democratic Republic of the Congo, Rwanda and South Sudan invited as guests. Regional banks at the meeting included the Bank of Central African States (BEAC) and the Central Bank of West African States (BCEAO) (Kaaruu, 2022). Digital currencies and digital assets are increasingly important for cross-border trade, as a means of addressing high international transaction costs. Work by the World Bank shows that sub-Saharan Africa has financial remittance costs twice those of South Asian countries and that the costs can be even higher in some African countries (Making Finance Work for Africa, 2021). The high costs are an obstacle to the development of the digital economy and will cause cryptocurrencies to remain attractive, albeit informally. Governments are therefore looking at central bank digital currencies for rapid payments at the national level and also for the purpose of facilitating cross-border payments. The issue under consideration will continue to be whether African States will want to take the approach of converting their national currencies to central bank digital currencies, resulting in a continent with 54 different such currencies, the convertibility of which may contribute to the costs of cross-border payments and the huge costs of currency conversion. According to the secretariat of the African Continental Free Trade Area, the annual conversion costs of the 42 African currencies are \$5 billion, which is a huge cost on trade (Mene, 2021). Proliferation of national central bank digital currencies in the region would be in line with the cybersovereignty recommendation in the African Union Data Policy (African Union, 2022). To facilitate this dialogue on central bank digital currencies, States should engage with each other through the African Continental Free Trade Area phase III negotiations on e-commerce and digital trade. This will accord blockchain technology support in its development, to enable Africa to harness central bank digital currencies effectively.

C) Unsupportive taxation frameworks

Taxation on ICT is inordinately high. In a study by the Global System for Mobile Communication Association, it was shown that, in Kenya, taxation of the cellular phone sector is at a rate 2.2 times higher than the sector's contribution to national GDP. This impedes investment in the sector and causes prohibitive service costs, leading to exclusion due to unaffordability (Global System for Mobile Communication Association, 2020).

Taxation on digital services is difficult to enforce on multinational enterprises operating in Africa, which affects revenue generation for network development. Multinational enterprises can potentially monetize data, engage in profit shifting and take advantage of a nexus to another jurisdiction. The Organisation for Economic Co-operation and Development (OECD) proposed a two-pillar solution, intended to address this challenge, but few African States are parties to the initiative. Only 25 African States are members of the Inclusive Framework on

Base Erosion and Profit Shifting, and Kenya and Nigeria opted out of the OECD two-pillar solution (Stork, Esselaar and Mureithi, 2022; OECD, 2021). Digital infrastructure operators express the view that multinational enterprises make use of the infrastructure maintained by those operators without contributing to the development of local networks.

D) Exclusion

The rapidly evolving digital transformation is radically affecting economic and social life, and those excluded from the digital transformation journey are prevented from thriving in the digital economy. Owing to African social structures, women, young people and persons with disabilities need special intervention measures if they are to thrive in the digital economy. This fails the test of all three of the principles underpinning the Sustainable Development Goals: the human rights-based approach, leave no one behind, and gender equality and women's empowerment.

In the particular case of women, the World Bank believes that the deepening of the digital economy is a huge opportunity that holds great promise for them. The Bank states that, through the possibility of remote and flexible working, the digital economy opens a new space for women to earn their living, overcoming exclusion, on the basis of cultural bias, mobility restrictions, their security and time limitations, from traditional labour markets (World Bank, 2015). However, in seizing that opportunity, women face obstacles that include unequal access to the Internet where women are less connected (Global System for Mobile Communication Association, 2022), lower digital literacy and, often, a lack of role models. Online discrimination, lack of visibility and security concerns also negatively affect participation by women in the digital economy. Since women are largely excluded from technology design, it is imperative to involve more women in that process, thus creating awareness among developers of potential bias against women embedded in technology (Sey, 2021).

