



REPUBLIC OF KENYA

MINISTRY OF INFORMATION
COMMUNICATIONS AND TECHNOLOGY

NATIONAL INFORMATION &
COMMUNICATIONS TECHNOLOGY (ICT) POLICY

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1 FOREWORD

The achievement of an information society and knowledge economy is one of the main priorities of the Government towards the attainment of the development goals and objectives for wealth and employment creation as espoused in Kenya's Vision 2030. The review of the ICT Policy of March 2006 is inspired by first, the need to align it with the New Constitutional dispensation in Kenya and Vision 2030 that seeks to transform our country into a leading information and knowledge hub of the region. Specifically, the driving force behind this review is to take on board the lessons learnt from the Vision 2030 Medium Term Frameworks and the three underlying pillars namely the Economic, Social and Political.

Secondly, the review is meant to provide a pro-active policy and regulatory framework that is not only in synch with contemporary technological realities and dynamics, but also expected to guide the orderly development of the ICT sector in such a way as to ensure maximum developmental impact for the benefit of all Kenyans. In reviewing this policy, the Government has taken cognizance of the tremendous impact of globalization and rapid changes of technology. These changes have invariably affected the traditional approach to the management of public affairs and service delivery, which increasingly informs the need for more pro-active policy and regulatory response.

The ICT sector is dynamic and the Government will regularly review ICT policies to resonate with the rapid technological advances, changing public needs and evolving global trends. Emphasis will be placed on policy implementation initiatives, programmes and projects. The overarching focus will be to provide access to ICTs, especially broadband to all Kenyans and seamless connectivity to the East African Community member states with proactive collaboration at regional and international levels.

This revised Policy will provide a clear and compelling roadmap to drive social, economic, cultural and political transformation through the effective use of Information and Communications Technology (ICT) in the years ahead. The Policy complements and builds upon Vision 2030 and provides many of the key strategies essential for achieving Kenya's national development targets. As we review the policy, we will concentrate on speeding up the building of high-speed, mobile, secure and ubiquitous new generation information technology infrastructure, developing modern internet industrial system, implementing the national big data strategy and enhancing cyber security.

By harnessing the power of the Internet, state-owned enterprises are expected to improve their sourcing, sales and logistics systems; streamline operations and identify, track market trends and boost their marketing, research and innovation capabilities. Operation of private-sector companies will become more efficient, translating into productivity gains and creating new markets for innovative products and services. The relevant strategies, policies and action plans have and will continue to bring about revolutionary transformation in Kenya.

In conclusion, it is my conviction that this policy instrument shall continue to set the pace in the right direction to further development of our ICT sector in particular and the economy in general, while ensuring that all stakeholders benefit fully from the consequent benefits.

Joe Mucheru

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2 VISION AND MISSION STATEMENTS

Vision

A prosperous and competitive ICT-driven Kenyan society.

Mission

To improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable, affordable and secure ICT services.

3 PREAMBLE

This Information and Communications Technology (ICT) Policy has been formulated through the process of public consultations. The Policy is premised on the following principles:

1. ICT is a developmental tool that should be widely accessible and utilized by the general population;
2. There will be a technology neutral approach in the adoption and regulation of ICT systems and services in the promotion of competition;
3. Innovation will be promoted for the benefit of consumers, producers and service providers while at the same time protecting the interest of innovators; and
4. Investing in human resource development and capacity building will also be prioritised.

The ICT Regulator, the Communications Authority of Kenya (CA) will be expected to adopt and implement the highest standards of procedural efficiency, transparency and responsiveness to technological changes.

Consideration was given to the review of the current legislative framework within the context of convergence to identify any inadequacies that may hamper effective regulation. As part of the legislative review it has been established that the deployment of ICT networks capable of delivering a range of services raises critical issues related to the quality of service and protection of personal information. In this context, legislative provision will be made inter alia to eschew minimum quality of service standards; the publishing of industry performance reports intervention of the ICT Regulator and creation of a National Cyber Security Agency.

4 INTRODUCTION

4.1 ICT and Vision 2030

The Kenya Vision 2030 aims to provide the national long-term development blue-print to create a globally competitive and prosperous nation, transforming Kenya into a newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment. Vision 2030 three pillars, namely the Economic, Social and Political are anchored on macroeconomic stability; continuity in governance reforms; enhanced equity and wealth creation opportunities for the poor. The Economic Pillar which captures the expectations of the ICT market seeks to improve the prosperity of all regions of the country and all Kenyans by achieving a 10% GDP growth rate by 2017.

The strategy of Vision 2030 is to undertake reforms in eight key sectors that form the foundation of society for socio-political and economic growth: Infrastructure, ICT, Energy, Science, Technology and Innovation (STI), Land Reform, Labour and Employment, National Values and Ethics, Public Sector Reforms, Ending Drought Emergencies and Security and Peace Building and Conflict Resolution.

In the Medium Term Plan II 2013-2017 of the Vision, six priority sectors that make up the larger part of Kenya's GDP (57%) and provide for nearly half of the total formal employment that were targeted are: Tourism, Agriculture, Livestock and Fisheries, Wholesale and retail trade, Manufacturing, IT enabled services (previously known as business process off-shoring), Financial services, and Oil and Gas.

Information Communication and Technology is identified as enabler or foundation for socio economic transformation. The vision recognizes the role of Science, Technology and Innovation in modern economy in which new knowledge plays a central role in boosting wealth creation, social welfare and international competitiveness. This will be done through the following ways:- economic and institutional regime that utilises existing knowledge; creation of new knowledge and entrepreneurship; educated and skilled population; dynamic information and communication infrastructure that facilitate processing and dissemination; and effective innovation system and research.

4.2 Rationale for Policy Review

The review of the ICT policy 2006 has been necessitated by changes in ICT that have taken place since 2006. The current ICT policy was developed in 2006 when the ICT's were at infant stages of development in Kenya. Since then a lot of new developments have taken place in the field of ICT especially convergence of ICT technologies hence the need for the review of the ICT Policy 2006 to keep it ablest with the current ICT technology.

