

Ghana Digital Economy Diagnostic

STOCKTAKING
REPORT



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Ghana Digital Economy Diagnostic

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REPORT

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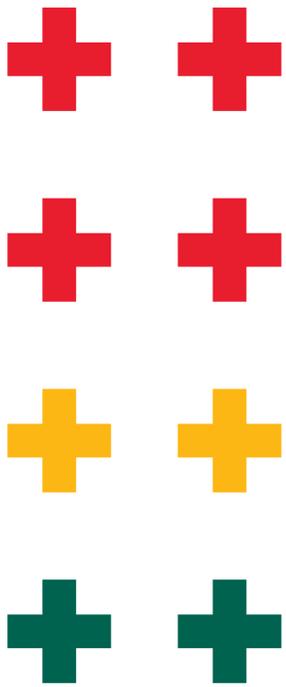
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About DE4A

Rapid digital transformation is reshaping our global economy, permeating virtually every sector and aspect of daily life, changing the way we learn, work, trade, socialize, and access public and private services and information. In 2016, the global digital economy was worth some \$11.5 trillion, equivalent to 15.5 percent of the world's overall GDP. It is expected to reach 25 percent in less than a decade, quickly outpacing the growth of the overall economy (Huawei and Oxford Economics, 2016). However, countries like Ghana are currently capturing only a fraction of this growth and need to strategically invest in the foundational elements of their digital economy to keep pace.

The Digital Economy for Africa (DE4A) Initiative forms part of the World Bank Group's support for the African Union's Digital transformation for Africa, which aims for every African individual, business and government to be digitally enabled by 2030. The Digital Economy for Africa initiative is underpinned by five principles:



COMPREHENSIVE

Taking an ecosystem approach that looks at supply and demand and defies a narrow silo approach in defining the digital economy elements and foundations.



TRANSFORMATIVE

Aiming at a very different scale of ambition beyond incremental "islands" of success.



INCLUSIVE

A digital economy for "everyone, in every place, and at all times" creating equal access to opportunities and dealing with risks of exclusions.



HOMEGROWN

Based on Africa's realities and unleashing the African spirit of enterprise to have more homegrown digital content and solutions.



COLLABORATIVE

Dealing with the digital economy requires a different flexible "mindset," collaborating among countries, sectors, and public and private players.

For a successful and inclusive digital economy, African countries need to build key foundational elements of a digital economy (see figure A). These foundations, or pillars, which are synergistic and require the use of public and private sector solutions, are the following:



DIGITAL INFRASTRUCTURE

Digital infrastructure provides the way for people, businesses, and governments to get online, and link with local and global digital services, thus connecting them to the global digital economy. For the digital economy, good and affordable Internet connectivity is a critical foundation.



DIGITAL PLATFORMS

Digital platforms offer products and services, accessible through digital channels, such as mobile devices, computers, and the Internet, for all aspects of life. Digital platforms enable producers and users to create value by interacting with each other. Governments operate digital platforms to offer citizen-facing government services and share information. Commercial firms also operate digital platforms to offer a growing array of products and services.



DIGITAL FINANCIAL SERVICES

Digital financial services enable individuals and businesses to conduct transactions electronically or online and open a pathway to a range of digital financial services in addition to digital payments, including credit, savings, and insurance. Access to affordable and appropriate digital financial services is critical for the participation of individuals and businesses in the digital economy.



DIGITAL ENTREPRENEURSHIP

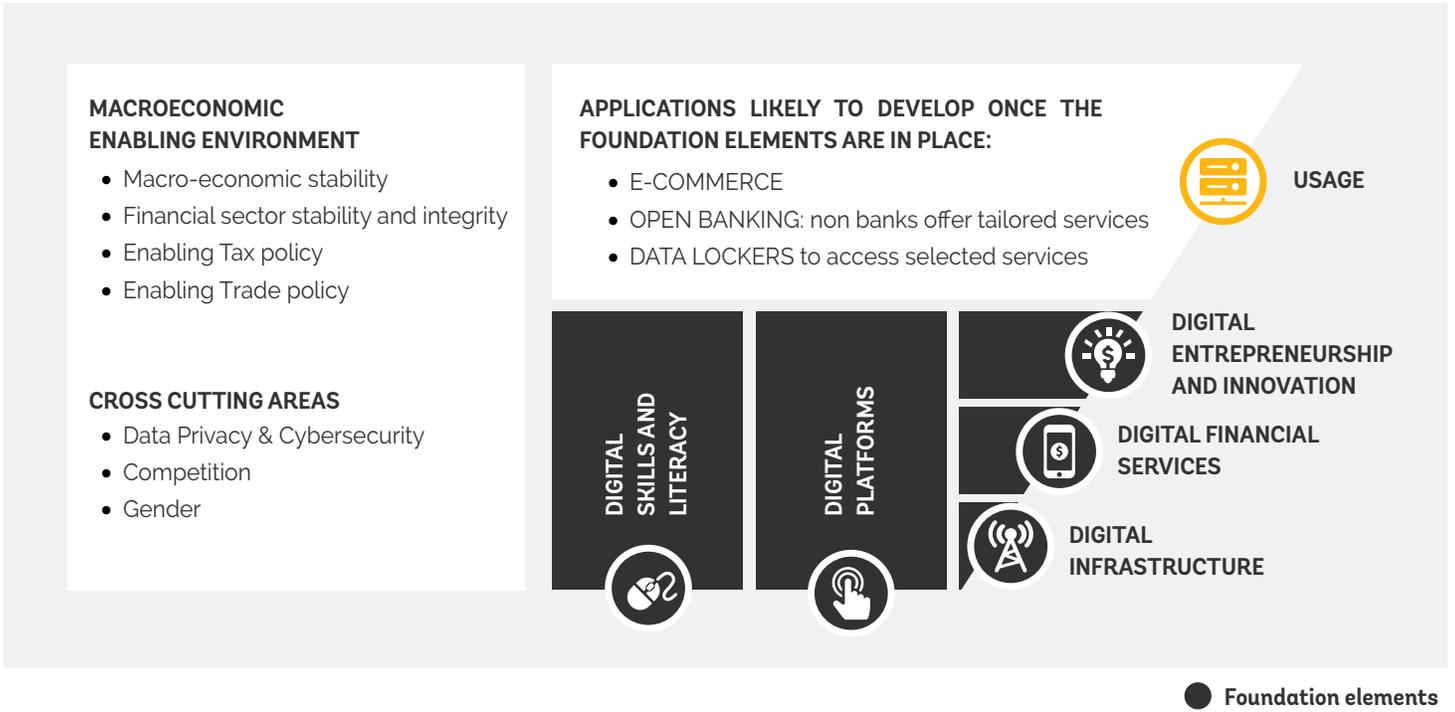
Digital entrepreneurship and innovation create an ecosystem to bring the digital economy to life, with new, growth-oriented ventures, and transformation of existing businesses, contributing to net employment growth and helping enhance competitiveness and productivity of an economy.

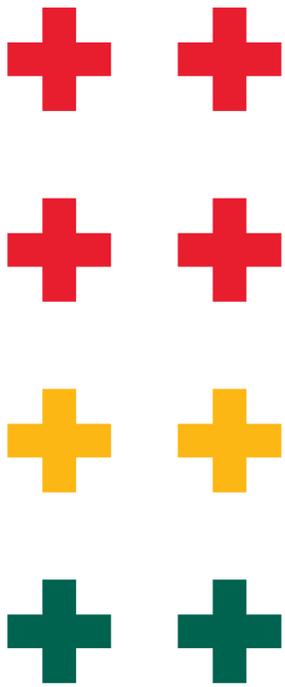


DIGITAL SKILLS

Economies require a digitally literate workforce in order to build robust digital economies and competitive markets. Digital skills constitute technology skills, together with business skills for building or running a startup or enterprise. Greater digital literacy further enhances adoption and use of digital products and services amongst the larger population.

▶▶ **FIGURE A:**
KEY COMPONENTS OF THE DIGITAL ECONOMY ECOSYSTEM







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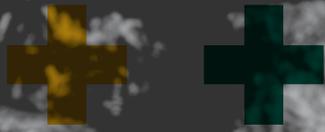
Abbreviations

ACH	Automated clearing house
API	Application Programming Interface
ATM	Automated teller machine
B2B	Business to business
B2G	Business to government
B2P	Business to person
BPO	Business process outsourcing
BoG	Bank of Ghana
BTCA	Better than Cash Alliance
C2G	Citizen to government
CAG	Controller & Accountant General
CSO	Civil society organization
DE4A	Digital Economy for Africa
DEMI	Dedicated Electronic Money Issuers
DFS	Digital financial services
DPA	Data protection agency
DSTV	Digital satellite television
ECICs	Enhanced Community Information Centers
EDR	External dispute resolution
EGDI	E-Government Development Index
EMI	E-money issuers
FCP	Financial consumer protection
FDI	Foreign direct investment
FI	Financial institution
G2B	Government to business
G2C	Government to citizen
G2G	Government to government
G2P	Government to person
GACH	Ghana Automated Clearing House
GDP	Gross domestic product
GEPP	Ghana E-Payment Portal
GhIPSS	Ghana Interbank Payment and Settlement Systems
GIFEC	Ghana Investment Fund for Electronic Communications
GIP	Ghana Interbank Payment and Settlement Systems Instant Pay
GIPC	Ghana Investment Promotion Centre
GoG	Government of Ghana
GPS	Global positioning system
GRA	Ghana Revenue Authority
GSA	Ghana Standards Authority
GSGDA	Ghana Shared Growth and Development Agenda
GSMA	Global System for Mobile Communications Association
GSS	Ghana Statistical Service
HCI	Human Capital Index
ICT	Information and communications technology





ID	Identity document
IDR	Internal dispute resolution
IoT	Internet of Things
IT	Information technology
IteS	IT-enabled Services
KYC	Know-your-customer
LEAP	Livelihood Empowerment against Poverty
M&E	Monitoring and evaluation
MDA	Ministries, departments and agencies
MM	Mobile money
MMDA	Metropolitan, municipal and district assemblies
MMI	Mobile money interoperability
MNO	Mobile network operator
MoC	Ministry of Communications
MSME	Micro, small and medium enterprise
MTN	Mobile telephone network
NBFI	Nonbank financial institution
NCA	National Communication Authority
NCSPS	National Cybersecurity Policy and Strategy
NEIP	National Entrepreneurship and Innovation Programme
NFC	Near field communication
NFIDS	National Financial Inclusion and Development Strategy
NIS	National Identification System
NITA	National Information Technology Agency
NQI	National Quality Infrastructure
NSS	National Service Scheme
NYA	National Youth Authority
OSI	Online Service Index
OTT	Over-the-top
P2B	Person to business
P2G	Person to government
P2P	Person to person
PE	Private equity
POS	Point of sale
PSSB	Payment Services and Systems Bill
QR	Quick Response
R&D	Research and development
RGD	Registrar General's Department
RTGS	Real-Time Gross Settlement
SCD	Systematic Country Diagnostic
SIM	Subscriber identity module
SME	Small and medium enterprises
TBILL4ALL	Treasury Bills for All
TII	Telecommunication Infrastructure Index
TIN	Tax Identification Number
USSD	Unstructured Supplementary Service Data
VAS	Value-added service
VC	Venture capital
WDR	World Development Report
YEA	Youth Employment Agency



Amid this promise, the digital economy also introduces new challenges and risks including a growing digital divide, risk of cyber-attacks and fraud, threats to privacy, and disruption to markets. Access to the Internet remains out of reach for most people, too few citizens have digital IDs or transaction accounts – locking them out of access to critical public services, financial inclusion, and markets. Digital startups struggle to attract funding and traditional businesses are only slowly adopting digital technologies and platforms to boost productivity and sales. Few interventions are investing strategically and systematically in developing digital infrastructure, data frameworks, platforms, skills, and entrepreneurship.

Ghana's economy is led by the services sector, with information and communications technology (ICT) contributing about 3.6 percent of the country's GDP, telecommunication services being the main one. The contribution of Ghana's ICT sector to the overall GDP of the country has grown steadily over the years, becoming one of the best performing sectors in the country's economy. In 2017, the contribution of ICT services was \$1.7 billion, or 3.6 percent of the overall GDP of Ghana. The combination of a competitive market structure, an improved international connectivity, an increase in private sector investment, and a reduction in telecommunications prices, in particular at the wholesale level, has been instrumental in fueling innovation and investments in the broader ICT sector, including in IT and IT-enabled Services (ITeS). A vibrant IT sector is emerging with companies such as mPedigree, Rancard, Softtribe, Hubtel, mPharma, Logiciel, Nosmay competing globally in software and applications platforms for everything from finance and payments to agriculture and medical services.

The Government of Ghana (GoG) is making significant efforts and investments that are expected to position the country as a regional hub for digital services. The current government recognizes the opportunity that digital development has for stimulating jobs, improving productivity, and accelerating inclusive growth, and has pledged to put digital economic transformation at the center of the country's Ghana Beyond Aid agenda. The government is also undertaking a number of keystone projects including a comprehensive digital address system, which is essential for digital commerce, and more aggressive automation of government business processes. These efforts are being complemented by a more proactive signaling to the international tech community that the country is open for business, including, for instance, the visit of a group of Ghanaian technology companies in April 2018 to engage counterparts in Silicon Valley led by the Vice President.

As part of Ghana Beyond Aid, the government aims now to develop a digital strategy and an implementation plan to establish Ghana as the leader in ICT innovation in Sub-Saharan Africa by 2023. It aims to (i) foster the growth of the local IT industry beyond the boundaries of

Ghana, (ii) bridge the urban-rural divide by expanding digital services to rural and underserved communities, and (iii) leverage ICT to: (a) increase efficiency, improve citizen experience and engagement with government by reducing the mean time to deliver government services to citizens; (b) increase transparency in government functions; and (c) increase government revenue generation.

Ghana's ability to position itself as a leading digital innovation hub will depend to a large extent on its ability to address risks and it needs to strategically invest in the foundational elements of its digital economy. A holistic approach to digital economy development is necessary to maximize Ghana's chance for attaining its digital potential. Rather than implementing multiple, fragmented interventions, a coordinated and high-level crossboundary approach that maximizes complementarities is needed to build an inclusive digital economy – to ultimately spur the development of high-impact applications for health, education, e-commerce, agriculture, and social service delivery, among others, while mitigating exclusion, fraud, and cyber risks.

Ghana's telecommunication sector has experienced impressive growth, thanks to early liberalization and deregulation of the market since the late 1990s. Strong competition has resulted in near ubiquitous mobile coverage and a high mobile penetration rate of 131 SIM cards per 100 inhabitants, compared to an average of 80 in the rest of Africa (GSMA 2018a). The country's mobile Internet penetration of about 68 percent is notable, albeit only slightly above the Africa regional average (GSMA 2018a).

More needs to be done to create a more comprehensive, robust, secure and redundant nationwide network and to make Ghana's digital economy more competitive. Most of the infrastructure is concentrated in urban and commercial areas with large sections of the country's rural areas without effective coverage. Internet cost remains high and access low, especially in rural areas. Providing reliable and fast broadband connectivity for ministries, departments, and agencies (MDAs), and metropolitan, municipal, and district assemblies (MMDAs) across the country is still a challenge. In the absence of a more robust and comprehensive nationwide fiber backbone, operators have been investing in parallel wireless solutions to extend 3G service to key parts of the country. Similarly, Ghana needs to unfold a cyber-conscious culture across the economy, particularly in financial institutions and SMEs, with a national program that raises awareness of cybersecurity risks and secure online behavior.

The growing desire to achieve greater efficiency, transparency and accountability has led to the government's continued investment in public sector digital platforms. A number of digital platforms have been developed in an effort to improve governance and delivery of public services, including a digital address system,

e-procurement, e-immigration, e-parliament, and e-judiciary. The government has just begun the rollout of the much-anticipated digital identification program (the Ghana Card). If the roll-out is successful, and take-up is widespread, it could be a critical first step to citizens' access to services including through online platforms. In this way, in the 2018 survey of the UN E-Government Index, Ghana is the only African country that transitioned from the middle to high E-Government Development Index (EGDI) level.

Nevertheless, a number of challenges exist that affect the government's ability to operate digitally. Trust in e-services offered by the government is generally low and the majority of Ghanaians are not even aware that e-government services exist. The National Information Technology Agency (NITA), as the key player in driving the digital transformation of the public sector in Ghana, does not have sufficient institutional capacity nor funding for implementation of the ambitious digital government platforms that the government envisions. As a result, MDAs suffer from a chronic lack of connectivity, and dysfunctional e-mail, websites, and other basic services. There is also a need to strengthen data protection expertise to protect personal data.

Ghana ranks third in Africa in private digital platforms, after Nigeria and South Africa (Insight2Impact 2019). Digital platforms in Ghana are transforming the provision of services, particularly in the retail, transportation, and accommodation sectors. Microwork platforms are becoming a source of jobs (1 percent of Internet users in the country are microwork users, reaching almost 80,000 in 2017 and mainly used by women and young people). Digital commerce is ramping up, positioning Ghana as the sixth country in Africa in B2C E-commerce in 2018, climbing six positions from its 2017 ranking. The government is providing training and support to increase online presence of Ghanaian products and services, including initiatives such as Ghana Online Mall, Digital Marketing, and Made in Ghana Mall.

However, there are a number of challenges and risks for the expansion of the platform economy in Ghana. First, different ministries, departments, and agencies, lead initiatives often with parallel and overlapping activities, and therefore there is a need for coordination and streamlining of programs. Platform diffusion remains low, as only 28 percent of domestic firms have a website and only 7.8 percent of people perform online transactions. The delivery of high quality and standardized products and services to local and international markets is a challenge for most Ghanaian companies.

Recognizing the importance of catalyzing greater innovation in and adoption of digital financial services (DFS), the Government of Ghana has adopted a National Financial Inclusion and Development Strategy (NFIDS) 2017-2023. The NFIDS commits the government to priorities that will serve as important steps towards achieving universal access to DFS and creating the Africa-

wide payments infrastructure by 2030. Complementing the NFIDS, the Government of Ghana is working concurrently on a National Digital Financial Services Policy, which is currently being drafted by the Ministry of Finance and the Bank of Ghana. The DFS policy is expected to outline the government's vision for the country moving into the next decade, including that (i) a majority of Ghanaians will have secure access to a broad range of suitable and affordable digital financial services, and (ii) business and government will have achieved greater transparency and efficiency to contribute to the equitable economic growth of the nation.

Ghana has made substantial progress on financial inclusion, due in large part to growth in DFS. According to the World Bank's Global Findex, the share of Ghanaian adults (over 15 years of age) with a formal financial account increased by 42 percent between 2014 and 2015. As a result, nearly 6 in 10 adults had formal access in 2017. With mobile account ownership increasing by nearly 200 percent between 2014 and 2017, mobile money has become the preferred payment alternative to cash when measured in terms of transaction volumes. In May 2018, the Bank of Ghana mandated that all mobile money providers connect to GHLink, with full interoperability between mobile money providers and banks introduced in December 2018.

Despite robust electronic payment infrastructure, Ghana remains a cash-based economy. 98.72 percent of payments by volume are still in cash and the main noncash instrument continues to be checks. The current extensive use of cash in Ghana among individuals can be explained by the high cost of digital payments that is often passed on to users, trust issues with using digital payments, low penetration of debit and credit cards, and low availability of POS devices at merchant points. Moreover, without business rules in place to govern pricing and other aspects of the scheme, many providers have effectively discouraged their customers from sending money off-net by increasing the fees for these transactions. As a result, interoperable transactions remain just a fraction of overall transactions. Additionally, financial technology firms (fintechs) are not yet connected to GHLink and there are no clear rules governing participation in the scheme.

Entrepreneurship support policies, programs, and actors in Ghana are growing at a rapid pace, but the country still lags many of its regional peers in terms of ecosystem maturity. Ghanaian entrepreneurs still face many challenges that threaten their ability to start and grow viable businesses. However, despite these challenges, Ghana has many of the core components and resources needed for a successful entrepreneurship ecosystem that can help achieve its long-term strategic vision of becoming a middle-income country and building an economy capable of providing good jobs that are suitable and sustainable for development. Political stability, an influential diaspora, and strong Internet connectivity are some of the factors that work in Ghana's favor toward creating a ripe ecosystem for entrepreneurship.

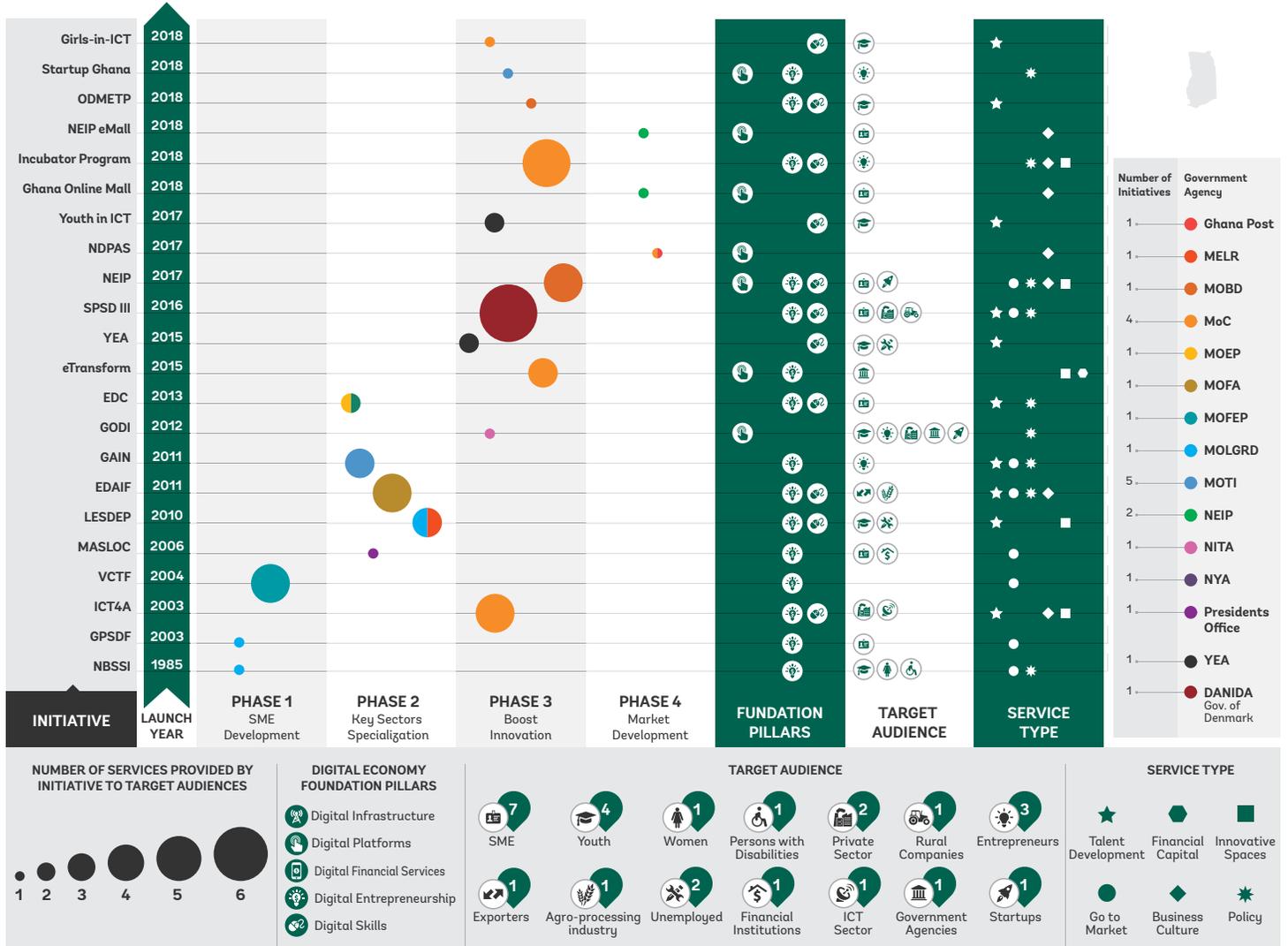
Like many Sub-Saharan African countries, Ghana has a young and increasingly urban population ready to tap into entrepreneurial opportunities. In 2017, nearly 60 percent of the population was under 25 years old (Index Mundi 2019) and 55 percent lived in urban areas, with the urban population growing at a rate of 3.5 percent from 2013-2017 (World Bank 2016a). The country is primarily English speaking, making it easier for Ghanaians to conduct business in international markets, while Ghana's diaspora is large (nearly 250,000 people in 2006) and concentrated in the United States and the United Kingdom, providing connections to key international consumer and financial markets (OECD 2019). Ghana also boasts a strong ICT infrastructure, though access to fiber connections is expensive.

However, leveraging these advantages into new businesses, new wealth, and higher standards of living will require Ghana to develop and sustain a strong entrepreneurship ecosystem. Ghana's ecosystem is growing rapidly. The 24 active entrepreneurship hubs (business incubators, accelerators, and similar spaces for entrepreneurs) now in Ghana represent an increase of 50 percent

since 2016 (GSMA 2018b). Although startup activity and the number of formal SMEs are not yet tracked, \$266 million of private capital was deployed in 15 venture capital deals in 2016-17 compared to \$63 million in 16 deals in 2014-15, illustrating some growth in venture financing (World Bank 2018a). However, government support for entrepreneurship is uncoordinated, consisting of multiple agencies and programs that provide overlapping support without a clear overall vision. A poor business environment, lack of access to credit and finance, and mixed quality of entrepreneurial support are other key challenges that must be addressed within the ecosystem.

The government has created multiple agencies and programs that support SMEs, entrepreneurs, and enterprise development, many of which provide overlapping support without clear coordination (see figure 0.1). Without clear rationalization of mandates, the impact that these programs may have on SMEs and entrepreneurship will remain limited. The lack of consolidation and streamlined structure for existing government support programs reduces their likelihood for sustainability.

FIGURE 0.1:
GOVERNMENT INITIATIVES THAT SUPPORT DIGITAL ENTREPRENEURSHIP IN GHANA



Source: - Authors

Ghana's labor force demand for digital skills is expected to reach nearly nine million people by 2030. This figure, however, does not represent the entirety of the training demand. The current digital skills workforce of almost four million people likely will need more digital skills training every four to five years, resulting in more than nine million digital skills training experiences. More than five million new people will need training and another four million will require additional digital skills training experiences. The total digital skills training needs will climb to nearly 19 million through 2030 (IFC 2019b).

The government is playing a significant role in building a workforce with strong digital skills. The current National ICT in Education Policy for Ghana (2015) states as its mission: to articulate the relevance, responsibility and effectiveness of utilizing information and communication technologies (ICTs) in the education sector, with a view to addressing current sector challenges and equipping Ghanaian learners, students, teachers, and communities in meeting the national and global demands of the 21st century. Though clearly stated, the implementation continues to face many challenges, including the absence of computer labs in schools, few or no computers in schools, lack of ICT teachers and unstable or no power supply. In turn, in the Global Competitiveness Report 2017-2018, Ghana ranks 48th and 87th on quality of education and Internet access in schools, respectively.

Only a few Ghanaians, below the numbers required for a successful and inclusive digital economy, have the requisite digital skills experience beyond the basic use of a computer or tablet. The private sector is paying a premium to get these skills, making it significantly more difficult for the public sector to retain people with such skills. There is high demand for digitally skilled professionals in both the public and private sectors in Ghana. There is a huge need for software developers, coders, cybersecurity professionals and project developers to further Ghana's progress to establishing a successful and inclusive digital economy.

To advance towards a vibrant digital economy that can foster Ghana's leadership potential, a set of recommendations are proposed for the development of actions aimed at solving the challenges identified across the digital economy foundations. Recommendations are classified by level of priority: (i) quick-wins, for improvement actions with immediate benefit that can be delivered quickly with results; (ii) high-priority, for critical recommendations that cannot be delayed; and, (iii) long-term, for actions that focus on consolidating results while building the policy framework, infrastructure, systems, and capacity needed to achieve goals, and, therefore, whose implementation spans a longer timeframe.

All five foundations of the digital economy rely on a robust legal and regulatory framework that fosters competition. All areas of the digital economy require effective competition. Firms operating within the digital economy – whether to offer digital connectivity, payment solutions, or digital platforms – require a level playing field. Free market forces can help drive down prices and ramp up usage. At the same time, all aspects of the digital economy need to be inclusive, giving equal opportunity to men and women, and to the disadvantaged.

The results of recommended interventions seek to support Ghana's achievement of the goals set under the Digital Roadmap for the Beyond Aid Agenda (Digital Roadmap Concept Note, May 2019). Progress on implementing actions to enhanced digital economy transformation is expected to:

- **EXPAND DIGITAL SERVICES TO BRIDGE THE URBAN-RURAL DIVIDE:** digital transactions, connections, applications, and services have the potential to transform the way people, governments, businesses, and civil society interact with each other. From parents enrolling their children in school, to social safety net administrators verifying the identity and eligibility of a new beneficiary, to businesses submitting their annual tax filings, the transactions that fill our daily lives have historically required paper forms, in-person visits during business hours, and cash payments. The combination of digital platforms, with digital financial services and powered by digital infrastructure, skills, and entrepreneurship, support transactions, marketplaces, and other spaces that are on-demand, paperless, and cashless, and available through the Internet from anywhere in Ghana and the world. Increased access to digital services contributes to equity and inclusion of disadvantaged groups, such as farmers, rural households and women, for instance, as they would be able to sell their local produce and homemade products.
- **FOSTER THE GROWTH OF THE LOCAL IT INDUSTRY BEYOND THE BOUNDARIES OF GHANA:** the rise of the Internet has brought to ventures in Ghana, enhanced adoption and adaptation of digital technology by existing businesses, opened access to microwork jobs, and is expected to generate new digital jobs (that is those that are nonexistent today) in both traditional industries and newly created industries. Recommendations for the growth of the local IT industry target the growth of digital firms as well as digital transformation of private sector by leveraging digital technology to improve performance of nondigital businesses, having both expected impacts on boosting job creation. In this way, a strong digital private sector is expected to contribute to Ghana's economic growth.

- **LEVERAGE DIGITAL TECHNOLOGIES TO IMPROVE QUALITY AND EFFICIENCY OF SERVICE:** digital transformation helps improve the efficiency and effectiveness of core functions and services of both, public and private, reduces duplication, combats fraud and corruption by increasing the security and traceability of transactions, and improves engagement and accountability. By

providing trusted venues and resources for digital transactions, including tax filling and formal registrations, digital technologies enhance the ability of the government to generate revenues. Overall, improved quality and efficiency of services is linked to more productive use of the economy's resources.

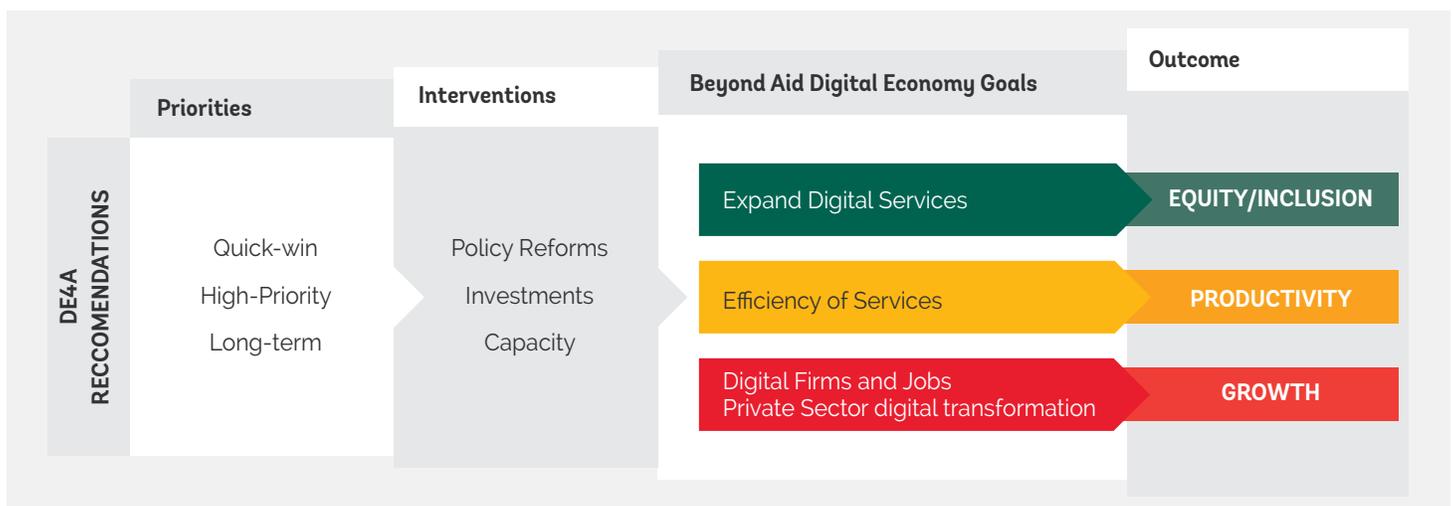
Hence, achievement of these objectives is also linked to progress towards the overarching development outcomes of equity and inclusion, economic growth, and productivity (see table 0.1).

►► **TABLE 0.1:**
RELEVANCE OF THE RECOMMENDATIONS TO DEVELOPMENT OUTCOMES

Digital Roadmap Beyond Aid Goals	Linkage to Recommendations' Results	Development Outcome
(i) foster the grow the local IT industry beyond the boundaries of Ghana	Foster digital firms and job creation	Growth
(ii) bridge urban-rural divide by expanding digital services to rural and underserved communities,	Expand digital services	Equity/inclusion
(iii) increase efficiency, improve citizen experience and engagement with government by reducing the mean time to deliver government services to citizens while increasing government revenue generation,	Improve quality/efficiency of services (including public and private sector services)	Productivity

Recommended priorities and Beyond aid goals are intrinsically linked to the development outcomes of equity/inclusion, productivity and growth.

►► **FIGURE 0.2:**
THEORY OF CHANGE TOWARDS A DIGITAL ECONOMY IN GHANA



Results of recommended interventions seek to support the achievement of the three overarching goals included at the Digital Roadmap for the Beyond Aid in Ghana. The proposed recommendations include 37 interventions that target the three established goals: six recommendations seek to improve digital infrastructure; eight to strengthen digital platforms; seven to mature digital financial services; nine to promote digital entrepreneurship; and seven to develop digital skills. Tables 0.2, 0.3, and 0.4 summarize the 37 recommendations grouping them by Beyond Aid goal.

Each recommendation follows from the analysis of the strengths and challenges in Ghana in the five foundational pillars (see appendix D for full descriptions of all recommendations). Each recommendation includes the expected development outcome, the type of intervention required, the government agencies that will need to coordinate to deploy such recommendation, the priority, the foundation pillar that gave origin, and the synergies to actions done in another foundation pillar.

►► **FIGURE 0.3:**
RECOMMENDATIONS SUPPORTING DIGITAL FIRMS AND JOB CREATION

17 Beyond Aid DE Goal
Digital firms and job creation

Development Outcome
Growth

Recommendations		Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DP.R6	Develop a coordinated digital commerce support program				MOTI, NEIP, NYA, BoG, Ghana Post		
DP.R7	Institutionalize data production and availability for evidence-based digital commerce policies				Ghana Statistical Service, MOTI		
DP.R8	Establish a regulatory Sandbox for Digital Commerce and Gig Economy labor regulations				MOTI, MELR, MoC		
DE.R1	Develop IT-ITES sector programs to support the scale up of Ghana's exports, players, digital innovation, and expertise				MOTI, MOFEP, MOC, MBD, NEIP, NYA		
DE.R2	Develop a digital technology adoption program to accelerate digital transformation of the economy, targeting specific audiences.				MOTI, MBD, NEIP, NYA, MOFEP		
DE.R3	Articulate Ghana's value proposition to position Ghana as a relevant global Digital Hub				MOTI, MOFEP, Ghana Investment Promotion Council, MOC, MBD, NEIP		
DE.R4	Unify the national vision for digital entrepreneurship by developing a single digital economy policy and establishing a digital economy observatory				MOTI, NEIP, National Intellectual Property, VCTF, MoC, MOFEP, NYA, MOE		
DE.R5	Improve specific regulations for digital industries (i.e. taxes, IP rights, limited partnerships)				MOTI, MBD, MoC, MoJ, National Intellectual Property Office, BoG		
DE.R6	Increase the pool of human capital with digital and entrepreneurial skills by amplifying existing efforts				MOTI, MoC, NYA, NEIP, MEST, MELR		
DE.R7	Streamline and consolidate entrepreneurship support and entrepreneurship intermediaries				MOTI, MBD, NEIP, NBSSI, VCTF		
DE.R8	Encourage the diversification at early-stage private capital and credit guarantees access for startups and SMEs				MOFEP, VCTF, BoG, Presidents Office		
DE.R9	Establish Digital Centers necessary for digital entrepreneurs to thrive across the country				MOC, MOTI		
DS.R1	Improve basic digital skills provision at education system				MOE, COTVET		
DS.R2	Boost supply of digitally savvy teachers				MOE, COTVET		
DS.R3	Increase coverage of quality digital learning resources				MOE, COTVET		
DS.R4	Align intermediate digital skills taught with future workforce needs				MOE, COTVET, MOTI, NYA		
DS.R5	Scale and co-found advanced digital skills				MOE, MOTI, NYA		

Development Outcomes	Type of intervention	Priority	Key Foundational Element	
Growth	Policy Reform	Long-Term	Digital Infrastructure	Digital Entrepreneurship
Equity/Inclusion	Investment	High-Priority	Digital Platforms	Digital Skills
Productivity	Capacity	Quick-Win	Digital Financial Services	

►► **FIGURE 0.4:**
RECOMMENDATIONS SUPPORTING EXPANSION OF DIGITAL SERVICES

12 Beyond Aid DE Goal
Expand digital services

Development Outcome
Equity/Inclusion

Recommendations		Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DI.R1	Revise Broadband Speed Targets				MoC, NCA		
DI.R2	Develop a robust and comprehensive middle mile (domestic backbone infrastructure)				NCA, NITA		
DI.R3	Increased investment in Last Mile Infrastructure				NCA, GIFEC, MoC		
DI.R4	Revise Spectrum Allocation and Award of Unified Licenses				NCA		
DP.R2	Prioritize the rollout of Digital ID to enable access to digital services				NITA, NIA		
DFS.R1	Mobile Money Interoperability				BoG		
DFS.R2	Drive greater digitization through opening new channels for government payments				BoG, MOFEP		
DFS.R3	Encourage competition and promote an enabling environment to drive DFS innovation				BoG		
DFS.R4	Adopt policies that encourage greater use of merchant payments				BoG, MOTI		
DFS.R5	Expand rural adoption by facilitating investments in last mile infrastructure and the digitization of agricultural value chains				BoG, MOTI, MOFA		
DFS.R7	Strengthen DFS and e-money regulation and surveillance				BoG		
DS.R6	Provide digital skills to under-represented groups				MOE, MOTI, NYA, MoC, NEIP		

Development Outcomes	Type of intervention	Priority	Key Foundational Element	
Growth	Policy Reform	Long-Term	Digital Infrastructure	Digital Entrepreneurship
Equity/Inclusion	Investment	High-Priority	Digital Platforms	Digital Skills
Productivity	Capacity	Quick-Win	Digital Financial Services	

▶▶ **FIGURE 0.5:**
RECOMMENDATIONS SUPPORTING EFFICIENCY AND QUALITY OF SERVICES

8 Beyond Aid DE Goal
Efficiency/ Quality of services

Development Outcome
Productivity

Recommendations		Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DI.R5	Streamline effective implementation of Cybersecurity Policy and Strategy				NITA, MoC, CERT-GH, National Cybersecurity Center		
DI.R6	Explore and encourage private sector solutions for data storage capacity needs				NITA		
DP.R1	Strengthen NITA to facilitate the citizen-centric development of public sector digital platforms				NITA		
DP.R3	Emphasize public sector digital capacity building				MoC, NITA		
DP.R4	Strengthen Protection of Ghanaians data				DPC, CPA, NCA		
DP.R5	Revamp and enhance GODI to maximize social and economic value of public data				NITA, MoC, Ghana Statistical Service, MOFEP		
DFS.R6	Strengthen digital financial consumer protection policies				DPC, BoG		
DS.R7	Establish a multi-stakeholder governance framework for coordinating efforts to foster digital skills with an ecosystem approach				MOE, MOTI, COTVET, NYA, MoC, NEIP		

Development Outcomes	Type of intervention	Priority	Key Foundational Element	
Growth	Policy Reform	Long-Term	Digital Infrastructure	Digital Entrepreneurship
Equity/Inclusion	Investment	High-Priority	Digital Platforms	Digital Skills
Productivity	Capacity	Quick-Win	Digital Financial Services	





Introduction

1.1 Country at a Glance

Ghana is a middle-income country that has performed well in the past two decades, with economic growth slowing in recent years.

Between 2005 and 2012, the Ghanaian economy grew an impressive 7.7 percent per year on average, with an annual job creation rate of 4.0 percent, meaning that every one percent increase in economic growth was associated with a 0.5 percent increase in job growth (see table 1.1). Economic growth has largely been driven by commodity exports (cocoa and gold, for which prices more than tripled between 2000 and 2010) and the start of commercial oil production in 2011. However, GDP growth rates slowed between 2012 and 2016, averaging 5.6 percent (with a low of 1.6 percent in 2015), while picking-up again to 8.5 percent in 2017.