As in the case with women, the digital economy presents new opportunities for young people, opening up huge external and internal digital markets to small and medium-sized enterprises, among others. Such enterprises account for 99 per cent of businesses in Africa and generate 60 per cent of jobs, excluding subsistence agriculture, and are central to creating youth employment (Karuiitha, 2020). Unfortunately, small and medium-sized enterprises face an element of digital exclusion in terms of digital infrastructure and data analytics tools. These are significant barriers to surmount for young people whose share in growth through digitalization relies on such enterprises.

Research conducted on behalf of the International Labour Organization and the Spanish National Organization of the Blind (ONCE) Foundation demonstrates that the digital economy presents opportunities for persons with disabilities – such as impaired hearing, vision, cognition, mobility, speech or neural functions – in the form of new jobs. The digital space presents tools that persons with disabilities can use to work on an equal footing with persons without disabilities, provides flexibility and low barriers to entry to self-employment and offers the possibility of remote work, which overcomes mobility challenges. With digital tools, persons with disabilities can overcome visual and hearing impairments. Strategies for an inclusive digital economy need to include ensuring accessibility by means of specific guidelines, fostering digital skills among persons with disabilities and promoting digital employment of

persons with disabilities. The collection of disaggregated data on persons with disabilities and on the nature of their disabilities will facilitate the development of intervention measures. Disability challenges should be taken into account when products and services in the digital space are being developed (Olney and Donoso, 2021).

E. Unique case of small and medium-sized enterprises

Consumers in this category can also be producers in the digital space, and small and medium-sized enterprises are the route of choice towards participating in the emerging digital economy. Small and medium-sized enterprises comprise up to 80 per cent of the African economy and employ 70 per cent of the population. The challenges for such enterprises include fulfilment logistics, which remains the largest barrier to the digital economy. Another challenge is the framework for cross-border data-sharing, which requires any small or medium-sized enterprise wanting to engage in digital trade to be familiar with the rules of multiple jurisdictions.

IV. Monitoring and evaluation framework

In order to monitor the evolution of the digital economy in Africa, the World Bank has developed an indicator: the Digital Economy Scorecard for the Digital Economy for Africa Initiative. In a similar vein, the Smart Africa Secretariat is developing the Digital Economy Index.

V. Conclusion

The digital economy is evolving in all African countries. The pace of change is more rapid in countries that have enacted the requisite policy, regulatory and operational frameworks and built the appropriate infrastructure for harnessing and promoting the digital economy. As noted above, some Governments have made significant political commitments, prioritizing the digital economy and appointing ministers whose portfolios encompass it. In other cases, however, there is no visible ongoing commitment to fostering the growth of the digital economy. In certain cases, even a lack of basic digital infrastructure is a barrier, with broadband penetration below the critical mass required to support a thriving digital economy.

At the regional level, the African Union and its organs continue to promote the development of regional policy and of legal and regulatory infrastructure, setting the pace for Governments and regional economic communities to harmonize cross-border regulatory frameworks and to deepen cross-border digital trade. Of particular note is the Declaration on Internet Governance and Development of Africa's Digital Economy of 2018, in which the critical role of the digital economy as an opportunity is acknowledged and a decision on how to promote the digital economy is set out. Additional frameworks are ongoing and include an e-commerce strategy. In the Digital Transformation Strategy for Africa, 2020–2030, a framework is set out for achieving sustainable growth by comprehensively undertaking the measures that are fundamental for a thriving digital economy, which include addressing digital infrastructure adoption and the requisite framework and applications, including digital identity, a single

digital market, a single data market and continuous growth of the Internet as a foundation for the digital economy.

African States are not alone; they have significant support at the regional, subregional and national levels from regional organizations, international companies and, very importantly, Africa-based organizations. It is this varied support that is aiding the growth of digital economy, albeit at different speeds in different countries. The digital economy remains exceptionally undeveloped and there is a great deal of opportunity for its growth. It is therefore critical to promote measures collaboratively in relation to the various horizontal components of the Digital Transformation Strategy for Africa, 2020–2030: the foundation pillars, the cross-cutting themes and the critical sectors. It is also essential to advance the vertical components of the Strategy, including digital industry, and digital trade and financial services.

