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THE DRAFT DIGITAL TRANSFORMATION STRATEGY FOR AFRICA (2020-2030)

I. INTRODUCTION

Africa presents a sea of economic opportunities in virtually every sector, and the continent's youthful population structure is an enormous opportunity in this digital era and hence the need for Africa to make digitally enabled socio-economic development a high priority. Digital Transformation is a driving force for innovative, inclusive and sustainable growth. From innovations such as for mobile money platforms to large-scale business process outsourcing developments, digitalization is creating jobs, addressing poverty, reducing inequality, facilitating the delivery of goods and services, and contributing to the achievement of Agenda 2063 and the Sustainable Development Goals.

Furthermore, Africa has fewer legacy challenges to deal with and is therefore adopting digitized solutions faster out of necessity. For Africa, the current moment offers a leapfrogging opportunity. Today's technologies such as artificial intelligence, robotics, block chain, drones, internet of things, wearable technologies, 3D printing, Big Data, and software-enabled industrial platforms — indicate the scale and speed at which technology is transforming traditional socio-economic sectors.

Recognizing the efforts of the continent's leadership to prioritize and accelerate digital transformation, and building on the vision of many African leaders, African countries are ready for a comprehensive digital transformation strategy to guide a common, coordinated response to reap the benefits of the fourth industrial revolution.

Based on African Union Executive Council Decisions related to ICT[1], ECA Resolution (812 –XXXI) on the African Information Society Initiative and the Smart Africa Board meeting held on the margins of the 32nd African Union Assembly of Heads of State and Government that highlighted the need for the ICT sector to lead the process, the AU Commission undertook to develop a comprehensive Digital Transformation Strategy for Africa in collaboration with the UN Economic Commission for Africa, Smart Africa, AUDA-NEPAD, Regional Economic Communities, African Development Bank, Africa Telecommunications Union, Africa Capacity Building Foundation, International Telecommunication Union and the World Bank.

The Digital Transformation Strategy for Africa will build on the existing initiatives and frameworks such as the Policy and Regulatory Initiative for Digital Africa (PRIDA), the Programme for Infrastructure Development in Africa (PIDA), the African Continental Free Trade Area (AfCFTA), the African Union Financial Institutions (AUFIs, the Single African Air Transport Market (SAATM); and the Free Movement of Persons (FMP) to support the development of a Digital Single Market (DSM) for Africa, as part of the integration priorities of the African Union. The Smart Africa Initiative has set the creation of a Digital Single Market in Africa as its strategic vision.

II. VISION AND OBJECTIVES

A. VISION

An integrated and inclusive Digital Society and Economy in Africa that improves the quality of life of Africa's citizens.

[1] EX.CL/Dec.739(XXII), EX.CL/Dec.545(XVI), EX.CL/Dec.613(XVIII), EX.CL/Dec.835(XXV), EX.CL/Dec.987(XXXII)

B. OVERALL OBJECTIVE

To harness digital technologies and innovation to transform Africa's societies and economies to promote Africa's integration, generate inclusive economic growth, stimulate job creation, erase the digital divide and eradicate poverty to secure the benefits of digital revolution for socio-economic development.

C. SPECIFIC OBJECTIVES

- Build a Digital Single Market in Africa by 2030

- By 2030 all our people should be digitally empowered and able to access safely and securely to at least (6 mb/s) all the time where ever they live in the continent at an affordable price of no more than (1cts usd per mb) through a smart device manufactured in the continent at the price of no more than (100 usd) to benefit from all basic e-services and content of which at least 30% is developed and hosted in Africa;

- Establish and improve digital networks and services with a view to strengthening intra-Africa trade, intra-investment and capital flows and the socio-economic integration of the continent, while maintaining a relational balance with other continents in the context of networked economies (Digital economy, collaborative economy)

- Generate the environment necessary to secure investment and financing to close the digital infrastructure gap and achieve an accessible, affordable and secure broadband, across demography, gender, and geography;

- Implement policies and regulations required to stimulate and accelerate digital transformation for national, regional and continental development;

- Enable the coherence of existing and future digital policies and strategies at regional and national levels and mobilize effective cooperation between institutions;

- Entry into force of the African Union convention on Cyber Security and Personal Data Protection by 2020 and for all Members States to adopt a complete set of legislation covering e-Transactions, Data Protection and Privacy, Cybercrime and Consumer Protection;

- Promote open standards and interoperability for cross-border trust framework, personal data protection and privacy;

- Create awareness and counterbalance issues of Cyber Security and Personal Data Protection and Privacy;

- Adopt and use the African Peer Review Mechanism as part of a continental wide Digital Governance;

- Promote the use of Country Codes Top Level Domains as they are critical national resources whilst ensuring that technical and administrative operations are at international standards to foster trust and use of African Domain Names in order to bring financial, economic and sociocultural benefits to Africa

- Build inclusive digital skills and human capacity across the digital sciences and education, both technical and vocational, to lead and power digital transformation including coding, programming, analysis, security, block chain, machine learning, artificial intelligence, robotics, engineering, innovation, entrepreneurship, and technology policy & regulation;

- Deliver a Massive Online Digital Skills for All program that provides basic online knowledge and security and privacy skills for 100 million African a year by 2021 and 300 million a year by 2025;

- Foster the policies that create an enabling environment for productive digital trade and digital payment and clearance systems to advance opportunities for digital work, fair competition for digital businesses, and contribute to an advantageous position of Africa in the global digital economy;

- Create a vibrant and inclusive "digital culture" that stimulate, ideas, innovation, cooperation, and partnerships, in various forms and configurations between public sector, business & the private sector and civil society to drive the socio-economic benefits of digital nationally and regionally.

- Support the Agenda 2063 flagship Pan-African "E" programme through providing policies and strategies that lead to transformative e-applications and services thereby making the digital revolution the basis for service delivery and ultimately transform Africa into a Digital Society.

- Build a vibrant sector approach to digitalization of the agriculture, health and education sectors

- 99.9% of people in Africa to have a digital legal identity as part of a civil registration process by 2030

- Design and implement innovative financing models to digitally transform Africa with an incremental investment of $20 billion from 2020 – 2025, growing to $50 billion a year from 2026 – 2030.

III. SWOT ANALYSIS

A SWOT (strengths, weaknesses, opportunities, threats) analysis is conducted to better assess the internal strengths and weaknesses, as well as the external opportunities and threats of a digital transformation strategy for Africa.

Strength	**Weakness**
• Momentum is gaining for a digital strategy for Africa. • Most AU Member States have developed ICT policies • Work has already been done with national governments to identify and address barriers to harmonization of laws and regulations in various sectors. • Mobile phone availability and becoming more affordable • Sustainability of growth of Internet	• Lack of a coordination framework among continental institutions pursuing the digitalization agenda of the continent. • Low cohesion, cooperation, coordination and harmonization among regional and continental actors • Limited policy and regulatory reforms to facilitate the interconnection of networks across borders, including national and commercial backbones, or supervisory frameworks for data protection, data storage/processing/handling. • Shortage of finance, mentoring, and training available for high potential digital entrepreneurs
Opportunity	**Threats**
• There is a space to establish a continental coordination framework for the digital agenda of Africa.	• The lack of a coordinated framework makes it difficult for AUC, Smart Africa, AUDA-NEPAD, ATU, and UNECA to optimize resources for effective and

• There is international recognition to improve effectiveness of law-making bodies and regulatory agencies with capacity building efforts for digital transformation. • There is an opportunity for a regional harmonization or cross-border systems for payments, cross border trade, identification and verification for digital transactions. • Opportunities for digital transformation to revolutionize the African financial sector • Onboarding the 200 million currently without internet access would result in significant gains in GDP, economic productivity and gender equality	efficient delivery of the digital agenda for the continent • Limited supervisory capacity to identify and mitigate risks which are exacerbated by digital technologies, including cyber-attacks, fraud, and over-indebtedness. • There is a gender gap in mobile access and usage. Failure to address this could result in greater inequality for women across the continent • Challenges related to FinTech-Cybersecurity, crypto currencies, etc.

IV. DEVELOPING THE STRENGTHS AND ADDRESSING THE WEAKNESSES

To leverage the strengths and address the current lack of a common digital coordination framework, the AU Commission is coordinating the development and formulation of the Digital Transformation Strategy for Africa to guide a common, coordinated digitalization agenda, enhance synergies and avoid duplication of effort.

The AU Commission will also develop and implement a communications strategy (including conferences, workshops) towards the public sector, private sector and citizens to ensure the following: buy-in of the public sector to the digital strategy, and to promote the importance of digital transformation;

- provision of up-to-date information on progress and how the private sector can contribute, and
- communicate the benefits of integration, and foster trust in digital services to the AU citizens

V. RESPONDING TO THE OPPORTUNITIES AND MANAGING THE THREATS

To respond to the opportunities and manage the threats, the AU Commission will work on a continental branding to promote the digital strategy and attract FDI and venture capital. The Commission in collaboration with other Continental Institutions and Regional Economic Communities will work with Member States to identify and address barriers to harmonization of laws and regulations and drive leadership for necessary reforms that ensure future investment in digital transformation.

VI. CONCEPTUAL FRAMEWORK

The Digital Transformation Strategy for Africa has been developed using the following approach:

a. **Informed by previous initiatives and documents**: The strategy takes into account the broad and diverse range of previous activities, initiatives, directions and mandates at the continental level.

b. **Collaborative/Multi-stakeholder:** The AU Commission developed the strategy in collaboration with the UN Economic Commission for Africa, Smart Africa, AUDA-NEPAD, Regional Economic Communities, African Development Bank, Africa Telecommunications Union, Africa Capacity Building Fund, International Telecommunication Union, World Bank

and other partner institutions. In addition, input and consultations with the private sector and civil society were sought.

From the conceptual to the practical: From Foundational Elements, to Analysis, to Pathways to Transformation, from there to Strategies to Unlock the Pathways, and finally Tools for Success.

The Digital Transformation Strategy for Africa is based on foundation pillars (Enabling Environment, Policy and Regulation, Digital Infrastructure, Digital Skills and Human Capacity, Digital Innovation and Entrepreneurship), critical sectors(Digital Industry, Digital Trade and Financial Services, Digital Government, Digital Education, Digital Health, Digital Agriculture) to drive the digital transformation and cross cutting themes (Digital Content & Applications, Digital ID, Emerging Technologies, Cybersecurity, Privacy and Personal Data Protection, Research and Development) to support the digital ecosystem. It will also include policy recommendations and actions under each foundational pillar, critical sector and cross-cutting theme. Some of the proposed recommendations and actions include those highlighted in the AU-EU Digital Economy taskforce report.

Annexed to the strategy will include a set of tools that Member States can use at their discretion, to assess and guide their policy, investment decisions and actions. These tools will include; a) An Assessment toolset that Member states can utilize to self-assess their digital transformation readiness; b) A Digital Maturity[2] Model where Member States can identify their current digital state (as is), and where they want to go (to be) along a development continuum; c) A set of flexible "pathways to prosperity" that bring together the various foundational pillars in different configurations to provide Member States with a range of options and alternatives to consider in pursuing digital transformation, in a way that is best suited to their needs.

The strategy is further guided by the following principles;

(i) SOLIDARITY AND COOPERATION:
Solidarity between African Union Member States; Cooperation between the AUC, RECs, African Institutions and International organizations; and Linked to Agenda 2063 and the Sustainable Development Goals (SDGs)

(ii) COMPREHENSIVE:
Adopting an ecosystem approach that avoids a silo approach and is comprehensive in defining and applying the requisite elements and foundations for digital transformation;

(iii)TRANSFORMATIVE:
Fully leverage, harness and accelerate impact on society by accelerating Africa's socio-economic development through digital transformation;

(iv) INCLUSIVE:
Digital Transformation for everyone, everywhere, that is affordable and ubiquitous, creating equal access to opportunities and mitigating risks of exclusion;

(v) HOMEGROWN:
Led and owned by Africa's Institutions, it will be embedded in Africa's realities and unleashing the African spirit of enterprise and creativity, to generate homegrown digital content and solutions, while embracing what is good and relevant;

(vi) NEW MINDSET:
Benefitting from the digital transformation requires a mindset change and new types of collaboration among stakeholders, and across sectors, with facilitation and retooling;

(vii) SAFE:

[2] Digital maturity is a measure of how ready a country/organization is to digitally transform.

Society that is well informed about both the opportunities and risks arising from a digital economy and society, and that healthy disruption to markets and business models is ensured;

VII. FOUNDATION PILLARS

All components of a Digital ecosystem are important, however, Foundation Pillars are those elements that are the foundations on which Digital Transformation is built, and without which a Digital Transformation would not be stable and self-sustaining. It is also important to recognize that a successful Digital Transformation will yield critical digital dividends across and between many sectors.

A. ENABLING ENVIRONMENT, POLICY & REGULATION

GENERAL OVERVIEW

Realizing the vision of digital transformation for Africa requires appropriate policies and an enabling environment with critical policy reforms to the foundation pillars and critical sectors to drive digital transformation.

Collaborative ICT regulatory measures and tools are the new frontier for regulators and policy makers as they work towards maximizing the opportunities afforded by digital transformation across industries. Recognizing the potential of emerging technologies and the impact that policy and regulatory frameworks can have on their success, countries and their regulators should encourage a regulatory paradigm that pushes frontiers and enables digital transformation.

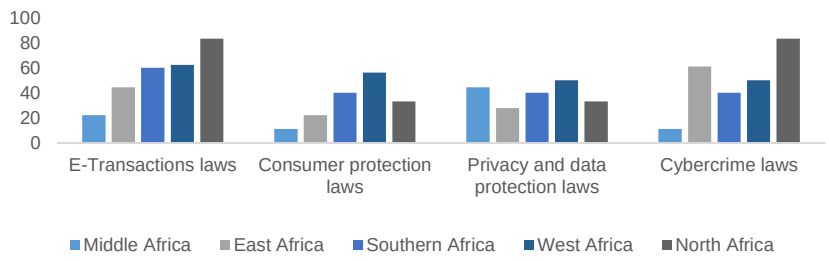
DEFINING THE PROBLEM

Governments have a responsibility to create an enabling environment with policies and regulations that promote digital transformation. Political commitment at the highest level, ensuring stability and predictability of the policy environment, promoting sustainable environment for the private sector to invest, adopting regulatory best practice and stimulating demand for digital solutions are all part of the enabling environment. A conducive enabling environment across foundation pillars and critical sectors for digital transformation is fundamental.

Policy makers and regulators need to keep pace with advances in technology, address the new regulatory frontiers and create the foundation upon which digital transformation can achieve its full potential. Being prepared for digital transformation and emerging technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), Machine to Machine communications (M2M) and 5G is fundamental.

