

Review on Digital Economy in Africa; Drivers and Sectors of Growth

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ABSTRACT

This review offers an overview of the digital economy in Africa, which includes the key drivers of the economy like technology, internet access and mobile usage. The sectors impacted by digital transformation like e-commerce, fintech, Agri-tech, health-tech, edtech and E-learning and it emphasizes the range of digital skills needed and the existing gaps among African youth, especially the vulnerable groups. It addresses the gaps in digital infrastructure like accessibility, availability and affordability. The digital divide and inequality in gender, urban-rural and income-based disparities and tackling regulatory and bureaucratic hurdles for startups and small businesses. This will help in understanding the digital transformation and digital economy takeoff across Africa and the impact it will have on the demand for young workers, and how we can equip them with the right digital skills at an individual level and also strengthening the overall digital workforce at the national and intercontinental scale. The goal is to uncover insights that can balance the digital labor market and pave the way for a more inclusive prosperous digital future in Africa.

Keywords: Digital, Economy, Africa, Drivers, Sectors, Growth

INTRODUCTION

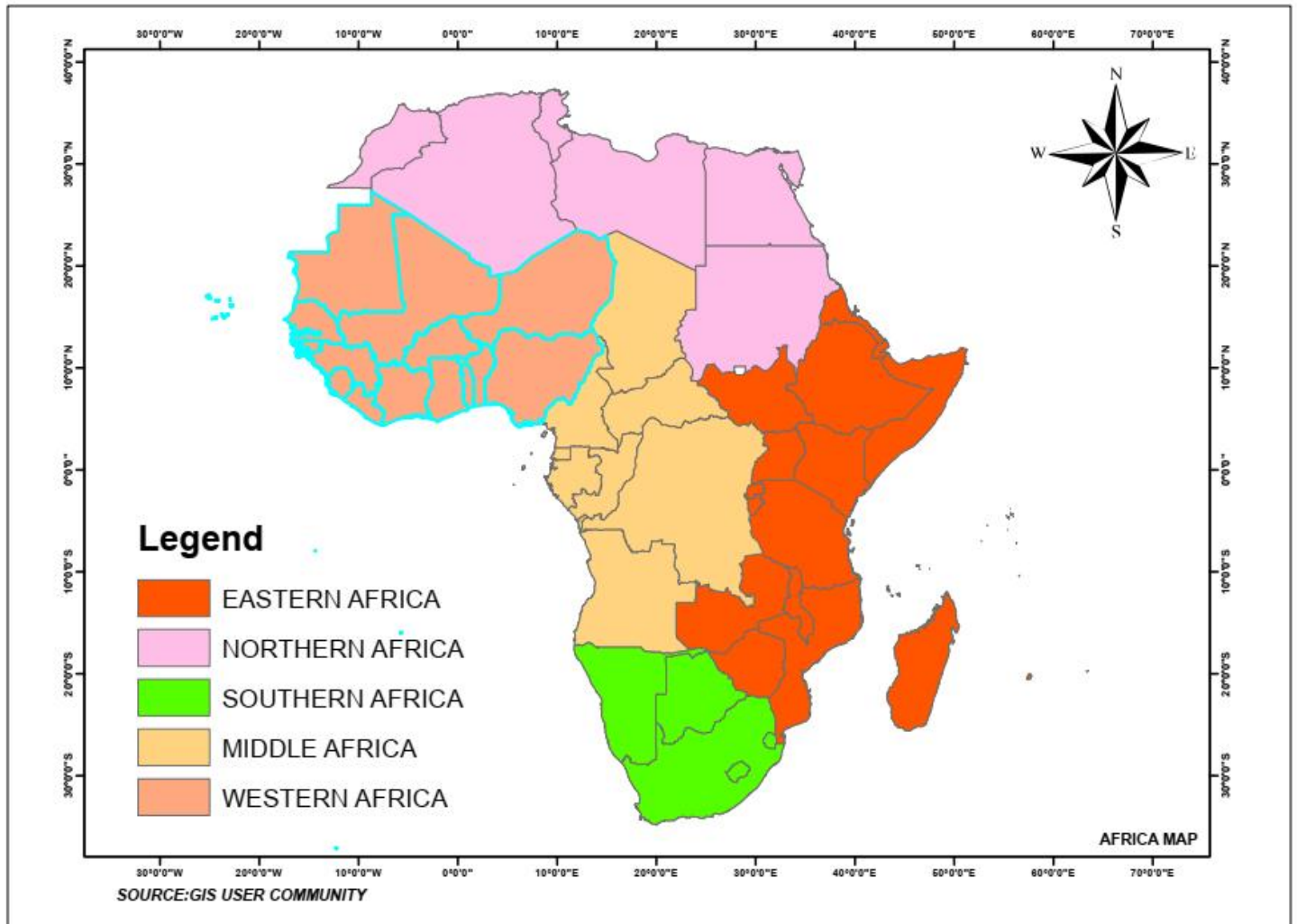
Africa is a continent rich in opportunities, and the job market is constantly evolving. There are several significant trends that are shaping the employment landscape on the continent. Thus, we note a dominance of the informal sector, an increase in digitalization; the growth of Telecommuting and Digital Skills; the era of digitalization and the Platform economy; Startups and Entrepreneurship; the predominance of the agricultural sector; Industrialization; the growing size of the service sector. Many young people are turning to starting their own businesses as a way to escape unemployment. Indeed, youth entrepreneurship is seen as a possible solution to the challenge of unemployment. Thus, nowadays many young people are turning to: **Technology and digital technology** (startups, hubs and incubators, digital marketing), Transportation (taxi services to mobile payment systems, motorcycle), Blockchain and Cryptocurrency; Information and Communication Technologies (ICT) (fintech, insurance); Social networks (media and entertainment; tiktok); Education (e-learning), Health and Well-being: (e-health, telemedicine, mobile-health, health tech), Agriculture (Agro-industry, agritech): it remains a crucial sector and is booming. Financial services (e-banking, e-business). Commerce (e-commerce): Clothing, beauty products, etc, Women's entrepreneurship: A quarter of African women of working age are entrepreneurs and are, according to experts, responsible for 65% of the continent's wealth (Women In Africa Philanthropy 2018). Social entrepreneurship; The green and sustainable economy and renewable energies (green entrepreneurship)

