DOING • BUSINESS • IN • GHANA

ICT
SECTOR

COMMUNICATION
TECHNOLOGY

INTRODUCTION

Ghana's Communication Technology Sector is viewed as a critical agent in the development agenda in the country. Telecommunication services are now relied upon for information delivery to the hinterlands, where access to roads and power is non-existent. Truly, the information age is gaining popularity in Ghana and leading the much-touted infrastructural transformation within its economy.

The Communication Technology sector has advanced remarkably over the past two decades. As one of the first African countries to introduce widespread liberalization in basic telecommunications services, in 1994, Ghana took an important step forward in embracing the potential of competitive markets to generate growth and innovation in the sector.

Now, investments into the infrastructural base of the sector includes licensed gateway operators, undersea cable connectivity, Private Licensed VSAT Systems, Fixed Wired Line Networks, Wireless Mobile Operators, Public telephones systems, Telecentres, Dedicated Transmission Networks, Public Distribution Networks (cable, TV, DSL, etc), Internet Backbone Connectivity throughout the Country and Public Access Point and Broadcasting Systems.

In socio-economic terms, farmers in the rural communities rely on their mobile phones to schedule timely pick-up of farm produces. The informal un-banked sector, mostly micro-entrepreneurs, can market their products and transact business in a faster and less costly manner on their phones without a bank account or a visit to the ATM. Families can keep in touch with their loved ones without travelling hundreds of miles to meet.

SUB-SECTORS

Operator/Service Providers	Number of Authorization/ Licenses	Number in Operation
Mobile Network Operators	6	6
Fixed Network Operators	3	2
Broadband Wireless Access	4	3
Television Stations	128	53
FM Stations	471	367
Tower Infrastructure Companies	3	3
International Submarine Cables	5	5
Domestic Fibre Operators	10	10

Telecommunications

Ghana's Telecom sector has gone through many phases of growth and diversification over the last two decades. It is presently characterized by vibrant competition and innovative products and services. The telephony licenses are classified into two (2): fixed and mobile. However, with the introduction of unified licensing, these distinctions no longer exist.

Currently, the six (6) mobile telephony licensees have the right to obtain fixed access licenses. When the current licenses expire in 2019, unified access licenses will be issued in line with the convergence of fixed and mobile access technologies.

Airtel Ghana	GSM
Expresso	CDMA
Vodafone Ghana	GSM
Glo Ghana	GSM
Millicom (Tigo)	GSM
Scancom Ghana (MTN)	GSM

The market continues to grow aggressively in all segments, since the enabling environment provided by government continues to promote competition. Increased competition, a key driver of growth in the industry, is witnessed in terms of:

- Rising sale of SIM cards and airtime
- Better and increased coverage
- Improved quality of service on most networks
- Introduction of cheap phones increasing the ability of more people to own phones
- More aggressive marketing promotions etc.

The table below presents details of telephone subscriptions for the period December 2010 to September 2017.
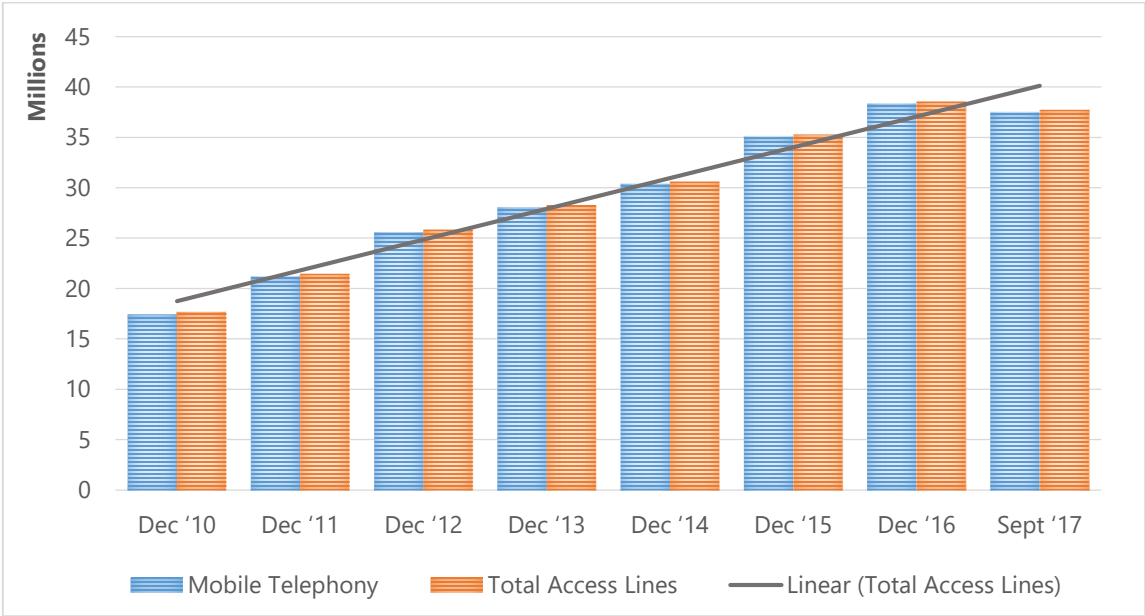
Table 2.0 Telephone Service Subscriptions (Dec 2010 - Sept 2017)

SUBSCRIBERS	Dec '10	Dec '11	Dec '12	Dec '13	Dec '14	Dec '15	Dec '16	Sept '17
Mobile Telephony	17,436,949	21,165,843	25,550,170	28,026,482	30,360,771	35,008,387	38,305,078	37,445,048
Fixed Telephony	277,897	284,721	284,981	270,422	260,407	275,600	251,490	286,493
Total Access Lines	17,714,846	21,450,564	25,835,151	28,296,904	30,621,178	35,283,987	38,556,568	37,731,541

In Dec 2008, total access lines were 11,713,699 comprising mobile subscriptions of 11,570,455 and a relatively low fixed telephony of 143,244. As at December 2010, total access lines in operation rose to 17,714,846. The rise in subscriptions ascended continuously with total access

lines reaching 35,283,987 and 38,556,568 in December 2015 and December 2016 respectively. 2017 marked an unusual decrease in voice subscriptions for all five telecom companies, except MTN. As such, its 0.58% gain in voice subscriptions, and consequently market share, did not reflect in the overall industry performance

Fig 2.1 Telephone Service Subscription- trend (Dec 2010 - Dec 2016)

Telecom Voice – Rate of Penetration

Ghana's population has grown from 23.3 million in 2008 to 28.6 million in September 2017, averaging a growth rate of 25% in 9 years. The penetration rate increased consistently from 52.4% in December 2008 to 114.35% ending 2011. Mobile phone penetration increased steadily to reach a 127.63% mark in December 2015. By December 2016, penetration reached an all-time 136.34%. By September 2017, the penetration rate stood at 131.9%.