Public policy, Legal and regulatory frameworks need to be up-to-date, flexible, incentive-based and market-driven to support digital transformation across sectors and across the continent regions. The Figure below shows the status of regions in Africa with regards to having in place relevant e-Commerce Legislation

Share of Economies With Relevant E-Commerce Legislation in Africa, by region, 2017 (%)



Source: OECD. 2018

Furthermore, acknowledging that the Internet is an essential tool and a dynamic force for economic, social and cultural development, there is need for localizing Internet Governance discussions and related Public policy matters to enable, develop and support local Internet/Digital economy.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Support the development and implementation of national, regional and continental digital transformation strategies to create demand and enable scaling up of digital initiatives;

- Develop and implement national and sectorial digital strategies
- Develop and implement regional and continental digital strategies
- Develop and implement cyberspace policy and legislations;
- Establish a capacity development programme to support African policymakers, regulators and other public sector representatives
- Design policies through a human-centric and holistic approach that take into account the local context and relevant crosscutting issues at all stages of policy design and implementation. A specific focus on women, people living in remote areas, disadvantaged and marginalized communities, is encouraged through a dialogue that involves these targeted groups.
- Develop and implement strategies for optimal utilization of scarce critical resources such as spectrum and management of IP addresses including migration toIPV6

Establishment of harmonized policy, legal and regulatory frameworks

- Develop harmonized regional and continental digital strategies
- Develop and adopt guidelines at regional and continental levels on regulation
- Promote regional/continental licensing mechanisms to facilitate establishment of regional/continental operators' networks and service providers;
- Support the African Union Commission and the Regional Economic Communities in integrating markets

Integrate the provision of eServices, developed by both the public and private sector, with adequate legal acts and regulation at all levels, ensuring that data needed to provide eServices for the community is openly available while fully respecting data protection rights.

- Allow relevant organisations in Member States or Region Economic Communities to reuse core registers and information systems from other organisations in a secure data exchange environment, enabling the different information systems and registers to communicate, share data and work together

- Better use of data for better decision-making around policy and regulation. Data driven decision-making implies systematic collection and assessment of market data (both supply and demand) to inform regulation and guide policy priorities. In addition to the system itself, policymakers and regulators require clear measurement frameworks and the technical capacity to monitor data

Strengthen collaboration between African Institutions and regulators in charge of digitalization

- Establish a common coordinated digitalization agenda in Africa
- Ensure policy coherence for the achievement of digital transformation in Africa

B. DIGITAL INFRASTRUCTURE

GENERAL OVERVIEW

Digital Infrastructure facilitates the development, provisioning, use and sharing of digital systems (products and services). These include Telecommunications fixed and wireless networks including broadband and high speed networks; terrestrial optic fibre networks, fibre over power lines,

submarine cables, satellite communication, mobile communication, IXPs; Postal infrastructure, Digital Terrestrial Broadcasting, Data Centers; Digital and smart devices…. This foundation pillar also looks at affordable Devices and Digital Platforms.

Affordable, accessible and reliable infrastructure is the foundation to achieve an inclusive digital transformation. Several studies demonstrate that broadband penetration and broadband quality are important factors for economic growth. According to a World Bank study, it is estimated that for every 10% increase in broadband penetration in low and middle income countries result in a commensurate increase of 1.38% of the GDP[3]. Studies also reveal the economic impact of broadband deployment directly through jobs created by deploying broadband infrastructure, and indirectly as a result of 'spill-over' externalities, such as increased productivity and new products and services i.e. through accelerated innovation[4]. In this regard, there is a need to expand national broadband coverage, ensure a conducive regulatory environment, provision of logistical services through transformed digital postal services and provision of digital platforms to serve as a layer on which multiple public and private sector organizations can build new or better services and solutions. Internet penetration in Africa is estimated to be 36% or 473 million people online.[5] Despite the current infrastructure challenges an additional 300 million people are expected to come online by 2025. Increasingly, it is "things" rather than people who are connected (the internet of things includes sensors, voice-activated devices, geospatial instruments, machine to machine communications, vehicle to vehicle communications, etc) and the intelligence of the network resides in the "cloud" rather than in the devices themselves. Therefore, to harness benefits or "dividends" from the digital transformation, abundant, low-cost connectivity is essential as it is widely understood that broadband drives productivity, innovation and growth.

Digital platforms are also an essential element of digital infrastructure and can serve people, businesses, and government agencies in all aspects of life, including healthcare, education, commerce, transportation, and public benefits. Digital platforms serve or enable other products or services. For the people who use these platforms to receive their monthly pensions, securely login to a government e-services portal, pay their utility bills, submit a complaint, access public information, or find a person to rent their car, these platforms can provide a seamless service delivery experience that increases user convenience, savings, and agency. For governments, digital platforms can increase the efficiency and effectiveness of core functions and services; reduce unnecessary duplication of systems; combat fraud and corruption by increasing the security and traceability of transactions; and improve civic engagement and accountability. For businesses, commercial platforms are an efficient mechanism to help firms, especially SMEs, expand access to markets, exchange goods and services and tap into underutilized assets and human resources, which potentially leads to more and better jobs in the economy.

With regards to Post, the wide reach of its physical infrastructure of nearly 30,000 outlets, interconnected to the global network of more than 660.000 Post Offices, can play an important role in the access to relevant information, digital, social and financial inclusion of the marginalized population. Given the capillarity of postal outlets and trust of local populations, the postal sector plays a significant role (a multipurpose platform and one stop shop) in socio-economic development, particularly in Africa in which 70% of the population live in rural areas, by facilitating communication, delivery of goods and services as well as providing wide universal access to many governmental and non-governmental services. For instance, nearly 1.5 billion people worldwide use postal financial services.

The Post also contributes to UNCTAD Business to Citizens E-commerce Index that consists of four indicators that are highly related to online shopping. [6]Post is the second largest financial inclusion

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[3] Kim, Y., Kelly, T., and Raja, S. (2010). Building broadband: Strategies and policies for the developing world. Global Information and Communication Technologies (GICT) Department, The World Bank, January 2010.

[4] Katz, R. L. (2012). Impact of broadband on the economy: Research to Date and Policy Issues. April 2012, ITU.

[5] We Are Social. Hootsuite. *Digital 2019*

[6] https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d12_en.pdf

player, behind the banks but way ahead of microfinance institutions and mobile telephone operators. A modern postal system which is truly endowed with appropriate ICT infrastructure can contribute to the delivery of e-governance services, e-commerce and financial inclusion to Africa's people notably those in rural and remote areas.

Digital terrestrial broadcasting is another area under the digital infrastructure pillar. The transition from Analogue to Digital Terrestrial Television also known as the Analogue Switch-Off (ASO) is a complex and lengthy process through which Analogue Television Broadcasting is replaced by Digital Television Broadcasting. The process started around the world in 2000 and the majority of developed countries across the world have completed the migration to full digital broadcasting services .For ITU Region 1, to which Africa belongs, the deadline for switching off analogue broadcasting services was decided during the ITU Regional Radio Communication Conference held in Geneva in 2006 (RRC -06) to be 17 June, 2015 in UHF band and 17 June, 2020 for some countries in the VHF.

The African Union and the Regional Economic Communities have been at the forefront of promoting and raising awareness of the decision makers on the importance to accelerate the migration to Digital Broadcasting. A number of strategic decisions and recommendations have been adopted by the AU Summit and its organs requesting African organisations such as AUC, RECs, African Telecommunication Union (ATU) and African Broadcasting Union (AUB) to coordinate efforts in supporting AU Member States in the migration process.

DEFINING THE PROBLEM

Nearly 300 million Africans live more than 50 km from a fibre or cable broadband connection[7], hence the lack of widespread availability of high-speed (broadband) internet remains a significant hurdle for Africa to fully harness the full potential of digital transformation. Mobile devices remain the primary way by which people access internet today, and dedicated internet connections to homes and offices (such as with fiber-to-the-premise) are mostly absent, except in some capital cities.

Dependence on mobile rather than fixed-line broadband means that unmetered pricing, or unlimited data use, is not very common in Africa. The mobile phone revolution has however opened the door to private sector investment in telecoms and now new business models and services have extended sustainable communication services significantly further. The value chain of digital infrastructure networks has been unbundled and new private sector players are developing network infrastructure like independent broadband operators and tower companies**.** Previously, to enter a market, an operator needed to invest in international (first mile), national (middle mile), and end-user (last mile) infrastructure. Now there is competition in each of these segments in most Member States of the African Union, with specialist service and infrastructure providers either competing or providing services to vertically-integrated network operators.

Furthermore, currently, submarine cables bring the necessary international connectivity to coastal areas, and some non-coastal countries are making remarkable efforts to connect their territory through terrestrial network infrastructures, but this is only the first step of the digital infrastructure. Currently, a very large part of the IT content consumed in Africa comes from outside and Data Centers are the digital infrastructure that will allow the development of a local digital industry**.** Therefore**,** Africa needs Tier III and Tier IV Data Center Infrastructure designed to host mission critical servers and computer systems, with fully redundant subsystems. The main benefit of this infrastructure localization on the continent will be cost savings on international connectivity and

[7] New Africa-Europe Digital Economy Partnership. *Accelerating the Achievement of the Sustainable Development Goals*. 2019

the latency decrease that will deliver a better application performance**.** The second interest is respect for data sovereignty, even though Africa is at the moment less restrictive, soon it will be necessary to ensure localization of all private data of Africa's citizens.

As for the postal world and particularly African Postal Services are at a major crossroads with the development of the digital economy, which is leading to a decline in traditional mail volumes. Some countries are moving forward but the majority of the Post Offices on the continent remain with outdated equipment, lack of electricity and Internet Connectivity and the staff needs to be capacitated with the required skills for the industrial revolution 4.0.

In addition, the combined effects of global liberalization, the lack of investment in critical production infrastructure, the opportunism of external actors, lack of appropriate and harmonized legislation, conflicts of interest between legislators and operators as well as unnecessary peddling of influences, have resulted in the African postal market being generally invaded by a pack of private predatory operators that undermine the public operators and, consequently, the provision of universal service which they are supposed to offer to everyone everywhere. Hence, the switch to digital technology has become a strategic priority for Posts wishing to remain at the forefront in the increasingly digital world.

Whereas with regards to Digital terrestrial broadcasting, despite commitment to complete the migration within the ITU deadline, only 16 AU Member States (30%) have been able to migrate. The majority of Member States are at advanced stage of the migration and will probably make the Analogue Switch Over (ASO) by 2020, while some have not yet started the transition process due to various challenges. This situation puts Member States at risk of cross border interference notably after June 2020, as most Member States broadcast their services in the VHF band, and no protection will be granted to Analogue services after the ITU deadline. The slow pace of migration to digital broadcasting also delays the release a significant amount of high quality radio spectrum referred to as "the digital dividend" (DD) which can be made available to enhance Mobile Broad Band penetration in Africa.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Promote national, regional and intra-continental interconnectivity

- Develop and implement, national, regional and continental digital infrastructure master plans taking into account convergence of technologies;
- Establish broadband infrastructure projects that promote regional integration;
- Establish and enhance Internet exchange points (IXPs), and their interconnection
- Modernize existing infrastructure, Integrate and complement new infrastructure projects with existing infrastructures
- Ensure that every AU Member State has a minimum of two international connections to ensure redundancy and competition on the market
- Establish Tier III and Tier IV Data Center Infrastructure designed to host mission critical servers and computer systems to support the development of a local digital ecosystem

Promote infrastructure sharing

- Ensure close collaboration and coordination with basic utilities infrastructure networks such as electricity, water pipe lines and transport networks in the rollout of digital infrastructure

- Encourage infrastructure and site sharing among Telecommunication/ICT Operators

Boost investment in telecom infrastructure at national, regional level to an interconnected continent, and develop financial instruments through partnerships between investors, government, financial institutions and international partners

- Build on and scale up existing initiatives to map the infrastructure needs in Africa and provide a priority list for investments in building the missing links taking into account all connectivity technologies and services

- Create innovative financial instruments for infrastructure deployment in Africa with a focus on underserved areas

Promote a favourable regulatory environment for competitive and harmonised regional and continental connectivity markets

- Strengthen the capacity of policymakers and regulators to implement harmonised telecom rules at the regional and continental level

- Foster transparent, predictable, pro-investment and pro-innovation regulatory frameworks

Promote measures that increase affordability of broadband and technology devices & services

- Implement initiatives to help reduce the price of devices and services

- Introduction of a Broadband connectivity Access Fund (BCAF) to extend infrastructure to underserved areas and reduce access pricing

- Adopt appropriate policy and regulation in areas such as taxation to promote the affordability of Internet

- Prioritise connections to public buildings such as libraries and schools

- Develop Digital platforms to serve people, businesses, and government agencies in all aspects of life, including healthcare, education, commerce, transportation, and public benefits.

Commit to undertake or strengthen ICT and postal policies reforms.

- Consider the postal sector and postal financial services (PFS) as an essential component of digital economy and the financial inclusion ecosystem;

- Include postal digitalization in both national priorities and national digital strategy as part of the innovation strategy for posts;

- Accelerate and intensify policy reform and speed up the implementation of existing decisions from the AU policy organs on reform, universal postal service, financial inclusion, post codes and addressing systems

- Promote the postal sector as a key vehicle to foster socio-economic development

- Use the postal sector as a platform to deliver government's services to all citizens for digital, financial and social inclusion;

Facilitate postal services access to funding for investment and infrastructure development and capacity building

- Digitalize the basic information infrastructure for postal services especially for e-commerce development;
- Encourage public-private partnership for increased investment in the posts;

- Accelerate implementation of addressing systems

Facilitate the coordination efforts to migrate to digital terrestrial broadcasting and harmonized use of the digital dividend at regional and continental level

- The AU Commission, ATU, AUB and RECS to coordinate efforts in providing assistance and support for African countries to enable them to complete the migration to Digital Terrestrial Broadcasting by June 2020.

- Need to work towards a harmonized use of the released radio frequencies (Digital Dividend) at regional and continental levels through developing policy and regulatory framework that ensures an equitable access and efficient use of these resources.