The Study Area – Africa

The world second largest continent is Africa located on latitude 9° 10' 21" to 37° 21' 1" N and longitude 18° 28' 12" to 15° 27' 52" E (fig.1) south of Europe. It is bordered by the Mediterranean sea to the North, the Red sea and Indian Ocean to the East and Atlantic Ocean to the West. Africa has diverse climate zones which includes, equatorial forest, tropical savannahs and vast deserts like the Sahara, along with areas with a wild Mediterranean type of climate at its Northern and Southern tips. Africa is home to over a billion people (1,216 billion), making it the second most populous continent after Asia (Africa population, 2026). Many African nations are classified

as developing countries but there are large variations in the standard of living across the continent. Africa is urbanizing rapidly, though it remains the least urbanized continent. Many of its largest cities, such as Cairo, Kinshasha and Lagos are located along the coast or serve as central inland hubs. The continent is rich in natural resources, including significant reserves of diamond, gold, oil, platinum, chromium and natural gas. It also holds a large percentage of the worlds arable land and fresh water.

Technologically, mobile phone penetration has increased rapidly, driving connectivity and financial inclusion through mobile banking and payments. Technology is also playing a key role in areas like agriculture and renewable energy. In the early twenty first (21st) century, Africa was home to many of the world’s fastest-growing economies driven by increased trade, a booming consumer class and a large young population. However, persistent issues like poverty, corruption and climate change still present obstacles to sustained development.



Source: Youth Mappers Gombe State University 2025

Fig. 1: Map of Africa

THEORETICAL FRAMEWORK

To understand the digital economy in Africa, the following theories are relevant.

The Digital Divide Theory

The Digital Divide Theory, explains inequalities in access to and use of information and communication technologies (ICTs) among individuals, groups, and societies. The theory emphasizes that disparities exist between those who have adequate access to digital technologies and those who do not have due to factors such as income, education, gender, location, and infrastructure.

The theory was developed through the works of scholars such as Jan van Dijk (2020) and Manuel Castells (2010), who argued that digital inequality extends beyond physical access to technology and includes differences in digital skills, usage patterns, and the benefits derived from technology.

Digital Divide Theory identifies different levels of digital inequality, including: Access divide (availability of internet and digital devices) Skills divide (ability to use digital technologies effectively) and Usage divide (differences in how technology is utilized).

The theory is relevant to this review because it helps explain how unequal access to ICT influences social, economic, educational, and developmental opportunities. In many developing countries, especially in Africa, rural populations, women, low-income households, and marginalized groups often experience limited access to digital resources due to poor infrastructure, high internet costs, inadequate electricity supply, and low digital literacy.

The theory therefore provides a useful framework for understanding how technological inequalities affect participation, communication, innovation, education, and development outcomes in society

The Diffusion of Innovation Theory

The Diffusion of Innovation Theory developed by Everett Rogers in 1962, explains how new ideas, technologies, products, or practices spread within a social system over time through communication channels. According to the theory, diffusion is the process through which an innovation is communicated among members of a social system. An innovation refers to any idea, practice, or technology perceived as new by individuals or groups. The theory emphasizes that adoption does not occur simultaneously among all people; rather, individuals adopt innovations at different stages depending on their awareness, interest, social influence, and perceived benefits.

