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# **Innovation meets Growth? Navigating the Digital Landscape in Ghana**

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**Abstract**

Digitalization is transforming the world around us, and Ghana is no exception. Digital technologies are changing the way we work, live, and learn. They are also creating new opportunities for economic growth and social development. This policy brief examines the enablers of digitalization in Ghana and submits recommendations for stakeholders in the digital economy. We argue that the government should play a leading role in supporting the development of the digital economy and ensuring that everyone benefits from the opportunities that digitalization presents. To this end, the present brief provides a valuable contribution to the debate on digitalization in Ghana and can help inform policymakers and other stakeholders as they develop policies to support the digital economy.

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# Introduction

Digitalization is the “use of digital technologies to change a business model and provide new revenue and value-producing opportunities”.<sup>1</sup> Digital technologies now permeate all aspects of the economic and social fabric of both developed and emerging economies. At the micro level, digitalization allows firms to lower transaction and operational costs, improve productivity, enhance data collection capabilities, modernize existing legacy processes, improve operational agility, provide better customer experience, and increase market share and profits. At the macro level, digitalization has positively impacted financial inclusion, access to public services, health outcomes, food security, education and more.<sup>2</sup> As African countries seek to transform their economies, policymakers need to know how digitalization fits into their current strategies and how can they leverage its benefits to drive transformation.

Ghana’s digital economy is currently valued at about USD 1 billion and may reach USD 5 billion by 2030.<sup>3</sup> Digitalization in Ghana is primarily fuelled by the service sector, with minimal contributions from the industrial and agricultural sectors. The service sector is currently the largest contributor to Ghana’s GDP, contributing to 45.9 per cent of total GDP (2021). The industrial sector is the next largest – contributing 30 per cent of GDP, followed by the agricultural sector at roughly 21 per cent in 2021.<sup>4</sup> Growth in the service sector was fuelled partly by robust digital transformation in five key areas: administration, finance, health, transport and storage as well as whole sale and retail trade.

The question is whether the government of Ghana can leverage digitalization to effectively support this economic transformation. The use by some European and Asian firms of modern digital technologies<sup>5</sup> has impacted positively on their bottom lines, their sustainability, and on their competitiveness in the global market. These include tools to improve manufacturing throughput, quality assurance and preventive maintenance, inventory control, safety, quality, real-time monitoring of plant operations, real-time decision-making, cost control, business process efficiency, and customer experience. Regrettably, adoption of these modern technologies by manufacturers in Ghana has been low because of the high

## Jetstream Africa

Jetstream Africa is an e-logistics company that provides cross-border trade solutions that ease exports across Africa through its technology-enabled freight forwarding, trade financing and insurance, and cargo tracking tools for African businesses. It is present in 29 countries, including 12 African markets, and has seen revenue increase by 48% in the last year. It shows that the use of digital solutions not only increases efficiency in business processes but also provides opportunities for collaboration with partners who offer complementary services such as insurance.

Source: *Ghana Ecosystem Primer & ACET*

<sup>1</sup> “Digitalization”, *Gartner Glossary*, accessed 30 November 2023.

<sup>2</sup> Karim Sabbagh et al., “Digitization for economic growth and job creation: Regional and industry perspectives”, in *The Global Information Technology Report 2013* (World Economic Forum, 2013), 35-42.

<sup>3</sup> “Ghana Information and Communication Technology”, *International Trade Administration*, 3 January 2022, accessed 30 November 2023.

<sup>4</sup> Ibid.

<sup>5</sup> These include 3D printing, robotics, smart manufacturing, cloud-based ERP, IoT, augmented and virtual reality, blockchain, machine learning, AI, predictive maintenance and big data & analytics.

cost of installing, maintaining, and regularly updating on-site IT infrastructure or cloud-based technology solutions; inadequate digital skills; lack of direct government support to firms embarking on digital transformation; inadequate access to finance; inadequate infrastructure to support a robust digital economy; and a lack of industrial/innovation hubs to link manufacturing with the digital economy.

In some advanced countries, industrial hubs have been used to facilitate manufacturing industry uptake of modern digital tools and to link manufactures with innovation centres. Industrial hubs are clusters of activity taking place within free zones, special economic zones, or manufacturing clusters that leverage digital solutions to improve the outputs of industry. If well planned, these hubs could provide platforms to link up big manufacturers with Ghana's digital entrepreneurs within a controlled environment, while offering basic facilities. There are plans by the Ministry of Trade and Industry to set up industrial parks to provide functions such as the industrial hubs in Ghana, but these remain on paper.<sup>6</sup>

### The Five Key Areas in Detail

**Administration:** Ghana has invested heavily in e-governance initiatives such as: (a) the Government Online Services Portal, which provides a one-stop window for public services provided by many revenue-earning government agencies; (b) an online platform for the payment of government services; (c) an e-workspace to manage daily business processes; and (c) the Ghana Integrated Financial Management Information Systems to manage public sector finances. Digitalization has also been extended to immigration services, property address registration, the justice system, driver licensing, social security and social protection services, passport acquisition, automobile insurance, government procurement, agriculture extension services, port services, and citizen registration.