C. DIGITAL SKILLS & HUMAN CAPACITY

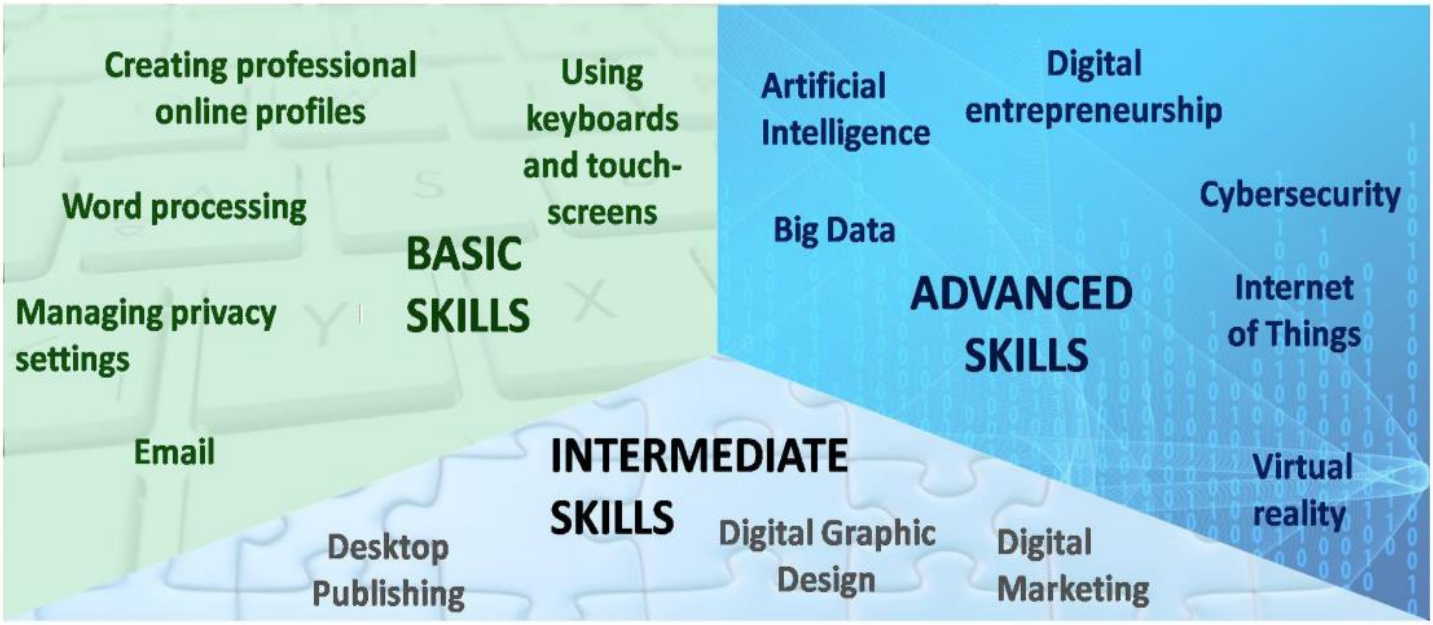
GENERAL OVERVIEW

Several preconditions must be met for Africa to realize the much-aspired digital transformation and be a globally competitive continent. The main one among them is the investment in and cultivation of highly skilled people, as producers, consumers and innovators of digital technologies. Investing in digital capabilities of citizens underpinned by both technological and human capacity offers the most robust strategy for the future. A critical mass of skilled workforce that can effectively master and apply emerging technological advancements & their sophisticated integration within every aspect of the social, economic and political systems is needed. Similarly, as active participants in the digital ecosystem, citizens must possess digital capabilities to embrace and use digital advancement in their daily lives. Emerging technologies require measures to continue building the digital skills of people not only as consumers but also as citizens. A collective digital capacity at individual, organizational and sectoral level is deemed critical to sustainably capitalize on home-grown and adaptive technological advancements.

The supreme currency in the digital age are people and their skills. With appropriate and coordinated human and institutional capacity development strategy, Africa's most precious asset, the youth who constitute 60% of the overall population, can be remodeled , harnessed, empowered and transformed into a digitally adaptive, skilled and innovative workforce that not only comprehend, adopt and move with global trends but chart its own digital pathways towards inclusive growth and development. New pathways with new sources of job creation are possible in this age of technological change.

DEFINING THE PROBLEM

There is an African digital skills gap. This gap widens when the gender gap is included. In addition, a youth "bulge" will result in 375 million young people entering the labor market by 2030. Ensuring the widespread availability of Digital Skills which allows individuals and businesses to harness the opportunities and guard against the risks of the digital economy is fundamental.



Source: ITU- 2018- Continuum of Digital Skills[8].

Building digital capability will enable African countries progress towards the foundation for Sustainable Development Goal (SDG) thematic Indicator 4.4.2: "Percentage of youth/adults who have achieved at least a minimum level of proficiency in digital literacy skills". However, digital capability will not be an easy endeavor in a continent faced with many lingering challenges of underdevelopment, poverty and instability, just to mention a few. Africa has the lowest literacy rate of 64.0% compared to the global average rate of 86.3% for people aged 15 and above (2). 15% of the African workforce is unemployed and 41% of Africa's 1.3 billion population are within the economically dependent age group of 15 years or below [2]. Although Africa makes 16% of the world population, its GDP share to the global economy only amounts to 5% (IMF, 2019). According to UNDP's 2018 Human Development Index (HDI) that measures people's wellbeing from three dimensions of *longer and healthier life, access to education and standard of living,* Africa is still lagging far behind the rest of the world. Despite notable cross-continental progress over the past few years, inequalities remained wide and deeper. Africa's school enrolment at pre-primary, secondary, and tertiary levels is grossly lower by 27% than the global average, while primary school dropout is higher by 21%. Gender inequality is also apparent. Females who make half of the population with higher social influence and life expectancy have low adult literacy and access to digital technologies, when compared to their male counterparts.

With the advancement of the digital economy and the encroachment of labour saving technologies, African countries will need people with skills that complement these technologies to allow new pathways to emerge. In light of this, any capacity development effort to digitize the African society must be people-centred, locally owned, deliberate and a systematically designed process to empower individuals, organizations and the society as a whole, to *unleash, strengthen, create, adapt, and maintain capacity over time.* Such a holistic digital capacity development approach allows the continual building of both the requisite digital skills and competencies and enabling environments. Education is a universally accepted basic human right that plays a decisive role in determining the society' capability to survive and thrive in the digitized global world. A skill-focused education system produces the required number, type and quality of workforces to develop and adopt digital systems, while the application of digital technologies further enables and continuously reshape the education curriculum, delivery and administration processes at all levels – from pre-primary to tertiary and lifelong learning. Accordingly, this require education systems to be flexible, inclusive, proactive and tuned into producing a new breed of workforce that readily and continually learns and unlearns on a wide array of complex skills and competency required in the ever-changing digital world. The report by the *Pathways for Prosperity Commission* on digital readiness stresses

[8] ITU-2018- Digital Skills Toolkit- Decent Jobs for youth-digital skills campaign

that harnessing the digital age requires two types of skills to develop at national and continental level. The first set of skills is Digital Skills. Each society will need to have a sufficiently large group with advanced digital knowledge and engineering skills. These skills are also required at the government level in order to be able to make decisions, support and take advantage of emerging opportunities. For the broader workforce, digital literacy is essentially required. For this, expanding access to the internet is essential for basic digital skills. The second set of skills that need to be cultivated are Digital Complementary Skills. Those skills that cannot easily be automated or codified will be increasingly in high demand in the digital economy. Skills such as empathy, personal communication, business consulting, communication and language skills as well as creativity and adaptability. Socio-emotional interpersonal skills as well as hard cognitive skills that are difficult to computerize would need to be developed and nurtured further. These are the skills of the future that any of the countries in Africa need not underestimate and seek to capitalize on in terms of crafting clear and strategic policy in making themselves digital ready.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Review education curricula in accordance with the evolving needs and trends in the digital economy and society.

- Review education curricula according to current needs and trends in the digital society, economy and labour market, with a focus on Science, Technology, Engineering, Art and Maths (STEAM) and a combination of digital, 21st century and e-business skills, across all areas of learning.
- Promote gender-inclusive education frameworks and policies and boost relevant education opportunities and digital skills development for women and girls in STEAM-subjects to narrow the gender digital divide.
- Encourage diversity and inclusion in STEAM education.

Provide schools and other educational institutions with technology equipment and, where possible, broadband Internet connection. More advanced equipment will need to be provided by companies in work-based learning systems. In parallel, ensure that teachers access digital training and promote the development of train-the-teachers programmes, both for their own

- professional development and for educating students on the use of technology to help create a scale-up and multiplier effect.
- Promote technology-supported learning, including creating and scaling-up eLearning platforms, which offer instant access, and use open educational resources. Ensure that innovative digital knowledge products and learning opportunities reach people from diverse educational, social backgrounds and regions, also by ensuring all platforms have mobile versions. To enhance access, the creation of specific offline functionalities targeted to those living in disconnected remote areas is encouraged.
- Support the establishment and scale-up of online higher-level education institutions, with curricula that combine STEAM with transversal skills. Support the development of learning communities active within online platforms, to promote peer-to-peer learning and exchange of best practices, as a model including a mix of blended learning to enhance completion rates.
- Scale-up projects and programmes that apply an intersectional approach to promote institutional networking and support quality higher education in Africa, tailoring policies and actions to the needs of regional and national labour market

Develop partnerships through a multi-stakeholder African Alliance for Digital Skills and Jobs

- Engage public stakeholders, private companies, international organisations and donors, universities and NGOs to deliver expertise on market needs and review, co-create education curricula at all levels and establish new programmes focusing on digital skills;
- Support knowledge transfer, exchange programmes between a) innovation hubs and research centres, and b) incentivizing mentorship or role model programmes.
- Develop forecasting tools to analyse the existing skills base and evolving needs in the labour market
- Set up incentive mechanisms and develop a regional qualification framework for African institutions to become centres of excellence delivering training on ICT in line with market needs

Mainstream digital skills and responsible online behaviour among all citizens to enable them to be active and successful participants in the digital society and raise awareness of risks in terms of digital rights, online safety and security

- Build multi-stakeholder public-private partnerships to provide training on responsible online behaviour and digital hygiene;
- Ensure that online services that are relevant to the everyday life of citizens (i.e. eGovernment, eLearning, eAgriculture etc.) are tailored to different levels of literacy, including financial literacy and digital skills, ensuring recognition in national and sector strategies.
- Invest in education initiatives that increase mobile digital literacy and confidence for men and women across all levels of education, income and familiarity with mobile and the internet;
- Scale-up training programmes on digital financial literacy
- Integrate libraries and other life-long learning venues into digital skills strategies

Facilitate digital skills development across all sectors of the economy that use technology with a specific focus on governments, administrations, service providers and civil society

- Create a skills-related policy environment that keeps up with digital entrepreneurship and ensures a business environment where trained professionals are linked with relevant business opportunities, which serves as a platform to propagate lifelong learning in the rapidly changing digital landscape.

- Ensure that training initiatives targeting existing and future workers across all sectors, including ICT professionals, encourage computational thinking, 21st century skills and provide advanced digital skills.
- Promote learning opportunities delivered by public and private partners for workers across all sectors, including on-the-job training and rapid-skill-training as well as knowledge sharing and mentoring within national and regional innovation hubs.
- Design training programmes on digital skills specifically targeting SMEs and start-ups within innovation hubs, at the national and regional level.
- Develop targeted learning opportunities to enhance skills among African web content developers.
- Promote the enhancement of digital skills through advanced in-company training and on-the-job training, after education and capacity building.
- Incentivize local and international companies to hire and train young African inexperienced human resources for local jobs or in the context of circular migration.
- Stimulate governments to use more local IT-resources and train them on the job, using international expertise to deliver on-the-job training;

- Adjust the international tender processes to include the possibility to make more use of locally trained/educated people.
- Stimulate diaspora reintegration and provide targeted on-the-job training.

D. DIGITAL INNOVATION & ENTREPRENEURSHIP

GENERAL OVERVIEW

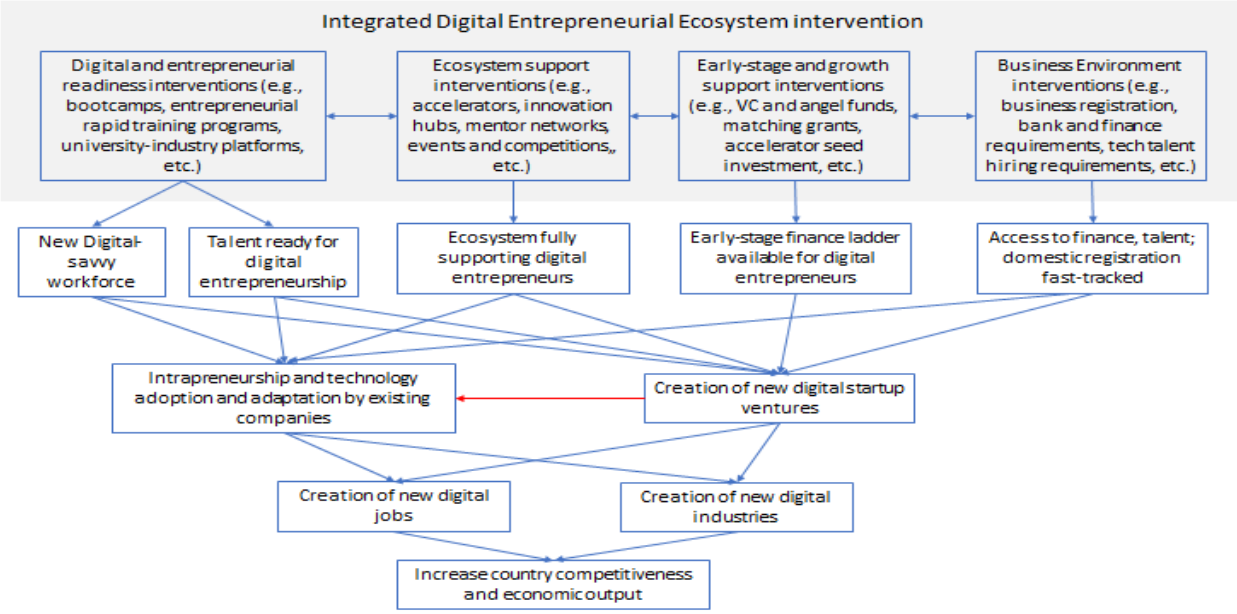
The priority for science and technology innovation in Africa has been emphasized by the African Union through the adoption of the Science, Technology and Innovation Strategy for Africa 2024 (STISA) and the African Science and Technology Consolidated Plan of Action (CPA).

Technology and innovation have been the major forces of progress in the world in recent years in terms of poverty reduction, human development, growth and competitiveness of national economies in the 21st Century. The importance of technology for development and economic growth was recognized in the SDGs and the AU 2063 Agendas and it is well recognized that it plays an even more central role in the attainment of all SDGs. In fact, the Goal 9 of the Sustainable Development Goals, “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”, implies that without technology and innovation, industrialization will not happen, and that without industrialization, development will not happen.

Innovation is at the heart of the continuing digital revolution that is affecting almost every part of the social, commercial, and political areas. Relentless innovation in the hardware, software, applications and networking fields including, Cloud Services, Artificial Intelligence, Blockchain, and the Internet of Things, 3D Printing, Digital Sequencing, Nanotechnology and sensors among others are driving change at a staggering pace. Innovation and Entrepreneurship are thus critical if Africa has to remain in the race with the rest of the world, and benefit from the Digital transformation within the broader framework of Agenda 2063.

This innovation ecosystem is giving rise to new ways of doing old things (e.g., mobile payment) as well as completely new forms of activity (e.g., Social media). Digital entrepreneurship takes advantage of these innovations and is on the rise across Africa. There is no question that the number of technology startups and the organizations to support them has multiplied in recent years. In Africa we now have

an inspiring generation of entrepreneurs that is working actively to bring the benefits of the digital age to every citizen and organization of Africa by unleashing the power of modern-day technology for the benefit of society. It is a generation that seeks to help create a brighter future full of opportunities and possibilities for the many generations.



Africa has 400+ technology hubs in 93 cities and 42 countries. More than 130 new hubs have opened over the last two years. There was an almost four-fold yearly increase in total funding received for start-ups in 2018[9]. In addition, the number of funding deals more than doubled and startups on the continent are increasingly receiving bigger ticket rounds of over $5 million. In 2018, African startups, mainly ICT, raised a record $1.1 billion[10]. African entrepreneurs have been at the forefront of using digital technologies to create innovative solutions to development problems. In each problem, constraint, or challenge, these innovators see opportunities. Some experiences, such as mobile money and pay as you go solar, have given Africa hope that it can also be a dynamic and innovative player.

