INCLUDE

KNOWLEDGE PLATFORM ON INCLUSIVE DEVELOPMENT POLICIES

Digitalisation of Basic Services in Ghana: State of Policies in Action and Lesson for Progress

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Executive Summary

In Ghana, successive governments across the political divide continue to demonstrate commitment to prioritizing the use of information and communication technology (ICT) for socio-economic transformation through investments and provision of appropriate legal and institutional framework for access, usage, affordability and participation. In particular, digitalisation has become the buzzword in policy circles as it is seen as the vehicle to drive change in terms of service provision and participatory government. Overall, Ghana has a high mobile phone subscription rate that exceeds the total population of the country. Yet, internet penetration lags behind as significant areas of the country suffer from erratic service or service unavailability. This has adverse implications for digital inclusion especially as internet availability and access are the engines of digitalisation. A further challenge for digital inclusion is that over a third of those sampled for this study indicated that they do not use the internet citing reasons such as cost of device, cost of data, unreliability of internet connections, and a lack of digital aptitude among others. Even for those who are lucky to have access to internet there is palpable lack of digital appetite for government services, and this reflects in high consumption of social media but low interest in the use of digitalised public basic services. Although majority of Ghanaians irrespective of socio-economic background judge digitalised services as essential and relevant for their lives and livelihoods, disparities in educational background, income, gender and geographical locations of citizens accessing digital services are manifesting in inequalities in access, usage, affordability and participation. Overall, the processes of digitalisation of basic services in Ghana are neither integrated nor synchronized as each service sector appears to be operating in a silo; and policy makers seem more driven by a desire to leverage digitalisation of services to increase revenue than as a conscientious effort to improve the delivery of basic services. Consequently, digitalised services have not significantly altered structures and processes of new and existing government services to the citizenry, and in most cases, what is referred to as a digitalised service is but insertion of technology into the old practices and operations of service provision. Hence, a significant number of digitalised basic services continue to be shaped by human interferences that impede efficiency, inclusion, and quality of services.

Key Findings:

- Digitalisation of basic services is characterized by inclusion deficit as some citizens are unable to participate in the use of digitalised services simply because of the unavailability of internet services.
- Cost of internet device and data have been found to be among the major reasons why some citizens are unable to access and use digitalised basic services.
- Income, rural-urban dynamics, and educational backgrounds are strongly associated with access and usage of digitalised basic services and thus shaped the inherent and existing inequalities.
- Gender disparities exist in access and use of digitalised services as more women than male suffer from digital exclusion.
- Although Ghanaians consider digitalisation as vital for efficient service provision, appetite for usage of digitalised services is very low when compared to uptake of social media.
- Most basic services which are undergoing digitalisation started on World Bank funding and many have stalled once the funding dried up.

- The posturing and signals from policy makers in relation to digitalisation of services is more about leveraging it for revenue mobilization than for the provision of timely quality services to the citizenry.

Key recommendations:

- Policy makers should consider instituting measures to monitor and evaluate the many services that have been digitalised in order to understand how shifts to digital service provision is functionally playing out on the ground beyond the initial euphoria and political rhetoric.

- The telecommunication sector of Ghana is driven largely by the private sector with the government providing regulatory functions. This means that with high poverty level, the good intentions of the policies are not translated into the actual usage due to the prohibitive device and data cost. Ghanaian policy makers should consider policy incentives that will ease the cost burden of internet access on the citizenry as it has implication for inclusion.

- Ghana's digital divide aligns strongly with its socio-economic divide hence, it is imperative that government considers mainstreaming digitalisation of basic services in policy efforts aimed at closing the existing socioeconomic gap.

- Government should prioritize gender-based policies of inclusion, access, and equity to deal with the gender gap in uptake of digitalised basic services.

- Government should consider implementing creative policies that will take advantage of high usage of social media to activate high appetite for the consumption of digital basic service by the citizenry irrespective of socioeconomic status.

- Policy makers should consider introducing a systematic framework for the determination and sequencing of basic services digitalisation beyond the lure of donor funding to ensure that digitalised basic services are sustainable and are national in character by way of addressing the unique challenges within the context of Ghana.

- Ghana should consider developing a comprehensive national digitalisation policy that encompasses all basic services in an integrated and synchronised manner with a linkage to digital identification of citizens so as to make it possible to easily track actual access and usage for the purposes of addressing lingering questions of inclusion and equity.

Introduction

Scientific advances and the innovations in information and communication technologies (ICTs) have foisted on policy makers and citizens a different policy environment, especially as these innovations and technologies become far more intrusive and pervasive (Janssen, & Helbig, 2018). Many more people globally now have access to mobile phone devices than to electricity, water and other basic services. Though ICT is seen as a means to facilitate accelerated access to basic services, question remains about ICT poverty and a lack of ICT know-how among significant sections of the population in developing countries. It is against this background that digitalisation, which is the "mass adoption of connected digital technologies and applications by consumers, enterprises, and governments" (Sabbagh et al., 2012, p. 121), continues to attract significant attention among researchers and policy makers. Digitalisation as a concept emerged initially as a way of using modern technology to scan and preserve official documents. Its meaning and scope have, however, expanded to include the application of ICTs to a wide range of activities including service delivery and new forms of interaction between and among governments, citizens, and businesses. The expansion in scope has resulted in what is now synonymous to e-governance. This shift is not surprising, as "there is a constant and necessary readjustment to be made between the trend towards technological innovation" (Rossel & Finger, 2007, p. 399). As such, the lines between digitalisation and e-governance have become blurred; as both terms are now used interchangeably to denote the art of leveraging ICT to render services to citizens in a manner that not only tackles basic needs of the population, but also empowers people by bridging the gap between governments and the governed, while simultaneously addressing both demand and supply-side constraints on access to services.

In its contemporary application, digitalisation involves the integration of the enabling features of ICT into existing or new governance arrangements with the view to improving cost-effectiveness and efficiency in the provision of goods and services, while also deepening interactions between citizens and government agencies (Lindgren et al., 2019). Heeks (2001), for instance, argued that the use of modern technologies (in particular, the internet and other web-based innovations that rely on telecommunication infrastructure for communication and information service delivery) make governance 'Simple, Moral, Accountable, Responsive and Transparent' (SMART). Sabbagh, et al., (2012) also argued that digitalisation makes incremental, yet significant contributions to economic growth. There is ample evidence to suggest that countries that attained high levels of digitalisation are able to attract about 20% more in terms of economic benefits in the form of boosting productivity, creation of new jobs, enhancing the ease of doing business, and promoting improvement in the quality of life in society than those with lesser experience of digitalisation. In addition, countries with advanced digitalisation capabilities are able to drive down unemployment, improve citizen's access to public services and enhance their quality of life, while also opening up government to "greater transparency and efficiency" (Sabbagh, et al., 2012, p. 121).

The global digital economy was worth about $11.5 trillion in 2016, equaling about 15.5 percent of the world's overall GDP (see Huawei and Oxford Economics, 2016). The information and communications for development study by the World Bank suggest a positive link between access to broadband and related services and economic growth in 120 countries from 1980 to 2006 (World Bank, 2009). The study noted that every 1.21% growth of GDP was due to a 10% increase in internet accessibility and affordability in developed countries, and a 1.38% increase in developing countries, thereby making the digital economy the new path to economic prosperity. Developing countries like Ghana are plugging in, albeit gradually, into this growth, though there is the need to strategically invest in the foundational elements of the digital economy if they are to keep pace (World Bank, 2019).

This report is a country case study of digitalisation in Ghana. Following a discussion of the methodology used in obtaining data for the report, the subsequent three sections analyze various dimensions of

digitalisation in Ghana. The first of these sections is a discussion of the institutional environment of digitalisation, focusing on existing data from government documents, newspaper reports, technical papers, and analytical works by experts. In this section, priority is given to issues of investment in digital infrastructure, institutional capacity, regulation, and e-readiness, among others. In the second section, we take an inventory of and discuss some of the major services undergoing digitalisation in Ghana. The specific service areas discussed include digitalisation at the ports and harbours, passport, property, national identification, financial services, education, health and social protection, vehicle registration, pharmacy, agriculture, records, and taxation among others. The third section examines issues of inclusion from the perspective of citizens through analysis of a national survey of citizens across the country. In the conclusion, the report raised some germane issues about the digitalisation initiative in Ghana, especially in relation to the issues of inclusion and questions of inequality.

Methodology

The study adopted a mixed research methods strategy in the data collection processes. Specifically, we (a) reviewed and analyze policy documents and existing literature, (b) conducted in-depth interviews with officials in state agencies in charge of digitalisation of basic services to understand the supply-side perspectives on digitalisation efforts, and (c) conducted a nationwide survey of 1,694 users to ascertain demand-side experiences of digitalisation. As such, the first part of this study (the context assessment) is based among others, on the analysis of the following national policy documents:

- ICT for Accelerated Development (ICT4AD) policy (2003)
- National Telecom Policy (2004)
- 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 (2008)
- Electronic Communications Amendment Act (2009)
- Electronic Communications Regulations (2011)
- Mobile Number Portability Regulations (2011)
- Subscriber Identity Module (SIM) Registration Regulations (2011); Electronic Transactions Amendment Act (2012)
- Data Protection Act (2012); National Broadband policy (2012)
- National Cyber Security Policy & Strategy (2015)
- Electronic Communications (Rules of Procedure of the Electronic Communications Tribunal) Regulations (2016)

The discussions in the second part of the report are based on qualitative in-depth interviews with various officials whose agencies are engaged in digitalisation. The selection of the agencies for the interviews was preceded by a scoping analysis through internet search engines and newspaper report reviews to ascertain the national profile of digitalisation of basic services. This approach provided useful data on services undergoing digitalisation. The primary objective of the in-depth interviews was to understand from the perspective of government officials what the driving forces behind digitalisation were in terms of specific problems they intended to solve; the extent to which issues of access and affordability were factored into the design of digital services; whether issues of spatial distribution and equity received any attention; and what the overall quality of digitalisation has been from their perspective. An interview guide, designed to elicit information on the state of the art, provided the context for the data collected from officials from the ministry of health, the ministry of communication, the office of the Vice-President, the passport office, the

birth and death registry, the judicial service, the Ghana Immigration Service, the procurement agency and GhanaPost, among others.

The third methodological strategy focuses on demand-side experiences of digitalisation in Ghana. We designed a user-based survey to understand how digitalisation policy interventions affect access, usage, affordability and participation of the citizenry. Here, a closed-ended survey instrument with various questions were administered to one thousand six hundred and ninety-four (1,694) ordinary Ghanaians consisting of 67.9% males and 32.1% females, using a simple random sampling strategy. For the purpose of ease with data collection, the country was divided into four clusters. The first cluster comprised of the Northern, Savanah and Upper East regions. Within the first cluster, data was collected from the following municipalities and districts: Tamale, Yendi, Kpandai, Salaga, Navrongo and Bolgatanga. The second cluster consists of Bono Ahafo, Ashanti and Eastern regions. Within this second cluster, the survey was undertaken in the following municipalities and districts: Sunyani, Sene East, Manhyia, Adansi South, Koforidua and East Akim. The third cluster consisted of Central and Western regions with data collection undertaken in such municipalities and districts as Cape-Coast, Ejumaku-Enyan-Essiam, Sekondi-Takoradi and Aowin. The fourth cluster covered Greater Accra and Volta regions where municipalities and districts such as Adentan, Shai Osudooku, Ho, Central and South Tongu were used as sites for data collection. The clustering was done in a manner that puts areas with shared characteristics together so that it is possible to generalize the results from the survey. The enumerators were trained and each was equipped with a mobile device with GPS locator that enabled data collected to be instantly submitted and synchronized online to a server where the data collection process was monitored in real time to ensure accuracy and reliability.