**Finance:** Many financial institutions offer online services through multiple delivery channels, including mobile devices. The fintech subsector is also one of the most active ICT sub-sectors in Ghana; the Boston Consulting Group (BCG) ranks Ghana as the third-highest country in 2020 for mobile money payment patronage, after China and Kenya. The sector had 20.4 million active users, generating 488.2 million transactions, valued at USD 9.5 billion in 2022. The sector also ranks high in terms of employment outcomes, with an estimated 699,592 registered mobile money agents in 2022 according to the Bank of Ghana.<sup>7</sup>

**Health:** The prevailing digital ecosystems and infrastructure have spawned the growth of over 15 e-health companies that have designed services such as phone/video consultations, online appointment bookings, prescription services, diagnostic services, and health insurance. Many hospitals have also introduced digitally enabled services related to diagnosis, patient monitoring and medical records, and informatics.

<sup>6</sup> "Shaping the Digital Transformation in Europe", *European Commission*, 22 September 2020, accessed 30 November 2023.

<sup>7</sup> Victoria Bright, Justice Oteng, and Elsie Gyan, "Fintech 2023", *Chambers Global Practice Guides*, 23 March 2023, accessed November 2023.

**Transport and storage:** Digital technologies are used for ticketing, processing of travel documents transport management systems, cargo monitoring/tracking, and logistics service platforms. The most popular area where digitalization has penetrated the Ghanaian market is ride-hailing services, which rely heavily on apps that connect passengers with local drivers. There are currently more than 100,000 app-based drivers operating across the major cities of Ghana.<sup>8</sup>

**Wholesale and retail trade:** Firms in the wholesale and retail trade in Ghana use B2B or B2C commerce platforms or social media to reach out to potential customers. There are currently more than 30 e-commerce firms in the country. In the industrial sector, by comparison, digitalization appears to be minimal. The manufacturing sub-sector, which represents a large proportion of the industrial sector, contributed 28.3 per cent of GDP in 2021 and 33.6 per cent of GDP in 2022. The manufacturing sector is characterized by a narrow base (in terms of product range), heavy reliance on imported raw materials, outdated technologies, and a focus on the small domestic market.

The majority of firms (MSMEs account for 85% of manufacturing employment) use rudimentary manual or automated technology, with a sprinkling of basic digital tools in business processes, and have a low level of linkages with large firms along the value chain. The few large firms in automotive manufacturing, agro-processing, textiles, footwear and garments, cocoa processing, oil refining and gas, chemicals and cement, pharmaceuticals, and wood processing have integrated digital tools into some business processes or use off-the-shelf software such as cloud-based Enterprise Resource Planning (ERP) or Customer Relationship Management (CRM) systems in their operations.

<sup>8</sup> Ejike Kanife, “Drivers at Arms: Cab-hailing drivers in Ghana talk about taxes, robberies and bearing weapons to survive”, *Technext*, accessed 30 November 2023.

# Enablers of Digital Transformation

To reap the benefits of digitalization for economic transformation, governments must work hand in hand with the private sector, and particularly with micro, small and medium enterprises (MSMEs), which form a significant portion of the private sector in many African countries. MSMEs play a critical role in the economic development of many countries by providing a source of income to much of the population. As a category, they contribute the most to GDP, have the highest capital-to-employment ratio, and provide a sustainable way of reducing poverty. In Africa, digital entrepreneurs and MSMEs have also played a leading role in expanding the frontiers of the digital economy, including training of citizens in relevant digital skills, and diffusion of innovative products and services. They have also helped in reducing the transaction costs of consumers by providing quicker access to information and e-payments solutions, despite the structural constraints under which they operate.

With such potential to drive growth, it stands to reason that helping MSMEs digitalize their businesses could increase their productivity and their bottom lines. The *KPMG Global Tech Report 2022* found that 99 per cent of businesses surveyed (2,200 organizations) generated returns on digital investments and successfully used digitalization to improve their profitability or performance over a two-year period. Seven per cent of them generated at least an 11 per cent uplift in profit or company performance due to digitalization.<sup>9</sup>

At the same time, African MSMEs have multiple challenges to overcome, many of which are identified in i4Policy's review of Small Business and Startup policies.<sup>10</sup> ACET's Digital and Innovation Policy Practice categorized these challenges into four key areas that span those identified by the African Union Digital Transformation Strategy<sup>11</sup>, the World Bank's Digital for Economy Report<sup>12</sup>, Strategy&'s Digitalization for Economic Growth and Job Creation Report<sup>13</sup>, and Innovation Spark's 2022 Ghana Ecosystem Report<sup>14</sup> (Figure 1). These include inadequate legal and regulatory frameworks to support the digitalization process, lack of financing for digital MSMEs, scarcity of relevant digital skills in firms and the general population, and the infrastructure required to deliver solutions.

<sup>9</sup> KPMG, *KPMG Global Tech Report 2022* (KPMG, September 2022).

<sup>10</sup> Innovation for Policy Foundation, "Benchmarking Small Business Acts and Startup Acts v2.0", Ecosystem 2023, accessed 18 November 2023.





<sup>11</sup> The African Union, *The Digital Transformation Strategy for Africa (2020–2030)*.

<sup>12</sup> World Bank Group, *Digital Economy for Ghana Diagnostic Report* (Washington, DC: World Bank, 2019).