The concept of the digital innovation divide entails that not all ecosystems are equal, either in terms of the inputs of talent (intellectual and creative), investment, and resources or in terms of their output, whether technological, social, or financial. This means that some communities and ecosystems are developing and benefitting from emerging technology and ICT-centric innovation, while others are reliant on older technologies or see little access to ICTs at all. These can be seen as the continuum of economies, moving from extractive, factor driven economies; through efficiency driven economies, which adopt technologies from other areas; to innovation driven economies. In many cases, different communities or sectors within an economy will exist at different points in this continuum, widening the innovation divide.

DEFINING THE PROBLEM

Despite the strong entrepreneurial mindset and the growing number of digital entrepreneurial intermediaries, Africa has not translated its potential into a vibrant or comprehensive digital entrepreneurial ecosystem, with commercial digital hubs that can generate talent and ventures to compete at the highest global level.

[9] Weetracker 2018

[10] Partech Partners, African Tech Startups, March 2019

The innovation divide stems in part from inefficiencies in the use or allocation of resources in the innovation ecosystem, from a lack of key supports, policies, and other elements of a nurturing environment, as well as a need for further collaboration between stakeholders in order to develop a complete ecosystem through coordinated support activities.
Focus should be on the whole system, rather than simply investing in inputs, and the need to neither under- nor over-utilize government intervention and ensure a cohesive, integrated regime of policies related to the ecosystem.

Member States will need to continue designing customized interventions to strengthen their specific entrepreneurship ecosystems of mutually reinforcing components that include a digital knowledge base and ICT market; a digital business friendly environment; access to finance; digital skills and e-leadership; and an entrepreneurial culture.

Realizing the vision of digital transformation for Africa will require appropriate digital innovation and entrepreneurship development policy agenda in alignment with the Sustainable Development Goals and the Science, Technology and Innovation Strategy for Africa 2024 (STISA) to enhance the competitiveness of the African private sector, to support the growth in the use of ICT, develop and strengthen institutional capacity.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Improve the policies for digital innovation and entrepreneurship

- Develop effective legal, institutional and regulatory framework and policy agenda for supporting the development of digital innovation, entrepreneurship and research & development
- Develop adaptive and anticipatory regulations legal and regulatory systems promoting academic and other forms of entrepreneurship, etc.
- Develop a National System of Innovation to address the pressing barriers to capabilities of humans to advance digital innovation, mainly poverty (broad definition), inequality (redistribution); social capital (cohesion & trust); institutions (policies, organizations, networks); natural capital (electricity, water); economic resources (e.g. access to credit, transport);
- Build government capacity on policy design, implementation on technology-related policies as well as on broader policies
- Strengthen the Protection of Intellectual and Innovative Property Right
- Promote and facilitate the development of private sector to stimulate both the supply of and demand for technologies needed in the economic sectors,

Create a conducive environment to empower people to innovate and facilitate access to finance and funding mechanisms for digital enterprises

- Develop structures and mechanisms that promote the production, diffusion, use and management of technology and innovations to accelerate the achievement of Agenda 2063 and SDG targets
- Establish an Innovation Fund from which the growing pool of hardworking and successful entrepreneurs can tap resources to stimulate digital innovation and entrepreneurship development, and commercialization through public-private partnership
- Provide incentives in the form of awards and national recognition to encourage innovation
- Facilitate access to funding for start-ups by local ecosystems (hubs) and development partners

- Build and support country-level angel investor networks in partnership with continental networks and educate and attract international venture capital firms to invest into African tech
- Support the establishment of local digital innovation centres serving as a co-creation and innovation hub for digital solutions of tomorrow and as a first entry point for foreign investors

Create an enabling ecosystem that addresses all interrelated barriers and needs and improve advisory services to stimulate digital entrepreneurship for digital enterprises

- Customize support to digital entrepreneurs, support networking for more peer mentorship services. Regionally, seek for successful serial entrepreneurs and “star geeks”.
- Develop a holistic continental mapping of ecosystems, building on existing initiatives, to identify and support the scaling-up of innovative models and financing platforms, accompanied by relevant soft and business skills training for digital entrepreneurs and to inform investors on existing relevant opportunities. This includes crowd funding, innovative fintech tools, mobile banking. Holistic mapping of the ecosystems to identify promising models that can be scaled up in Africa.
- Promote the availability of quality information, accuracy and accessibility to market actors, to increase awareness of existing solutions and opportunities among digital entrepreneurs and the public.
- Promote open data policies that can ensure the mandate and sustainability of data exchange platforms or initiatives to enable new local business models, while ensuring data protection and cyber resilience to protect citizens from misuse of data and businesses from cybercrime.
- Encourage governments to entrust national start-ups and social enterprises with public projects by adopting their cost-efficient solutions to address local issues (agriculture, health, administration).
- Segment and group countries by the maturity level of their innovation ecosystem and define four or five thematic business clusters as centres of excellence, in the context of the EU-Africa Start-up Initiative to be created *(proposed action under recommendation on partnerships).*
- Support African digital entrepreneurs to network and showcase their products outside Africa – i.e. in trade fairs.
- Encourage cooperation with start-up advocacies to further improve market and regulatory reforms through multi-stakeholder dialogue.
- Train, advise, coach and mentor the entrepreneurs through blended learning.

Establish and strengthen partnerships among African actors, to harmonise efforts related to digital entrepreneurship at the continental, regional and national level

- Embed digital entrepreneurship in continental, regional and national policies and enable structured policy dialogue between public and private partners to inform policymakers about the most pressing actions to be made in creating a favourable environment for digital entrepreneurship, with a focus on building on continental, regional and national partnerships

- Support Member States in setting up national start-up strategies and start-up laws in terms of both legislation drafting, and enforcement. Invest in research for start-up Acts. This should be based on a multi-stakeholder, bottom-up approach and taking entrepreneurs' point of view into the legislation process.

- Fund regional and continental knowledge-sharing, training and technical meetings, addressing the needs of the digital ecosystems and create open educational resources

- Support the establishment and financing of innovation Hubs in collaboration with private sector

- Encourage and promote digital innovations designed locally by empowering all relevant local actors (governments, start-ups, research, private sector)

VIII. CRITICAL SECTORS TO DRIVE DIGITAL TRANSFORMATION

Digitalization of the following sectors are critical if the benefits of digital transformation are to be realized by the general population. The successful digitalization of these sectors is dependent on the implementation of the foundations pillars mentioned above.

A. DIGITAL INDUSTRY

GENERAL OVERVIEW

There is need for Africa to develop a competitive advantage in the area of digital exploitation and production through the development of a competitive ICT industry and service sector. The digital industry will play a key role as a key partner in the process of moving the continent into the fourth Industrial revolution. Member States will therefore need to promote and facilitate the role of the private sector in the development and participation in the global digital economy. Digital technologies have opened new ways to organize production, logistics and delivery, and offers better means to serve and satisfy consumers. Mass production is increasingly flexible, individualized and resource friendly to be able to serve the customer markets. Production is monitored and controlled in real-time to reflect dynamically changing customer demands. At the other end of the chain, real-time consumer trends are collected with increasing levels of granularity. Big data is produced, traded and shared. A major share of the value of the whole business domain is contained in this big data.

DEFINING THE PROBLEM

The Industrial ecosystem is being redefined as ICT rises as the core element of competitiveness in all industrial sectors bringing about mass expansion of new products and services. However, the low levels of know-how for the tools in the Digital Industry is threatening the traditional industries.

There has been an active expansion of online companies generating competition with offline giants, disrupting the traditional manufacturing, delivery and sales processes albeit in Africa, the sectors such as agriculture, government services, manufacturing that could benefit from such innovation has lagged behind, due to legacy processes or high startup investments. The need to use industrial digital technologies such as additive manufacturing, artificial intelligence, remote monitoring, 3D printing and cloud analytics is the way to ensure that Africa's industries are digitalized. For example, the manufacturing industry is faced with new technological opportunities and business models.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Support the development and growth of the ICT industry to facilitate the production, distribution and provision of ICT products, goods and services

- Establish ICT assembling and manufacturing plants

- Promote development and production of software and hardware in Africa
- Facilitate setting up of business process outsourcing (BPO) in Africa
- Establish Technological Parks and Incubators
- Encourage and assist industries in the use of ICT to automate and modernize their business and industrial processes
- Support the industrial sector so that it can generate employment opportunities that serve to eradicate poverty

Promote and attract investment to spur the digital industry in Africa

- Encourage and facilitate the active participation of African and foreign investors in the digital industry and in the development the ICT export sector
- Promote joint ventures between local and foreign companies to facilitate the rapid development of the digital industry and service sector
- Promote the development of a competitive ICT export sector with the active participation of local producers and service providers.

Create conducive environment to promote growth of the digital industry

- Establish regulatory clarity between online and offline businesses within the same sector
- Invest in digital infrastructure, lowering tariffs on digital products, encourage adoption of low-tech, disruptive applications such as mobile money and social media, and reduce product market regulations.
- Incentivize firms to invest in more efficient digital solutions and encourage the entry of startups that can put competitive pressure on incumbent firms

B. DIGITAL TRADE AND FINANCIAL SERVICES

GENERAL OVERVIEW

Agenda 2063: The Africa We Want, envisions Africa as a continent on equal footing with the rest of the world as an information society, an integrated e-economy where every government, business and citizen has access to reliable and affordable ICT services by increasing broadband penetration and providing venture capital to young ICT entrepreneurs and innovators.

This critical sector looks at the development of a robust digital market characterized by increased quality of financial inclusion, fair competition and advanced consumer protection with main focus areas on digital trade and financial services.

The AfCFTA will be a market of 1.2 billion consumers, which will reach 1.7 by 2030 with a combined GDP of 2.1 to 3.4 trillion US dollars, depending on sources of data. In addition, Africa's current private and business to business consumption is estimated at US$4.0 trillion. Intra-African trade is expected to increase by 52.3% by 2022 and double if there is effective elimination of Non-Tariff Barriers. Digital trade will play a key role in boosting intra-African trade.

Integrating Africa to a single digital market will create economies of scale and opportunities to grow Africa's economies and the key to unlocking these opportunities is the ability to adapt to digital trade and financial services. E-commerce and Digital Financial Inclusion will be the basic enablers in this case to ensure that Africa truly becomes the single digital market we want.

Digital trade encompasses digitally-enabled transactions of trade in goods and services that can either be digitally or physically delivered, and that involve consumers, firms, and governments (OECD).
E-Commerce transaction is the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing of orders. The payment and the ultimate delivery of the goods or services do not have to be conducted online (OECD).

Digital Financial Services refers to a broad range of financial services accessed and delivered through digital channels, including payments, credit, savings, remittances and insurance. Digital channels used for these financial transactions are the internet, mobile phones, Automated Teller Machines (ATMs), Point of Sales (POS) terminals among other tools. Digital Financial Services (DFS) concept includes mobile financial services (MFS) which has become a very popular trend across the African continent with the emergence of the use of mobile phones to access financial services and execute financial transactions such as M-Banking, M-payments and M-money.

Registered mobile money accounts in world regions, 2013-18

	2013	2014	2015	2016	2017	2018
Sub-Saharan Africa	98.3	146	222.8	277.4	348.60	395.70
Northern Africa and Middle East	35.8	37.9	41.7	44.1	47.27	48.89
Latin America and the Caribbean	8.3	14.9	17.3	23	23.53	26.99
East Asia and the Pacific	23.7	21.8	26	36.6	68.55	94.61
South Asia	35.5	76.9	101.9	164.2	258.36	287.59
Europe and Central Asia	1.5	1.5	1.7	10.4	11.55	12.35

Source: GSMA (2017), 2017 State of the Industry Report on Mobile Money

With the launch of the African Continental Free Trade Area (AfCFTA), the importance and relevance of Digital Financial Services becomes primordial as it would facilitate greater intra-African trade and put in place the needed cross border payment systems in the operationalization phase of the AfCFTA. It would also facilitate the transactions involved in other financial products and services (e.g., to deposit savings or make a loan payment). Transaction data produced by digital payments can also reduce informational asymmetries between borrowers and lenders, and serve as a useful input into credit decisions.

Digitalization offers new opportunities to boost the economy (through e-commerce and digital Financing), cut red tape and reduce trade costs (through e-payments, e-government and the digitalization of public services), leap frog and participate in the 4th industrialization revolution. This

potential is even greater for Landlocked Developing Countries (LDCs).

DEFINING THE PROBLEM

In spite of the opportunities, there are several limitations that African countries continue to face; some of which relate to the current infrastructure, digital and technological gap.

While digital trade represents a multi-trillion-dollar market globally, Africa currently claims only a small slice of e-commerce revenues. Nevertheless, Digital trade in Africa is rapidly growing and is expected to constitute a growing share of trade towards the intra African trade agreement.

Increasing infrastructure and deploying the right policies for e-commerce enables the large informal sector and enterprises to market, receive payment and make purchases with international buyers, thus increasing the scale of market.

In 2017, e-commerce accounted for 12 per cent of global trade in goods (International Trade Centre, 2017). The International Trade Centre estimated that the market size of e-commerce would reach US$50billion in 2018 from US$8billion in 2013 (International Trade Centre, 2015), while McKinsey has projected that the value of e-commerce will reach US$300billion by 2025 (McKinsey, 2013). For cross-border trade, there is the opportunity to export a greater number and diversity of goods to a larger pool of countries (International Trade Centre, 2017).

New technologies give access to markets that were previously closed and removes distortions in demand by giving customers direct access to products previously controlled. Rapid technological developments have created new markets that now connect consumers, lower transaction costs and reduce information asymmetry.

E-commerce channels are increasingly being used by governments for the delivery of public services such as visa processing and issuance, civil registration, tax payments and tendering. For trade facilitation, trade portals to provide trade information, and single windows are used to enable the virtual completion of trade formalities with the associated reduction in time and cost of clearing goods at ports. These single windows are also used to coordinate the processes of the multiple government agencies operating at seaports.

Digital Financial Services is also another sector that needs to be further tapped into. Not only does it provide users with the flexibility to do financial transactions and banking online and on the go, but it is also a means to settle trade payments, digitalize government transactions through Central Banks, move from traditional paper based Banking to Digitalized and automated systems that are more efficient, easier to track and monitor; and quicker to access.

The link between financial inclusion and development is well recognized and that financial inclusion can play a great role in attaining many of the SDGs. The use of financial technology, in particular mobile money, has become increasingly widespread in a number of Member States of the African Union. For example Kenya is ranked as 26th worldwide in the Digital Financial Inclusion Rankings. Of the 395.7 million registered mobile money accounts in Sub-Saharan Africa, 145.8 million are active (GSMA report 2018). In addition, according to the 2018 Africa's Development Dynamics on Growth, (AUC/OECD), Africa uses more mobile banking than all other developing regions put together.

The Digital Financial Services (DFS) market in Africa looks very promising. Mobile financial services have become an important component of Africa's financial services landscape, from payments and current accounts, to savings, loans, investment and insurance. Central Banks are also working in close collaboration with Private Banks to develop Digital Financial Strategies with an area of focus on cashless economies.