4.3 Guiding Principles of the National ICT Policy

4.3.1 Constitutional Principles and Values

Uphold the Constitution of Kenya, respect essential values of human rights, equality, freedom, democracy, social justice and the rule of law.

4.3.2 Technology and Convergence

Keep pace with change in technology, broadband capacity, interconnectivity, regulation, competition and Innovation.

4.3.3 Universal Service

Universal Service with reasonable and equitable access to all electronic communication services at an affordable cost.

4.3.4 Open Access

Regulatory intervention should wherever possible be based on open access principles to ensure maximised, efficient and fully-leveraged use of available infrastructure and services, through encouraging infrastructure sharing, spectrum re-farming, optimal interconnection, balanced with the need for fair returns on investment.

4.3.5 Competition

Adequate competition in all relevant markets in products, function and geographical reach while at the same time promoting investment and innovation.

4.3.6 Innovations

Encouragement of innovation, attraction of investment and promotion of ease of doing business for a positive social and economic impact through ICTs.

4.3.7 Standards

Standardization of ICT products and services for quality assurance and adherence to the national and international standards.

4.3.8 Internationalization, National Cohesion and Integration

The maintenance of global connectivity and the promotion of One Kenya shall be a key tenet of electronic communications.

4.3.9 Privacy and Security

The privacy, security of the person and property shall be paramount in the deployment of information and communications technologies.

4.3.10 Recognition of the UN Sustainable Development Goals

The Sustainable Development Goals (SDGs) and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet. Implementation of the SDGs addresses science, technology and innovation, capacity building, data monitoring and accountability; among other issues which are of great importance to the ICT sector. All three pillars of sustainable development – economic development, social inclusion and environmental protection – need ICTs as key catalysts, and ICTs will be crucial for achieving the SDGs.

Though not a stand-alone goal in the SDGs, ICTs are a key cross-cutting enabler for promoting and achieving each and every SDG and ICTs have great potential to accelerate human progress, to bridge the digital divide and to develop knowledge societies. Kenya will endeavour to domesticate the SDGs targets that relate to ICTs

4.4 Situational Analysis

Currently, Kenya is one of Africa's fastest growing ICT markets where ICTs have increased productivity in all spheres of production process and enabled expansion of skills, contributing to improved standards of living for Kenyans. The Economic survey 2016 report provides an overview of the ICT sector performance and development trends in Mobile Telephony Service, Fixed Telephony Service, Internet/Data Service, Registered Domains, Broadcasting, Postal and Courier Service and Tariffs. Some of these key indicators are given below:

Contribution to Gross Domestic Product: The contribution of ICT to GDP dropped from 1.2 % in 2014 to 0.9 % in 2015. This could be due to low value addition on ICT inputs which are mostly imports.

Fixed Telephone: During the year under review, Telkom Kenya decommissioned the fixed wireless network due to the obsolete technology, expensive maintenance cost and high competition from other telephone technologies. Consequently, subscribers under Code Division Multiple Access (CDMA) network were migrated to the company's mobile network. This resulted in a decline of fixed wireline

capacity from 340 thousand in 2014 to 75 thousand in 2015. However, the wireline connections, increased by 77.1 per cent from 48 thousand in 2014 to 85 thousand in 2015.

Mobile Network Services: In 2015, the mobile telephone capacity declined by 3.5 per cent to 62.8 million owing to the exit of Essar Kenya (YU) limited. Airtel Kenya and Safaricom took over subscribers and infrastructure from the exiting operator, respectively. However, Equitel, which is a Mobile Virtual Network Operator (MVNO) on Airtel infrastructure, entered the market during the same year. This led to an increase of 12.1 per cent mobile connections to stand at 37.7 million subscribers in 2015. The growth in the subscribers resulted in an expansion in used mobile capacity from 51.7 per cent in 2014 to 60.1 per cent in 2015. In the mobile money sector, the number of agents increased by 16.4 per cent from 123,703 in 2014 to 143,946 in 2015. Similarly, the number of mobile money transfer service subscribers grew by 2.8 per cent to 26.8 million over the same period. Total amount of money transacted through mobile money platforms expanded by 18.7 per cent to KSh 2,816 billion during the review period.

International Telephone Traffic: The international telephone traffic increased by 11.4 per cent from 1,053 million minutes in 2014 to 1,173 million minutes in 2015. This was a reversal from the declines that had been recorded since 2013. The outgoing and incoming international telephone traffic increased by 17.9 per cent and 6.3 per cent, respectively, in 2015. The increase in the international mobile traffic was partly due to the reduction of international mobile rates within the East African Community, except Tanzania, through the One Network Area Initiative that enhanced the standardization of the calling rates. The decline in fixed line traffic may be attributed to the decommissioning of the fixed wireless network during the review period.

Roaming Traffic: Total roaming traffic more than doubled to 194.8 million minutes in 2015. Similarly, both outbound and inbound roaming more than doubled to 91.2 and 103.6 million minutes, respectively, during the review period. The increase in roaming traffic may partly be attributed to the reduced calling rates within the East African Community (EAC) and the visits by high-level dignitaries during the review period.

Domestic Traffic: The total domestic telephone call traffic increased by 27.7 per cent from 30.7 billion minutes in 2014 to 39.2 billion minutes in 2015. Mobile to mobile telephone traffic increased by 28.2 per cent to 39.1 billion minutes, to account for 99.7 per cent of the total domestic telephone traffic. Mobile to fixed telephone traffic increased by 13.3 per cent to 75.4 million minutes. However, fixed to fixed telephone traffic registered a drastic decline from 23.3 million minutes in 2014 to 5.3 million minutes in 2015 mainly attributed to the decommissioning of the fixed wireless network.

Message Services Traffic: Multimedia Messaging Services (MMS) enables individuals mainly to send graphics, sound or video. The number of messages sent via MMS rose by 13.9 per cent to 13.7 million in 2015. The total number of messages sent via Short Messaging Services (SMS) increased by 3.3 per cent compared to a 38.2 per cent increase recorded in 2014. The number of international SMS received declined by 19.0 per cent to 131.1 million in 2015 compared to a 60.7 per cent increase recorded in 2014. The slowed growth in SMS was associated with high uptake of Over the Tops (OTTs) platform such as Whats App and use of social media during the review period.