<sup>13</sup> Strategy&, *Digitization for Economic Growth and Job Creation: Regional and Industry Perspectives* (Booz & Company, 2013).

<sup>14</sup> Innovation Spark, *Ghana Innovation Ecosystem Report 2022: Year in Review* (Innovation Spark, 2022).



MSME challenges (i4 policy)	Pillars of Digital Transformation				ACET Enablers	
	AU Digital Transformation	World Bank Digital Economy	Innovation Spark	Strategy&		
Governance	Enabling environment, policy and regulation	n/a	Regulation	Governance		<b>Strategies, policies &amp; institutional frameworks</b>
Access to finance, markets, business support, culture	Digital innovation and entrepreneurship	Digital financial services	Investment support	Capital		<b>Business frameworks and financing</b>
Infrastructure	Digital infrastructure	Digital platforms Digital infrastructure	Digital infrastructure	Infrastructure		<b>Infrastructure</b>
Human capital	Digital skills and human capacity,	Digital skills	Digital talent	Skills		<b>Human capital</b>

**Figure 1:** MSME Challenges and Corresponding Enablers of Digital Transformation (ACET). Source: ACET.

The four challenge areas can be addressed by respective “enablers” (see Figure 1):

**Enabler 1: Strategies, policies and institutional frameworks**

These include the strategies, policies, laws, regulations and government institutions created to govern digitalization, e.g. ethics, cybersecurity, data standards and protection, e-commerce, and investment.

**Enabler 2: Business frameworks and financing**

This encompasses the institutions, stakeholders, processes and services and investments driving the digital economy. Stakeholders in the private sector and tech startup environment supporting the digital economy include financiers, academia, business support services, hubs, development partners, and the media.

**Enabler 3: Infrastructure**

This refers to the connectivity and digital infrastructure and technology (hardware, software, industrial clusters and learning networks) available to support digitalization.

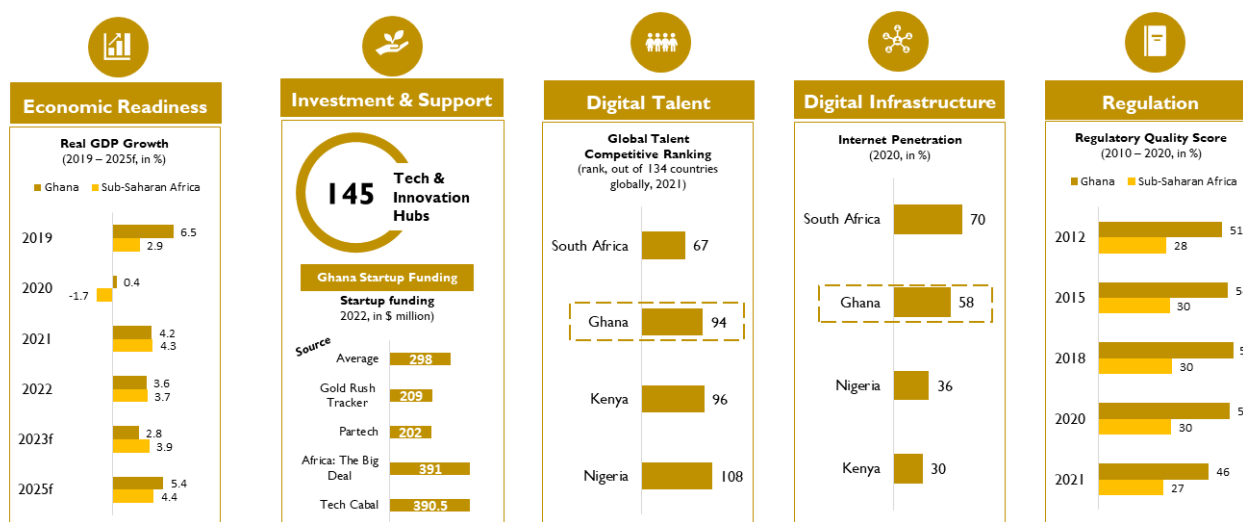
**Enabler 4: Human Capital**

This addresses the talent pool, digital literacy and skills, culture, usage and ownership of digital technologies, and digital inclusion.

The *Ghana Innovation Ecosystem Report 2022* shows that Ghana has been making strides in these enabling areas but there is more to be done (Fig. 2).<sup>15</sup> In terms of strategies, policies and institutions, Ghana’s Regulatory Quality Score from 2010 to 2020 was 46 per cent, compared to the average for Sub-Saharan Africa of 27 per cent. In terms of business frameworks, it has at least 145 technology and innovation hubs and raised between USD 299 million and USD 391 million. Where infrastructure is concerned, its internet penetration was 58 per cent – second only to that of South Africa. And when it came to human capital it ranked 94 out of 134 in the Global Talent Competitive Ranking. This paper dives into the drivers of growth and opportunities for improvement.

STARTUP ECOSYSTEM ENABLERS

Ghana ranks favourably in most enabling factors; more must be done to provide a conducive business environment.