Digital regional payments systems have also emerged to reduce the cost and time associated with cross-border trade, such as:

- COMESA Regional Payment and Settlement System
- East African Payments System
- SADC Integrated Regional Electronic Settlement System

At the continental level, a couple of payments and settlement platforms are also under development such as the ones by UPU and Afreximbank. The UPU- Ecom@africa initiative aims at establishing an integrated, inclusive and innovative e-commerce ecosystem provided by designated Operators through e-commerce (online) platforms using the postal network and products for cross-border logistics, deliveries, returns and payments, while the one for Afreximbank is expected to allow cross-border payments wherein both the sender and receiver transact in local currencies.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Promote intra-African integration in digital trade to achieve wider participation by enterprises in national, regional and international e-commerce (especially cross-border)

- Reduce barriers to cross-border digital trade and market access by supporting Africa's efforts to establish a continental digital single market in line with the Continental Free Trade Agreement that aims at removing legal and technical barriers to trade
- Develop an enabling regulatory framework for e-commerce at the continental level, including common rules for consumer protection
- Allow regional and continental integration of African data markets through open standards, while taking into account that security and regular upgrading of these tools must be guaranteed
- Develop and improve the regulatory environment for financial and payment services
- Support programmes promoting e-Money adoption, especially in rural & peril-urban areas
- Include elements on e-commerce in the digital skills training programmes targeted at Africa's MSMEs.
- Develop training/outreach campaigns to increase awareness and trust. Educating Africa's consumers about the benefits of online Banking, shopping and some basic safety rules will be a key factor to drive consumer adoption.
- Analyse issues relating to parcel delivery and propose solutions based on regional cooperation
- Support eco-system initiatives that tackle the issue of lack of physical addresses.

Create a conducive environment for the development and uptake of digital financial services

- Create a supportive regulatory environment that allows the linking of different fintech solutions (and if possible, conventional banking services, to target the market of remittance payments and to further include the unbanked and increase their access to financial services)

- Develop national and regional forums to foster public and private dialogue around Digital Financial policy and regulation. The continuous evolution and innovation in the sector require continuous dialogue between the government and the private sector to develop the right enabling environment for the private sector to develop the right services that will be used by the unbanked populations

- Ensure national and regional interoperability projects for e-Money and other DFS solutions

- Enable market entry of innovative, technology-driven financial service providers and solutions and encourage greater competitiveness

- Strengthen financial consumer protections with respect to disclosure/transparency, responsible lending, data privacy, and dispute resolution

- Establishing technology-forward Regional and National financial inclusion strategies

- Encourage the creation of a single African payments area to bolster cross-border trade, transfers and investments;
-
- Promote legislation on registration, ease of doing business and mobile payments integration across borders for digital entrepreneurs
- Digitize government-to-person payments
- Enable the use of low-cost delivery channels, including retail agents
- Use the African Union Financial Institutions flagship project as one of the key vehicles to develop the continent's financial sector and put in place an African single currency to facilitate intra-African trade. As such, it can also be used as a vehicle to advocate for further development of Digital Financial Strategies across the continent when advocating for the establishment of these institutions

C. DIGITAL GOVERNANCE

GENERAL OVERVIEW

Effective government is the cornerstone of poverty reduction and inclusive growth. Weak capacity countries results in falling revenue mobilization and fiscal space, inefficient targeting of public expenditures, procurement inefficiencies, and poor service delivery to citizens. In contrast, citizens' expectations are rising for governments to perform on par with the service standards of the private sector. Technology adoption can be transformational in improving governance and government performance. It has the potential to boost government efficiency, transparency, responsiveness, citizen trust, and service delivery.

In recent years, countries worldwide have improved their uptake of digitalization of government with the objective of improving government effectiveness. The global average for the UN e-government development index has improved from 0.47 in 2014 to 0.54 in 2018.

For years, efforts to digitalize government services have mirrored the vertical silos of the government organization and, often, that of donors. Countries have invested in digitalizing core government back-office processes to address challenges relative to specific government functions, with the objective of increasing efficiency and automation of processes (for example, integrated financial management information systems, human resources management information systems, e-procurement, and so on). On the one hand, the silo approach results in systems that have their own structures and which do not communicate with each other, resulting in reduced efficiency potential. On the other hand, it leaves citizens and businesses dealing with multiple government entities with their own separate processes and systems, which reduces the quality of the user experience of citizens.

A whole of government approach considers the government as one entity, which allows for the definition of technology standards across government, the design of an enterprise architecture for services, the sharing of infrastructures across different agencies or ministries, the establishment of shared services, and the integration of systems through system interoperability layers. The use of shared services and infrastructures contribute in reducing the cost of investment across government[i]. For citizens, having a single government portal, a whole of government services catalogue, with interoperable systems in the back-end, improves user experience on access to services. In this way, citizens do not have to deal with multiple government entities and systems to access public sector services.

DEFINING THE PROBLEM

Despite advancement over the past years, according the UN e-government development index, Africa is lagging compared to other regions. The average score for Africa increased from 0.26 in 2014 to 0.34 in 2018. Nevertheless, only four countries (the Seychelles, Tunisia, South Africa, and Mauritius) out of 54 in the African continent scored above the world average of 0.54 in 2018, while 11 countries (Tanzania, Uganda, Seychelles, Kenya, Ethiopia, Morocco, Ghana, Rwanda, Mauritius, Tunisia, and South Africa) scored above the world average of 0.56 for online services. Nonetheless, disparity of e-government development level is high among Member States of the African Union.

The political will, lack of coordinating structures among the AU member states and a single pan African digital ID system has been the main reasons for the low levels of digital governance.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Develop Policies, Strategies, Standards and Guidelines to facilitate the deployment of Digital Governance services

- Develop comprehensive national, regional and continental Digital Governance strategies

- Develop a high level Enterprise Information Service Architecture (EISA). EISA to integrate work processes and information flows with technology to achieve the strategic objectives of each sector. EISA should promote and support inter-operability, open systems, end-user satisfaction and prudent technology investment and best practices

- Define the national and regional e-Government Inter-operability Technical Framework (ITF). The ITF is to define policies and specifications for governing information flow across Government and Regions as well as setting core standards for data and information integration and management. The ITF should also set out policies for establishing and implementing e-Government Metadata Standard across the public sector

- Develop technical standards for setting requirements for the verification of the identity of

individuals and organizations during on-line Government to Government, Government to Business and Government to Citizens e-Government transactions and interactions

- Develop a technical briefing document defining technical requirements for assessing threats and vulnerabilities to e-Government security systems and the taking of countermeasures for each security objective.

Deploy the essential enabling building blocks of eGovernance services

- Implement enabling eGovernance Services based on internationally recognised standards. Allow regional and continental integration of public eServices through common standards and open standard software tools. Develop Reference Solutions, corresponding IT-architecture frameworks and Reference Models for related legal requirements and implementation on a regional or continental basis for synergies and ensuring interoperability

- Establish an entity that has the responsibility for planning and coordinating e-Government efforts

- Seek regional or continental inter-government agreements to exchange and re-use the Intellectual Property regarding eGovernance solutions, respecting the IP of third parties

- Establish electronic government registers or digitalise existing ones, starting with an electronic population registry, eBusiness register and Land Use register

Promote Private Public Partnerships in developing digital services

- Develop Government-to-Business Services (G2B)

- Develop Government-to-Government Services (G2G)

- Develop Government-to-Citizen Services (G2C)

D. DIGITAL EDUCATION

GENERAL OVERVIEW

The AU Continental Education Strategy (CESA-2016-25) strongly recommends improving ICT capacity including use of ICTs platforms at all levels of education, to promote education access and quality; research, knowledge generation, and innovation, and take advantage of the fourth Industrial revolution

The education sector will be critical in helping to prepare the workforce and contribute to ensuring that these transformations are inclusive and lead to reduction of poverty and inequalities. In addition, there is a unique opportunity to transform the delivery of education itself. In particular, the spread of the Internet and mobile broadband, digital platforms, digital content and digital tools allows the education sector in Africa to make use of technology to expand access, improve quality, link up with international education and research networks, and strengthen management of the sector.

Education technology can also be used to expand access to hitherto unreached populations. This is especially important for Africa where a significant number of young people still do not complete primary and secondary schooling. Higher education is out of reach for the vast majority: the median gross enrollment ratio in higher education is less than 10 percent in the majority of countries in Africa. As

more secondary school leavers reach the portals of traditional universities and tertiary education institutions, policy makers are forced to often expand access with significantly lower quality. Digital technologies, especially the possibility of online learning, offers the potential of vastly expanding access to postsecondary education.

DEFINING THE PROBLEM

Introduction of technology in education in Africa has not generally been successful at scale. There have been many promising pilots but scaling up has run up against challenges of implementation, including technical barriers, policy and regulatory constraints, and capacity to manage the integration of technology in education.

Connecting Africa's universities, skills-training institutions and secondary schools with broadband Internet is essential if the continent is to realize the potential of digital technologies in education. Further, all young people need to acquire digital skills at the basic and intermediate levels if they are to use technology. Integration of digital skills training into the core curriculum of formal education courses for all learners, irrespective of their specialization, is essential.

Another major consideration is to equip teachers with the knowledge, skills, and confidence to use technology to improve their own professional competence and the learning of their students. If technology is to change teaching, teachers must actively espouse it. Without addressing these factors in a concerted manner, the spread of technology in education will encounter insurmountable barriers.

From 2008 to 2018, about 15,000 new education apps and online technologies accelerating the widespread adoption of digital education. HolonIQ's data-driven research on the global education market estimates that about US$152 billion has been invested in these technologies, and it is projected to more than double to US$342 billion by 2023.

With the surge in education technology products, new digital technologies constantly appear in the marketplace, making it difficult for policy makers to assess the pros and cons of different approaches. The taxonomy elaborated here unbundles promising digital technologies and organizes these into clusters as a way of framing opportunities to leverage technology in teaching, learning and administration. Countries can review, assess, and implement specific technologies carefully taking into account educational goals, expected outcomes, and country-specific contexts.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Promote the use of ICTs for both formal and informal Education

- Modernize current curricula to exploit ICTs for learning purposes.
- Initiate drives to identify already developed educational content earmarking it for localized content.
- Encourage and make more affordable the access of educational institutions to the Internet.
- Encourage the development of Africa's specific eLearning and computer-based training (CBT).
- Support the proliferation of virtual universities and educational institutions
- Promote the use of educational Websites that provide support to formal education.
- Encourage and foster ICT R&D through the establishment of a university portal or network.
- Strengthen public libraries and reading places, assisted by ICTs, to develop reading and information-seeking behavior of the society
- Support and encourage the development of eLearning and CBT for informal educational subjects

- Encourage the development of locally relevant informal educational material
- Encourage the use of ICTs to encourage lifelong learning
- Promote the use of citizen guides in various areas as part of general education and knowledge (legal, medical, education and other issues)
- Use radio and TV for the improvement of informal educational levels.

Improve both formal and informal Education in ICTs

- Spread the learning of ICTs at all educational levels: primary, secondary, vocational training and university.
- Identify the required ICT literacy levels for various educational levels
- Develop training schemes for teaching ICTs to teachers
- Encourage the use of already established ICT training material to avoid the local redevelopment of the same.
- Encourage and support ICT training institutes through promotion, incentives and exemptions.
- Encourage the involvement of the ICT sector in formal ICT education.
- Encourage continued ICT education and professional development.
- Encourage the introduction of certification and the accreditation of institutes that provide certification training
- Improve informal ICT skills for citizens through media such as radio and TV.
- Raise awareness of the importance of informal ICT education through eLearning, the web and computer based training (CBT).
- Expose children to ICTs from an early age

Raise Public Awareness of ICTs

- Encourage the media to allocate time for news about general technological development, ICT educational programs and ICT progress in Africa.
- Encourage national awards in ICTs and related technologies.
- Host continental and international ICT exhibitions and conferences.
- Maintain a constant vigil on the benefits already reaped by ICTs for social and economic development.

E. DIGITAL HEALTH

GENERAL OVERVIEW

The vision for the Africa Health Strategy 2016-2030 is an integrated, inclusive and prosperous Africa free from its heavy burden of disease, disability and premature death. This is expected to be realized by building an effective, African-driven response to reduce the burden of disease through strengthened health systems, scaled-up health interventions, inter-sectoral action and empowerment of communities.

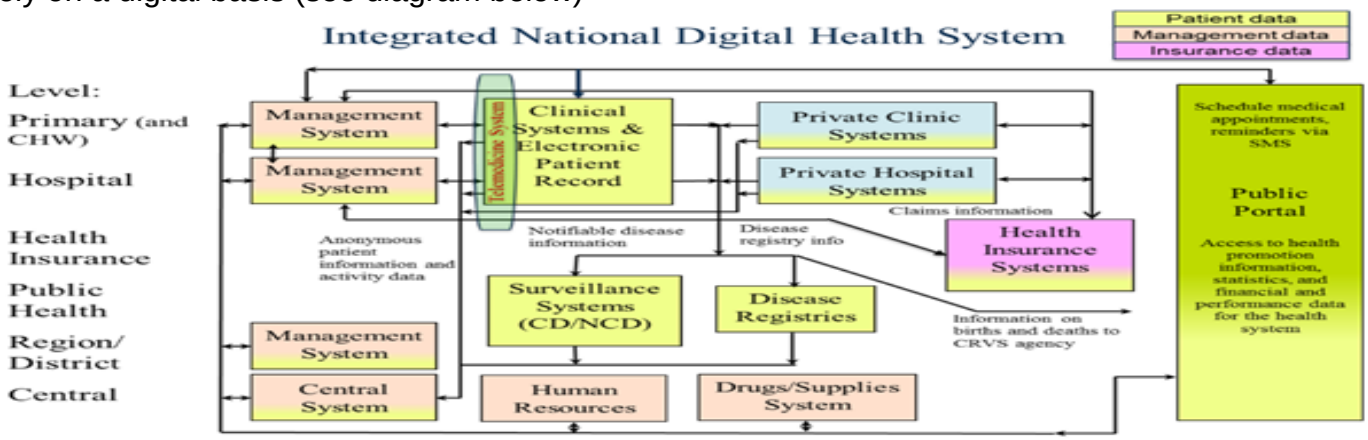
One of the strategic objectives of the Africa Health Strategy 2016-2030 is strengthening health research, innovation, ICTs for health, technological capabilities and developing sustainable evidence informed solutions for Africa's health challenges;

A digitally enabled health system is expected to contribute to Sustainable Development Goal 3 to ensure good health and wellbeing for all at all ages. Universal access to affordable high-speed broadband communications technology promises to assist the health system to provide higher quality and more patient-focused care, especially in rural and remote areas, by giving health workers access to tools that allow them to do more, make better decisions, and draw on resources previously only available in major urban centers. It also promises to put patients firmly in control of their own health data and contribute to improved security of this data.

DEFINING THE PROBLEM

Digital health shows great promise in supporting health system transformation. Positive trends include (a) greater recognition of the importance of digital technology and the need for government leadership, including from the Ministry of Health (MOH), in the process; (b) reduced barriers, especially in the availability of mobile devices, including smartphones, decreasing hardware costs, and better network connectivity; and (c) a focus on integration and interoperability of digital health solutions, including the importance of standards and a focus on scale, and increased awareness of the need for harmonized approaches.