Fixed telephone penetration, on the other hand, has been relatively marginal over the years. Positively, it reached 1% rate of penetration in September 2017.

Details are presented below:
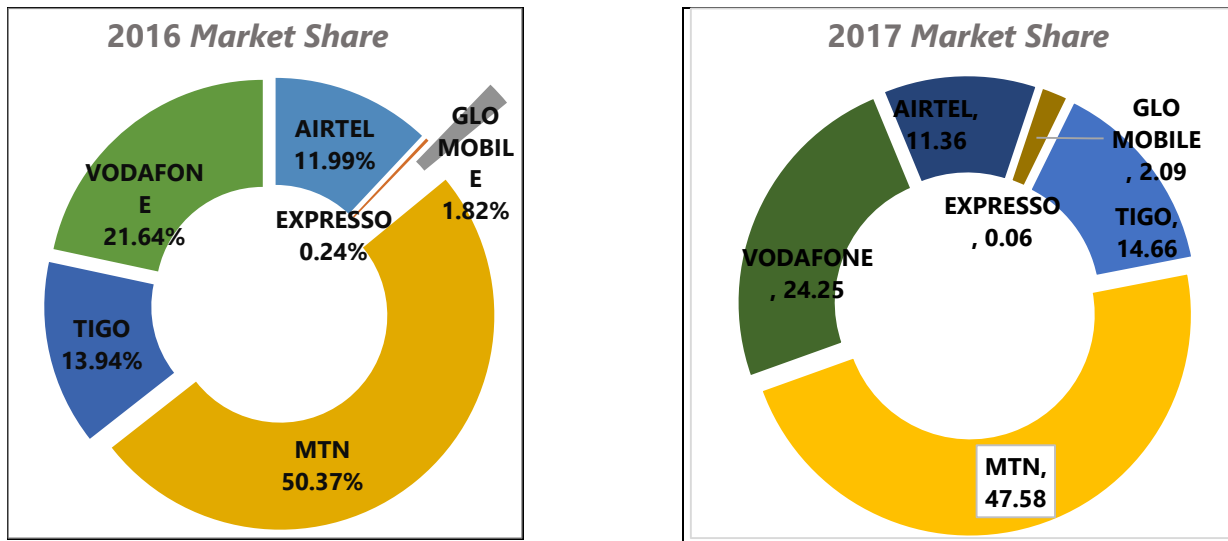
Table 3.0 Rate of Penetration Source: NCA

Penetration	Dec '08	Dec '10	Dec '12	Dec '14	Dec '15	Dec '16	Sept '17
Mobile	51.8%	74.2%	100.4%	113.37%	127.63%	136.34%	130.91%
Fixed	0.6%	1.2%	1.1%	0.97%	1.0%	0.9%	1.00%
Total	52.4%	75.4%	101.5%	114.35%	128.63%	137.24%	131.91%

It can be observed that the rate of penetration has increased consistently over the years and is significantly determined and positively correlated to mobile subscriptions and usage.

Telecom Voice - Market Shares

As at September 2017, MTN was the leading mobile phone company with 17,817,273 subscribers (*from 19,296,157 subscribers by December 2016*), representing 47.58% of the market. With 9,079,502 subscribers (*from 8,289,913 subscribers by December 2016*), Vodafone Mobile followed with 24.25% market share. Next was Millicom (Tigo), holding 14.66% market share with 5,489,994 subscribers (*from 5,339,052 subscribers by December 2016*). Airtel took the fourth position with a subscriber base of 4,253,993 (*from 4,591,051 subscribers by December 2016*) representing approximately 11.36% of the market. Glo Mobile controls 2.09% of the market with a subscriber base of 781,022 (*from 695,306 subscribers by December 2016*). 0.06% of the Market is controlled by Expresso, having 23,264 subscribers (*from 93,599 subscribers by December 2016*).
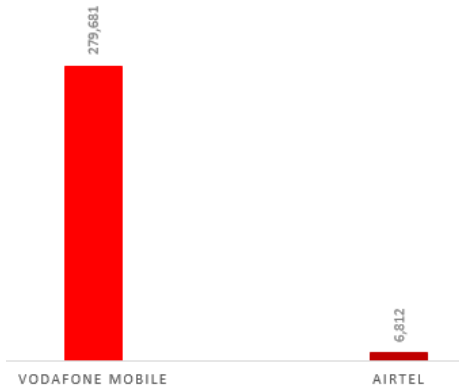
Fig 4.0 Market Share (Mobile Voice)

Fixed Telephony – Market Share & Penetration

There are two (2) operators providing fixed line services to the public in Ghana. These operators are Vodafone and Airtel. As at the end of September 2017, the total subscriptions for the fixed operators was 286,493 representing a percentage increase of 1.75% from the previous month. Vodafone recorded a total subscription of 279,681 while Airtel ended the month with 6,812 subscriptions.