Everett Rogers identified four major elements of diffusion: Innovation Communication channels, Time and Social system. The theory also categorizes adopters into five groups based on their willingness to accept innovations: Innovation, Communication channels, Time and Social system. The theory categorizes adopters into five groups based on their willingness to accept innovations: Innovators, Early adopters, Early majority, Late majority, and Laggards, The adoption process occurs through five stages: Knowledge, Persuasion, Decision, Implementation and Confirmation. The theory further explains that the rate of adoption is influenced by certain characteristics of the innovation, including: Relative advantage, Compatibility, Complexity, Trialability and Observability.

This theory is relevant to the review because it helps explain how individuals or communities adopt new technologies, ideas, or practices. It provides an understanding of factors influencing acceptance or rejection of innovations, especially in areas such as digital technology, agriculture, health, communication, education, and climate change adaptation.

In developing societies, adoption of innovations may be influenced by literacy level, access to information, cultural beliefs, economic conditions, and infrastructure. Therefore, the Diffusion of Innovation Theory provides a suitable framework for analysing the spread and acceptance of innovations within society

METHODOLOGY

Research Design

This review adopts a qualitative research design using a systematic literature review and secondary data analysis to examine the growth of the digital economy in Africa. The qualitative approach is considered appropriate because the study seeks to provide an in-depth understanding of the drivers and sectors contributing to digital economic expansion across the continent. Through the review of existing literature, reports, and documented evidence, the study explains how digital technologies have transformed economic activities and created new opportunities for development in Africa. The design also enables the researcher to synthesize existing knowledge, identify recurring themes, and draw conclusions on the current state and future prospects of Africa's

digital economy. Only materials published in the twentieth century are reviewed. All sources of data have been acknowledged appropriately.

Digital Economy In Africa: Drivers And Sectors Of Growth

Key Drivers of the Digital Economy in Africa

To understand the growth and impact of the digital economy in Africa, three key drivers that includes the digital infrastructure which is the backbone of the digital economy—it's what makes digital services possible. It includes network systems, data centres, and other critical infrastructure that provide internet connectivity. But having cables and servers alone isn't enough; reliable power systems are just as essential, ensuring that governments, businesses, and individuals can stay connected.

When assessing digital infrastructure, we often look at three main factors that includes, **availability** – is digital infrastructure even present in the area, **accessibility** – Can people actually use it, or are there barriers (e.g., geographic limitations) and **affordability** – Can individuals and businesses afford access to digital services?

These dimensions help us measure the strength of digital infrastructure and its role in shaping the digital economy across different regions.

Digital infrastructure lays the foundation, but digital services and platforms are what turn raw connectivity into meaningful experiences. These services transform cables and electronic signals into the vast, interactive digital world we explore every day. They exist across nearly every sector finance, retail, agriculture, healthcare, education, and beyond. They also represent a major space for entrepreneurship, as many of today's most successful startups are built on digital platforms. Take AI tools like ChatGPT and DeepSeek, for example. These technologies have captured global attention, sparking discussions among experts and the general public alike. Some believe they are ushering in a new era of digital transformation, but at their core, they still fall under the category of digital services. This means we can analyse them within the same framework as other digital services and platforms, despite their cutting-edge nature.

Finally, user-end digital devices are the physical tools that allow individuals to connect to the digital world and use digital services in their everyday lives, the most impactful example is the smartphone. In many parts of Africa and the world, mobile phones are the primary gateway to digital access, making them a crucial driver of digital inclusion. Other examples of user-end devices include: Personal computers (PCs & laptops), Wearable technology (smartwatches, AR/VR headsets), Smart home devices (voice assistants, IoT-enabled gadgets), and electric vehicles (EVs) with advanced connectivity.

To measure the spread and impact of digital devices in a given region, we often look at digital device penetration rates—in other words, how widely specific devices are adopted by the population.

These three drivers—**digital infrastructure, digital services, and user-end devices**—together shape the growth and potential of the digital economy. By understanding them, we can better assess how digital transformation is unfolding across Africa and beyond.

The development of these three key drivers—digital infrastructure, digital services, and user end devices—fuels what we call digital transformation. It's not an exaggeration to say that today, digital transformation is touching every sector of the economy and nearly every aspect of our daily lives. Of course, not all industries are transforming at the same pace. Some sectors began their digitalization decades ago, while others are just starting to catch up. Even though each sector follows its own path to digital transformation, studying how certain industries have evolved can help us anticipate trends, identify new opportunities, and recognize potential barriers in sectors where the process is still emerging.

It's also important to recognize that the speed at which people adopt new technologies is a major driver of inequality. One theory that helps explain this phenomenon is the Technological Kuznets Curve (Shin et al., 2008). The idea is simple: those who gain early access to new innovations benefit first, pulling ahead of others who are left behind. However, over time, as the technology becomes more widespread and universally

accessible, this gap starts to close, reducing inequality. This is why it's crucial for Africa to accelerate its digital transformation. The faster individuals, businesses, and governments adopt and integrate digital technologies, the better positioned they'll be to compete in the global digital economy.