Source: IMF World Economic Outlook Database (2022), Worldwide Governance Indicators (2022), World Bank Economic Indicators (2022), Global Talent Competitive Index (2021), TechPoint Intelligence (2022), Dealbase Africa Database (2022), The Big Deal Database (2022)

Figure 2: Ghana Startup Ecosystem Enablers. Source: Ghana Innovation Ecosystem Report 2022

<sup>15</sup> Ibid.

# Methodology

To assess the impact of digitalization in Ghana, ACET completed desk research to identify the enabling conditions; conducted an online survey to understand the needs of MSMEs; and held an online stakeholder validation workshop with both local and international experts to answer questions relating to a number of different categories:

**Digital economy overview:** What is the value of Ghana's digital economy and which sectors are being transformed by digitalization?

**Strategy, policies, and governance:** Which strategies, policies, laws, and regulations govern the digital economy and influence digitalization in Ghana? Who are the institutional actors responsible for governance and coordination? What are MSMEs' perceptions of the required policies and incentives needed to improve digitalization in Ghana?

**Business frameworks:** Who are the key stakeholders outside government supporting digitalization, and what services do they provide? What are the digital transformation processes within firms, e.g. the status of digitalization, business issues being addressed by digitalization, and the purpose and drivers of digitalization in the business?

**Infrastructure:** What infrastructure is available in Ghana? What technologies have firms deployed? What are the gaps?

**Human capital:** What types of digital skills are available in Ghana and what skills are needed?

The firms covered by the survey are primarily micro, small and medium-sized businesses in ICT fintech, ed-tech, artificial intelligence and big data, agriculture/agri-business, logistics, software development and IT services, HR and marketing, and communications. The most preferred legal form used by these firms was either private limited company or sole proprietorship, with the remainder being Registered by Guarantee.

While most of the firms surveyed have been operating for between one and 10 years, half of the firms are relatively young and were launched within the last three years. They were at the early stage of the maturity continuum, using basic web-based, cloud-based and mobile internet technologies to provide services for their clients. A third of the firms have operated for more than five years and claim to be at a mature stage of digital transformation. These are firms that have actively invested in digital technologies to improve their internal capabilities in response to external factors such as advances in technologies, customer demands, new technological trends and dynamic digital innovations, and government digitalization policies.

# Findings & Analysis

## Enabler 1 – Strategies, Policies and Institutional Frameworks

Since the early 2000s, Ghana has developed multiple strategies, policies, and legislative frameworks to regulate the digital economy. In 2019, Ghana developed a digital roadmap as part of its Ghana Beyond Aid Strategy. This roadmap outlined policies to digitize public services, improve financial inclusion through mobile banking and e-payment services, and streamline tax collection and business registration. The strategy planned to leverage biometric national ID cards to support these initiatives.<sup>16</sup>

Digitalization is also identified as one of the key priorities of Ghana's National Medium-Term Development Policy Framework (2022–2025). It identifies two ICT objectives to (i) enhance application of ICT in national development and (ii) expand the digital landscape. It identifies a plethora of initiatives to implement, such as the digitalization of land records; maintaining the National Digital Addressing System; increasing broadband coverage, accessibility and affordability of digital devices; and others.<sup>17</sup> It is supported by over 14 policies and an extensive legal framework, including the Digital Financial Services Policy; the ICT for Accelerated Development policy; National Cyber Security Policy & Strategy; Electronic Communications Regulations, Electronic Transactions Act, National Communications Act, Data Protection Act, and more.

These strategies, policies and regulations are implemented by multiple institutions managing the digital economy, including the National Communications Authority (NCA), the National Information Technology Agency (NITA), the Ghana Investment Fund for Electronic Communications (GIFEC), the Ministry of Communications and Digitalization (MOCD), and others. While the strategy is still under implementation, some gains have been realized. For example, the government implemented a Mobile Money Interoperability (MMI) initiative that leveraged a Universal QR Code payment system for both bank accounts and mobile wallets. This made Ghana the fastest-growing mobile money market in Africa, with 36.9 million registered mobile money accounts. The implementation of the National ID Scheme (Ghana Card) and its linkages to other services, such as national health insurance, social security, banking and other systems, have also begun to streamline service provision.<sup>18</sup>

Despite these forward-looking initiatives, their implementation has not been without criticism and some initiatives seem to be in direct conflict with other policies. For example, recent investments of over USD 184 million in surveillance technology by Ghana have caused concern that they are being used to target opponents, journalists, and activists.<sup>19</sup> Similarly, improvements in mobile infrastructure and the Digital Financial Services policy reduced the proportion of the unbanked population from almost 60 per cent in 2014 to 32 per cent in 2021, and provided mobile money to 56 per cent of the population.<sup>20</sup> In May 2022, however, the implementation of the electronic levy (E-levy) on digital transactions eroded those gains, decreased consumer confidence in digital finance and impacted the bottom lines of

<sup>16</sup> “Ghana forges ahead with strategy to digitise public services, spurring growth in ICT sector”, *Oxford Business Group*, accessed 14 September 2023.

<sup>17</sup> Government of Ghana, *National Medium-Term Development Policy Framework (2022–2025)* (December 2021), accessed 14 September 2023.

<sup>18</sup> Anthony Xavier Chabry, “Ghana’s Digitalization Revolution, a Catalyst for Economic Development”, *Face2Face Africa*, 1 July 2021, accessed 14 Sept 2023.