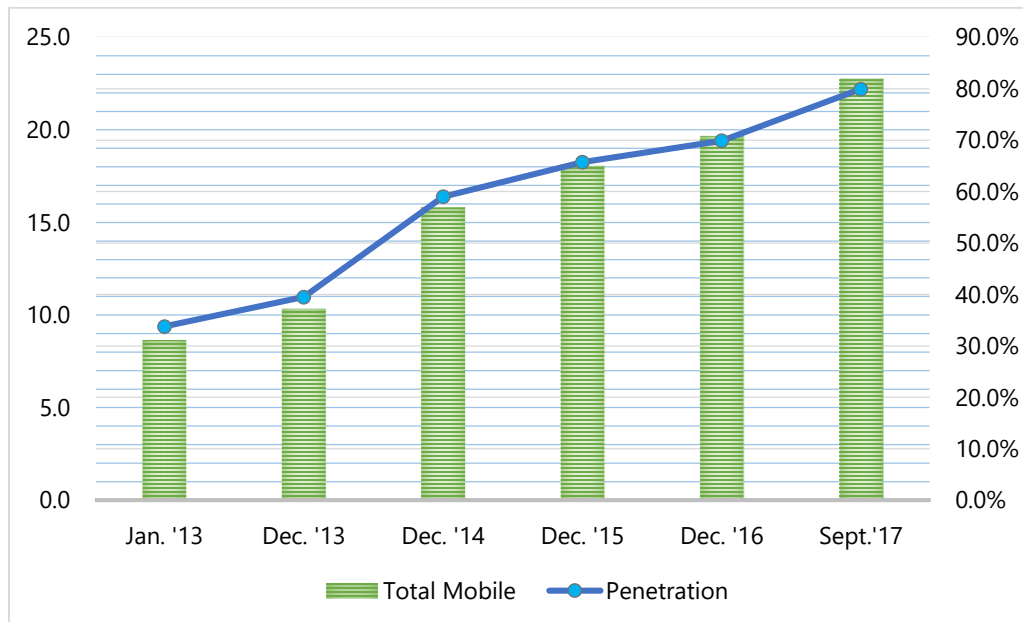**Figure 3 – Fixed Telephony Subscriptions for September 2017**

Telecom Data – Rate of Penetration

At the end of September 2017, the total subscriptions of mobile data in the country was 22,865,821 with a penetration rate of 79.94%.

Month	Jan-13	Dec-13	Dec-14	Dec-15	Dec-16	Sept-17
Total Mobile	8,646,532	10,323,941	15,805,925	18,031,188	19,642,152	22,740,419
Penetration	33.80%	39.50%	59.02%	65.745%	69.91%	79.94%

Fig 4.3 Mobile Data Subscription trends

Telecom Data – Market Shares

MTN's mobile data subscriptions for September 2017 was 12,925,524 – a market share of 56.53%.
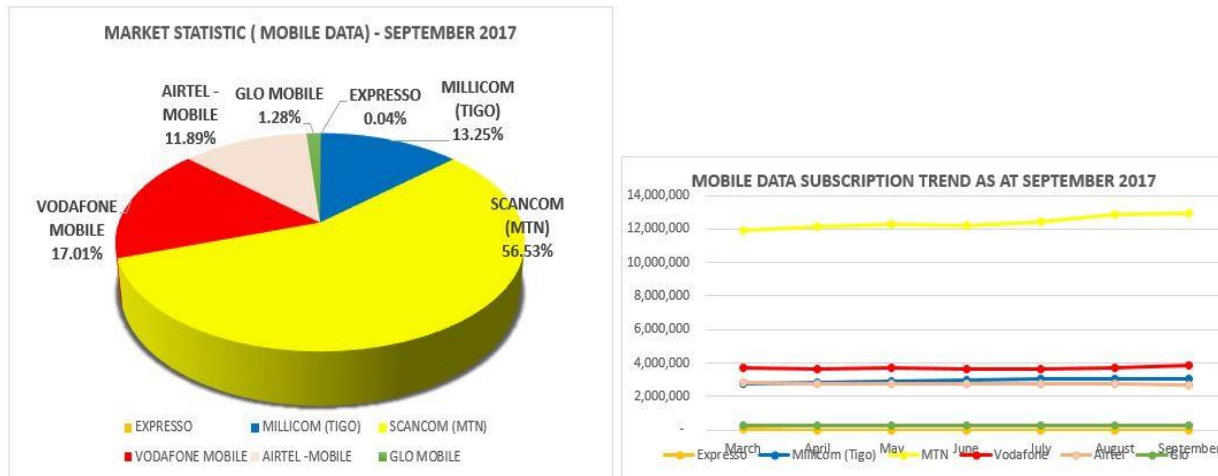
Total mobile data subscriptions for Vodafone was 3,889,821, reflecting a market share of 17.01%.

Airtel's mobile data subscriptions was 2,718,966 and their market share was 11.89%.

Tigo's data subscriptions was 3,029,361, representing 13.25% market share.
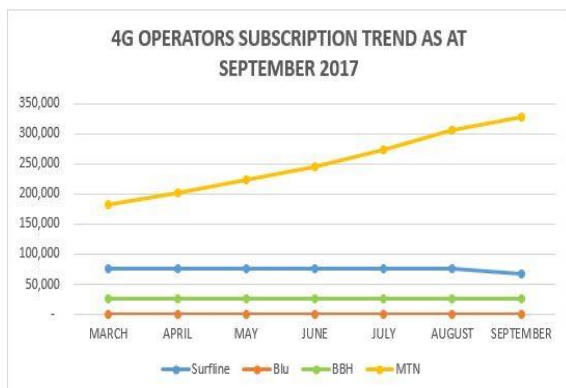
Glo recorded data subscription of 291,998 which reflects a market share of 1.28%.

Expresso's mobile data subscriptions was 10,151 and a market share of 0.04%.

Broadband Wireless Access (4G Data) Operators

The total number of subscriptions for 4G Data was 422,204 as at the end of September 2017, an increase of 12,879 new subscriptions. Surfline recorded subscriptions of 67,702, a decrease from the August figure of 76,236. Blu Ghana recorded a total subscription of 884, a decrease from August's 920. Broadband Home recorded a total of 25,689, a decrease from last month's 25,954 subscriptions. MTN was the only operator that recorded a month on month increase with September's 327,929 subscriptions being 21,714 more than August's.