VI. Recommendations

Stakeholders should take additional action in a number of areas. In taking such action, stakeholders should leverage the Digital Transformation Strategy for Africa, 2020–2030, while keeping in mind the various ongoing activities in support of the Strategy, especially on an enabling environment and, in particular, on data policy, on a digital identity, on cybersecurity, on electronic payment systems and on harnessing emerging technologies to deepen the digital economy. In addition, while taking such action, stakeholders should also draw inspiration from the ideals of the African Continental Free Trade Area.

The first area for additional action is measuring and reporting on the digital economy, which breaks down into two aspects. First, the term digital economy needs to be defined because many of the stakeholders cited in the present position paper use it interchangeably with other terms, such as digital trade, e-commerce and Internet economy; in addition, they all emphasize different areas of activity that need to be prioritized for its growth. Of course, the digital economy is still evolving, which represents an opportunity to develop a common definition of the digital economy, which must certainly be aligned with global processes. Such a definition will facilitate the description of which activities are included in the digital economy, the establishment of a clear value chain for its evolution and the setting-out of relevant intervention measures along the value chain. Second, a common framework must be implemented for official data collection on the digital economy in Africa. Alongside the definition of the digital economy, developing its indicators – within the global community, for compatibility purposes – will enable monitoring and evaluation. This will facilitate data collection at the national and regional levels and will highlight areas that require special intervention. Data collection should be aligned with international standards, in order to ensure comparability. This will highlight any areas in which special intervention measures might be necessary, in order to leave no one behind, in line with the Sustainable Development Goals.

The second area for additional action is a coordinated approach to the digital economy. This entails establishing a multi-stakeholder platform for constructive collaboration on the development of the digital economy and on the sharing of experiences. The Digital Transformation Strategy for Africa, 2020–2030, illustrates the many building blocks of which a thriving digital economy is comprised and the present position paper details the numerous

stakeholders involved in all those building blocks. An overarching pathway creating linkages will provide a framework for sharing among all stakeholders, whether international, regional or subregional, whether Governments, private businesses, civil society organizations or academic institutions. This will create synergies and ensure that all building blocks are given appropriate support. Governments have well-developed institutional infrastructures for coordination on policy and regulatory action; however, the private sector, as regards realization of the digital economy, and civil society, as regards advocacy, both play essential roles and their participation needs to be prominent.

The third area for additional action is a treaty-level framework for the digital economy, to which end the phase III negotiations on the African Continental Free Trade Area should be fast-tracked and the resulting protocol implemented. The digital economy has many building blocks for which regulatory frameworks spanning multiple jurisdictions need to be agreed in order for them to function. Phase III of the African Continental Free Trade Area should include components that are critical for the digital economy, in order to ensure cross-border compatibility of systems and enforceable cross-border regulations. When operationalized, the Malabo Convention will provide a seamless framework on personal data-sharing and on data protection. The goodwill behind the African Continental Free Trade Area can be the driving force in establishing the requisite legal framework for the digital economy.

The final area for additional action is the creation of a pan-African institutional framework for the digital economy, under the African Continental Free Trade Area. As mentioned in section II.A of the present position paper, the current estimate is that the digital economy will account for 25 per cent of global GDP by 2025. Through the many institutions of the African Union, the regional economic communities and Governments have developed and promulgated policy directives, decisions, mandates, initiatives, regulatory frameworks and recommendations to deepen the digital economy, complemented by the work of international organizations, private businesses and civil society organizations; many have not been implemented, for various reasons. Such an institutional infrastructure will give focus to African efforts to establish the digital economy, will constitute a repository of all those efforts and, importantly, will catalyse the implementation of decisions and avoid repetition.

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