Dependence on commodities results in volatility and noninclusive growth. Ghana's commodity driven growth has increased economic volatility with cyclic volatility costing Ghana about 0.3 percent of growth per year during 2000-2015, and as much as 0.7 percent per year in the early 2010s. Moreover, while growth rates are still high, their impact on poverty has dramatically slowed since 2012. As emphasized by the recent World Bank Systematic Country Diagnostic (SCD) for the country (World Bank 2017c), Ghana's largest fall in poverty, 2 percent a year, was experienced during 1991-1998. As growth accelerated, however, the annual reduction in poverty rate fell to 1.4 percent in 1998-2005, and 1.1 percent in 2005-2012. Between 2012 and 2016, the poverty rate declined by only 0.2 percent per year, and stood at 23.4 percent in 2016. This may reflect the declining contribution of agriculture, in which the majority of poor households are engaged, the limited job opportunities for higher productivity in the services sector, and a largely capital-intensive industrial development in commodity-focused sectors.

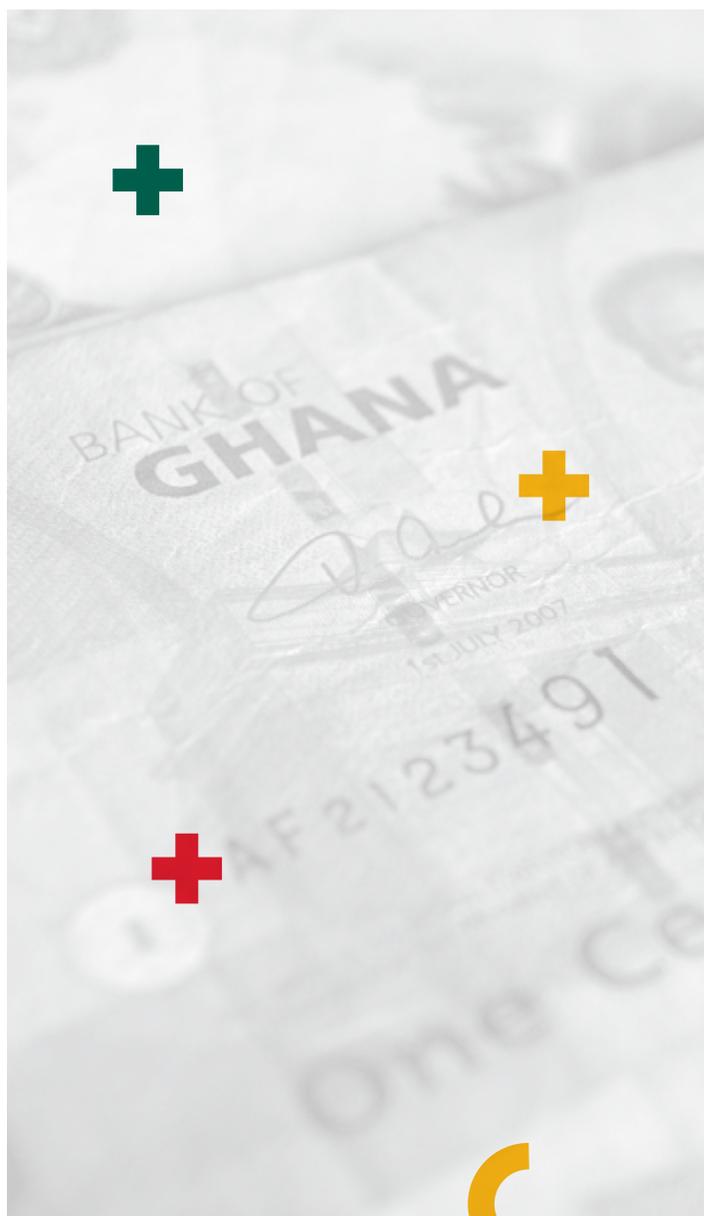
▶▶ **TABLE 1.1:**
GDP GROWTH, POVERTY REDUCTION, AND SECTORAL DRIVERS

	Annual GDP growth (%)	Annual GDP per capita growth (%)	Annual poverty reduction (%)	Growth elasticity of poverty	Sector shares of GDP (%)			Sector contribution to GDP (%)		
					Agriculture	Industry	Service	Agriculture	Industry	Service
1991-1998	4.4	1.7	2.0	-1.18	42.6	15.1	32.4	24.0	-1.0	78.0
1998-2005	4.8	2.1	1.4	-0.55	40.1	18	31.9	29.0	20.0	51.0
2005-2012	7.7	5.0	1.1	-0.17	29.8	20.9	49.3	14.0	39.0	47.0
2012-2016	5.6	3.2	0.2	-0.07	21.2	26.4	52.4	—	—	—

Source: – World Bank 2018g.

Ghana needs to invest more, diversify, and increase productivity – in short, accelerate economic transformation, if it is to achieve higher and inclusive growth. Ghana’s medium-term prospects are strong: GDP growth was 8.5 percent in 2017 (Ghana Statistical Service 2018) and was projected to be 7.5 percent in 2018, assuming fiscal consolidation remains on track. However, the “lack of structural transformation and economic diversification” are the key challenges to achieve inclusive development for commodity-dependent developing countries such as Ghana (UNCTAD 2017a). The oil and gas sectors are expected to continue to be the main driver of growth, with a recovery of commodity prices in the medium term further boosting export earnings. However, at 16.7 percent of GDP during 2014–2016, Ghana’s overall gross capital formation is low compared with its structural and aspirational peers and productivity growth remains limited. According to the World Bank Long-Term Growth Model, even if investment levels reached 25–30 percent of GDP – moderately higher than the historical average of 20–25 percent – the predicted per capita growth would not go much beyond the 1.7–2.5 percent range, barely keeping up with the projected 2.2 percent population growth. This suggests that raising overall productivity, in addition to higher investments in nontraditional (nonextractive) sectors, will be critical to ensure that growth is inclusive and achieves poverty reduction.

The current government’s strategy is to transform the Ghanaian economy to achieve inclusive and sustainable growth, with the private sector as the main driver. In the words of Ghana’s President, the aim is to “build the most business friendly economy in Africa” and foster the competitiveness of Ghanaian firms (World Bank 2018g). To achieve this, the government’s agenda includes: reforming the energy sector, improving trade facilitation and the business environment, investing in infrastructure, and diversifying beyond primary products (hydrocarbons, gold and cocoa).¹



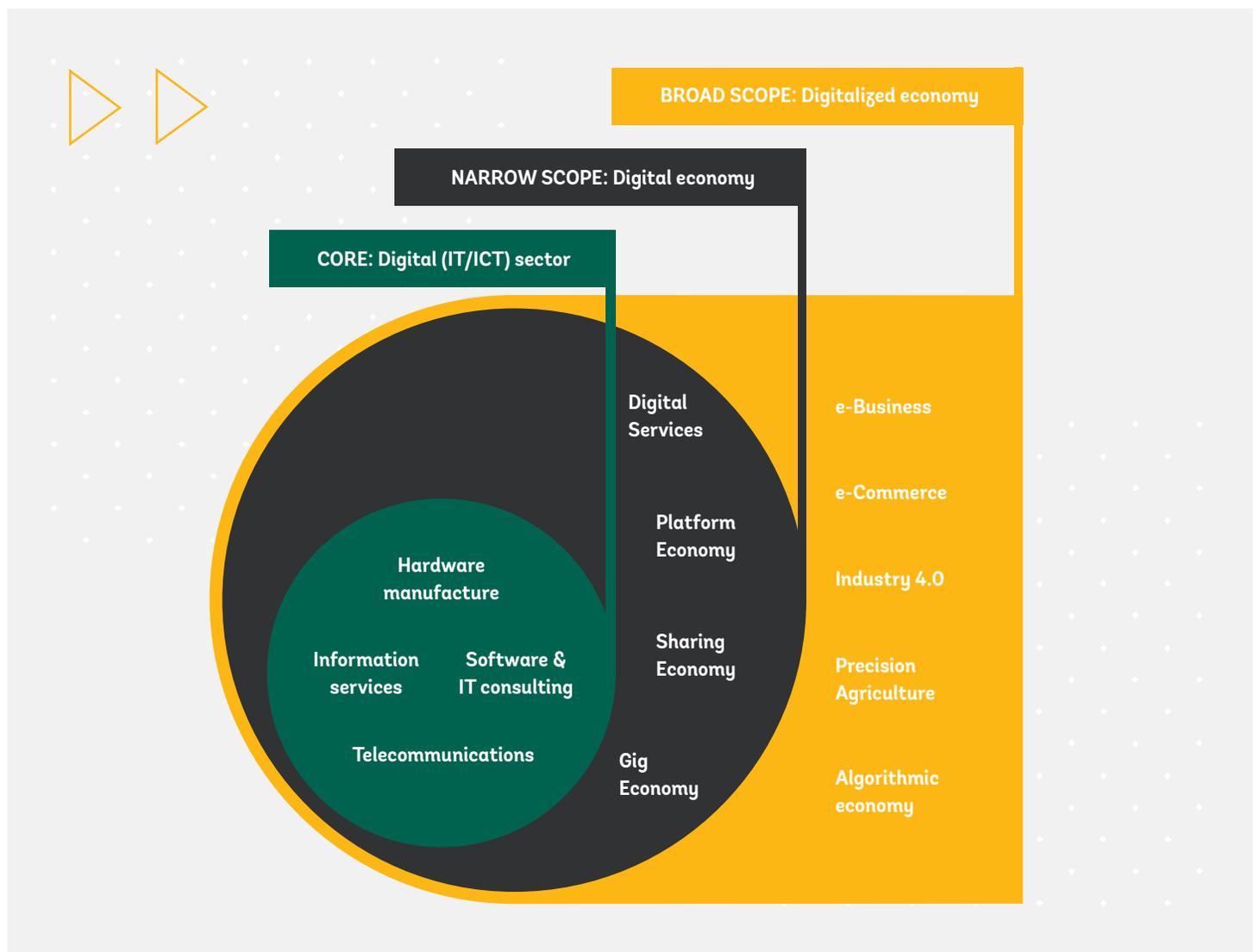
1.2 Background on the Digital Economy

In Ghana and around the world, potential opportunities for digitizing economies are immense. Digital economies are growing by an average of 15 to 25 percent a year (Sabbagh and others 2013). The information and communications technology (ICT) sector lies at the core of a digital economy, and its impact covers all types of business activity, as well as public service provision and daily life for individuals (see figure 1.1).

The ICT sector in Ghana comprises six groups of activities, with telecommunications services dominating in terms of employment and number of establishments (see table 1.2). The Integrated Business Establishment Survey for 2014 revealed the following insights (Ghana Statistical Service, 2015):

- **ICT ESTABLISHMENTS.** There were 4,153 ICT establishments in the country, adding 7 percent of total establishments in Ghana. Seventy-one percent of establishments are quite young since their launch year was between 2015-2014. Establishments are concentrated in two regions, in Greater Accra (42.4 percent) and Ashanti (20.7 percent).
- **JOBS IN ICT.** There are 39,506 persons engaged in the ICT sector, 70 percent of them working in Greater Accra, and 10 percent in Ashanti.
- **MAIN ICT ACTIVITIES.** Telecommunications services account for 45.3 percent of ICT employees; Computer programming, consultancy, and related activities employs 13 percent.

►► **FIGURE 1.1:**
REPRESENTATION OF A DIGITAL ECONOMY



Source: Bukht R and Heeks R, 2017

►► **TABLE 1.2:**
ICT SECTOR EMPLOYEES AND ESTABLISHMENTS IN GHANA (2014)

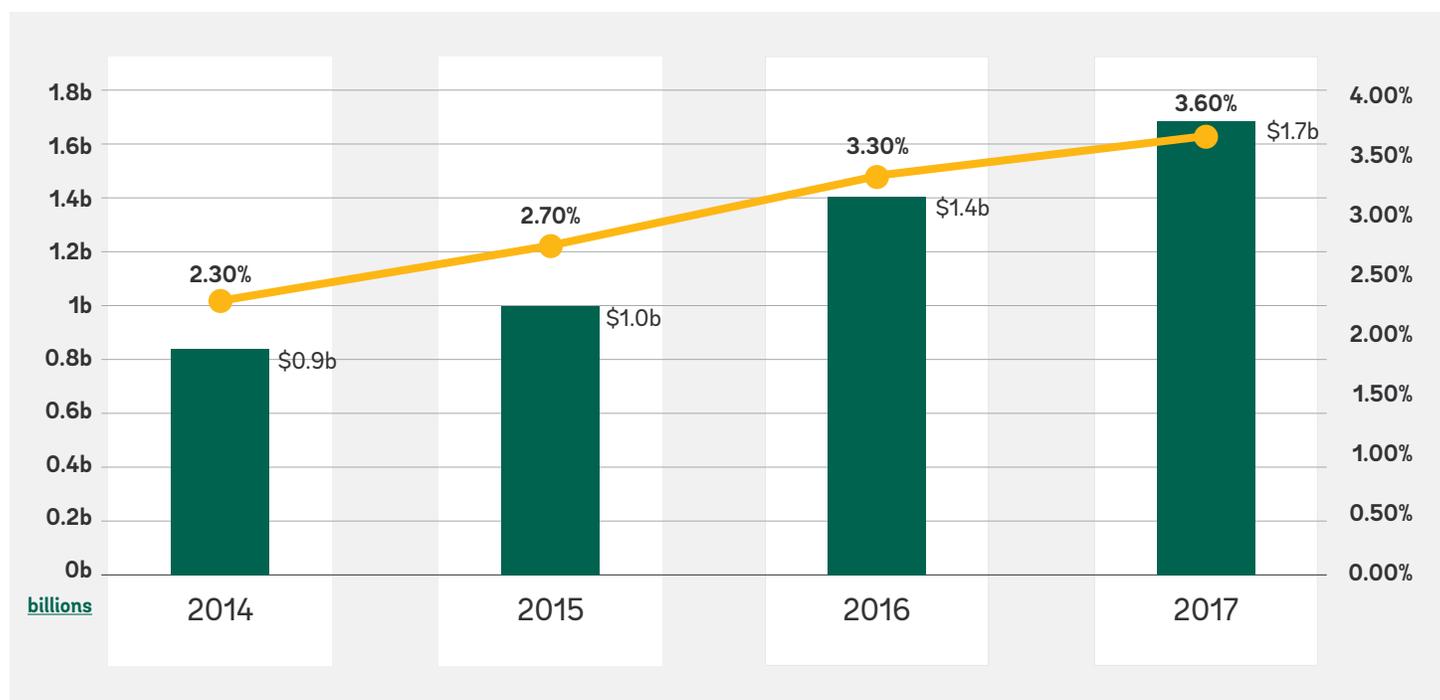
Activity group	Employees ICT Sector (%)	Establishments (%)
Information and communication	100	100
Publishing activities	7.8	5.0
Motion picture, video and television program production, sound recording	3.6	12.0
Programming and broadcasting activities	22.8	11.6
Telecommunications services	45.3	40.2
Computer programming, consultancy and related activities	13.0	14.5
Information service activities	7.6	16.6

Source: Integrated Business Establishment Survey, Ghana Statistical Service.

Ghana's economy is led by the services sector, with ICT contributing about 3.6 percent of the country's GDP (IFC 2019). The contribution of Ghana's ICT sector to the overall GDP of the country has grown steadily over the years, becoming one of the

best performing sectors in the country's economy. In 2017, the contribution of ICT services was \$1.7 billion, or 3.6 percent of overall GDP (see figure 1.2).

►► **FIGURE 1.2:**
GROWTH IN GHANA'S ICT SECTOR



Source: Ghana Statistical Service (2017)

● ICT Sector ● % of GDP

Ghana's digital sector has experienced impressive growth thanks to early liberalization and deregulation of the telecommunications market in the late 1990s. The combination of a competitive market structure, improved international connectivity, an increase in private sector investment in communications infrastructure, and a reduction in telecommunications prices, in particular at the wholesale level, has been instrumental in fueling innovation and investments in the broader ICT sector, including in IT and IT-enabled Services (ITeS). A vibrant IT sector is emerging with companies such as mPedigree, Rancard, Softtribe, Hubtel, mPharma, Logiciel, Nosmay competing globally in software and applications platforms for everything from finance and payments to agriculture and medical services. There are over 20 registered business process outsourcing (BPO) companies, a handful of IT parks, and over 50 innovation hubs for incubating and providing training and mentorship to startups.

The traditional ICT industry has also been disrupted by automation, standardization, and emerging technologies. Cloud services, the Internet of Things (IoT), artificial intelligence (AI), and robotics, among others, have reduced demand for back office and contact center services. That said, the ITeS/BPO sector continues to hold significant promise, while some key African countries are rethinking their strategies and positioning themselves to attract significant investments in niche markets. For example, the BPO sector contributed about \$4 billion towards South Africa's national GDP and employed 222,500 people in 2016. The value of Egypt's BPO industry was estimated at \$1.3 billion in 2016 and is expected to expand to about \$2 billion by the end of 2019, employing close to 100,000 people in 2015. The Egyptian government has a goal of increasing IT-related contributions to over 8 percent of GDP by 2020. Kenya has targeted the ITeS sector to contribute about 8 percent to the country's GDP as well as creating 180,000 jobs. (Research and Markets 2017). While Ghana continues to make strides in the ICT, ITeS, BPO and software development space, there is no coherent strategy, and little support is provided to promote the current and potential opportunity.

In the past few years, adoption of disruptive technologies has gathered pace in Ghana. There have been several recent initiatives by the Government of Ghana to adopt new technologies and some other developments in the private sector have also contributed to this demand:

- The Ghana Health Service, in partnership with the World Health Organization (WHO), has developed the Vaccine Wastage Sentinel Monitoring System, which uses sensor technology to monitor the supply chain of vaccines to improve management and minimize wastage.

- Google opened an AI research lab in Accra in April 2019, which is the first AI research center in Africa (see box 2.7).
- The Ministry of Lands and Natural Resources in Ghana is working with IBM to plan a blockchain-based solution for land administration. This will change the current inefficient paper-based central land records system to an immutable and secure decentralized ledger of land records.
- Rancard, a Ghana-based company and a leader in social recommendations and AI-powered customer engagement technology, has recently launched R2, which is a virtual agent that makes use of best-in-class machine learning and artificial intelligence (AI) to automate interactions between businesses and their customers.
- The government has signed a deal with a U.S. tech firm Zipline that will see unmanned drones delivering blood and other medical supplies to hospitals and clinics.

The government has undertaken a series of policy and infrastructure-related reforms in recent years, including the ICT for Accelerated Development Policy (ICT4AD), National Telecommunications Policy, the Data Protection Act, the Electronic Transaction Act, the Electronic Communications Act, implementation of a fiber optic backbone that should put it on a more solid footing for sustained economic growth, improved service delivery, and more effective policy making. Liberal policies and strategic initiatives for private sector participation have paved the way for the creation of a highly competitive digital market in Ghana. In 2003, the ICT4AD policy set out the plans to engineer an ICT-led socioeconomic development process with the potential to transform Ghana into a middle-income, information-rich, knowledge-based and technology-driven economy and society (ICT4AD Policy 2003). The government is currently taking steps to update the ICT4AD policy towards a new digital roadmap strategy for the country.

As part of Ghana Beyond Aid, the government aims to develop a new policy in line with digital opportunities to develop a digital strategy and an implementation plan to establish Ghana as the leader in ICT innovation in Sub-Saharan Africa by 2023. It envisages to (i) foster the growth in the local IT industry beyond the boundaries of Ghana, (ii) bridge the urban-rural divide by expanding digital services to rural and underserved communities, (iii) increase efficiency, improve citizens' experience and engagement with government by reducing the mean time to deliver government services to citizens while increasing government revenue generation, (iv) increase transparency in government functions (Digital Roadmap Conference Concept Note 2019).

1.3 Rationale for Digital Economy Development

For countries in Africa, the digital economy offers opportunities and brings the risk of being left behind. Improved digital connectivity can only achieve the desired transformational impact on economic opportunity and inclusive growth if combined with improvements in digital skills and literacy, the coverage of digital identity schemes, access to digital payments and other financial services, as well as digital support to startups and existing businesses. With such capabilities, the African economy can harness digital data and new technologies, generate new content, link individuals with markets and with government services, and roll out new and sustainable business models.

Yet in much of the African region today, too few citizens have digital IDs or transaction accounts, locking them out of access to critical public services, financial inclusion, and markets. Digital startups struggle to attract funding and “traditional” businesses are only slowly adopting digital technologies and platforms to boost productivity and sales. There is a shortage of workers with the digital skills needed, while limited digital literacy holds back adoption and use of digital products and services. Inadequate policy and regulatory frameworks, including for data protection, cybersecurity, and competition, also constrain the development of a digital economy in Africa.

Digital economies also introduce new risks – to consumers, creditors or firms, on personal data and cyber threats, in ways systemic or otherwise – and require safeguards to mitigate these risks and ensure robust job markets. A key area of concern has been that widespread adoption of automation and other digital technologies can cause significant net job losses. However, in the aggregate, technological change does not seem to have led to a significant increase in joblessness and global employment continues to expand in line with the growth in the labor force (ILO 2018). Though it may displace jobs, automation using technology causes “creative destruction,” stripping some jobs, while creating new ones. To develop safeguards for job markets, developing countries in Africa need to invest in the requisite skills and systems early on, including in the digital domain, so that such skills are tied to meaningful jobs. This can help strengthen the country’s competitiveness in the global marketplace.

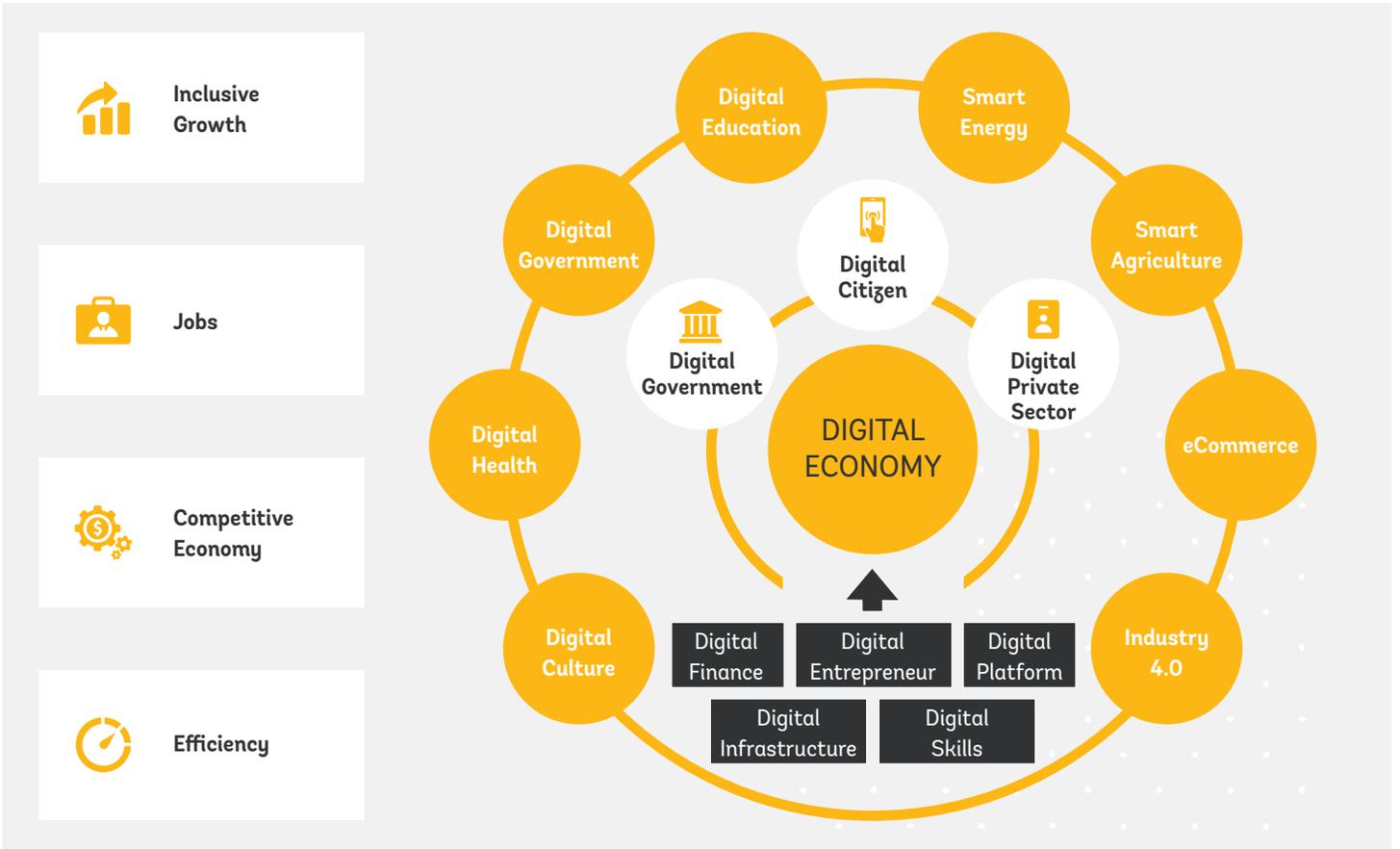
Additionally, while digital economic development can be critical, the process is neither linear nor a panacea. Effective prioritization and sequencing are required, especially as it deals with the public sector. For example, if public service delivery is a key priority to improve the targeting of the poor, the development of government platforms will need to be prioritized. Key investments and reforms may need to be prioritized as part of an overall development strategy. Shifting

cash into digital accounts for government payments, remittances, small and medium enterprise (SME) payments, and agricultural value-chain payments can enable broad-based participation in digital economy. Digital financial services can be more accessible for lower-income segments of the population, and for women and agricultural households – population segments often underserved by traditional financial services.

A digital economy has the potential to enhance productivity and gains in multiple ways. A digital economy can change the way economies of scale are achieved, particularly with online service delivery, as the incremental cost of offering an additional product or service may become negligible. The digital economy may provide better matching of buyers and sellers in a competitive marketplace. It may address certain concerns with asymmetric information, solving some principal-agent problems where buyers and sellers are separated by intermediaries, or, even, multiple levels of intermediaries. It may strengthen people’s trust in firms or governments by enabling some decentralized forms of trust (such as with blockchain) where centralized authorities are not trusted. It may allow products and services to be customized and targeted – enabling better inclusion but also easier ways to exclude some too.



►► **FIGURE 1.3.**
DIGITAL ECONOMY CAN BRING SHARED PROSPERITY AND REDUCED POVERTY



1.4 Diagnostic Methodology

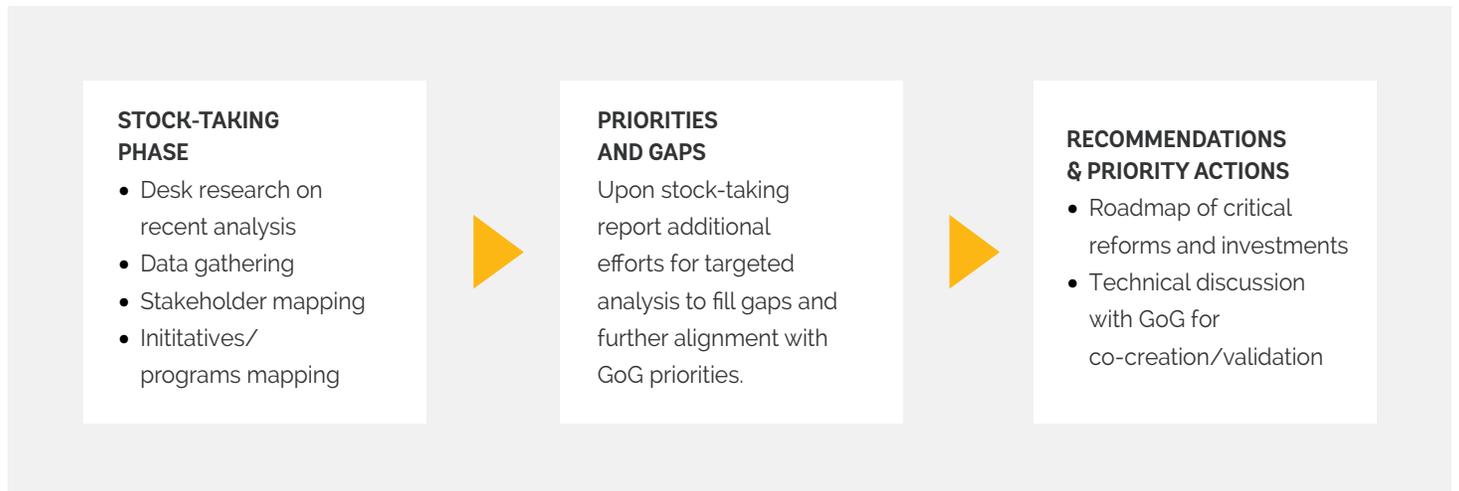
The analysis of Ghana's digital economy has been launched as part of the World Bank Group's DE4A Initiative, which takes stock of recent relevant assessments and leverages the integrated and foundation-based diagnostic framework to examine the present level of digital economy development across Africa. This assessment, which focuses on Ghana, maps the current strengths and weaknesses that characterize the national digital economy ecosystem, as well as identify challenges and opportunities for future growth. The DE4A framework findings ultimately provide practical and actionable recommendations that inform priority areas for development, proposing a mix of possible policy reforms and interventions that directly address the needs and support for harnessing the economic and social benefits digital economies bring and mitigates risks.

With the purpose to identify priority actions for Ghana to continue strengthening its digital economy progress, this stocktaking exercise has been conducted by a multidisciplinary WBG team in collaboration with the Government of Ghana (GoG). The stocktaking exercise focuses on integrating insights from the exhaustive analysis already completed in the country into comprehensive analysis aligned to the five-foundational elements framework presented above. Throughout the stocktaking exercise, analytical gaps are also being identified for further, targeted inquiry.

Ultimately, the goal of this analysis is no other than setting out the roadmap for priority interventions that would underpin Ghana's ambitions to become a digital economy leader in the region. As such, this analytical work seeks to inform the GoG on critical reforms and required investments in line with government priorities. Given the vast information and data already available, the approach proposed for this work was tailored to Ghana's unique advanced starting point and is depicted in figure 1.4.



▶▶ **FIGURE 1.4.**
APPROACH TO STOCKTAKING OF GHANA'S DIGITAL ECONOMY



For the digital entrepreneurship foundation, this report performs a diagnostic stocktaking to assess the key components of Ghana's digital entrepreneurship ecosystem, using the framework adopted by the New Metrics of Entrepreneurship Methodology Note developed by the World Bank (2019a). The new metrics

methodology examines the interactions between pillars of the entrepreneurship ecosystem, based on the supply and demand for knowledge and the capacity to convert it into successful or impactful businesses.







DE4A

Foundational Elements

This chapter provides diagnostic findings on the state of development of the digital economy in Ghana. Following the DE4A framework, first, Digital Infrastructure pillar findings and recommendations are presented, followed by the Digital Platforms assessment, the status of Digital Financial Services, and, then, the Digital Entrepreneurship analysis is described. Finally, the chapter presents the Digital Skills pillar findings and recommendations.

2.1 Digital Infrastructure

IMPORTANCE OF DIGITAL INFRASTRUCTURE

Digital infrastructure provides the way for people, businesses, and governments to get online, and link with local and global digital services – thus connecting them to the global digital economy.

Broadly, digital infrastructure consists of connectivity (such as high-speed Internet and Internet exchange points),² the Internet of Things (such as mobile devices, computers, sensors, voice-activated devices, geospatial instruments, machine-to-machine communications and vehicle-to-vehicle communications), and data repositories (such as data centers and clouds).³ With a growing digital economy, information security and cybersecurity also become more significant, adding security functions to protect critical information and infrastructure. For the digital economy, good connectivity provided by broadband Internet is a critical foundation (World Bank 2018f).

DIAGNOSTIC FINDINGS: CURRENT STATE OF DIGITAL INFRASTRUCTURE

Ghana's telecommunications sector has experienced impressive growth thanks to early liberalization and deregulation of the market since the late 1990s. Strong competition has resulted in near ubiquitous mobile coverage and a high mobile penetration rate of 131 SIM cards per 100 inhabitants, compared to an average of 80 in the rest of Africa. The country's mobile Internet penetration of about 68 percent is notable, albeit only slightly above the Africa regional average (GSMA 2018a).

>> Backbone Infrastructure

The World Bank's World Development Report (WDR) 2016 report: *Digital Dividends* (World Bank 2016a), provides a useful framework for analyzing the broadband supply chain: starting from the **first mile** (the point where the Internet enters a country – international Internet access, including submarine cable landing stations and satellite international connectivity) through the **middle mile** (national backbone and intercity network, including fiber backbone, IXPs) to the **last mile** (reaching the end user through local access network). The framework also highlights an **invisible mile** (the intangible parts of the network such as spectrum, licensing, cybersecurity, and so on) which could constrain or promote broadband access. A problem on any of these **miles** results in disparate networks and poor delivery of services.

There are five submarine cable landings in the country providing over 340 Gbps in available capacity (see table 2.1). At the national level, five⁴ regional mobile operators, (MTN, Vodafone, Airtel/Tigo, Expresso, and Glo) continue to make significant investments in terrestrial backbone and last mile infrastructure.

►► **TABLE 2.1.**
SUBMARINE CABLES IN GHANA (2017)

In 2017	Capacity Available to Operator (Gbps)	Capacity Available in use
Glo-Glo 1	20	6
MTN-WACS	25	20
Vodafone- SAT- 3	5.645	43.1
MainOne- MainOne cable	270	22.09
Kasapa- Dolphin	20.6	1.15
Total	341.25	92.34 (usage 27%)

Source: NCA

What appears to be missing is a robust and comprehensive middle mile, or the domestic backbone infrastructure to carry traffic from the landing points to all parts of the country – cities, towns, and rural communities. While there is significant backbone infrastructure (largely microwave) across the country, there is no single comprehensive and seamless domestic fiber backbone infrastructure. Most of the operators have invested in parallel

infrastructure on similar, more profitable routes across the country (see table 2.2). Additionally, the 800-kilometer Eastern Corridor Fiber Optic Intercity Network, managed by the National Information Technology Agency (NITA), which links Ghana's north and south to international submarine gateways, remains largely unutilized because of high wholesale prices and the missing last mile to the communities.

▶▶ **TABLE 2.2.**
TERRESTRIAL FIBER NETWORK

In 2017	Capacity Available to Operator (Gbps)	Capacity Available in use
National Network Statistics	Total National Coverage in Km (fiber)	14,322.03
	Total lighted fibres in Gbps	1,797.66
	Total Fibre capacity in use Gbps	876.61 (48.8%)
Number of Operators	9	

Source: NCA

Reaching out to largely rural and poorer customers is often a challenge to most private operators. The Ghana Investment Fund for Electronic Communications (GIFEC) is leading efforts to close rural connectivity gaps through a number of initiatives including a recent partnership with MTN and Ericsson for a \$12 million Rural Telephony Project to extend mobile telephone service coverage to about 40 rural communities in the country. Similar efforts from GIFEC, the Ministry of Communications (MoC), and the World Bank include

establishment of over 200 community and regional innovation centers that are providing various communication and innovation services to rural and underserved communities. The fact remains, however, that the country still has relatively low Internet and voice penetration (actual voice penetration may be no more than 50 percent of the population). GIFEC has significant resources. In 2016, it received about 35 million (about \$6.5 million) from the operators.



>> Access

>>> Wireless

At the end of December 2018, there were a total of 40.94 million mobile subscribers (138 percent penetration rate) in Ghana, with annual growth of 11.5 percent (Fitch Solutions 2019). The rapid growth of 3G/4G services are supported by value-added mobile solutions and applications provided by mobile operators. 3G service launched in 2013. Currently four operators provide 3G services and, as of December 2018, there were about 14 million 3G subscribers. 4G services launched in June 2016. Currently only one provider (MTN) provides 4G services. As of December 2018, there were about 1 million 4G subscribers (TeleGeography 2019).

>>> Broadband

Compared to the rapid growth of the mobile market, broadband infrastructure development in Ghana has been slow. In particular, the fixed broadband network (including copper, fiber, or cable) is not effective. End-user prices are still high (typically in excess of 120 (about \$22) per month) and not affordable for those with average incomes (about 1000 or \$185 per month). Providing reliable and fast broadband connectivity for ministries, departments and agencies (MDAs), and metropolitan, municipal and district assemblies (MMDAs) across the country is still challenging. The eTransform Ghana project has been providing support for NITA to reduce the connectivity gap.

▶▶ **TABLE 2.3.**
TELECOMMUNICATIONS INFRASTRUCTURE INDICATORS ACROSS PEER COUNTRIES (2017)

Infrastructure Indices	Ghana	Kenya	South Africa	Nigeria	Morocco	Mauritius	Egypt
Fixed Telephone lines/100 pop	1.05	0.14	6.4	0.07	5.73	32.65	6.77
Mobile Telephone Subscriptions/100 pop	127.46	86.15	161.99	75.92	122.88	145.4	105.54
Mobile Internet Users/100 pop	34.6	16.6	54	25.67	61.76	52.19	44.95
Mobile Internet Bandwidth, Mbps	7.11	15.29	-	11.58	18.86	11.89	16.67
Fixed Broadband internet users/100 pop	0.2	0.58	2.99	0.04	3.86	19.44	5.35
Fixed Line Broadband Bandwidth/ Mbps	25.11	15.11	-	10.34	13.59	13.86	6.51
Mobile cellular prices in US\$	3.01	2.57	7.55	4.09	11.22	4.98	2.11

Source: ITU, 2017



>> Key Government Ministry and Institutions for Digital Infrastructure Development in Ghana

The Ministry of Communications (MOC) is responsible for the development of reliable and affordable digital infrastructure and services in Ghana and in charge of development policy and regulation of ICT in Ghana.

The National Information Technology Agency (NITA) is the ICT policy implementation arm of the Ministry of Communications, and NITA has implemented several digital government infrastructures and provides connectivity to MDAs and MMDAs across the country. NITA has built a Tier 3 data center to host all government applications

(see section 2.2 on Digital Platforms for a description of how NITA functions with regards to government platforms).

The National Communication Authority (NCA) is an independent regulator responsible for setting standards, licensing, and regulating communications services (wire, cable, radio, television, satellite, and others) in Ghana. NCA has been proactively implementing future-forwarding policies and promote adoption of new technologies and services. Also, NCA has been influential in terms of improving the quality of ICT and digital services in Ghana.

►► **TABLE 2.4.**
KEY POLICY AND LEGISLATIONS RELATED TO ICT/DIGITAL DEVELOPMENT IN GHANA

Year	Name of policy and legislations
2003	ICT for Accelerated Development (ICT4AD) policy
2004	National Telecom Policy
2008	The National Communications Act (Act 769, Revision of the existing National Communications Act, 1996)
2008	Electronic Communications Act
2008	National Information Technology Act
2008	Electronic Transactions Act
2009	Electronic Communications Amendment Act
2011	Electronic Communications Regulations
2011	Mobile Number Portability Regulations
2011	Subscriber Identity Module (SIM) Registration Regulations
2012	Electronic Transactions Amendment Act
2012	Data Protection Act
2012	National Broadband policy
2015	National Cyber Security Policy & Strategy
2016	Electronic Communications (Rules of Procedure of the Electronic Communications Tribunal) Regulations

Ghana's proactive policy and regulatory interventions have been key to the relative success of the reforms and progress made to date. Several policies have been put in place to strengthen competition, including the ICT for Accelerated Development (ICT4AD) Policy (2003), the proinvestment National Telecommunications Policy (2004), and National Broadband Policy (2012), though some are in need of updating. A foundational legal framework has also been developed and key legislation passed for strengthening the ICT regulatory agency and other regulatory institutions, and for safeguarding electronic communications and transactions. The National Communications Regulations of 2003 provides the foundational legal framework for the main regulator, the National Communications Authority (NCA). The NCA and other regulatory institutions are supported with several industry-specific regulations, such as the National Communications Authority (NCA) Act 769, Electronic Communications Act (Act 775), Electronic Communications Amendment Act (Act 786), Electronic Transactions Act (Act 772), DTT Broadcasting Policy, 2016, The National Information Technology Act, Ghana Investment Funds for Electronic Communications (GIFEC) Act,

Data Protection Act, National Broadband Policy and Implementation Strategy, amongst others. While the NCA is the main regulator of the sector, GIFEC exists to provide universal service and access to underserved and rural communities, and the National Information Technology Authority (NITA) is mandated to create an enabling environment for effective deployment and use of ICT by all public-sector institutions and organizations.

Improved international connectivity has resulted in a fall in wholesale bandwidth prices, and relatively cheaper retail prices to end-users. The Government of Ghana, with funding from the Danish International Development Agency (DANIDA), has complemented investments through a \$38 million Eastern Corridor Fiber Optic Backbone Project, providing about 800 kilometers of fiber optic cable for over 120 communities across Ghana. It links Ghana's north and south as well as international submarine gateways via the country's Eastern Corridor. Funds are being explored for a counterpart Western Corridor project to complete the loop.

>> **Challenges**

Despite progress, a number of challenges persist, the main ones being summarized below:

In Ghana, most of the infrastructure is concentrated in urban and commercial areas with large sections of the country's rural population without effective coverage. There are several white spots in the urban areas and the periurban areas are also not well covered. In the absence of a more robust and comprehensive nationwide fiber backbone, operators have been investing in wireless solutions to extend 3G service to key parts of the country. MTN's recently launched 4G LTE service is introducing faster and more reliable mobile data services to the country, but in March 2019 there were only about 20,000 subscribers. Internet penetration of about 36 percent is provided largely through 3G mobile connections. Several keystone projects are being deployed by private operators and are contributing to strengthening the network. These include CSquared's Metro Fiber, the only private sector owned, wholesale-only, carrier-neutral, and open-access network of over 1,000 kilometers currently operational across the largest cities in Ghana (Accra, Tema, and Kumasi); Vodafone and MTN's fiber to-the-home (FTTH) services which are already connecting ISPs and several thousands of homes and communities; and Gridtel's Fiber on Power Transmission Network, which is providing backbone services to operators and ISPs across the country.