Internet Service Providers

According to the National Communications Authority, mobile broadband penetration rose from 65.3% in 2015 to 68.4% in 2016 with total Mobile Broadband Subscriptions rising from 18,031,188 to 19,331,239 in 2015 and 2016 respectively. Ghana is presently the country with the highest mobile broadband penetration in Sub-Saharan Africa.

As a critical source of information, the internet is viewed as a significant development enabler. Although Ghana's mobile market is quite saturated with over 120% penetration and keen competition between the 6 mobile service providers, there still exists room for progress when it comes to the provision of internet connections. Nevertheless, internet usage has improved tremendously over the years.

Together with the mobile cellular market, the internet market in Ghana presents an important potential for growth and development. The improvement in internet penetration has also been partly facilitated by the coming of Wimax technology and mobile broadband networks.
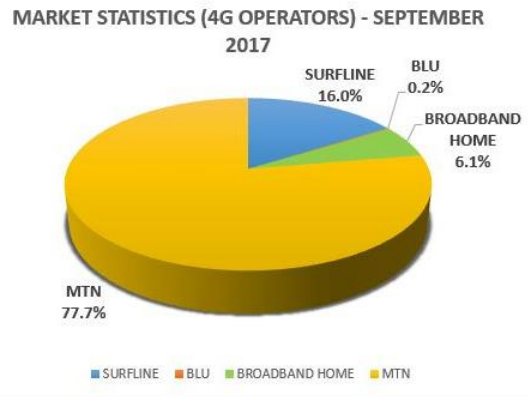
An ISP is a company that supplies Internet connectivity to home and business customers. ISPs support one or more forms of Internet access, ranging from traditional modem dial-up to DSL and cable modem broadband service to dedicated T1/T3 lines.

More recently, Wireless Internet Service Providers or WISPs have emerged that offer Internet access through wireless LAN or wireless broadband networks.

The registration of an internet service provider expires after five years from the date of registration and may be renewed for periods of five years on application by the service provider.

In addition to the six (6) mobile operators who account for mobile subscription numbers, there are four (4) Broadband Wireless Access (BWA) licensees and fifty two (52) authorized Internet Service Providers (ISPs) providing data services in the market.

Airtel Ghana	**GPRS/EDGE/3G/HSPA**
Broad Band Home (BBH)	**WIMAX**
BLU	**TD-LTE**
Expresso	**CDMA EVDO**
Ghana Telecom (Vodafone)	**GPRS/EDGE/3G/HSPA**
Glo Ghana	**GPRS/EDGE/3G/HSPA**
Millicom (Tigo)	**GPRS/EDGE/3G/HSPA**
Scancom Ghana (MTN)	**GPRS/EDGE/3G/HSPA**
Surfline	**FD-LTE**

MARKET STATISTICS (4G OPERATORS) - SEPTEMBER 2017

SURFLINE 16.0%
BLU 0.2%
BROADBAND HOME 6.1%
MTN 77.7%

■ SURFLINE   ■ BLU   ■ BROADBAND HOME   ■ MTN

Fixed Broadband

In 2005, the number of broadband subscribers stood roughly at 1904, representing 0.01 per hundred inhabitants. By 2010, the number of fixed subscribers increased by 2530.36% to 50,082 subscriptions with roughly 0.21 per hundred inhabitants having fixed broadband services. The rise continued with 75,092 and 87,789 broadband subscriptions being recorded in 2015 and 2016 respectively. Broadband penetration has also increased from 0.07 per 100 inhabitants to and 0.3 lines per 100 inhabitants over the years.
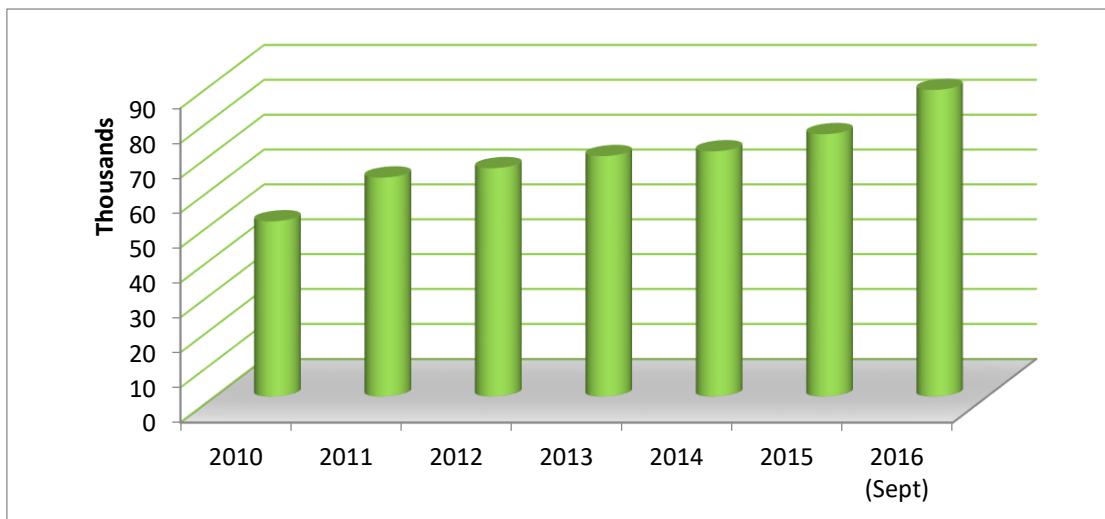
Fig 6.0 Fixed broadband subscriptions

Year	2010	2011	2012	2013	2014	2015	2016
No. of Subscriptions	50,082	62,646	65,332	68,795	70,170	75,092	87,789
Per 100 Inhabitants	0.21	0.25	0.3	0.3	0.3	0.3	0.3

Source: ITU, NCA (Ghana)

It is significant to note that the internet subscriptions per 100 inhabitants are lower than the internet penetration per year since a majority of Ghanaians make use of internet cafés.

Fig 6.1 Fixed broadband subscriptions

ELECTRONIC PAYMENT SYSTEMS

The payment system is the entire matrix of institutional infrastructure arrangements and processes in a country set up to enable economic agents (individuals, businesses, organizations and Government) initiate and transfer monetary claims in the form of commercial and central bank liabilities.