Internet: The number of licensed Internet Service Providers (ISPs) increased by 24.9 per cent from 177 in 2014 to 221 in 2015. The estimated internet users also expanded by 35.9 per cent to 35.6 million users over the same period. Total wireless internet subscriptions increased by 45.4 per cent to 23.8 million with the terrestrial mobile data subscribers having the largest share. Total wired internet subscriptions increased by 20.2 per cent to 115,111 with fixed fiber optic data accounting for 96.7 per cent of the total wired subscriptions in 2015. Fixed fiber optic data grew by 37.1 per cent to 111,354

subscriptions in 2015. However, fixed Digital Subscriber Line (DSL) data reduced significantly from 14,512 subscriptions in 2014 to 3,732 subscriptions in 2015.

Bandwidth Capacity: Available bandwidth capacity increased by 83.0 per cent from 847,523 megabits per second (mbps) in 2014 to 1,550,768 mbps in 2015. The increase in the bandwidth capacity was attributed to fiber installation in the counties during the review period. The utilized bandwidth capacity increased by 71.6 per cent to 854,551 mbps in 2015. The ratio of total utilized bandwidth to available capacity shrank from 58.8 per cent in 2014 to 55.1 per.

Broadband Subscriptions: The total wireless broadband subscriptions increased from 4.2 million to 7.1 million due to significant uptake of the Global System for Mobile (GSM), which went up by 85.6 per cent to 6.3 million subscribers in 2015. This was occasioned by migration of CDMA to mobile technology and the entry of Equitel subscribers. Fiber to home and office increased by 35.9 per cent and 37.2 per cent, respectively.

Fixed and Mobile Telephone Charges: In 2015, the telephone services installation and subscription fees remained unchanged at KSh 3,394 and KSh 580 per month, respectively. During the period, the average call cost per minute of fixed to fixed local calls decreased from KSh 4.50 to KSh 3.00 while that of fixed to mobile remained unchanged at KSh 9.00. The average call cost per minute of mobile-to-mobile decreased from KSh 3.10 in 2014 to KSh 3.08 in 2015 while that of mobile to fixed remained unchanged at KSh 3.25. However, the average price of SMS went up from KSh 1.00 to KSh 1.25.

Domains: The total number of domains grew by 33.8 per cent to 51,543 in 2015. The number of “.co.ke” domains increased by 35.5 per cent to account for 92.7 per cent of the total registered domains in 2015. The growth in the number of registered Kenyan based domains was mainly attributed to the reduction in renewal and average annual fees from KSh 2,320 to KSh 580 and KSh 2,300 to KSh 650, respectively,

Media Frequencies and Subscriptions:

The number of Frequency Modulation (FM) for radio increased to 608 while television frequencies rose to 302 in 2015. The number of digital signal distributors in the country increased to five due to the entry of the self-provisioning and common carrier signal distributors in the market. The number of digital TV stations increased to 62 due to the migration from analogue to digital platform. Digital Terrestrial Televisions (STBs) subscriptions more than tripled to 3.7 million in 2015 while cable TV and direct to home satellite subscriptions increased by 44.6 per cent and 18.3 per cent, respectively. The number of radio stations increased by four to 139 stations in 2015.

ICT Penetration Rate (Total Population): During the year under review, ICT penetration rate improved for all categories except that of the fixed line, which declined from 0.52 in 2014 to 0.19 in 2015. The improvement in the uptake of ICT was partly attributed to the affordability of mobile phones in the market; cheaper internet bundles offered by mobile operators and finalization of phase one of laying the fiber optic cables across the country. The internet penetration stood at 54.2 per cent in 2015 with that of wireless internet increasing to 53.9 per cent. Total broadband penetration increased to 16.4 per cent in 2015 from 9.9 per cent in 2014. The bits per second per capita (Bps/person) increased by 66.9 per cent to 20,293.0 in 2015. The mobile money penetration remained unchanged.

ICT Penetration Rate (3 years and above): This measures the ICT penetration for the population aged three years and above which is considered capable of owning and using ICT equipment. The mobile penetration stood at 94.0 per cent while internet penetration stood at 59.6 per cent in 2015. Broadband subscriptions increased to 18.1 per cent in 2015 from 10.9 per cent in 2014.

Employment: There was a marginal decline in the level of employment by telecommunication operators from 6,201 in 2014 to 6,147 in 2015. Over the same period, employment in the ISPs increased by 25.3 per cent to 7,817. This was partly due to the laying of fiber optic in the country.

Newspaper Circulation and online Newspaper Readership: In 2015, the circulation of daily English and Kiswahili newspapers continued to decline due to online readership of newspaper as the English and Kiswahili daily circulations declined by 3.4 per cent and 10.2 per cent, respectively. Similarly, the number of weekly English newspapers in circulation decreased by 5.8 per cent over same period. However, the average online users went up by 53.7 per cent in 2015.

Challenges: The ICT sector is faced with the following challenges:

- (a) ICT services in unserved and underserved areas and for persons with disabilities.
- (b) How to harness ICT for efficient and effective government, economic growth and job creation for the youth.
- (c) High cost and unreliability of Telecommunication.
- (d) Small talent of BPO/industry specific skills.
- (e) Lack of standardization of components and systems being procured and applied across the Government.
- (f) Limited country-wide ICT awareness that hinders cultural and attitudinal change.
- (g) A wide internal digital divide between rural and urban areas as well as low bandwidth.
- (h) High costs of migration from analogue to digital broadcasting.
- (i) Cyber-crime.
- (j) Regional disparities in adoption and utilization of ICT services slowing speed of regional integration.
- (k) Inadequate policies and legal frameworks.
- (l) Inadequate competent and skilled human capacity.

4.5 Overarching Policy Objectives

The main policy objective is that the government will ensure that the entire public sector, including service delivery in health, education, and infrastructure, is fully supported by high-quality ICT infrastructure.