Digital transformation has proven to be a game-changer in several key industries, boosting economic growth, increasing efficiency, and promoting sustainability. In the Digital Transformation Agenda 2020-2030, policy makers from the African Union (2019) sets goals to promote "an Integrated and inclusive digital society and economy in Africa that improves the quality of life of Africa's citizens, strengthen the existing economic sector, enable its diversification and development, and ensure continental ownership with Africa as a producer and not only a consumer in the global economy. (Africa Union, 2019)" To achieve these goals we need to understand key sectors where digital technologies have already made a significant impact and what are some sectors showing great potential for the next round of digital transformation: The sectors include social media Digital platforms that enable users to create online communities, share information, exchange ideas, and engage in social and professional networking. E-Commerce – Online marketplaces and digital retail platforms that connect buyers and sellers across regions, expanding market access for businesses of all sizes. FinTech (Financial Technology) – Digital banking, mobile payment solutions, and financial services that increase financial inclusion. A great example is M-Pesa, which has transformed mobile banking in Africa. Agri Tech (Agricultural Technology) – Digital solutions that improve agricultural productivity, efficiency, and rural development. For instance, XAG provides AI-driven smart farming tools to optimize crop production.

EdTech and E-Learning – Digital education tools that enhance learning experiences and workforce training, making education more accessible and flexible. HealthTech (Healthcare Technology) – Innovations in telemedicine, AI-driven diagnostics, and digital health records, enabling better healthcare access, especially in remote areas.

Transportation – Advancements in electric vehicles (EVs), ride-hailing apps, and autonomous driving technologies are transforming mobility and reducing carbon footprints. Sustainable Development & Environmental Management – AI-driven digital solutions that improve cost efficiency, optimize energy use, and enhance pollution control. A prime example is United AI Green Tech's water management system, which leverages digital tools to improve water conservation and reduce waste. These sectors demonstrate the power of digitalization in fostering economic growth, sustainability, and inclusion.

Digital Gaps And Divides Among African Youth

The first gap in digital skills is the **Basic Digital Literacy**: This is the foundation of digital skills. It includes the ability to use digital devices, access information online, navigate communication tools such as emails and messaging apps, and practice online safety.

Intermediate / Application Skills: At this level, individuals go beyond basic usage and can leverage digital applications and services to perform more complex tasks. These include, Basic coding, Data analysis Network setup, Digital marketing and e-commerce management, Using AI tools to generate simple scripts or images.

Advanced / Research Development Skills: This is the highest level of digital expertise, where individuals can develop new applications, services, and platforms. This includes specialized skills such as: Chip architecture design, AI and machine learning model training, Cybersecurity expertise and Software development.

Research by Sun, (2024) and Ndlbalema,(2023), has shown that Africa still faces large and persistent disparities in digital literacy. While some regions have made progress in expanding digital access, many young people remain excluded from opportunities due to poor infrastructure, lack of digital education, and economic constraints. For policymakers looking to enhance digital skills among African youth, the message is clear and crucial.

Expand Infrastructure for Basic Digital Literacy: Widespread internet access is the foundation of digital inclusion. Without affordable, reliable connectivity, people cannot acquire even the most basic digital skills. Investment in broadband networks, public Wi-Fi, and mobile data affordability is essential.

Develop a Strong Digital Education and Training System: Building a structured pathway for digital skill development is key to preparing Africa's workforce for the digital economy. This means, incorporating digital skills training into school curricula, expanding vocational and bootcamp-style programs for intermediate and advanced skills and encouraging public-private partnerships to scale digital education initiatives. By implementing these two or three strategic approaches, Africa can cultivate a tiered workforce that aligns with labour market demands, ensuring sustainable economic growth and greater digital inclusion.

Digital Infrastructure: Availability, Accessibility, Affordability

One of the biggest factors affecting digital literacy rates in Africa is the lack of digital infrastructure (Ndlbalema, 2023). Without strong infrastructure, even the most well-designed digital education programs and services cannot reach their full potential. When discussing digital infrastructure, we can analyse it from three key perspectives, **Availability:** This refers to whether the fundamental building blocks of digital connectivity exist in a given region like **Internet Connectivity** – Are reliable internet services available in the area? **Power Supply** – Do people have consistent access to electricity to support the use of digital devices and services? **Access to Digital Services** – Even if there is internet and power, are essential digital platforms and applications available and relevant to the local population?

Secondly Accessibility: Even if the infrastructure is in place, the next question is whether people can actually use these digital services. Accessibility issues often stem from:

Lack of digital skills or literacy preventing individuals from taking advantage of available technologies.

Physical barriers, such as distance to an internet access point or weak network coverage.