Ghana's payment system has improved significantly since 1997 when the MICR cheques were introduced, and continues to evolve to meet the developmental needs of the country. The current trend in Ghana's payment systems development is being driven by economic, financial, public policy factors as well as a growing local ICT industry and global trends in payment systems development.

The development of payment and settlement systems in Ghana has been premised on the following key objectives, amongst others:

- To establish a robust oversight and regulatory regime for the payment and settlement systems
- To bring efficiency to fiscal operations of the Ghana Government
- To deepen financial intermediation
- To discourage the use of cash for transactions whilst encouraging the use of paper-based instruments for payments as part of the short-term development plan
- To develop an integrated electronic payment infrastructure that will enhance interoperability of payment and securities infrastructures
(Source: BOG)

Mobile Financial Services

Mobile money is a way of transferring money, making payments and initiating other transactions using a mobile phone and other mobile devices. In Ghana, it has played an important role in extending financial services to the unbanked and underserved population.

Participants in this allied sub-segment include, telecommunication companies, partnering banks or financial institutions or any other duly registered e-money issuers, agents of these e-money issuers and users of the service.

In Ghana, the service is regulated by Bank of Ghana, exercising its powers under the Banking Act, 2004 (Act 673) and the Bank of Ghana Act, 2002 (Act 612) in line with BoG's mandate to promote and supervise electronic and other payments, funds transfer, clearing and settlement systems under the Payment System Act 2003 (Act 662). The National Communications Authority ("NCA"), the regulator of the telecoms sector also plays a key role.

The deep penetration of mobile technology in Ghana has made it a great medium for innovation around service delivery. Since the introduction of mobile money to the Ghanaian market in 2009, it has played a key role in the push for financial inclusion. According to a study conducted by the Consultative Group to Assist the Poor (CGAP), in 2010 a relatively large segment of the Ghanaian population (44.0%) was excluded from the financial services sector altogether. By 2015 however, the segment of the population excluded from the financial services fell to 25%, following the introduction of mobile money services.

The mobile money sub-sector is set to experience high growth in the years ahead on account of favorable regulatory environment and pro-financial inclusion policies. Interoperability of mobile payments is one of the key priorities of Ghana. The overall objective is to reduce transaction costs, engender competition and promote all-inclusive financial growth. (BOG)

BUSINESS PROCESSING OUTSOURCING
Ghana is ranked the **No. 1** destination in Sub-Saharan Africa (ahead of Mauritius and Kenya) and **No. 29** globally out of 51 countries by the 2016 A.T. Kearney Global Services Location Index™. The country was earlier ranked the **No. 1** destination in Sub-Saharan Africa (ahead of Mauritius and Senegal) and **No. 15** globally out of 50 countries by the 2009 A.T. Kearney Global Services Location Index (GSLI).

Government remains interested in making Ghana a competitive destination for Business Process Outsourcing having identified it as a focus area for development with much emphasis being placed on it as an economic driver. This galvanized the establishment of the IT Enable Services (ITES) Secretariat, an implementing arm of the Ministry of Communication, to promote and develop the sub-sector to become a very large source of income and employment generation.

The preference for Ghana in connection with this industry is supported by its large pool of skilled and trainable English speaking labour, GMT time zone location, competitive labour costs etc. Currently, the IT-Enabled Services sector provides approximately 3,000 jobs and Ghana's potential to become a significant player in this industry is recognized as enormous.

E-BUSINESS
Aside computers, there is increasing use of mobile phones to access internet services. Therefore, the use of services (e-commerce, advertising and marketing) provided through the internet is on the rise.

Following the introduction of up-to-the-minute networks in Ghana, people can surf the net anywhere at any time and mobile phone users can have easy and fast data exchange on the internet. More financial institutions and other businesses are undertaking internet banking and venturing into the use of electronic money transactions.

The Ghana Interbank Payment and Settlement Systems (GhIPSS), established by the Bank of Ghana to reform the country's payment system, has set up an e-commerce window which is scheduled to soon become operational. This infrastructure will make it possible for private sector businesses in Ghana to sell and receive payment online within and outside the country.

THE INFRASTRUCTURAL SUB-SEGMENT
The infrastructural base of the ICT sector includes licensed gateway operators, undersea cable links, private licensed VSAT systems, Fixed Centres, dedicated Transition networks, Public Distribution Networks, Wirleless Mobile Operators, Public telephones Systems, Tele-internet Service Providers, the Ghana Interbank Payment and Settlement Systems (GhIPSS) e-commerce platform, Internet Backbone Connectivity throughout the country and Public Access Point and Broadcasting Systems.

As an initiative to support emerging technologies, the Ministry of Communication is also facilitating the establishment of Science and Technology Parks. The construction of an ICT park in Accra started mid-2012. Funds have also been secured to commence the construction of a second ICT park in Cape Coast.

Over the years, broadband connectivity has improved significantly and this is partly due to the arrival of undersea cable links. Their arrivals have subsequently improved internet speed and made prices more competitive. Presently, there exist five of them, namely, SAT-3, the West African Cable System (WACS), Main One Cable, Glo-1 and the African Coast to Europe (ACE) submarine cable.

SAT-3 is the first undersea cable to be brought into Ghana. It arrived in 2001 and presently has capacity of 340GB per second. The Main One undersea cable followed almost 10 years later (arrived in 2010) and has 5.12TB per second capacity. In 2011, Glo-1 arrived and has 2.5TB per second capacity. The WACS came on board in 2012 with capacity of 5.12TB per second. Early 2013, the ACE also came on board with 5.2TB.

SECTOR COMPOSITION

The country's Communication Technology Industry comprises telecommunications operators, internet service providers, VSAT data operators, software manufacturers, broadcast institutions, ICT education providers, internet cafés, etc. Generally, the Ministry of Communications and the National Communications Authority (NCA) oversees activities in the sector.