The complex systems required to integrate and manage a across a multifaceted health system, including primary, secondary and tertiary health, patient data and health insurance can only be done effectively on a digital basis (see diagram below)



While there has been progress on digital health in Africa, substantial barriers remain because the foundation elements have not been adequately addressed. Barriers to scaling up of digital health interventions include: (a) weak infrastructure and device access, including reliable electricity and affordable high-speed broadband connectivity, especially in rural areas; (b) a lack of sufficient and consistent funding for digital health programs; (c) limited human resource capacity and digital skills.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Support the development of the necessary prerequisite elements to* realize the full potential of digital health *that responds to national health priorities and drives progress toward universal health coverage

- Develop a digital health strategy that lays out a compelling vision and provides clear direction to health system stakeholders. Assess the health needs of a country and consider how digital health solutions can address them.

- Establish a strong leadership, intersectoral collaboration between ICT and health by putting in place an intersectoral governance system with an action-oriented taskforce that advocates, advises, builds the capacity and monitors digital health initiatives

- Establish a robust monitoring and evaluation framework and harmonize key performance indicator (KPI) frameworks across digital health initiatives

Put in place regulations and policies needed to protect patient safety and privacy to foster trust in digital health solutions and facilitate their adoption while allowing innovation to continue to unfold

- Create appropriate data-protection and data-quality policies and regulations to enable digital health systems to support Universal Health Coverage

- Evaluate opportunities to improve healthcare delivery supported by digital health solutions and assess existing healthcare delivery regulations within Member States and adapt them as needed to enable the delivery of new healthcare services

- Define policies for teleconsultations and e-prescriptions, thus allowing smooth integration with current clinical practices and address the ethical concerns of professional medical bodies and patients by communicating the benefits and limitations of teleconsultations

Ensure interoperability to allow the integration and leveraging of different digital health solutions and data sources among government programs, hospitals, community health workers and patients

- Make interoperability a strategic priority and be identified in the national digital health strategy as a prerequisite for the success of digital health initiatives

- Set up a standards and interoperability taskforce to oversee standards-selection and interoperability issues and help define the approach toward interoperability in Member States taking relevant use cases into account

- Make use of existing interoperability profiles and base standards: Most standards that might be need already exist, but bringing them together in the right way is complex

F. DIGITAL AGRICULTURE

GENERAL OVERVIEW

According to the Food and Agriculture Organization of the United Nations, Africa is projected to be home to about 2 billion people by 2050. This population increase adds to the mounting demand for food and soaring food prices. Therefore, farm productivity must accelerate at a faster rate than the global average to avoid continued mass hunger. Obviously, sustainable solutions for decent employment in agriculture in Africa must address the intertwined issues of minimizing drudgery, while maximizing returns to effort, which could be achieved through harnessing opportunities in agribusiness entrepreneurships, and innovations to enhance productivity and competitiveness.

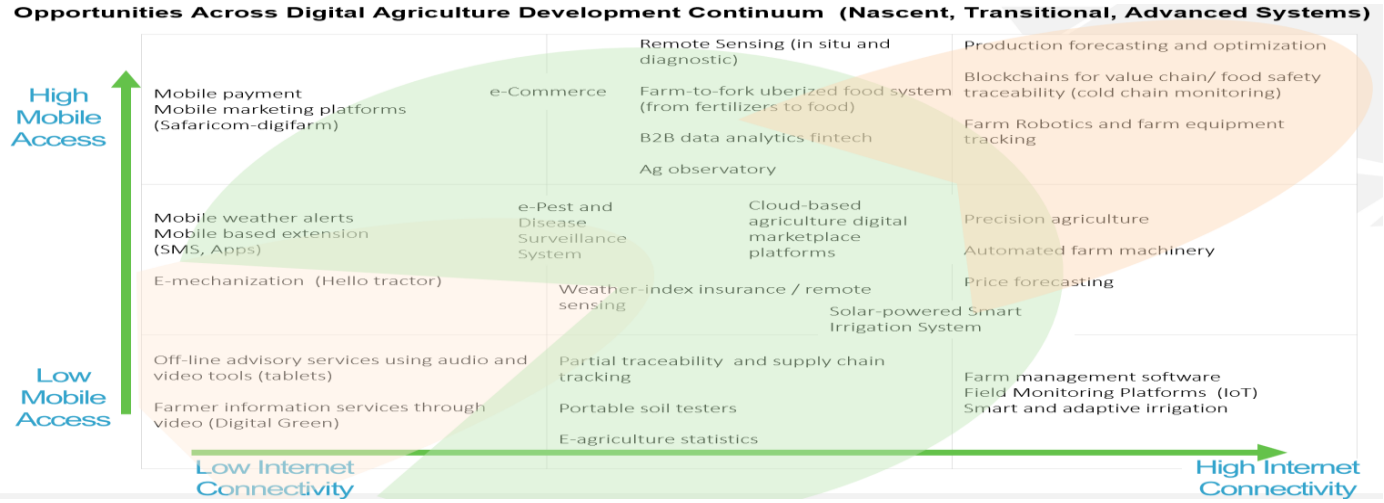
Considering agriculture as an essential driver of economic development and an area of great opportunities for people in Africa, harnessing opportunities in agribusiness entrepreneurship and innovations, including in ICT innovations, along the value chain, contributes to improving the sector's image, increases productivity and returns to investment and provides new employment opportunities, hence attracting more young people. Access to cheaper and more reliable ICT devices, particularly mobile phones, and increased connectivity in Africa is already an opportunity for adoption.

Digital technology opens vast untapped potential for farmers, investors, and entrepreneurs to improve the efficiency of food production and consumption in Africa. From precision farming to an efficient food supply chain, technology could bring major economic, social, and environmental benefits. Indeed, the

sheer optimism across the startup ecosystem is that extreme hunger can be sharply reduced in Africa, in this generation, by significantly transforming the industry that employs most of its citizens

DEFINING THE PROBLEM

Three characteristics of Africa's food system make it well-suited to benefit from digital technologies. First, the food system is large and complex, with many dispersed actors. Digital technology has the potential to connect Africa's hundreds of millions of rural inhabitants, many of them farmers, with the emerging trillion-dollar African food market. Digital technologies can connect upstream input suppliers – whether suppliers of seed, machinery, fertilizer, finance, or advisory services – with farms and farm enterprises. And digital technologies can link food buyers and sellers more efficiently, both within countries and across borders.



Source: World Bank. 2019. *Scaling Up Disruptive Agriculture Technologies in Africa*, Advisory Services and Analytics, currently under review.

Second, vast inefficiencies in resource use and marketing represent an opportunity for digital technologies to transform African farming. Food production is risky due, in part, to limited information about weather patterns, soil characteristics, future market demand, and other variables.

Third, Africa's food system is characterized by inequalities in access to technologies, information, and markets that digital innovations can help to overcome. Even in poorly-connected rural contexts, sophisticated off-line digital agricultural technologies can provide opportunities to help illiterate farmers. Digital agricultural information platforms or mobile finance solutions can level the playing field for marginalized groups, such as women, who traditionally have lower access to information and markets. Farmer identification programs can help to better target vulnerable farmers with support services.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Create conducive environment to foster the development of digital agriculture

- Improve rural digital infrastructure: foster competition in telecoms to boost rural coverage and lower costs

- Develop digital agrifinance services: for example, e-vouchers for direct benefit transfers and incentives for farmers and other agribusiness SMEs, and improved access to finance for startup and early-stage agritech enterprises

Provide farmers with reliable marketing information that helps them reach their markets more effectively, at lower cost and with wider opportunities

- Support agricultural digital platforms: for example, digital farm registries, digital marketing platforms and agricultural observatories

- Enhance agricultural digital skills and literacy: for example, provide targeted training for farmers, particularly for women, and extension agents

- Empowering women in agriculture using ICTs. advice provided y

Promote the deployment of digital solutions in Agriculture

- Implement digital solutions to schedule sprinkler irrigation systems and enhance the quality and productivity of land and eventually increase farmers‘ incomes

- Deploy eAgriculture information systems with content such as on health, nutrition and educational advice which can empower women by addressing the multiple responsibilities they have in caring for families as well as farming. Using Mobile telephony for sending and saving money enables rural woman to have some sort of autonomy over their finances.

- Implement traceability solutions to be able to respond to the quality standard requirements and help large buyers track, manage, pay, and reward small producers

IX. CROSS CUTTING THEMES

A. DIGITAL CONTENT AND APPLICATIONS

GENERAL OVERVIEW

The Extraordinary Session of the African Union Conference of Ministers in charge of Communications and Information Technologies (CITMC) held in Johannesburg in 2009 acknowledged the benefits of the dotAfrica domain name to Africa and adopted a resolution (in the Olivier Tambo Declaration) to "Establish dot Africa as a continental Top-Level Domain for use by organizations, businesses and individuals with guidance from African Internet agencies".

Furthermore, the Addis Ababa Declaration on Information Communication Technologies adopted by the Summit of the African Union Heads of State and Government held in Addis Ababa in January-February 2010 [Doc. Assembly/AU/11(XIV)] directed the Commission to promote better utilization and management of critical internet resources.

Digital content provides a vital alternate view of looking at digital technology from the point of view of the end user and not the view of the hardware, network and service engineers and providers. Digital developments derive their value from the content they deliver or enable for users. It is thus important for this content to be both locally relevant and of high quality to stimulate demand for improved and

more tailored delivery and expertise. Digital content also inevitably brings change in all spheres of development, raises new challenges and can have significant impacts on social, economic and political developments. Consequently, it is important to consider the role and effect of digital content in the digital transformation of the continent.

Country Code Top Level Domains (ccTLDs) and the Africa Top Level Domain (dotAfrica) promote and support the development of the local internet ecosystem and hence needs to be supported. In this regard, the Addis Ababa Declaration on Information Communication Technologies adopted by the Summit of the African Union Heads of State and Government held in Addis Ababa in January-February 2010 [Doc. Assembly/AU/11(XIV)] directed the Commission to promote better utilization and management of critical internet resources. Furthermore The Extraordinary Session of the African Union Conference of Ministers in charge of Communications and Information Technologies (CITMC) held in Johannesburg in 2009 acknowledged the benefits of the dotAfrica domain name to Africa and adopted a resolution (in the Olivier Tambo Declaration) to "Establish dot Africa as a continental Top-Level Domain for use by organizations, businesses and individuals with guidance from African Internet agencies".

DEFINING THE PROBLEM

There are 216 million active Social Media Users in Africa[11], yet, the vast majority of content accessed by users in Africa is hosted overseas. This content must traverse international links that are often expensive and sometimes under provisioned, which can have a significant impact on the economics of access as well as the user experience. While there has been some effort in recent years to increase the amount of locally produced content, it is equally important to develop an effective environment to encourage the local hosting of content, by local content developers as well as international content delivery networks, as part of efforts to develop the local Internet ecosystem.

Currently, there is a modest uptake of the Country Code Top Level Domains (ccTLDs) and dotAfrica (.africa) domain name in the African Registrar Market. The lack of locally hosted content can have significant impacts on the entire Internet ecosystem in a country. First, accessing any type of content abroad can be costly for Internet Service Providers and therefore, international links are typically under-provisioned, resulting in slow access times that limit usage. Second, the high costs for accessing international content are passed on to users, with high prices acting to limit usage. Finally, these limits on demand will, in turn, restrict the creation of more Internet content, keeping the entire ecosystem underdeveloped. Hosting more content locally would not only lower costs, but also improve the quality of service. Lowering latency will increase consumption of existing websites, and also encourage the creation and take-up of new services and applications. For instance, some services, such as VoIP and video streaming, are directly dependent on a fast and reliable network to function.

It is critical that users have access to content that is locally relevant and locally hosted. There is a distinction between locally relevant content and locally hosted content because most, if not all, countries in Africa already produce locally relevant content, but it is not always available online or hosted locally, which has an impact on usage.

Furthermore, increasingly, individuals, organizations and communities are using digital technologies to document and express what they value and what they want to pass on to future generations. There is therefore need to preserve the African heritage in digital format, and its relevant Intellectual property rights. Promoting the penetration and use of ICTs into local communities using African languages

[11] We Are Social. Hootsuite. *Digital 2019*

including codification programs and encouraging the development of local and relevant content-based applications is also essential.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Establish a conducive policy and legal framework

- Promote local content development as a government policy priority
- Ensure legal and policy clarity for local content developers, hosting providers, content delivery networks, and other relevant stakeholders

Support multistakeholder, partnerships and marketing activities

- Conduct multi-stakeholder local content forums to raise awareness on local hosting benefits, discuss issues, and identify market solutions
- Development of partnerships with government or industry bodies to ensure training for data-centre employees is complete and up to date to meet expectations and services levels demanded by the industry
- Tailor and market hosting products and services by local data centres to more closely match the needs of the African content market, particularly the growing market in smaller websites
- Promote wider implementation of data measurement tools and techniques by relevant stakeholders, including ISPs and content developers, to improve understanding and management of the dynamics of content hosting
- Encourage content developers on the performance and potential business benefits of local hosting, in addition to cost considerations
- Promote advertising of existing and new local data-centre capabilities
- Mobilize and capacitate the Internet Corporation for Assigned Names and Numbers (ICANN) Accredited Registrars in Africa and develop future growth strategies with the aim of growing the African ccTLD's and dotAfrica (.africa)

B. DIGITAL ID

GENERAL OVERVIEW

Identify forms the basis of human activity and is a "right". The benefits of a legal identity include gender equality, social protection delivery, financial inclusion, improved governance, safer migration, superior health delivery, enhanced and refugee child protection, reducing statelessness, and better access to land and property rights. The United Nations concept of "legal identity for all" [12] supports the attainment of the SDGs and Agenda 2063: The Africa we want.

[12] The United Nations Legal Identity Agenda 2020- 2030 (UN LIA), backed by the Deputy Secretary-General, was launched as a One UN approach to support of Member States building holistic, country-owned, sustainable civil registration, vital statistics and identity management systems. Building on existing systems and structures, these UN LIA's

Digital ID or the digitalization of identity is the unique identification of individuals through a digital channel. The benefits of Digital ID cuts across not only the entire spectrum of the social and economic domains but also human rights. Digital ID forms a key mechanism for furthering the United Nations concept of "legal identity for all" and supports the attainment of the SDGs and Agenda 2063: The Africa we want.

Digital ID can form the basis of a foundational ID as part of civil registration and on which other functional elements such as national ID, refugee ID, non-resident ID, etc. can be "stacked" or built. By digitalizing ID and in particular using biometrics (fingerprint, iris, facial recognition, etc.) the ability to both positively and uniquely identify individuals becomes a reality in a way that paper-based identification cannot achieve.

Several African Union Member States are taking advantage of rapid advances in digital technology to establish national digital ID platforms or systems, a vital component of the digital economy, without which full participation in Africa's emerging digital economy will be impossible.

The drive for digital ID is in recognition of the fact that the economy in Africa must evolve or even transform in order to achieve sustainable, inclusive growth. Therefore, digitalization is a key enabler, which would allow African citizens to participate in the digital economy, and especially empower women and the excluded. A standards-based Digital ID provides regional integration in support of AfCFTA by enabling a trusted flow of data across borders. However, it does require a holistic and harmonized approach based on standards and principles and supporting the development of strategies and policies, including interoperability and scalability.