PART 1
Context of Digitalisation in Ghana

Ghana's experience with digitalisation is part of the globalisation process (Dzisah & Etzkowitz, 2012; Dzisah, 2011 & 2006) but also occurring at the time when public policy processes are recognizing a shift away from elite approaches to policy making to ones that create platforms to leverage experience and other inputs of citizens as far as government decisions and service delivery are concerned (Kpessa, 2011; Fraser-Moleketi & Senghor, 2011; Kpessa & Atuguba, 2013). In Ghana, earnest efforts at digitalisation began in the early 2000s (Adu & Dube, 2016), following a series of ICT related reforms that date back to the 1980s. Ghana is among the earliest of African countries to invest in internet connectivity; and the internet has proven to be a major influencer significantly shaping the costs of communicating within Africa, and with the rest of the world. Ghana's experience with the Internet offers insights into the potential for and limitations of the Internet in Africa. Currently, seven internet service providers among which MTN Ghana, Vodafone, Surfline, Busy 4G, AirtelTigo, iBust, and Teledata ICT are considered the major ones. What is now a highly competitive sector started as a nationalized monopoly in the form of Ghana Postal and Telecommunication. Beyond the sector being competitive, it now offers services especially internet access that has become the bedrock of digitalisation, a phenomenon perceived as the vehicle for accessing and delivering of basic services. It is anticipated that digitalisation would revolutionise the delivery of public services in Ghana. However, viewed contextually, digitalisation is itself an evolutionary product that involves policy decisions and reforms, legislative and regulatory frameworks, as well as investments and performance as far as the growth of ICT in Ghana is concerned.

Policies Trajectories

Policy makers recognize that Telecommunication development assists transformation as it encourages interaction between individuals and communities. As such over the years, there has been policies and decisions targeted at harnessing the sector's potential. It was in the pursuit of this objective that digitalisation has now become cardinal agenda for development across the globe. But in Ghana, policies and decisions that paved the way for recent digitalisation drive could be traced to liberalization of the economy in the early 1980s, a move that truncated monopolistic economic practices of the Ghana Postal and Telecommunication Services as the sole supplier and distributor of all telecommunications equipment to citizens and private entities. The national telecommunications provider exercise monopoly at the time over telephone services, including installation and maintenance of telecommunications equipment.

In 1976, the Ghana Posts and Telecommunications (P&T) Corporation undertook an exercise aimed at improving service quality. Known as the First Telecommunications Project (FTP), this initiative was aimed at rehabilitating the telecommunications network in the country. Following this was a second phase known as the Second Telecommunications Project (STP) in 1987, that targeted among others, (a) expansion of external plant and microwave transmission networks, (b) rehabilitation of earth receiving satellite station, and (c) rehabilitation and expansion of the switch network in 13 urban and 26 rural areas and training of manpower. An estimated US$173 million obtained from multilateral sources was spent on this project. The second phase of the project which started in 1987, was planned to end in 1991 but was extended to 1994 due to "delays in project design and implementation, and extensive procedures to be followed in the disbursement of funds" (Frimpong, 1996, p. 23). The initiatives also included an expeditated action on the construction of earth receiving satellite to augment the narrowband submarine cable used for international telecommunication services (ibid). The efforts notwithstanding, "availability of telecommunications services

is far from universal in Ghana, because only the population in the urban areas has access to the services" (ibid, p.27), and only few services were provided.

In 1987, however, as part of the structural adjustment policies under the aegis of the World Bank and the IMF, policy makers in Ghana took a decision to open up participation in the sector to private entities. This resulted in the proliferation of business interest in the telecommunication sector, and by 1992, approximately forty telephones companies, mostly subsidiaries of established telecommunications providers in the United States and Europe entered the market and began to supply, install and maintain telephonic equipment. Osei-Owusu (2017) argued that the "World Bank, a major financier of the country's economy and, in particular, financier for most of GP&T's capital expenditures, was interested in the privatization of the GP&T because the model of telecom liberalization was becoming successful in developed countries" (p. 50). Following the liberalization, the then Ministry of Transport and Communication spearheaded reforms after a series of consultations with workers in the telecom service sector, the International Telecommunication Union (ITU), and the international financial institutions, and launched in 1994 a program known as Accelerated Development Program (ADP) (Ministry of Transport and Communications, 1999).

One of the principal objectives of the ADP was to accelerate a transition towards denationalisation of the sector. To this end, a new entity known as Ghana Telecom was established to replace Ghana Post and Telecommunication in June 1995 (Osei-Owusu, 2017). In order to attract investor interest to support the operations of the newly established Ghana Telecom, a 30% share was sold to a consortium led by Telecom Malaysia Berhad. This dismantled the monopoly of Ghana Telecom ushering in a duopoly with the entry into the market of Westel, an American Company. Westel paid 10.5 million U.S. dollars and was granted license in December 1997. This restructuring was a signal to the investor community that Ghana was ready to create an enabling environment for competition. Ghana gained full internet connectivity the same year (Overa, 2006).

With the arrival of the internet, Ghanaian policy makers took the initial step in June 2003 to harness the internet for socio-economic transformation through an initiative known as the "The Ghana ICT for Accelerated Development (ICT4D) Policy". The process of formulating this policy began in August 2002 when the government constituted an eight-member National ICT Policy and Plan Development Committee to develop appropriate policy guidelines for mainstreaming ICT into the country's socio-economic transformation processes. The committee's work was in four phases: (a) developing the framework; (b) drafting the policy; (c) developing the implementation plan; and (d) the actual implementation. Using a consultative approach, the committee was able to design an ICT for development policy framework for Ghana, with a vision "to improve the quality of life of the people of Ghana by enriching their social, economic and cultural wellbeing through the use of ICTs as the engine for accelerated socio-economic growth" which was passed into law in 2004 (Kwami, 2010, p. 205).

A significant number of issues gave rise to the prioritization of ICT as a vehicle for governance and socio-economic development through digitalisation. These include (a) the social and economic pressures of a youthful population and a quest to turn that cohort of the population into an asset for development; (b) the poor performance of the economy against the background of a rapidly growing population with a declining per capita income; (c) an economy with low job creation capacity, dominated by an under-performing agricultural sector with weak and under-developed industrial and services sector; (d) the heavy national debt per capita ratio and high debt servicing commitments; (e) underdeveloped and under-performing private sector with a disproportionate informal sector; (f) relatively weaker base for scientific research as well as lack of commitment to research and development (R&D) capacity; (g) high illiteracy rates, high school drop-out rate and limited access to higher education by the vast majority of the population especially girls and women; (h) underdeveloped physical infrastructure including the requisite foundations for communications and telecommunications (Government of Ghana, 2003).

As a response to these challenges, Ghana's ICT policy for development set out priorities and strategies to "to transform Ghana into an information-rich knowledge-based society and economy through development, deployment and exploitation of ICTs within the economy and society" (Government of Ghana, 2003, p. 1). The policy was categorical in specifying sectors such as education, management of human resources, public service delivery, health, agriculture, infrastructure, research & development, law and order, community mobilization for development, value-addition, governance, and commence and private sector development among others as key priority areas for the deployment of ICT integration and solutions for development. As noted by Kwami (2010) the ICT policy focused on fourteen priority areas by drawing inspirations from the country's extant "Vision 2020 Socio-Economic Framework, the Ghana Poverty Reduction Strategy Paper (GPRS I & II), the Ghana Science and Technology Policy, and the Coordinated Programme for Economic and Social Development of Ghana" (p. 205-206). Nonetheless, the overall objective of this ICT for development policy is to ensure effective mainstreaming of technology in the performance and delivery of public services as a measure to improve service quality and governance processes, economic management and state-society relationships. As the table below illustrates, over the course of time, the ICT policy has paved the way for the development of a number of legislations and other policies to enhance the operational environment as implementation was broadened to include digitalisation. Subsequently policy makers introduced a National Broadband Policy and Implementation Strategy to facilitate the deployment of ICT knowledge systems and digital technologies in both public and private institutions. This policy is designed to promote the development, expansion, and improvement of broadband network capacity through modernization of ICT infrastructure to support deployment to all sectors. More specifically, the national broadband policy is seen as the anchor for broadband infrastructure aimed at promoting socio-economic transformation, social cohesion, through universalisation of broadband capabilities. The policy was also designed to stimulate competitive private sector interest in investment in broadband networks, services, and application, and drive demand to ensure efficient take-up of broadband services. To achieve its objectives, the policy was framed to identify gaps in existing regulations and address with the primary purpose of promoting managerial efficiency especially in the resource allocation (Ministry of Communication, 2012). Overall, this broadband framework is viewed as fundamental in ensuring cost-effectiveness and inclusion, as well as, a necessary condition for enhancing employment opportunities in ways that "facilitate and encourage the development of a nationwide physical infrastructure to support sustainable economic growth" (Ministry of Communication, 2012, p. 6).

As a key component of the government's digitalisation agenda, the national broadband policy is seen as a catalyst for radically transforming education services delivery, quality of the country's human resources, the delivery of healthcare, the management of energy resources, delivery of public safety, civic participation and the nature of government's engagement with the citizenry; and dissemination of information (Ministry of Communication, 2012, pp. i &9). The overall objective of the broadband policy is to deliver "an IT architectural and infrastructural networks and their propellants that will provide a superhighway for the effective and efficient transmission of voice, data, video and internet services to impact on the transformation of service delivery to promote socio-economic growth" (Ministry of Communication, 2012, p. 7). The government has also invested in interoperable broadband infrastructure networks to encourage e-governance in the form of government-to-government services especially with reference to exchange of information between the various Ministries, Departments, and Agencies (MDAs). This is also aimed at providing the enabling environment for engagement with the citizenry at all levels of decision making and service delivery.

Major policies and relations in the Lifeworld of Digitalisation in Ghana

DATE	ACT	PURPOSE
14th June, 2016	Electronic Communication Tribunal Regulation	A provision of regulations for persons or parties dissatisfied with a decision of the Authority.
23rd July 2015	National Cyber Security Policy and Strategy	To create education and awareness of cybercrime and the need for a central coordinating body and a public private partnership model to ensure there is uniform risk management of all critical information infrastructures.
10th May, 2012	Data Protection Act, 2012	To protect the privacy and protection of individual and personal data and also provide processes to obtain, hold, use or disclose personal information.
24TH November, 2011	Subscriber Identity Module Registration Regulations	A network operator shall complete registration of the Subscriber Identity Module Regulation and comply with the directives given by the Authority under the Act.
31st May, 2011	Mobile Number Portability Regulations	A mobile telecommunications service provider shall be required to assist a subscriber to transfer from one mobile telecommunications service provider to another while maintaining the mobile number allocated to him/her by the mobile telecommunications service provider from whom that subscriber is transferring.
17th February 2011	Electronic Communications Regulations	Regulations concerning the provision of universal access and service of electronic communication, non-discrimination, fair competition, security of public communications networks and services, privacy and secrecy, prioritization of national security and defence and development of the communications industry.

31st December, 2009	Electronic Communication (Amendment)	To amend the electronic communication act (2008), to provide a minimum rate for international incoming electronic communication traffic.
6th January, 2009	Electronic Communications Act, 775	To provide for the regulation of electronic communications, broadcasting networks, the use of electro-magnetic spectrum and make sure they operate within standards set.
18th December 2008	Electronic Transactions Act 772	To provide for and facilitate electronic communications and related transactions in the public interest by removing and preventing barriers to electronic communications and transactions, and developing safe, secure and effective environment for the consumer and also ensuring the special needs of vulnerable groups and persons with disability are duly taken into account.
11TH December 2008	National Communications Authority, Act 769	To regulate the provision of communications services and establish and monitor the implementation of national communications standards and compliance by the public. This replaced the earlier 1996 legislation.
10th January 2005	National Telecommunications Policy	To provide universal access for all communities in Ghana to the telephone, internet, and multimedia services by the year 2010, affordable prices for telecommunication services especially for low-income citizens, connection of all schools and medical facilities, government offices and public broadcasting stations to advanced telecommunications services and profitable investment opportunities for businesses.
June 2003	ICT4AD POLICY	To promote an ICT led socio-economic development process with the potential to transform Ghana into a middle-income information-rich, knowledge-based and technology driven economy and society by creating an enabling environment to aid and develop the human resource capacity and accelerate the development of women while eliminating the gender inequalities in education.
December 1996	National Communications Authority (NCA)	The Authority is the statutory body mandated to license and to regulate electronic communications activities and services in the country.