More needs to be done to create a more comprehensive, robust, and redundant nationwide network and to make Ghana's digital economy more competitive. The cost of the Internet is still high and access low, especially in rural areas. The Alliance for Affordable Internet 2018 report (A4AI 2018) confirmed Ghana is yet to meet the affordability target of "1 for 2"—defined as 1GB of data for no more than 2 percent of national monthly income.⁵ Ghana also compares only modestly with key competitors in Africa and the world on broadband speeds. It is ranked 10th out of 12 leading African countries (110th out of 189 globally) with its average broadband speed of 2.3 Mbps.⁶ Kenya, which ranks first in Africa (51st in the world) with 10.71 Mbps is the only African country with speed above the minimum 10 Mbps considered to be needed by consumers "to fully participate in a digital society" (Ofcom 2019). On the International Telecommunication Union's (ITU) ICT Development Index, Ghana dropped slightly to 112 out of 175 countries in 2016 (ITU 2017).

Spectrum licensing prices represent a major barrier to digital infrastructure growth. The NCA has generally been quite efficient in developing a strategy and engaging in public consultations to auction spectrum in Ghana. However, the industry considers that prices being achieved through these auctions are prohibitive, and likely to strangle its growth. In 2015, the NCA sold 800 MHz of 4G spectrum for \$67.5 million to MTN, which was the only operator who could afford the high fees. MTN currently has only about

20,000 4G subscribers. Moreover, the current licensing regime requires operators to acquire new sets of licenses to deploy new technologies and services. This restricts innovation in the range of services that can be offered within existing spectrum bands. A number of countries, including Botswana, Kenya, Cote D'Ivoire, and Nigeria, have transitioned to a unified licensing regime to reflect convergence of the telecommunications sector.

Despite the expansion of Internet exchange points (IXP) in Ghana, sustainability has not been achieved yet. IXPs are critical to lowering the cost of bandwidth and allow local traffic/content to be exchanged locally, obviating high fees required for international transit. While Ghana's IXP membership has grown and currently includes over 20 members (MNOs, ISPs, government, educational institutions), its long-term sustainability is questionable for two key reasons: first, a dearth of locally produced content, and second, most local content being hosted outside of Ghana.

Reduced number of grade A facilities with high broadband prices combined with the lack of highly skilled/low-cost labor has explained the slow takeoff of BPO services in Ghana. The government made concerted efforts to address some perceived challenges including improvements in broadband quality and price and other infrastructure. Ghana's 2012 National Broadband Strategy defined high-speed broadband as Internet speeds greater than 2 Mbps, in line with ITU's 2011 definition. The objective then was to achieve this target by 2020. In principle, Ghana has already achieved this objective, with estimated current average speed of 2.3 Mbps. However, many countries, including the United States, have revised broadband speed targets as part of new broadband plans and strategies. It is clear that countries with the most robust Internet infrastructure also rank the highest in the Global Competitiveness Report: the faster the speed, the more consumers can transact business and access services online.

Poor performance of the government's data center. For data centers/cloud services, the global potential is important (for example, 40 percent annual growth in India, with a global public cloud market estimated to grow to \$236 billion by 2020, following a 22 percent CAGR between 2015 and 2020). The poor performance of the government's data center (Tier 3, \$30m investment, largest in the country) which is being managed by NITA, points at opportunities for the private sector to step in: opportunities for privatization are being discussed. These are to be balanced with a trend towards the geographical concentration of data centers globally, so the need for local storage needs to be properly assessed (CPSD Ghana 2017).

The cyber ecosystem in Ghana has also been described as still in its early stages and experts have said the country's culture is not yet cyber conscious. Ghana is estimated to have lost about \$50 million to cybercrime in 2016. The threat of attacks continues to be a challenge for both government and businesses. The National Cybersecurity Policy and Strategy (NCSPS) from 2016 had been drafted under the lead of the Ministry of Communications (MoC) and its implementation is at an early stage (World Bank 2018b). The NCSPS includes a five-year strategic plan 2016-2020, with nine priority areas, which are directly linked to the socioeconomic

and development goals of the ICT4AD policy, in particular pillar 14 "Facilitating National Security and Law and Order," one of the policy's Priority Focus Areas (World Bank 2018b). However, Ghana's Critical Infrastructure Protection (CIP) has been described to be in its infancy by experts (Ghana Cybersecurity Capacity Review 2018). Though there have been a number of coordinated attacks against several government websites in the past, they were handled by NITA and the Ghana Computer Emergency Response Team (CERT-GH), and none of the incidents impacted on the national crisis management concerning cyber incidents (World Bank 2018b).

RECOMMENDATIONS AND NEXT STEPS

DI.R1.

Revise Broadband Speed Targets

Ghana needs to revise its stated minimum threshold speeds for what constitutes broadband service, as the most competitive countries are doing. Singapore, for example, which ranked as one of the world's fastest countries,⁷ has a mean download speed of 70.86 Mbps – nearly ten times faster than Kenya and more than 20 times faster than Ghana.

DI.R2.

Develop a robust and comprehensive middle mile (domestic backbone infrastructure)

Policies and actions should encourage additional investment in domestic backbone for more efficient utilization of existing infrastructure and completion of missing links. The NCA needs to provide better guidelines on infrastructure sharing for these and other emerging complementary infrastructures, including those being provided by the power companies Gridco and ECG, as well as CSquared's metro fiber. Promotion of infrastructure sharing will limit concentration and duplication of infrastructure in more profitable areas and redirect resources to underserved communities. The government needs to accelerate efforts to complete the counterpart Western Corridor project to ensure a more redundant national backbone. The planned connectivity transaction, led by NITA, under the World Bank-funded eTransform Ghana program, should also help here.

DI.R3.

Increased investment in last mile Infrastructure

The government needs to be more proactive in the use of resources to partner with the private sector in the extension of services to more underserved communities.

DI.R4.

Revise spectrum allocation and award of unified licenses

The NCA needs to revise its spectrum policy to allow more competition, investment, and expansion of broadband for all Ghanaians. The award of additional frequency spectrum emerging from the digital TV migration process should also be more open. A unified licensing regime could introduce more competition in the sector for both 3G and 4G⁸ operators and could encourage more investment in broadband services at competitive cost to operators.

DI.R5.

Streamline effective implementation of cybersecurity policy and strategy

Ghana needs to unfold a cyber-conscious culture across the economy, particularly for financial institutions and SMEs, with a national program that raises awareness of cybersecurity risks and secure online behavior. Task regulators, in particular MoC and the Bank of Ghana (BoG), need to mandate the implementation of a nationally agreed baseline of IT security standards, including procurement processes and in all steps of software development.

DI.R6.

Explore and encourage private sector solutions for data storage capacity needs

Local data storage requirements should be assessed and partnerships fostered with the private sector to ensure market needs are met. A cascade approach should be followed before investing more public resources to ensure Ghana's data storage needs are fulfilled.

2.2 Digital Platforms

IMPORTANCE OF DIGITAL PLATFORMS

Digital platforms span every aspect of life and are offered by government and firms: Digital platforms represent the use of digital technology in all aspects of life, such as healthcare, education, commerce, or government services.⁹ Both governments and firms operate digital platforms, serving people, businesses, or government. Governments use digital platforms (public sector platforms) to improve the delivery of government services, or to improve the effectiveness of its functions. For example, a government operates digital identity as a government platform to offer a unique identity to every person in a country, and for use by most, if not every, sector in the country. Firms use digital platforms (private sector platforms) to offer new products or services. For example, a firm operates an e-commerce platform to offer retail services online, or by connecting buyers with sellers.

Digital marketplaces help create economies of scale and capitalize on the network effects of digital products or services to strengthen a country's competitiveness. This is particularly relevant in the context of a digital economy, where tech startups have potential to scale up and capture market share. Digital platforms can achieve exponential growth and value, as increasing numbers of users adopt the services offered, and generate more data and content. In building and boosting a digital economy, countries have potential to create larger markets within which companies may offer digital products or services (whether online or by mobile phone), while removing barriers to crossborder e-commerce, incentivizing investment, and increasing the competitiveness and dynamism of each region's or country's digital economy. It is particularly beneficial for digital products and services because of the network effects they create. Increasing the size of the digital marketplace may thus help amplify these network effects in Ghana and Africa, and may offer the opportunity for locally developed applications, platforms, and content providers to grow.

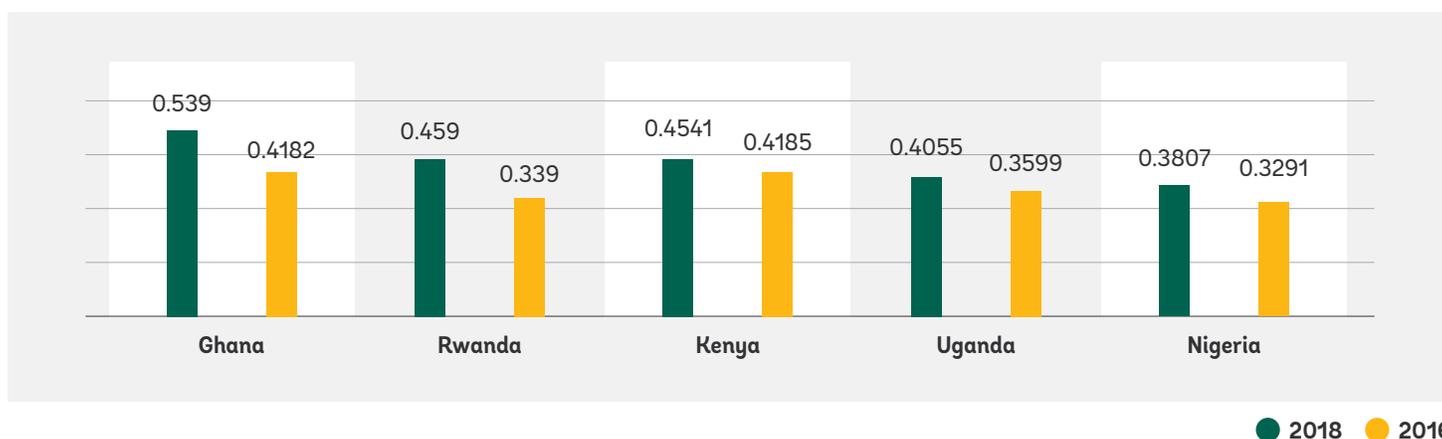
DIAGNOSTIC FINDINGS: CURRENT STATE OF DIGITAL PLATFORMS

>> Public Sector Platforms

The growing desire to achieve greater efficiency, transparency, and accountability has led to the government's continued investment in public sector digital platforms. A number of digital platforms have been developed in an effort to improve governance and delivery of public services. Notable among them is the automation of tax and business registration systems, which has significantly broadened the tax base and streamlined business processes by reducing the number of days for registering businesses.

In the 2018 survey of the UN E-Government Index (EGDI), Ghana is the only African country that transitioned from the middle to high level. Based on the technical features of national websites as well as e-government policies and strategies applied in general and by specific sectors in delivering services, the number of African countries in the High-EGDI-level group remains relatively modest at six, with only one country, Ghana, joining the group since 2016. The EGDI is a weighted average of normalized scores on the three most important dimensions of e-government: the scope and quality of online services as indicated by the Online Service Index (OSI),¹⁰ the status of the development of telecommunication infrastructure rated through the Telecommunication Infrastructure Index (TII), and the inherent human capital scored through the Human Capital Index (HCI). Each of these indices is by itself a composite measure that can be extracted and analyzed independently.

►► **FIGURE 2.1.**
UN E-GOVERNMENT INDEX ACROSS PEER COUNTRIES



Ghana's EGDl encapsulates the various fronts on which progress has been achieved. This includes some steps toward streamlining its institutional and policy frameworks to capitalize on ICT innovations. Since 2017, the country has also been investing in improving online services delivery and has so far made significant contributions towards the development of ICTs under the e-Ghana and e-Transform projects. The Ghana Shared Growth and Development Agenda (GSGDA) incorporates an ICT strategy which implies increasing use of ICT across economic sectors, e-government, in implementing the National Electronic Security system, and the proliferation of other ICT-related mechanisms for public benefit.

Government commitment to, and spending on, technology in Ghana is intensifying to attract investors from across the globe.

Public-sector digitization and outsourcing contracts have been awarded to both multinational companies as well as local players in the market to provide ICT services for MDAs and MMDAs. Such efforts put Ghana on a strong footing to digitize and improve efficiency of the delivery of various services.

Against that background, this section further assesses the existing strengths as well as the remaining challenges on Ghana's path toward fully developed public sector digital platforms. Both strengths and weaknesses run along the core building blocks for these platforms:

- Institutional setup for digital government development and management;
- Data policy and frameworks;
- Digital ID;
- Back-office systems and shared systems;
- Interoperability; and
- Digital service delivery.

These building blocks are tightly interconnected. Institutional setup and leadership underpin the coordination of digital government initiatives. This, in turn, depends on the legal and behavioral norms regarding sharing the data among the MDAs and the public at large. Coordination and data exchange further enable or hinder the creation and operating of shared systems, as well as ensuring interoperability among the systems of MDAs. Creation of shared systems and ensuring interoperability also depends on how much of the government back-office operations are digitized in the first place. At the interface with the public, digital ID services are crucial to ensuring trust and facilitating secure transactions. Finally, all of these issues impact the ability of the government to provide digital services to its citizens.

>>> Institutional Setup for Digital Government Platforms

Digital government development in Ghana is led by the Ministry of Communication (MoC). MoC is spearheading several key initiatives such as the National Identification System (NIS), ICT Infrastructure Development Program, Public Key Infrastructure, Open Data Initiative, and other digital government initiatives. As mentioned in the Digital Infrastructure pillar, the ministry has established 20 enhanced Community Information Centres (eCICs) in selected areas in the northern part of Ghana to bridge the technological gap between served and underserved areas. The Government of Ghana has undertaken several other massive digitization projects, such as the National Digital Property Addressing System, and efforts on the land records digitization agenda.

The National Information Technology Authority (NITA) is the ICT policy implementing arm of the Ministry of Communications. A public service institution established by Act 771 in 2008 (the NITA Act), NITA is the agency responsible for implementing Ghana's ICT policies. In addition to digital infrastructure, its mandate includes "identifying, promoting and developing innovative technologies, standards, guidelines and practices among government agencies and local governments." It is also responsible for "ensuring the sustainable growth of ICT via research and development, planning and technology acquisition strategies to facilitate Ghana's prospect of becoming a technology-driven, knowledge-and values-based economy." NITA has implemented the e-Government Infrastructure Platform Project to connect all MDAs and MMDAs across Ghana. NITA has also built a Tier 3 data center to host all government applications and has also decided to commercialize its excess capacity to generate more revenue to support developmental work. Currently, NITA is also pursuing a public key infrastructure (PKI) and is also working on developing a compliance policy for all the government institutions for third-party software licensing and usage.

>>> National ID and e-ID

The need for a national ID platform to form the underlying infrastructure for other digital ID platforms has been recognized by the Government. There is an ongoing national ID card program led by the National Identification Authority to ensure that every Ghanaian has a national ID card known as the Ghana Card. The process of registration and issuances of the national ID began in May 2018. The Ghana Card is meant to serve as the primary ID card that Ghanaians will use to access all services in the country – it will serve as a valid ID to open a bank account, apply for a passport, telephone account, driver's license and many other services. The Ghana Card will help consolidate ID information, which is currently held in nine separate databases across various government and public entities.

>>> Back-Office Systems and Shared Systems

The digitization of back-office systems started in Ghana in the 1990s with the digitization of payroll. Initially, the Integrated Personnel Payroll System (IPPS) handled both the payroll and human resource aspects. However, with the introduction of the Human Resource Management Information System (HRMIS) in 2014, the HR functionality is handled separately. The payroll system is running on an Oracle platform and includes over 600,000 public employees. The automation of the payroll system has helped to improve the security and monitoring of the system. The system is currently mature and includes full budgetary control (no payments possible outside the budget). Further enhancements to delivery and performance, fiscal and user security, and disaster recovery plans are currently underway. Future enhancements include pensions and integration into the Oracle financials.

Ghana Integrated Financial Management Information System (GIFMIS) began its rollout in 2011 and has since been adopted by 283 MDAs across Ghana. This has resulted in the timely preparation of monthly financial reports, annual financial statements, effectiveness of expenditure commitment and payroll controls, reduction of audit observations, and regularity of account reconciliation.

The Human Resource Management Information System (HRMIS) is currently being rolled out and is managed by the Public Service Commission. Now in its fifth year of implementation, much headway has been made, with about 84 percent of public services currently included in the system. This allows for sufficient analysis of human resource management (HRM) and allows for position control, that is, a system of tracking information based on positions rather than employees. The transition to the electronic system has had some teething problems, including technical and behavioral challenges. At the same time, there is a strong buy-in from the senior management in the MDAs who already reap the benefits from the electronic system: better management of the number of civil servants, picking up double entries ("ghosts") and flagging them for payroll, and improving the system of onboarding.

The Ministry of Finance runs a budget preparation and reporting system, Hyperion. Hyperion is connected to GIFMIS, pushing budget data for budget implementation. It is also interfaced with HRMIS, providing the compensation budget. It is further connected to the Commonwealth Secretariat Debt Recording and Management System. There are plans to connect it further to the procurement planning system and to a high-level public investment management planning, to provide a link with capital budgeting.

GIFMIS, HRMIS, and payroll reside at a shared data center at the office of the Accountant & Controller General (CAG). As such, they share computing, storage, and networking with the CAG.

NITA is expected to provide the bulk of shared services. This includes e-mail, web hosting, videoconferencing, and processes to be defined within each MDA (for example, task planning, task assignment, escalation). The Smart Workplace platform is also available and gaining popularity among the MDAs. Currently there are also plans for a government cloud computing service to avoid the need for MDAs to own their own servers.

>>> Interoperability

The interoperability between payroll, GIFMIS, HRMIS, and Hyperion systems is now mostly functional. As long as they have connectivity, MDAs and local governments can access payroll, invoices, budget information, and other key information online in real time.

More centrally, the Ghana Government Enterprise Architecture (GGEA) is designed for increased interoperability through the principles of shared infrastructure services, service-oriented architecture and event-driven architecture. These principles are essential ingredients for interoperability and the GGEA is designed to ensure that information for government services is available anytime, anywhere, to anyone who is authorized to access it, from many channels.

The GGEA enables Ghana's e-Government Interoperability Framework (eGIF). The eGIF is a set of policies, technical standards, and guidelines covering ways to achieve interoperability of public-sector data and information resources, ICT, and electronic business processes. It creates the ability for any MDA to join its information, ICT, or processes with those of any other using a predetermined framework based on open (that is, non-proprietary) international standards. eGIF will act as a foundation for the overall e-government strategy to ensure that government-wide systems are implemented in accordance with widely accepted policies, technical standards, and guidelines. MDAs and the public service adherence to the eGIF policies and specifications is mandatory.

>>> **Digital Services**

With the improvement in broadband and mobile penetration, the adoption of e-services in Ghana is beginning to take root.

NITA has developed the e-government portal (www.eservices.gov.gh) that is designed to serve as a single service point – a one-stop shop – for the public for government digital services. The services available include forms to obtain a driver’s license, passport, online registration of taxpayer identification numbers, and others. Other services outside this one-stop shop, such as registration of births and death, company registration, criminal background check, fingerprint analysis, background check for job and visa applications, and marriage licenses, have digital applications. Upcoming digital platforms for identification, procurement, immigration, and parliamentary and judiciary services are expected to result in cost savings and transform the way government engages with citizens and businesses. Several private players have also entered the market as intermediaries for citizen to government (C2G) and government to citizen (G2C) payments using mobile money platforms, such as IT Consortium, Wirecard, and so on.

Ghana Single Window is a secure trade platform that facilitates the exchange of information between the GoG and the logistics and trading community, thus allowing Ghana’s digital government initiatives to be used extensively.

Ghana Single Window was launched in 2002 and has been progressively updated and extended in line with international best practice. The platform reduces the need for data to be entered multiple times – instead it can be exchanged and reused electronically, achieving faster, more accurate results and improving the ease of compliance with Government of Ghana requirements. It is deployed and supported by Ghana Community Network Systems (GCNet). GCNet is a public-private partnership in which the government of Ghana holds a 38 percent shareholding. The following systems are integrated into the Ghana Single Window.

Ghana has a digital business registry which makes the registration process less cumbersome.

The digital portal used for registration is a public-private partnership supported by NITA and the Ministry of Finance. The digital business registry improves the efficiency of processing registration applications and the Registrar General’s Department (RGD) aims to complete processing applications within 48 hours if the applicant meets all requirements. It makes business registration accessible to all firms irrespective of their location and eliminates the activities of middlemen who add friction to the business registration process while increasing the cost of doing business. The RGD has opened as fully automated offices in various locations across Ghana to decentralize the process of business registration and save time and resources for the many businesses who throng the department for registration. The digital portal is also integrated with the Ghana Revenue Authority (GRA) e-tax portal and the Tax Identification Number (TIN) is used as the linking identifier. In addition, a recent 2019 initiative by the Registrar General’s Department has established a requirement for all businesses to link a digital address code for their business to complete its registration process.

This automation has led to substantial improvements for both businesses and government.

GRA’s automation led to a substantial increase in automated business registrations (87,900 in 2015) and TIN registrations (425,305 in 2015). In addition, for the government, it meant an increase in tax revenue from 12 percent in 2009 to 16.9 percent in 2015, and enhanced efficiency in tax collection. The RGD automation system led to similar improvements, including a consistent increase in registration of companies, an average 15 percent year-over-year increase in the number of companies registered between 2014 and 2016. In addition, a consistent increase in efficiency and payment collection for registrations was recorded.

▶▶ **TABLE 2.5.**
A SAMPLE OF GHANA’S DIGITAL SERVICES

TradeNet Services	eTax Services	eRegistrar Services
TradeNet permits the logistics community to exchange trade-related documentation electronically with all agencies involved in trade-related processes.	eTax allows taxpayers to register for a Tax Identification Number (TIN), manage their profile, submit tax returns online and make electronic payments to settle liabilities. A TIN is required for all importers wishing to bring goods into Ghana.	eRegistrar allows investors to register their businesses online and pay associated fees electronically. During business registration, the new company is automatically issued with a TIN – a requirement for all importers wishing to bring goods into Ghana.

>>> **Open Data**

In January 2012, NITA launched the Ghana Open Data Initiative (GODI). It created a central repository of datasets from 25 government agencies including The Energy Commission, Ghana Statistical Service, and the Ministry of Finance. The 2011 Web Foundation feasibility report indicated that the Government of Ghana had the political will to make information transparently available to its citizens. An Open Data Steering Committee was appointed to guide GODI in August 2012. It included representatives of the cabinet, NITA Board, Ministry of Communication, and civil society organizations (CSOs). Since 2018, NITA has embarked on a project to address GODI's weaknesses. As of June 2019, the GODI platform hosted 90 datasets in open data formats from 11 agencies. Going forward, the MoC has submitted a new draft policy on data sharing to the cabinet that envisions three phases: portal to receive datasets; building the ecosystem around the use of the datasets (for example, hackathons); and training for MDAs on data and change management.

The Ghana Statistical Service (GSS) is responsible for production, management, and dissemination of national statistics in the country. In March 2018, GSS published the Ghana Statistics Development Plan 2018-2022. It recognizes the need for Ghana's official statistics to be the standard bearer for accuracy, consistency, and credibility of statistics in the country. In particular, this strategic plan seeks to address the underdevelopment of the administrative data system, such that more and better-quality data may be collected at lower cost, while simultaneously ensuring survey credibility. This will be particularly important to fulfill the reporting requirements of both national and international development program, such as the Ghana Shared Growth and Development Agenda, the African Union's Agenda 2063, and the Sustainable Development Goals.

>>> **Challenges**

Nevertheless, a number of challenges exist that affect the government's ability to operate digitally as a platform:

Institutional setup. NITA as a key player in driving the digital transformation of the public sector in Ghana is institutionally weak. It does not have sufficient institutional capacity nor funding for implementation of the ambitious digital government platforms that the government envisions. As a result, MDAs suffer from the chronic lack of connectivity, dysfunctional e-mail, websites, and other basic services that they expect from NITA. It is therefore paramount to invest in NITA's capacity as well as its ability to ensure basic ICT functionality across MDAs in order to build trust in shared services, such as common servers and government cloud computing. This will take time and a significant increase in funding of the agency, as well as consistent institutional, leadership, and human capacity building. In addition to empowering and enabling NITA, it is important to strengthen the coordination of digital initiatives from the center of government, for example, from the Office of the President, in order to set the tone for the MDAs.

Digital ID. Even though 98 percent of Ghanaians have some sort of ID, Ghana currently has nine separate databases across various government and public entities and no unique property addressing scheme in place. The multiplicity of current ID systems, fueled by inefficiency and delays, is making it difficult for government agencies, businesses, and financial institutions to properly authenticate citizens and their data. This, in turn, is contributing to a high cost of doing electronic business in Ghana. The inefficient ID system is also challenging the government's ability to offer targeted services and generate revenue. The government is currently working to remedy this situation by rolling out the Ghana Card program.

Back-office systems, interoperability, and shared systems. While payroll and Hyperion are mature systems, HRMIS and GIFMIS are still ongoing projects, largely because their development began more recently. Although their rollout has been progressing reasonably well, it will take several more years to complete. The main challenges include change management and continuous capacity building. Capacity is an ongoing challenge even for the use of the mature systems, leading to an overreliance on consultants for every minor upgrade. As for the shared systems, the key challenge is the lack of trust of the MDAs in NITA's capacity to deliver quality shared services. In order to build that trust, the investment in NITA and gradual demonstration effects of the agency's ability to deliver will be critical.

Digital service delivery. Digital platforms for the national identification card, digital address system, e-procurement, e-immigration, and e-parliamentary and e-judiciary services are currently being built, some with the support of the eTransform project. Upon completion, they are expected to bring efficiency and transform the way in which the government engages with citizens and businesses. However, trust in e-services offered by the government is generally low and the majority of the Ghanaian society is not even aware that e-government services exist (World Bank 2018b). At the time of drafting, the online e-service portal was down as NITA's servers were undergoing an upgrade. In sum, while many of the building blocks for digital services are in place, they are not always well connected and have not yet produced the expected outcome for citizen. The main issue seems to be the insufficient user-centricity in development of the digital services and government platforms in general. A change in thinking and the adoption of a more citizen-centric approach will be required to overcome this challenge.

Open data. Contrary to what is specified in the terms of use of the GODI website, there is no open data license attached to government-produced datasets. This means that not all of the content available through data.gov.gh is legally "open" according to international standards, which would allow commercial and noncommercial exploitation and redistribution without restitution. Further, available datasets are largely outdated and some are in nonmachine-readable formats. There is no data collection procedure in place between MDA focal points and GODI, and data officers collect datasets from each MDA separately. As a result, GODI has not fully met its primary objectives.

>> Private Sector Platforms

Private digital platforms can create multiple opportunities to engage in trade and development, but policy concerns arise too.

UNCTAD states that economic policies and regulations will need to maximize the benefits while at the same time minimizing the costs of digital platforms (UNCTAD 2019).

- **Benefits:** Efficiency gains, reduced information asymmetries supported by rating systems, lower consumer prices, increased market access, more competition, and better use of underutilized resources and increased flexibility for the providers of services.
- **Growing concerns:** rising market power of super platforms and the related implications for competition, data protection and ownership, consumer protection, and taxation and employment policies.

Private digital platforms include nonprofit and profit-oriented approaches. This section will focus on digital commerce platforms and digital labor platforms that facilitate the sharing economy.

>>> Domestic Private Platforms

Ghana ranks as the third country in Africa with the most private digital platforms operating, after Nigeria and South Africa (see figure 2.3). In Nigeria, 94 digital platforms operate, in South Africa 91, followed by Ghana with 72 platforms. Out of 72 private digital platforms operating in the country, 42 percent developed locally (domestic platforms listed in appendix C). In comparison, in Nigeria, 73 percent of private digital platforms operating are African, with 59 percent in South Africa, and 56 percent in Ghana. Private digital platforms are comparatively young in Ghana, with 83 percent of them launched less than five years ago (Insight2Impact 2019).

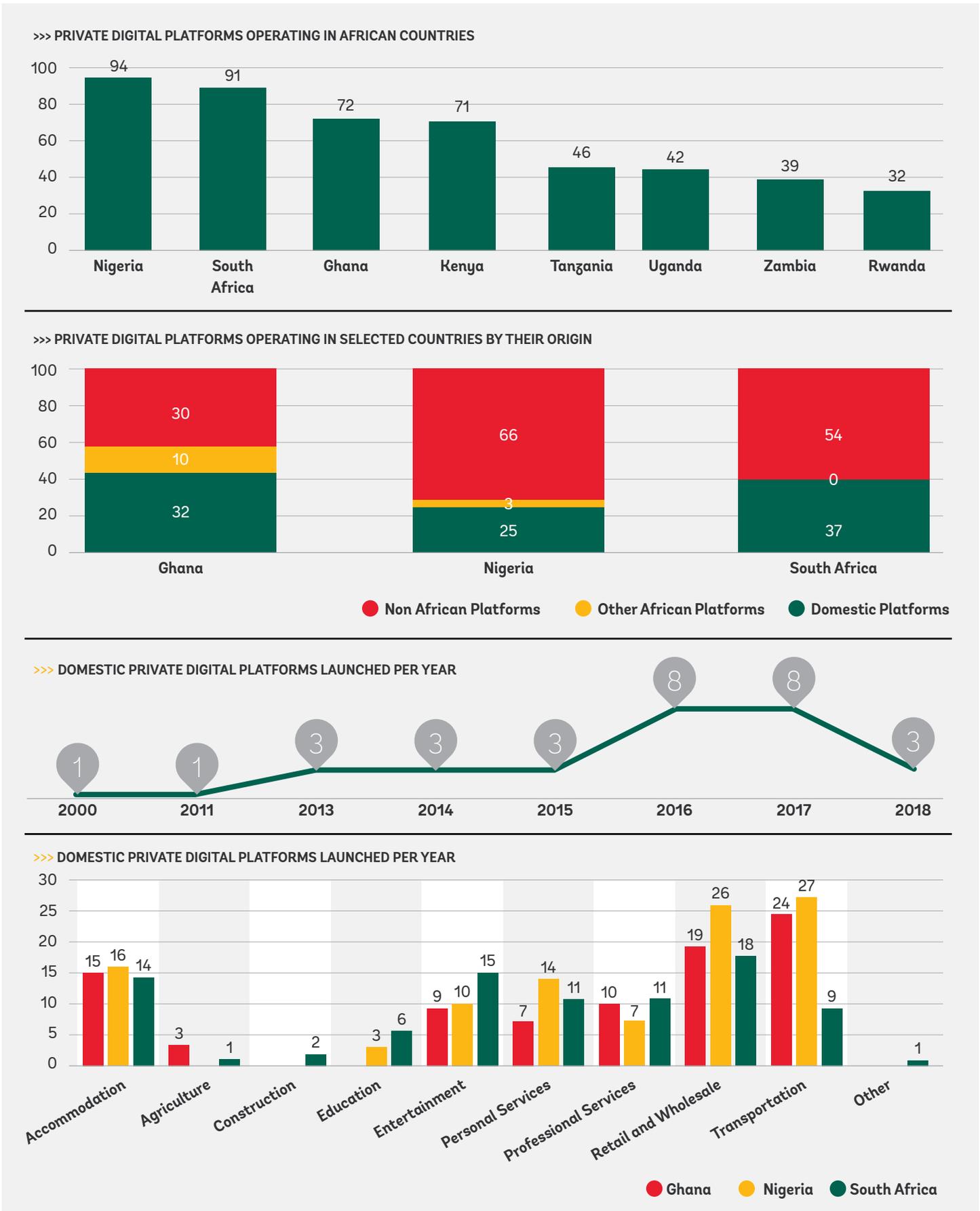
Although super platforms are utilized locally, they do not displace the opportunity to develop and use innovative local platforms.

For example, Uber started operations in Ghana in 2016, growing the market for such service but charging a significant commission per ride (20-25 percent). Drivers' dissatisfaction became a business opportunity, and in 2017, Uru and Dropping, local endeavors, launched different business models, eliminating surge charges, and charging a fixed low-booking fee per trip, respectively.

Digital platforms in Ghana are transforming the provision of services. Retail, transportation, and accommodation are the services to which private digital platforms facilitate access in Ghana.



▶▶ **FIGURE 2.2.**
PRIVATE DIGITAL PLATFORMS OPERATING IN GHANA AND SELECTED AFRICAN COUNTRIES



Source: : Authors' analysis using data from Africa's digital platforms database, Insight2Impact (March, 2019)

>>> **Microwork platforms**

In Ghana, microwork¹¹ platforms are a source of job creation.

It is estimated that 1 percent of Internet users in the country are microwork users (see table 2.6), almost reaching 80,000 in 2017 (Research ICT Africa 2017). Considering that digital workers could make up more than 10 percent of the labor force of Africa by 2030 (Mastercard Foundation 2019), such types of work requires attention considering the working-age population and Internet use rapidly growing.

In Ghana, microwork platforms are mainly used by women and young people, while contributing to poverty alleviation in rural areas. Remarkably, in the country, microwork platforms are used more by women than men, of which 56 percent have a secondary school certificate, and almost 60 percent were unemployed (Research ICT Africa 2017). In the country, there are 19 microwork platforms in use, such as 15ghana.com and freelancer.com, through which local talent is satisfying local and global demand (Insight2Impact 2019).

▶▶ **TABLE 2.6.**
MICROWORK IN AFRICA, SELECTED COUNTRIES

	Micro Workers (% of Internet Users) ^a	Micro Workers (2017) ^b
Nigeria	3%	1,523,474
South Africa	3.22%	970,540
Kenya	0.98%	130,824
Ghana	0.99%	79,717
Mozambique	0.77%	22,161
Tanzania	0.08%	6,244
Rwanda	0.33%	3,522

Source: a. Research ICT Africa, *Beyond Access Survey (2017)*.
b. Calculation considering country Population in 2017 (World Bank) and data from Research ICT Africa, *Beyond Access Survey (2017)*, for Internet use percentage and Micro workers percentage.

>>> **Digital Commerce**

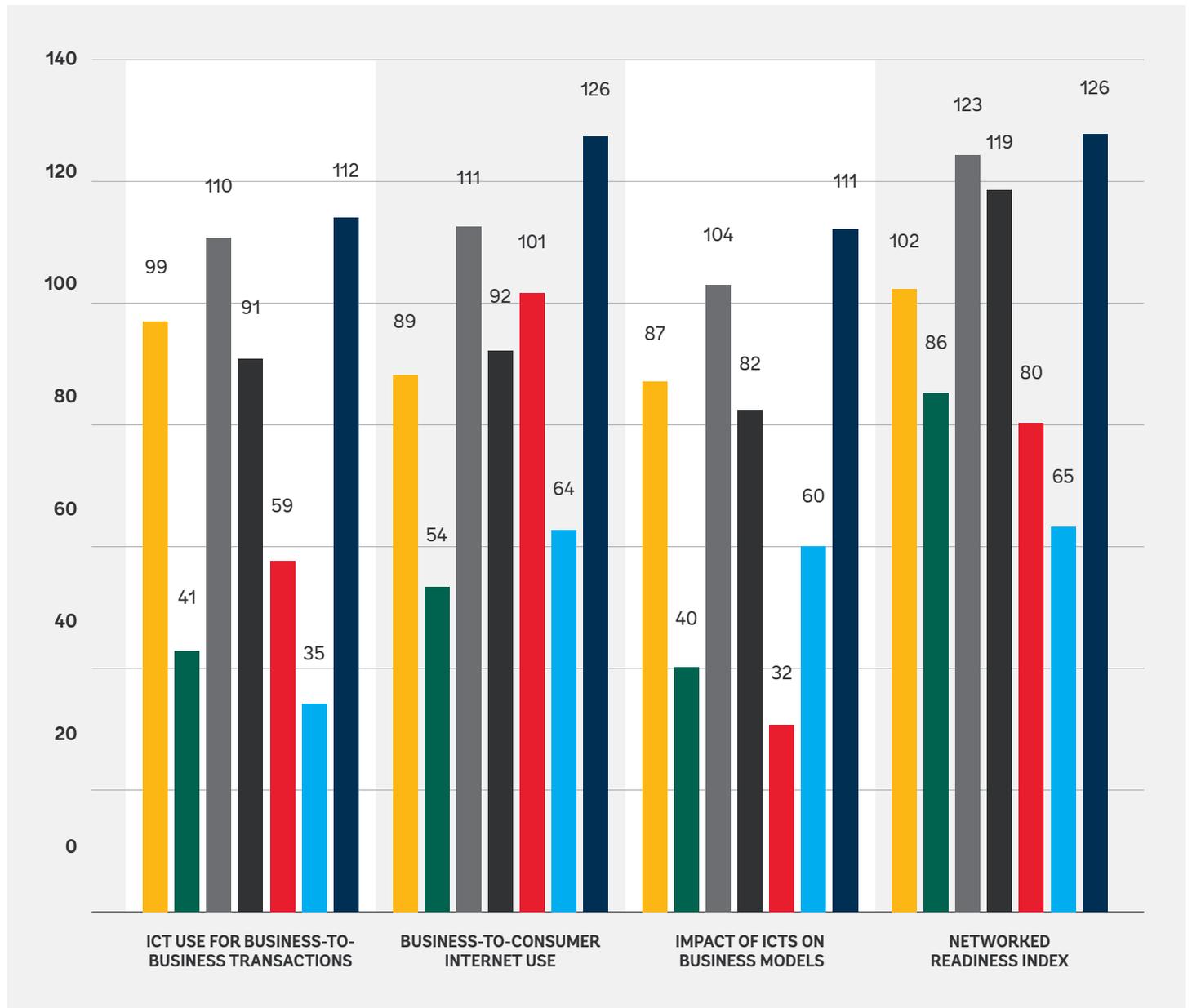
Digital commerce is growing, positioning Ghana as the sixth country in Africa in business to consumer (B2C) e-commerce in 2018, climbing six positions from its 2017 ranking (UNCTAD 2018 and 2019). Online shoppers grew from three percent in 2018 to 7.8 percent in 2019 (DataReportal 2019). Even when 54 percent of mobile connections are still from basic and feature phones (GSMA 2018a), a double-digit growth rate in mobile Internet penetration is an opportunity to increase digital commerce. In addition, 64.9 percent of firms interact with clients or suppliers using e-mail.

B2C commerce in the country is growing at a fast pace, increasing from \$30 million to \$90 million between 2009 and 2012. At the continental level, the B2C market in Africa was worth about \$5.7 billion

in 2017. Moreover, estimates reveal that by 2030, digital commerce will total \$500 billion, which is equivalent to 10 percent of expected continental gross domestic product (Mastercard Foundation 2019).

At the continental level, African platforms are preferred to non-African Platforms. The availability of African marketplaces is broadening access to local products and services (see box 2.1) with 49 percent of African online users shopping solely domestically, compared to the 6 percent of shoppers that buy only from crossborder platforms (PayPal 2016). Even so, social platforms, such as WhatsApp, Facebook, and Instagram, are becoming popular as online marketing and advertising tools in the country.

▶▶ **FIGURE 2.3.**
DIGITAL COMMERCE RANKINGS, SELECTED AFRICAN COUNTRIES



● Nigeria ● South Africa ● Kenya ● Ghana ● Mozambique ● Tanzania ● Rwanda

Source: Data from WEF, 2016, Network Readiness Index.

Note: Total number of countries assessed = 139, best ranking is 1.

■ **BOX 2.1.**
JUMIA – AFRICAN E-COMMERCE PLATFORM

Jumia was founded in 2012 in Nigeria by two locals and two ex-McKinsey consultants. Today the company is known as the African Amazon. To thrive digital commerce in the continent, the company tackled Africa's digital commerce challenges:

- **Addressing** – Jumia partnered with over 100 thousand logistic partners.
- **Payment** – Besides cash on delivery option, the company developed JumiaPay to facilitate online and mobile payments, covering 54 percent of transactions in 2018.
- **African offering** – to attract local consumers, the platform partnered with African SMEs to offer products and services through its marketplace.

According to the company, after seven years of operations, they achieved (Jumia, 2019a):

- E-commerce operations in 14 African countries
- 1.2 billion consumers and 17 million SMEs to serve across Africa
- Over 700 million visits to their marketplace in 2018
- One transaction or lead every two seconds
- 81 thousand active local SME sellers on the platform
- Over 29 million products, hotels, restaurants, and other services listed

In April 2019, Jumia went public on the New York Stock Exchange (NYSE) and raised \$196 million in net proceeds. The share price, was initially offered at \$14.50; on June 10, 2019, the share price was \$24.88 (Jumia, 2019b).

■ **BOX 2.2.**
TRAINING AND SUPPORT TO INCREASE ONLINE PRESENCE OF GHANAIAN PRODUCTS AND SERVICES

- **Listing of firms** – To facilitate Ghanaian firms to be contacted online based on their business classification, the National Entrepreneurship and Innovation Programme (NEIP) is providing support to 10,000 businesses with a full directory, product images, and brief videos. Such contents are part of the listing diffused at Ghana Online Mall (<https://ghanaonlinemall.com>), a private digital platform.
- **Digital Marketing** – To stimulate the use of social media to market products and services online, the National Youth Authority (NYA), in partnership with the Kofi Annan Centre of Excellence in ICT, launched the e-Marketing and Digital Media Entrepreneurship Training Program, which in its first edition trained 2,900 young adults during three months throughout ten centers around the country.
- **Digital Commerce** – Made in Ghana Mall (<https://madeinghanamall.com>) is a NEIP Initiative to position a secure online marketplace for authentic made-in-Ghana products that can be delivered globally by using DHL international services. This domestic e-mall provides a tool for Ghanaian companies to showcase their products for free.