4.5.1 Broad Strategies

- (a) Encourage Public-Private Partnerships (PPPs) for ICT-enabled systems.
- (b) Promote the local-assembly ecosystem that will spur the light manufacturing industry in order to guarantee affordable communication devices.
- (c) Institute innovation clusters that will generate a critical supply of highly-skilled technical personnel required to drive the information society.
- (a) Facilitate broadband access to all citizens and ensure Broadband connectivity of all public facilities by 2020.
- (b) Promote investment in the ICT sector.
- (c) Ensure availability of spectrum resources to support the development of ICT infrastructure and accessibility countrywide.
- (d) Support human resource development and capacity building.
- (e) Facilitate access to devices and development of local content.
- (f) Encourage innovation and competition in the ICT sector.
- (g) Provide ICT training of all relevant public officials and service providers.
- (h) Facilitate ICT-based delivery systems for healthcare, education, and infrastructure.

- (i) Facilitate deployment of the Internet of Things (remote sensing and control of connected devices) for the public infrastructure and environmental management.
- (d) Encourage universities to scale up education and incubation of ICT solutions, including through partnerships with the business sector.

5 ICT INFRASTRUCTURE AND ACCESS

5.1 Infrastructure Development

The increase in the uptake of internet based and other ICT related services, requires appropriate infrastructure to enable social and economic growth. Thus infrastructure-related policy is increasingly focused on how to effectively ensure affordable and wide spread access to ICT services. Infrastructure is thus the core foundation of an integrated ICT eco-system. Without enabling infrastructure, all other components cannot exist. Policy which governs how a country's infrastructure is developed and managed is therefore fundamental to the supply of services which enable growth.

5.2 Deployment of ICT Infrastructure Services in Counties

In Kenya there is a devolved system of governance according to the Constitution of Kenya, 2010, which placed telecommunications and ICT a mandate of The National Government. Government will therefore put in place measure to encourage investments and rollout of ICT services across all Counties.

Licensed operators under the Unified Licensing Framework (ULF) will be given incentives plus equitable coverage obligations to address the underserved and unserved areas in the Counties with the support of the Universal Service Fund (USF). The Communications Authority will support licensing of County-based service providers to offer last mile access solutions.

5.3 Infrastructure Sharing

The development and provision of a robust ICT infrastructure underpins sustainable growth in the sector. Towards this end the Government will continue to promote availability and access to efficient, reliable and affordable ICT infrastructure at County, National and International levels. The Government will support the building of high-speed, mobile, secure and ubiquitous new generation ICT infrastructure networks through high-speed links and high-speed wireless broadband networks at town and village levels.

In order to develop a modern Internet system, an action plan will be put in place to integrate the mobile internet, cloud computing, big data and the internet of things with modern manufacturing; promoting e-commerce, industrial networks, Internet banking and a new system supporting high-tech manufacturing in agriculture, tourism, energy, finance, public services and logistics. Internet-based companies will be encouraged to increase their presence in the international market. This is aimed at providing and implementing sufficient Internet capacity to schools, colleges, and businesses; and to provide effect a reliable and secure Internet infrastructure.

5.4 Open Access System

There is need for the creation of a policy environment that fosters competition, universal access to services and affordable quality services. One of the major bottlenecks identified related to that of access to critical and essential infrastructure. This issue is also highlighted in the National Broadband Strategy which states that access to critical and essential infrastructure will determine the failure or success of achieving published broadband targets. The Strategy notes the relatively poor level of broadband penetration. Among various provisions, it proposes the creation of a fair and competitive environment, particularly enabling service-based competition open access to infrastructure rolled out through public investment. Best practices provides that a predictable and technology neutral competitive environment premised on open access principles can deliver better results.

Objectives of promoting an open access regime include creating a clear access regime that is enforceable and creating a uniform access regime that takes into consideration all technologies and services:

The policy aims to balance the requirements for an open access regime with the reality that more investments are needed in the last mile for connectivity. The need to ensure a return on investment by those who invest in the last mile is a good reason why policy should be balanced and cautious.

5.5 Infrastructure and Access Policy Objectives

- (a) Develop an efficient, high capacity national ICT infrastructure to enhance service delivery to the public with special emphasis on governance, health and educational institutions;
- (b) Promote and strengthen research and development, innovation and manufacturing activities in the country; and
- (c) Promote systematic and comprehensive expansion of ICT infrastructure and services with special attention to rural and urban marginalized areas;
- (d) Increase the amount of local internet traffic flowing in the ICT infrastructure
- (e) Promote investment in ICT infrastructure and access by creating an enabling and supportive environment,
- (f) Promote an integrated, converged, technology neutral and secure ICT infrastructure to support delivery of the various services,
- (g) Create an enabling environment to facilitate development and deployment of ICT infrastructure in the counties to support devolved government and structure,
- (h) Encourage and promote the sharing of public and private ICT, utility, rights of way to ensure resiliency and redundancy in order to support disaster recovery plans,
- (i) Promote equitable access and sharing of natural sites, rights of ways, physical infrastructure and co-location of ICT facilities by licensed operators based on technical and commercial considerations,
- (j) Promote and create a fair and competitive environment through the enforcement of open access to ICT infrastructure
- (k) The government will provide support infrastructure such as energy, security, roads to support the faster, safer and cheaper deployment and maintenance of ICT infrastructure,

- (l) Data Centre infrastructure build out is carried out in cognizance of globally approved standards for purposes of ensuring quality of service under open access, carrier neutrality model and security

5.6 Strategies

The government will undertake the following key measures:-

- (a) Create an enabling framework for the deployment of broadband across the country;
- (b) Promote broadband as an instrument of economic development, and accelerate uptake of broadband in Kenya among government institutions, businesses and private citizens in an equitable, transparent and customer-centric way;
- (c) Ensure the availability and reliability of broadband connectivity through a continued monitoring of the market and through the setting up of a quality of service regulatory framework;
- (d) Provide access to government-owned infrastructure assets to industry players
- (e) Ensure the development of broadband-enabled open and interoperable e-services;
- (f) Ensure more affordable Internet connection prices as well as promote competition between ICT players
- (g) Make available spectrum for and ensure orderly deployment of ultra-high-speed mobile/wireless technologies such as Long Term Evolution (LTE)/4G and other advance mobile communications networks;
- (h) Expand High Speed Broadband to reach all Counties by implementing the National Broadband Strategy to encourage the deployment of broadband access technologies by encouraging the provision of quality broadband services to all citizens in Kenya;
- (i) Avail spectrum for last mile solutions to provide universal broadband access
- (j) Enhance access to ICTs by persons with disabilities

5.7 Broadcast Signal Distribution

The Government will continue to license broadcast signal distribution services depending on the market growth and the availability of the required radio frequency spectrum resources to ensure that the use of broadcasting infrastructure is maximized. All licensed signal distributors will be required to provide services to licensees on an open access and non-discriminatory basis.