Disability inclusion, ensuring that digital tools are accessible to people with disabilities.

The third one is Affordability Even when digital services are available and accessible, affordability remains a critical barrier for many Africans. This includes:

The cost of digital devices (smartphones, laptops, tablets)

The cost of internet access (data plans, broadband subscriptions)

The cost of digital services (platform subscriptions, cloud services)

Using this availability-accessibility-affordability framework, we can assess digital infrastructure in specific regions. This approach helps us understand what governments and companies have already accomplished and what challenges still prevent people from fully participating in the digital world. By addressing these three dimensions, we can work toward closing Africa's digital divide and ensuring digital opportunities are accessible to all.

Existing Gaps in Digital Skills

The digital skills gap remains one of the biggest obstacles to fully realizing the benefits of digital transformation in Africa. Data from multiple reports confirm that while demand for digital skills is increasing rapidly, the supply remains critically low, creating a major mismatch in the labour market.

According to a World Bank (2019) report, digital skills levels in Africa are significantly behind global standards. In a survey measuring digital proficiency on a scale from 1 (not at all) to 7 (to a great extent), ITU, 2020 found that : most Sub-Saharan African (SSA) countries scored below 4.4. In 2022, African countries scored between 1.8 and 5 on the Digital Skills Gap Index, while the global average was 6 (Africa Human Capital Heads of State Summit, 2022). 12 out of the world's 20 countries with the weakest digital skills are in Africa (World Bank, 2023). This data highlights the urgent need to improve digital literacy and skills development across the continent.

While digital skills levels remain low, the demand for digital talent is rising rapidly:

65% of job recruits in African companies require at least basic digital skills (IFC, 2019).

By 2030, an estimated 230 million jobs in SSA will require digital skills (IFC, 2019).

Despite this demand, the supply of workers with even intermediate digital skills is far below what companies need.

This growing gap indicates that without urgent action, Africa risks missing out on economic opportunities tied to the digital economy.

One of the key reasons for this digital skills deficit is the lack of digital education integration in schools and universities. In 2019, only 50% of African countries included 'computer' skills in their school curricula, compared to 85% globally (Kandri, 2019).

Only 11% of Africa's tertiary education graduates have received formal digital training (Kandri, 2019).

This means that most students are leaving school without the digital competencies required by today's job market, worsening the labour market mismatch. For Africa to fully capitalize on the opportunities of digital transformation, governments, private sectors, and educational institutions must take immediate action to:

1. Integrate digital skills training into national education systems, from primary schools to universities.
2. Scale up vocational training and bootcamp programs to equip young Africans with in demand digital skills.
Improve access to affordable digital infrastructure so that more people can engage in online learning and digital upskilling.
3. The evidence is clear: Africa's workforce is not yet ready for the digital economy, and without urgent reforms, this gap will only widen. To build a digitally skilled labour force, investment in education, training, and infrastructure must become a priority.

Gaps in Digital Infrastructure

Despite significant growth in internet access across Sub-Saharan Africa, overall connectivity remains low. A World Bank report found that, on average, only 28.5% of individuals in Sub Saharan Africa live in households with internet access (Seuyong, 2023). The World Development Indicators (WDI, 2023) report shows that 37% of individuals in Africa use the internet, a figure that, while higher than previous estimates (Mahler, 2019; Frankfurt, 2020; Masaki, 2020), remains far below the global average of 67% (WDI, 2023). In addition to internet access, other critical infrastructure gaps persist like electricity Access: Below 60% of the population has access to reliable electricity, which is a major barrier to digital inclusion. Computer and Tablet Access: Only 10% of individuals have access to a computer or tablet (Seuyong, 2023). Mobile Phone Access: More promising, 76% of individuals own a mobile phone, making it the most widely available digital device (Seuyong, 2023). These numbers highlight the significant barriers to digital inclusion in Africa. Without widespread availability and accessibility of essential infrastructure, digital literacy and participation in the digital economy will remain limited.

Digital Divide: The Vulnerable Among the Vulnerable

Even as Africa struggles with overall low digital skills and infrastructure, disparities within the continent create an even wider digital divide, disproportionately affecting certain groups based on geographic dimensions, socio-demographics, and economic factors.

One of the most striking digital divides in Africa is the urban-rural gap. While urban areas have rapidly adopted digital technologies, rural communities continue to face fundamental barriers to internet availability, electricity access, and affordability of digital devices.

A study using Afrobarometer data from 34 African countries found that: 64% of urban respondents reported owning either a smartphone, computer, or both.

Only 29% of rural respondents reported the same—less than half of their urban counterparts (Krönke, 2020).