The infrastructure for Digital ID exists and is growing. This includes internet coverage, security, biometric technology, smart devices, and cloud services. The trend in each of these areas is for improved service and performance at a lower cost. As such, the foundational digital infrastructure that supports digital ID is continuously growing in reach and dropping in cost. Africa is experiencing the fastest growth in internet usage rates, with a 20 percent increase each year. Seven countries in Africa have "affordable internet."[13] Most people in Africa access the internet via a smartphone, and the price of smartphones fell by 20 to 30 percent in most emerging economies between 2008 and 2016. Also, the average selling price of a fingerprint sensor found in a mobile phone fell by 30 percent in 2017 alone.[14] All these improvements mean the technology needed for digital ID is not only available now but is more affordable than ever. This situation makes it possible for African countries to leapfrog paper-based approaches to identification.

DEFINING THE PROBLEM

A large number of Africa's citizens have no legal means of identification. Comprehensive civil registration forms the basis of a well-functioning Civil Registration and Vital Statistics (CRVS) system. However, many of the civil registration and identification systems in African Union Member States are fragmented and under-resourced. This has led to the current situation where about 542 million people in Africa do not

efforts to reduce the global identity gap will be closely coordinated across shared value sectors in health and proven interventions aimed at accelerating progress towards Sustainable Development Goal target 16.9—legal identity for all, including birth registration—and SDG 17.19.

[13] Alliance for Affordable Internet. 2018 Africa Regional Snapshot

[14] Chris Burt, "Fingerprint Cards reports cost cutting and changing focus after tough 2017," BiometricUpdate.com, February 9, 2018; Danny Thakkar, Biometric devices: Cost, types, and comparative analysis, Bayometric.

have a foundational identification and therefore are "invisible." Of this number, around 95 million children under five have never had their births recorded, and 120 million children do not have a birth certificate.

The lack of identities implies that about half of the continent's population are not only disempowered from meaningfully participating in the productive process to generate economic growth, but are also inhibited from accessing various services to improve their well-being. Citizens who do not have legal identity have difficulty asserting their rights, including their rights of citizenship. Legal identity can spur innovation and entrepreneurship by reducing transactions cost and enhancing traceability of products. Legal identity can also strengthen the capacity of state institutions and their ability to deliver essential social services to the citizenry.

The rapid modernization and urbanization of African[15] societies and the increasing sophistication of commercial transactions are increasing the need for legal identity. ID is required to obtain health services, tax certificates, travel documents, open bank accounts, exercise franchise, establish credit, etc. Further, conflicts in Africa have resulted in the internal displacement of large numbers of people, all of who need humanitarian assistance. Without legal identity, it has been difficult to deliver humanitarian assistance to them and to repatriate them to their communities/countries following the cessation of hostilities.

In a 2017 study, nearly one in five people without a bank account identified the reason as the lack of necessary identification documents. In low-income countries, women disproportionately lack identification, which contributes to their higher levels of exclusion. For example, 45 percent of women over the age of 15 lack identification in low-income countries, compared with only 30 percent of men.[16]

Despite the opportunities digitalization presents, there is more to be done to enable the main drivers of digitalization in Africa. Only a few African countries have made progress in developing digital ID systems as a basis for legal ID, and to exploit the digital economy. Further, after almost 25 years of ICT development on the continent, for many African countries ICT readiness (infrastructure & access), ICT use, and ICT capability (skills) is still low but rising, per the trends in the International Telecommunications Union's ICT Development Index. Internet penetration averages 20 percent, but with wide variations from 90 percent to 3 percent, while only 7 percent of African households subscribed to high-speed internet services at the end of 2017[17]. Similarly, mobile penetration was estimated at 44 percent in 2017[18].

Further, digital ID and the digital economy thrive on trust. Data privacy breaches, cyber-attacks, and cyber-fraud around the world are on the rise, impacting on productivity, revenue, and client trust in the digital economy. While digital ID is designed to mitigate the low levels of trust in the digital economy (and e-commerce in particular), a high level of trust is equally required for digital ID systems to succeed; i.e., trust in the ID issuing authority, in the design of the ID and in the technology[19]. It is essential, therefore that African Union Member States have adequate regulation;

[15] Urban societies are known to be characterized by higher levels of impersonal transactions and lower levels of trust. A legal identity minimizes the constraint on market transactions arising from low trust in an impersonal environment.

[16] ID4D-Findex survey data 2017, World Bank

[17] ITU 2018

[18] GSMA 2018 for sub-Saharan Africa

[19] There has to be trust that the data will not be breached by outsiders and that the state will not use the data for nefarious purposes.

particularly around data governance and digital platforms, to ensure that trust is preserved in the digitalization.

It is equally critical that the pursuit of digitalization is mindful of continental aspirations such as the "Free Movement of People" and the AfCFTA which should facilitate the creation of a common digital single market. This reiterates the need for interoperability in digital platforms such as digital ID and payment systems, and hence harmonization of standards.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Ensure inclusion, security, privacy and data ownership in digital identity systems

- Develop legal and regulatory frameworks covering data privacy, security, and user rights
- Design and implement digital identity systems that are inclusive and with the rights and interests of Africa's citizens at the center
- Design and implement digital identity systems that incorporate strong security
- Design and implement digital identity systems that empower individuals and protect online privacy as a fundamental right
- Ensure Digital identity data belongs to, and remains in the control of Africans.

Support interoperability and neutrality of digital identity systems

- Put in place regulatory systems and policies to ensure interoperability
- The African Union Commission, the Regional Economic Communities and the United Nations Economic Commission for Africa, and relevant implementing partners to work together on continental and regional standards, including on authentication protocols, minimum data fields, deduplication protocols, biometric formats as well as other formats, model regulations, and other standards
- Design and implement digital identity systems using open standards

C. EMERGING TECHNOLOGIES

GENERAL OVERVIEW

Digitalization, automation and Artificial Intelligence (AI) are bringing new unprecedented dimension of prosperity for humanity. Emerging technologies such as blockchain, artificial intelligence, Internet of things, 3D printing, etc. provide practical ways of applying them to perform tasks normally requiring human intelligence. They also hold the potential to disrupt our economies and destroy lives throughout several generations.

The Internet of Things and the Internet of Nano Things, often referred to respectively as IoT and IoNT, describe new connected devices that range from wearable technology like smart watches to connected (Nano) sensors used in manufacturing, transportation, health and agriculture in a growing trend that seeks to bring technology to every sector.

Recent global estimates indicate that IoT devices will number 22 billion by the year 2022 meaning that in the near future, IoT devices could be the main interface used online to communicate, shop and interact on the Internet by users in Africa and across the world. IoT and IoNT bring the promise of global economic opportunities and new innovations that will transform the way we work, live and play.

The driving force behind this accelerating change is a shift from physical to digital and from firm-based to network-based business models. Africa should not miss potentials offered by emerging technologies to transform itself and make the 21st century the Africa's century.

DEFINING THE PROBLEM

If utilized well, new and emerging technologies could provide some of the biggest opportunities to enterprises, but they will also present challenges. They pose risks and questions not only to business but to society as a whole. Planning for how to deal with these emerging technologies and where value can be derived while assessing potential risks before they become a fully-fledged reality is essential for businesses that want to thrive in the world of AI, Big Data and IoT. We cannot yet know all the implications of these innovations but businesses will need to predict and plan for how these technologies will disrupt them and their industry.

Regulation of emerging technologies in Africa is also a problem that requires swift action, the preeminent issue now and in the future is how to protect citizens and ensure fair markets while allowing the emerging technologies and businesses flourish. Although these innovations have contributed to the digital space, they have also raised legal and regulatory concerns. AU Member States will need to explore ways in which emerging technologies can be harnessed to support digital transformation, while putting in place the legal framework to protect users and the society at large.

Recognizing the potential of emerging technologies and the impact that policy and regulatory frameworks can have on their success, countries and their regulators should encourage a regulatory paradigm that pushes frontiers and enables digital transformation.

As emerging technologies evolve, regulators in Africa will need to rethink their approaches, adopting models that are agile, iterative, and collaborative to face the challenges posed by emerging technologies and the fourth Industrial Revolution.

Currently in Africa, emerging technologies are unregulated. The preeminent issue now and tomorrow is how to protect citizens and ensure fair markets while allowing the emerging technologies and businesses flourish.

The reality of this new digital age is that Government has to keep pace with technology in order to play the role that it must with any industry: to ensure that the playing field is level and open to all, to set and enforce the rules of the road, and to protect the public from any negative effects of these advances.

The ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems is becoming a reality of the digital ecosystem. More devices are being manufactured IP-ready and can be connected to platforms that enable them to collect and send data. The ability to transfer data over a network without requiring human-to-human or human-to-computer interaction needs to be planned for as Africa moves into the 4th Industrial Revolution [Internet of Things].

Furthermore, the ability of computer systems to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages is evolving over time and already exists in some parts of the world [Artificial Intelligence]. Blockchain technology has also developed very rapidly over the last few years and has challenged traditional systems of creating, holding and sharing information and records. Its applications have ranged from creation of Crypto-currencies such as Bitcoins and others, to the development of "smart contracts" and other forms of record keeping. The applications of Blockchain has been productive and put to good economic use, but similarly, it has been used for criminal activity as Blockchains allow people's identity to be concealed. AU Member States will need to explore ways in which Blockchains technologies can be harnessed to support digital transformation, while putting in place the legal framework to protect users and the society at large.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Promote policies and regulations that address emerging technologies with regard to how best to protect citizens, ensure fair markets and enforce regulations while allowing new technologies and business to thrive

- Rethink regulatory approaches and adopt models that are agile, iterative, and collaborative to face the challenges posed by emerging technologies and the fourth Industrial Revolution
- Develop policies that address the spectrum issues around emerging technologies in general and IoT devices in particular
- Develop outcome-based regulations and test new models in sandboxes

Establish coordination mechanisms among relevant sectors

- Coordinate the establishment of national and regional taskforces to research into secure Emerging technologies and propose guidelines that will educate Internet users on how to identify secure IoT devices
- Improve coordination among sectoral regulation
- Encourage public and private sector to embrace the emerging technologies (Block chain, Artificial Intelligence…)

D. CYBERSECURITY, PRIVACY AND PERSONAL DATA PROTECTION

GENERAL OVERVIEW

As Member States of the African Union increase access to broadband connectivity, they are becoming more interconnected and vulnerable to cyber-attacks. It becomes critical to reinforce our human and institutional capacity to secure our cyberspace by building trust and confidence in the use of cyber technologies. In today's digital world, personal data have also become the fuel that drives much of current online activities.

The AU Executive Council at its 32nd Ordinary Session held from 25- 26 January 2018, in Addis Ababa, Ethiopia adopted decision EX.CL/Dec.987(XXXII) in which it endorsed the AU Declaration on Internet

Governance and development of digital economy and adopted Cyber Security as a flagship project of the African Union Agenda 2063.

Furthermore, the AU 23rd Assembly of Heads of State and Government adopted the African Union "Convention on Cyber Security and Personal Data Protection". This convention also known as the Malabo Convention seeks for a common approach at continental level on the security of the cyberspace and to set up minimum standards and procedures to define a credible digital environment for developing the electronic communications and guarantee the respect of the privacy online. The convention is now open to all Member States of the African Union for signature and ratification in conformity with their respective constitutional procedures and subsequently the convention shall enter into force thirty (30) days after the date of the receipt by the Chairperson of the Commission of the African Union of the fifteenth (15th) instrument of ratification.

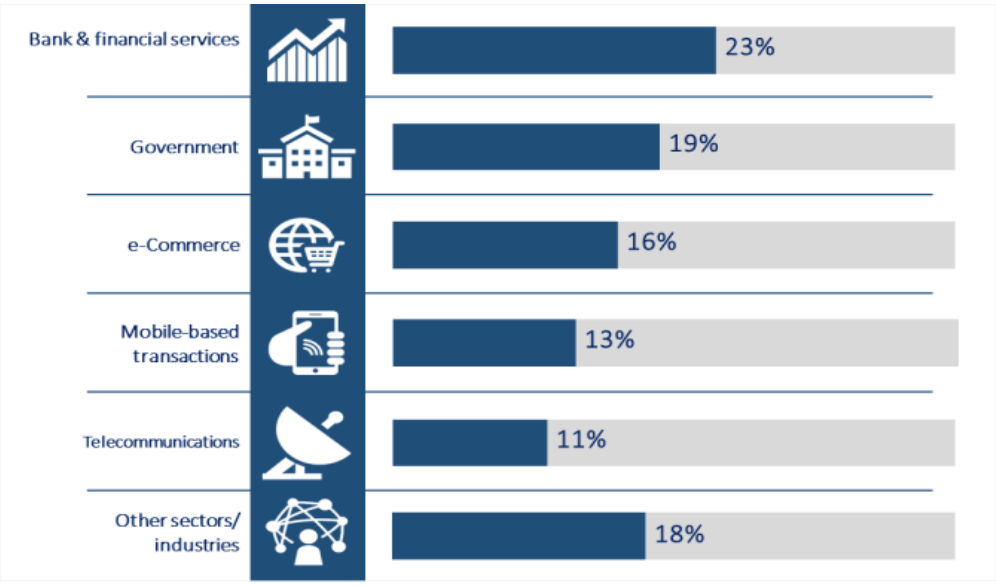
DEFINING THE PROBLEM

The incidents and threat of cyber breaches, and the spread of viruses and malware is pervasive.
Given the global threat, a comprehensive and consistent response is required. Only by raising the awareness of the public, educating businesses on cybersecurity, collaborating with industry groups and associations and encouraging cybersecurity firms and services, can the enormous threat be mitigated. Without trust, the digital economy cannot flourish.

Every day, large amounts of data are collected, stored and transmitted across the globe. According to Africa Cybersecurity Report 2018[20] , cybercrimes cost African economies $3.5 billion in 2017. In 2018, annual losses to cybercrimes were estimated for Nigeria at $649 million, and Kenya at $210 million. Likewise, according to the South African Banking Risk Information Centre (SABRIC), South Africa loses $157 million annually to cyber-attacks. . The continent faces a severe shortage of cybersecurity manpower. It is estimated that Africa will have a shortage of 100,000 cybersecurity personnel by 2020[21] As more and more economic and social activities shift into connected information spaces, volumes of trans-border data flows, specifically personal data are increasing, thus making data protection regulations critical.

Cybercrime cost in Africa by industry (2017)

[20] https://www.serianu.com/downloads/SaccoCyberSecurityReport2018.pdf
[21] https://portswigger.net/daily-swig/how-africa-is-tackling-its-cybersecurity-skills-gap.



Source: Africa Cyber Security Report 2017, Serianu.

The African Union Commission is committed to work closely with Regional Economic Communities and international specialized Institutions to provide guidance to African Union Member States on cybercrime and cyber security policies National cybersecurity strategy, legal and regulatory frameworks, and human and institutional capacity represent a foundational block for building a cyber-resilient digital economy and society. The cybersecurity strategy sets an overall direction and introduces selectivity in the protection of critical national assets; legal and regulatory frameworks establish a rule of law governing the cyberspace that is global in nature and therefore requiring global collaboration and coordination resulting in global and regional conventions and agreements; and human and institutional capacity ensures that local and regional capabilities exist in the various areas of cybersecurity expertise. Therefore, it is important to introduce these crosscutting enablers before diving deeper into sector specific cybersecurity strengthening measures.