Several Acts and Policy documents underpin the Communications Technology industry such as;

- The National Communications Authority Act
- National Information Technology Agency Act 771
- Electronic Transactions Act 772
- Electronic Communications Act, 2008
- Revised Broadcast Bill 3
- E-Transform Ghana Project Document
- Draft Digital Terrestrial Television Policy Document
- Ghana Broadband Strategy Document
- Ghana Integrated ICT for Accelerated Development (ICT4AD) Policy document

The Ministry of Communications (MOC) has the core responsibility of initiating and developing national policies aimed at achieving cost effective information and communications infrastructure and services, for the enhancement and promotion of economic competitiveness.

In this connection, the Ministry is made up of the various agencies and bodies that assist with the implementation of policies related to operational and regulatory framework. These include:

- National Communications Authority
- National Information Technology Agency (NITA)
- Data Protection Commission (DPC)
- Postal and Courier Services Regulatory Commission (PCSRC)
- Ghana-India Kofi Annan Centre of Excellence in ICT (AITI-KACE):
- Ghana Meteorological Agency (GMET)
- Ghana Investment Fund for Electronic Communications (GIFEC)
- Ghana Post Company

As an initiative to support emerging technologies, the Ministry of Communications is also encouraging and facilitating the establishment of a Science and Technology Parks.

An allied agency, the National Communications Authority, is also responsible for licensing and regulating all businesses operating in the communications sub-sector. The National Communications Authority Act and the Electronic Communications and Transactions Act were passed in the spirit of strengthening the capacity of the regulator i.e. the National Communication Authority, since the existence of fair competition depends on the fairness of

the regulator. The sector also has various private sector players including telecommunications operators, internet service providers, VSAT data operators, software manufacturers, broadcast institutions, ICT education providers, internet cafés, etc.

Ghana Association of Software and IT Services Companies (GASSCOM) is Ghana's premier trade association for the IT software and services industry. Member companies are engaged in the business of software development, software services, IT-enabled/BPO services and e-commerce.

GASSCOM was set up to facilitate business and trade in software and services and be a strong advocate in soliciting government and other public sector support and encourage the advancement of the industry as a key and strategic sector for the growth of the Ghanaian economy in the next millennium. Founding members include some of the most distinguished names in the ICT industry in Ghana: Persol Systems Ltd, IPMC, Exzeed Company Ltd, Somuah Info Systems Ltd, Platinum Technologies Co. Ltd, ACS BPS Ghana Ltd, e.Services Africa Ltd, The Softribe Ltd and H.I.M Solutions Ltd.

The table below presents a quick summary of the Operators and Service Providers in the sector (in terms of the numbers authorized and those in actual operation).

Fig 1.0 Summary of Operators and Service Providers

	Category	No. Authorized	No. Operating
1	National fixed network operators	3	2
2	National Mobile cellular operators	6	6
3	Direct to Home (DTH) Satellite Services	48	15
4	Internet Service Data Providers	52	52
5	VSAT Data Providers	67	48
6	FM Stations		
	• Public	31	31
	• Community	70	58
	• Campus	17	15
	• Commercial	329	243
7	TV Operators:		
	• Free on air TV Operators		
	✓ Analogue Terrestrial Television	21	15
	✓ Digital Terrestrial Free-to-Air TV Program Channel	7	0
	✓ Satellite TV Broadcasting (Free-to-Air Direct-To-Home Bouquet)	6	1
	✓ Satellite TV Broadcasting (Free-to-Air Direct-To-Home Single	35	11

Channel)		
• Pay per view TV Operators		
✓ Digital Terrestrial Pay Television (Service Only)	1	1
✓ Digital Terrestrial Pay Television (Service and Frequency)	5	4
✓ Satellite TV Broadcasting (Pay TV Direct-To-Home Bouquet)	7	3
✓ Digital Cable Television	1	0

GOVERNMENT'S POLICY DIRECTION

Ghana remains a very safe and secure investment destination. It has established the necessary legal and regulatory framework which guarantees the safety of investments in the ICT industry. Presently in place is the ICT for Accelerated Development (ICT4AD) Policy which is a long-term strategy for developing the ICT Sector and expanding its role in the Ghanaian economy. The ICT4AD vision for Ghana is *"To improve the quality of life of the people of Ghana by significantly enriching their social, economic and cultural well-being through the rapid development and modernization of the economy and society using information and communication technologies as the main engine for accelerated and sustainable economic and social development"*

National Digital and Property Addressing System – Ghana's official addressing system, aptly-dubbed 'ghanapostGPS,' is a modern approach to allocating addresses within a defined space with the aid of the latest geocoding technology. According to President Nana Addo Dankwa Akufo-Addo, the project, incorporated in partnership with the Ministry of Communications and Ghana Post, would give the country a trustworthy database of addresses. All local government agencies can use it for planning purposes, municipalities and district assemblies can use it to value properties, while private institutions such as banks, real estate companies, retail businesses, etc. can improve their operations and activities.

Establishment of an ICT Park in Ghana - The Ministry of Communication monitored the implementation of the Mobile Virtual Network Operating License; Interconnect Clearing House License; International Wholesale Carrier License and Unified Telecom License. In 2017, the Ministry worked to finalize a partnership agreement with the Republic of Mauritius to invest in the ICT Park in Dawa, Accra. Government plans to construct Information and Communications Technology ("ICT") Park to promote Research and Development and entrepreneurship among the youth in 2018.

The Digital Terrestrial Television project - The first, second and third phases of the Digital Terrestrial Television project, covering Greater Accra, Ashanti, Volta, Northern, Upper West and Upper East Regions have been completed in 2017. Education and awareness campaigns are being undertaken while the Ministry monitors and intensifies sensitization of the digital

television transmission service nationwide before the analogue switch-off. The smooth process of migration from analogue to digital television transmission is expected in 2018.

Increased Availability of Broadband/Reduction in the Price of Bandwidth - Over the past two years, owing to massive investments made by major industry players, the Ministry of Communications has commissioned major submarine fibre optic cables to increase bandwidth capacity. Ghana has, cumulatively, approximately 7,160 Gigabytes (i.e. 7.16 Terabytes) of bandwidth capacity available. The country is thus well positioned as the potential ICT-enabled Services hub in the sub-region.