Regulatory Institutions

Ghana's digitalisation program is grounded on a number of institutional establishments with specific responsibilities collectively aimed at the provision of efficient services to business and citizens. These institutions include: (a) the Ghana Domain Name Registry, (b) the National Information and Technology Agency, (c) the National Communication Authority (NCA), (d) the National Cyber Security Centre (NCSC), (e) the Ghana-India Kofi Annan Centre of Excellence in ICT (AITI-KACE), and, (f) Data Protection Commission (DPC), among others. The Ghana Domain Name Registry was established in 1996. It exists as a statutory non-for-profit company with a responsibility to manage and regulate Ghana's .gh spaces. In the performance of its duties, this entity does not engage directly in the registration of domain names, instead, it outsources domain registrations to other agencies once they go through laid down processes and fully certified to perform that function. Accredited agencies in this regard play the important roles of facilitating registration, renewal, as well as modification of data for companies and individuals who apply for the .gh domain names. By this arrangement, domain registrations in Ghana can only take place through accredited registrars.

In 2008, policy makers established the National Information Technology Agency (NITA) as a public service institution with the mandate to serve as the ITC implementing wing of the Ministry of Communication and Digitalisation. Its specific responsibility in the pursuit of the country's digitalisation agenda include the identification, promotion, and development of technology-based innovations; as well as provision of guidelines to shape the use and practices of ICT by government ministries, departments and agencies. Among others, NITA performs this responsibility with an objective to ensure sustainable growth in the country's ICT profile, especially through rigorous pursuit of research and development strategies. As the primary public agency mandated to ensure reliable provision of ICT in Ghana, NITA support Ghana's overall development goal of building a knowledge-based economy that is driven largely by technology, with the potential to service both public and private entities while contributing to job creation and increased employment (National Information Technology Agency Act, 2008). NITA is also responsible for ensuring the smooth implementation of the Electronic Transaction Act, 2008, by regulating entities registered under the act to provide ICT and related services (Electronic Transactions Act, 2008). This regulatory framework is designed to provide the necessary legal regime and technology platform for promoting public interest electronic communications and related transactions such as e-government services, electronic communications and transactions with public and private bodies, institutions, and the citizenry (National Information Technology Agency Act, 2008). Since its inception, the NITA has implemented the e-Government Infrastructure Platform Project to connect all MDAs and MMDAs across Ghana; and also built a Tier 3 data center to host all government applications with a capacity to provide hosting services to private sectors institutions. Currently, NITA is pursuing a public key infrastructure (PKI) and working on developing a compliance policy for all the government institutions for third-party software licensing and usage. Since its establishment, NITA has implemented several digital infrastructure platforms, and provided connectivity to government agencies and institutions throughout the country

With the liberation of the telecommunication sector and entry into the industry by private actors, the government established the National Communication Authority (NCA) through an Act of Parliament in 1996 to serve as an independent regulator of telecommunications service providers. The NCA is designed not only to ensure a fair competitive environment for players in the sector, but also to protect telecommunication service consumers and service providers against exploitation and misuse. It has the authority to mete out sanctions especially against telecommunication service providers that flout the rules of the game or engage in anti-competitive conduct in broadcasting or use of spectrums and telecommunication operations. In a nutshell, the NCA has the overall duty of creating a level playing field for the use of telecommunication services, and in particular in regulating communications via cable, wire, television, radio, satellite and other

related technologies in the country. As Samarajiva (2001) observed the emergence of regulatory agencies like the NCA formed part of the shift in global norms towards demanding independent arbiters in arenas of competitions to avoid arbitrary practices, settling disputes as well as the need to guarantee stable operating environment for long term investment in the telecom sector. Although its responsibilities are many, the primary ones include, transparent regulation, issuance of operating licenses, interconnection mediation, tariff regulations and consumer protection.

In order to ensure adequate protection in the digitalisation processes, an agency known as the National Cyber Security Centre (NCSC) was established, and mandated to oversee the country's Cybersecurity development through the implementation of priority and strategic initiatives and investments for a secure and resilient digital Ghana. The NSCS was necessitated by a growing recognition of various forms of cyber threats that seek to undermine the processes of digitalisation. For instance, Ghana has historically experienced cybercrimes, typically in the form of “internet fraud targeting gullible foreigners known locally as sakawa or 419” which “involved credit card and advanced fees fraud” that “capitalized on the vulnerabilities and gullibility of internet users” (Motiwala, 2017, p. 1). A 2013 report by the US Federal Bureau of Investigations (FBI) ranked as the second country in Africa with the highest rate of “cyber fraud and financial scams” (ibid). Thus, the NSCS was established to “provide a proactive and reactive response and reporting mechanisms to cybersecurity incidents, promote capacity building and awareness creation efforts, provide child online protection, and foster cybersecurity domestic and international cooperation. With the passage of the Cybersecurity Act, 2020 (Act 1038), the NCSC is expected to transition into the Cyber Security Authority (CSA)” with a broader mandate. Thus, the adoption of a cyber security policy in 2015, was in recognition of risks associated with reliance on internet and web-based service provision. In particular, the NCSC is expected to promote policies that safeguard Critical National Information Infrastructure (CNII), and to protect public and private investments and citizens’ interests with special attention to: (a) National Defense and Security, (b) Banking and Finance, (c) Information and Communications, (d) Energy, (e) Transportation, (f) Water, (g) Health Services, (h) Government, (i) Emergency services and, (j) Food and Agriculture.

Notwithstanding its enduring relevance to the provision of basic services, digitalisation could also be harmful if personal information, privacy and confidentiality are not protected. This is particularly important given that the right to privacy forms part of fundamental human rights and freedoms under Ghana’s constitution as well as other international obligations to which the country is a signatory. Often laws of privacy, confidentiality and data protection provide a framework for ensuring the dignity and respect of individuals through a process that disallows intrusions and invasions upon their person, correspondences and communications, home and property as a means to fortify the autonomy, name and dignity of persons. It was in recognition of this, that policy makers established Data Protection Commission (DPC) in 2012 as part of the overall digitalisation strategy. The DPC is an independent statutory body set up through an Act of parliament in 2012 to provide confidentiality and privacy protection for users of information and telecommunication data. It does this by regulating the processes and procedures for accessing, possessing, use and disclosure of personal information. Since coming into force, October 2012, the DPC has been working to give effect to its mandate. While the Ghana-India Kofi Annan Centre of Excellence in ICT (AITI-KACE) was established and tasked to facilitate research, teaching, learning and educational technologies in the sector; Ghana Investment Fund for Telecommunications (GIFTEL), as an agency of the Ministry of Communications was to facilitate the provision of universal access to basic telephony for the unserved and underserved communities in the country.

One of the major regulatory measures that shape the processes of digitalisation in Ghana is the Electronic Communications Act, 2008 which regulates the provision and use of electronic communications, broadcasting, and the use of the electro-magnetic spectrum (Electronic Communications Act, 2008, 2009). It also provides the legal regime for addressing grievances and disagreement as may arise through the Electronic Communications Tribunal Regulations LI 2235 that sets out the parameters for dispute

adjudication (Rules of Procedure of the Electronic Communications Tribunal Regulations, 2016). It is to develop and implement the required regulatory standards for compliance by entities permitted to provide communication services in the country. As such, to discourage unhealthy business practices among industry players the Mobile Number Portability Regulations (LI1994), was enacted to allow mobile number switching across networks (Mobile Number Portability Regulations, 2011). Thus, in Ghana today, a subscriber is permitted to transfer from one mobile telecommunications service provider to another whilst the subscriber retains the mobile number allocated to that subscriber by the mobile telecommunications service provider from whom that subscriber is transferring. This notwithstanding, poor customer service is present. Given that the telecommunication platform holds a variety of information, the Data Protection Act, 2011 was passed to ensure the proper collection, use and storage of information by public and private entities in the country (Data Protection Act, 2012). In addition, Vodafone's monopoly over the provision of affordable broadband internet in Ghana using its SAT3 undersea cable was ended in 2010 to allow GLO-1 and MainOne to enter the information and communication technology provisions market in Ghana.

Investments and Performance

Ghana's has witnessed significant improvement in its performance over the years. Ghana liberalized its telecommunications sector in 1994 with the adoption of a five-year ICT Accelerated Development Plan directed at restructuring the telecoms sector and repositioning it as a major vehicle for socio-economic transformation and growth (Fraser-Moleketi & Senghor, 2011). Ghana registered 'GH.COM', the first commercial internet domain, in 1993, and by 1995, in collaboration with other organizations, it became the first West African and second sub-Saharan African country to attain full interconnectivity (Alhassan, 2019). In pursuit of using ICT as the fulcrum of the next phase of its developmental agenda becoming more realistic, significant investment the in infrastructure for the deployment of internet and Information Communication Technology related services was carried out. This phase is captured in a major policy document, the Shared Growth and Development Agenda (2014-2017). Through multiple streams of financing, the Government of Ghana built a number of ICT infrastructure to facilitate the growth of the sector to spearhead the socioeconomic transformation of the sector. In 2006, the World Bank supported the country's e-Ghana Project with a loan facility of about US$40.0 million from International Development Association (IDA) resources, with a counterpart funding of US$ 2.00 million by the Government of Ghana. Equally, an investment of US$44.70 million was made targeted at the Ghana Integrated Financial Management Information System (GIFMIS) (World Bank, 2016). Further support for this project came from other Development Partners, particularly the European Union (EU) and the UK's Department for International Development (DFID) (World Bank, 2016). Ghana secured a co-financing agreement of US$27.32 million from both institutions for the GIFMIS project.

The overall objective for the investment made into providing technology infrastructure was to improve the e-Ghana project for public services. Similarly, the Government of Ghana devoted a sum of US$97million to the e-Transform Ghana Project. This was meant not only to digitize government institutions for effective service delivery through the prudent use of Government resources, but also to nurture new business opportunities and create jobs through the development of iHubs and mLabs (Ministry of Communication, 2015). Specific interventions under e-Transform project included the e-Parliament and e-Justice initiatives, which were designed to digitalize services delivery in these sectors. Thus, Government invested about US$5million in the e-Justice project to support and enhance justice delivery in the country.[1]

Government of Ghana views digitalisation and the ICT infrastructure as critical for promoting economic growth and providing employment opportunities. As such the government investment's in ICT was driven

[1] https://newsghana.com.gh/us5-million-invested-in-e-justice-program-in-ghana/

primarily by the desire to develop the IT Enabled Services (ITES) industry, with a view to improve efficiency and transparency in the operations of government institutions and agencies (World Bank, 2016). A significant part of government's investment in ICT was the establishment of the National Data Center to promote an integrated use of ICT to improve efficiency and transparency in governance and to facilitate storage, management, and dissemination of data for both public and private establishments. In addition, a Business Process Outsourcing (BPO) Center established to provide the necessary platform for the youth to participate in the knowledge economy by taking advantage of opportunities for entrepreneurship and employment (Ministry of Communication, 2015). To ensure broadband connectivity across the country as a way of bringing rural Ghana into the digital economy, the Eastern Corridor Fiber Optic was constructed to install 808.35km of fiber optic cables to connect 120 communities between Ho and Bawku with a link from Yendi to Tamale. The University of Health and Allied Sciences in the Volta Region is a major institutional beneficiary of this project. In particular, the university is able to leverage it to strengthen its teaching, research and learning services. These investments were designed to: (a) created an ICT enabled environment for public and private use, (b) support to Local ICT Businesses and ITES, and (c) support e-Government for improved public service delivery, and (d) enhance revenue generation and management of public funds (Ministry of Communications, 2015).