<sup>19</sup> “Ghana’s Democracy at Risk Due to Use of Surveillance Technology, Warns New Report”, *Institute of Development Studies*, 27 September 27 2023, accessed 30 November 2023.

<sup>20</sup> GSMA, *The E-levy in Ghana: Economic Impact Assessment* (GSMA, 2023).

businesses. Nine months after its implementation, transaction values and mobile money revenues fell by up to 35 per cent year-on-year, with revenues 20 per cent lower than pre-tax levels.<sup>21</sup>

This conflict in policy presents a question as to how aligned government entities are in their approach to implementation of their strategic objectives and whether more needs to be done to reduce the overlapping roles and improve coordination among them. Some development partners, including GIZ, have been able to hold government accountable by facilitating dialogue and advising key stakeholders to avoid conflict and seek the most effective strategy for implementation. Development partners have also played a key role in supporting grassroots efforts from digital entrepreneurs to drive policy action. For example, since 2019, GIZ has supported the Ghana Hubs Network, Ghana Startup Network, Ghana Chamber for Young Entrepreneurs, and the Private Enterprise Foundation in their quest for the development of a Startup and Innovation Bill that would support tech-enabled startups. In response to the need for a more integrated ecosystem, GIZ also supported the initiation of Ghana's Digital Innovation Week that brings together stakeholders across the country to dialogue on pertinent issues. This has been effective in bringing together over 6,000 ecosystem actors to connect with each other and address emerging topics over the past three years.

When asked to recommend policies and programmes to improve the digitalization of firms in Ghana, a majority of respondents suggested policies to facilitate access to finance and tax incentives for firms.

## **Enabler 2 – Business Frameworks**

It is estimated that 70 per cent of digital transformation programmes are not successful and fail to reach their stated goals due to factors like internal resistance to change; lack of expertise among employees; lack of organizational-change management strategies to counter the disruptive effects of digitalization; negative mindsets among employees; budget constraints; and high costs involved in building and maintaining costly onsite IT infrastructure or cloud-based technology solutions.<sup>22</sup> To properly drive this economy, support for financing, business operations, customer experience and others must be in place.

To assess Ghana's context, we asked survey respondents about their perceptions of the drivers and barriers to digitalization. The underpinning drivers of digitalization for respondents were improvement in the customer experience, business processes/productivity, and reduction in costs/ increase in revenue.<sup>23</sup> When it came to barriers, respondents identified the lack of funds and high rent costs for business space as their internal barriers, while high operations costs remained the external challenge.

### **Opportunities for Support**

Within the digital ecosystem, there are multiple stakeholders who support digitalization in Ghana. These include private sector companies (e.g. large telcos such as MTN, AirtelTigo, Vodafone and their Mobile Money Providers; e-commerce platforms such as Jumia and Tonaton; and startups such as Zeepay and Expresspay) who invest in infrastructure; and financial institutions who provide capital to businesses and support digital platforms and

<sup>21</sup> Ibid.

<sup>22</sup> "Digital Transformation Challenges and How to Overcome Them", PECEB, 9 November 2022, accessed 30 April 2023.

<sup>23</sup> IDOS Digitalization in Ghana Stakeholder Workshop, 18 April 2023.

payment systems. Academic institutions (e.g. KNUST, University of Ghana); private knowledge providers (e.g. Soronko Academy) and tech and innovation hubs (iSpace, Ghana Tech Lab) also provide young people and entrepreneurs with digital skills. Development partners such as Mastercard Foundation, GIZ, the World Bank, AfDB and others also support the ecosystem with funding and capacity building.

In the realm of financial accessibility, it is crucial to highlight that Ghana holds the position of the fifth most attractive investment destination in Africa. Notably, the nation has witnessed an impressive 143 per cent increase in startup investments, measured by Compound Annual Growth Rate, since the year 2018.<sup>24</sup> Innovation Spark estimates that in 2022 Ghanaian companies saw USD 298 million to USD 391 million in investment, led by the fintech (46%) and health sectors (23%). Funding sources were led by venture capital (71%), followed by private equity (19%), development finance (8%) and accelerators (2%).

Despite this increase in investment in the tech ecosystem over the past few years, these have been limited to a few startups (mostly venture capital) and some MSMEs through development partner programmes, government programmes and incubators/accelerators. In 2022, the government announced two new funds of funds – the Startup Catalyst Fund (\$20 million) and Strategic Industries Fund (\$20 million) to increase the capital pool for SMEs. However, alternative financing (grants) also has a role to play for a majority of MSMEs who are not investment-ready. In 2022, international development agencies (56%), hubs and accelerators (28%), competitions and prizes (13%), charitable organizations, and state-sponsored Interventions led grant funding (see Figure 3).

In order to scale up, ecosystem stakeholders must work to develop more investment-ready startups and SMEs. This requires formalization of more MSMEs and patient capital to help them build a good foundation for growth (strong business models, systems and processes, tools, etc). Development partners, hubs, accelerators and other enablers are particularly important not only for the alternative financing, but for funding other actors who

ALTERNATIVE FUNDING SOURCE

International Development Agencies and incubators serve as alternative sources of funding (grants) for early-stage companies.