Last Mile Effect - To ensure the continuous development of infrastructure, Government has particular interest in the "last mile effect", which encourages the extension of fibre optic networks by the last mile to enable all districts and communities get connected.

The National Information Technology Agency (NITA) - The National Information Technology Agency (NITA) will begin the process of commercializing its infrastructure to raise enough revenue, maintain, expand and upgrade the infrastructure, sell off the excess capacity as well as expand and improve upon its business operations and modules for MDAs and MMDAs. NITA estimates to complete the commercialization of 50% of the 780km eastern corridor fibre optic project in 2018.

National Fibre Communications Backbone Infrastructure - To complement the efforts of the private sector in the extension of affordable and efficient connectivity solutions, the National Fibre Communications Backbone Infrastructure Network aimed at providing open access broadband connectivity is being developed.
Following the successful completion of the southern loop, the 2nd phase of the National Communication Backbone from Tamale to the northern parts of the country and neighbouring countries is being pursued. Thus far, 800 kilometres optic fibre infrastructure which runs through 126 communities along the eastern corridor from Ho to Bawku with a link from Yendi to Tamale have successfully been deployed.

Ghana Investment Fund for Telecommunications (GIFTEL) - GIFTEL has been set up to facilitate the extension of communications services to underserved and un-served areas through the provision of common facilities. It has thus far completed a total of 39 Common Telecom Facilities and this has enabled telecommunications providers to extend their services to over 273 communities. For instance, GIFTEL has undertaken the common telecom tower service facility at Nandom, in the Upper West Region which now offers transmission coverage to over 10 towns.

Business Process Outsourcing (BPO) - Government is focused on priority skills development areas within the BPO/ITES industry with the Ministry of Communications partnering with the Ghana Telecommunications University College (GTUC) to train several Call Centre and Data Entry Trainers. Further, the BPO/ITES training curriculum has also been streamlined with the skill requirement of the industry.

To bridge the technological gap between the served and underserved areas, 20 enhanced Community Information Centres (eCICs) have been constructed in selected areas in the Northern part of the country, as well as the refurbishment of the Public Works Department (PWD) warehouses into a world class Business Process Out-Sourcing (BPO) facility.

SECTORAL DEVELOPMENTS

Merging for 2nd place: The merger between Bharti Ghana Limited (Airtel) and Millicom Ghana Limited (Tigo) This merger will result in an entity which will be the second largest mobile network operations in the country. It is believed that the consolidation of the two telecom brands will lead to greater industry stability, better quality of service through continued investments in the sector, and introduction of more innovative services for customer benefits. The combination of the two entities aims to bring together the strengths of both companies to better serve customers in Ghana.

Kenko Doctor: Ghanaian e-health startup Eiko Health has launched Kenko Doctor, a new platform that allows users to book appointments with doctors via a mobile app. One of the revolutionary features of the app is that the doctor can also use the platform to update a patient's medical records, getting rid of those massive medical files and easing the digital transformation for doctors. The startup makes its money by charging healthcare facilities and doctors a subscription fee to use the electronic medical records system, as well as a percentage of the fee collected by the doctor for each appointment. It plans to expand outside of Ghana to Nigeria, Kenya, South Africa, Asia, Europe and the Americas.

Mobile Money Payment Interoperability System: Ghana's mobile customers will be able to undertake money transfers between two accounts at different mobile money companies or to transfer money between mobile money accounts and bank accounts. The system is expected to largely eliminate the difficulties associated with traditional banking services, such as the difficulty in opening bank accounts, the high costs associated with maintaining a bank account relative to customers' income levels, the need to have basic literacy, administration and record keeping abilities and English-language capacity to operate a bank account, and the sheer intimidating nature of banking halls.

GLOBAL IDEAS/ PLAYERS/ TRENDS

Mobile Money Rising - Launched in 2007, Kenya's <u>mobile phone-based money transfer</u>, financing and <u>microfinancing</u> service, m-Pesa (M for mobile, *pesa* is <u>Swahili</u> for money) has since been adopted by Afghanistan, South Africa, India, Romania and Albania. 42% of Kenya's GDP is transacted on M-Pesa. Ultimately, improvements in the mobile money sub sector leads to development of an effective payment ecosystem, deepening of financial inclusion for otherwise unbanked population in Africa and promoted of cash-lite economy for heavily cash-based communities. In 2017, Ghanaians undertook 981,564,563 mobile money transactions totaling over GH¢31 billion (US$6.8 billion)

The rise of Silicon Savannah - Most discussions of the origins of Africa's tech movement circle back to Kenya, which laid down four markers between 2007 and 2010 to inspire the country's Silicon Savannah moniker: mobile money, a globally recognized crowdsourcing app, Africa's tech incubator model, and a genuine government commitment to ICT policy. Notable as it has become, Silicon Savannah is but one corner of Sub-Saharan Africa's tech scene. Across the region a Silicon Valley inspired network is developing.

From Nigeria to Kenya, and Rwanda to Ghana, tech innovation is starting to influence multiple sectors: energy, agriculture, banking, healthcare, entertainment, transport and fashion. Across the region, the existence of roughly 200 African innovation hubs, 3,500 new tech-related ventures, and $1 billion in venture capital (VC) to a pan-African movement of start-up entrepreneurs.

Blockchain technology - The technology underlying the cryptocurrency bitcoin, blockchain will do for trust what the internet did for information. At its core, blockchain is an algorithm and distributed data structure that enables decentralized verification of any transaction, so that it is "hacker-proof." This allows transactions to do away with intermediaries - such as a stock exchange - that currently function as guarantors of a transaction.

Blockchain is being used for a variety of purposes ranging from improving land registries, promoting food safety and improving urban and industrial development through incentive-based zoning and land use. In the shipping and logistics sector, technology will cut red tape and dramatically reduce the administrative cost of clearing shipments from the producer all the way to the final importer-which today makes up about 20% of the total cost of moving a container.