As a result of these efforts, the United Nation's EGDI survey (2018; 2020) observed that there has been a tremendous progress in internet penetration and connectivity measured in terms of the country's population of internet users moving from 5.3% in 2010 (Alhassan, 2019) to 46.5% in 2021 (Internet World Statistics, 2021). The EGDI 2020 survey report for instance counted Ghana among few countries at "lower-middle-income levels" yet "deliver rather well in online services provision" (p. 24). There is an upward movement in penetration, which was estimated to be between 30.3% and 48% consisting of about 14.76 million users of internet as at January 2020. Social media usage has also been on the rise with about 62% on Youtube, 71% on Facebook, and 82% on WhatsApp. Mobile phone remains the main device for accessing the internet for majority of users with overall subscription rates reaching 39.97 million, which is estimated to be about 130% of the country's population. The main mobile network operators include MTN, Vodafone, Airtel-Tigo and Glo with an additional 52 internet service providers all of which contribute to a very competitive internet service market. Internet service quality has witnessed improvement with the introduction of fibre optics. In an effort to "improve network access in remote communities, the Ghana Investment Fund for Electronic Communications, in early 2020, backed the deployment of 2000 new OpenRAN sites to help network operators reach underserved communities"[2] Below is a profile of regional distribution of mobile phone ownership from the records of the National Communication Authority (NCA).

Regional Distribution of mobile phone ownership by individual five years and above in Ghana

No.	Region	% Distribution
1	Ahafo Region	48.8
2	Ashanti Region	54.5
3	Bono East Region	48.8
4	Bono Region	55.9
5	Central Region	58.2
6	Eastern Region	52.2
7	Gt. Accra Region	73.7
8	North East Region	37.1
9	Northern Region	41.8

[2] https://paradigmhq.org/report/londa-digital-rights-and-inclusion-in-ghana

10	Oti Region	42.2
11	Savannah Region	47.7
12	Upper East Region	43.9
13	Upper West Region	36.3
14	Western Region	49.3
15	Western North Region	47.4
16	Volta Region	52.7
	NATIONAL AVERAGE	54.1

Source: National Communication Authority, 2019

The NCA (2019) study also shows that only 7.9% of citizens five (5) years and above own computers of which 5.1 own laptops; 1.2% own desktops while 1.6 own tablets. The study further revealed that only 39.7% of the population know what the internet is although 73.8% have experience call over the internet. While 40.8% admitted to engaging in mobile phone transactions, only 16.8% have access to the internet. With support from the World Bank, the ministry initiated digitalisation reforms in a number of government ministries, departments and agencies, with the primary objective of ensuring that the government's e-services are inclusive and supportive of citizens' needs (Ministry of Communication, 2021).

Under Ghana's Broadband Strategy (2012), policy makers envisioned transformation that will enable governments to communicate with citizens using modern information technology platforms. Consequently, digitalisation is perceived as the appropriate mechanisms to achieving this objective. As such, government has initiated in a number of policy areas with the goal of creating a more digital friendly environment, where public services are readily accessible in a transparent and efficient manner. In 2022, Ghana's Vice President Dr. Mahamudu Bawumia noted that the priority given to digitalisation by governments is due to its potential to facilitate formalisation of the informal sector of the economy, open up new sources of revenue mobilisation, assist with proper identification of citizens, promote proper landed property identification and registration and minimize human interferences with its associated corrupt tendences in public service delivery.

Technology has been used to drive socioeconomic transformation in virtually every sector of the public sphere and aspects of peoples' daily lives. ICTs have changed the way we learn, work, trade, socialize, and access public and private services and information (Alhassan, 2019). Trends from the periodic surveys by United Nations E-Government index show that Ghana has been making steady process and judged as one of the top performers in ICT related services in Africa. This progress is across the years is illustrated in the table below. With the exception of Human Capital Value where trends in progress has not been consistent, every other indicator such as e-participation, telecommunication infrastructure index, online service index, and E-Government Development index have witness tremendous progress especially between 2003 and 2020.

2020 Ghana	2020	2018	2016	2014	2012	2010	2008	2005	2004	2003	
E-Government Development Index rank	101		101	120	123	145	147	138	133	143	139
E-Government Development Index value	0.59600	0.53900	0.41815	0.37354	0.31590	0.27537	0.29970	0.28662	0.23693	0.24065	
E-Participation Index rank	82		85	98	84	101	110	60	105	97	102
E-Participation Index value	0.63100	0.62920	0.45763	0.39215	0.10530	0.08571	0.20454	0.03174	0.03278	0.03450	
Online Service Index value	0.63530		0.69440	0.44928	0.31496	0.30065	0.14920	0.29431	0.18846	0.05019	0.08296
Telecommunication Infrastructure Index value	0.55960	0.35580	0.25936	0.24438	0.11105	0.05924	0.04092	0.02141	0.02061	0.01900	
Human Capital Index value	0.59300		0.56690	0.54581	0.56130	0.53601	0.62150	0.56410	0.65000	0.64000	0.62000

In Sub-Sahara Africa, Ghana has become one of the top performers in the use of ICT advancements for economic growth, ranking consistently high in the past couple of years. According to the UN E-Government Index Survey, Ghana ranked first in the region in 2016 and 2018 respectively, transitioning from middle to high level when it was assessed on efforts to enhance the use of e-governance along the scope and quality of online services, as indicated by the Online Service Index (OSI) (World Bank, 2019). These findings reflect the shift in, and continuation of, ICT and related policies since 2003 by successive governments. But the question remains as to the extent to which these growths are impacting the population, especially vulnerable groups in terms of access, usage, participation, and affordability.

In the early 2000s, policy makers in Ghana began to re-orient the development trajectory of the country by recognizing the critical role that information, knowledge and technology could play in facilitating socio-economic development and the improvement of living conditions. Ghana's attempt at using ICT to accelerate the provision of basic services and to propel the socioeconomic development of the country is captured in a number of policy documents and legislative acts to regulate the provision of ICT services to all Ghanaians irrespective of location. The policy and legislative frameworks provided policy guidelines and institutional mechanisms for ensuring that service provision is of comparable standard to those in other jurisdictions and does not compromise the collection and use of sensitive biodata of consumers. Some of the policies initiated by governments over the years to guide and regulate the development of the ICT industry in Ghana include, but are not limited to: the National Broadband Policy and Implementation Strategy; the Ghana National Cyber Security Policy & Strategy; and The Ghana ICT for Accelerated Development (ICt4AD) Policy.

Overall, Ghana's digitalisation drive has three main dimensions, and these consist of Government to Citizen (G2C), Government to Government (G2G) and Government to Business (G2B) services. Although digitalisation has been on the agenda for most public service agencies, government departments and

agencies, there is a lack of an overarching framework to integrate the ongoing efforts. The result of this is that most ministries, government departments and agencies are digtalising their services but are working in silos. Even more interesting is the fact that the attraction to digitalisation is shaped more by external funding considerations. Many agencies are uploading digitalisation as a service delivery strategy either because they have World Bank funding for it or intend to use it to leverage such funding, and as some officials have argued, once funds are exhausted, projects also stalled. In 2021, the Ministry of Communication, which has been the backbone of information technology related initiatives, was renamed the Ministry of Communication and Digitalisation with a renewed mandate to develop a "reliable and cost-effective world-class Communications infrastructure and services, driven by appropriate technological innovations, accessible by all citizens to enhance economic competitiveness in a knowledge-based environment" (https://www.moc.gov.gh/about). On the basis of this mandate, this ministry has become the central point of digitalisation activities in Ghana.

PART II
The Current Status of Digitalisation of Basic Services

Taken together, the policies implemented by successive governments have rapidly evolved a digital technology ecosystem in Ghana that can adequately support digitalisation of basic services. Digitalisation is the new buzzword for policy makers and other government officials in Ghana. This largely is because it is seen as means for citizens to obtain basic public services through electronic means, including having access to government information, enabling transactions with government agencies and departments, without the constrains often imposed by time and space, and in the process promote transparency, reduce corruption and promote availability of services to all (Hossan and Bartram, 2010). In recognition of the progress being made with investments in information and communication technology (ICT), Ghana emerged as the only African country in 2018 to have successfully made a transition from a middle to high level in the EGDI 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" (World Bank, 2019, p. 44). The World Bank (2019) has observed that there are about 4,153 ICT establishments in Ghana, with Greater Accra Region and Ashanti Region alone hosting approximately 73% of such entities and making significant contributions to job creation and employment (World Bank, 2019). Further, international recognition of Ghana's progress in ICT initiatives is manifested in Google establishing a major regional office for its operations in the country; and plans are far advanced by Twitter to open its regional office in Ghana[3]. Accra, the national capital of the country, hosts the "biggest Tier-3 600-Rackspace Data Center in West Africa, with a 45 Rackspace back-up" situated at the Kwame Nkrumah University of Science and Technology, Kumasi. This has the capacity for storage of large volumes of documents, videos, audios, biometric, web hosting and cyber security" (Omane-Boamah & Atta-Boateng, 2020).

[3] https://www.bbc.com/news/world-africa-56860658

List and status of e-services in Ghana

Basic Service	Nature of Digitalisation	Status
Passport	An integrated online platform for the application and payment for passports and other travel documents services (https://www.ghana.gov.gh/)	About 75% functionality as the service is not 100% digitalised and still requires customer interaction with the passport office to complete the process.
Ghana card	Registration forms can be downloaded online via the national identification authority's website. Filled forms are submitted via a dedicated email on the website while personnel from the authority are later deployed in person to capture additional details of the applicants. NB. Service applicable to households with a membership of more than five (5).	Ongoing. About 16 million Ghanaians are currently registered and issued with a Ghana card. The card's architecture supports e-visas and e-passports. Also, the card is recognised globally as proof of Ghanaian citizenship. The government has hinted at linking the card to vital data such as the voter registry, birth and deaths, and paper-based biometric passports.
Social Security	An online-based self-service portal for the provisioning of the contributory based social security services for both formal and informal sector workers	Ongoing.
Drivers' License and Vehicle Registration	An online platform for acquisition, renewal of drivers' license and also for vehicle registration (http://www.dvla.gov.gh/)	Ongoing. The digitalisation drive is reported to have increased revenue accruing to the government by 136% (2017-2020), with the base period before the digitalisation as (2013-2016)
E-health	A comprehensive national strategy that incorporates the use of various electronic-based mediums such as personal digital assistants, smartphones and software in the provisioning of health services (see the Ghana e-health strategy)	Ongoing
e-Education	The use of various Learning Management Software to offer to teach and learning services for pre-tertiary students (see NATIONAL E-LEARNING GUIDELINES FOR PRE-TERTIARY SCHOOLS IN GHANA).	On-going with erratic electricity supply, server downtimes hampering the effective use of the services