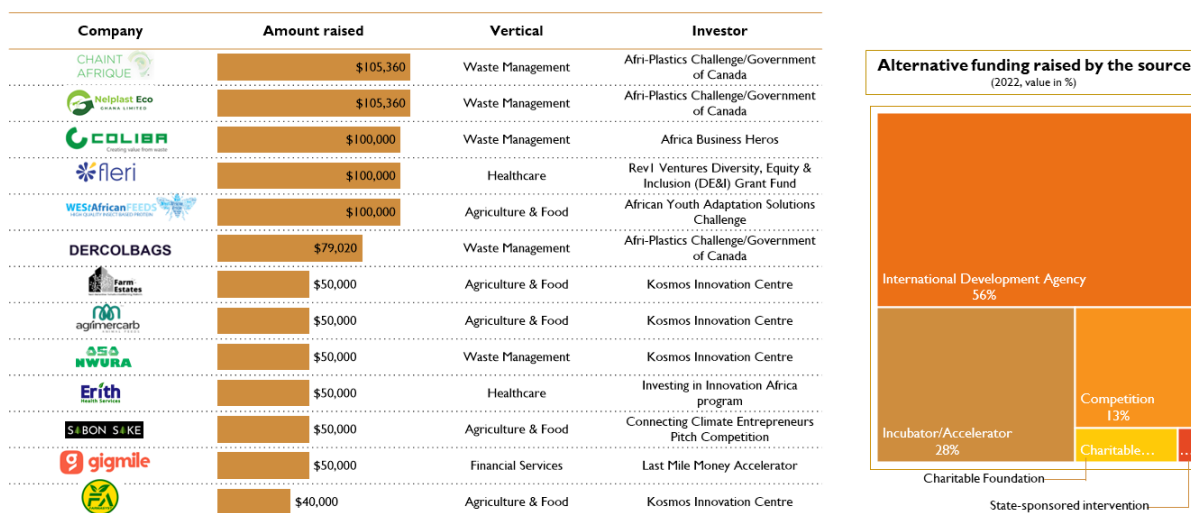


Figure 3: Alternative Funding Sources for Early-Stage Companies, Innovation Spark, Ghana Innovation Ecosystem Report, 2022.

<sup>24</sup> Innovation Spark, Ghana Innovation Ecosystem Report 2022.

Sources: GoldHub Tracker (2023), Panarch Africa Report (2023), Africa: The Big Deal Database (2023), TechTable Deal Flow (2023)

build this foundation through operations support, training and mentorship. Women Entrepreneurs for Africa Program (WE4A), for example, was an accelerator sponsored by GIZ, the Toney Elumelu Fund, Seed Stars, the EU and other partners. It provided 30 women-owned businesses with grants to support operations, training and mentorship, and even procured equipment in some instances. This type of funding is critical in that it provides the patient capital that allows early stage MSMEs flexibility as they grow and experiment.

### Enabler 3 – Infrastructure

The digital economy thrives on a robust ICT infrastructure such as broadband bandwidth, middle-mile connectivity, a reliable electricity supply, good road network and special purpose industrial parks. Ghana has an extensive connectivity infrastructure made up of high-capacity networks, 4G systems, local wireless connectivity, backbone networks, and operational digital platforms directly associated with transport and energy infrastructure.

This starts with five submarine cable landings that supply 340 Gbps to the country (first mile). These then connect to the national backbone and intercity network (middle mile) through four internet exchange points (IXP), before reaching end users through local access networks (last mile).<sup>25</sup> There is also an extensive network of data repositories run by universities and operators such as Info source, NITA, ONIX DATA, PAIX Ghana, Airtel, MTN Main One, Global Data Technology Corporation, Data Communications & Network Systems, and DocuPro. This has resulted in an internet penetration of 68 per cent and mobile penetration of 131 SIMS/100 inhabitants, which is higher than the Sub-Saharan average of 80 SIMS/100.<sup>26</sup> Even with such progress, respondents indicated that additional infrastructure is still required to improve digitalization. Where network infrastructure is concerned, the challenge appears to be at the middle mile, where there is no single seamless backbone structure. Much of this infrastructure is concentrated in urban areas, leaving rural areas less connected. Additionally, the reliability of electricity in some areas is a challenge, despite high access (85%). This is because tariffs and inefficiencies in the distribution system (old infrastructure and theft) result in 25 per cent losses.<sup>27</sup>

In terms of firm-level digital business platforms, participants utilized social media platforms/networks, digital/e-commerce platforms, and mobile apps, with fewer using emerging tech such as AI, Cloud, IoT, robotics, blockchain, and 5G. While some of the respondents have the capacity to absorb and deploy these modern digital tools, their low uptake is due largely to lack of skills, funding challenges, and inadequate readiness of the current digital landscape to absorb this technology.

Respondents also listed the high cost of data as a challenge, despite Ghana's price per 1 GB being the third cheapest in Sub-Saharan Africa at USD 0.40 and ranked 33rd in the world.<sup>28</sup> While further research may be required to understand this conundrum, it may be that the cost of data is high relative to income levels (individual wages and company revenues) in a country that struggles with unemployment and underemployment. Some MSMEs may also perceive this in context of the quality and reliability of service, depending on which service they subscribe to.