5.8 Internet Exchange Points

Internet exchange points (IXPs) can improve Internet quality and affordability in local communities; strengthen local Internet connectivity, develop local Internet industry, improve competitiveness, and serve as a hub for technical activity, encourage local service hosting and local content development and applications.

The Government will encourage and promote of partnerships that seek to deploy additional IXPs to encourage the development and use of deployed infrastructure, including national and international fibre cables, and local datacentre development.

5.9 Mobile Money Interoperability

The national payment regulations that have been launched by the National Treasury have made specific provisions for mobile money interoperability standards from an infrastructure perspective.

Since the launch of mobile money services in Kenya in 2007, this offering has been widely adopted by both the Government and Private sector as a payment platform that enables users to access financial and non-financial products via mobile phones. The Government recognizes the economic importance of mobile money and the growing need to conveniently access the services across the country. To address mobile money challenges so as to drive financial inclusion across the country, the government will:

- (a) Encourage mobile operators to share mobile money infrastructures including agent networks on transparent, fair and non-discriminatory basis;
- (b) Provide incentives to mobile operators in cases where sharing mobile money infrastructures would expose them to return on investment risks (the implementation of sharing should protect the value of existing investment in infrastructures and services);
- (c) Collaborate with the Central Bank of Kenya in developing mobile money interoperability policy that fosters competition;
- (d) Promote innovation in mobile money services;
- (e) Ensure the mobile money infrastructure sharing protects public interests and guarantees high security and quality of service.

5.10 Data Centres

Data centres are critical ICT infrastructure that ensures business continuity by protecting businesses critical applications and data against loss that could arise from natural disasters, acts of terrorism, sabotage, and technical faults among others.

5.10.1 Policy Objectives

The government will:

- (a) Promote Data Centre infrastructure buildout carried out in cognizance of globally approved standards for purposes of ensuring quality of service under open access, carrier neutral model;
- (b) Develop incentives to ensure and protect investment in the field of data centre;
- (c) Facilitate the development and enactment of legislation on localization to support growth in IT service consumption – as an engine to spur data centre growth;
- (d) Ensure that Data is processed fairly and lawfully in accordance with the rights of citizens and obtained only for specific, lawful purposes;

5.10.2 Strategies for Data Centres

The government recognizes the important economic role of data centres across all sectors of the economy and in order to deliver value to stakeholders and to guide the continuous growth of the same in both public and private sectors; it will adopt the following strategies:

- (a) Ensure government Ministries, Departments and Agencies share and optimize data centre ICT infrastructure in order to save costs by eliminating the need for infrastructure expenses incurred by individual agencies and also provide cost efficient, scalable and secure environment for Government data and information;
- (b) Ensure the security of the Government information is harmonized and managed centrally;
- (c) Optimal use of human capacity (mainly ICT staff);
- (d) Encourage neutral data centre providers (third party independent of the companies);

- (e) Encourage businesses to partner and invest jointly in data centre infrastructure deployment or share data centre infrastructure to minimize network duplications;
- (f) Encourage local ownership in data centre companies;
- (g) Ensure availability of basic infrastructure especially reliable cost-effective grid power.

5.11 Complementary Infrastructure

The lack of adequate complementary infrastructure has hampered provision of efficient and affordable ICT services in the country.

5.11.1 Policy Objectives:

- (a) Provision of support infrastructure, such as reliable power and roads;
- (b) Supporting infrastructure for software development;
- (c) Implementation of a combination of technologies, policies and procedures, which will support digital signatures, encryption and other Public Key Infrastructure(PKI)-Enabled security services: and
- (d) Promotion of local manufacture and assembly of ICT equipment and accessories.

5.11.2 Strategies

The Government will:

- (a) provide incentives to enable development of infrastructure for public good and to strengthen mechanisms that ensure open access for all players and users;
- (b) ensure universal and open access to reliable and affordable broadband infrastructure by all citizens and for other EAC member states that are landlocked;
- (c) harmonize ICT policy, legal and regulatory framework with the other East African Community member states; and
- (d) promote provision of reliable ICT broadband infrastructure connecting all the capitals and major cities of the East African Community member countries.

5.12 Rights of Way (Way leave)

The approvals of rights-of-way and clearance to all service providers are critical for the development of the telecommunications infrastructure. The Government will facilitate the recognition of ICT infrastructure as a utility.

5.13 Disaster Management

The Government will avail incentives to ICT Service Providers to provide facilities for emergency communication and prediction, monitoring and early warning of disasters.

6 SCIENCE TECHNOLOGY AND INNOVATION

The Kenya Vision 2030 recognises the critical role played by Research and Development (R&D) and Innovation in accelerating economic development in all the newly industrializing countries of the world. ST&I is one of the foundations for socio-economic transformation in the Kenya Vision 2030.

6.1 Policy Objectives

The main objectives of science, technology and innovation (ST&I) are to create indigenous ST&I capacities appropriate to national needs, priorities and resources, and to create an STI culture whereby solutions to socio-cultural and economic problems of the individual, the community and the nation are recognized and sought.

6.2 Link to National Vision

ST&I is one of the foundations for socio-economic transformation in the Kenya Vision 2030, enabling creation of new knowledge which plays a central role in wealth creation, social welfare and international competitiveness. At the economic front, STI will play a critical role in ensuring that productivity growth occurs, and that the economy is progressively transformed into a knowledge-based economy. Universities and research institutions will be critical drivers of innovation systems and the resultant developments in ST&I and application of knowledge, especially in biotechnology, value-addition, manufacturing, and ICT.