Payment of Salaries	An online-based portal for viewing and downloading of payslips for public sector workers.	Completed, but uptake of the digitalised service is not given priority.
Social protection	Mobile money is used to disburse grants for beneficiaries of various social protection programmes such as the Livelihood Empowerment Against Poverty (LEAP)	Ongoing.
Digital property	a modern and revolutionary approach to allocating addresses within a defined space with the aid of the latest geocoding technology integrated into a smart-phone based application	The digitalisation is 100% completed, but user uptake is ongoing. The decentralised agencies of government assist households to get a plague of the digital address fixed to their houses. The addressing services enable the door-to-door deliveries to function correctly and facilitate the ambulance services' operations.
e-Justice	An integrated online system for the provision of judicial services and information such as various forms to apply for services, reports and legal documents such as the constitutions, judgements on any case, etc. https://judicial.gov.gh/index.php/e-services/ejustice	Ongoing but currently targeted at legal professionals such as judges, lawyers and public servants in the judicial service. Citizens assess services through the e-justice portal through their lawyers.
m-Birth	Computerised registration of infants using mobile technology such as tablets, phones and laptops	Ongoing
e-records	Digitisation and automation of the operations of the Public Records and Archives Administration Department (PRAAD) as well as all the records of the	A pilot programme is ongoing at the National Archives of Accra. Other regional archives are yet to be digitalised.
E-immigration	'The E-Immigration project forms part of the overall E-Ghana project. It consists of Secured Border Management System (SBMS), Visa Management System, and online applications for visas and permits.	Ongoing but stalled by shrinking of donor support

	The SBMS module on completion will be rolled out to be the new passenger processing system. As part of its component is the electronic gate. (e-gate) a system which would help the Service improve on the speed of passenger processing. Passengers who will be enrolled on the e-gate system can access it.'	
E-Procurement	'GHANEPS (Ghana Electronic Procurement System) is a web-based, collaborative system, developed by the requirement of public procurement laws, to facilitate public procurement processes in Ghana. It offers a secure, interactive, dynamic environment for procuring all categories, complexity or value.' https://www.ghaneps.gov.gh/epps/home.do	Ongoing. The human interface is still required.
E-Property	Online platforms for the payment of service fees; land registration barcode for online follow-ups; searches for legal owners of lands digitalised	Ongoing. The Human interface is required for all services. Server downtimes slow down efficient operations of the digitalised services.
Paperless port operation	A management information system that integrates the internal processes of doing business at the ports of Ghana into one system to deal with delays, middle-men and leakages in the operations of the Tema and Takoradi ports	Completed with greater efficiency reported
E-Taxes	An integrated online platform for the provisioning of various tax services such as the filing and payment of taxes (https://gra.gov.gh)	Ongoing
Motor Insurance (e-verification)	Using the Motor Insurance Database (MID) as the source for authentication, the validity of any motor insurance can be assessed with a USSD code by policyholders and law enforcement	Completed, the service is, however, for the verification of motor insurance registration only.

	agencies such as the Police Service. This has almost eliminated fake Motor Insurance documents.	
E-Agriculture	through USSD codes, farmers register electronically and are provided with codes to access fertilisers. Using the USSD codes, registered farmers could claim allocated bags of fertiliser at outlets within their communities to prevent the smuggling of fertiliser from the country.	Ongoing but sustainability may be challenged when donor funds are no longer available

Ghana's progress with digitalisation has manifested in several ways, including periodic review of legislations to untie institutional bottlenecks and the rolling out of digital platforms for public administration and provision of basic services, such as the issuance of the digital national identification Card, e-justice system, e-smart driver's license, e-property addressing system, mobile money interoperability system, paperless port system, Ghana Post GPS, electronic renewal of the National Health Insurance Scheme (NHIS), e-Immigration system, e-Cabinet system, e-Parliament, and e-Procurement, among others (Demuyakor, 2021, p. 43). Recently, Ghana.Gov, a digital service and payment platform to enable citizens access most government services was launched. The government has recently launched a digital system where every property across the nation has a unique digital address code as a first step towards solving the challenges associated with locating business and residences across the country when it comes to service delivery. In October 2017, policy makers introduced the Digital Address system, popularly known as Ghana Post GPS. It allows the app user to generate their digital address with the aid of geocoding technology, cutting out the need for convoluted navigation instructions. In addition, a new addressing system, which leverages on the existing GhanaPost GPS system, is made up of a unique house number, street name, digital address and a QR Code containing the ownership and other details of the property. However, the ability of this technology to function effectively in informal settlements environment where life and livelihood are most disorganized and unpredictable remains a major challenge. The first phase of the project, which began under the erstwhile Ministry of Special Development Initiatives (MDSI) was the continued collaboration between the Ministry of Local Government and Rural Development with the Land Use and Spatial Planning Authority (LUSPA). This project was able to ensure the registration of over 4 million properties with the new address plates, at no cost to the property owner. According to officials, the same system has been used to map and assign every location in Ghana a unique digital address using spatial database information system.

As services are digitalised, policy makers have taken steps to provide Wi-Fi opportunities for segments of the society to facilitate easy access to services. For instance, a public wi-fi system was built to serve airports and schools. In particular, major airports have been equipped with internet services to serve the travelling public. This opportunity is, however, not available to the entire travelling public as it is mostly limited to travelers who use the VIP lounges or those travelling first class and business class on selected airlines through Kotoka International Airport. In other words, passengers who have funds to purchase high-end tickets are the ones with access to free wi-fi services at the airport. Other passengers who wish to access information or digitalised service online at airports are allowed to do so at a fee. The pursuit of digitalisation is driving several recent initiatives with the expectation that government relationship with the citizenry will improve (BoG, 2018). The quest for digitalisation has resulted in initiatives such "e- procurement, e-immigration, e-parliament, e-justice, e-cabinet and other initiatives such as the national digital property addressing system, the introduction of paperless port operations, among others" (Boakye, Nwabufo & Dinbabo 2021, p. 2).

The Education Sector

The educational sector is one of the basic service areas that has been experiencing digitalisation. Following challenges associated with placement of Junior High School students into Senior High Schools across the country, the government decided to switch to computerized system and subsequently developed a database for executing this task. Introduced in 2005 and known as the Computerized School Selection & Placement System (CSSPS), the program digitalised the selection of schools for students proceeding to Senior High Schools by outsourcing school choice decisions to a computerized system that "automatically places public school students from junior secondary schools to senior secondary schools, based primarily on scholarship" (Andoh-Baidoo, Bebb & Agyepong 2012, p. 409). Notwithstanding its challenges, the computerized school placement system has been instrumental in minimizing regional restrictions on students and has assisted in reducing human interferences associated with the previous manual approach.

Under the CSSPS, students and their parents anywhere in Ghana can access the database using either computers or smartphone devices to ascertain schools of their placement without the need to travel to seek and obtain admission into Senior High Schools. The CSSPS approach has also been adopted by other agencies within the education sector. In particular, the management of Ghana's National Service Scheme (NSS) (mandatory Post tertiary youth service has digitalised placement of National Service Personnel (NSPs) across the country, making it possible for prospective service personnel) to be alerted via text messages about details of their national service placement irrespective of geographical location. Following detection of ghost names in the scheme's payroll in 2014, the government took a decision to switch from manual system of payment to a digitalised system that allowed NSPs to instantly access their monthly allowances at designated point of sale (POS) devices and automated machine of financial institutions irrespective of time and space. Despite the success of the CSSPS, digitalisation at the pre-tertiary level has not gone beyond school placements. As such, when COVID-19 pandemic struck, most public schools closed down while private schools immediately switched to online learning platforms.

At the tertiary education level, universities provide open access to wi-fi for registered students and faculty. With the support of the World Bank, about thirteen universities operate free wi-fi system in their institutions to promote e-learning and administration of student records (Ghana News Agency, 2021). For instance, at the University of Ghana, students and faculty are able to conduct classes on an e-learning platform known as Sakai, with access to the internet through the free wi-fi system. The University of Cape Coast has also put in place the Moodle e-learning platform with added portals for lecturers and students. Payslip information known as the Xpay and Student Information Systems are also available on an electronic platform at the University.[4] Similarly, Kwame Nkrumah University of Science and Technology has taken advantage of the wi-fi system and has put in place an E-learning and virtual classroom portal in addition to a student's app called AIM, where students can check their registration status and results among others[5]

The focus on tertiary education obviously means that digitalisation in the education sector only serves the interest of a privileged few, with the large majority at the pre-tertiary level completely underserved. Even at the tertiary level, there are legitimate concerns about reliable electricity, access to computer devices especially for students from economically poor backgrounds, and inequity especially in light of a recent policy to have internet in the country's Colleges of Education supplied by private vendors paid for by students (GhanaWeb, 2021). In a recent study, Mugisha et. al. (2021) noted that educational reforms in Ghana notwithstanding, "there is still a number of challenges that hinder quality teaching and learning. These challenges include inadequate ICT skills as well as infrastructure and human resource. In addition, teacher educators are resistant to change from traditional to modern methods of teaching" (p. 56).

The Justice System

In the area of justice delivery, digitalization has been introduced in response to delays in processing cases and a desire to move court processes to a paperless operation. With funding from the World Bank, the government launched a program dubbed e-Transform, with the purpose of automating court cases from the first stage of filing at the registrar to the final determination of cases. The underlying objective for this project is that the current manual court system has inherent inefficiencies such as duplication of suit numbers, manual transfer of files from one registry to another when changes happen, fraudulent issuance of receipts for payments, loss of files etc., that lead to poor turnaround time on the adjudication of cases, thus affecting justice delivery (Addadzi-Koom and Bediako, 2019). From the perspective of policy makers, the e-justice system aimed to reduce not only bribery and corruption within the Ghanaian judiciary, but also reduce the cost of litigation because it has the potential to reduce material and labour costs as well as cut down on

[4] https://ucc.edu.gh/main/web-services

[5] https://www.knust.edu.gh/academics

travel time for persons with cases in the court system. Launched in 2019, the e-justice project is currently being piloted in parts of the Greater Accra Region, with the expectation that it will be extended to judicial institutions in the regional capitals and some metropolitan areas. The efforts at digitalizing justice delivery have been applauded as a great initiative, however, a critical analysis of the e-justice initiative shows that it is nothing more than an internal management device and not one that interfaces directly with citizens having cases at the court. As an official at the Ministry of Justice noted:

> *E-justice is a system that is designed to carry out the court processes. If a case is filed it is put into the system, so the system then assigns the case to a particular judge to work on. If a judge has a lot of cases on his portal, the system will automatically know that this judge has a lot of cases so the new cases might not go to that judge. It will go to a judge with few cases on his or her portal. If a judge is on leave, the system knows the judge is on leave so cases will not be sent to that judge's portal until the judge resumes work (Include-Interview 2022).*

The Agricultural Sector

Digitalisation has also been used as a means of encouraging modern agricultural activities in the country. Under a World Bank sponsored project known as the West African Agriculture Productivity Programme (WAAPP), policy makers introduced an e-agriculture initiative with the primary purpose of leveraging the great utility value of modern technology to supply timely scientific knowledge to farmers and help improve their yields. An important component of the e-agriculture program includes e-farm information (Farmer Audio Library/Interactive Voice Response System [IVR], provision of information on toll-free lines; e-field extension, data collection and feedback from farmers, and e-learning and resource centres, for the promotion of youth in agriculture, and regular online publications and dissemination of new and information on innovations, new methods, and practices across the agriculture value chain. Seen as a means to bridge critical gaps between farmers and technology, the e-agriculture program uses electronic means to render extension services, create, store and retrieve databases.