This limited availability and accessibility in rural areas also affects digital literacy rates. Individuals in rural communities use digital devices and services far less frequently, leading to slower digital adoption and lower skill levels compared to their urban counterparts. This growing geographic digital divide suggests that efforts to expand digital access must prioritize rural infrastructure investment, ensuring that people in remote areas are not left behind in Africa's digital transformation. Beyond geographic differences, socio-demographic factors such as gender, income, and education level further deepen Africa's digital divide. Certain groups—particularly women, low-income individuals, and rural populations—face significant barriers to digital access, leaving them excluded from the digital economy. A recent survey by Impact HER and the African Union, CIEFFA (2024), covering over 4,000 women across 52 African countries, reveals a stark gender based digital divide: Only 50% of respondents have some form of internet access, meaning half of these women are entirely disconnected from digital opportunities. 34.7% of respondents do not own any digital device. Among those without a digital device, 84% live in rural areas, underscoring the compounded disadvantage faced by women in remote locations. More than 50% cited financial constraints as the primary reason for not owning a digital device, making affordability a key barrier to digital inclusion. However, access to devices and the internet is just one part of the problem. The survey also highlights a major gap in digital skills training and education: 60% of respondents have never attended digital skills training, with 72% of them being women and girls from rural areas.

As a result, nearly 60% of women and girls scored “poor” or “very poor” in their digital skills proficiency assessment. The gap is even more severe in emerging AI technologies—92% of urban women and 97% of rural women have never received AI training. When asked about why they had missed digital skills training, the top three reasons were:

training is too expensive, lack of access to training opportunities, lack of time due to work, family, or other commitments.

These findings reveal that the gendered digital divide is not just about access to devices and the internet, but also about affordability, training availability, and socio-economic constraints that limit participation. Without targeted action, women—especially those in rural areas—risk being left even further behind in Africa's digital transformation. Addressing these socio-demographic disparities is crucial for inclusive and sustainable digital development.

Economic Dimension

Economic inequality and lack of affordability are major barriers to digital inclusion in Africa. Throughout our discussion, we have repeatedly seen how financial constraints limit access to digital devices, the internet, and training programs, preventing many individuals from acquiring essential digital skills. A 2021 report by the International Finance Corporation (IFC) and the World Bank, which examined five African countries (Côte d'Ivoire, Kenya, Mozambique, Nigeria, and Rwanda), predicts a widening affordability gap in digital skills training, by 2030, only 25-35% of households in these countries will be able to afford training for foundational digital skills, even when limiting spending to just 1-3% of their income (World Bank, 2023). The situation worsens for higher-level digital skills training. Only around 3% of households, on average, will be able to afford training in advanced and highly specialized digital skills.

Affordability is expected to decline further in four of the five countries, with Rwanda being the only exception, where affordability is projected to remain stable or improve. These figures highlight a critical issue: without financial support, a significant portion of the population will be unable to access the education and training needed to compete in the digital economy.

Implications of the Economic Digital Divide

Limited Social Mobility: The inability to afford digital education and training will reinforce existing economic inequalities, preventing lower-income individuals from accessing better job opportunities in the digital economy.

Slower Workforce Development: With only a small fraction of households able to afford advanced digital training, the supply of highly skilled digital workers will remain critically low, further widening the skills gap.

Unequal Digital Transformation: If affordability barriers are not addressed, Africa's digital transformation will disproportionately benefit wealthier individuals and urban populations, leaving low-income and rural communities behind. Without intervention, the affordability gap in digital skills training will continue to widen, exacerbating economic inequality and slowing Africa's digital progress. Ensuring that digital education is financially accessible will be key to fostering inclusive economic growth and a competitive digital workforce.

Addressing the Digital Gaps and Divide

From our analysis so far, Africa's digital economy has immense potential, but realizing this potential is no simple task. One of the most pressing challenges is how policy makers can address the lack of sufficient digital skills and human capital, particularly among the youth given the socio-economic challenges they are facing. To bridge the mismatch between supply and demand in the digital labour market, three-stage model can introduce "Use, Improve, Excel" model. This model provides a structured approach to strengthening digital human capital in Africa, ensuring that young people not only participate but succeed in the digital economy. More importantly, it highlights the logical order of steps needed to address current digital challenges in an economically and socially realistic and achievable manner. The first stage, "Use," focuses on ensuring that as many people as possible have access to the internet and digital platforms. As we've discussed, internet penetration in Africa remains at just 30%—far below the global average of 60%. Before we can expect to see a thriving community of digital professionals and experts, we must first expand basic digital access. The primary goal here is to attract more users to the internet by making it available, accessible, and affordable. People are naturally drawn to digital platforms due to their efficiency, convenience, and entertainment value, meaning extensive education efforts are not necessary at this stage. It aligns with the interests of the private sector.

Expanding digital access benefits businesses, as almost all digital companies prioritize growing their user base. This opens up opportunities for collaboration between governments, private companies, and civil society, helping to overcome funding and technical barriers.