>>> Challenges

However, there are challenges and risks for the uprising of the platform economy in Ghana, which can be summarized as follows:

Institutional coordination. Work on digital commerce and the collaborative economy spans different ministries, departments and agencies, often with parallel and overlapping activities. This need for coordination includes dialogue with other relevant stakeholders, including the private sector, social entities, and customer groups.

Digital gap. There is a lack of information regarding digital commerce in the country, which narrows the understanding of challenges and opportunities, and limits monitoring of efforts taken. The large population is not benefitting from digital commerce or the collaborative economy since only 35 percent of the people are Internet users, and on digital skills the country ranks 76th (out of 139 countries) and 11th among 34 Sub-Saharan countries. If not properly addressed, the digital gap may increase economic inequalities among people.

Platform diffusion. Usage and development of private digital platforms in Ghana is growing but diffusion remains low, mainly because of low Internet user penetration (35 percent) and a low percentage of people doing online transactions (7.8 percent). Economic benefits of microwork are limited since only one percent of the population aged 15 and older are taking advantage of these platforms.

B2C and B2B are lagging. Ghana ranks 92nd in B2C transactions (WEF 2016). In Africa, B2C accounts for only one percent of retail sales, while the B2C share of global retail sales accounts for 10.2 percent with a total value of \$2.4 trillion (eMarketer 2017). Ghana ranks 99th in B2B transactions (WEF 2016), while only 28 percent of domestic firms have a website (World Bank 2017a). Considering that B2B typically represents 75 percent of digital commerce, this type of interaction needs attention to increase digital trade.

MSME digital maturity. There is no data at country level, but at the continental level, micro, small and medium enterprises (MSMEs) identify as their main bottlenecks to engage in digital commerce: that their products are not suitable, their technical knowledge, their business knowledge, and logistics costs (Mastercard Foundation 2019).

Buildup of reputation ratings. The hiring of workers in microwork platforms and buying products or services to new small and medium enterprises (SMEs) is mainly based on evidence, such as previous client testimonials, making it difficult for new entrants to digital platforms or to shift to another platform.

Data security and lack of trust. Shoppers in Africa are most likely to see data security as a barrier to shopping online in their own country (PayPal 2016). GSMA has estimated that as much as 85 percent of e-commerce transactions in Africa are "payment on delivery," a sign of a low-trust environment in which the buyer will only part with payment on evidence of delivery.

Standards compliance. The delivery of high-quality and standardized products and services to local and international markets is critical to support rapid economic transformation underpinned by strong growth of manufacturing. Reaching these high standards of products and services demanded by global trading partners and customers is a challenge for most Ghanaian companies.

Logistics. Ghana ranks 76th on the Integrated Index for Postal Development, which measures performance of countries at four dimensions: reliability, reach, relevance, and resilience (UPU 2018). The National Digital Property Addressing system brings a digital solution to mitigate difficulties but addressing in some parts of the country is still a challenge. In addition, package delivery solutions and logistic hubs can continue to improve delivery performance.

Tax policies. According to UNCTAD, governments should endeavor to strike a balance between ease of collection and fairness, and to be neutral with regard to different sectors of the economy. As such, care must be taken to avoid unintended consequences arising from tax policies on entrepreneurs, small businesses and the poorest members of society.

Risks for workers. There is global concern around the collaborative economy regarding potential harmful labor practices. Risks include poor pay, long working hours, and the lack of social protection for workers.

>> **Enabling Conditions to Create Platforms**

The Government of Ghana has embarked on a reform agenda to strengthen the regulatory and institutional framework for standardization and National Quality Infrastructure (NQI),¹² Upgrading NQI is being led by the Ghana Standards Authority (GSA) and the goal is to support companies to adopt appropriate production technologies and improved processes to ensure that all goods and services for international and domestic markets meet the required quality, environmental, and health and safety standards.

GSA faces a number of constraints limiting its capacity to implement its strategic plan and meaningfully contribute to key industrialization development and diversification programs. These include inadequate laboratory equipment, servicing and repair, inadequate provision of laboratory and office space, and insufficient training of GSA staff in metrology and certification of products and systems. One of the most critical shortcomings in the NQI system is the absence of a demand assessment for QI (Quality Infrastructure) services. This is needed so that the system can prioritize QI services, improving efficacy and efficiency in the utilization of public resources.

Ghana has recognized the power of data generated by digital platforms and the need to ensure that consumers have adequate control over their data. The data protection act was adopted in 2012, and officially launched the act in November 2014, to protect the privacy of consumers and personal data by regulating the processing of personal information. The act established a Data Protection Commission (DPC) whose mandate is to protect the privacy of the individual and personal data by regulating the processing of personal information.. In late 2018, the government established a Cyber Security Center and is in the process of developing a cybersecurity strategy and capacity to address the challenge of cybercrime. Ghana's cybersecurity ecosystem protects individual rights and privacy as well as general economic interests, as described in the Digital Infrastructure section, is in its early stages.

The effective implementation of data protection in Ghana has been affected by (i) lack of public sector commitment, (ii) financial challenges, (iii) lack of in-country data protection expertise, and (iv) enforcement challenges. In turn, there is limited awareness of the existence of DPC and of obligations of data controllers with low appreciation of data security issues and citizens' rights.

After long delays, in March 2019 the Ghanaian Parliament passed into law the Right to Information (RTI) Bill to allow citizens access information.¹³ It provides for the operationalization of the constitutional right to information from public and some private institutions, subject to exemptions that are necessary and consistent with the protection of the public interest in a democratic society. It also seeks to foster a culture of transparency and accountability in public affairs and to provide for related matters. On July 20, 2017, while delivering the keynote address at the Africa Open Data Conference held in Accra, the President affirmed that his government would ensure the passage of the bill to "encourage citizens to hold the government accountable and ensure greater transparency." The Research Department of Parliament has estimated that the implementation of the Right to Information in Ghana will cost 750 million (about \$140 million) over the next five years. The report which was compiled in 2017 indicated that the cost will revolve around the setting up of an RTI Commission.

The full potential of public data as a raw material for innovation and improved services is largely untapped in Ghana. The African Development Bank estimates that the economic potential of open data to Africa could equate to roughly 1–2 percent of the region's GDP, with significant opportunities to be gained for the region in the agriculture sector, in public procurement, and in geospatial data, and there is far greater upside potential than downside risk. Ghana's national program has been suffering from a lack of investment and oversight since its launch in 2012. Although several hackathons have been held to encourage the public to use the data, the current supply of 90 datasets from 11 agencies (in energy, agriculture, education, and health) is far from meeting the strong and growing demand for government data.

RECOMMENDATIONS AND NEXT STEPS

DP.R1

Strengthen NITA to facilitate the citizen-centric development of public sector digital platforms

NITA is a key player both as a service provider for MDAs and as an institutional anchor for the development of public sector digital platforms. As such, it requires both a significant boost in financing as well as a serious investment in its institutional, technical, human, and leadership capacity. The lack of trust in NITA's ability to provide services to MDAs is a bottleneck for the development of shared services and for utilizing the existing preconditions for interoperability. Change management strategies will also be required to shift NITA's approach to a more user-centric one, where the development of G2C and G2B, but also G2G services is thought about from the point of view of the end-user.

DP.R2

Prioritize the rollout of digital ID to enable access to digital services

The rollout of the Ghana Card program will lift the key constraints both on citizens' access to digital services as well as increase their efficiency and effectiveness. At the same time, to truly maximize the citizens' use of digital services, the rollout of the digital ID must go hand-in-hand with upgrade of NITA servers and an information and communication campaign to encourage their usage.

DP.R3

Emphasize public sector digital capacity building

The ability of the Ghanaian public sector to capitalize on digital back-office systems, shared services, and to provide digital services to citizens critically depends on the ongoing development of digital capacity among civil servants. The current situation suffers from very thin in-house capacity and an overreliance on contractors for ongoing upgrades. Building a cadre of government ICT professionals who work together with other technical specialists will increase the effectiveness and efficiency of the existing digital government platforms and their further development. This includes better change management to increase trust in digital platforms.

DP.R4

Strengthen protection of Ghanaians' data

There is a need to strengthen data protection expertise with international knowledge sharing activities on international good practices on data protection. The government's commitment to protect Ghanaians' personal data should warrant DPC's independence with own financial and logistic allocations to increase the operational capacity for awareness raising activities, investigations, and enforcement.

DP.R5

Revamp and enhance GODI to maximize social and economic value of public data

The adoption of a proper licensing regime for GODI would be the first quick-win step from the open data policy-making perspective. An open data policy serves the government users of Ghana and other "supply-side" organizations, and citizens and private sector consumers. Open data needs to provide policy guidance, instructions, requirements, and tools for implementing open data effectively in Ghana. The policy would need to spell out which types of data may not be considered open and why, and how to safeguard sensitive information. It may also enhance the governance of the GODI, describe interagency working groups and provide points of contact. The GSS must also venture into new territories and explore the potential role that big and open data could play in the development and dissemination of official statistics.

DP.R6

Develop a coordinated digital commerce support program

Build on a multiagency coordinated action plan, with a multistakeholder approach with a clear champion. The program should take advantage of ongoing local government efforts (such as NYA and NEIP), regional efforts (such as the Nairobi Manifesto on the Digital Economy and Inclusive Development in Africa (UNCTAD 2018) and private digital platforms (domestic and regional) to increase crossborder market (such as Jumia). Actions need to go beyond online advertising and move towards facilitating individuals and MSMEs (urban and rural) to complete digital commerce transactions to increase B2C and B2B in the country; and, build online reputation for individuals, MSMEs, and the country itself. Domestic efforts regarding training, rural coverage, logistics, and building trust in domestic commerce could benefit from lessons learned from international experiences, especially the Taobao Villages case (see box 2.3).

DP.R7.**Institutionalize data production and availability for evidence-based digital commerce policies**

Collecting data to monitor digital commerce and the collaborative economy is fundamental to define and assess policy actions and to measure the digital economy. Ghana needs to conduct enterprise surveys with special attention on innovation and technology (the most recent survey took place in 2013). To determine what questions and topics to include in surveys, the Ghana Statistical Service can review UNCTAD's "Questionnaire for Official Statistics on the ICT sector, and ICT use by enterprises"¹⁴ and the variables collected by Eurostat regarding ICT usage and e-commerce in enterprises. Surveys should be conducted every two years to maintain the relevance of the data collected. Given global efforts on standardization for digital commerce data, this recommendation focuses on bridging Ghana's data gap on digital commerce and is intrinsically linked to the fourth recommendation in Digital Entrepreneurship (R4) on a digital economy observatory.

DP.R8.**Establish a regulatory sandbox for digital commerce and microwork economy labor regulations**

Whether and how to regulate these topics are an ongoing discussion globally with no consensus on which is the better regulatory framework to adopt. A regulatory sandbox could provide a safe space to test innovative approaches in collaboration with the private sector and without damping the benefits of the digital economy. Topics could cover pay conditions, competition, tax regime, data protection, among others.

BOX 2.3.**RURAL E-COMMERCE DEVELOPMENT IN CHINA, TAobao VILLAGES**

China leverages e-commerce to create a sustainable business model in a rural area.

- **Taobao Village** is a typical example of online retail in rural areas, that sell local featured products, such as clothes, shoes, apples, and rice (AliResearch 2017).
- Its annual sales are over Y 10 million (about \$1.5 million), even though some merchants sell over Y 1 million (about \$150 million).
- At least 10 percent of village households actively engage in e-commerce or at least 100 active online shops operated by villagers, primarily with the use of Taobao.com and Tmall.com
- The number of Taobao Villages increased from 20 in 2013 to 3,202 in 2018 (World Bank 2019b).

Recognizing the opportunity, the Alibaba Group and local governments deployed training and infrastructure development "packages" to involve poor rural communities in e-commerce.

Ongoing research indicates that e-commerce is creating new opportunities for people, including for the less advantaged and those living in remote areas.

2.3 Digital Financial Services

IMPORTANCE OF DIGITAL FINANCIAL SERVICES

Digital financial services (DFS) offer a more convenient, secure and efficient way for people, businesses, and governments to access a range of financial products and services. Given their potential to enhance efficiencies and expand access to financial services, DFS are increasingly viewed as central to the health and development of a country's economy. Digital financial services can encompass a range of payments use cases (for example, retail payments, person-to-person payments, government payments, bill payments, remittances), as well as other products and services, such as credit, savings, and insurance. The products and services available to users are facilitated by modern financial services

infrastructure that can include credit bureaus, collateral registries, automated teller machines, point-of-sale devices, agent networks, Internet and mobile phone penetration. Innovation in DFS and the enabling infrastructure that supports it have expanded the types of providers offering financial services beyond traditional financial institutions, including mobile network operators (MNOs), financial technology firms (fintechs) and big tech platforms (for example, Apple, Amazon, Google, Facebook). By breaking down barriers to entry in the financial services industry, DFS can drive value for users and increase financial inclusion. Appendix A includes detailed data on DFS performance.

DIAGNOSTIC FINDINGS: CURRENT STATE OF DIGITAL FINANCIAL SERVICES

Recognizing the importance of catalyzing greater innovation in and adoption of DFS, the Government of Ghana has adopted a National Financial Inclusion and Development Strategy (NFIDS) 2017-2023. Cocreated with the World Bank, this new strategy outlines a series of reforms to increase financial inclusion from 58 percent in 2015 to 75 percent in 2023. The reforms are structured around five mutually reinforcing priority areas or pillars of financial sector development: (i) Financial Stability; (ii) Access, Quality, and Usage of Financial Services; (iii) Financial Infrastructure; (iv) Financial Consumer Protection; and (v) Financial Capability (World Bank 2018c). The NFIDS commits the government to priorities that will serve as important steps towards achieving the World Bank's DE4A Initiative objectives: Universal Access to Digital Financial Services, and creating the Africa-wide payments infrastructure 2030 are aligned with the NFIDS objectives. The DE4A Initiative will strengthen and complement the operations deployed under this new strategy, helping the Government of Ghana achieving its objectives of financial inclusion through leveraging the advantages and opportunities of digital technologies. DFS has the potential to make formal financial services more accessible and less costly, promoting efficiency and offering both the private sector and government several benefits in revenue collection and stimulating entrepreneurship growth.

Complementing the NFIDS, the Government of Ghana is working concurrently on a National Digital Financial Services Policy, which is currently being drafted by the Ministry of Finance and the Bank of Ghana. The DFS policy is expected to outline the government's vision for the country moving into the next decade, including that (i) a majority of Ghanaians will have secure access to a broad range of suitable and affordable digital financial services, and (ii) business and government will have achieved greater transparency and efficiency to contribute to the equitable economic growth of the nation.

The DE4A initiative is equally aligned with the government's Coordinated Program of Economic and Social Development Policies (2017-2024), especially with the priority of moving the country away from cash and towards electronic payments. The policies also outline other priorities for the financial sector, such as the need to undertake reforms that deepen financial markets, promote financial inclusion, and enhance the supervision and regulation of financial institutions.

Ghana was relatively early to issue branchless banking guidelines in 2008, which were intended to set the stage for the development of a digital financial services ecosystem in the country. However, several well-intentioned provisions in the guidelines were widely seen as hampering provider investment in new products and services such as mobile money. Recognizing these challenges, the BoG issued revised agent and e-money guidelines in 2015, which have been hailed by banks, mobile network operators, GSMA, the Ghana Telecoms Chamber, and others in the industry as a best practice policy framework for digital financial services. Most importantly, the new rules permit nonbanks to be directly licensed by the Bank of Ghana, allowing them to own and run e-money businesses and create an open and level playing field for various types of digital financial services providers (CGAP 2018a).

Since the adoption of the 2015 guidelines, the Government of Ghana has taken further steps to foster an inclusive digital financial system through the passage of the Payment Systems and Services Act in 2019. This new act, while still awaiting signature by the President, sets the stage for further competition and innovation by formalizing the licensing process for and opening the nation's financial infrastructure to fintechs, which have proliferated in recent years and are driving the development of new use cases and enhanced user experiences. This represents an unprecedented opportunity to expand the adoption and use of digital financial services.

In addition to an enabling regulatory environment, Ghana has already deployed the necessary infrastructure to promote digital payments. Ghana Interbank Payment and Settlement Systems (GhIPSS), a wholly owned subsidiary of the Bank of Ghana (BoG), provides the backbone of the country's digital payments infrastructure. GhIPSS facilitates interbank transfers, automated teller machine (ATM) networks, domestic card payments, automated clearing house (ACH), and mobile money interoperability.

- Gh-link™** switches and clears all transfers and facilitates net settlement in the BoG RTGS (Real-Time Gross Settlement) for ATM networks, domestic card payments, interbank transfers and interoperable transfers between mobile money providers and financial institutions. Importantly, financial institutions and mobile money providers are the only participants in Gh-link, with fintechs currently not connected to the switch. Gh-link also includes GhIPSS Instant Pay (GIP), which allows payments to be sent instantly between accounts at different financial institutions using channels such as Internet banking, mobile, ATM, POS or tellers. For the moment, GIP participation is limited only to banks – mobile money providers and fintechs not participants.
- E-Zwich** is the brand name for the National Switch and Smart card payment system. The E-Zwich system consists of a biometric smart card (E-Zwich card) that acts as a digital wallet for cardholders and switch that allows for cash-in/cash-out at branches, ATMs, and agents of participating financial institutions. The payment system was initially introduced in 2008 (before the advent of mobile money) as a way to interconnect financial institutions and provide an alternative to foreign card schemes that would also be accessible by smaller, rural banks. Smart card holders can transfer funds between E-Zwich cards and accounts at these institutions and can use the cards to make purchases at merchant locations with E-Zwich-enabled POS devices. The cards are issued by participating banks.
- Ghana Automated Clearing House.** GACH can be used to handle bulk or single electronic credit and debit of funds and does not require scanned documentation. There are two types of ACH transfers, namely ACH Direct Credit and ACH Direct Debit.¹⁵

With support from the World Bank's e-Ghana Project, Ghana has also rolled out a new Ghana E-Payment Portal (GEPP),¹⁶ which is designed to facilitate electronic payment for government services by citizens, businesses, and other entities conducting business with the GoG. The e-Payment Portal accepts a range of payment options, including card payments, mobile money, and bank transfer. Available services include payment of fixed fees, tangible goods, and services payments. Payments for taxes are also supported.¹⁷

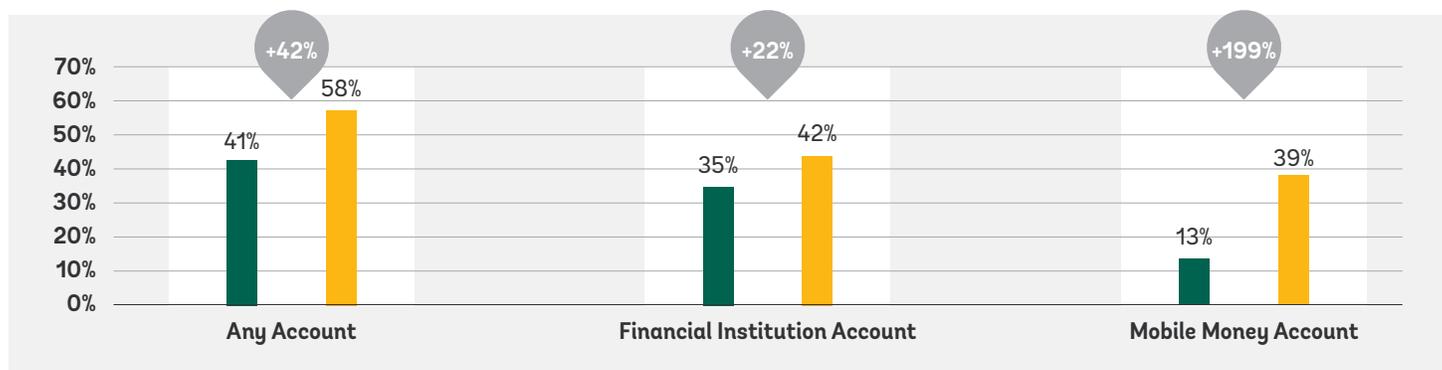
Nevertheless, Ghana has made substantial progress on financial inclusion, due in large part to growth in digital financial services.

According to the World Bank's Global Findex, the share of Ghanaian adults (age 15+) with a formal financial account increased by 42 percent between 2014 and 2017. As a result, nearly 6 in 10 adults had formal access in 2017. The percentage of adults with an account (by themselves or together with someone else) at a bank or another type of financial institution or who had used a mobile money service increased from 41 percent in 2014 to 58 percent in 2017. The number of adults who made or received a digital payment in the past year increased from 25 percent in 2014 to 49 percent in 2017 (Findex 2017). The percentage of Ghanaians with an account at a formal financial institution (bank or Nonbank financial institution, NBFi) grew by 22 percent between 2014 and 2017, while mobile money account ownership increased by nearly 200 percent over the same time period (see figure 2.4). Thanks largely to this dramatic rise in mobile money account ownership, the majority of Ghanaians (58 percent) are now financially included – a 42 percent increase over 2014 (Findex 2017).

With mobile account ownership on the rise, mobile money has become the preferred payment alternative to cash when measured in terms of transaction volumes.

Cheques remain the dominant cash alternative for higher-value payments, but statistics indicate that mobile payments are not far behind (see figure 2.4). While card-based payments, including E-Zwich, have not witnessed the same level of adoption because of the ongoing scarcity of POS terminals at merchant locations, these channels have also grown in usage over recent years.

►► **FIGURE 2.4.**
OWNERSHIP OF ACCOUNTS (2014 & 2017)



Source: Global Findex.

● 2014 ● 2017

▶▶ **FIGURE 2.5.**
VALUE AND VOLUME OF PAYMENT TRANSACTIONS PER PAYMENT INSTRUMENT 2017



Source: Bank of Ghana. PAYMENT SYSTEMS OVERSIGHT ANNUAL REPORT, 2017

The increase in E-Zwich card transaction volumes and number of cards is largely the result of a government decision to digitize G2P payment streams such as the Livelihood Empowerment Against Poverty (LEAP) social transfer program and government employee salaries using the cards. However, use of the card beyond receiving payments remains relatively low, as indicated by low average account balances. Limited merchant acceptance and cash-out points mean that most recipients simply withdraw their funds upon receipt, thus limiting the potential for these cards to contribute to broader digital payments usage (BTCA 2017).

Importantly, the increasing popularity of mobile accounts has also facilitated a rise in digital financial services beyond payments. Mobile money increasingly serves as the rails for a range of bank and fintech products and services, including savings accounts, pensions, credit, remittances and even investment products such as treasury bills. In some cases, these services are offered in direct partnership with mobile money providers and can be accessed directly on the provider's Unstructured Supplementary Service Data (USSD) menu, while in other cases they are offered as over-the-top (OTT) services that leverage mobile money as a payments channel.

Moving forward, the Government of Ghana has embarked on an ambitious digitization agenda that bodes well for ongoing innovation in, and adoption of, digital financial services. The roll out of a new biometric national identity card (the Ghana Card) and digital addressing system (Ghana Post GPS) will offer additional pieces of market-level infrastructure that can support a more robust DFS ecosystem. Examples of how this new digital infrastructure can be leveraged to support greater financial inclusion include digital know-your-customer (KYC) utilities (CGAP 2018c), data sharing utilities, and a more inclusive digital payments ecosystem that allows for greater competition between providers and drives greater value for customers.

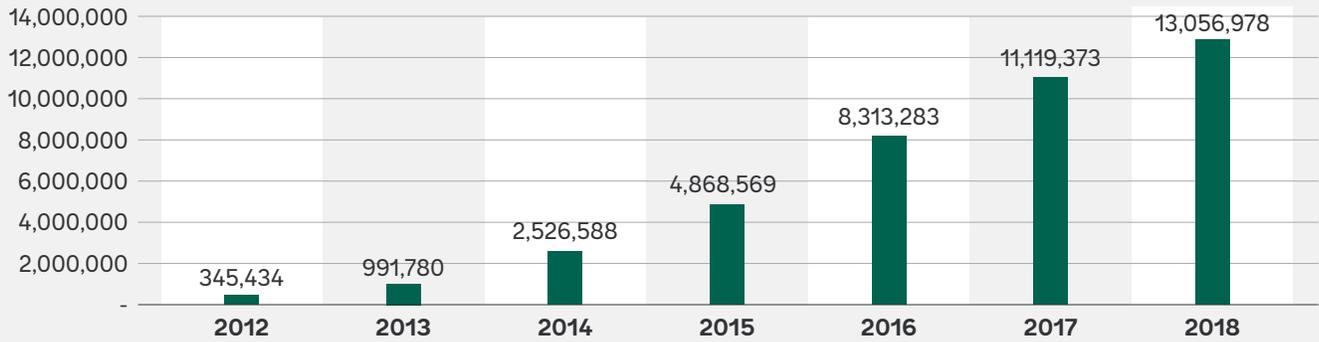
>> **Mobile Money**

Expansion of agent banking as a delivery channel for financial services. Following the adoption of the 2015 E-Money Issuers (EMI) guidelines, there was an explosion in provider investments in agent networks (see figure 2.6). These investments in crucial cash in/cash out points are widely seen as a prerequisite for greater adoption of mobile money, and this is borne out by payments system statistics that show the number of active accounts and transaction volumes increasing alongside the number of active agents in the country (see figure 2.6).

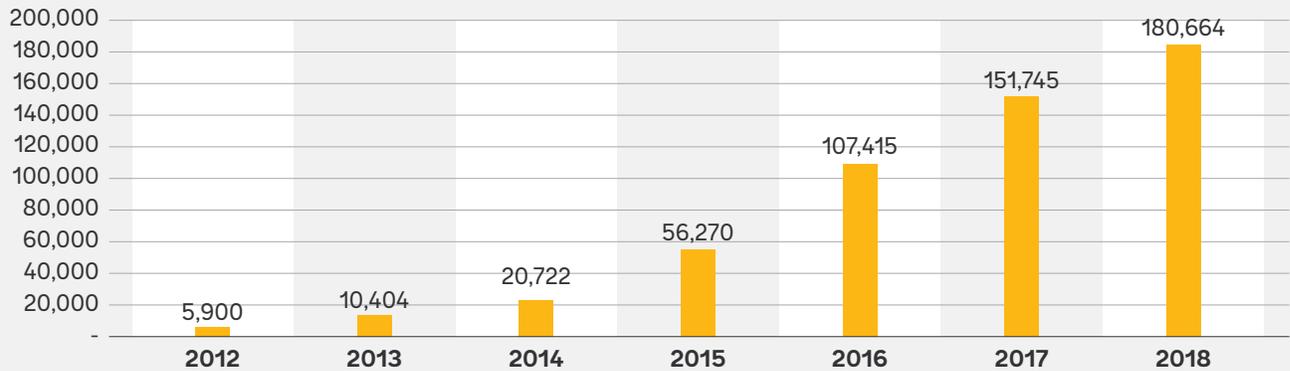


▶▶ **FIGURE 2.6.**
ANNUAL ACTIVE MM ACCOUNTS, ACTIVE MM AGENTS AND VOLUME OF MM TRANSACTIONS

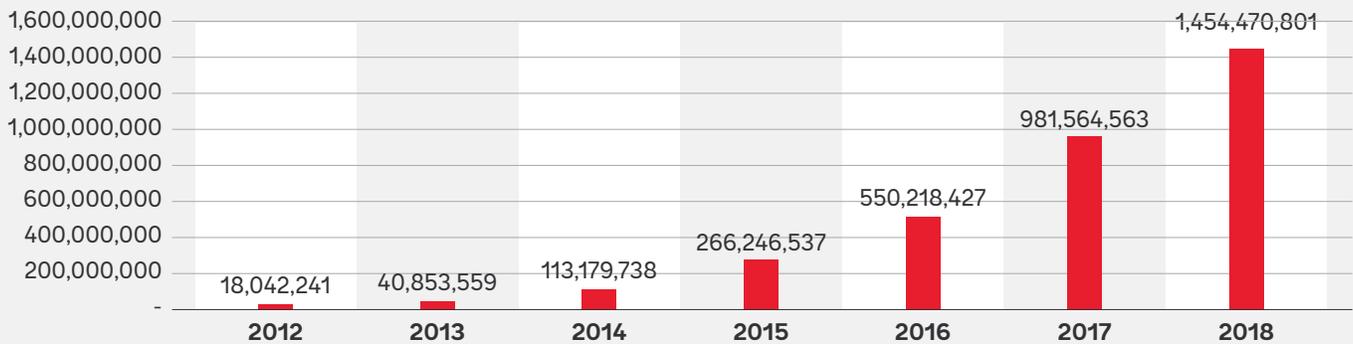
ACTIVE MOBILE MONEY ACCOUNTS



ACTIVE MOBILE MONEY AGENTS



VOLUME OF MOBILE MONEY TRANSACTIONS



Year	2012	2013	2014	2015	2016	2017	2018
Active mobile money accounts	345,434	991,780	2,526,588	4,868,569	8,313,283	11,119,376	13,056,978
Active mobile money agents	5,900	10,404	20,722	56,270	107,415	151,745	180,664
Volume of transactions	18,042,241	40,853,559	113,179,738	266,246,537	550,218,427	981,564,563	1,454,470,801

Source: BoG 2018b.

Thanks to its decision to invest aggressively in agent networks even before the adoption of the 2015 guidelines, MTN Ghana has emerged as the main player in the mobile money space with approximately 75 percent of the country's active accounts in 2017. Questions remain regarding the impact of MTN's dominance on competition in the space, even as a range of new players, products, and services enter the market to challenge MTN's position (CGAP 2018a).

Another factor driving mobile money adoption is widespread mobile phone ownership and network coverage. The most recent data available shows that 87 percent of Ghanaians were covered by a mobile network in 2016 (WEF 2016b). In 2017, 67 percent of Ghanaians owned a mobile phone, which indicates some room for additional growth as this stands well above the 39 percent mobile money account ownership. At the same time, smartphone ownership remains relatively low, at just 27 percent in 2017 (GSMA 2017). Given the importance of smartphones as a channel for fintechs and over-the-top (OTT) products and services, future increases in smartphone penetration may also lead to greater competition, innovation and customer choice.

One of the most important factors behind mobile money adoption has been an enabling regulatory environment created by the government's release of the 2015 EMI guidelines. These regulations include a number of best practices, including mandating that mobile money providers pass the interest earned on float along to customers (pass-through interest), which has increased the attractiveness of money wallets as stores of value rather than just transaction accounts. Furthermore, the guidelines stipulated that mobile money accounts would be included in the country's deposit protection scheme, while also featuring less stringent KYC (Know Your Customer) requirements (tiered-KYC) – thus making it safer and easier for excluded customers to open an account (CGAP 2018c).

With many of the necessary pieces of an inclusive digital payments ecosystem in place, the government's recently mandated Mobile Money Interoperability (MMI) offers a further opportunity for growth. Interoperability refers to the ability of mobile money providers to interconnect with each other, and it is commonly assumed that this ability to transact across provider networks provides additional value to consumers by removing barriers to person-to-person (P2P) payments, merchant payments, and more. In May 2018, the BoG mandated that all mobile money providers connect to GHLink, with full interoperability between mobile money providers and banks introduced in December 2018. This arrangement allows for the seamless movement of funds between and among mobile money, bank, and E-Zwich accounts.

Despite this robust electronic payment infrastructure, Ghana remains a cash-based economy. 98.72 percent of payments by volume are still in cash and the main noncash instrument continues to be checks. The current extensive use of cash in Ghana among individuals results from (i) the high cost of digital payments that is often passed on to users (that is, charging customers a fee to use credit cards or mobile money); (ii) trust issues with using digital payments, and (iii) the low penetration of debit and credit cards and low availability of POS devices at merchant points (BTCA 2017).

Still, additional challenges remain. Without business rules in place to govern pricing and other aspects of the scheme, many providers have effectively discouraged their customers from sending money off-net by increasing the fees for these transactions. As a result, interoperable transactions remain just a fraction of overall transactions (see table 2.7). Additionally, fintechs are not yet connected to GHLink and there are no clear rules governing participation in the scheme (BTCA 2017).

►► **TABLE 2.7.**
VOLUME AND VALUE OF MM INTEROPERABILITY, 2018

Year	Mobile Money Interoperability	Mobile Money	Interoperability Ratio
Volume	2,266,631	1,454,470,801	0.16%
Value (¢ million)	212.89	223,207.23	0.10%

Source: BoG 2018a.

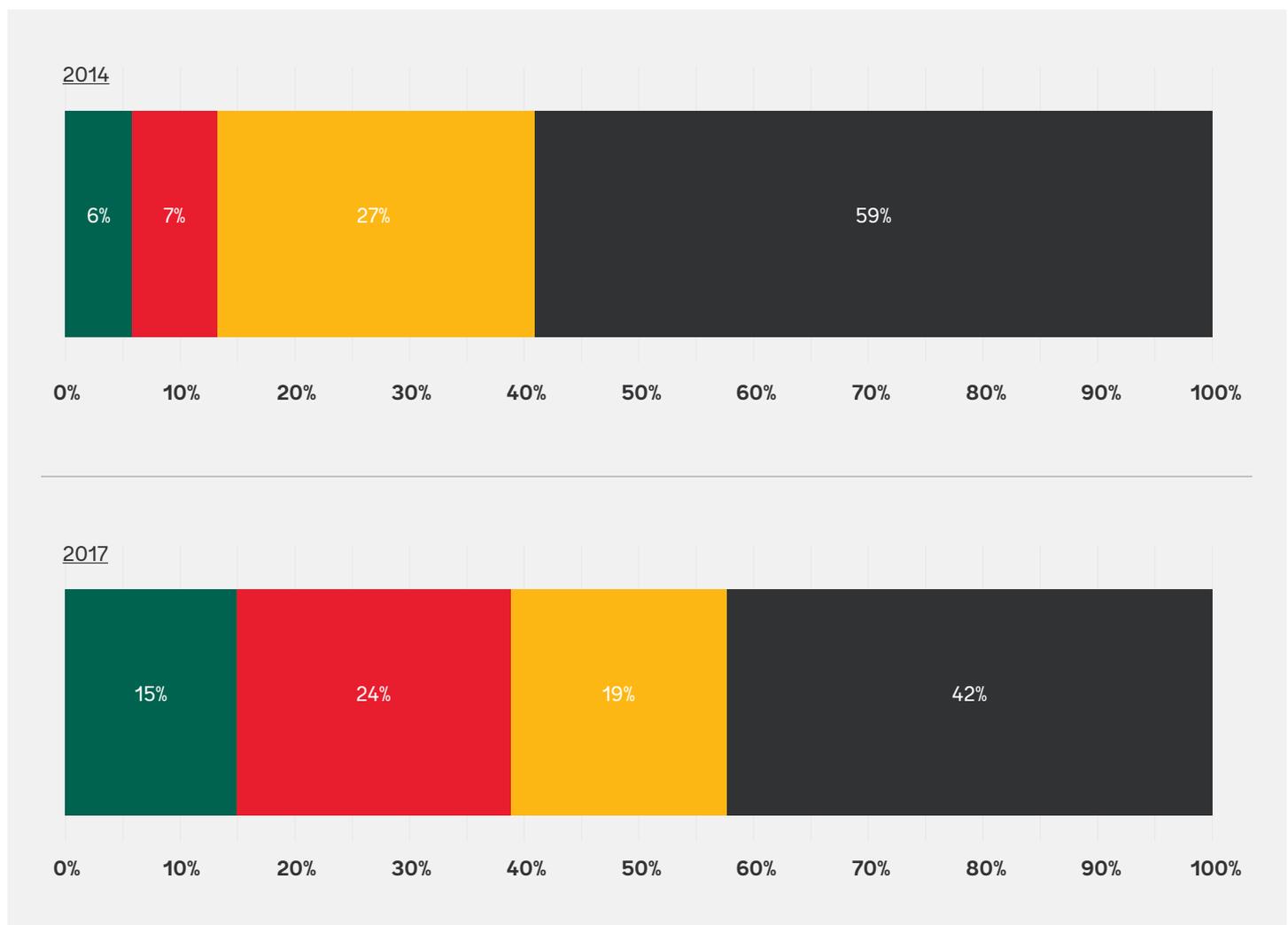
Payment aggregators represent yet another key piece of Ghana's mobile money ecosystem. At a basic level, all aggregators do two things: Integration, where they connect the systems of payment instrument providers to third party systems; and value-added services (VAS), like notification of successful payments, reconciliation, and receipts (CAGP 2019). It is quite difficult for utilities and other service providers to integrate directly with each MM provider – instead they go through aggregators, which saves them the work

of connecting to each provider API (and saves the MNOs the time of providing support to each service provider to use their APIs). Through these bilateral integrations, digital payment providers are able to offer a broad range of innovative solutions, such as; digital savings accounts, where money can be moved back and forth between a mobile wallet and an account at a bank, insurance products, credit products, and more.

Overall, the success of mobile money in Ghana has not only contributed to greater account ownership, but also to a broad transformation in how Ghanaians pay for goods and services and access financial services. This transformation is highlighted by mobile money's contribution to overall account ownership, in which 15 percent of Ghanaians are included by mobile money alone, while another 24 percent have both a mobile money account and some other form of formal financial institution account (bank or NBFi) (see figure 2.7). Furthermore, given the availability of formal savings/credit products offered in partnership with mobile money providers, it may be reasonable to assume that some of the significant increase in individuals who have both a mobile and financial institution account points to mobile money having a role in expanding access to bank and NBFi services. Findex finds that of those with a financial institution account, 29 percent used a mobile phone or the Internet to access their account in the past year. In fact, there is evidence that DFS such as mobile money has already made a strong contribution to increases in financial inclusion in Ghana.

As adoption of mobile money continues to grow, its impact is also being felt throughout the country's economy. For example, rural use of mobile money is on the rise, with 35 percent of adults in rural areas reporting that they had used a mobile money service in 2017 (up from 12 percent in 2014) (see figure 2.8). This has also had an impact on the agriculture sector, illustrated by an increase in the number of adults who have received a payment for agricultural products (9 percent in 2017 versus 1 percent in 2014) (Findex 2017). Still, the persistent gap in account penetration between rural and urban areas suggests that action could be taken to stimulate uptake. Mobile network coverage continues to be weakest in rural areas, where the economics of establishing towers remain challenging (GSMA 2017). Expanding network coverage in rural areas could offer a means towards driving greater adoption. Furthermore, given the importance of agriculture to Ghana's rural economy – it contributes nearly 20 percent to GDP (World Bank 2017c) – digitization of payments in agricultural value chains could also contribute to higher usage among rural populations.

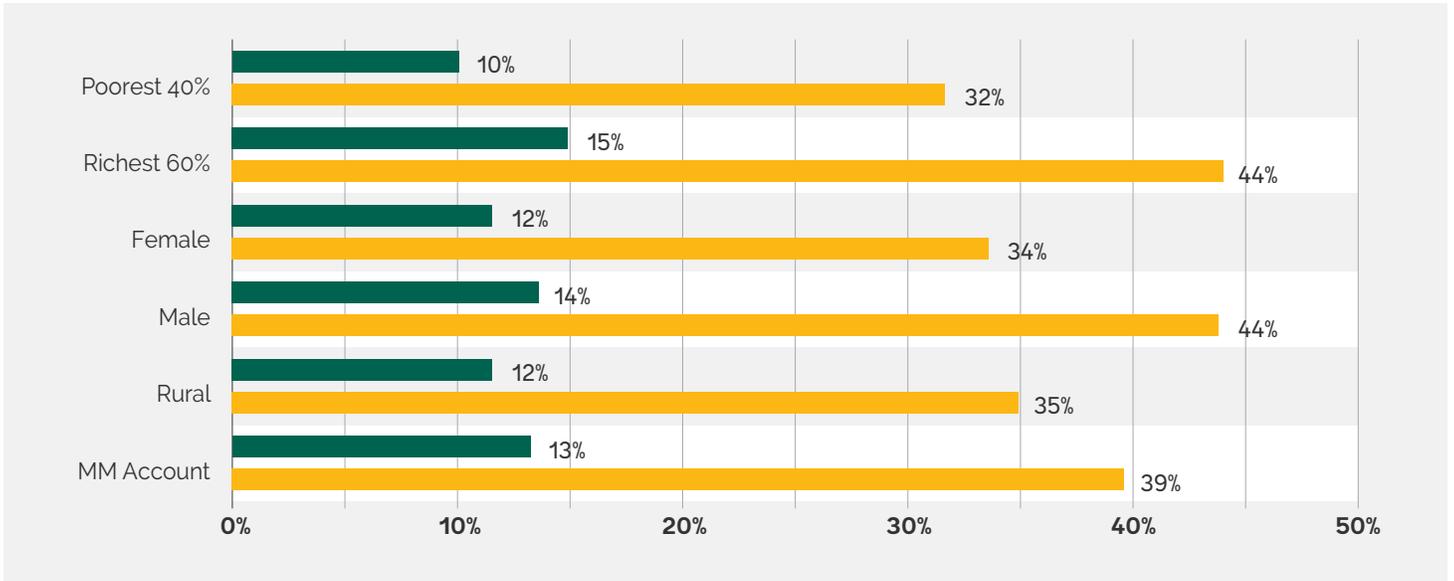
►► **FIGURE 2.7.**
FINANCIAL INCLUSION BY ACCOUNT TYPE 2014 VS 2017 PER PAYMENT INSTRUMENT 2017



Source: Global Findex

● Mobile Money Only ● Mobile Money and FI Account ● FI Account Only ● No Formal Account

►► **FIGURE 2.8.**
MOBILE MONEY ACCOUNT USE BY POPULATION SEGMENT 2014 VS 2017



Source: Global Findex

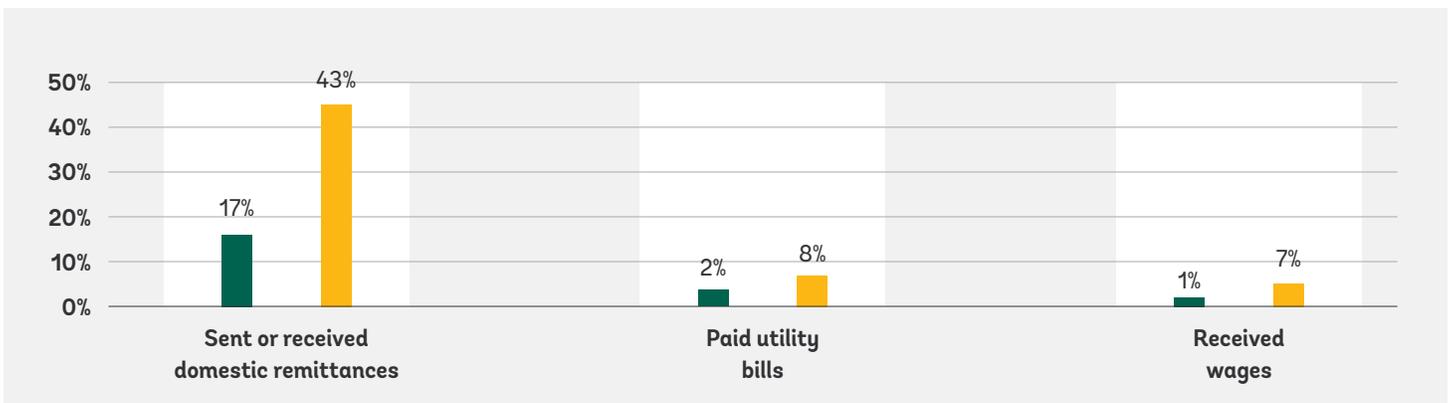
● 2014 ● 2017

There is also evidence that the financial inclusion impact of mobile money has accrued to both women and low-income households.