In addition, the initiative registers farmers and uses USSD codes to electronically give farmers important codes to access fertilizers and other farm inputs. Thus, under this program, registered farmers are able to use their USSD code to determine and claim their allocations of bags of fertilizers within their communities and the process avert corruption and smuggling to neighbouring countries. According to ICT unit of the Ministry of Food and Agriculture (MoFA), the main objective of the e-agriculture programme is to provide affordable, prompt, and efficient agricultural service delivery using information and communication technologies (ICTs). To save time and effort of farmers, the e-agriculture programs allow farmers to access information using technological means at home in contrast to previous arrangements that require them to visit District officers to be educated on issues such as how to increase their yields, handling of products in the post-harvest phase as well as marketing of their products. Farmers with smartphone under this project are able through various technological application to engage in live chats with experts and obtain instant responses on issues of concern to them. According to the head of the ICT unit, MoFA:

> *The biggest challenge that Ghana faces today is educating the growers about quality issue. Using ICT platforms and portals can help farmers and growers on best farming practices. The national e-Agriculture programme centre has a call center facility with a toll-free number where farmers call for information on various Agricultural extension and advisory services…The general public has directly and*

indirectly been impacted by e-agriculture. The various sources of information aren't just limited to farmers but also anyone who needs any form of information about starting a farm, taking care of their pets, purchasing of agro-products, etc. the enquiries can be made without any problem, thanks to this project (FAO, 2017)

If you look careful at the objective of this services, government revenue generation is at the front and centre rather than providing a public service. As such, like most services experiencing digitalisation in Ghana, once funding for the e-agriculture program dried up, its operations collapse. However, under a new GH¢100 billion Ghana COVID-19 Alleviation and Revitalization of Enterprises Support (CARES) "Obaatan pa" programme, government has begun the registration of famers in the five northern regions to activate the e-agriculture project.

The Health Sector

In the health sector, digitalisation is considered a panacea to the many challenges that constrained efficient and effective delivery of care to patients. Acting as the principal healthcare provider, the Ghana Health Service "has implemented a number of policies aimed at improving healthcare delivery and access. These policies have not yielded the expected results due to lack of accurate and timely data" (Adu et.al, 2015, p. 13). It is against this background that health sector digitalisation began in Ghana. Digitalisation of health has been on the agenda of health reforms, and was one of the first to be piloted, yet its scope in terms of national coverage remains limited. According to the Head of IT at the Ministry of Health

The health sector decided that we want to have a national e-health solution so that instead of those individual ones that are portable. Because the agenda is to have a record that is portable. That means if a patient goes to Komfo Anokye then he goes to Korle-Bu they should be able to retrieve the data. If the patient goes to a district hospital, then is referred to a teaching hospital, they should be able to retrieve the data. So, we are looking at continuity of care for patients because the challenge we have been having is that anytime a patient goes to a facility, they lose their small card so retrieving their folder is an issue. So, we realize that one patient in one hospital is having about five folders because anytime he goes, he has forgotten his folder number and we can't retrieve it so we give the person a new folder. Therefore, in terms of history and patient's data access becomes a challenge. So, we are looking at a situation where we will digitize all the electronic systems right from OPD records all the way through the solution. So, to help us improve data collection, help us have access to patient's data and also help in verifying health insurance data by submitting new claims directly. One key area we are trying to build in the system is called the early warning system for public health alert (Include-interview, 2022)

At the heart of the e-health initiative is the promotion of: (a) an online database for all hospitals and health records (paperless process); (b) establishing a digitalized system that connects all health facilities across the country; (c) digital folders for all Ghanaians to enable healthcare practitioners to have access to health history of patience when the need arises; (d) a USSD framework for verifying national health insurance claims as a measure against fraud; (e) online renewal of expired national health insurance card; (f) digitally synchronized pharmaceutical system, currently in a pilot phase involving 45 pharmacies; (g) using medical drones to supply essential medicine and urgently required drugs to health facilities with centres currently operating from Omenako, Mpanya, Vobsi, and Sefwi Wiawso. Officials admit the reach of the e-health

program is currently limited although it has ambitions of being expanded to cover the entire country in the future.

> *The objective is to have it nationwide within the next 5 years. As we speak now, we have done all the teaching hospitals, all the five teaching hospitals have been rolled out, 10 regional hospitals that have also gone live, we have plenty district hospitals that are also live now. So, the objective is to finish with the district hospitals then we go to the health centres and then the chips centres. So, within the next 5 years we are digitizing all the hospital system by deploying the e-health project in there (Include-Interview, 2022).*

Immigration Services

In addition, the Ghana Immigration Service and the Ministry of Foreign Affairs have also since 2010 been engaged in digitalisation of aspects of their services and operations. The government sought to eliminate the bottlenecks surrounding the acquisition of passports by clearing the political economy of middlemen who were acting as intermediaries between the citizens and the passport office. In an interview with a director of Passport, he outlines the digitalisation drive in the following words:

> *Passport office is one of the government institutions that has been able to respond to the government's policy focus to offer digitalised services given the exigencies of our times. Since March 2020, the office has rolled out an online application service for applicants. An applicant can access the service by going online (GHANA.GOV) to book an appointment. The appointment can be placed at any of the fourteen (14) application centres across Ghana. Currently, the application centres do not cover the following regions: North East, Oti, Savannah, Bono East, Ahafo, Upper East and Western North. Out of the existing 14 centres, four are in Greater Accra Region; two each are in Kumasi and Tamale, with the rest distributed equally in the other regions.*
>
> *The applicant books the date from the available windows and later visits the application centre as part of the appointment process. The applicant visits the centre where the appointment was placed at the due date with the requisite supporting documents (which are listed on the web portal) to begin the processing. When the process is completed, the applicant is informed, and they visit the application centre again to pick up the passport. Applicants who opt for expedited service (at extra cost) have their passports delivered to their preferred address. The drive to digitalise part of our service provisioning was because applicants were stacked in long queues all day without success and those who wanted to get the service early reported very early.*
>
> *I would say that a revolution is happening in the passport's administration space. It is driven by the vision of the minister of Foreign Affairs. We currently have a passport application system devoid of frustration. Ghanaians should therefore embrace it. In the past, several people missed the opportunity to travel because their passports were not ready by their travel deadlines. Some students who had*

scholarships could not take advantage of those opportunities because of delays in passport applications. Now, such delays are a thing of the past. All travel aspirations and opportunities can be facilitated with a seamless passport application service which adds to our development goals. The service cost is now GHS 100.00 due to the digitalisation, but Ghanaians do not feel burdened due to the quality of the service we provide. The passport application is the first step when travelling, where visa applications are mostly online based. Therefore, the minimum expectation for all international traveler's is some ICT knowledge and literacy. Thus, we don't want to use illiteracy and lack of ICT knowledge as an excuse to stall the digitalisation agenda (Include-interview, 2022).

From the excerpts of the interview enumerated above, it is revealing that in its current form, the digitalisation of passport application is only partial as it no longer requires applicants to manually fill forms but they must yet still visit designated regional centres for the capture of their biometric details. The only difference between the manual passport application system, and the digitalized passport one is that the latter captures and stores applicants' biodata in a database for future verification when the need arises, as a measure against impersonation and fraud. Otherwise, the operations under the digitalised application continues to experience the human interferences, delays, and fraudulent middlemen acting between the office and citizens. Beyond passport, the Ghana Immigration service is also digtalising its overall border operations in an initiative known as e-immigration, under which a system is developed to take account of "workflow for border control and VISA permit issuing" (Interview, 2022).

Trade Services

Similar measures have been taken at the country's major seaport where digitalisation has been introduced to minimize face-to-face interaction between actors, reduce clearing times, eliminate the submission of paper documents, harmonise trade processes, and enable single document submission (Senyo, Effah, & Osabutey, 2021). This was necessitated by the fact that the bureaucracy involved in goods clearance was cumbersome and entailed manual processes that were laboriously heavy on paperwork. In addition to the delay in clearing, the process also fostered a system of corruption due to the inherent inefficiencies that led to loss of revenue to the State. Officials view digitalisation dubbed "paperless port system" as reducing the bureaucratic layers and simplifying the processes of clearing goods thereby saving time needed to clear goods as well as blocking avenues of corruption at the ports, while increasing government revenue. Digitalisation has effectively ended the era of duty negotiations and bargaining between port officials and citizens in clearing goods, by ensuring that duties are automatically calculated by a computerized system. According to the Global Trade Review, in 2019 the government through the Ghana Revenue Authority (GRA) reported a growth in import revenue of 3.9% as a result of its new paperless port clearing system, while data from the authority's customs division show that import revenue increased from 12.7 billion Ghana Cedis in 2017 to 13.2billion Ghana Cedis in 2018. The GRA attributes the increment in revenue to the implementation of the digitalised paperless port system.

Under the Ministry of Transport, the Driver Vehicle License Authority (DVLA) has also digitalised its operations with the view to eliminating fraudulent intermediaries called "goro boys" and enable citizens have direct and unimpeded access to services such as registration of vehicles and acquisition of drivers' license in a transparent manner. A significant number of DVLA's services are said to be fully digitalised, and officials argue that drivers' license digitalisation alone in 2019 resulted in about 109% increase in demand for services thereby increasing by about 136% from 168.4 million in 2016 to 168.4 million by 2020. The digitalised DVLA services are available especially in regional capital across the country but questions remain about efficiency and reliability especially given that citizens are expected to make a number of travel

trips to DVLA offices to have their biometric and other details captured. Similar initiatives have been taken by the National Insurance Commission, which began digtalising its operations in January 2021 to among other things shift from manual operation to online platforms that allow law enforcement agencies to verify insurance status of vehicles anywhere and at any time on their smartphones. The digitalised system also enables the use of a USSD code, to check the status of an insurance policy, type of policy, vehicle registration, ownership instantly at the click on a button on any computer or mobile phone device.

Financial Services

Among sectors undergoing e-governance reforms in Ghana, digitalisation of financial services (DFS) has received the most attention. In this area, "the Government of Ghana seeks to build on these advances to create a resilient, inclusive and innovative DFS ecosystem that contributes to social development and a robust economy with a thriving private sector" (Government of Ghana, undated p.9). Policy makers hold the view that developing a "holistic digital payment ecosystem for goods and services", where "individuals can pay for most goods or services simply by providing their national ID number with a biometric check or using a contactless NFC-enabled national ID card" hold the key to financial inclusion, formalization of the informal sector and increasing the size of the tax paying population. In an interview with the desk officer at the Office of the Vice President of Ghana on the issue of DFS he reiterated government position that:

> *They are trying to bridge the digital payment gap. So, if you look at the National Financial Inclusion Strategy, of course, it is very evident there that we are trying to get more people into the formal financial ecosystem. So, we are looking at not just the banking side of it but all the dimensions of financial services including insurance. It includes people especially people who are geographically excluded by their issues of connectivity, electricity and all those things, so how do you make financial services to every top digital firm…So, we are bridging these gaps at different levels. If you look at the DFS policy it has some of these key things like the action areas. So, there are different action areas. Action area 1 is looking at governance. So, one indicator from the governance is to strive for improved forms of dialogue between industry and the relevant regulators and supervisors and within the government of Ghana itself. Enhanced engagement because when you enhance engagement, key gaps can be bridged, the different stakeholders understand the contest better. So, if you engage then there is knowledge sharing then that can go to enhance how policies are drafted and how two products are developed to solve a specific use case. That is one of the key things that it is believed will help drive data from national services. We also have established a digital task force in the Ministry of Finance focused on DFS and that is the Digital Coordination Unit and that is under the action area one which is the governance. Putting an engagement mechanism to ensure that the key stakeholders can easily share knowledge and interact and then having a specific task force focused on promoting DFS. And then the other one was regulation because regulation is key to anything in relation to when you want to advance any form of societal agenda. You will need something to guide how partakers or members of a certain economic community can play (Include-interview, 2022).*

The emerging trend is that the rollout of digital payment infrastructure has shifted significant number of payments to digital platforms. For instance, significant proportion of the population especially in urban areas can now access public utility services such as electricity and water "via mobile money through pay-as-you-

go (PAYG) systems connected to smart meters", and "can recharge their electricity meters from the comfort of their own homes, while others can pay their post-paid water bill without traveling to and queuing at a public utility cash point." Digitalisation of financial services is bridging the access divide as even "hawkers are able to accept mobile money through QR codes or NFC-enabled USSD phones" (Government of Ghana, undated p. 12). Payment of salaries to civil servants as well as pension benefits to both formal and informal sector retirees are considered part of the essential components of the financial ecosystem and also actively undergoing digitalisation. Although, the country remains heavily a cash economy, one report notes that:

> *Ghana is leveraging mobile technology to leapfrog the shift of its payments to a fully digital regime. Expanding the country's payments digitization and fintech environment will not only add value to the overall payments system in terms of quality, efficiency, security, and convenience, but it will support efforts at increasing formal financial inclusion, with its attendant benefits of transparency, accountability, and increased revenues, and help reduce the use of cash (Government of Ghana Undated)*

In furtherance of digitising financial services, the Bank of Ghana has initiated two main reforms to accelerate the digitalisation processes. First the Bank announced the introduction of "digital currency – the e-cedi – to complement and serve as a digital alternative to physical cash." Second, it launched a regulatory initiative to provide tools for financial institutions to interact among themselves to share innovations about best practices. Although digitalisation efforts appear highly fragmented at the current stage, there are efforts to synchronize and integrate various digitalised services to enable access and use within a one stop shop. As such key institutions in Ghana's digitalisation ecosystem have begun replacing their unique citizens' access details with the Ghanacard as single identification for all services. To this end, citizens enrolling unto the Social Security and National Insurance Trust (SSNIT) will no longer obtain separate SSNIT numbers but only use their Ghanacard cards to join. Similarly, tax identification numbers have also effectively been replaced with the Ghanacard numbers for all citizens, and efforts are underway to merge the databases of the National Identification Authority (NIA) with that of the Criminal Investigations Department (CID) of the Ghana Police Service to "enable easier access to the criminal records of Ghanaians."