Cryptocurrency – This recent digital currency is a medium of exchange, created and stored electronically in the blockchain, using encryption techniques to control the creation of monetary units and to verify the transfer of funds. Bitcoin is the best known example.

Internet of Things (IoT): is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing machines, headphones, lamps, wearable devices, etc. The IoT is a giant network of connected "things"; simply the relationship will be between people-people, people-things, and things-things.

5G mobile networks - 5G stands for "fifth generation." This will be the version of mobile network technology that is expected to roll out by 2020. It will be 40–60 times faster than current mobile technology. The World Bank calculates that with "a 10% increase in high-speed Internet connections, economic growth increases by 1.3%" and leads to "democratization of innovation. 5G will enable low-cost, low-power sensors to be embedded in building, appliances, and vehicles. It will be a key enabler of the "internet of things."

Intelligent Transport technologies - Technology is transforming transport with a speed and scale that are hard to comprehend. The transport systems of tomorrow will be connected, data-driven, shared, on-demand, electric, and highly automated. Drones are reaching new heights which were considered impossible and dangerous for certain daily activities. More innovatively, drones are now handling deliveries for companies, cutting down on cost and time to commute for delivery. Autonomous and electric vehicles are expected to drastically change the energy demand market, carbon emission and the challenges of travel.

INVESTMENT OPPORTUNITIES
There are considerable investment opportunities in the ICT sector. The sector requires service providers in connecting international voice calls to the local public network. Internet Service Providers are also required to offer internet access to the public especially the rural areas at less cost and broadcasting operators to establish Radio and Television broadcasting in the country.

There is also a lack of ICT Facilities and Infrastructure on a broad scale across the nation. Investments are needed in the Provision of Software for the country, extension of the broadband network to reach the whole country and to provide computer access to rural students.

Technological and other support related services such as the supply of quality telecommunications equipment, ICT Equipment and Office and Network Equipment. There are also opportunities in the following areas:

- Education in the area of software development, networking, VSAT, telecommunication and IT Engineering
- Production of Business Solution (software and networking services)
- Business Processing Outsourcing

- Supply of High-Tech Telecommunication Equipment.
- Back Office Operations (especially for the Financial Institutions)
- Provision of Broadband Facilities and Services
- Internet Service Provision Service
- Transaction Processing
- Manufacturing, assembling and supply of computers and accessories
- VSAT services
- E-commerce and Legal Database Services
- Logistics Management Services and Medical Transcription Services

INVESTMENT INCENTIVES AND GUARANTEES

Ghana is a safe investment destination. Guarantees against expropriation of private investments provided under law are buttressed by the Ghanaian Constitution. Some investment guarantees are detailed below:

i. Free transferability of capital, profits and dividends
ii. Insurance against non-commercial risks – Ghana is a signatory to the World Bank's Multilateral Investment Guarantee Agency (MIGA) Convention
iii. Double Taxation Agreements (DTAs) – to rationalize tax obligations of investors in order to prevent double taxation. DTAs have been signed and ratified with several countries.

Incentives to the sector may apply under the following provisions:
- Listed companies enjoy corporate tax of 25% and newly listed companies enjoy 25% corporate tax for the first three years
- Location Incentives (tax rebate) for manufacturing industries located in the regional capitals

The Ghana Investment Promotion Centre Act (865), 2013, also provides for automatic incentives and benefits.

GHANA'S COMPETITIVE ADVANTAGE

Reputable surveys rate Ghana as one of the most attractive locations for doing business in Africa. However, in view of the Government's policy to make Ghana the Gateway to West Africa, serious efforts are still being made to make the business environment friendlier thereby reducing occupancy costs for commercial and industrial properties and the general cost of doing business in Ghana.

The Ministry of Communications (MOC) is facilitating the vision of government to develop policies and programmes to transform Ghana into a country with sufficient, efficient, cost effective and accessible communications infrastructure to propel appropriate technological applications and innovations to enhance socio-economic development.

GHANA'S UNIQUE ATTRACTION

Ghana offers many attractions to the foreign investor:

a) A stable political environment: Ghana has enjoyed a stable political climate with smooth transition of government over the years.

b) A sound macroeconomic policy: Government's macroeconomic policy is designed to accelerate the process of growth and transformation of the economy under competitive conditions. Monetary policy has been consistent and fiscal discipline is apparent from lower budget deficits. Inflation continues its downward course and access to foreign exchange is improving.

c) 100% foreign ownership permitted on-going privatization of programme.

d) A large Economic Community of West African States (ECOWAS) market (250 million people).

e) Good and ever improving physical infrastructure: Ghana has developed seaports, airports and roads network. Telecommunication facilities are available as are basic utilities like water and electricity.

f) Availability of skilled and trainable labour.

g) Competitive labour cost: Ghana also offers a large workforce of both skilled and unskilled labour at affordable and competitive rates. The current minimum wage rate is GH¢7.00.

h) Quota-Free access to USA & European Union markets.

i) Proximity to European Union (6 hours flight time) and USA markets (9 hours direct flight time).

j) Fast developing financial infrastructure: With over 30 banks, insurance, and brokerage firms, and a stock exchange that allows companies to raise long term capital at low cost, Ghana's finance sector is one of the most developed in Africa

k) High degree of personal safety.

l) Warm and friendly people: Ghana is internationally recognized for her hospitality and warm affection for her investors.

m) All investors interested in Ghana's ICT Sector are assured of a safe and secure investment environment which has the backing of a very encouraging legal and regulatory regime to protect their investments.

POTENTIAL SOURCES OF FUNDING

Viable companies and projects can easily attract financing both on the local and international financial markets. The main sources of funding are (as at April 2018):

- 35 Banks, with 4 foreign representative banks
- 70 non-bank financial institutions
- 140 rural banks
- The Ghana Stock Exchange

- Ghana Venture Capital Fund
- International development finance institutions based in Ghana, such as the International Finance Corporation (IFC) and the African Development Bank (AfDB)

A number of foreign financial institutions also provide off-shore financing directly to companies in Ghana.