An analysis of Findex data suggests that of the increase in mobile money account use between 2014 and 2017, about 43 percent of new users were women. However, women’s use of mobile money continues to lag behind that of men, with 34 percent of women reporting having used mobile money compared to 44 percent of men. While use among the poor has also increased, a similar gap between rich and poor Ghanaians remains: 32 percent of the poorest 40 percent used mobile money compared to 42 percent among the country’s richest 60 percent.

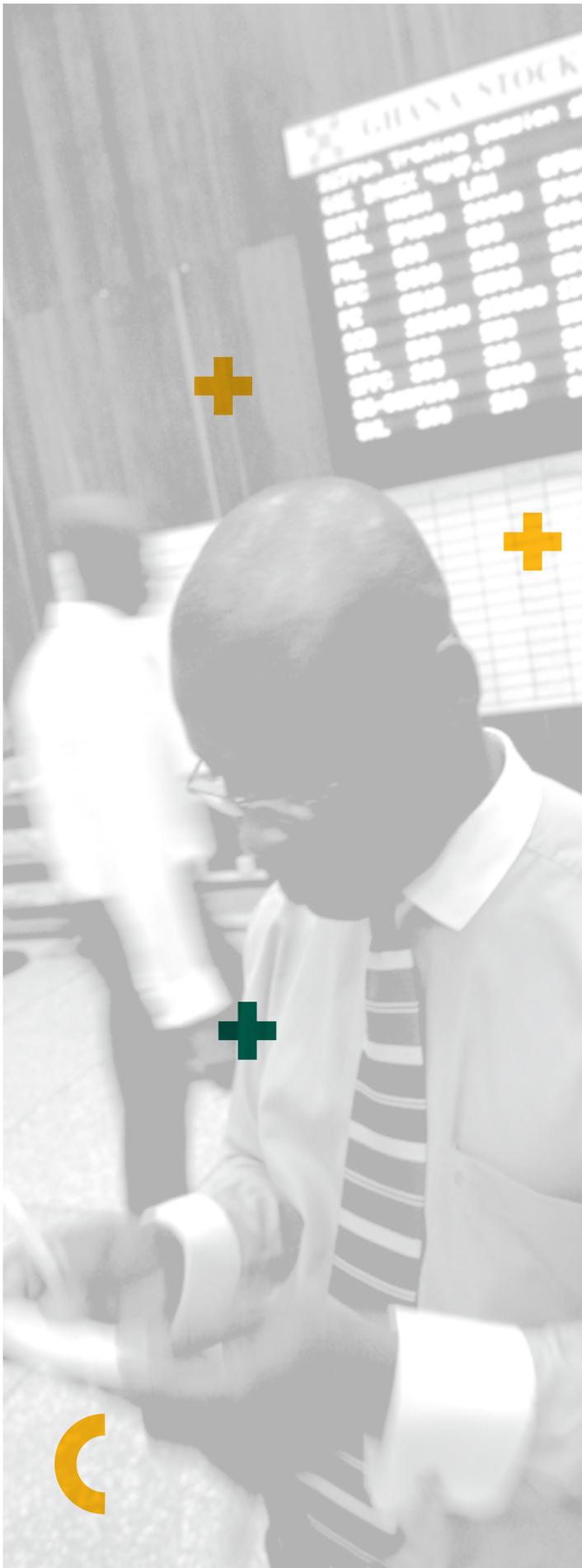
The most common mobile money transactions in Ghana are the transfer of value from one person to another person (P2P), payment of goods and services such as buying airtime, paying for utility bills, and digital satellite television (DSTV) bills, salaries of some workers, taxi fares, microcredit, savings and microinsurance (Findex 2017). Since 2014 the percentage of adults paying utility bills (water, electricity or trash collection) using a mobile phone increased from 2 percent to 8 percent (see figure 2.9). In terms of wages, in 2017, 7 percent of adults received their wages through a mobile phone, a substantial increase since 2014, when only 1 percent of adults received their wages through a mobile phone. However, the main driver of mobile money use continues to be P2P, with 43 percent of adults reporting that they had either sent or received domestic remittances via mobile phone (Findex 2017).

►► **FIGURE 2.9.**
MOBILE MONEY USE 2014 VS 2017



Source: Global Findex

● 2014 ● 2017



Despite the increasing diversity of use cases for mobile money, there are several untapped opportunities for growth. For example, few if any Ghanaians receive government payments via mobile phone despite near 100 percent digitization of these payments (Findex 2017). One reason for this may be the government's decision to promote use of the E-Zwich card for payment of government salaries and benefits, which has increased use of the card over the past several years. Moreover, the Better than Cash Alliance (BTCA) finds that nearly 100 percent (99.9 percent) of payments for consumption goods by volume are made in cash, indicating a significant opportunity for increasing use of mobile money for merchant payments. When it comes to these merchant payments, mobile offers an advantage over card payments as BTCA cites the unavailability of POS terminals at merchants as a key barrier to greater digitization (BTCA 2017).

As mobile money has become increasingly common, the nature of competition has also evolved, with some financial institutions engaged in a type of "coopetition" in which they use mobile money services and agent networks as channel to reach new customers (CGAP 2018a). In September 2016, Ecobank Capital Advisors, a subsidiary of Ecobank, launched Ecobank TBill4All in collaboration with MTN Mobile Money. The Ecobank TBill4All is a self-service digital product that allows Ghanaians to invest in 91-day and 182-day Treasury bills using MTN's mobile money platform (BTCA 2017). There are also a range of savings, credit, and insurance products offered by mobile money networks in partnership with financial institutions. However, banks are also launching their own mobile financial services, including Ecobank's Masterpass QR solution that allows customers to pay merchants by scanning a Quick Response (QR) code displayed at checkout on their smartphones, or by entering a merchant identifier into their feature phones.

One negative consequence of increasing mobile money use is that these payments services are increasingly the target of fraud. According to the Ghana Chamber of Telecommunications, MTN Mobile Money, TigoCash, Airtel Money, and Vodafone Cash recorded 388 money fraud cases in 2016, up from 278 in 2015 (African Eye Report 2017).

In this context, the speed of DFS development tends to leave in its wake a range of "catch-up" work to fill in and harmonize financial consumer protection (FCP) standards. Ghana has a comprehensive framework for consumer recourse that applies to all financial services providers (including EMIs). However, the framework for disclosure is more fragmented, with a specific regulation on credit products (other than credit cards) and disclosure provisions included in the e-money guidelines (there are still no rules specified for savings products). On the other hand, protections against error and fraud in payments services are insufficient, although there is a significant push underway in Ghana to address these issues (CGAP 2018b).

>> **FinTech Ecosystem**

There are several private sector digital platforms resulting from the growing competition in the financial technology (fintech) space in Ghana. Payment aggregators, such as Interpay, Slydepay, expressPay and others have invested in the development of services that support card, mobile, and web (Internet banking) payments. They also offer interoperable P2P transfers and electronic payments for government services, utility payments, merchant payments and the convenience for customers to pay school fees to many educational institutions in Ghana with their mobile phone (BTCA 2017). Some payment aggregators have also deployed technologies like near field communication (NFC) to make electronic payments more convenient.

The microinsurance is a sector where fintech innovation has been concentrated. Generally known for loyalty-based, "freemium" products, microinsurance companies such as BIMA, MicroEnsure, and aYo, a joint venture between MTN Group and MMI Holdings, have formed strategic partnerships with mobile money providers (MM providers) and banks to offer customers one-month insurance policies that cover life, hospitalization, maternity, and disability, among other policies. The People's Pension Trust has partnered with Vodafone and Dusk Capital to develop a mobile-enabled pension product that is targeted at informal workers. This innovative pension product allows workers in the informal sector to make voluntary pension contributions through Vodafone Cash (BTCA 2017).

Moving forward, the recent passage of the Payment Systems and Services Act (PSSA) will further drive innovation in the fintech space. Fintechs are currently prevented from receiving licenses from the Bank of Ghana and connecting to the national switch, which excluded them from the interoperability scheme and forced them to forge bilateral connections with providers. But as the PSSA has made its way through the legislative process, the Bank of Ghana has recently been proactive in involving fintechs in regulatory dialogue. Once the PSSA is signed into law (enacted in September 2019), the act will address many of the impediments to fintech innovation by formalizing a licensing process for fintechs and allowing them to benefit from the country's robust payments infrastructure, including through inclusion in the interoperability scheme.

>> **Digitization of Government Payments**

Almost 100 percent of all government-to-person (G2P) and government-to-government (G2G) payments are digital. However, about 90 percent of government-to-business (G2B) and other government payments by volume are still made via check or cash (BTCA 2017). In terms of value, 86 percent of government payments are made electronically, but person-to-government (P2G) and business-to-government (B2G) payments remain largely cash based. In the case of B2G, 47 percent of total payments by value are made electronically, whereas just 27 percent of P2G payments are conducted electronically.

While multiple channels are currently available for government payments (E-Zwich, mobile money, cards and direct debit/credit), most of the recent increase in electronic government payments are E-Zwich transactions. In order to promote the E-Zwich scheme, the government encourages use of the system for payment of salaries for civil servants, payments to beneficiaries of Livelihood Empowerment Against Poverty (LEAP), and personnel of the National Service Scheme (NSS). The promotion of E-Zwich for G2P payments has been to the exclusion of other channels such as mobile money: in 2017, just 6 percent of adults received government payments through a mobile phone (Findex 2017). Still, the adoption of E-Zwich beyond government payments has been a constant challenge. At this stage most, E-Zwich transfers are being immediately cashed out by recipients, meaning that government payments are not being retained in the electronic payment's ecosystem (BTCA 2017).

P2G payments (for example taxes represent an opportunity for digitization, and the government has allowed for the use of mobile money for some services, including payment for passport applications and school fees. But according to the most recent data from Findex, just 1 percent of Ghanaians used a mobile phone to pay school fees in 2014. For some payments to government, the launch of the Ghana E-Payment Portal (GEPP) offers an opportunity for greater digitization in the future. However, a transaction fee is charged to customers for usage of the portal, so it is not surprising that there is low uptake of these services to date (BTCA 2017).

RECOMMENDATIONS AND NEXT STEPS

Government can build upon its digital financial services success and drive greater financial inclusion and financial sector development by considering the following recommendations:

DFS.R1.

Mobile money interoperability

High mobile phone penetration, investments in robust agent networks, and a proliferation of use cases have made mobile money one of the most promising drivers of financial inclusion in Ghana. Recent steps to implement interoperability are promising, especially as they reduce barriers to use and acceptance of digital payments by allowing for the seamless transfer of funds across providers. However, in order to go beyond technical interoperability, which has sometimes failed to drive transaction volumes in other markets, a more holistic perspective is needed. For interoperability specifically, this means looking at governance and business rules that drive incentives in the scheme (who can participate and under what conditions, pricing, and so on). Specific recommendations include allowing fintechs to connect to GhIPSS, while also revisiting rules around transaction pricing to encourage greater adoption by customers. Furthermore, government should consider expanding interoperability to allow both mobile money providers and fintechs to participate in GhIPSS InstantPay, thereby facilitating real-time interoperable payments that would increase the attractiveness of digital payments versus cash.

DFS.R2.

Drive greater digitization through opening new channels for government payments

Current efforts to promote E-Zwich card usage by using the cards to pay government salaries and benefits have led to the successful digitization of these payment streams. However, the lack of merchant acceptance points and cash in/cash out points mean that the funds in these accounts are immediately withdrawn upon receipt. Government should endeavor to open up payment options for recipients so that they can choose the most convenient mode of payment, including mobile money. By offering payment to recipients' preferred provider, there is a greater likelihood that the funds will remain in digital form and will thus contribute to Ghana's cash-lite vision.

DFS.R3.

Encourage competition and promote an enabling environment to drive DFS innovation

The roll out of the biometric Ghana Card national ID, digital addressing through Ghana Post GPS and real-time payments through GhIPSS Instant Pay present an enormous opportunity for digital financial services. Markets such as India, Bangladesh, Thailand, and others have connected these pieces of infrastructure to offer a range of new use cases and overcome barriers to DFS use. For example, biometric ID and digital addressing systems can be leveraged to create a digital KYC utility that automates customer due diligence and overcomes barriers to account opening. These systems could also be connected to create a secure store of personal data that could be shared on-demand with providers in order to qualify for credit or other financial services. Additionally, connecting ID systems to real-time payments can further enhance interoperability by enabling customers to perform instant transactions everywhere regardless of device, provider, or account type by simply verifying their biometric identity. Such a system could help to overcome barriers to merchant payments and increase competition by levelling the playing field between banks, MNOs, and fintechs. Increasing the use of DFS depends on ensuring affordability and relevance of use cases to citizens and businesses alike. One way to achieve this goal is through encouraging greater competition, which drives innovation and pushes down costs, thus producing greater value for customers. The government should proceed with the implementation of the draft Payment System and Services Bill in a way that facilitates risk-based licensing and oversight of fintechs by the Bank of Ghana. The Bank of Ghana should also allow fintechs to connect to GhIPSS and participate in the country's interoperability scheme in order to level the playing field and allow them to compete directly with banks and MNOs. Finally, the government should continue to resist proposals to impose new taxes on mobile money transactions, which risks driving up prices and slowing Ghana's transition to a cash-lite economy.

DFS.R4.**Adopt policies that encourage greater use of merchant payments**

A key barrier to further advances in digitization is the low uptake of merchant payments. When customers cannot use electronic funds to pay for goods and services, there is a greater likelihood that they will convert these to cash, thus undermining the government's vision of a cash-lite economy. Working with providers to reduce the cost of merchant payment transactions is one way to increase the attractiveness of paying digitally, while interoperability and other policies that ease the cost of merchant acquisition can increase acceptance points and thus the convenience of digital payments.

DFS.R5.**Expand rural adoption by facilitating investments in last mile infrastructure and the digitization of agricultural value chains**

Given the importance of agriculture to Ghana's economy, particularly key value chains such as cocoa, digitization of payments along these value chains could contribute significantly to rural adoption of DFS, which currently lags behind that of urban citizens. Government should work with providers to stimulate investment in rural network coverage, agents, and merchants that make DFS more accessible to rural households. Policies that encourage the sharing of infrastructure like towers and agents can help expand coverage. Additionally, incentives such as tax rebates or other support offered to providers who invest in underserved rural communities could help to narrow the access gap. Finally, the government should work with agribusinesses and the Cocoa Board to encourage digitization of bulk payments to producers, which can help to drive adoption and usage of DFS not only among farmers but also within rural economies.

DFS.R6.**Strengthen digital financial consumer protection policies**

There must be a well-developed strategy for digital financial customer protection regulation that covers areas such as effective consumer redress through internal dispute resolution (IDR) and external dispute resolution (EDR) mechanisms and supervision by the Bank of Ghana. A well-regulated consumer services protection policy will boost confidence in the usage of digital financial services. Ghana currently boasts a comprehensive framework for consumer recourse that applies to all financial services providers. But the framework for disclosure is fragmented, with a specific regulation on credit products, disclosure provisions included in the e-money guidelines, but no rules for savings products. Protections against error and fraud in payments services are also insufficient (CGAP 2018b). The country should push for a more comprehensive disclosure framework. Furthermore, given the importance of protecting consumer privacy and data, efforts should be made to ensure that adequate resources are allocated to the Data Protection Agency (DPA) and it should be empowered to supervise service provider compliance.

DFS.R7.**DFS and e-money regulation and surveillance**

The government needs to strengthen the digital financial services monitoring and evaluation (M&E) and compliance procedures, implementing an efficient surveillance system and a robust regulation framework for E-Money Issuers, especially regarding capital requirements, provisions to cover financial risks, and e-money issuing permissions. The Payment Services and Systems Bill (PSSB) under consideration by the government must be reinforced with an increased budget for effective implementation. The E-Money Guidelines foresee that electronic money will be issued by both regulated financial institutions and duly licensed nonbank entities (such as subsidiaries of MNOs and other third parties) engaged solely in the business of e-money and incidental activities, defined as Dedicated Electronic Money Issuers (DEMI). While they came into force since 2015, the E-Money Guidelines have not yet been fully implemented. Therefore, although direct licensing of DEMIs is possible in theory, given the lack of implementation, E-Money Issuers have not yet been licensed and are still being regulated informally (BTCA 2017). Likewise, capacity building of public workers and private companies' experts in this field is a must.

2.4 Digital Entrepreneurship

IMPORTANCE OF DIGITAL ENTREPRENEURSHIP

Digital entrepreneurship can be defined as the formation of new ventures and the transformation of existing business by creating and using novel digital technologies. Digital enterprises are characterized by a high intensity utilization of new digital technologies (particularly social, mobile, analytics, and cloud solutions) to improve business operations, invent new (digital) business models, sharpen business intelligence, and engage with customers and stakeholders through new (digital) channels. Establishing entrepreneurship ecosystems depends on a range of factors that go beyond investment into traditional inputs such as R&D, infrastructure, and education.

Helping create the ecosystem for entrepreneurship may further grow the digital economy: Harnessing the potential of disruptive technologies to drive Africa's transformation requires addressing the main barriers to digital entrepreneurship. While countries in Africa have made great strides in fostering entrepreneurship ecosystems, progress is mostly clustered in a few countries and urban centers.

African entrepreneurs have been at the forefront of using digital technologies to create innovative solutions to development problems. In each problem, constraint, or challenge, these innovators see opportunities. Some experiences, such as mobile money and pay-as-you-go solar energy, have given Africa hope that it can also be a dynamic and innovative player (Juma 2017).

DIAGNOSTIC FINDINGS: CURRENT STATE OF DIGITAL ENTREPRENEURSHIP

Findings show that the number of entrepreneurship support policies, programs, and actors in Ghana is growing at a rapid pace, but the country still lags many of its regional peers in terms of ecosystem maturity. Ghanaian entrepreneurs still face many challenges that threaten their ability to start and grow viable businesses. However, despite these challenges, Ghana has many of the core components and resources needed for a successful entrepreneurship ecosystem that can help achieve its long-term strategic vision of becoming a middle-income country and building an economy capable of providing good jobs that are suitable and sustainable for development. Political stability, an influential diaspora, and strong Internet connectivity are some of the factors that work in Ghana's favor toward creating a ripe ecosystem for entrepreneurship.

Like many Sub-Saharan African countries, Ghana has a young and increasingly urban population ready to tap into entrepreneurial opportunities. In 2017, nearly 60 percent of the population was under 25 years old (Index Mundi 2019) and 55 percent lived in urban areas, with the urban population growing at a rate of 3.5 percent from 2013-2017 (World Bank 2016b). The country is primarily English speaking, making it easier for Ghanaians to conduct business in international markets, while Ghana's diaspora is large (nearly 250,000 people in 2006) and concentrated in the United States and United Kingdom, providing connections to key international consumer and financial

markets (OECD 2019). Ghana also boasts a strong ICT infrastructure, though access to fiber connections remains expensive.

Leveraging these advantages, however, into new businesses, new wealth, and higher standards of living will require Ghana to develop and sustain a strong entrepreneurship ecosystem. Ghana's ecosystem is growing rapidly. The 24 active entrepreneurship hubs (business incubators, accelerators, and similar spaces for entrepreneurs) now in Ghana represent an increase of 50 percent since 2016 (GSMA 2018b). Although startup activity and the number of formal SMEs are not yet tracked, \$266 million in private capital was deployed in 15 venture capital deals in 2016-17 compared to \$63 million in 16 deals in 2014-15, illustrating some growth in venture financing (World Bank 2018a). However, government support for entrepreneurship is uncoordinated, consisting of multiple agencies and programs that provide overlapping support without a clear overall vision. A poor business environment, lack of access to credit and finance, and mixed quality of entrepreneurial support are other key challenges that must be addressed within the ecosystem. Table 2.8 shows Ghana's global ranking in several well-known innovation and entrepreneurship indices. In these indices, Ghana is an average performer compared to its regional peers, ranking between 75 and 107 globally.

▶▶ **TABLE 2.8.**
GHANA INNOVATION/ENTREPRENEURSHIP RANKINGS

	Country Ranking					
	Ghana	Kenya	Morocco	Mauritius	Nigeria	South Africa
Global Entrepreneurship Index, 2018	93	109	65	NA	101	57
Global Innovation Index, 2018	107	78	76	75	118	48
Global Competitiveness Report: Innovation Ecosystem Component, 2018	87	66	88	50	92	46
StartupBlink Ecosystem Report, 2019	75	52	65	NA	56	51

Sources: Cornell University, INSEAD, and WIPO 2018; WEF 2018; Acs and others 2018; and StartupBlink 2019.

Despite the challenges present in Ghana today, its ecosystem is home to a range of vibrant initiatives and several notable success stories. There are a small number of globally competitive digital startups emerging that are gaining international recognition. The country's IT sector is home to companies such as mPedigree, Rancard, SoftTribe, Hubtel, mPharma, Logiciel, and Nosmay, which compete in state-of-the-art software and applications platforms for everything from finance and payments to agriculture and medical services.

>> Supply Factors

Supply factors are all the sources of knowledge that support firm demand within the ecosystem. Physical capital includes efficient domestic industries, as well as institutions that support entrepreneurs and SMEs through a range of services. On the human capital side are the available workforce, as well as educational institutions and training programs that teach the skills that feed into higher worker, managerial, and entrepreneurial efficacy. The knowledge capital side comprises the country's research infrastructure and technology transition capacities.

>>> Physical Capital

The number of entrepreneurship and SME support organizations in Ghana has been growing rapidly, but the quality of support provided is generally mixed and there are few support organizations outside of Accra (see box 2.4). In 2017, there were 24 active entrepreneurship hubs (business incubators, accelerators, and similar spaces for entrepreneurs) in Ghana, an increase of 50 percent over the 16 active hubs present in Ghana in 2016 (see appendix B). However, despite this growth in support organizations, Ghana still lags many of its regional peers, including Kenya, Morocco, Nigeria, and South Africa, in the number of entrepreneurship hubs nationwide (GSMA 2018b).

BOX 2.4. ACCRA DIGITAL CENTER OFFERS READY-TO-GO SPACE FOR DIGITAL BUSINESSES

The Accra Digital Centre (ADC) was initiated in 2011 with support from the World Bank and Rockefeller Foundation. ADC was established to meet the demand for affordable "plug-and-play" facilities for existing and prospective IT and business process outsourcing (BPO) companies. The center is also home to a Mobile Applications Lab (mLab) and an Innovation Hub (IHub), allowing ADC to serve as an incubation hub for technology startups working in emerging technologies such as the IoT, cybersecurity, AI, and so on. With \$10 million funding secured from the eTransform Ghana program, 12 warehouses were refurbished and repurposed by the Ministry of Communication to support the development of the IT and business processing services industry.

ADC has recently become operational, with several BPO and technology companies already utilizing it.

ACCRA DIGITAL CENTRE

- Started in 2011 an investment of \$8.3M
- Collection of 12 novated warehouses of the Public Works Department; each building is 735 square meters: total usable area is 8,820 square meters



The Ministry of Communications facilitated the development of an independent company, Ghana Digital Centre, with its focal node based at ADC. This organization plans to develop more digital support centers across Ghana based on the lessons learned from ADC.

While growing in number, entrepreneurship support organizations are of mixed quality and many are not able to adequately support businesses past startup stage through to growth and maturity (World Bank 2019c). Some hubs are actively incubating and growing new startups, but many are more akin to coworking spaces that

offer limited support services. Acceleration courses are rare, as are active mentorship programs (see box 2.5). Many incubators are also faced with high rates of attrition among their startup cohorts, which threatens their sustainability.

BOX 2.5.
MELTWATER ENTREPRENEURIAL SCHOOL OF TECHNOLOGY (MEST)

Meltwater Entrepreneurial School of Technology (MEST) is a full time, 12-month program in Accra that provides entrepreneurship training in business, communication, and advanced digital skills in software development to graduate-level African participants.

MEST targets Africans who are interested in starting their own software companies. It requires completion of an online form followed by in-person assessments and a series of tests to evaluate applicants' analytical thinking, business acumen, and interest in technical entrepreneurship. The program received more than 2,500 applications in 2018 with about 1,000 individuals making it past the initial application filter. Its interview panels are made up of business professionals, including general managers and recruitment managers.

MEST Entrepreneurs in Training complete three capstone projects during the program. EITs are required to develop their business ideas and simulate the entire process up to market launch. This enables them to understand how to start their own businesses before investors evaluate their final pitches.

Students spend roughly 80 percent of their learning in classrooms, while the remainder is spent on lectures, field work, market research, events, and group projects. These activities allow participants to receive an interactive learning experience.

Apart from focusing on technical skills, the program's emphasis on business and communication skills have emerged as important in local employment. The strong partner network at MEST further allows participants to engage with and receive mentorship from pioneers in the technology industry. Throughout the program, guest lecturers also travel to Ghana to mentor and teach EITs.

MEST has grown from 10 percent female students in 2008 to 30 percent in 2018, and the organization is working to increase that number. To develop this initiative, it recently launched a partnership with on-profit STEMbees, founded by MEST alumni. The partnership is aimed at providing mentorship to young women looking to pursue careers in science and technology fields.

Source: <https://meltwater.org/>.

Entrepreneurship hubs are also largely concentrated in Accra and on the ICT sectors. The ecosystem is generally weak outside of Accra and leaves startups and entrepreneurs outside of the capital underserved (see figure 2.10).

▶▶ **FIGURE 2.10.**
TECH ECOSYSTEM OUTLOOK, Q2 2019

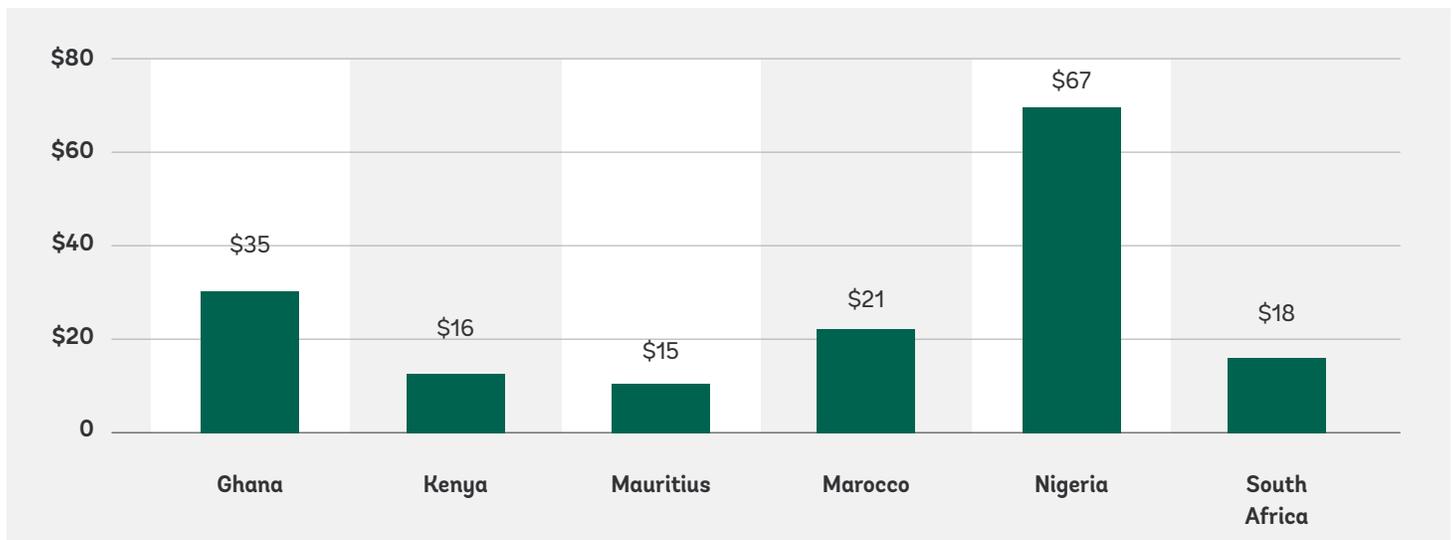


Source: Briter Bridges Innovations Maps.

Startups and SMEs are also challenged by a lack of space and high commercial rents. Commercial property rents in Accra are higher than most of Ghana's regional peers, as shown in figure 2.11, and affordable space is extremely limited. There are currently over 20 registered Business Process Outsourcing (BPO) companies and

several innovation hubs for incubating and providing training and mentorship to startups; however, there only a few tech parks, such as the Accra Digital Center, that offer affordable rental rates for startups and other ICT-related businesses (World Bank 2017b).

▶▶ **FIGURE 2.11.**
MONTHLY COMMERCIAL PROPERTY RENT PER SQUARE METER (\$)



Source: WEF 2018b.

Limited usage of modern technology solutions. Given notable Internet coverage gaps in rural areas, particularly in Ghana's northern region, Ghana's digital market has relied on lower technology solutions – SMS, USSID, 2G, or 3G – instead of fiber optic to function. The potential market is probably limited to about 200,000 users, with the demand for more advanced technologies mostly coming from the urban population and large businesses (World Bank 2017c).

Growing foreign direct investment. Ghana experienced a moderate amount of green field foreign direct investment (FDI) in the areas of ICT and digital infrastructure, research and development, and business services sectors from 2015-17, totaling \$3.7 billion. This was higher than its regional peers Mauritius (\$159 million) and Kenya (\$2.2 billion), but lower than Morocco (\$5 billion), Nigeria (\$6.4 billion), and South Africa (\$5.6 billion) (UNCTAD 2017b).

>>> **Human Capital**

Ghana generally lacks the entrepreneurship and business skills that would allow Ghanaian startups to survive the commercial phase. The state education system generally fails to provide Ghanaians with the entrepreneurial, problem-solving, and technical skills required to generate and sustain significant startup activity (DfID 2013). In particular, entrepreneurs need a range of soft skills related to developing and managing teams, communicating and presenting ideas, networking, and time management, which are not part of Ghana's traditional education system (Dalberg 2011).

However, Ghana is home to several organizations that provide solid entrepreneurship training curricula, such as: Ashesi University, a private university with a focus on entrepreneurship that won the 2017 Education Prize at the World Innovation Summit (see box 2.6); and the Meltwater Entrepreneurial School of Technology (MEST), an entrepreneurial training program, seed fund and incubator for African tech startups with 60 students from five countries. The Government of Ghana also has several programs that aim to develop entrepreneurship skills among Ghana's youth, including the Employment and Entrepreneurship Programme.



■ **BOX 2.6.** **ASHESI UNIVERSITY'S MODEL FOR PROVIDING PRACTICAL DIGITAL ENTREPRENEURSHIP SKILLS**

Ashesi University, an internationally recognized Ghanaian private university founded in 2002, places a strong emphasis on interdisciplinarity in its curriculum, aiming to develop critical thinking, creative problem solving, ethical reasoning, and effective communication skills among its students. Ashesi offers degrees in business, management, computer sciences, and engineering, often partnering with business leaders to identify existing gaps between Ashesi's curriculum and local industry needs.

Ashesi hosts a number of projects that promote entrepreneurship and interdisciplinary skills, including the Education Collaborative, a week-long workshop that brings together higher education leaders and stakeholders to communicate best practices in teaching, management, and administration; the Ghana Climate Innovation PayPal (GCIC), an incubator that provides business advisory services, financing, and mentorship to clean tech startups; and the Ashesi Innovation Experience (AIX), a two-week program for high-school students designed to promote creative problem solving, leadership, and entrepreneurship.

Growing entrepreneurial workforce. Given the country's increasingly young, increasingly urban population, the pool of potential entrepreneurs is large and growing by the year, so more organizations will be needed to provide them with the skills to succeed at starting and growing a business. For example, in 2017, about 30 percent of Ghana's ICT students said they wanted to launch their own business but did not have the necessary business skills to do so (World Bank 2017c).

In technical skills, while there is a good availability in ICT education, quality is limited. There is large involvement from the private sector, but quality needs improvement as training courses and curricula are largely focused on hardware and graduates generally lack the software skills demanded by the modern ICT market. Ghana's ICT education and training curricula were largely developed to meet the needs of the first ICT revolution (hardware), and skills needed for the second revolution (software) are missing: cybersecurity, web design, marketing, and development. Demand for ICT specialists is high, requiring additional investment in education and training to both increase the quantity of ICT skills in the market and to develop new curricula and specialties not currently taught in the country (World Bank 2017c). Scientists and engineers are also generally in short supply in Ghana (World Bank 2017c).

>>> Knowledge Capital

Ghana's academic and research institutions designed to foster technological development are generally weak and not aligned to the economic needs of the country, and overall research outputs are low relative to many of Ghana's regional peers (UNCTAD 2011).

Research inputs, in terms of research and development expenditure as a percentage of GDP, were 0.38 percent in 2010, well below its regional peers Kenya, Morocco, and South Africa. Ghana's research outputs in 2016, in terms of publications and patent applications, were similarly low when compared to regional peers, as can be seen in table 2.9.



►► **TABLE 2.9.**
RESEARCH OUTPUTS IN 2016

Output	Ghana	Kenya	Morocco	Mauritius	Nigeria	South Africa
Publications	982	987	156	4,062	3,826	11,881
Patent applications by residents	15	135	1	198	No data	728

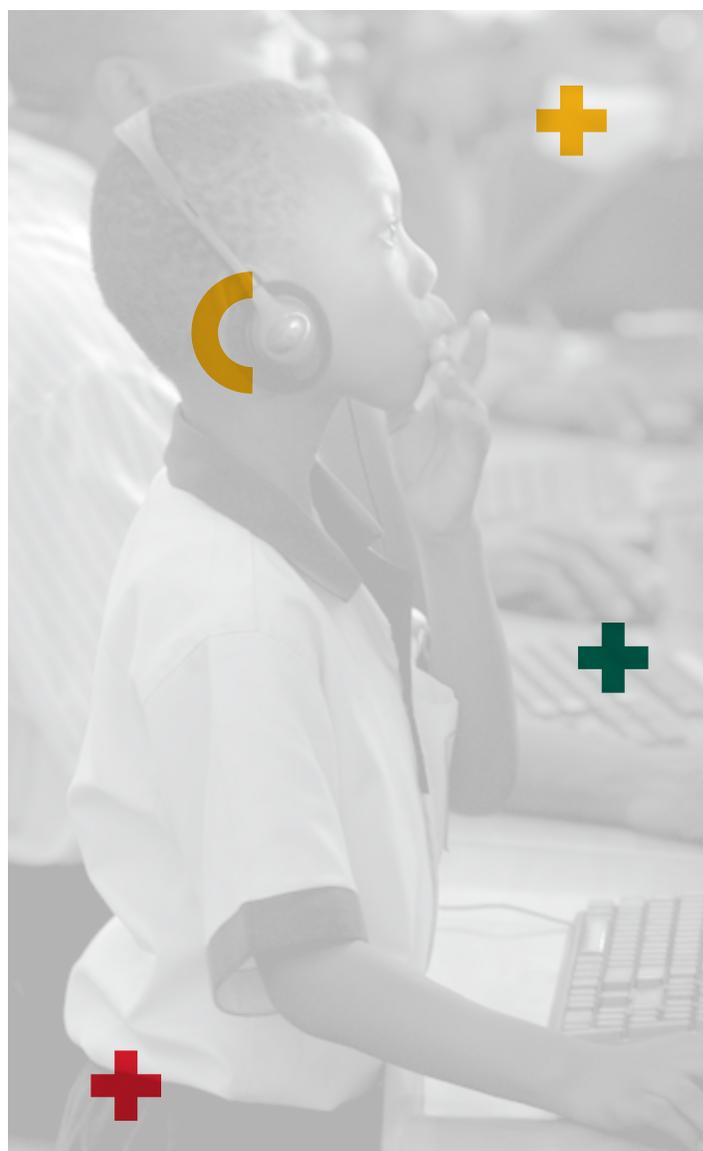
Source: World Bank 2016b.

However, Ghana has in place many of the individual components necessary for effective knowledge capital creation. It has at least 16 research and development (R&D) institutes, most of which are managed by the Council on Scientific and Industrial Research (CSIR), 7 public universities, about 40 private universities, 10 public polytechnics, many technical institutes (see box 2.7), and several technology support and regulatory agencies (UNCTAD 2011).

■ **BOX 2.7.** GOOGLE AI RESEARCH CENTER

In April 2019, Google opened a new AI research center in Accra, which aims to bring together top machine learning researchers and engineers to develop new AI applications. The center will collaborate with local universities and research centers, to build products that can solve problems that Africa faces today. The center will also focus on enhancing Google Translate's ability to capture African languages more precisely.

The capacity of the overall R&D system is limited in comparison to middle-income countries such as India or South Africa. This is because of several factors, including policies and institutions that are not aligned with the country's economic growth and human development goals; weak links and poor positive feedback between and among institutions, including the higher education and research institutes and the private sector; and a lack of incentives and mechanisms that encourage communication and collaboration (UNCTAD 2011).



>> Demand Factors

Demand factors are the overall set of incentives for firms to invest and accumulate. This includes the macro context, in particular, the volatility of sales, the competitive structure, and the trade regime that determine whether firms seek to enter or grow. It also includes firm's internal capabilities, including their managerial capacity and production and technological systems. Demand factors also include national entrepreneurial characteristics, including risk tolerance and ability to recognize business opportunities.

>>> Market Incentives

There are several large market opportunities for digital startups in Ghana and the West African region, in developing digital products for local digital and analog infrastructures and in digitizing and curating locally relevant information. The mobile banking (see DFS section), e-commerce, and IT-enabled services (ITeS) market segments have been highlighted as particular areas of opportunity. The largest constraints are existing broadband Internet blackspots, which limit the size of Ghana's internal market, and the fact that Ghana remains a largely cash-based society, limiting opportunities for mobile and Internet transactions. Ghana's economy has been booming in recent years, with Ghana's internal market, measured in GDP purchasing power parity (GDP PPP), growing at a rapid pace – 4.5 percent from 2013 to 2017 – which is higher than regional peers Mauritius, Morocco, Nigeria, and South Africa (WDI 2017). Meanwhile, Ghana's external market, measured in total exports in U.S. dollars, grew by 2.6 percent from 2012 to 2017, higher than all of its regional peers (WITS 2017).

Recent evidence has shown that African companies struggle to compete internationally in global digital platform markets (for example, apps, software, devices) but can find success targeting domestic and regional markets with localized products and services (Friederici and others forthcoming). Regionally, there are a number of untapped opportunities for digital entrepreneurs related to wider penetration of mobile phones and the Internet and to the digitization of existing enterprises. Ghana's mobile phone penetration rate is relatively high (at 140 percent, but only 50 percent if unique subscribers are counted), and as mobile phones continue to spread, so too does the potential market for a broad range of app-based services for digital enterprises. The country's Internet penetration rate is 66.8 percent with 3G, and that number will likely increase with the auction of 4G licenses in 2016 and as mobile data costs decline. Access to affordable and quality broadband service reduces transaction costs for businesses and consumers and allows for flexible firm locations, opening up new geographic opportunities. In addition, broadband allows for information technology ITeS exports such as business process outsourcing (BPO). A study of 27 developed and 66 developing countries found that a one percentage point increase in the number of Internet users is correlated with

a boost in exports of 4.3 percentage points (Clarke and Wallsten 2006). Broadband also contributes to the competitiveness of the service sector, bringing positive spillover effects to less technology-intensive industries.

Digitization of existing enterprises and industries likely represents the largest opportunity for digital entrepreneurs, though important challenges remain. A 2014 McKinsey report identified six industry sectors where the Internet and digitization would likely have the largest impact on in Sub-Saharan Africa: financial services, education, health, retail, agriculture, and government. The report estimated that technology-related productivity gains in these sectors could reach \$148 billion to \$318 billion by 2025 (McKinsey 2014). Unlocking these untapped markets will require additional technology deployment, in the form of fiber and 4G Internet connections, and coverage expansion to reduce the number of black spots in rural and underdeveloped areas (World Bank 2017c). Existing enterprises – particularly SMEs – may also require a range of additional support before they are able to adopt new digital technologies and services. Firms in developing countries require a range of complimentary factors, including managerial competencies that will allow them to adjust their business strategies and processes to fully utilize digital technologies (Cirera and others 2019).