PART III
Analysis of Digital Inclusion in Ghana

This section examines issues of inclusion based on the analysis of a national survey data. The discussion is tailored around usage which encompasses the larger conversation around the ownership of computer-based devices, digital literacy and the inherent inequality of access, income, affordability, and participation. The section started with a general overview of internet access and usage and its aggregation in term of education, age, location and gender. This paves the way for the interrogation of the data in terms of social media usage, access and usage in relation to basic digitalised services.

Overview of Internet Access and Usage

Given the importance of internet services to access and usage of digitalised services, the survey asked respondents about their internet use and its importance in their lives. Of the total number of 1,694 surveyed, 91.7% of indicated that the internet is important in their lives, 6.7% found it to be neither important nor not important, whilst 1.6% indicated that the internet is not important at all in their lives. Clearly, though the information communication revolution has permeated all facets of the human condition, a critical reading of the data on access and usage is very much instructive. As shown in the table below, out of the 1,694 sampled, 64.5% use the internet whilst 35.5% do not use the internet.

	No.	%
Do you use the internet?		
Yes	1,093	64.5
No	601	35.5
Total	1,694	100

The research probed the reasons for non-usage of the internet among the respondents. The critical factors identified as inhibiting access and usage were: lack of device (73%), inability to buy internet data (43.4%), deliberate decision not to use the internet (43.3%), inability to use the internet (30.9%), unreliable connectivity (17.6%), lack of internet service (12%), and challenges with power supply (9.2%). This explains the extent to which human physical interactions remains entrenched in the daily routines of the ordinary Ghanaian, and in effect constitutes the dominant worldview.

Internet Usage and Access: Education, Age, Location and Gender

As in the larger social world, educational attainment, age, location, and gender impacts internet usage. For instance, the majority of those who do not use or cannot access the internet are more likely to be without any formal education (79.4%) or have a limited formal education up to Junior High School (JHS) level (49.2%). The trend analysis indicates that only 28.2% of respondents with at least Senior High School (SHS) education indicated that they do not use the internet. Similarly, the non-usage of the internet category is 14.3% for those who completed training college and 11.5% for those with at least a bachelor's degree.

In terms of age, the majority of those who are non-internet users tend to be the elderly, that is those aged 60 years and above. If we disaggregate the data, among respondents who are 60 years and above, 81.3% are non-internet users. Also, of the total number of the young adults within the 40-59 age cohort surveyed,

47.2% do not use the internet. For the youth cohort (14 to 39 years), the non-internet users represent about 32.2% of the youth surveyed.

Similarly, when we interrogate the data in terms of location, there are more non-internet users in the rural areas (41.6%) than the urban (31.3%) areas. This rural-urban disparity is also reflected in the lack of access to internet device ownership, internet connectivity and speed, knowledge of internet use, as well as the inability to regularly buy internet data.

There is also a gender dimension to internet usage and inclusion. The gender disparity is indicative of the fact that females are disproportionately disadvantaged when it comes to inclusion. For instance, while 41.5% of the females surveyed are non-internet users, the number among males is 32.6%. Also, only 19.4% of the males and 10% of the females indicated that they use the internet to access government digitalised basic services online. In addition, whilst 34.8% (males) and 28% (females) engaged in shopping online, the patronage of online business among the population overall is low. This pattern is also reflected in the use of the internet for online banking activities, which is 31.7% for males and 29.2% for females. Though it seems the brunt of the cost of internet services are borne equally (71% for both males and females), however, among those surveyed, males (55.9%) are more likely than females (44.3%) to apply and pay for basic services online.

Also, males (81.4%) are more likely than females (67.9%) to consider the internet as an important source for obtaining information. This gender disparity is also reflected in the fact that 79.7% of the males surveyed consider the internet as relevant platform for the provision of basic services in comparison to 65% of females who feel the same. The reasons provided for not accessing the internet within the different gender dimensions ranges from the inability to buy data regularly, which is 45.1% among the females and 42.4% among the male respondents. In terms of device ownership, among the female respondents only 24.5% have a device to access the internet, meaning 75.5% of the female respondents do not have device to access the internet while among the male category, 28.5% own a device, leaving 71.5% without a personal device to access the internet.

Internet Usage and Access: The Social Media Dimension

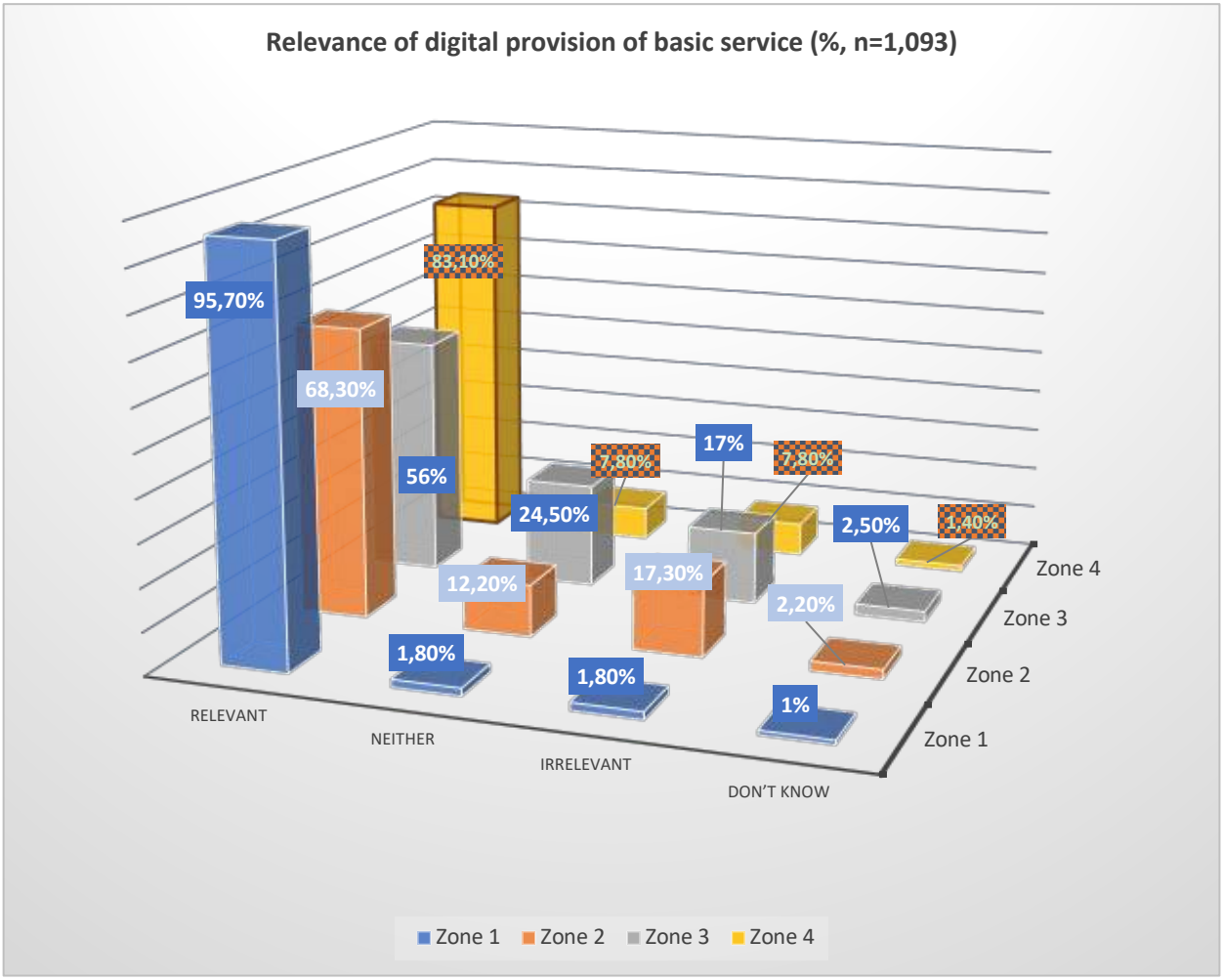
Among those who use the internet, a significant majority 97.1% do so via their mobile phones, 2.3% do so through their laptops, 0.4% on desktop computers, and 0.3% on their tablets. Yet 65.4% of those who responded to using internet said they did not use any digitalised government service in the three months prior to the survey, even though 57.9% say they accessed the internet multiple times in a day, with 69.9% spending more than an hour online daily.

The survey revealed that about 90.2% of the respondents used the internet for social media (Facebook, WhatsApp, and Instagram etc.) related activities. However, when it comes to accessing digitalised government services online, only 16.7% do so. In addition, 32.8% of citizens sampled confirmed the use of the internet for business activities, 58.8% use it for online learning and 50.3% used it for email communication. However, only 31% use it for banking activities, notwithstanding the priority given to financial digitalisation by the government. In addition, only 52.5% of those surveyed use the internet to apply and pay for online services. Among the various age cohorts, usage of internet for social media and government services is reflective of the general trend, the uptake in terms of the usage of digitalised government services is low.

Furthermore, the use of internet for social media activities is also very popular among Ghanaians irrespective of their income level. For instance, 87.4% of those within the low income category (GH¢50-GH¢299), 91.7% of those earning between GH¢300-GH¢399 and 99.1% of those earning above GH¢2,000-

GH¢2,999, all indicated that the internet is important in their lives. Also, if we look at the extent of assessment of government digitalised services based on income level, the findings are very disappointing. For instance, whilst 87.9% of those in the lowest income bracket (GH¢50-GH¢299) use social media regularly, only 9% used the internet to access digitalised basic services. Similarly, for those earning between GH¢300-GH¢399, 92.3% used the internet for social media activities but only 11% use it for accessing government digitalised services. On the part of those earning above (GH¢2,000- GH¢2,999), while 88.1% use the internet for social media, only 22.8% utilised it to access government digitalised services. This pattern is repeated on the issue of the internet ability to help obtained much needed information as well as on the question of overall relevance of digitalisation of basic services.