<sup>25</sup> World Bank Group, *Ghana Digital Economy Diagnostic* (Washington, DC.: World Bank, 2019), accessed 28 November 2023.

<sup>26</sup> *Ibid.*

<sup>27</sup> "Ghana's Electricity Mix has Improved but Reliability and Cost is Still a Challenge", *The Conversation*, 9 June 2021, accessed 7 November 2023.

<sup>28</sup> "Worldwide Mobile Data Pricing: The Cost of 1GB of Mobile Data in 237 Countries", *Cable.co.uk*, accessed 28 November 2023.

These challenges to infrastructure may be partially resolved by clustering these services in a digital industrial hub or similar innovation cluster, as described earlier. Clustering electrical and internet infrastructure can give MSMEs access at a lower cost, and also aggregates customers for service providers. The Accra Digital Center is one example of such a hub, as are other tech and innovation hubs. However, these are often limited to internet access, space and electricity, with only a few having hardware for 3D printing, AI, Internet of Things (IOT) enabled technology, Computer Numerical Controlled (CNC) machines and industrial robotics. These technologies rely on reliable electricity, internet, cooling, and often dust-free spaces, which can be catered for with shared infrastructure provided by technology parks.

Adding emerging technology and sector-specific infrastructure to existing hubs or new industrial parks that are cost-effective will not only increase access to basic infrastructure but enable knowledge transfer and strategic integration of MSMEs into industrial value chains. In Ghana's manufacturing sector, where firms have not fully embraced modern digital technologies, digital industrial hubs or clusters could be used to develop linkages between industry and the digital economy. For example, current artisanal clusters for metal and wood fabrication such as Suame Magazine and Agbogbloshie Market are often located in city centres but not fully integrated into export processing zones and industrial areas. Meanwhile, they provide key services for the automotive sector, e-waste recycling, and serve some large industrial clients using outdated equipment and low-tech manufacturing.

## Enabler 4 – Human Capital

The IFC's report *Digital Skills in Sub-Saharan Africa: Spotlight on Ghana* (2019) projects a demand for digital skills in Sub-Saharan Africa, estimating that by 2030 approximately 230 million jobs across the region will necessitate such expertise. Notably, Ghana is expected to contribute significantly to this demand, accounting for 9 million of these digitally skilled positions. In contrast, just one-third of these are available today (only 25% of the population has basic digital skills, and 10% has intermediate or advanced digital skills). Fifty per cent of respondents in the survey confirmed this shortage of advanced ICT and digital skills, especially in big data and analytics, business analysis, business process management, data science, project management, and machine learning. This scarcity opens up a USD 130 billion opportunity for training across Africa, and a USD 3.5 billion opportunity for firms specialized in providing digital skills capacity building in Ghana,<sup>29</sup> but this requires both domestic and foreign investment, combined with government strategy, to come to fruition.

In Ghana, there is currently no comprehensive data on the number of jobs created by digitalization in the country, however, anecdotal evidence suggests that digitalization is creating jobs. The evidence identified below, while ambiguous and non-uniform, offers a glimpse into the sources of these jobs.

The largest need for Sub-Saharan Africa digital skills, according to the IFC report, is in business-to-business and business-to-government training. The private sector, working with ecosystem stakeholders, can help build these intermediate and advanced skills to drive employability. They would need to focus on practical short courses that are aligned to industry needs and pair soft skills, mentorship, and career advice for employability. Companies such as Google, Microsoft, Facebook, and Andela have seized this opportunity to

<sup>29</sup> International Finance Corporation, *Digital Skills in Sub-Saharan Africa – Spotlight on Ghana* (2019), accessed 28 November 2023.



develop and acquire skilled talent across the continent. Private sector entities in developed countries could similarly consider options for training local talent for employment in their home countries. In the age of remote working, this would be a win-win situation that would provide lower labour costs (e.g. in India) for global employers and higher incomes for local employees.

Development partners can also provide support by subsidizing this type of skills training, as has been done by GIZ for E-Waste Training, SNV in agriculture and food, Mastercard Foundation for education, etc. They can also support basic digital skills for the general population to increase public awareness of digital technologies, their use and how it impacts them.

#### **Is Digitalization contributing to employment outcomes?**

- Disrupt Africa estimates that 633 African tech startups employed 34,201 people in 2022 and, of these, 872 jobs were in Ghana.<sup>30</sup>
- VC4A's 2018 report on venture finance in Africa also found that 71 per cent of 522 Ghanaian ventures identified are creating jobs, with an average of 8.04 FTE per venture.<sup>31</sup> When taking a further look at the age groups, 60 per cent of the employees are between 12 and 35 years, which is equal to the percentage that has been tracked by VC4A on a pan-African scale.
- According to Ghana's Ministry for Communication and Digitalization, the Accra Digital Centre has created job opportunities for 5,000 people since it was launched and has trained another 15,000 in digital skills.<sup>32</sup>
- In 2015 the GSS Integrated Business Establishment Survey reported that there were 4,153 ICT establishments in Ghana employing 39,506 persons; and in 2019 it was reported that there were over 180,000 mobile money agents employed across the country.<sup>33</sup>

*Note: While these numbers are small in comparison to the approximately 592,000 unemployed people in the country, or approximately 4.4 million people who are underemployed, the potential of digitalization is tangible.*

<sup>30</sup> Disrupt Africa, *The African Tech Startups Funding Report 2022*, accessed 7 November 2023.