The World Bank's 2017 Ghana CPSD ICT Deep Dive identified mobile money, e-commerce, ITeS, and agribusiness as the sectors that present opportunities for ICT- and digital-enterprises in Ghana (see DFS chapter for details on mobile money):

E-commerce in Ghana grew from \$30 million to \$90 million between 2009 and 2012, though Deloitte estimates that only 10 percent of retail in 2018 had an e-commerce platform in the region (UNCTAD 2015). Growth of the sector has slowed down after an enthusiastic start because of fraud in marketplaces and bad first experiences. The cash economy is a constraint on e-commerce growth, and cybercrime and cybersecurity remain a challenge.

IT-enabled services (ITeS). Ghana ranked as the number one destination in Sub-Saharan Africa and 29th globally in the 2016 AT Kearney Global Services Location Index. However, despite this promise, Ghana's performance in the ITeS sector has been poor in recent years. The market is small and fragmented, with about 20 registered BPO companies in the country. The closure of one of the largest BPO companies, ACS, in 2015, which was providing jobs for over 1,000 Ghanaian young people has dampened the sector's vibrancy (World Bank 2017b). There remain promising, albeit smaller, BPO companies that are providing innovative back office support services to telecommunication operators, power, financial and insurance companies. The traditional ITeS has also been disrupted by automation and standardization, as well as by other emerging

technologies such as cloud services, the IoT, artificial intelligence, and robotics, which have reduced demand for back office and contact center services. That said, the ITeS/BPO sector continues to hold significant promise for Ghana.

Agribusiness. Digitization of agriculture is still at an early stage of development in Ghana. There are 4.8 million farmers in the country and the potential for growth is important. Esoko (a startup which provides information for and about 400-500,000 farmers related to market prices, extension services, seeds, inputs, and so on) aims to add 200,000 more farmers in its database every year. Solutions have already been deployed in rice, maize, soya, cocoa, vegetables (cabbage and lettuce), and fish, with projects for extension in cassava, pineapple, mango, and banana). Lack of mobile Internet coverage in rural areas is a constraint.

Additionally, open data platforms, particularly those that make large-scale government data sets available, also represent a major opportunity for digital entrepreneurs (see analysis on GODI in the digital platforms section). Numerous studies have found that making public data available via open data platforms creates opportunities for the private sector and generates economic value, with estimates ranging from the billions to trillions in economic gains (McKinsey Digital 2013; Zeleti and others 2016). Open government data can serve as the foundation for new digital products and services and provide business intelligence through data analytics.

>>> Firm Capabilities

Information about the private sector is extremely limited in Ghana. This lack of data, particularly data covering SMEs and startups, is a barrier to introducing targeted reforms or incentives to boost and improve the sustainability of small businesses in the country. Part of the challenge is that Ghana's private sector is dominated by informal firms, which constituted 90.5 percent of all firms in the country in 2014 (Ghana Statistical Office 2015), while the number of formal startup SMEs are not yet tracked.

Available data suggests that Ghana is neither a high or low performer among its regional peers in terms of firm capabilities. In 2013, 58.9 percent of firms had an annual financial statement reviewed by external auditors, 33.2 percent of firms had their own website, 14.5 percent of firms used a technology licensed from a foreign company, and 22.9 percent of Ghanaian firms invested in some level of R&D, all slightly above the Sub-Saharan average (World Bank 2017a). The World Economic Forum's 2017 Executive Opinion Survey ranked Ghana lower than Kenya, Mauritius, Morocco, Nigeria, and South Africa in firm-level technology adoption (WEF 2017).

As in the rest of the world, SMEs in Ghana lag larger firms in both technical and managerial capacities. Ghana's SMEs have limited access to quality providers of technical assistance and demonstrate inefficient practices and low management capabilities. There is also a gap between SMEs and large firms in ICT connectivity, reducing SMEs' abilities to adopt and use new digital technologies (International Trade Centre, 2016).

>>> Entrepreneurial Characteristics

Available data about the entrepreneurial and risk-taking characteristics of Ghana's pool of entrepreneurs show that they generally have positive opinions about entrepreneurship and their own capabilities for starting a new business, along with a low fear of failure. In the 2012 Global Entrepreneurship Monitor Adult Population Survey, Ghanaians generally had higher opinions about entrepreneurial activities than their regional peers, as shown in table 2.10.

▶▶ **TABLE 2.10.**
SOCIETAL ATTITUDES TOWARDS ENTREPRENEURSHIP

Output	Ghana (%)	Sub-Saharan Africa Average (% unweighted)
Entrepreneurship as a good career choice	84	76
High status to successful entrepreneurs	91	80
Media attention for entrepreneurship	82	77

Source: Global Entrepreneurship Monitor 2013.

Ghana also ranked highest among Sub-Saharan Africa countries in 2012 in opportunity-driven entrepreneurship, that is, the percentage of early-stage entrepreneurs who claim to be driven by opportunity as opposed to finding no other option for work; and who indicate the main driver for being involved in this activity is being independent or increasing their income, rather than just maintaining their income (Global Entrepreneurship Monitor 2013). Ghanaians are also generally tolerant of risk, with Ghana ranking third in Africa in the 2017 Global Preferences Survey's Risk-Taking Index behind South Africa and Botswana (Falk and others 2018).

>> **Challenges**

Barriers impair the linkages between the demand and supply factor of knowledge in the ecosystem. These include access to finance, regulations, and social capital.

>>> **Access to Finance**

Access to finance is a recurrent problem for Ghanaian startups and SMEs. There is a gap in early-stage risk capital funding for startups, and access to credit is a challenge for both startups and SMEs. The two most recent Ghana World Bank Enterprise Surveys (in 2007 and 2013) both identified access to finance as the largest single challenge in Ghana's business environment.

As in most countries around the world, access to early-stage financing for new or growth-oriented companies is limited in Ghana (World Bank 2019c). While the government has tried to stimulate venture capital funding through the Venture Capital Trust Fund (VCTF), important challenges persist. Seed funding for new startups is limited, and venture capital, while growing, is limited by a shortage of investment-ready companies, lack of a stronger cadre of investment professionals and highly skilled lawyers, and legal and regulatory issues. Assessments of the industry also point to limited knowledge of how to structure VC-type investments (both from the demand and supply side), as well as lack of diversity in how the investments are structured, as constraints for further growth of risk financing in the country.

Although there is limited data infrastructure to monitor startup activity in Ghana, \$266 million in private capital was deployed in 15 venture capital deals in 2016-17, compared to \$63M in 16 deals in 2014-15 (World Bank 2016c). The startup phase of business financing (grants and investments of less than \$25,000) appears to be reasonably funded in Ghana, evidenced by the growing number of incubators and startups in the country. However, there is a shortage of funds at the early/acceleration stage (typically \$25,000 to \$500,000) of both investible deals and investors, with many startups failing at commercialization and scaling-up (pointing at the lack of entrepreneurship skills of startup teams, as well as poor incentives for investors with a lack of equity markets and exit strategies). For growth stage (\$1 million and above) deals, there are several regional investors willing to invest (World Bank 2016c). Currently there are three main categories of private equity (PE) or venture capital (VC) funds either active or operating in Ghana, with most of the dynamism in the PE/VC ecosystem coming from regional and pan-African funds investing in Ghana, rather than the local Ghanaian funds.

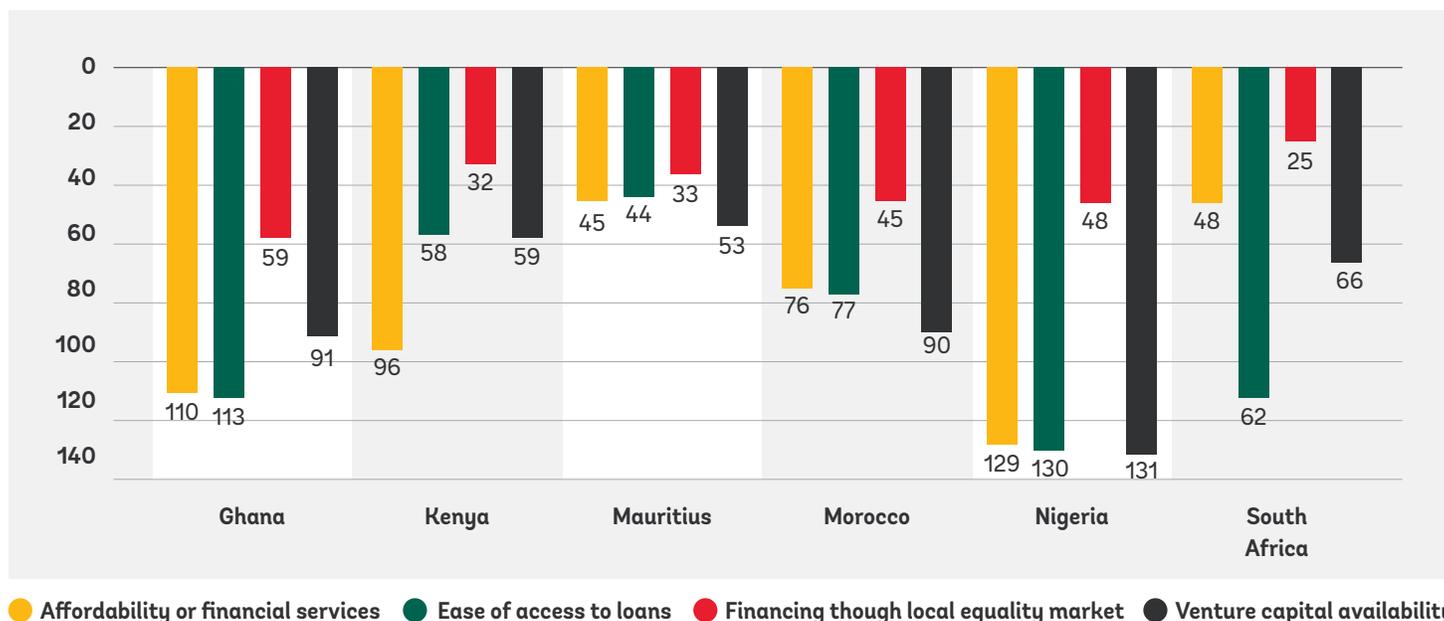
- **Local VCTF-backed funds**, with local fund managers, capitalized by VCTF and mainly Ghanaian financial institutions. These funds invest in Ghanaian SMEs, with a ticket size of less than \$1 million.
- **West Africa regional funds** (such as Injaro Capital Holdings and West Africa Emerging Market Growth Fund), with a focus across the region, but sometimes with a specific focus on Ghana and Côte d'Ivoire. Investors for such funds include development finance institutions (DFIs), international family offices, regional pension funds, and so on. These funds typically have a ticket size of \$1-\$5 million.
- **Pan African or global funds**, with sometimes an explicit allocation or strategy to invest in Ghana (for example, Helios, ECP, Abraaj). These funds are typically invested in by DFIs and institutional investors. They sometimes have offices in Ghana (for example, Abraaj). Ticket sizes are over \$20 million.

Ghana is generally touted as an attractive investment destination on the continent because of its stable government and business environment. However, there are also some market impediments specific to private equity/venture capital in Ghana. For example, the SME investment terrain is difficult, as it is in many developing countries. SMEs lack the financial literacy to recognize the added value of PE/VC; they are usually family-owned businesses that are reluctant to cede control or ownership to outsiders; SME financials are often not in order; and SMEs are typically reluctant to reveal financial information, which causes problems for valuation. Exit is also an issue, whether the intended exit route is acquisition or IPO. Although exiting to the public markets remains a secondary source of liquidity in Ghana as it is in most emerging markets, it is worth noting that the Ghana Stock Exchange has had few recent IPOs. Finally, domestic institutional investors are not comfortable with the PE/VC asset class in general. While Ghanaian banks have been more active and early players in PE/VC in Ghana, both pension funds and insurance companies are less comfortable investing in the asset class, partly because of investment guideline restrictions. In addition, the service industry surrounding the private equity industry is generally weak – for example, due diligence, legal services, and so on (World Bank 2016c).

Lack of adequate credit information, high interest rates, and a weak insolvency framework are barriers to accessing credit for both entrepreneurs and SMEs. According to the 2019 World Bank Doing Business Rankings, only 22.4 percent of Ghanaian adults are covered by the credit bureau. On the supply side, limited availability of credit information is a barrier to financing startups. Bank loans are often not an option for small businesses because of the lack of collateral and credit information and high interest rates (often above 20 percent) (World Bank 2017c). Moreover, the process in place to recover debt and a weak insolvency framework makes financial

service providers reluctant to provide credit to new entrepreneurs. The 2019 Doing Business report shows that Ghana's insolvency framework is weaker than the regional average. In addition, the time required to recover debt is 1.9 years and the cost of recovery is approximately 22 percent of the debtor's estate value.¹⁸ In overall access to financing, Ghana ranked 110th in the world in affordability of financial services, 113th in financing through the local equity market, 91st in the ease of access to loans, and 42nd in venture capital availability in the Global Competitiveness Report 2017-2018, as shown in figure 2.12.

►► **FIGURE 2.12.**
FINANCIAL MARKET DEVELOPMENT ACROSS COUNTRIES



Source: Global Competitiveness Index 2017-2018.
Note: Higher values denote lower global rankings for each indicator.

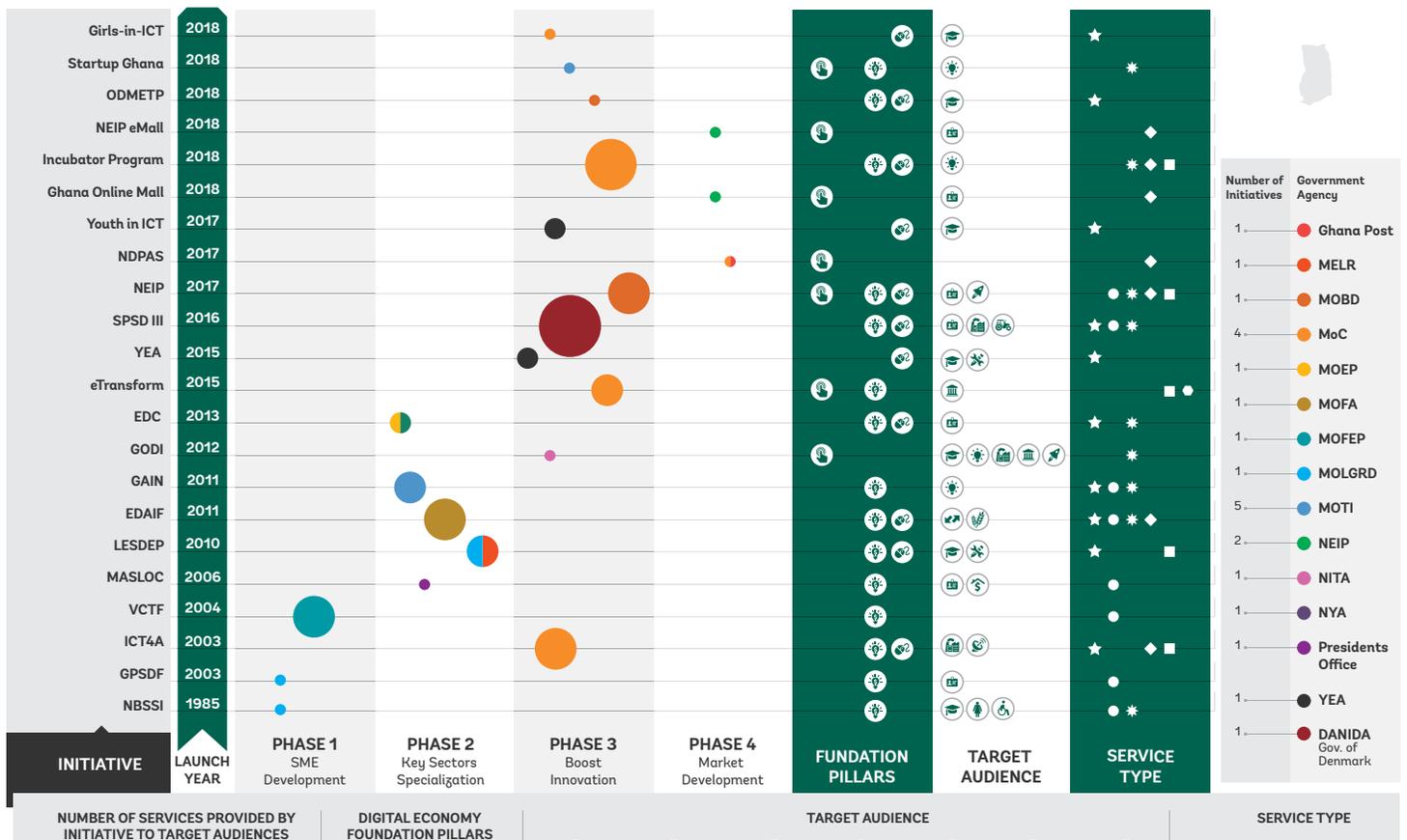
»» **Regulations**

The Government of Ghana has numerous entrepreneurship support policies and programs, but they suffer from overlap and coordination, which hinders their effectiveness. ICT regulations have several gaps and grey areas, which constrain private sector investment and market creation. Ghana also has a generally poor environment for doing business.

The government has created multiple agencies and programs that support SMEs, entrepreneurs, and enterprise development, many

of which provide overlapping support without clear coordination (see figure 2.13). For example, the two lead ministries for SME and entrepreneurship development, the Ministry of Trade and Industry (MOTI) and the Ministry of Business Development (MBD), are currently formulating national policies that appear to have significant overlap. Without clear rationalization of mandates, the impact that these programs may have on SMEs and entrepreneurship will remain limited. The lack of consolidation and streamlined structure for existing government support programs reduces their likelihood of sustainability.

▶▶ **FIGURE 2.13:**
GOVERNMENT INITIATIVES THAT SUPPORT DIGITAL ENTREPRENEURSHIP IN GHANA



Source: Authors

Currently, the legal/regulatory environment in Ghana for private equity and venture capital is still being developed. The Securities and Exchange Commission (SEC) was recently authorized to register, license, authorize or regulate private equity funds and venture capital funds, though regulatory guidelines for PE and VC are still being drafted. Scant regulation for private equity and venture capital is not necessarily problematic in a nascent ecosystem because PE/VC funds typically target sophisticated investors. However, Ghana has a bifurcated legal/regulatory framework, which creates some confusion in the ecosystem (World Bank 2016c).

There are also legal and regulatory gaps related to ICT and digital industries that constrain private sector investment and market creation, calling for a rationalization of the existing framework and its implementation in consultation with the private sector. The private sector has developed in the absence of a legal/regulatory framework for digital activities, and the legislator/regulator is now catching up, creating tensions and grey areas. Some important parts of the legal framework are missing, or grey areas subsist (related to data storage, consumer protection, data ownership, privacy and cybersecurity, and so on) that could affect the growth of digital industries (World Bank 2017c).

Implementation of new ICT regulations is also an issue: Ghana has adopted no less than 11 laws related to ICT in recent years

but lacks the resources to implement them. For example, the Data Protection Commission was created in 2012, but has limited resources to operate.

Ghana's general business regulatory environment, as measured by the World Bank's Ease of Doing Business rankings, is poor when compared to high-income countries and middle of the road when compared to its peers in Sub-Saharan Africa. Ghana improved its ranking to 114 out of 190 economies in 2019, up six places from its 2017 ranking, with major regulatory challenges related to starting a business, enforcing contracts, and trading across borders.

Regarding intellectual property, according to WIPO both patents and trade secrets are effective forms of IP protection, but one may be more suitable than the other depending on the subject matter and circumstances. It is important that those taking decisions about IP strategy are aware that trade secrets can potentially be as valuable as patents when protecting digital innovations. While most large multinational companies have the resources and funds to invest in the patenting process, which can be costly and time-consuming, SMEs often struggle with it. Trade secrets, on the other hand, are relatively straightforward, entail no registration costs or lengthy legal processes and can add real value for small businesses. That is why it is important to raise awareness among SMEs about the value of trade secrets and how to protect them effectively.



>>> **Social Capital and Culture**

Limited social capital. Social capital serves as the connective tissue of an ecosystem, bringing together actors, ideas, and resources. This social capital is partially lacking in Ghana, hindering connectivity and coordination across the ecosystem. There are a number of networks and events in Ghana focused on bringing together entrepreneurs and investors, but these many actors lack platforms for communication and coordinating support. Linkages and connections among Ghana's research institutions, and between research institutions and industry, are also weak.

Lack of innovation among telecom providers. Ghana's telecommunications providers have been playing an increasing role in offering platforms for digital content developers and users. While they are not interested in developing content by themselves, they sponsor several initiatives that look promising (for example,

MTN apps challenge and Tigo innovation challenge) for fostering connections between digital entrepreneurs and end users (World Bank 2017c).

Social media usage, which can be an effective platform for entrepreneurial activities, has been growing. Social media can also provide platforms for ecosystem actors to connect and share information. Social media usage is growing at a rate of more than 20 percent per year in Ghana, with over 5.6 million users in 2018.

The social media penetration rate is 23 percent, higher than regional peers Kenya and Nigeria, but lower than Mauritius, Morocco, and South Africa. However, the use of LinkedIn, a global business- and employment-oriented social media platform, is low in Ghana, with only 3 percent of Ghanaians using the platform, lowest among its regional peers (We Are Social 2018).

RECOMMENDATIONS AND NEXT STEPS

DE.R1.

Develop IT-ITeS sector programs to support the scale up of Ghana's exports, players, digital innovation, and expertise.

Advancing towards a vibrant digital economy requires a national private sector policy approach. Public efforts need to capitalize on those made on digital infrastructure, public digital platforms (government digitization), and digital financial services. Policies are needed to develop a competitive IT-ITeS sector and to accelerate private sector transformation taking advantage of digital innovation for improved productivity. To transform Ghana into the most relevant digital hub in Africa requires a bigger footprint of capable and innovative IT-ITeS companies operating in the country. What involves increasing jobs, exports, number and size of local and global players, while boosting innovation within the sector. The IT-ITeS sector comprises entrepreneurs, SMEs, large indigenous companies and global players, and efforts to facilitate their scale up in headcount and expertise calls for targeted and connected initiatives where government agencies play an active role in collaboration with the private and academic sector

DE.R2.

Develop a digital technology adoption program to accelerate digital transformation of the economy, targeting specific audiences.

Joint efforts between the government and the IT sector can help nurture and accelerate digital transformation of the private and public sector in Ghana, specially SME, women-owned businesses, and nondigital sectors. According to BCG, 7 out of the 10 most innovative companies are digital natives and thus digital innovators; and while 79 percent of strong innovators reported that they have properly digitized innovation processes, only 29 percent of weak innovators made the same change (BCG 2018). Digital innovation adoption of private and public sectors can be done with country-based IT companies, but initiatives will be needed to ramp the local IT sector into an innovative digital partner. To improve the supply of business-ready ideas and innovations, including disruptive technologies (that is artificial intelligence, the IoT, and robotics) GoG can establish programs or instruments to promote R&D, technological innovation, and digital upgrading in Ghana's private sector in the form of competitive grants or tax incentives for research and development. Also, provide more incentives and platforms for collaboration between research institutes, universities, and the private sector through collaborative research or centers of excellence for ICT or digital solutions.

DE.R3.

Articulate Ghana's value proposition to position Ghana as a relevant global digital hub

To become a trusted destination the country needs to showcase its expertise, business infrastructure, and a set of capable and competitive companies based in Ghana. Positioning Ghana's name as a top destination to outsource and invest goes beyond a branding campaign and event participation. To build an articulate message of Ghana's value proposition, a portfolio of capable IT companies operating in the country and a set of satisfied customers willing to share their experience while working with a Ghana-based company are needed. Exporting companies will need to be proficient to manage offshore client needs, and prove their experience and capacity to deliver quality services, on time, and on budget. To comply with requirements and service level agreed, companies will need to invest in tools and technical and soft skills.

DE.R4.

Unify the national vision for digital entrepreneurship by developing a single digital economy policy and establishing a digital economy observatory

Establish a clear national vision for the development of the digital economy – captured within a single digital economy policy document and clearly define the role of digital entrepreneurship in achieving that vision. And establish an observatory that systematically captures data and tracks progress in Ghana's development of the digital entrepreneurship ecosystem that is, number of startups, investment deals, jobs, and so on).

DE.R5.

Improve specific regulations for digital industries (that is taxes, IP rights, limited partnerships)

This would entail to (i) Creating tax policy, business registration, and insolvency rules that support startups and risk-taking entrepreneurial businesses; (ii) Utilizing procurement policy to incentivize production of digital solutions by local SMEs, specially IT-ITeS to scale up companies; (iii) Establishing a dedicated digital intellectual property (IP) track within Ghana's IP office to raise awareness among SMEs about the value of trade secrets and how to protect them effectively; and (iv) Creating legislation to enable limited partnerships, and ensure that private equity/venture capital (PE/VC) regulations allow funds to be formed as limited partnerships.

DE.R6.

DE.R6. Increase the pool of human capital with digital and entrepreneurial skills by amplifying existing efforts

Explore the private partnerships for the provision of rapid digital skills programs combined with entrepreneurial skills (for example, Codetrain, MEST) to targeted underserved audiences, such as women and talent based at second-tier cities, by providing training grants and facilitating training spaces and mentorship participation.

DE.R7.

DE.R7. Streamline and consolidate entrepreneurship support and entrepreneurship intermediaries

This would include (i) Streamlining and consolidating GoG support programs for digital SMEs and entrepreneurs; (ii) Restructuring and building capacity at GoG agencies that support digital entrepreneurship (NEIP, NBSSI, VCTF) to ensure adequate program funding, efficient operations, and incorporation of systematic monitoring and evaluation to assess impact of activities; (iii) Providing benchmarking and program funding for entrepreneurship hubs/intermediaries to boost their quality of support past the startup phase and in areas outside of Accra; and (iv) Providing intermediary organizations with funding to develop a platform that enables effective collaboration between these organizations.

DE.R8.

Encourage early-stage private capital and credit guarantees access for startups and SMEs

The government should restructure the Venture Capital Trust Fund (VCTF) to ensure it operates as a trusted intermediary in the venture capital ecosystem by enforcing clear independent governance (for example an independent investment committee). Provide early-stage financing and VC industry-wide technical assistance (TA) through the VCTF that diversifies the stage of financing support (particularly sub-\$500,000 investment deals), the types of partner vehicles (for example, seed funds, accelerators, angel networks), and the diversity of investment instruments (for example, venture debt, quasi-equity). Encourage partial credit guarantees and other risk sharing mechanisms to lower the cost of capital from traditional financing institutions (that is, banks) to startups and SMEs.

DE.R9.

DE.R9. Analysing digital centers necessary for digital entrepreneurs to thrive across the country

Establish additional tech parks such as the Accra Digital Center to bring commercial rents down and provide affordable class-A real estate to digital startups and SMEs. It is important that these tech parks are established on the outskirts of major cities such as Accra and Tema to bring down rental prices. Furthermore, recommendations on digital infrastructure should be implemented to expand broadband coverage for opening the nationwide market for digital solutions.

2.5 Digital Skills

IMPORTANCE OF DIGITAL SKILLS

Intimately linked to the overall digital economy are the skills and know-how of the workforce to innovate and implement digital technology. The drive to develop a digital economy would be of little use without human capital that possess the digital skills to operate and reap the benefits of it. Digital skills are not only the backbone of a digital economy, but it is critical to creating a level playing field that facilitates innovation (see box 2.8). The ability to harness talent, encourage technological innovation, and mobilize digital skills is key to economic growth.

A transition in the global economy is underway what will disrupt the landscape for jobs and work. The Fourth Industrial Revolution is shaping the future where technological advancement promises disruption across sectors, requiring more complex skills and retraining of the workforce.

- About 65 percent of children entering primary school today, according to one estimate, will end up working in a job that does not yet exist (WEF 2018a).
- Online platforms are enabling entirely new industries and redefining interactions with customers and employees.
- Automation is changing the demand for labor as technological advancement makes it possible for machines to do the jobs once performed by people.

Owing to the pace of innovation, a significant gap in supply and demand exists across all levels of digital skills in the region, especially on intermediate and advanced skills. Nearly 50 percent of subject knowledge acquired during the first year of a four-year technical degree will be outdated by the time students graduate (WEF 2018a). The supply of digitally skilled labor in Sub-Saharan Africa and Ghana must increase to meet anticipated labor market needs or Africa's economies will falter. Companies are turning to talent abroad, and while governments have taken steps to integrate information and communication technology in education, the policy response has not been sufficient. New models for skilling are required that will enable lifelong skills acquisition and retraining.

The declining contribution of agriculture to Ghana's economy and shift towards the services sector, entails equipping those households that were previously engaged with the agriculture sector with the necessary skills needed for job opportunities in the services sector. One of the objectives of the government's overall theme of "Sowing the Seeds for Growth and Jobs" is to develop leadership skills, quality education, entrepreneurship, job skills, and creative skills. Digital skills are critical for spurring the digital economy in Ghana and enabling the country to become the IT hub for the West African subregion.

■ BOX 2.8. DIGITAL SKILLS

Digital skills refer to skills related to the use of technology. The development of ICT involves a set of skills that are continuously evolving and built upon as technology shapes our working lives. Skills are separated into three levels: basic, intermediate, and advanced (World Bank 2018d).

- Basic digital skills are entry level functional skills required to make rudimentary use of digital devices and applications (UNESCO 2017). With basic digital skills, users are typically able to operate devices such as computers and smartphones, access and store information from online resources, and set up online accounts and profiles.
- Intermediate digital skills enable individuals to use digital tools for more significant task-oriented purposes. Intermediate skills include using professional software for presentations and analytics, digital marketing and social media analytics, and web and graphic design. They can be used across business functions, such as accounting or project management.
- Advanced digital skills allow people to use technology in empowering and transformative ways. UNESCO defines these as "the group of skills that form the basis of specialist ICT occupations and professions (UNESCO 2017). Advanced skills may include programming, big data analytics, cloud computing, cybersecurity, web development, and search engine optimization.

The influence of technology and automation means that the future of work will be very different to the present and will require a changing set of skills. Countries are faced with an unprecedented challenge of updating education systems built for another era. They must confront this reality to prepare the next generation of learners for an evolving landscape with new kinds of jobs, including digital skills and sociobehavioral skills.

Global employers consider digital skills among the top seven skills required for the future workforce, with a higher proportion in Ghana recognizing this (see figure 2.14). While a demand-supply gap for all skills is identified, this implies a greater demand for these skills than their supply in the economy. This gap is even more severe in Sub-Saharan Africa and Ghana.

►► **FIGURE 2.14:**
SIGNIFICANCE OF SKILLS REQUIRED IN THE FUTURE WORKFORCE, BY MARKET



Source: IFC, 2019b

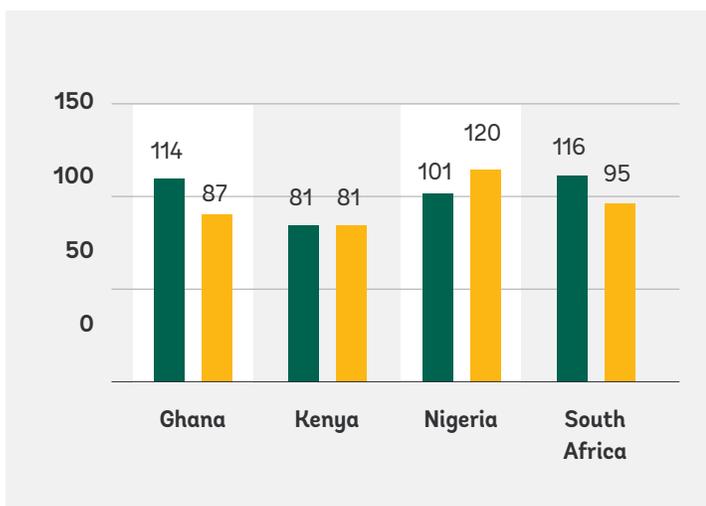
DIAGNOSTIC FINDINGS: CURRENT STATE OF DIGITAL SKILLS

The government is playing a significant role in building a workforce with strong digital skills. The current National ICT in Education Policy for Ghana (2015), first drafted in 2003 and subsequently reviewed in 2006 and 2008, states the mission to articulate the relevance, responsibility and effectiveness of utilizing ICT in the education sector. It aims at addressing current sector challenges and equipping Ghanaian learners, students, teachers, and communities to meet demand for 21st century skills. The policy document is structured around three pillars, each of which is expected to receive slightly different policy interventions and strategies to assure effectiveness, namely: (i) ICT as a learning and operating tool; (ii) ICT as integrated into teaching and learning; and (iii) ICT as a career option for students. The policy further places ICT as a fundamental subject to be taught from basic to more senior schools.

Significant improvement on Internet access in schools have not enhanced quality levels throughout the education system yet.

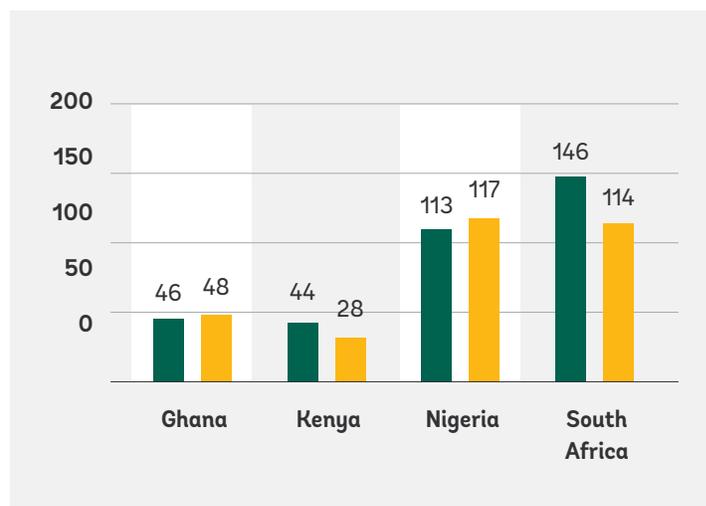
In the Global Competitiveness Report 2017-2018, Ghana ranks 48th and 87th on quality of education and Internet access in schools, respectively (see figures 2.15 and 2.16). If compared to 2013-2014 rankings, Ghana's rank on Internet access in schools was 114th, which shows a meaningful improvement; while in quality of the educational system ranked the country at 46th, which shows stagnation. When compared to other countries in the region, only Kenya shows a better performance on both indicators.

►► **FIGURE 2.15:**
INTERNET ACCESS IN SCHOOLS



● Internet access in schools 2013-2014
● Internet access in schools 2017-2018

►► **FIGURE 2.16:**
QUALITY OF EDUCATION

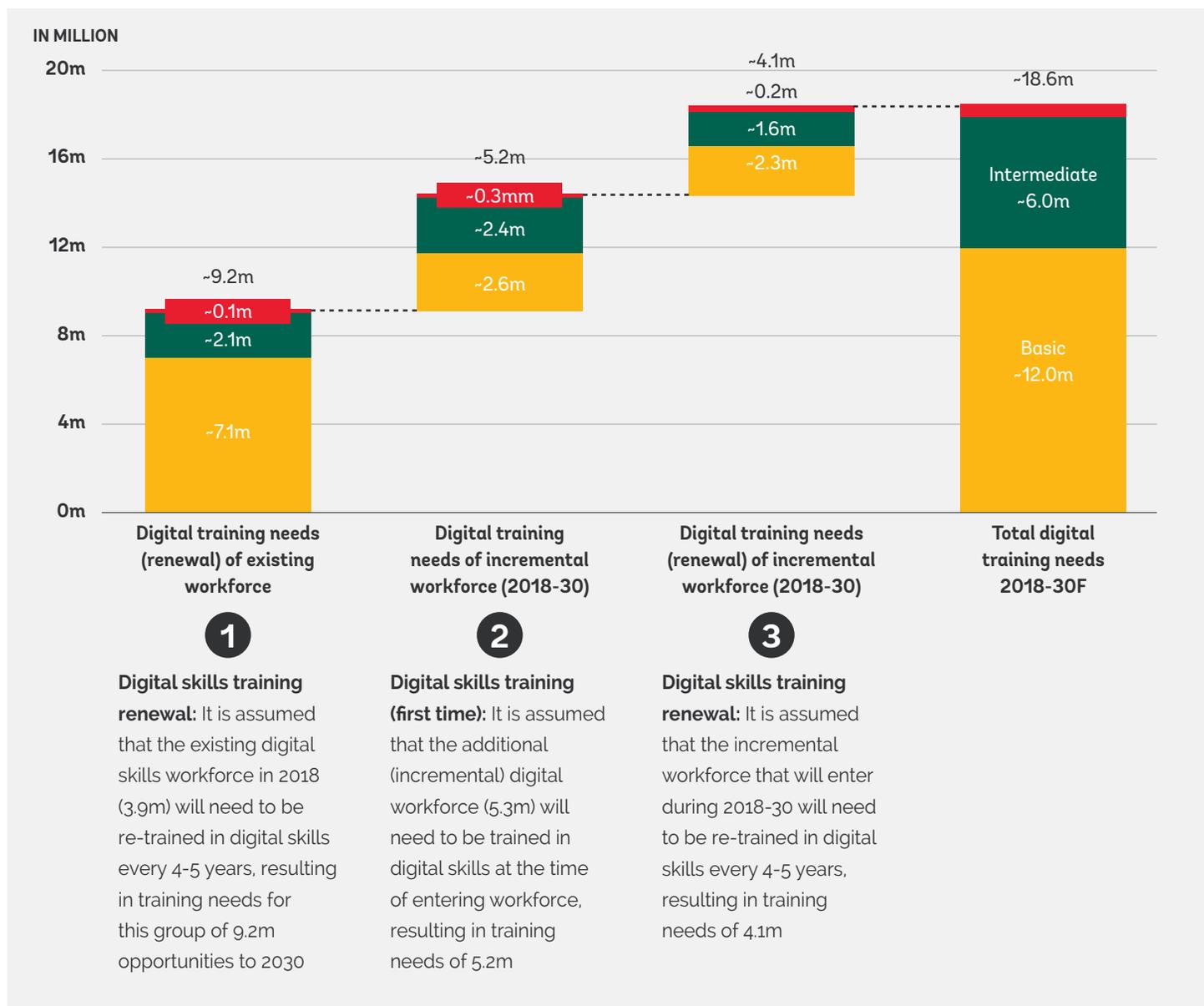


● Quality of education 2013-2014
● Quality of education 2017-2018

Source: WEF, Global Competitiveness Report 2017-2018, 2013-2014.

In Ghana, half of the labor force will need digital skills. The IFC study found that the overall requirement for digital skills, assuming a workforce of more than 20 million Ghanaians, is expected to reach 50 percent by 2030 (IFC 2019b). This will comprise a 75 percent to 80 percent usage rate in the formal sector and 45 to 50 percent in the informal sector. This figure, however, does not represent the entirety of the training demand since actual and new workforce skills needs incremental and renewal must be considered. Therefore, total digital skills training needs will climb to nearly 19 million by 2030 (see figure 2.17).

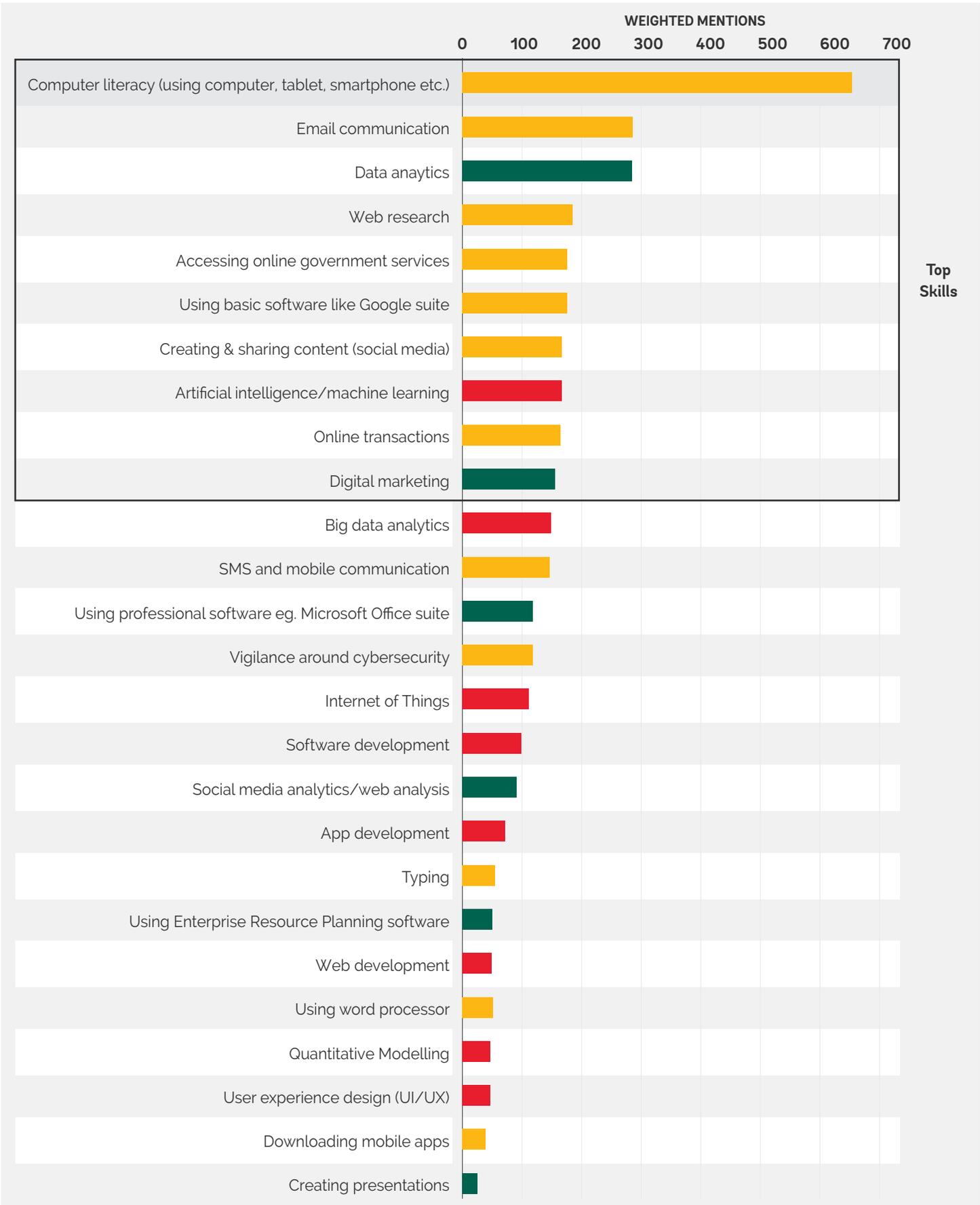
►► **FIGURE 2.17:**
CUMULATIVE DEMAND FOR DIGITAL SKILLS TRAINING IN GHANA, BY LEVEL OF SKILL, 2018-2030



Source: IFC 2019b.