In addition to income levels, the survey also explored location and internet usage. The survey shows a high rate of internet usage especially for social media purposes in all the four clusters that the country was zoned for the purposes of this survey. With the exception of the Middle cluster which had about 44%, more than 50% of the respondents within all the clusters use digitalised learning platforms. However, there are variations in how much importance people attached to the internet and digitalisation of basic services in the various clusters. In terms of the relevance of digitalisation in the lives of the respondents, 95.7% of respondents in zone 1 consisting of the regions in the northern sector of the country consider the digitalisation as relevant, 68.3% of the respondents in zone 2 that is the middle cluster, 65% in zone 3, that is the South West cluster and 83.1% in zone 4, that is the South East cluster all indicated that digitalisation is relevant.



There is a high likelihood that because the various telecommunication data providers have packages for social media usage unlike government services, the tendency to utilise less of the government digitalised services may be attributable to the lack of incentive to access and use government digitalised basic services. As we have noted, the overall digitalisation process have not removed the human interaction from the daily routines resulting in the low levels of patronage as indicated by the survey results as discussed in the next section.

Internet Usage and Access: Basic Digitalised Services

That Ghanaians are accessing the internet through mobile telephony is a fact. The critical issue is which government services are they using their time online on? As indicated in the table below, 47.99% of respondents indicated that they do not spend time accessing any of the well-known government flagship digitalised services. Ideally, with the prominence giving to digitalisation, the expectation is that there should be an upsurge in the utilisation of these services. However, the reality is far from the expectation especially when compared with the usage of social media in all its varied forms. In fact, apart from the Covid 19 induced upsurge in accessing e-education (17.14%), most of the respondents hardly use digitalised basic services as indicated in the table below.

Which of the following public services have you ever accessed online?	No.	%
Ghana card	68	5.83
Social Security	31	2.66
Drivers' License and Vehicle Registration	6	0.51
E-health	77	6.6
e-Education	200	17.14
Payment of Salaries	66	5.66
Social protection	1	0.09
Digital property	4	0.34
e-Justice	0	0
m-Birth	3	0.26
e-records	5	0.43
E-immigration	5	0.43
E-Procurement	34	2.91
Paperless port operation	1	0.09
E-Taxes	7	0.6
E-Agriculture	2	0.17
E- Pharmacy	0	0
Scholarship Secretariat application	11	0.94
Passport	54	4.63
Other (specify)	32	2.74
None	560	47.99
Total	1,167	100

Source: Include Ghana Survey Data,2022

Citizens sampled irrespective of their location in Ghana were categorical about the importance of the internet in their lives, especially, when it comes to social media usage and looking for information in relation to their family's wellbeing. Overall, while 75.5% of the respondents indicated that digitalisation of basic services is relevant, 11.8% do not think so. Also, while 11% of those surveyed think the internet is neither relevant nor irrelevant, 1.7% flatly indicated that they do not know. In a nutshell, we can conclude that though people are aware and consider the internet as relevant in their lives, there exists some disparity showing that people living in some parts of the country use digitalised services more than others. Overall, a significant proportion of the population across the country are excluded from the benefits of digitalisation.

Ironically, one of the main reasons given for the shift to digitalisation of services is to leverage the advantages of modern technology to formalize the operations and activities of the informal sector. However, as the table below illustrates, there is less use of digitalised services among persons whose economic activity takes place in the informal sector when compared their counterparts in the formal private and formal public sectors.

How do you relate to each of these issues about internet and digitalisation of services?	Public Sector	Formal Private Sector	Informal Sector
	%	%	%
I regularly access a social media account (Facebook, Instagram, etc.)	92.5	84.7	90.2
Agree	5.2	15.3	4.8
Neutral	2.3	0	5
Disagree	100	100	100
Total			
I regularly access digitalised government services			
Agree	43.9	23.6	10.6
Neutral	19.7	31.9	16.9
Disagree	36.4	44.4	72.5
Total	100	100	100
I use it regular to buy or do business online			
Agree	43.4	36.1	30.4
Neutral	14.5	25	9.9
Disagree	42.2	38.9	59.7
Total	100	100	100
It serves as a means of e-learning platform			
Agree	66.5	48.6	58.1
Neutral	9.2	25	7.8
Disagree	24.3	26.4	34.1
Total	100	100	100
I can access my banking and finances online			
Agree	56.6	40.3	25
Neutral	12.7	27.8	6.5

Disagree	30.6	31.9	68.5
Total	100	100	100
I am able to apply and pay for basic services online			
Agree	69.4	73.6	47.3
Neutral	15.6	13.9	14.5
Disagree	15	12.5	38.2
Total	100	100	100
I occasionally lose Internet access due to the cost			
Agree	63	47.2	75
Neutral	15	33.3	9
Disagree	22	19.4	16
Total	100	100	100

For those who worked within the public sector, 33.9% have never participated in the online sharing of government information regarding basic services in the last three months, 33.5% often; 29.5% rarely participated, with about 4% indicating that they don't know. The corresponding numbers for the rest of the sectors are formal private sector, 30.6% never, 34.7% often participated, 27.8 rarely and 6.9% don't know. Judging by the findings of this nationwide survey, the implication for policy is clear. Though a lot of effort, human, infrastructure and financial have gone into digitalizing basic services, the fact remains that the services remain removed from the population imaginations of the citizenry.

Conclusion

Ghana's digitalisation drive is characterized by an inclusion deficit shaped largely by uneven availability and non-usage of government digitalised basic services. This has set in motion inequality in access and usage that reflects in disparities associated gender, educational background, income levels and location. Urban areas have relatively easier and more reliable internet availability compared to rural areas; higher levels of education are associated with increased internet access and use of digitalised services; persons with higher levels of education tend to access and use digitalised services more than those without high educational background; and more males than females are accessing and using digitalised services. Major factors shaping this disparity are unavailability and inaccessibility by segments of the population. Often, unavailability is thought of in terms of lack of internet access. While internet availability is key, a different kind of unavailability can be observed in the Ghana case. In this case, the processes of digitalisation are initiated at the national capital in Accra but the initiative never percolates to points of service provision across the country where the street-level bureaucrats could operationalize them as intended.

On the supply side, interviews with officials revealed that often many of them are more preoccupied with incorporating information technologies for the purposes of either promoting internal bureaucratic paperless operations rather than concerns about providing services to the population. For instance, m-birth is designed to ensure capture of birth records, at the point of occurrence, into a database as a replacement of the existing manual ways of recording such events, digitalisation efforts in these areas have not been extended to clinic and hospitals as well as traditional birth attendants who actually witness such occurrences.

Another example is what happens under the e-justice system; in the true sense of digitalisation such an initiative should allow parties to any case in the judicial system to log into a digitalised platform and monitor progress of their cases in terms of scheduling hearings and decisions, but the system as it currently exists is limited to the national capital, and even more serious is that is limited to communications between lawyers and judicial bureaucrats so the ordinary citizens accessing justice gets locked out. In the case of the passport provision, digitalisation only incorporated biometric elements into the existing operations and that has not changed the hustle citizens go through in the acquisition of passports. At best, digitalisation with the introduction of biometric has eliminated impersonation and fraud but has not changed the delays and human interferences with their accompanying corrupt practices involved in the acquisition of passports, neither has it made it easily available across the country. Even in the case of the Ghana Electricity Company (ECG) which has successfully developed an app which citizens can access and purchase power for their home, the particular type of meters used for this service are limited to few newly developing urban areas thereby excluding majority of citizens from accessing this digitalised initiative on their old meters. As a result, one can conclude that though internet penetration is very high in Ghana, as evidence by our survey that showed that most Ghanaians across different income and age groups are active users of social media, the fact however, remained that fewer than expected citizens are able to access and use digitalised basic services.

The practical experience of the digitalisation of education and health are not different from the experiences in other sectors. In health, although digitalisation is expected to make it easier for patients' files to be retrieved at any health facility in the country to ensure appropriate quality care based on health history, the large majority of health facilities are not networked so by default, most citizens are underserved by digitalisation. It was when COVID-19 struck that the state of digitalisation in education especially for public school became obvious. Most public school were compelled to close down simply because there is not system in place to activate teaching and learning through digital means. Thus, while some private basic schools especially those in urban areas were able to switch to e-learning platforms to ensure schooling is

not interrupted by the pandemic, most public schools in both rural and urban areas were shut down. This phenomenon points to a situation of multi-headed inequality in which rural dwellers and the urban poor who cannot afford to send their children to private schools were excluded from benefiting from digitalisation simply because it was unavailable to them. As such the digitalisation of basic services is faced with challenges of inequality based on both income and location because of the negligence of the supply side.

On the demand side, although internet penetration in Ghana is comparatively high, significant segments of the population find it inaccessible thereby excluding them from the digitalisation processes by default. From this study, majority of Ghanaians (97%) access the internet through their mobile phones, yet a study by the National Communication Authority (NCA) revealed that only about 46.1% of citizens have phones that are internet-enabled (NCA, 2020). But given that only a small fraction of the population is able to access the internet through other devices, Ghana's digitalisation is characterized by high levels of exclusion resulting largely from inability of many people to acquire internet-enabled devices. In other words, it is not enough for the internet to be available, if citizens do not own the devices that have the capability of granting them access, the service will be meaningless. As one report noted, "Ghana has been successful in expanding access to mobile services, and penetration rates exceed the regional average. However, when the number of unique subscribers is considered, half the population remains without access to mobile services" (Deloitte, 2015). Even though several reasons accounted for the inability of citizens to use the internet and hence access digitalised basic services, in the majority of cases, cost of device and its associated data cost are cited as the major hindrance. The situation is exacerbated by income inequality as high-income earners have relative ease in acquiring such devices compared to those from low-income backgrounds.

In terms of income inequality, the data from the Ghana Statistical service (2019) suggest that urban households have 76.6 percent of the total national income whereas rural localities have 23.4 percent. In terms of ownership of computer devices, only about 7.2 percent of the population aged 12 years or older own at least one type of computer device. The percentage is higher for males (11.5%) than females (3.3%). Out of those who own a computer device, 5.2 percent own a laptop, 1.8 percent own a desktop while only 0.9 percent own a tablet (GSS, 2019). In terms of mobile telephony, 74.3 percent of the population use mobile phones but only 63.8 percent own these devices. This is an indication that about 10 percent of the population who use the mobile device do not own one. The rural urban dichotomy shows that there is about 20 percentage points difference in use or ownership of mobile phones with urban dwellers having the higher proportions (GSS, 2019). As this study has shown, this pattern of inequality is reflected in differences between males and females' ownership of phones, access and use of digitalised services and further reinforced already existing gender differences in income and educational backgrounds.

This Ghana case study has demonstrated that there is a e disconnect between government's digitalisation efforts and citizens internet activities. While Ghanaians are using the internet, irrespective of gender, income, educational background and location what they are using the internet for is mainly to surf the social media world. Once one interrogates digitalised government basic services, the numbers often paled in comparison across the various sociodemographic characteristics. Thus, while citizens and government converge on the importance of internet and digitalisation, they appear to be travelling in parallel solitudes especially as to what interest the internet must serve. Citizens would prefer to have well-functioning digital platforms from which they can obtain basic services, but the government appears to be fixated on how digitalisation can be used to immediately mobilize revenue. Although the two are not mutually exclusive, citizens worry that the entire digitalisation agenda is driven not by a policy to provide timely and quality service, but rather as a mechanism to expand the national revenue envelop. For example, the policy discourse and political rhetoric on digitalisation in Ghana has most often been about financial inclusion with little to no deliberate mention of services. In addition, while government has produced policy documents that layout its strategy for digitalisation of financial services, there is no explicit policy document that spells out an integrated and comprehensive strategy guiding digitalisation in education, health, employment, and housing among others, and as if the confirm the suspicion of many, the government has recently imposed

1.5% tax on electronic transactions including mobile money. Thus, instead of using digitalisation to activate speedy and reliable access to basic services that directly improve the lives and livelihoods of citizens, digitalisation as framed and articulated within policy circles has been reduced to the elevation of its revenue mobilisation potential while subordinating its service-oriented capabilities to peripheral concerns.

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