The main idea here is to build partnerships between the public and private sector to tackle the infrastructure challenges. For example, policy makers can introduce possible tax breaks or tax credits for companies that engaged in infrastructure investment in rural areas. Policy makers should also encourage innovative companies, especially local startups, to introduce service platforms promoting the connection between virtual and physical economy like ridesharing, food delivery, e-commerce, etc. This really can be a win-win-win situation. The public sector can raise funding to fill the infrastructure gap. The private sector can benefit from expanded business. And the whole society can benefit from more efficient and cost-effective services introduced with establishment of a universal basic digital literacy. While the rapid expansion of digital technology and global tech companies can be powerful partners, they also have the potential to create or deepen inequalities. Public and civil sector leaders must ensure that local communities—especially underprivileged groups—are protected as digital infrastructure expands. The benefits of the vulnerable groups who have been discussed in the earlier section, the rural residents, the lower-income people, female citizens, should be addressed.

Policy makers and civil society should work together to transfer significant share of the investment to improve the digital accessibility of these groups. For example, different solutions to address the difficulties in both digital and physical infrastructures brought by the remoteness of the rural communities should be considered. Instead of providing a universal internet service to every individual, the policy makers can consider digital hotspot to all communities and gradually improve it to cover larger geographic areas.

Once basic digital access is established, the next stage, "Improve," focuses on building intermediate and advanced digital skills. At this stage, policies should be designed to empower people beyond basic digital literacy by providing training in job-ready digital skills.

Key approaches include:

Integrating digital training into school curriculums at all levels of education. The policy makers should identify top areas where there is skills-set gap and think backwards how at each step of education, from university-level to elementary-level, what kind of digital skills need to be fostered.

Expanding government- and civil society-led training programs to upskill youth and workers. In this process the government with suggestions from the civil society can establish a national apprenticeship framework with clear guidelines for employers, training providers, and apprentices. Through this framework, policy makers should focus on the quality and the approach of the digital training and make sure the vulnerable groups are being addressed. Curriculums addressing fundamental STEM skills should be introduced.

Encouraging private companies to provide youth training programs, apprenticeships, and internships to help young people gain real-world experience. The policy makers can introduce possible tax breaks or tax credits for companies that engage a higher number of apprenticeships programs.

The final stage, "Excel," is about transitioning from being participants in the digital economy to becoming leaders. The goal here is not just to train workers for international tech companies but to cultivate Africa's own digital innovators, entrepreneurs, and industry leaders. Key strategies include:

Encouraging local entrepreneurship by creating policies that support small and medium-sized digital enterprises. Clear policy signal and substantive funding should be provided to encourage innovative startups and enterprises. Providing funding, infrastructure, and mentorship opportunities to help African startups grow and compete is essential for the African countries to build their power in the digital world.

Investing in higher education and research in digital technologies to foster local expertise. This can include establish collaboration with international institutions to facilitate knowledge exchange.

Establishing partnerships between research institutions and digital companies to make sure the skills fostered in schools matches what is needed in the labour market. Research projects focusing on technological application and studies of basic science and technology should both be addressed in the skills building agenda.

Case Studies In Africa

As we explore strategies for closing Africa's digital skills gap, it is essential to look at real-world success stories that have made meaningful progress. These case studies demonstrate how governments, private sector players, and civil society organizations have worked together to expand digital literacy and workforce development in Africa.

Kenya Digital Literacy Program (ICT 2025)

The Kenya Digital Literacy Program (ICT 2025) is a three-phase initiative launched in 2013 to integrate information and communication technology (ICT) into education. The goal is to ensure that young students gain early exposure to digital tools, fostering both basic and intermediate level digital skills. Phases of the Program:

Phase I: Introduces digital literacy to students in grades 1 to 3.

Phase II: Expands digital education to grades 4 to 6, incorporating more interactive and practical learning.

Phase III: Strengthens digital competency in grade 6 and above, preparing students for more advanced technological engagement.

Early Challenges

Initially, there was a lack of coordination between key agencies responsible for different project components.

Without clear roles and responsibilities, implementation was slow, and progress was fragmented. Adjusted Approach & Solutions:

The government restructured the initiative by clearly allocating specific project components to different agencies, ensuring that each had a well-defined role and policy guidelines for implementation.

This targeted approach improved execution, ensuring that students could progressively build strong digital skills throughout their schooling years

Rwanda Digital Talent Policy 2016 (Domingo et al. 2024)

Rwanda has been at the forefront of Africa's digital transformation efforts, and the Rwanda Digital Talent Policy (2016) represents one of the country's most ambitious initiatives to develop a digitally skilled workforce. The policy was designed to address low digital literacy rates, the urban-rural digital divide, and gender disparities, ensuring that more Rwandans—especially youth—gain the skills needed to participate in the digital economy.