Globally, most of the top digital skills requested are basic level; however, in Ghana, emphasis is also given to intermediate and advanced skills as a mean to improve in competitiveness, especially in the burgeoning services sector. Respondents to the Global Digital Skills Survey¹⁹ agreed on the top digital skills required for the future workforce, regardless of geography (see figure 2.18); however, Ghanaian respondents expect more emphasis on intermediate skills, such as data analytics, use of professional software, and digital marketing.

►► **FIGURE 2.18:**
SIGNIFICANCE OF DIGITAL SKILLS NEEDED IN THE WORKFORCE, ALL MARKETS



Source: IFC, 2019

● Basic digital skills ● Intermediate digital skills ● Advanced digital skills



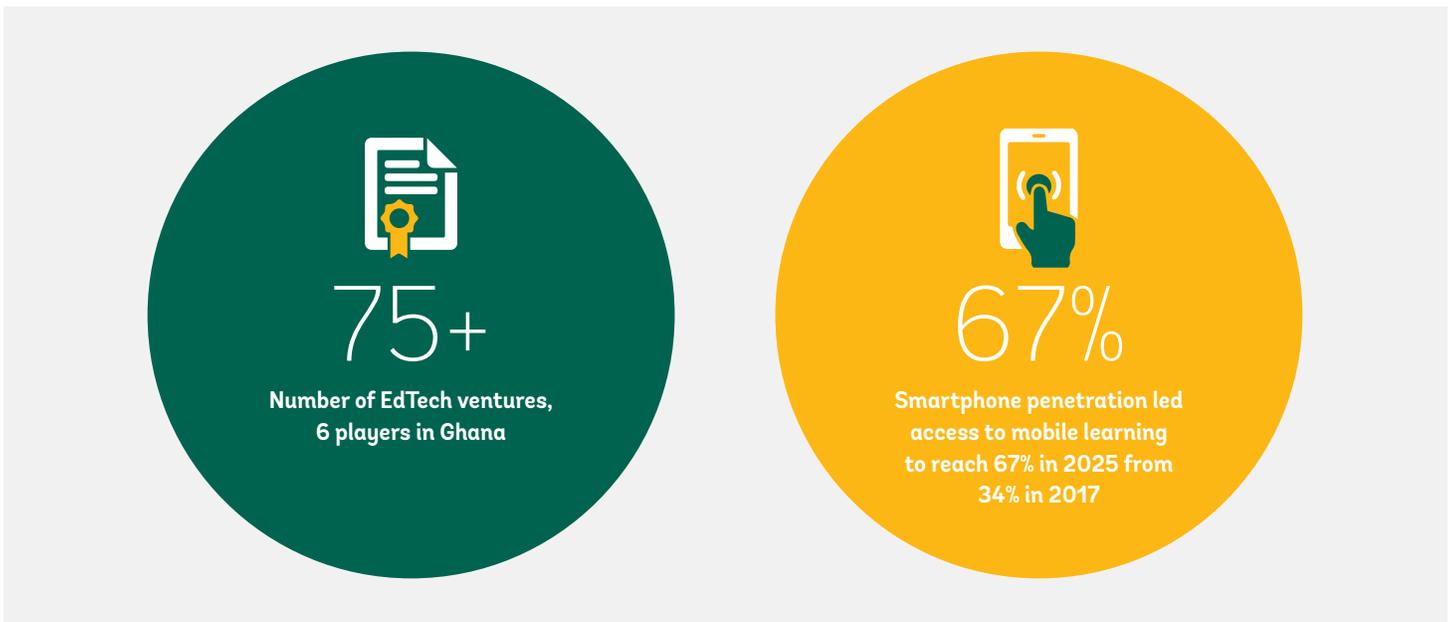
The e-learning market in Africa is expected to grow at a much faster pace than the rest of the world and to reach \$1.57 billion, growing at a CAGR of 17 percent. Ghana, being a leader in terms of mobile penetration in Africa, is poised to grow even faster in the EdTech market.

There are number of public sector efforts focused on young people. Policy efforts to expand employment outcomes among young people cut across the MDAs, including the Council for Technical and Vocational Education and Training (COTVET). COVET was established by Act of Parliament 718 in 2006 to coordinate and oversee all aspects of technical and vocational training across the formal and informal sectors. In 2012, the Parliament passed a Legislative Instrument (LI 2195) to legally enable COTVET to undertake registration and accreditation of training providers in

the public and private sectors. COVET implements the National Apprenticeship Program (NAP) as well as the Ghana Skills Development Initiative (GSDI) in collaboration with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Moreover, the Youth Employment Agency, established in 2015, aims to empower young people to contribute meaningfully to sustainable socioeconomic development of Ghana.

Many private sector organizations and the nonprofit sector have undertaken training programs to contribute to and improve the labor force in Ghana, particularly among young people. The key focus of youth employment initiatives in Ghana is skills development and training, entrepreneurial training, apprenticeship, employment services, and direct employment.

►► **FIGURE 2.19:**
eLEARNING MARKET



Source: briterbridges.com

>> Challenges

The National ICT in Education Policy for Ghana continues to face considerable challenges, mainly related to its implementation.

These include the absence of computer labs in schools, few or no computers in schools, lack of ICT teachers, and unstable or no power supply (National ICT in Education Policy for Ghana 2015).

There is high demand for digitally skilled professionals in both the public and private sector in Ghana.

Only a few Ghanaians have the required digital skills and experience beyond the basic use of a computer or tablet. In turn, the private sector is forced to pay a premium to attain these skills, which makes it even more difficult for the public sector to retain such professionals (World Bank 2017b). Respondents to the Global Digital Skills Survey in Ghana cited lack of access to practical educational experiences such as internships as the main obstacle, and education as the second biggest driver for the demand-supply gap found for digital skills. Employers across Sub-Saharan Africa report lack of access to workers with appropriate skills as a critical constraint to their growth and productivity (World Bank 2017b). The increasing demand for software developers, coders, cybersecurity professionals and project developers with relevant working experience would condition Ghana's progress towards a successful and inclusive digital economy (World Bank 2017b).

Poor Development of foundational skills. Ghana stands out in the region for having steadily increased its preprimary net enrollment ratio from 63 percent in 2008 to 90 percent in 2014 (UNESCO 2015). This in part reflects the government's commitment to meeting global development goals. However, studies of Ghana's preschool sector have found that the curriculum is rarely implemented, and that quality is low across the country (Wolf 2018). Strengthening foundational skills from the earliest years of education will be critical for equipping next generations with the skills the economy would demand in the future.

Supply of trained teachers. Ghana also faces a shortfall of 140,000 teachers (IFC 2017) and qualified candidates are in short supply (World Bank 2018e). The GoG has set out national teacher training policies, though these have yet to be fully implemented and suffer from lack awareness, insufficient funding, and minimal infrastructure support facilities.

Provision of quality learning resources. Digital skills improvement relies on students' access to both these basic and additional technology-based learning materials. Computers are not equitably accessible and are often concentrated in a few schools that meet basic infrastructural needs to install them. In Ghana, employers also mention the lack of access to suitable ICT resources as one of the biggest challenges in digital talent recruitment (IFC 2019b).

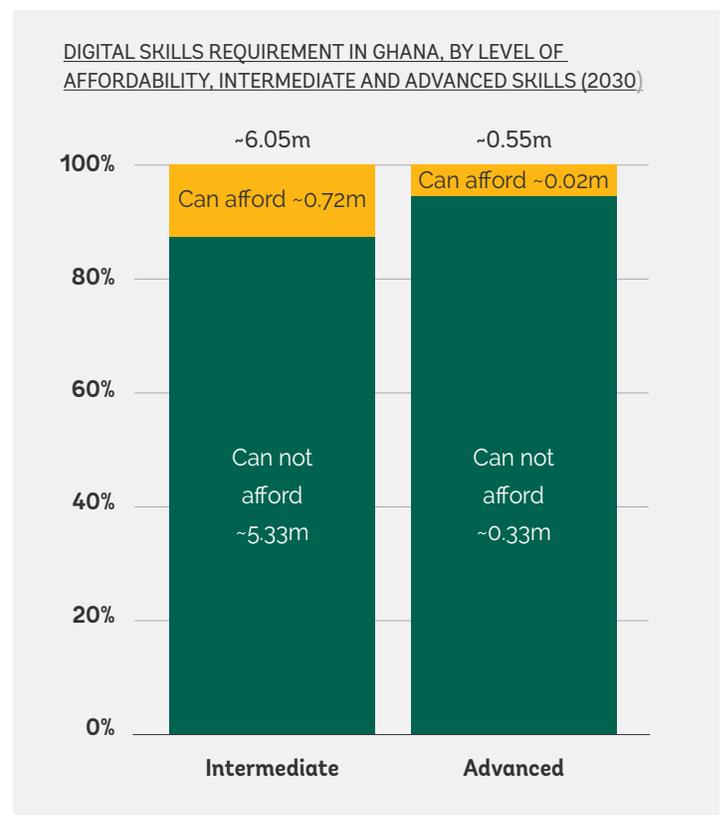
While there are various programs to bolster digital skills particularly among young people, systematic information and data on the scope of these programs is not available.

Many efforts target digital skills for young people. For instance, the Youth Employment Agency (YEA) runs the largest program in terms of youth coverage, and it is just one of 17 public sector initiatives that support digital skills for young people. Moreover, little is known about which programs are most effective in bridging the digital skills gap in Ghana. To guide public policies and inform private efforts, more evidence is needed about the effectiveness of various initiatives and approaches in fostering youth employment and smooth transition from education and training to work. In addition, existing programs are mostly concentrated in urban areas and are not accessible to Ghanaians in rural areas. The majority of programs do not provide support or follow up beneficiaries, which dilutes their effectiveness and reduces opportunities for improvement.

Because of price barriers, by 2030 only one million people will be able to afford intermediate and advanced digital skills training

(see figure 2.20). Basic digital skills training programs are unlikely to be viable for business-to-consumer models since the potential for self-pay is limited and there is the expectation that such skills can be acquired at school age. Intermediate and advanced digital skills courses provide an opportunity for the private sector to directly charge trainees.

►► **FIGURE 2.20:**
SKILLS AFFORDABILITY



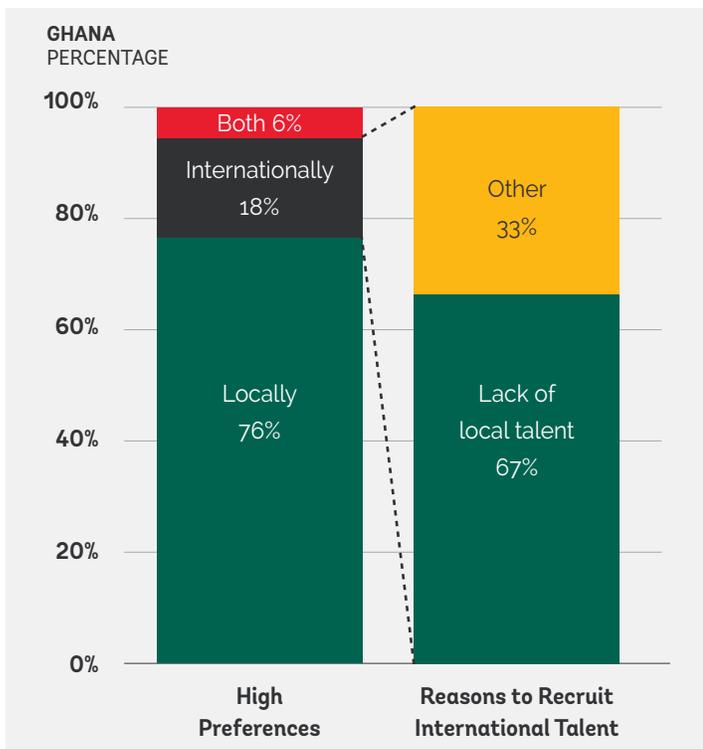
Most private sector-led skills development initiatives are expensive for the population. Moreover, there is a wide gap between the cost associated with government and privately run initiatives. According to the 2016 Ghana Youth Employment Inventory Report, the cost of fully government-funded programs is 100–150 (about \$18–27) per participant, compared to the average cost of 2,320 (about \$425) per participant in private sector programs. Private sector training programs, including those run by corporate entities, NGOs, and civil society organizations, tend to be smaller in coverage and focus more on providing digital skills.



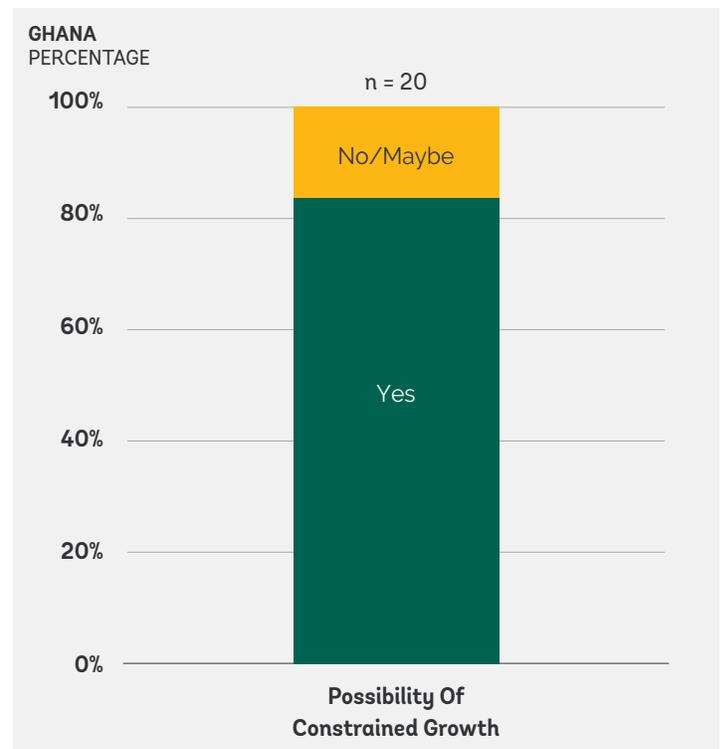
By not addressing the digital skills gap, the country's economic growth rate may not be sustained. A lack of digital skills could constrain the growth of Africa's economies and reduce productivity just as more industries need to adopt digital technologies to drive productivity. IFC's findings coming out of the Digital Skills in Sub-Saharan Africa Spotlight on Ghana suggest:

- Nearly 20 percent of surveyed Ghanaian companies recruit only internationally. Of these, nearly 70 percent do so because they cannot find skilled local talent (see figure 2.21).
- Insights from market participants suggest that many employers are leveraging either in-house or externally secured training to fill gaps in employees' digital skills.
- The demand-supply gap in digital skills could be harming productivity and compromising Sub-Saharan African competitiveness. The 80 percent of Ghanaian industry members consulted believe an undersupply in digital skills is likely to hamper economic growth in Ghana (see figure 2.22).

►► **FIGURE 2.21:**
RECRUITMENT OF EMPLOYEES
WITH DIGITAL SKILLS IN GHANA



►► **FIGURE 2.22:**
RESPONSES: WILL UNDERSUPPLY OF DIGITAL SKILLS
CONSTRAIN EXPECTED GROWTH IN THE ECONOMY



Source: IFC 2019b.

RECOMMENDATIONS AND NEXT STEPS

DS.R1.

Improve basic digital skills provision in the education system

The most effective training solution will depend to a large extent on the digital skills being taught throughout the education system as foundational skills. For basic skills, schools are perceived as the ideal platform for delivery. To spur improvement, policy makers need to create frameworks for public education institutions to leverage up-to-date digital skills training content. Take advantage of existing online training resources, such as Massive Open Online Courses (MOOCs).

DS.R2.

Boost supply of digitally literate teachers

Ghana also faces a shortfall of 140,000 teachers (IFC 2017) and qualified candidates are in short supply (World Bank 2018e). The GoG has set out national teacher training policies, though these have yet to be fully implemented because of a lack of awareness of the policies, insufficient funding, and minimal infrastructural support facilities. To tackle such challenges, GoG should invite other stakeholders to coinvest in them.

DS.R3.

Increase coverage of quality digital learning resources

To make computers equitably accessible by improving basic school infrastructure needs, especially in rural areas. In parallel, a mobile literacy curriculum could leverage mobile penetration to take better advantage of smart devices.

DS.R4.

Align intermediate digital skills taught with future workforce needs

For intermediate skills, both school age and preemployment/postsecondary education are essential. To focus on employability, partnerships with the private sector are vital to improve the curriculum and provide relevant working experience (internships) during the schooling phase. The emphasis on the most demanded intermediate skills for the workforce is critical, such as data analytics, use of professional software, and digital marketing.

DS.R5.

Scale and cofund advanced digital skills

Advance digital skills will require significant resources to upgrade the provision and coverage of effective training. The scale-up of the supply of advanced skills would require partnering with other stakeholders, including the private sector, donors, and private training service providers. These types of training surpass schooling years and encompass short courses such as rapid-skills training or bootcamps, typically from three to 12-months long, and with a mix of instructional methods geared towards practical learning rather than theoretical concepts. The private sector can provide business-to-consumer training, while others may involve business-to-business or business-to-government services, and others may include ecosystem-building activities that contribute to broader sector development.

DS.R6.

Provide digital skills to underrepresented groups

Conduct campaigns to provide digital skills to underrepresented groups, offer free or subsidized training, stimulate private scholarships by offering tax incentives for such scholarships, raise awareness in lagging communities with an outreach strategy.

DS.R7.

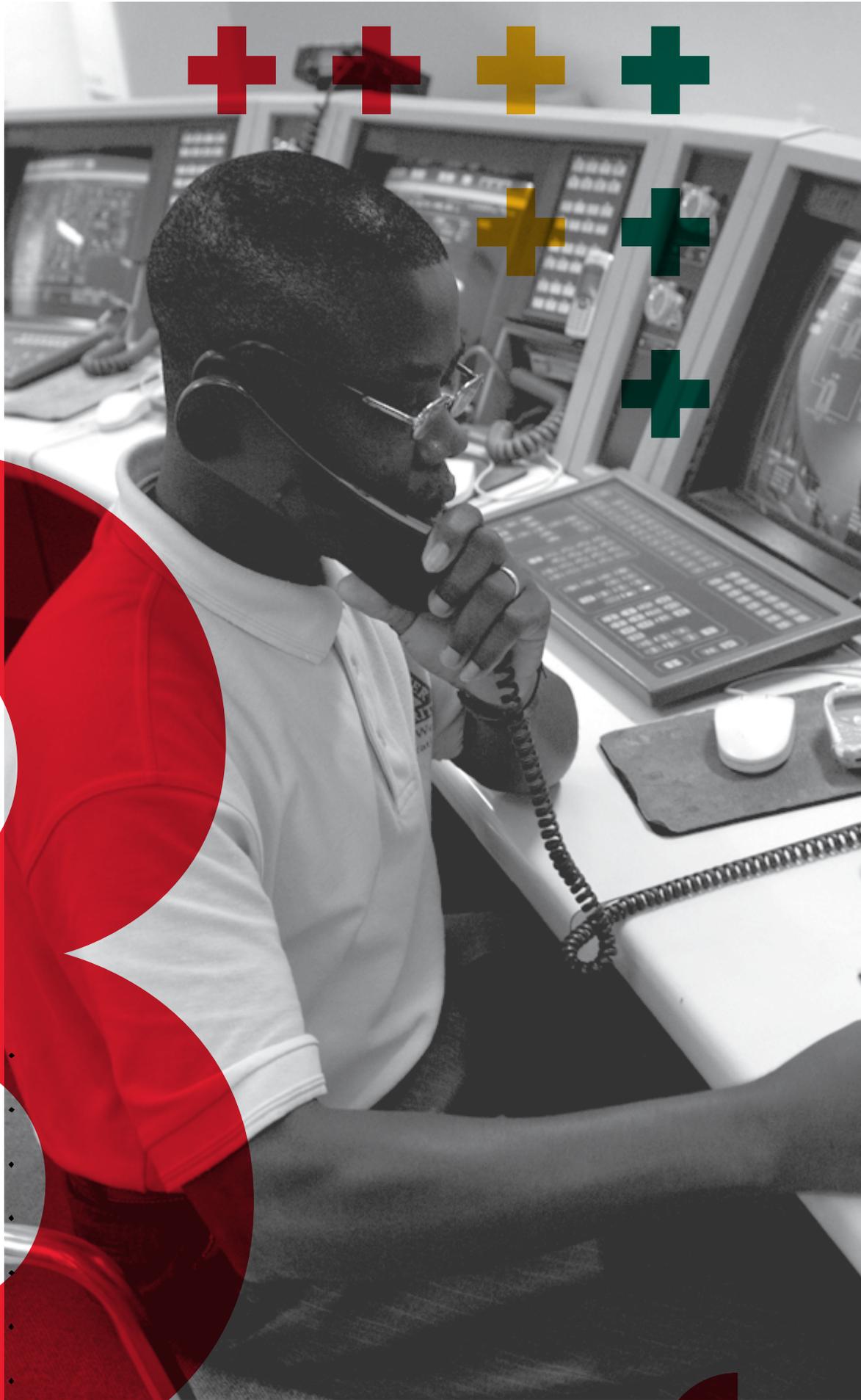
Establish a multistakeholder governance framework for coordinating efforts to foster digital skills with an ecosystem approach

There is space for multiple stakeholders to take multiple roles and actions to improve and ramp-up digital skills training. If efforts are not orchestrated, impact may be diminished. To articulate efforts, a governance framework should be established with an ecosystem approach (see table 2.11).

►► **TABLE 2.11:**
OPPORTUNITY FRAMEWORK FOR STAKEHOLDERS

	 PROVIDE TRAINING	 DEVELOP ECOSYSTEM
POLICYMAKERS	<ol style="list-style-type: none"> 1. Partner with training or curriculum providers to roll out digital skill training in schools, colleges and communities 2. Develop digital skills courses with public institutions (for example, technical and vocational education and training, primary, secondary) 	<ol style="list-style-type: none"> 1. Create frameworks for public education institutions to leverage up-to-date digital skills training content 2. Continue to expand infrastructure 3. Create frameworks for public private partnerships
PRIVATE EDUCATION OPERATORS/ SERVICE PROVIDERS	<ol style="list-style-type: none"> 1. Provide training directly to learners 2. Partner with government to provide curriculum or direct training (for example, in schools) 3. Partner with corporates to provide curriculum or direct training 	<ol style="list-style-type: none"> 1. Support operators and public sector to upgrade content 2. Improve access to infrastructure (for example, devices, internet access) 3. Develop tools/platforms to support unskilled people to get online
TECH COMPANIES	<ol style="list-style-type: none"> 1. Provide curriculum and content potentially in partnership with government or private providers 2. Directly provide training to develop talent pool 	<ol style="list-style-type: none"> 1. Set standards in terms of certifications required for digital training 2. Advise government on policy 3. Provide teacher training and support government infrastructure initiatives
DONORS	<ol style="list-style-type: none"> 1. Fund basic skills training 2. Fund programs enabling skilling for marginalized and underrepresented groups 3. Support the early expansion of innovative or untested models, including student financing 	<ol style="list-style-type: none"> 1. Fund the development of improved digital skills content 2. Support development and access to low cost devices
INVESTORS	<ol style="list-style-type: none"> 1. Help scale and import effective training models 2. Consider investment in student financing models that enable expansion of access 	<ol style="list-style-type: none"> 1. Invest in infrastructure and telecommunication
LARGE EMPLOYERS	<ol style="list-style-type: none"> 1. Directly provide training to develop talent pool 2. Invest in digital skill programs as a part of corporate social responsibility 	<ol style="list-style-type: none"> 1. Actively seek to partner with government or private operators to align curriculum to latest industry standards 2. Invest in infrastructure development as a part of CSR

Source: IFC, 2019b





Conclusion: A Way Forward

To advance towards a vibrant digital economy that can foster Ghana's leadership potential, a set of recommendations are proposed for the development of actions aimed at solving the challenges identified across the digital economy foundations.

Recommendations are classified by level of priority: (i) quick-wins, for improvement actions with immediate benefit that can be delivered quickly with results; (ii) high-priority, for critical recommendations that cannot be delayed; and, (iii) long-term, for actions that focus on consolidating results while building the policy framework, infrastructure, systems, and capacity needed to achieve goals, and, therefore, whose implementation spans a longer timeframe.

Ghana's ability to position itself as a leading digital innovation hub will depend to a large extent on its ability to address risks and needs to strategically invest in the foundational elements of their digital economy.

A holistic approach to digital economy development is necessary to maximize Ghana's chance of attaining its digital potential. Rather than implementing multiple, fragmented interventions, a coordinated and high-level crossboundary approach that maximizes complementarities is needed for building an inclusive digital economy. To ultimately spur the development of high-impact applications for health, education, e-commerce, agriculture, and social service delivery, among others, while mitigating exclusion, fraud, and cyber risks.

All five foundations of the digital economy rely on a robust legal and regulatory framework that fosters competition.

All areas of the digital economy require effective competition. Firms operating within the digital economy – whether to offer digital connectivity, payment solutions, or digital platforms – require a level playing field. Free market forces can help drive down prices and ramp up usage. At the same time, all aspects of the digital economy need to be inclusive, giving equal opportunity to men and women, and to the disadvantaged.

The results of recommended interventions seek to support Ghana's achievement of the goals set under the Digital Roadmap for the Beyond Aid Agenda (Digital Roadmap Concept Note, May 2019). Progress on implementing actions to enhance digital economy transition is expected to:

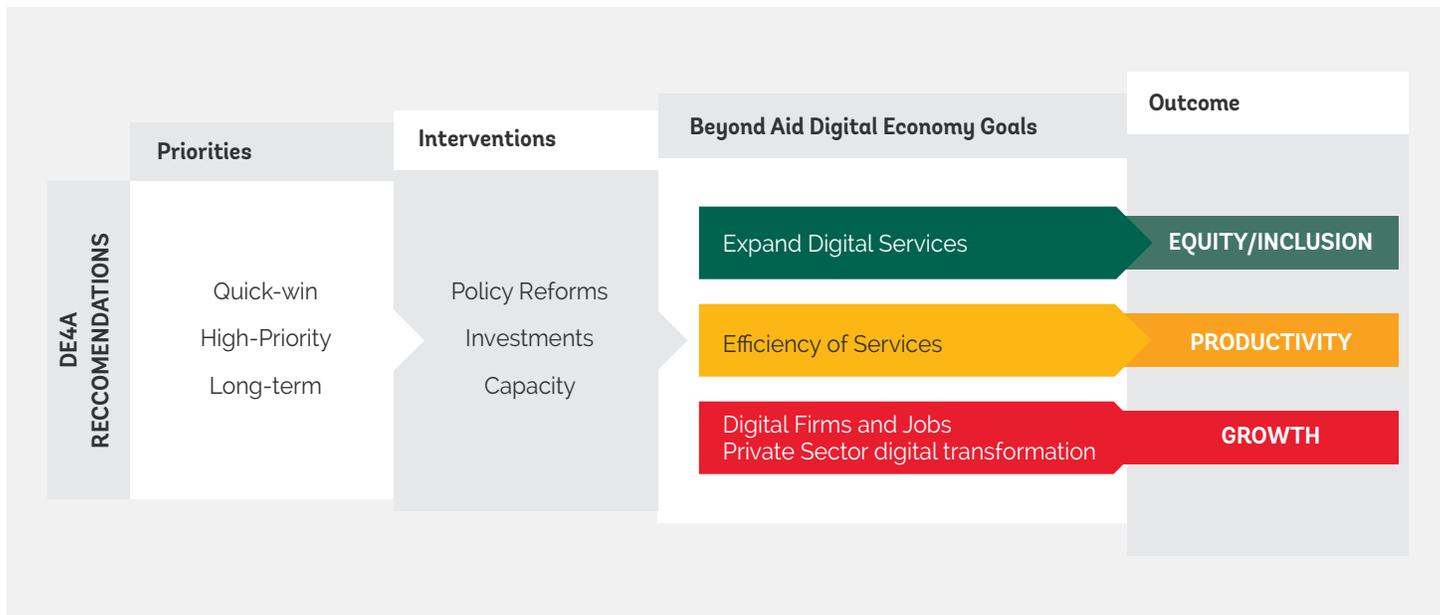
- Expand digital services to bridge the urban-rural divide:** digital transactions, connections, applications, and services have the potential to transform the way people, governments, businesses, governments, and civil society interact with each other. From parents enrolling their children in school, to social safety net administrators verifying the identity and eligibility of a new beneficiary, to businesses submitting their annual tax filings, the transactions that fill our daily lives have historically required paper forms, in-person visits during business hours, and cash payments. The combination of digital platforms with digital financial services and powered by digital infrastructure, skills, and entrepreneurship – support transactions, marketplaces, and other spaces that are on-demand, paperless, and cashless, and available through the Internet from anywhere in Ghana and the world. Increased access to digital services contributes to equity and inclusion of disadvantaged groups, such as farmers, rural households, and women, for instance, as they would be able to sell their local produce and homemade products.
- Foster the growth of the local IT Industry beyond the boundaries of Ghana:** the rise of the Internet has brought to ventures in Ghana, enhanced adoption and adaptation of digital technology by existing businesses, opened access to microwork jobs, and is expected to generate new digital jobs (that is, those that do not exist today) in both traditional industries and newly created industries. Recommendations for the growth of the local IT industry target the growth of digital firms as well as digital transformation of the private sector by leveraging digital technology to improve performance of nondigital businesses, having both expected impacts on boosting job creation. In this way, a strong digital private sector is expected to contribute to Ghana's economic growth.
- Leverage digital technologies to improve quality and efficiency of service:** digital transformation helps improve the efficiency and effectiveness of core functions and services of both the public and private sectors, reduces duplication; combats fraud and corruption by increasing the security and traceability of transactions, and improves engagement and accountability. By providing trusted venues and resources for digital transactions, including tax filling and formal registrations, digital technologies enhance the ability of the government to generate revenues. Overall, improved quality and efficiency of services is linked to more productive use of the economy's resources.

►► **TABLE 3.1.**
RELEVANCE OF THE RECOMMENDATIONS TO DEVELOPMENT OUTCOMES

Digital Roadmap Beyond Aid Goals	Link to Recommendations' Results	Development Outcome
Foster the growth of the local IT industry beyond the boundaries of Ghana	Foster digital firms and job creation	 Growth
Bridge urban-rural divide by expanding digital services to rural and underserved communities	Expand digital services	 Equity/inclusion
Increase efficiency, improve citizen experience and engagement with government, increase transparency in government functions, and increase government revenue generation	Improve quality/efficiency of services (including public and private sector services)	 Productivity

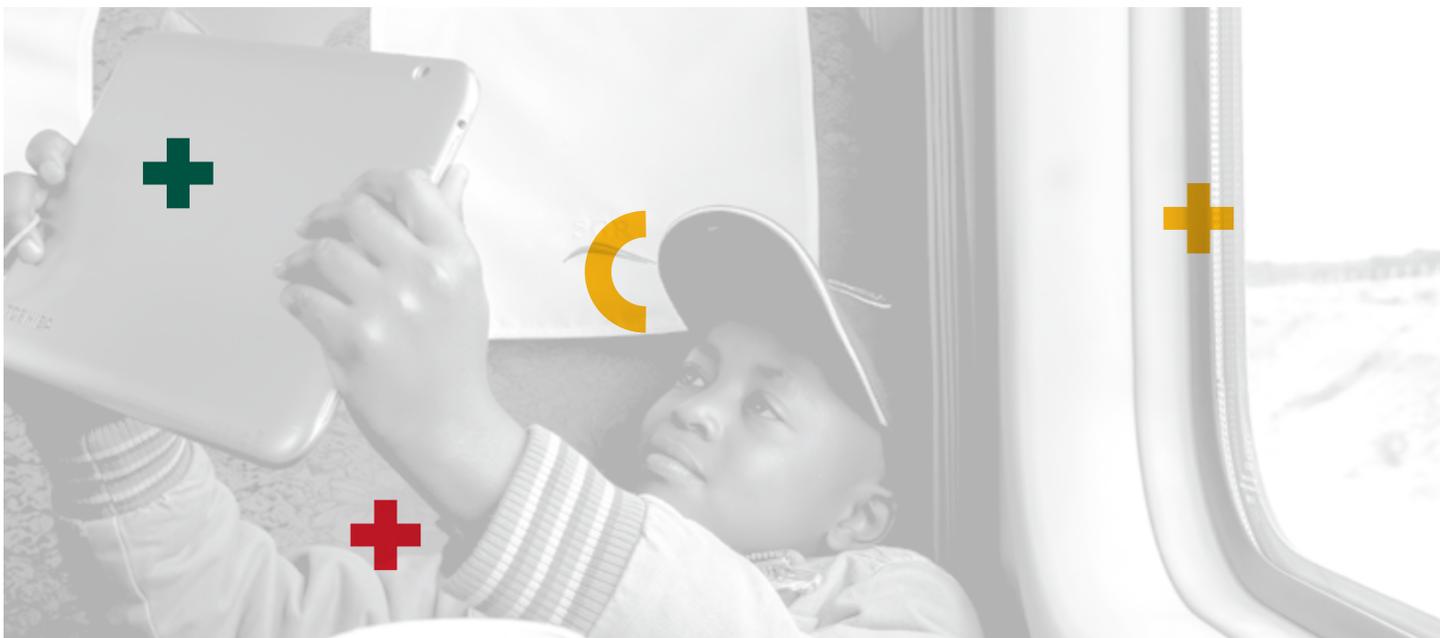
Recommended priorities and Beyond Aid goals are intrinsically linked to the development outcomes of equity/inclusion, productivity and growth (see figure 3.1).

►► **FIGURE 3.1:**
THEORY OF CHANGE TOWARDS A DIGITAL ECONOMY IN GHANA



Thus, the recommended interventions seek to support the achievement of three overarching goals included in the Digital Roadmap for the Beyond Aid in Ghana. The proposed recommendations include 37 interventions that target the three established goals: six recommendations seek to improve digital infrastructure; eight to strengthen digital platforms; seven to mature digital financial services; nine to promote digital entrepreneurship; and seven to develop digital skills. Tables 3.2, 3.3 and 3.4 summarize the 37 recommendations, grouping them by Beyond Aid goal.

Each recommendation follows from the analysis of the strengths and challenges in Ghana in the five foundational pillars (see appendix D for full descriptions of all recommendations). Each recommendation includes the expected development outcome, the type of intervention required, the government agencies that will need to coordinate to deploy such recommendation, the priority, the foundation pillar that gave origin, and the synergies to actions pursued in other foundations.



▶▶ **TABLE 3.2:**
RECOMMENDATIONS SUPPORTING DIGITAL FIRMS AND JOB CREATION

17

Beyond Aid DE Goal
Digital firms and job creation

Development Outcome
Growth

Recommendations	Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DP.R6 Develop a coordinated digital commerce support program				MOTI, NEIP, NYA, BoG, Ghana Post		
DP.R7 Institutionalize data production and availability for evidence-based digital commerce policies				Ghana Statistical Service, MOTI		
DP.R8 Establish a regulatory Sandbox for Digital Commerce and Gig Economy labor regulations				MOTI, MELR, MoC		
DE.R1 Develop IT-ITES sector programs to support the scale up of Ghana's exports, players, digital innovation, and expertise				MOTI, MOFEP, MOC, MBD, NEIP, NYA		
DE.R2 Develop a digital technology adoption program to accelerate digital transformation of the economy, targeting specific audiences.				MOTI, MBD, NEIP, NYA, MOFEP		
DE.R3 Articulate Ghana's value proposition to position Ghana as a relevant global Digital Hub				MOTI, MOFEP, Ghana Investment Promotion Council, MOC, MBD, NEIP		
DE.R4 Unify the national vision for digital entrepreneurship by developing a single digital economy policy and establishing a digital economy observatory				MOTI, NEIP, National Intellectual Property, VCTF, MoC, MOFEP, NYA, MOE		
DE.R5 Improve specific regulations for digital industries (i.e. taxes, IP rights, limited partnerships)				MOTI, MBD, MoC, MoJ, National Intellectual Property Office, BoG		
DE.R6 Increase the pool of human capital with digital and entrepreneurial skills by amplifying existing efforts				MOTI, MoC, NYA, NEIP, MEST, MELR		
DE.R7 Streamline and consolidate entrepreneurship support and entrepreneurship intermediaries				MOTI, MBD, NEIP, NBSSI, VCTF		
DE.R8 Encourage the diversification at early-stage private capital and credit guarantees access for startups and SMEs				MOFEP, VCTF, BoG, Presidents Office		
DE.R9 Establish Digital Centers necessary for digital entrepreneurs to thrive across the country				MOC, MOTI		
DS.R1 Improve basic digital skills provision at education system				MOE, COTVET		
DS.R2 Boost supply of digitally savvy teachers				MOE, COTVET		
DS.R3 Increase coverage of quality digital learning resources				MOE, COTVET		
DS.R4 Align intermediate digital skills taught with future workforce needs				MOE, COTVET, MOTI, NYA		
DS.R5 Scale and co-found advanced digital skills				MOE, MOTI, NYA		

Development Outcomes	Type of intervention	Priority	Key Foundational Element	
Growth	Policy Reform	Long-Term	Digital Infrastructure	Digital Entrepreneurship
Equity/Inclusion	Investment	High-Priority	Digital Platforms	Digital Skills
Productivity	Capacity	Quick-Win	Digital Financial Services	

►► **TABLE 3.3:**
RECOMMENDATIONS SUPPORTING EXPANSION OF DIGITAL SERVICES

12 Beyond Aid DE Goal
Expand digital services

Development Outcome
Equity/Inclusion

Recommendations		Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DI.R1	Revise Broadband Speed Targets				MoC, NCA		
DI.R2	Develop a robust and comprehensive middle mile (domestic backbone infrastructure)				NCA, NITA		
DI.R3	Increased investment in Last Mile Infrastructure				NCA, GIFEC, MoC		
DI.R4	Revise Spectrum Allocation and Award of Unified Licenses				NCA		
DP.R2	Prioritize the rollout of Digital ID to enable access to digital services				NITA, NIA		
DFS.R1	Mobile Money Interoperability				BoG		
DFS.R2	Drive greater digitization through opening new channels for government payments				BoG, MOFEP		
DFS.R3	Encourage competition and promote an enabling environment to drive DFS innovation				BoG		
DFS.R4	Adopt policies that encourage greater use of merchant payments				BoG, MOTI		
DFS.R5	Expand rural adoption by facilitating investments in last mile infrastructure and the digitization of agricultural value chains				BoG, MOTI, MOFA		
DFS.R7	Strengthen DFS and e-money regulation and surveillance				BoG		
DS.R6	Provide digital skills to under-represented groups				MOE, MOTI, NYA, MoC, NEIP		

Development Outcomes	Type of intervention	Priority	Key Foundational Element	
Growth	Policy Reform	Long-Term	Digital Infrastructure	Digital Entrepreneurship
Equity/Inclusion	Investment	High-Priority	Digital Platforms	Digital Skills
Productivity	Capacity	Quick-Win	Digital Financial Services	

►► **FIGURE 3.4:**
RECOMMENDATIONS SUPPORTING EFFICIENCY AND QUALITY OF SERVICES



Beyond Aid DE Goal
Efficiency/ Quality of services

Development Outcome
Productivity

Recommendations		Outcome	Type of Intervention	Priority	Institutional coordination	Foundation	Synergies
DI.R5	Streamline effective implementation of Cybersecurity Policy and Strategy				NITA, MoC, CERT-GH, National Cybersecurity Center		
DI.R6	Explore and encourage private sector solutions for data storage capacity needs				NITA		
DP.R1	Strengthen NITA to facilitate the citizen-centric development of public sector digital platforms				NITA		
DP.R3	Emphasize public sector digital capacity building				MoC, NITA		
DP.R4	Strengthen Protection of Ghanaians data				DPC, CPA, NCA		
DP.R5	Revamp and enhance GODI to maximize social and economic value of public data				NITA, MoC, Ghana Statistical Service, MOFEP		
DFS.R6	Strengthen digital financial consumer protection policies				DPC, BoG		
DS.R7	Establish a multi-stakeholder governance framework for coordinating efforts to foster digital skills with an ecosystem approach				MOE, MOTI, COTVET, NYA, MoC, NEIP		

Development Outcomes

- Growth
- Equity/Inclusion
- Productivity

Type of intervention

- Policy Reform
- Investment
- Capacity

Priority

- Long-Term
- High-Priority
- Quick-Win

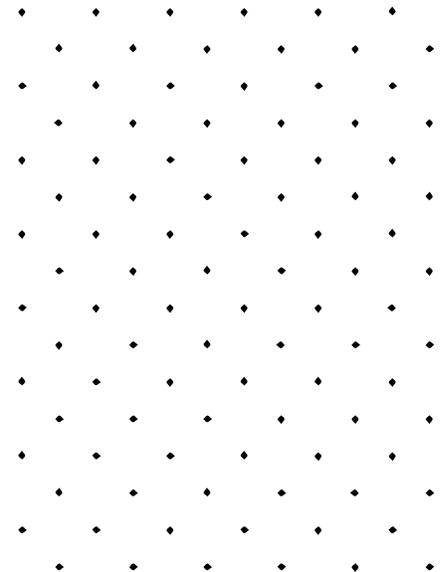
Key Foundational Element

- Digital Infrastructure
- Digital Platforms
- Digital Financial Services
- Digital Entrepreneurship
- Digital Skills



Notes

1. <https://www.gipcghana.com/press-and-media/546-government-launches-national-entrepreneurship-programme.html>.
2. Connectivity includes mobile and fixed access networks, metro and backhaul networks, national backbone networks, and international connections.
3. Service enabling infrastructure includes private or independent data centers, and, increasingly, Infrastructure-as-a-Service and Software-as-a-Service cloud platforms.
4. The recent merger of Airtel and Tigo reduced the number from six to five operators.
5. 1 GB of data was 3 percent of GNI per capita income in 2016.
6. <https://www.cable.co.uk/mobiles/worldwide-data-pricing/>.
7. <https://www.cable.co.uk/broadband/speed/worldwide-speed-league/>
8. Additional 4G licenses have been issued to three broadband wireless operators who are restricted to data.
9. Digital platforms may be defined as "multisided marketplaces with business models that enable producers and users to create value together by interacting with each other" (Still and others 2017), and by facilitating matching, searching, exchanging, transactions, and so on (Evans 2013). They provide the place for collecting, sharing and aggregating data, performing analytics, and delivering new and improved services. Digital platforms may help eliminate traditional data sharing barriers between organizations and transform the way businesses, governments, citizens, and civil society interact.
10. The Online Services Index component of the E-Government Development Index is a composite indicator measuring the use of ICTs by governments in delivering public services at the national level and is based on a comprehensive survey of the online presence of all 193 Member States.
11. Microwork is a series of small tasks that have been broken out of a larger project and can be completed via the Internet by any worker with a computer and Internet access.
12. NQI is defined as the institutional framework that establishes and implements the practice of standardization.
13. The Right to Information Bill was first drafted in 1999 under President Rawlings. Various advocacy groups emerged to press for the immediate passing of the bill into law in 2002, but it was reviewed in 2003, 2005, and 2007.
14. Questionnaires for Official Statistics on the ICT sector, and ICT use by enterprises. https://unctad.org/en/Pages/DTL/STI_and ICTs/ICT4DQuestionnaire.aspx.
15. Ghana Interbank Payment and Settlement Systems (GhIPSS). <https://ghipss.net/index.php>.
16. e-Payment Portal: <https://www.epay.gov.gh/>.
17. e-Payment services: <https://www.epay.gov.gh/services-by-category/services.html>.
18. Recovery cost as a percentage of the debtor's estate is 9.3 percent in OECD high-income countries.
19. More than 60 percent of respondents were African, of whom 50 percent were Ghanaian.