<sup>31</sup> VC4A, *Startup Ecosystem Analysis: Ghana* (VC4A, 2018), accessed 28 November 2023.

<sup>32</sup> GhanaWeb, *5,000 jobs created in digital sector – Ursula*, accessed 1 Dec 2023.

<sup>33</sup> "Cumulative Number of Active Mobile Money Agents in Ghana from 2012 to 2019," *Statista*, accessed October 02, 2023.

# Recommendations

## Strategies, Policies, and Institutional Framework

- **Reform the policy and regulatory regime to accommodate emerging tech:** Ghana has a robust policy and regulatory regime to govern the digital economy. However, a detailed audit of the country's digital policy and regulatory regime to identify areas requiring upgrades to international standards will be helpful. For example, regulations to govern e-commerce and modern digital tools such as AI, IoT, machine learning, and block chain are currently inadequate. Dialogues with international partners (e.g. between the African Union and the European Union), policymakers and private sector will be useful in teasing out the lessons learned across continents.
- **Deepen e-government and build trust in these services:** The World Bank digital economy diagnostic report on Ghana affirms that Ghana has made some progress in e-government but was quick to add that many Ghanaians do not take advantage of the facilities because of lack of trust and inadequate digital skills. Government business services play a critical role in any digital economy, therefore the government needs to increase awareness of the existing range of digitally enabled government services and ensure reliability of these services to encourage uptake.
- **Improve coordination among implementing agencies and regulatory bodies:** The government is implementing many digital initiatives in an ambitious strategy to make the country a hub of digitalization. Improved coordination is needed across government and with the digital ecosystem stakeholders to monitor and assess the impact of these initiatives.
- **Collaborate with development partners to support the digital ecosystem:** Development partners have a role to play in keeping governments accountable to their strategies, and in bridging the financing gap for implementation. German development agencies in Ghana are already playing a key role in providing support to MSMEs by brokering dialogue amongst stakeholders on the right policies to support the digital ecosystem.

## Business Frameworks

- **Increase access to finance for digital MSMEs:** Many of the respondents in this survey mentioned lack of funding as a big constraint on their businesses, despite increased private investment in the past few years. Venture capital and private equity provided a majority of investments for seed-stage and fast-growing startups, while international partners lead in grant funding for early-stage firms. As many MSMEs fall into the latter category, there is more opportunity for government, private sector, and international development partners to support MSMEs through grant funding, subsidised loans, and alternative financing options that provide more patient capital than traditional banks do. Businesses are leveraging digital solutions to improve customer service, improve business processes/productivity, and reduce costs/increase in revenue. All of these will have positive impacts on the economy, if improved incrementally.


## Infrastructure

- **Invest in Digital Infrastructure:** The digital economy thrives on a robust infrastructure such as broadband bandwidth, a robust and comprehensive middle mile, reliable electricity supply, good road network, and special-purpose industrial parks. Results from the survey indicate that Ghana does not have adequate infrastructure needed to ensure a rapid growth of the digital economy. While basic network infrastructure exists, additional investment is required in order for it to expand to include data centres, cloud computing, internet access and electricity access, particularly in the middle and last miles. This will require investment from the private sector and development partners through public-partnership models and blended financing solutions.
- **Consider a cluster approach (e.g. digital/industrial hubs) to scale access:** These solutions could also be achieved by leveraging economies of scale through digital and industrial clusters or parks where this infrastructure is provided and subsidized for businesses. This could be done by strengthening tech hubs, the Ghana Digital Centres or supporting the development of larger clusters in manufacturing and sectors of interest.

## Human Capital

- **Assess digital skills needs and build capacity through training:** The supply of digitally skilled labour in Ghana must increase to meet the anticipated labour market needs of economic growth and the digitalization and automation of agriculture, manufacturing, and services. There are major skills gaps negatively impacting the digital economy, mainly in big data and analytics, business analysis, business process management, data science, project management, and machine learning.  
There is a need for the Government of Ghana to carry out a detailed assessment of the skills needs of the ICT industry, especially for modern digital skills. It may also be prudent for government to use fiscal measures such as tax rebates for firms that invest in the training of their staff in specified digital skills or that provide monetary incentives to educational institutions who run programmes in specified ICT skills required by actors in the digital economy.
- **Private sector and development partners have a USD 3.5 billion opportunity to narrow the supply gap in Ghana:** Making this a reality requires investments from stakeholders – both private and public, local and foreign. The private sector can meet this supply gap by providing training opportunities for government and businesses – especially at the intermediate and advanced digital skills level. These can be met with short practical courses that combine practical digital skills with soft skills required by employers. Development partners can also help by subsidizing these opportunities for training and partnering with academic institutions, or established training bodies, as some already do in Ghana. With the right application of these recommendations, adequate leadership, and coordination from government to facilitate implementation, and strategic partnerships, Ghana will make significant strides towards digital transformation in the years to come.

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