This will lead to industrial and entrepreneurial development with new products and services, and areas of economic growth. From a social development perspective, ST&I will be applied to provide solutions that will enhance natural resource management for public safety, food security and poverty alleviation as well as resolving human and animal health conflicts and developing a sustainable tourism industry.

6.3 National Priority Sectors for ST&I Policy Interventions

The national sectors significant to achievement of national growth and development targets are Agriculture and Rural development; Health and Life Sciences; Trade and Industry; Human Resource Development; Physical Infrastructure; Energy; Environment and Natural Resource Management; Information Communication Technology (ICT); and Space Science Technology. Specifically, the following areas of innovation will be given a high priority: biotechnology; space science; telecommunications, electronics and computers; and automobile and nuclear electricity.

6.4 Kenya National Innovation System (KNIS)

An innovation system essentially refers to the interactions among diverse group of actors involved in the production, diffusion and use of new, and economically useful knowledge. An effective innovation system is required for a country to harness the potential offered by modern science and technology to its social and economic advantage. Kenya's current innovation system lacks coordination among the actors, is linear and fragmented, has limited linkages between academia, industry and government; the academic curricula and graduate skill sets are not well-aligned to industry needs and, has inadequate funding and support for innovations. Generally, it does not effectively serve critical national needs. The government will therefore adopt a new Kenya national innovation system (KNIS) to ensure that the education and research system (universities, TVET institutions, sector-based research centres, national research and education network and schools), the business system (from start-up informal businesses to large and multi-national companies), the intermediate organisations, ST&I infrastructure (financial, information, IPR regime, regulatory, incubation centres, science and technology parks, special economic zones, etc.) and framework conditions in which they operate interact, dynamically and effectively respond to national needs of the stakeholders (consumer, private sector and Government) , while continuously learning from these interactions.

7 CONTENT AND APPLICATIONS DEVELOPMENT

7.1 Introduction

The overall objective will be to develop local content in ICTs for greater access and relevance to the citizens. To this end, the policy objectives on local content will be to:

- (a) Support locally based development of ICT applications and multimedia content for productivity;
- (b) Encourage the use of Kiswahili as the National language and local languages in developing content;
- (c) Encourage the development of content that captures and preserves knowledge and culture of local communities;
- (d) Promote electronic publishing, collection and preservation of local materials; and
- (e) Encourage the development and management of information and knowledge resources as a national heritage.

7.2 Digital Content

Relevant local digital content production can spur ICT uptake while providing employment opportunities for the youth. To promote local digital content, the Government shall consider the following:

- (a) Adopting Open Data principles: - in order to share historical/archive data that can be a rich source for the creative and broadcast industry;
- (b) Promoting Animation Labs (A-Lab):- Government will support incubation labs focused on animation & film production that is largely computer generated;
- (c) Content Ratings: - The Government will, develop policies and legislation that take into consideration age appropriate content that upholds national values.
- (d) Copyright Protection:- Government will recognise digital content as copyright material and will actively protect the rights of copyright owners through law enforcement to prevent digital content piracy.

7.3 Gaming content

The software industry focusing on entertainment is one of the fastest growing global industries. The Government will consider the following in order to tap into this market:

- (a) Specialized Certification Programs: The Government will work with industry to promote acquisition of high-end programming skills required to deliver high quality gaming software;
- (b) Subsidies: The Government will introduce fiscal incentives like capital investment subsidy, reimbursement of levies, duties etc.; to promote this segment.

7.4 Access to Information

The Government recognizes information as a resource, which must be generated, collected, organized, leveraged, secured and preserved for national prosperity. The Government will therefore develop a framework for re-use of public sector information with a view to ensuring value addition by private sector in order to promote the development of local content and information industry in Kenya.

In addition, the Government will strive to improve quality of public information by restructuring public information management to ensure timely access to accurate information on Government policies and programmes for informed decision making. This will be achieved through refurbishment of Government websites, digitization of key Government registries, development of a Public Communications Policy, production of the annual Kenya Yearbook, modernization of the Kenya Broadcasting Corporation and Kenya News Agency, among other interventions.

7.5 Data Protection

The Government will develop data protection legislation that ensures the protection of the confidentiality and integrity of citizens' information. The legislation shall provide for collection, use, retention, security and disclosure of such information, including disclosure to law enforcement agencies.

7.6 .ke Domain Administration

By 3rd Quarter of 2015/16 financial year, the number of domain names as registered by the Kenya Network Information Centre (KENIC) was 58,259. To encourage more .ke domain name uptake, CA and KENIC will take measures which include proactive promotion of the .ke domain name in consultations with other relevant stakeholders.

The Government will promote .ke by exclusive use of .go.ke domains in all government business and communications

7.7 Broadcasting content

Broadcasting plays an important role in the lives of citizens worldwide and is the most effective means of reaching the largest number of people simultaneously.

The policy framework will continue to be focused on encouraging market liberalization and establishing a market structure that attracts and protects national and international investment in the broadcasting content and services.

7.7.1 The Public Broadcaster and National Public Broadcasting Service

The Kenya Broadcasting Corporation (KBC) will be restructured to ensure its relevance and viability as the public broadcaster. KBC, operating commercially, with universal service obligations, and with Government support to sustain its universal service obligations will provide national public broadcasting and county broadcasting services in collaboration with County Governments. KBC may also establish a subsidiary to provide commercial broadcasting services subject to fulfilment of licensing and regulatory requirements. The Government may designate any other entity to provide public broadcasting services.

7.7.2 Private/Commercial Broadcasting Services

The main objective of granting of licenses for private broadcasting services will be the development of a diverse and pluralistic broadcasting landscape, while taking into account the viability of individual enterprises as well as the industry as a whole. Private broadcasting service providers will be expected to provide a diversity of programming content, contribute to job creation and human resource development.

The CA shall issue broadcast licences in a fair, timely, and competitive manner.

Private broadcast licenses will not be granted to any political party, or affiliate of a political party. To avoid hoarding of the scarce frequency resources, CA will develop guidelines with appropriate regulatory safeguards to ensure broadcast licensees start operations within timeframes stipulated in their licences upon being granted broadcast licenses.