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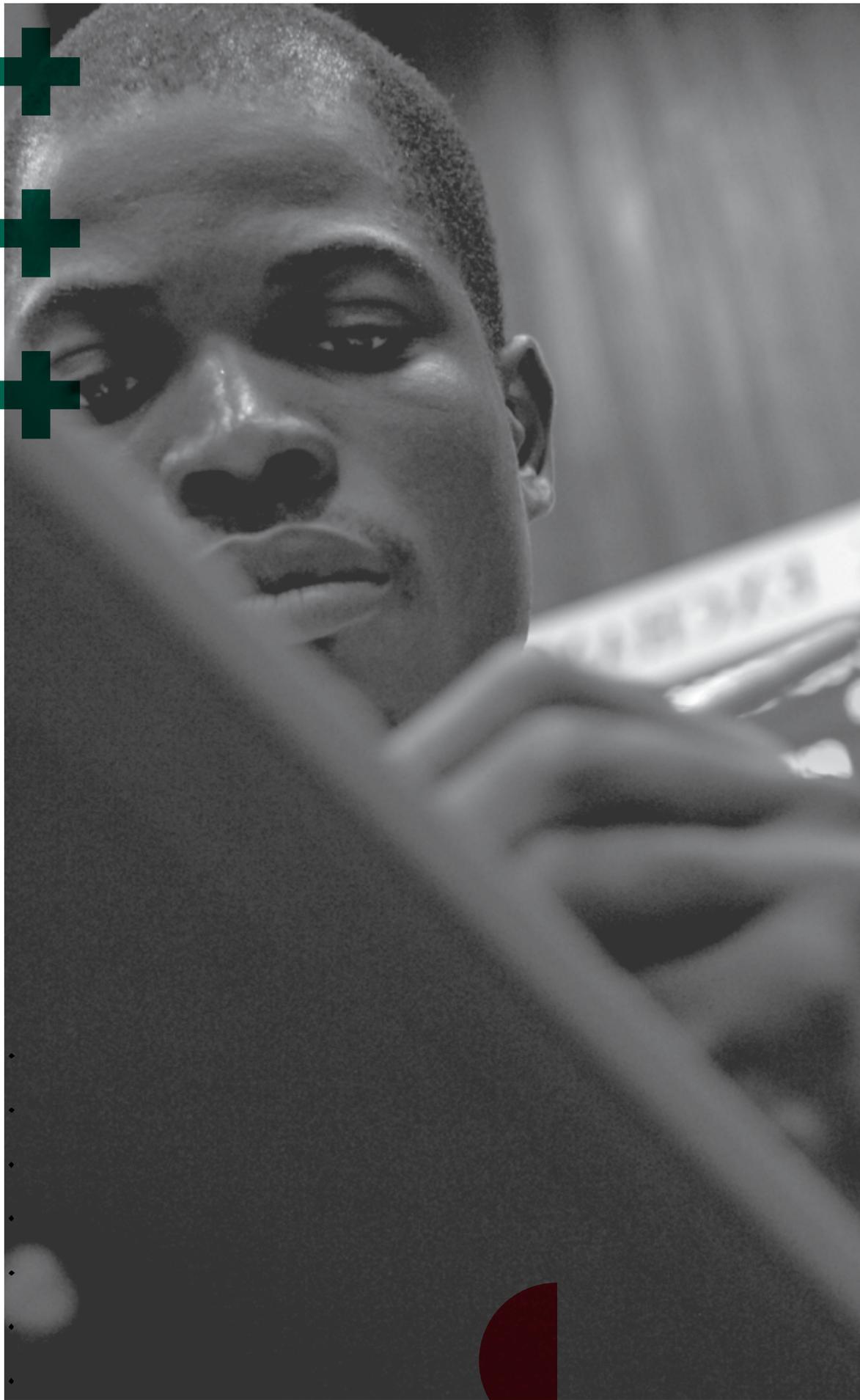
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APPENDIX A.

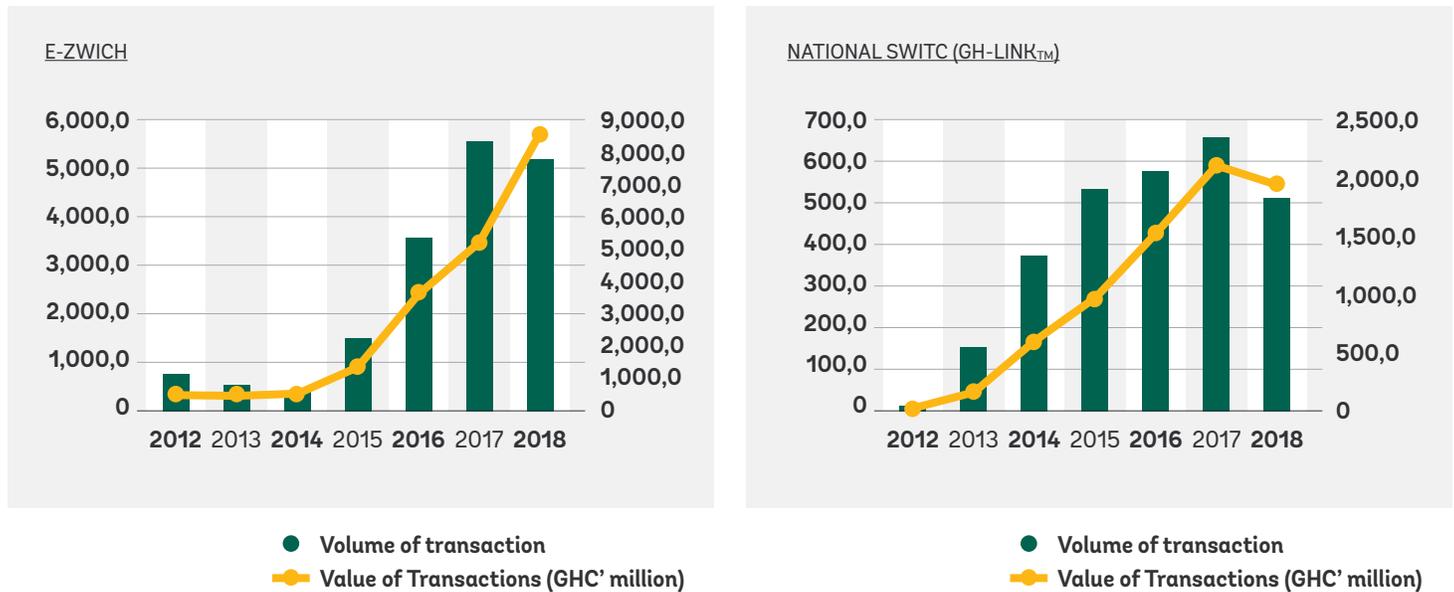
Digital Financial Services

▶▶ **TABLE A.1:**
GOVERNMENT, BUSINESS, AND PEOPLE PAYMENTS, 2016

	Number of Monthly Transactions	Percentage of Electronic Transactions	Number of Electronic Transactions	Total Monthly Value (GHS)	Percentage of Electronic Payment	Total Value of Electronic Payment (GHS)
Government Total	8,828,812	23%	2,023,950	2,987,828,488	86%	2,573,402,654
G2P	771,276	100%	771,276	1,182,767,799	100%	3,431.49
G2B	7,561,417	10%	756,556	1,028,666,667	60%	614,240,833
G2G	496,119	100%	496,119	776,394,022	100%	776,394,022
Business Total	9,572,372	28%	2,694,720	35,448,103,531	35%	12,464,574,875
B2G	1,308,057	43%	558,921	7,361,553,381	47%	3,462,590,983
B2B	4,060,995	4%	182,493	25,319,469,753	30%	7,687,449,579
B2P	4,203,320	46%	1,953,306	2,767,080,396	48%	1,314,534,314
People Total	550,528,862	0.4%	2,441,607	8,309,818,546	29%	2,373,903,567
P2G	10,685,254	9%	993,896	667,844,063	27%	178,322,799
P2B	534,110,135	0.2%	557,706	4,561,141,972	4%	172,315,292
P2P	5,733,472	16%	890,005	3,080,832,510	66%	2,023,265,475
Grand Total	568,930,046	1%	7,160,277	46,745,750,564	37%	17,411,881,096

Source: BTCA.

▶▶ **FIGURE A.1:**
ANNUAL VALUE AND VOLUME OF PAYMENT TRANSACTIONS THROUGH E-ZWICH AND NATIONAL SWITCH



E-Zwich	2012	2013	2014	2015	2016	2017	2018
Volume of Transaction	1,147,418	814,441	625,167	2,251,101	5,365,085	8,367,017	7,759,354
Value of Transactions (GC¢ million)	217.8	217.2	272.7	922.9	2,362,96	3,431.49	5,651.14
Total number of cards	792,966	903,724	1,084,121	1,369,369	1,838,044	2,364,456	2,774,799
Average Value per Card (GC¢)	23.6	21.0	20.9	47.3	58.8	62.1	83.4
Volume of transactions per card	1.4	0.9	0.6	1.6	2.9	3.5	2.8
National Switch (gh-link™)	2012	2013	2014	2015	2016	2017	2018
Volume of Transaction	10,295	549,456	1,346,963	1,899,645	2,067,498	2,340,409	1,830,183
Value of Transactions (GC¢ million)	1.10	67.50	183.32	305.14	447.04	603.43	543.74

Source: BTCA.

►► **TABLE A.2:**
ANNUAL VALUE AND VOLUME OF PAYMENT TRANSACTIONS BY DEBIT, CREDIT, AND PREPAID CARDS

Debit Cards	Half year ending DEC 2015	Year Ending 2016	Year Ending 2017
Number of cards issued (cumulative)	4,304,097	5,446,030	5,953,484
Value of transactions	22,852,411	46,546,021	60,382,177
Value of transaction (GC¢)	5,213,724,329	13,582,667,448	17,785,179,796
Credit Cards	Half year ending DEC 2015	Year Ending 2016	Year Ending 2017
Number of cards issued (cumulative)	5,438	9,217	14,698
Value of transactions	57,801	138,037	185,101
Value of transaction (GC¢)	33,728,201	70,085,071	99,989,316
Prepaid Cards	Half year ending DEC 2015	Year Ending 2016	Year Ending 2017
Number of cards issued (cumulative)	44,250	58,907	86,017
Value of transactions	143,531	312,143	472,071
Value of transaction (GC¢)	51,855,244	103,259,073	255,875,512

Source: Payment System Oversight Annual Report, 2017.

▶▶ **TABLE A.3:**
GOVERNMENT, BUSINESS, AND PEOPLE PAYMENTS BREAKDOWN, 2016

GOVERNMENT TOTAL	Number of Monthly Transactions	Percentage of Electronic Transactions	Number of Electronic Transactions	Total Monthly Value (GHS)	Percentage of Electronic Payment	Total Value of Electronic Payment (GHS)
	8,828,812	23%	2,023,950	2,987,828,488	86%	2,573,402,654
G2P	771,276	100%	771,276	1,182,767,799	100%	1,182,767,799
Wages and salaries	496,320	100%	496,320	1,009,166,667	100%	1,009,166,667
Pension	168,456	100%	168,456	167,351,132	100%	167,351,132
Social welfare programs (e.g., LEAP)	106,500	100%	106,500	6,250,000	100%	6,250,000
G2B	7,561,417	10%	756,556	1,028,666,667	60%	614,240,833
Procurement of goods and services	7,558,656	10%	755,866	908,250,000	61%	554,032,500
Corporate tax refunds	2,761	25%	690	120,416,667	50%	60,208,333
G2G	496,119	100%	496,119	776,394,022	100%	776,394,022
Transfers to local government (metropolitan, municipals and districts assemblies)	72	100%	72	717,250,000	100%	717,250,000
Social security contributions	496,047	100%	496,047	59,144,022	100%	59,144,022
B&P 2 Government Total	11,993,311	13%	1,552,817	8,029,397,444	45%	3,640,913,782
B2G	1,308,057	43%	558,921	7,361,553,381	47%	3,462,590,983
Fines and fees to Govt.	77,538	1%	676	262,561,740	36%	93,821,132
Taxes	176,720	10%	17,672	1,760,821,517	68%	1,188,554,524
Utilities	249,879	5%	12,494	5,242,318,124	40%	2,096,927,250
Social security contributions	803,920	66%	528,079	95,852,000	87%	83,288,077
P2G	10,685,254	9%	993,896	667,844,063	27%	178,322,799
Fines and fees to Govt.	68,504	3%	1,913	53,256,778	16%	8,337,600
Taxes	2,775,027	35%	964,983	383,261,817	44%	168,635,199
Social security contributions	150,000	18%	27,000	7,500,000	18%	1,350,000
Bill pay: water & electricity	7,691,723	0% ^a	0	223,825,469	0%	0

Source: BTCA Country Diagnostic.

Note: a. This estimate may not be accurate given that digital payment options exist and Findex found evidence of their use. (Paid utility bills: using a mobile phone (% age 15+) 2017: 8%).





APPENDIX B.

List of Main Entrepre- neurship Hubs In Ghana

No.	Name of Hub	Functions
1	Ispace	Provides space and training programs targeted at innovators at different stages of their entrepreneurial journey
2	Hapaspace	Provides incubation, acceleration and other programs, coworking and training space
3	Impact Hub	Tech hub and coworking space provides a workspace which offers high-speed Internet access and exposure to a wealth of entrepreneurship advice
4	MEST	Offers tech startups software training, skills development to manage businesses
5	BaseCamp	Botanical workspace that gives freelancers, entrepreneurs, and creatives a relaxed setting to conduct business
6	Hopin Academy	Entrepreneurial organization and co-working space
7	Kukun	Spaces are intended for conducive collaboration, brainstorming, and socialization between businesses, freelancers and like-minded people
8	Kumasi Hive	Offers a wide range of office space options including training spaces, a makerspace, a hardware studio as well as meeting and event spaces
9	Ghana Climate Innovation Center	Develops entrepreneurs and small businesses in "Ghana's Green Economy"
10	Soronko Academy	The brainchild of the Tech Needs Girls mentorship program that teaches girls between 6-18 years how to code and create technology
11	Workshed	Ecosystem of space and consulting services designed to assist in achieving business success
12	Developers in Vogue	A community and hub for women in the science, technology, engineering, and mathematics (STEM) fields
13	Startup Weekend	54-hour weekend event, during which groups of developers, business managers, startup enthusiasts, marketing gurus, graphic artists and more pitch ideas for new startup companies, form teams around those ideas, and work to develop a working prototype, demo, or presentation
14	Accra Digital Center	Mobile Applications Lab (mLab) and an Innovation Hub (IHub)
15	The Hatchery	Entrepreneurial organization and coworking space
16	Stanford SEED	Stimulate the creation of economic opportunities through innovation, entrepreneurship, and the growth of businesses
17	EQWiP Hubs	A global network of innovation spaces that connect and transform the economic trajectory of youth through market-driven work skills and entrepreneurship incubators, gender responsive programs, mentorships, networks, and seed grants for new entrepreneurs



APPENDIX C.

Ghana's Domestic Private Digital Platforms

Platform	Description	Launched in
15Ghana	Online marketplace for products and services, allowing users to showcase their talents and expertise for a price	2015
AgroTrade	Digital food distribution platform creating shared value for businesses and smallholder farmers	2018
Ahwenepa	Online shopping from Ghanaian suppliers and designers	2013
Ayatickets	Ticketing solution for express and authentic tickets to events, using mobile money or credit card	2017
Aquantuo	Platform for those travelling to or from Ghana to make money with extra luggage space or pick up an extra suitcase	2016
Dropping	Transport platform to get around in taxis, private cars or on a bicycle	2017
Dziffa	Online shopping center for African goods	2015
Edwom	All-in-one e-commerce platform for consumers to buy and sell goods	2016
EgoTickets	To sell, manage and buy event tickets online	2013
Enshika	Online booking transport service	2017
EshopAfrica	Fair trade social business and online store creating sustainable businesses for traditional African artisans	2000
Eziban	Food delivery	2018
Farmerline	Transforming smallholder farmers into successful entrepreneurs by increasing their access to information, inputs, and resources to increase productivity	2011
ForHey	Laundry and dry-cleaning service with pick-up and delivery	2014
GoPharma	Connects trained pharmacists in the city with untrained staff in rural facilities helping people in rural Ghana gain access to modern medical advice	2016
Ghana Wedding Market	National online search and marketplace that aims to feature listings for thousands of weddings and event-related businesses throughout Ghana and internationally	2018
IzyTickets	E-ticket marketing and distribution company	2017
Klloyds	Platform that allows purchases from any part of the world and gets items delivered locally; also provides services to move or just deliver goods	2014
Mewokrom	Food delivery service	2016
MyTicketGH	Tool to sell tickets online	2015
Mr Delivery	Food delivery service	2013
Pigarea	Food ordering and delivery platform	2016
Swiftly	Shipping services	2016
Tonadzi	Food ordering and delivery platform	2017
TROTRO Tractor	Connects farmers and tractor operators, allows tractor owners to monitor movement and work progress of their equipment	2016
Uru	Ride-sharing platform	2017
VentSell	Event ticket marketplace and aggregator of sports, concert, and theatre tickets in Africa	2016
Wop3Car	Car rental	2017
Yenko Taxi	Taxi service	2017
Zoobashop	Online store with a range of electronics, home appliances and items of fashion	2014



APPENDIX D.

Recommendations to Enhance the Digital Economy in Ghana

#	Recommendation	Description
DIGITAL INFRASTRUCTURE PILLAR		
1	DI.R1. Revise Broadband Speed Targets	Ghana needs to revise its stated minimum threshold speeds for what constitutes broadband service, in line with the best ranked countries in competitiveness. Singapore, which ranked as the world's fastest country by Cable.co.uk, has average speed of 70.86 Mbps more than five times Kenya and 20 times Ghana.
2	DI.R2. Develop a robust and comprehensive middle mile (domestic backbone infrastructure)	Policies and actions should encourage additional investment in domestic backbone for more efficient utilization of existing infrastructure and completion of missing links. The NCA needs to provide better guidelines on infrastructure sharing for these and other emerging complementary infrastructure including those being provided by the Power Companies Gridco and ECG, as well as CSquared's metro fiber. Promotion of infrastructure sharing will limit concentration/duplication of infrastructure in more profitable areas and redirect resources to underserved communities. The government needs to accelerate efforts to complete the counterpart Western Corridor project to ensure a more redundant national backbone. The planned connectivity transaction, led by NITA, under the World Bank-funded eTransform Ghana program should also help here.
3	DI.R3. Increased investment in Last Mile Infrastructure	The government needs to be more proactive in the use of resources to partner with private sector in the extension of services to more underserved communities.
4	DI.R4. Revise Spectrum Allocation and Award of Unified Licenses	The NCA needs to revise its spectrum policy to allow more competition, investment, and expansion of broadband for all Ghanaians. The award of additional frequency spectrum emerging from the digital TV migration process should also be more open. A unified licensing regime could introduce more competition in the sector for both 3G and 4G operators and could encourage more investment in broadband services at competitive cost to operators. Additional 4G licenses have been issued to three broadband wireless operators who are restricted to data.
5	DI.R5. Streamline effective implementation of Cybersecurity Policy and Strategy	Ghana needs to unfold a cyber-conscious culture across the economy, particularly financial institutions and SMEs, with a national program that raises awareness of cybersecurity risks and secure online behavior. Task regulators, in particular MoC and BoG, need to mandate the implementation of a nationally agreed baseline of IT security standards, including procurement processes and in all steps of software development.
6	DI.R6. Explore and encourage private sector solutions for data storage capacity needs	Assess the local data storage requirements and foster partnerships with the private sector to avoid disconnection to market needs. A cascade approach should be followed before investing more public resources to ensure Ghana's data storage needs are fulfilled.

#	Recommendation	Description
DIGITAL PLATFORMS PILLAR		
7	DP.R1. Strengthen NITA to facilitate the citizen-centric development of public sector digital platforms	NITA is a key player both as a service provider for MDAs and as an institutional anchor for the development of public sector digital platforms. As such, it requires both a significant boost in financing as well as a serious investment in its institutional, technical, human, and leadership capacity. The lack of trust in NITA's ability to provide services to MDAs is a bottleneck for the development of shared services and for utilizing the existing preconditions for interoperability.
8	DP.R2. Prioritize the rollout of Digital ID to enable access to digital services	The rollout of the Ghana Card program will lift the key constraints both on citizens' access to digital services as well as increase their efficiency and effectiveness. At the same time, to truly maximize the citizens' use of digital services, the rollout of the digital ID must go hand-in-hand with upgrade of NITA servers and an information and communication campaign to encourage their usage.

#	Recommendation	Description
DIGITAL PLATFORMS PILLAR		
9	DP.R3. Emphasize public sector digital capacity building	The ability of the Ghanaian public sector to capitalize on digital back-office systems, shared services, and to provide digital services to citizens critically depends on the ongoing development of digital capacity among civil servants. The current situation suffers from very thin in-house capacity and an overreliance on contractors for ongoing upgrades. Building a cadre of government ICT professionals who work together with other technical specialists will increase the effectiveness and efficiency of the existing digital government platforms and their further development. This includes better change management to increase in trust in digital platforms.
10	DP.R4. Strengthen Protection of Ghanaians' data	There is a need to strengthen data protection expertise with international knowledge sharing activities on international good practices on data protection. The government's commitment to protect Ghanaians personal data should warrant DPC's independence with own financial and logistic allocations to increase the operational capacity for awareness raising activities, investigations, and enforcement.
11	DP.R5. Revamp and enhance GODI to maximize social and economic value of public data	The adoption of proper licensing regime for GODI would be the first quick-win step from the open data policy making perspective. An open data policy that serves government users in Ghana and other "supply-side" organizations, and citizens and private sector consumers. Open data needs to provide policy guidance, instructions, requirements, and tools for implementing open data effectively in Ghana. The policy would need to spell out which types of data may not be considered open and why, and how to safeguard sensitive information. It may also enhance the governance of the GODI, describe interagency working groups and provide points of contact. The GSS must also venture into new territories and explore the potential role that big and open data could play in the development and dissemination of official statistics.
12	DP.R6. Develop a coordinated digital commerce support program	Build on a multiagency coordinated action plan, with a multistakeholder approach with a clear champion. The program should take advantage of ongoing local government efforts (such as NYA and NEIP), regional efforts (such as the Nairobi Manifesto on the Digital Economy and Inclusive Development in Africa (UNCTAD 2018) and private digital platforms (domestic and regional) to increase crossborder market (such as Jumia). Actions need to go beyond online advertising and move towards facilitating individuals and MSMEs (urban and rural) to complete digital commerce transactions to increases B2C and B2B in the country; and, build-up online reputation for individuals, MSMEs, and the country itself. Domestic efforts regarding training, rural coverage, logistics, and building trust on domestic commerce could benefit from lessons learned in international experiences, especially the Taobao Villages case.
13	DP.R7. Institutionalize data production and availability for evidence-based digital commerce policies	Collecting data to monitor digital commerce and the collaborative economy turns fundamental to define and assess policy actions and to measure the digital economy. Ghana needs to conduct enterprise surveys with special attention on innovation and technology (the most recent took place in 2013). To determine which questions and topics to include in surveys, the Ghana Statistical Services can review UNCTAD's "Questionnaire for Official Statistics on the ICT sector, and ICT use by enterprises" (https://unctad.org/en/Pages/DTL/STI_and ICTs/ICT4DQuestionnaire.aspx) and the variables collected by Eurostat regarding ICT usage and e-commerce in enterprises. Surveys should be conducted every two years to maintain the relevance of the data collected. Data to monitor digital commerce and the collaborative economy is fundamental to assess policy actions and to measure the digital economy. Given global efforts on standardization for digital commerce data, this recommendation focuses on bridging Ghana's data gap on digital commerce and is intrinsically linked to the forth recommendation in digital entrepreneurship (R4) on a digital economy observatory.
14	DP.R8. Establish a Regulatory Sandbox for Digital Commerce and Gig Economy labor regulations.	Whether and how to regulate these topics are ongoing discussion globally with no consensus on which is the better regulatory framework to adopt. A regulatory sandbox could provide a safe space to test innovative approaches in collaboration with the private sector and without damping the benefits of the digital economy. Topics could cover pay conditions, competition, tax regime, data protection, among others.

#	Recommendation	Description
DIGITAL FINANCIAL SERVICES PILLAR		
15	DFS.R1. Mobile Money Interoperability	High mobile phone penetration, investments in robust agent networks and a proliferation of use cases have made mobile money one of the most promising drivers of financial inclusion in Ghana. Recent steps to implement interoperability are promising, especially as they reduce barriers to use and acceptance of digital payments by allowing for the seamless transfer of funds across providers. However, in order to go beyond technical interoperability, which has sometimes failed to drive transaction volumes in other markets, a more holistic perspective is needed. For interoperability specifically, this means looking at governance and business rules that drive incentives in the scheme (who can participate and under what conditions, pricing, and so on). Specific recommendations include allowing fintechs to connect to GhIPSS, while also revisiting rules around transaction pricing to encourage greater adoption by customers. Furthermore, government should consider expanding interoperability to allow both mobile money providers and fintechs to participate in GhIPSS InstantPay, thereby facilitating real-time interoperable payments that would increase the attractiveness of digital payments versus cash.
16	DFS.R2. Drive greater digitization through opening new channels for government payments	Current efforts to promote E-Zwich card usage by using the cards to pay government salaries and benefits have led to the successful digitization of these payment streams. However, the lack of merchant acceptance points and cash in/cash out points mean that the funds in these accounts are immediately withdrawn upon receipt. Government should endeavor to open up payment options for recipients so that they can choose the most convenient mode of payment, including mobile money. By offering payment to recipients' preferred provider, there is a greater likelihood that the funds will remain in digital form and will thus contribute to Ghana's cash-lite vision.
17	DFS.R3. Encourage competition and promote an enabling environment to drive DFS innovation	The roll out of the biometric Ghana Card national ID, digital addressing through Ghana Post GPS, and real-time payments through GhIPSS Instant Pay present an enormous opportunity for digital financial services. Markets such as India, Bangladesh, Thailand, and others have connected these pieces of infrastructure to offer a range of new use cases and overcome barriers to DFS use. For example, biometric ID and digital addressing systems and can be leveraged to create a digital KYC utility that automates customer due diligence and overcomes barriers to account opening. These systems could also be connected to create a secure store of personal data that could be shared on-demand with providers in order to qualify for credit or other financial services. Additionally, connecting ID systems to real-time payments can further enhance interoperability by enabling customers to perform instant transactions everywhere regardless of devices, provider or account type by simply verifying their biometric identity. Such a system could help to overcome barriers to merchant payments and increase competition by levelling the playing field between banks, MNOs, and fintechs. Increasing the use of DFS depends on ensuring affordability and relevance of use cases to citizens and businesses alike. One way to achieve this goal is through encouraging greater competition, which drives innovation and pushes down costs, thus producing greater value for customers. The government should proceed with the implementation of the draft Payment System and Services Bill in a way that facilitates risk-based licensing and oversight of fintechs by the Bank of Ghana. The Bank of Ghana should also allow fintechs to connect to GhIPSS and participate in the country's interoperability scheme in order to level the playing field and allow them to compete directly with banks and MNOs. Finally, the government should continue to resist proposals to impose new taxes on mobile money transactions, which risks driving up prices and slowing Ghana's transition to a cash-lite economy.

#	Recommendation	Description
DIGITAL FINANCIAL SERVICES PILLAR		
18	DFS.R4. Adopt policies that encourage greater use of merchant payments	A key barrier to further advances in digitization is the low uptake of merchant payments. When customers cannot use electronic funds to pay for goods and services, there is a greater likelihood that they will convert these to cash, thus undermining the government's vision of a cash-lite economy. Working with providers to reduce the cost of merchant payment transactions is one way to increase the attractiveness of paying digitally, while interoperability and other policies that ease the cost of merchant acquisition can increase acceptance points and thus the convenience of digital payments.
19	DFS.R5. Expand rural adoption by facilitating investments in last mile infrastructure and the digitization of agricultural value chains	Given the importance of agriculture to Ghana's economy, particularly key value chains such as cocoa, digitization of payments along these value chains could contribute significantly to rural adoption of DFS, which currently lags behind that of urban citizens. Government should work with providers to stimulate investment in rural network coverage, agents, and merchants that make DFS more accessible to rural households. Policies that encourage the sharing of infrastructure like towers and agents can help expand coverage. Additionally, incentives such as tax rebates or other support offered to providers who invest in underserved rural communities could help to narrow the access gap. Finally, the government should work with agribusinesses and the Cocoa Board to encourage digitization of bulk payments to producers, which can help to drive adoption and usage of DFS not only among farmers but also within rural economies.
20	DFS.R6. Strengthen digital financial consumer protection policies	There must be a well-developed strategy for digital financial customer protection regulation that covers areas such as effective consumer redress through internal dispute resolution (IDR) and external dispute resolution (EDR) mechanisms and supervision by the Bank of Ghana. A well-regulated consumer services protection policy will boost confidence in the usage of digital financial services. Ghana currently boasts a comprehensive framework for consumer recourse that applies to all financial services providers. But the framework for disclosure is fragmented, with a specific regulation on credit products, disclosure provisions included in the e-money guidelines, but no rules for savings products. Protections against error and fraud in payments services are also insufficient (CGAP 2018b). The country should push for a more comprehensive disclosure framework. Furthermore, given the importance of protecting consumer privacy and data, Efforts should be made to ensure that adequate resources are allocated to the Data Protection Agency (DPA) and it should be empowered to supervise service provider compliance.
21	DFS.R7. DFS and e-money regulation and surveillance	The government needs to strengthen the Digital Financial Services M&E and compliance procedures, implementing an efficient surveillance system and a robust regulation framework for E-Money Issuers, especially regarding; capital requirements, provisions to cover financial risks and e-money issuing permissions. The Payment Services and Systems Bill ("PSSB") under consideration by the government must be reinforced with more budget for an effective implementation. The E-Money Guidelines foresee that electronic money will be issued by both regulated financial institutions and duly licensed nonbank entities (such as subsidiaries of MNOs and other third parties) engaged solely in the business of e-money and incidental activities, defined as Dedicated Electronic Money Issuers (DEMs). While they came into force since 2015, the E-Money Guidelines have not yet been fully implemented. Therefore, although direct licensing of DEMs is possible in theory, given the lack of implementation, e-money issuers have not yet been licensed and are still being regulated informally (BTCA 2017). Likewise, capacity building of public workers and private companies' experts in this field is a must.

#	Recommendation	Description
DIGITAL ENTREPRENEURSHIP PILLAR		
22	DE.R1. Develop IT-ITeS sector programs to support the scale up of Ghana's exports, players, digital innovation, and expertise.	Advancing towards a vibrant digital economy requires a national private sector policy approach. Public efforts need to capitalize those made on digital infrastructure, public digital platforms (government digitization), and digital financial services. Policies are needed to develop a competitive IT-ITeS sector and to accelerate private sector transformation taking advantage of digital innovation for improved productivity. To transform Ghana into the most relevant digital hub in Africa requires a bigger footprint of capable and innovative IT-ITeS companies operating in the country. What involves increasing jobs, exports, number and size of local and global players, while boosting innovation within the sector. The IT-ITeS sector comprises entrepreneurs, SMEs, large indigenous companies, and global players, and efforts to facilitate their scale up in headcount and expertise calls for targeted and connected initiatives where government agencies play an active role in collaboration with the private and academic sector
23	DE.R2. Develop a digital technology adoption program to accelerate digital transformation of the economy, especially SMEs.	Joint efforts among government and IT sector can help nurture and accelerate digital transformation of the private and public sector in Ghana, especially SMEs, women-owned businesses, and nondigital sectors. According to BCG, 7 out of the 10 most innovative companies are digital natives and thus digital innovators; and while 79 percent of strong innovators reported that they have properly digitized innovation processes, only 29 percent of weak innovators made the same change (BCG 2018). Digital innovation adoption of private and public sectors can be done with country-based IT companies, but initiatives will be needed to ramp the local IT sector into an innovative digital partner. To improve the supply of business-ready ideas and innovations, including disruptive technologies (that is artificial intelligence, the Internet of Things, and robotics) GoG can establish programs or instruments to promote R&D, technological innovation, and digital upgrading in Ghana's private sector in the form of competitive grants or tax incentives for research and development. Also, provide more incentives and platforms for collaboration between research institutes, universities, and the private sector through collaborative research grants or centers of excellence for ICT or digital solutions.
24	DE.R3. Articulate Ghana's value proposition to position Ghana as a relevant global Digital Hub	To become a trusted destination the country needs to showcase its expertise, business infrastructure, and a set of capable and competitive companies based in Ghana. Positioning Ghana's name as a top of mind destination to outsource and invest, goes beyond a branding campaign and event participation. To build an articulate message of Ghana's value proposition, a portfolio of capable IT companies operating in the country and a set of satisfied customers willing to share their experience while working with a Ghana based company are needed. Exporting companies will need to be proficient to manage offshore client needs; and prove their experience and capacity to deliver quality services, on time, and on budget. To comply with requirements and service level agreed, companies will need to invest in tools and technical and soft skills.
25	DE.R4. Unify the national vision for digital entrepreneurship by developing a single digital economy policy and establishing a digital economy observatory	Establish a clear national vision for the development of the digital economy – captured within a single digital economy policy document and clearly define the role of digital entrepreneurship in achieving that vision. And establish an observatory that systematically captures data and tracks progress on Ghana's development of the digital entrepreneurship ecosystem (for example, number of startups, investment deals, jobs, and so on).

#	Recommendation	Description
DIGITAL ENTREPRENEURSHIP PILLAR		
26	DE.R5. Improve specific regulations for digital industries (that is taxes, IP rights, limited partnerships)	This would entail (i) Creating tax policy, business registration, and insolvency rules that support startups and risk-taking entrepreneurial businesses; (ii) Utilizing procurement policy to incentivize production of digital solutions by local SMEs, specially IT-ITeS to scale up companies; (iii) Establishing a dedicated digital intellectual property (IP) track within Ghana's IP office to raise awareness among SMEs about the value of trade secrets and how to protect them effectively; and (iv) Creating legislation to enable limited partnerships, and ensure that private equity/venture capital (PE/VC) related regulations allow PE/VC funds to be formed as limited partnerships.
27	DE.R6. Create a pool of human capital with digital and entrepreneurial skills	Develop curricula at all levels of the education system for missing skills and IT-literacy support. Ensure digital skills become a central component of education and skills development programs in tertiary institutions. Encourage private provision of rapid digital skills programs (for example Codetrain, MEST).
28	DE.R6. Streamline and consolidate entrepreneurship support and entrepreneurship intermediaries	This would include (i) Streamlining and consolidating GoG support programs for digital SMEs and entrepreneurs; (ii) Restructuring and building capacity at GoG agencies that support digital entrepreneurship (NEIP, NBSSI, VCTF) to ensure adequate program funding, efficient operations, and incorporation of systematic monitoring and evaluation to assess impact of activities; (iii) Providing benchmarking and program funding for entrepreneurship hubs/intermediaries to boost their quality of support past the startup phase and in areas outside of Accra; and (iv) Providing intermediary organizations with funding to develop a platform that enables effective collaboration between these organizations.
29	DE.R7. Boost early-stage risk capital financing and access to credit for SMEs	The government should restructure the Venture Capital Trust Fund (VCTF) to ensure it operates as a trusted intermediary in the venture capital ecosystem by enforcing clear independent governance (for example, an independent investment committee). Provide early stage financing and VC industry-wide technical assistance (TA) through the VCTF that diversifies the stage of financing support (particularly sub-\$500,000 investment deals), the types of partner vehicles (for example, seed funds, accelerators, angel networks), and the diversity of investment instruments (for example, venture debt, quasi-equity). Encourage partial credit guarantees and other risk sharing mechanisms to lower the cost of capital from traditional financing institutions (that is banks) to startups and SMEs.
30	DE.R8. Establish Digital Centers necessary for digital entrepreneurs to thrive across the country	Establish additional tech parks such as the Accra Digital Center to bring commercial rents down and provide affordable class-A real estate to digital startups and SMEs. It is important that these tech parks are established on the outskirts of major cities such as Accra and Tema to bring down rental prices. Furthermore, to implement recommendations on digital infrastructure to expand broadband coverage for opening the nationwide market for digital solutions.

#	Recommendation	Description
DIGITAL SKILLS PILLAR		
31	DS.R1. Improve basic digital skills provision at education system	The most effective training solution will depend to a large extent on the digital skill level being taught throughout the education system as foundational skills. For basic skills, schools are perceived as the ideal platform for delivery. To spur improvement, policy makers need to create frameworks for public education institutions to leverage up-to-date digital skills training content. Take advantage of existing online training resources, such as Massive Open Online Courses (MOOCs).
32	DS.R2. Boost supply of digitally savvy teachers	Ghana also faces a shortfall of 140,000 teachers (IFC 2017) and qualified candidates are in short supply (World Bank 2018e). The GoG has set out national teacher training policies, though these have yet to be fully implemented due to a lack of awareness of the policies, insufficient funding, and minimal infrastructural support facilities. To tackle such challenges, GoG should invite other stakeholders to coinvest in them.
33	DS.R3. Increase coverage of quality digital learning resources	To make computers equitably accessible by improving basic school infrastructure needs, especially in rural areas. In parallel, mobile literacy curriculum could leverage mobile penetration to take better advantage of smart devices.
34	DS.R4. Align intermediate digital skills taught with future workforce needs	For intermediate skills, both school age and preemployment/postsecondary education are essential. To focus on employability, partnerships with private sector would turn vital to improve the curriculum and provide relevant working experience (internships) during the schooling phase. The emphasis on the most-demanded intermediate workforce skills is critical, such as data analytics, use of professional software, and digital marketing.
35	DS.R5. Scale and co-fund advanced digital skills	Advance digital skills will require significant resources to upgrade the provision and coverage of effective training. The scale up of the supply of advanced skills would require partnering with other stakeholders, including the private sector, donors, private training service providers. These types of training surpass schooling years and encompass short courses such as rapid-skills training or bootcamps, typically from three to 12-month long, and with a mix of instructional methods geared towards practical learning rather than theoretical concepts. The private sector can provide business-to-consumer training, others may involve business-to-business or business-to-government services, others may include ecosystem-building activities that contribute to broader sector development.
36	DS.R6. Provide digital skills to under-represented groups	Conduct campaigns to provide digital skills to underrepresented groups, offer free or subsidized training, stimulate private scholarships by offering tax incentives for such scholarships, raise awareness in lagging communities with an outreach strategy.
37	DS.R7. Establish a multistakeholder governance framework for coordinating efforts to foster digital skills with an ecosystem approach	There is space for multiple stakeholders to take multiple roles and actions to improve and ramp-up digital skills training. If efforts are not orchestrated impact can be diminished. To articulate efforts a governance framework should be established with an ecosystem approach.