Current Digital Literacy Landscape in Rwanda

Only 30% of Rwandan youth are digitally literate, a rate that mirrors broader regional disparities in Sub-Saharan Africa (Domingo et al., 2024).

Significant gaps remain between urban and rural areas, as well as between men and women, in access to digital education and training.

Key Strengths of the Rwanda Digital Talent Policy

Proactive, State-Driven Approach- The policy was led by the government of Rwanda, ensuring strong political commitment and institutional support. A multi-stakeholder approach engaged local organizations, private sector players, and international partners, making implementation more effective.

E-Government Integration to Enhance Digital Literacy- The adoption of e-government services, such as tax registration and governance systems, helped improve digital engagement among both civil servants and the general public.

By encouraging citizens to interact with digital platforms, the government indirectly fostered basic digital skills adoption.

Strong Collaboration with Academic Institutions to Build Digital Talent -Rwanda prioritized partnerships with leading academic institutions to develop high-level digital expertise:

Carnegie Mellon University Africa (CMU-Africa) in Kigali was established to train top-tier digital professionals and leaders in AI, data science, and software engineering.

The University of Rwanda partnered with the Rochester Institute of Technology (RIT) in the U.S. to offer cutting-edge digital courses and research opportunities. These initiatives have helped create a growing pool of highly skilled graduates, positioning Rwanda as a potential regional hub for digital talent.

Challenges and Barriers

1. **Weak Demand in the Local Labor Market -** While Rwanda has made significant strides in training digital talent, the local job market has not kept pace with the increasing supply of skilled workers. This mismatch raises concerns about brain drain, as many Rwandan graduates seek opportunities abroad where demand is higher. More efforts are needed to attract digital investment and foster job creation within the country.
2. **Limited Regional and Civil Society Engagement -** The policy has been heavily government-led, with limited involvement from regional governments and civil society organizations. Expanding participation

from grassroots organizations and local NGOs could help increase outreach, especially in rural areas, ensuring that women and marginalized communities benefit more directly.

Key Takeaways from the Rwanda Digital Talent Policy

Government leadership and strong institutional backing are crucial for large-scale digital training initiatives. Public-private partnerships with academic institutions can accelerate digital skills development and train future industry leaders. E-government services can serve as a tool to indirectly promote digital literacy, encouraging more citizens to engage with technology. Digital workforce development must be matched with job creation efforts, ensuring that skilled workers have employment opportunities within local markets.⁵ Engaging regional and civil society actors can improve accessibility and ensure that vulnerable populations benefit equally from digital transformation efforts. By addressing these challenges, Rwanda can strengthen its position as a leader in digital skills development, serving as a model for other African nations working to build a digitally skilled and competitive workforce

SUMMARY AND CONCLUSION

African companies understand their local markets and consumers better than international firms. With the right support and investment, they have the potential to outperform global competitors by creating solutions that truly meet the needs of their communities. A key aspect of business optimisation is the strategic use of artificial intelligence (AI) for automation. AI driven solutions can enhance customer support by offering 22/7 assistance through AI clones and chatbots, ensuring seamless interactions with customers. At the same time, investing in local research institutions and providing better research conditions will help retain top talent and encourage young minds to pursue careers in digital innovation.

The key to closing the digital divide is ensuring that Africa's workforce is equipped with the right skills to meet the growing demand for digital talent. The "Use, Improve, Excel" model offers a structured approach to digital skills development, ensuring that individuals move from basic access to digital leadership. By strengthening digital infrastructure, expanding digital skills training, and addressing inequalities, Africa can fully harness the power of digital transformation and position itself as a leader in the global digital economy.

Future Policy Directions

System Transformation: The transformation sought in this transition to the digitaleconomy is not linear; it is accelerated, intentional, and disruptive. Rather than adding digital tools onto existing systems, policy must reshape the digital ecosystem and its integration into the labour reproduction system. This entails aligning digital investments with employment outcomes.

Inclusion: Everyone regardless of gender, income, geography, or disability—must have access to affordable internet and digital tools. Without inclusion, the digital economy risks exacerbating existing inequalities.

Innovation and Autonomy: Beyond importing technologies, African nations should cultivate the capacity to innovate locally, tailoring solutions to their own needs and values.

Cybersecurity and Cultural Integrity: The safety of users' information must be guaranteed by strong regulatory frameworks. Moreover, digital content and access should respect cultural values (relative to morality and decency), ensuring that innovation aligns with social norms (e.g., flexible work options for mothers)

Job-Centered and People-Centered Goals: Ultimately, policy success should be measured by its impact on job creation and quality of life—not just broadband coverage or app usage. The creation of meaningful, stable and culturally grounded jobs --rather than a modern digital environment – is the ultimate goal. The overarching message is clear: policy must act as a compass, guiding nations through competing alternatives, with a steady hand on the tiller even when the digital “wind” cannot be controlled.

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