7.7.3 Community Broadcasting Services

Community broadcasting service providers, who are fully controlled by a non-profit entity, will be licensed to offer non-profit services that serve a particular community. They will be required to:

- (a) Offer a distinct broadcasting service dealing specifically with community issues, which are not usually dealt with by private or public broadcasting service covering the same area; and
- (b) Focus on the provision of programmes that highlight community issues, including, but not limited to; developmental issues, health care, basic information and general education, environmental affairs and local culture.

Licensing of community broadcasters will follow an approach where prospective service providers will make application to CA. The licenses will be granted after evaluation based on clear conditions and availability of frequencies in the service area. In order to promote the development of community broadcasting services, the CA will endeavour to reserve broadcast frequencies and/or television channels for this purpose. Community broadcast licenses will not be granted to any political party, or affiliate of a political party.

7.7.4 Policy Objectives

The overall policy objective for the broadcasting sector is to create, within the framework of the Constitution, an environment that enables broadcasting services to be provided in the public interest and to contribute equitably to the socio-economic and cultural development of Kenya. Specific objectives of the policy are to:-

- (a) Encourage the growth of a broadcasting industry that is efficient, competitive and responsive to audience needs and susceptibilities;
- (b) Ensure the development of broadcasting services that reflect a sense of Kenyan identity, character, cultural diversity and expression through the development of appropriate local content;
- (c) Promote diversity in ownership, control and programming of broadcasting services and availability throughout Kenya;
- (d) Promote fair competition, innovation, protection of intellectual property rights and investment in the broadcasting content industry;
- (e) Ensure adherence to social responsibility by encouraging the development of and respect for the Programming Code and other codes of practice by all broadcasting licensees;
- (f) Ensure universal access to, and viability of public service broadcasting;
- (g) Require any person wishing to provide broadcasting services to obtain the necessary licenses;
- (h) Require broadcasters, including those re-broadcasting free-to air programmes to meet the prescribed local content levels taking into account the type of programming a broadcaster airs and availability of local content;

- (i) Require broadcasters to avail their services to serving public interest free of commercial interest in times of emergencies;
- (j) Require CA, in consultation with the broadcasting, media professionals and production industry as well as the public, to devise mechanisms to ensure increased local content in the various types of programming services including films, drama, children’s programmes, documentaries and music;
- (k) Encourage media training institutions in conjunction with the broadcasting industry to nurture research into aspects of programming and curriculum development in the industry;
- (l) Require government agencies and private sector to promote local production of advertisements and create an enabling environment for the production and export of local broadcast and media products that will contribute towards job creation;
- (m) Require all broadcasters to act in the public interest and be guided by the programming code developed by CA and other codes of conduct which will inter alia address:
 - (i) broadcast of material suitable for children;
 - (ii) broadcasts that contain scenes of violence, sexually explicit conduct and offensive language;
 - (iii) audience advisories to assist audiences in choosing programmes;
 - (iv) the need to report news truthfully, accurately and fairly, without intentional or negligent departure from the facts;
 - (v) the need to exercise care in dealing with individuals’ privacy in accordance with Article 31 of the Constitution;
 - (vi) The need to adhere to limitations on the freedom of expression and the freedom of the media in accordance with Article 33(2);
 - (vii) the need to accommodate diversity of opinion; and
 - (viii) Strict adherence by broadcast stations to regulations and guidelines issued for fair coverage during elections.

8 DEVICES

In order to grow broadband penetration, there is need for affordable devices to citizens to ensure they can access services. Towards deepening broadband penetration, there is need for manufacturers to avail low prices devices that are affordable to majority of the Kenyan population. Towards this end, government will consider:

- (a) Support for Local Production/Assembly Line - for electronic devices through establishment of Special Economic Zones,
- (b) Promote ICT friendly tax regimes - (Zero-rated/Tax holidays) on devices to ensure affordability and penetration of ICT Services,
- (c) Discouraging Counterfeit/substandard devices/handsets – by enhancing collaboration between Government Agencies (KEBS/CA/KRA) to ensure enforcement of device standards from the point of entry/manufacture to their availability in the market,
- (d) Standardization & Compatibility – through harmonization of device standards that support different technologies.
- (e) Address environmental issues (green ICTs)- with help of KEBS to ensure the design, use and disposal of ICTs is sensitive to environmental requirements.

9 POSTAL AND COURIER SERVICES

9.1 Postal/Courier Market

The Government recognizes that all citizens have a right to access basic postal services and will ensure that the country has a vibrant and efficient postal sector across the physical, electronic and financial platforms in order to increase the sector's contribution to the country's economy. This will be achieved by, ensuring that postal operators provide affordable, equitable and efficient universal service, among other measures.

An effective postal and courier system is key to the development of e-commerce and other sectors of the ICT economy.

9.1.1 Policy Objectives

This policy aims to achieve the following objectives:

- a) Development and provision of high quality services and responsiveness to customer needs;
- b) Increased access to quality and affordable universal postal services;
- c) Promotion of private sector participation in the postal sector;
- d) Promotion of e-commerce activities in the country
- e) Enhancement of postal security;
- f) Promotion of R&D in the postal sector; and
- g) Increased cooperation with sub-regional, regional and global postal service organizations.

9.1.2 Strategies

- a) Rollout of more postal service points;
- b) Improvement of collection and distribution of mail and parcels;
- c) Restructuring of Postal Corporation of Kenya for greater commercial viability;
- d) Promoting competition in all non-exclusive postal market segments;
- e) Enhancing universal access to postal services;
- f) Review of the exclusive market segments, from time to time to allow for more competition;
- g) Promoting the use of the postal network in the delivery of electronic services; and
- h) Supporting the provision of financial services through the postal system.

9.2 Liberalisation of Postal Services

The Government has liberalised the competitive segments of the postal/courier sub-sectors such as fast mail and courier services where the private sector has continued to play an important role. Further liberalization will be undertaken in line with prevailing economic and market conditions. The policy also aims at creating an environment that attracts increased investments in the sector and allows the development of postal infrastructure and services that support national development goals.