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POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Support interventions to strengthen cybersecurity at national level:

- Develop and adopt national cybersecurity strategies and legal and regulatory framework for data protection/privacy, cybersecurity standards and governance, and cybercrime

- Establish national cyber-security governance structures under multi-stakeholder structures (involving policy makers, economic, educational, technical and business communities, legal, law enforcement, Academia, diplomatic, military ...etc.)

- Promote human and institution capacity building (public awareness campaign, professional training, R&D, Computer Emergency Response Teams, CERTs, etc.)

- Conduct capacity building of policy makers and law enforcement to strengthen cyber security

Support interventions to strengthen cybersecurity at regional and continental level

- Establish framework and mechanism for regional cooperation and mutual assistance;
- Support the signing and ratification of both the Malabo and Budapest Conventions;
- Establish regional CERT and forensic labs
- Set up regional centers of excellence for training and research
- Ensure commercial rights of the use of personal data of Africa's citizens stays in Africa or provide a fair commercial share to Africa.

E. RESEARCH AND DEVELOPMENT

GENERAL OVERVIEW

It is common knowledge today that, Africa cannot ensure sustainable development without science, technology and innovation to transform traditional knowledge to competitive products at the regional and international levels. However, a number of challenges still need to be addressed to ensure that countries gain the full benefits of science, technology and innovation.

Much empirical and theoretical work emphasizes that research and development (R&D) is an important contributor to economic growth. R&D spending is likely to lead to growth through its positive effect on innovation and total factor productivity (TFP) (Romer, 1990; Lucas, 1988). As Grossman and Helpman (1994) note, improvements in technology through industrial innovation have been the driving force behind the inexorably rising standards of living in the developed world over the long run[22]

Research targeted at enhancing innovation will allow businesses to gain a competitive advantage, support sectors to transform, and achieve their digitalization potential. To achieve this, the strategy will focus on a framework for creating various facilities and programs to enhance and support the country's innovative capability to enable them to build new and innovative products.

DEFINING THE PROBLEM

Africa has been slow to both adapt to and develop its science and technology sectors and commercialize its innovations despite multiple agreements for example the decision by Heads of Governments and States to increase the investment in R&D to at least 1% of GDP on research and development and the adoption of the Science, Technology and Innovation Strategy for Africa 2024 (STISA). Although Africa accounts for 13.4 per cent of the world's people, it produces only 1.1 per cent of the scientific knowledge. Only 1% of global investment in R&D is spent in Africa, and the continent holds a tiny 0.1% of the world's patents[23].

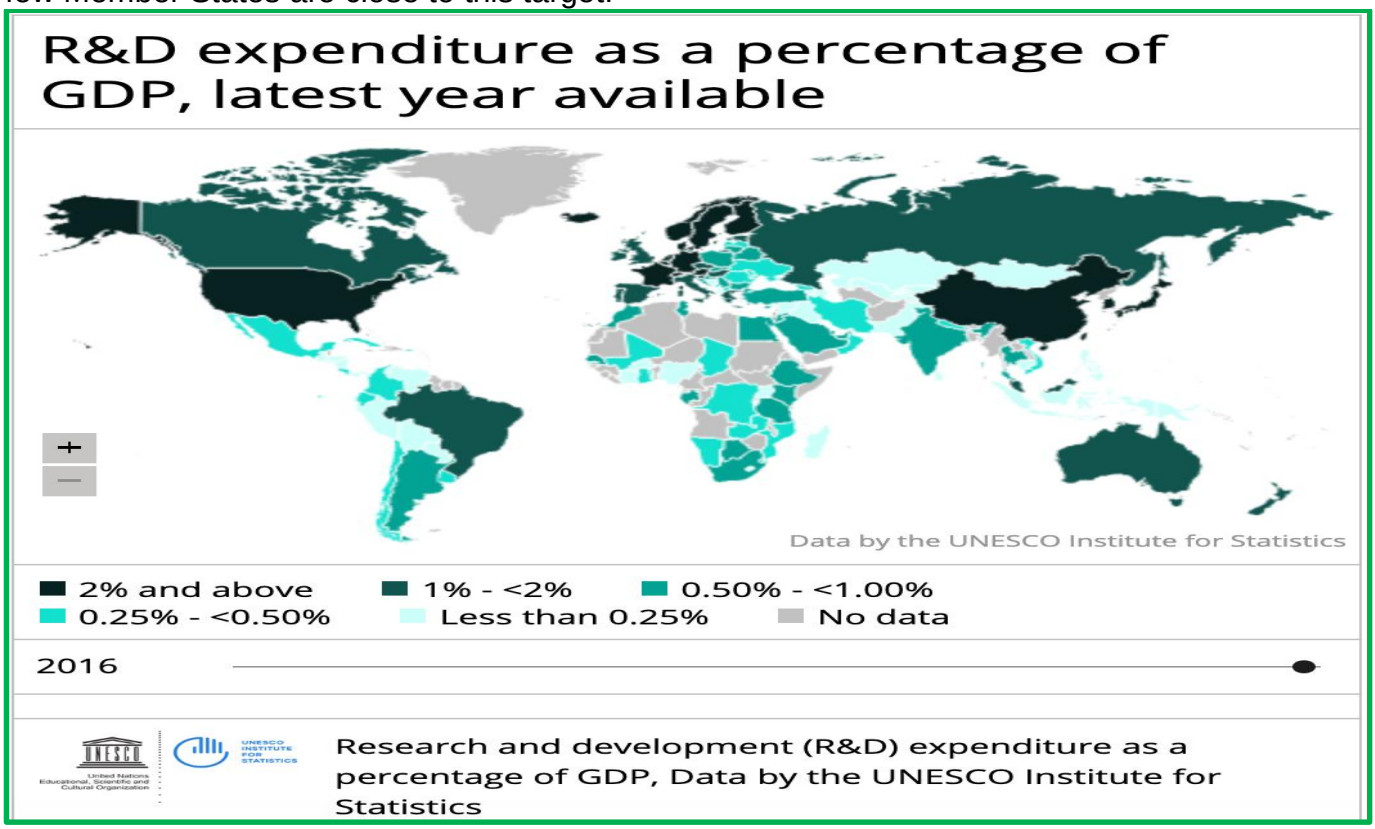
[22] The Impact of Research and Development on Economic Growth and Productivity – Pepperdine University

[23] https://www.iriweb.org/sites/default/files/2016GlobalR%26DFundingForecast_2.pdf

There is need to promote and facilitate scientific R&D work to a level that could have impact on Africa's capacity to develop, produce, manufacture and assemble Digital products and services as a step towards developing a local, globally competitive ICT service sector and industry.

The transition from the conduct of science or research to the application of scientific knowledge to generate specific product and process innovations will require more than the establishment of Research and Development institutions and programs. It will also require the creation and/or use of business or commercial oriented enterprises for innovation. Such institutional arrangements can take different forms such as the development of technology and innovation cities. Technology and Innovation cities will facilitate the creation of jobs, establishment of new firms, facilitate the link between universities and these firms; and encourage high technology development.

The African Union has set a target of 1% of GDP invested on R&D, but data available show that very few Member States are close to this target:



POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Build and strengthen cooperation between stakeholders (including governments, private sector and citizens) on research and development

- Leverage national and international technology transfer processes
- Foster networking between universities and the rest of national innovation system and multi-stakeholder's collaborations to facilitate the transfer of university research results market
- Encourage partnership and collaboration between the education institutions, training system and the industry to address skills scarcity needs

- Encourage transfer of science and technology innovations, cooperation and networking among AU Member States
- Provide a platform for collaborative projects among AU Member States

Improving resource development capacity for research and development

- Improve macroeconomic frameworks that promote R&D;
- Redefine the university research agendas of all stakeholders in the innovation system
- Promote technological innovation within the research community
- Enhance capacities of intermediaries and specialists aiming to support university researchers commercialize their research results
- Boost the monitoring and evaluation bodies to assist in the commercial exploitation of university research results
- Establish a system to encourage women and youth in research, technology and innovation activities
- Invest in Research & Development, with a focus on innovation and start-ups and encourage governments to co-invest into start-ups to de-risk and leverage private investment.
- Setting Institutions for digital innovation and research, and development to ensure effective higher learning and education of scientists, engineers, and technicians from Africa.
- Encourage/include public operators in strategies aimed at embracing the emerging technology (block chain, Artificial Intelligence…) through research and development.

X. STRATEGIC ENABLERS

Achieving digital transformation in Africa will require political commitment at the highest level, aligning of policies and sector regulation and a massive scaling-up of investment and dedication of resources towards the foundation pillars and critical sectors for digital transformation. It will take leadership and a vision to push the frontiers of innovation, regional integration and public-private coordination so that the 21st century will be the Africa's digital transformation century. The common strategy recognizes the diversity of contexts and situations for African Union Members States and acknowledges the likelihood of variable speeds and multiple pathways towards common goals.

A. POLITICAL COMMITMENT

- Build regional and international support for the African Digital Transformation Strategy
- Align the Strategy with Africa Vision 2063 and the Sustainable Development Goals (SDGs)
- Encourage AU Member States and partners to implement the Strategy effectively.
- Ratification of AU Convention on Cybersecurity and Personal Data Protection
- Appoint a Champion for Digital Transformation in Africa
- Establish the necessary coordinating structures for the Digital Economy in Member States, RECs and the AU Commission

B. FINANCING AND INVESTMENT

GENERAL OVERVIEW

ICT projects in Africa are being financed by Development Finance Institutions (DFIs) and the Private sector in all stages of project planning, development, preparation and implementation. Historically, the DFIs have focused on financing large scale ICT projects with an average size $30m to $200m. Over the past few years DFIs have started financing small ICT projects in the range of $5m to $10m through equity investment and using Venture Capital (VC) fund.

During the past 10 years, the private sector has invested in over 450 ICT companies in Africa which resulted in a total investment of $45bn. Telcos companies were ranked on top of the list with average project size above $100m.

As for the African Development Bank, a menu of instruments and windows for financing ICTs can cater for its various clients. The Bank's ICT interventions cut across a range of sectors and are carried out in different ways which are continuously evolving. The interventions also consider the prevailing policy, regulatory, economic, and social environments. These considerations call for a flexible and wide spread financing mechanisms that encompass different needs while providing effective and reliable financial services.

Instruments used by the Bank and other DFIs to finance ICT interventions on the African continent are as follows:

- Special investments (this takes the form of either public and private sector project loans, lines of credit, equity investments and guarantees);
- Policy based lending (PBL); and
- Technical Assistance Grants.

AFRICAN DEVELOPMENT BANK FINANCING INSTRUMENTS

Bank Group various Financing Windows:

- Loans from African Development Bank (ADB) Window
- Loans to the Private Sector from the ADB Window
- Middle Income Trust Fund
- NEPAD Infrastructure Project Preparation Facility Fund (IPPF)
- Loans from the African Development Fund (ADF)
- Grants from ADF
- The Nigerian Trust Fund (NTF)

In addition, the Bank has established the Africa Investment Forum which is Africa's investment market place dedicated to advance projects to bankable stages.

Among the above-mentioned instruments, the NEPAD Infrastructure Project Preparation Facility Fund (IPPF) has been instrumental for the completion of feasibility studies on regional digital infrastructure for East and Southern Africa.

DEFINING THE PROBLEM

The identified digital transformation foundation pillars include digital infrastructure, digital services, digital entrepreneurs; digital skills and conducive policy/regulatory environment require significant financial resources to carry out studies, support innovative projects, capacity building, advisory services

for PPP packaging and interventions in policy, standards and regulations. Africa is still confronted with important bottlenecks and challenges to establish these key digital foundational pillars.

The development of major national and cross border digital infrastructure networks such as broadband networks, submarine cable systems, satellites, broadband mobile networks is financed by DFIs and other major commercial financial institutions through trusted large companies, mostly Telcos, with strong CAPEX needs. However, myriad of small, early-stage and risky digital and data services projects undertaken by digital entrepreneurs, with lack of intermediary financing or supporting mechanisms and many other digital players with limited financing needs due to their "asset light" structure such as offshoring companies face serious financing challenges.

There is a need to undertake a match-making of the type of digital operation financial needs to the available financing opportunity that is suitable for that operation.

African countries need to take advantage of the existing instruments at the Bank to scale up the critically needed ICT interventions on the continent, tapping from both the ADB and ADF windows.

There is also a need to use all the Bank's grants facilities (NEPAD IPPF, MIC Trust Fund, EPSA, FAPA, etc.) to stimulate the Bank's lending to its Regional Member Countries (RMCs) to support building of digital infrastructure and promoting digital services in the Continent.

On the other hand, the growing private-public partnership space for digital investment implies that there is a need to focus on leveraging public-private partnerships and the channeling of public resources through the private sector in order to build digital infrastructure at national and regional levels and scale up digital services and competitiveness in the Continent.

POLICY RECOMMENDATIONS AND PROPOSED ACTIONS

Support financing of ICT projects at the national and regional levels through:

- Leveraging private investment and PPPs in ICT interventions
- Use of blended finance to crowd in private capital for digital infrastructure
- Use of senior and subordinated loans, equity participations and guarantees to promote digital infrastructure and digital services
- Harnessing ADF resources to support its interventions in the ICT sector, in line with new ADF-15 replenishment and operational priorities, both in form of policy-based and project loans/grants
- Use of bilateral Trust Funds to meet requests from all African Countries to support innovative projects in digital infrastructure and digital services
- Establishing a dedicated ICT Trust Fund to complement Bank's response to pre-investment studies for regional ICT projects, by financing key activities of the strategy
- Providing seed funds to kick-start ICT small scale projects such as digital health, digital education, digital agriculture, etc. on the continent using bilateral funds and support local ICT innovation.
- The use of the Africa Investment Forum platform to advance projects to bankable stages.

- Mobilize financial resources by strengthening regional cooperation and multi stakeholder partnerships and promotion of public and private partnerships
- Create incentives for foreign investments

- Promote the development of domestic finance by providing support to local entrepreneurs and investors
- Develop innovative approaches for the creation and management of universal access/service funds.
- Develop dedicated funding mechanisms for digital transformation

C. Private Sector Engagement

- Promote public private partnerships and other multi-stakeholders partnerships.

D. Regional and International Cooperation

- Enhance continental and regional cooperation to implement the Strategy
- Facilitate and support the establishment of regional communication networks
- Harmonize legislation at continental and regional levels towards a Digital Single Market (DSM)
- Collaborate with development partners to implement the Strategy
- Leverage synergies with existing regional and international initiatives with shared goals.

E. Capacity Development

- Build capacity among officials on digital development.
- Promote the uptake and usage of digital tools.
- Strengthen cross-border and regional co-operation on digital infrastructure.
- Provide training for citizens and communities.

E. Advocacy and Awareness

- Strengthen awareness and advocacy among targeted groups.
- Provide communication, education and awareness programs for leaders, decision-makers, local communities, and civil society.
- Increase awareness, mobilization, coordination and efficiency on regional, continental and international initiatives on digitalization

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Annex 1. Smart Africa Paper on Digital Single Market
Annex 2. UNECA Paper on Digital Identity