The postal market is divided into the exclusive and non-exclusive market segments. The main player in the exclusive segments is the Postal Corporation of Kenya which provides among others the following services on an exclusive basis:

- a) Delivery of letters, postcards, printed paper and small packets with weights up to a maximum of 350grams. This limit will be reviewed in line with prevailing economic and market conditions and any variations published in the Kenya Gazette;

- b) Printing and issuance of postage stamps and philatelic materials; and
- c) Provision of private letterboxes and street posting boxes.

The non-exclusive and competitive services, which are provided mainly by the private sectors include the following:

- a) Courier services;
- b) Parcel services;
- c) Direct mail marketing services;
- d) Postal financial services;
- e) Electronic and hybrid mail;
- f) Distribution of publications; and
- g) Agency services.

9.3 Market Structure

The policy focus is on creating an environment that attracts increased investments in the sector and allows the development of postal infrastructure and services that support national development goals. The postal market is divided into the exclusive and non-exclusive market segments.

9.3.1 Exclusive Services

The Postal Corporation of Kenya will provide the following services on an exclusive basis:

- a) Delivery of letters, postcards, printed paper and small packets with weights up to a maximum of 350grams. This limit will be reviewed in line with prevailing economic and market conditions and any variations published in the Kenya Gazette;
- b) Printing and issuance of postage stamps and philatelic materials; and
- c) Provision of private letter boxes and street posting boxes.
- d) Standards and other conditions will be prescribed for universal service provision.

9.3.2 Non-Exclusive Services

Non-exclusive services will include:

- (a) Courier services;
- (b) Parcel services;
- (c) Direct mail marketing services;
- (d) Postal financial services;
- (e) Electronic and hybrid mail;
- (f) Distribution of publications; and
- (g) Agency services.

9.3.2.1 Courier Services

The need for a faster and more efficient means of goods delivery has been growing and requires same day or overnight delivery. The Government recognizes that the growth of the courier segment has traditionally been driven by private sector. Operators in this market segment are required to be licensed.

9.3.2.2 Parcel Services

The parcel distribution market caters for all postal material falling outside the definition of a letter. Private sector operators currently serve only the high volume, short distance, low unit cost routes. The Government will promote private investment in this segment. This market segment is therefore, open for competition.

9.3.2.3 Direct Mail Marketing Services

Direct mail marketing is a form of advertising that enables the same message to be sent to a large number of individuals or organizations. Mail order companies rely heavily on efficient postal services for customer communication, distribution of catalogues, receiving customers' orders, goods distribution and the mailing of statements. Growth in the mail order segment is stimulated by the increasing interest in distance learning and growing sales of consumer products and services. This market segment is liberalized.

9.3.2.4 Postal Financial Services

The majority of economically active heads of households works in urban areas and requires banking services in rural areas to support the rest of their families residing in such areas. To help this segment of the working population to support their dependants, the Government will support the provision of financial services in rural areas through the postal system. In this regard, the government will support use of appropriate technology in the financial transfer systems in the country.

9.3.2.5 Electronic and Hybrid Mail Services

The use of modern communications technology can significantly improve the speed of mail delivery and funds transfer. The Governments' ultimate aim is to have all post offices connected to the Internet to support electronic mail services.

9.3.2.6 Distribution of Publications

The distribution of newspapers, magazines and journals require a reliable postal service and is time sensitive. Currently, daily newspapers are distributed by private companies to cover street sales, home and office deliveries. However, there has been a significant increase in the number of publications, especially technical and niche market magazines, which lend themselves to distribution via the post to the subscriber. This market segment is fully liberalized.

9.3.2.7 Agency Services

The main objective of agency services is to utilize the postal system to provide profitable value added services on a competitive basis.

To ensure that the postal system is fully used for the benefit of society, it is essential that both the Government and the private sector make optimal use of the system as an agent for payment of the following among others:

- (a) Tax,
- (b) Municipal service charges,
- (c) Electricity,
- (d) Motor vehicle licenses, and
- (e) Pension.

In this regard, the Government will continue to support use of postal/courier outlets as service points that will enable citizens to enjoy e-government services at all points in the country under the *Huduma Service* initiative.

9.4 Postal Security

It's noted that Postal crime has the potential to bring not only property and financial loss to the postal service providers and the public, but also leads to the violation of privacy. These crimes also pose a threat to national security, environmental and bring along health related concerns. The need to put in place mechanisms for combating postal crime cannot therefore be overstated.

The current political, social and economic environment in the country and the region in general is witnessing security challenges and therefore adds to the need for appropriate measures to be taken

to ensure a safe and secure mail and courier network. It is also recognized that the prevailing terrorist activities rife in the region exacerbates the situation. This calls for the need by government to develop security guidelines to guide operators in the sector to address these inherent risks. Consequently the will continue to improve the security management framework in postal/courier circles with a view to addressing the above stated challenges.

9.5 Philatelic Service

The provision of philatelic services, which involve designing and issuing stamps, will remain an exclusive privilege of the PCK. Such services mirror the unique and varied nature of the Kenyan society, history, culture, heritage, institutions, flora, fauna, and events of outstanding national and international interest.

The CA will regulate and monitor the issuance of stamps particularly those of a commemorative nature.

9.6 Establishment of a National Addressing System (NAS)

The Government acknowledges that good addressing and high quality address data constitute an important part of a nation's infrastructure. Quality addressing and postcode systems are essential to the socio-economic infrastructure and development of a country. They also form the cornerstone of quality postal services, facilitating business transactions and hence the country's economic growth. The lack of a complete, correct and unique national addressing system constitutes a major socio-economic challenge for Kenya.

Worldwide, it has been accepted that addresses are an essential tool for economic and social development and that the existence of complete, correct and unique address data should be seen as being of fundamental importance for all countries.

Identified weakness in the existing postal addressing system in which mail is delivered through some 400,000 private office boxes and bags to a population of 40 million. The policy will emphasise the need to establish the new addressing system which will meet diversified needs of the public and enhance contribution to the national development.

9.6.1 Benefits of NAS

- (a) More revenue will be realized by tax authorities. This is because inadequate address system makes it difficult to identify and trace all businesses which are potential taxpayers and hence loss of a lot of revenue due to lack of proper postal codes and addressing system.
- (b) Remarkably boost e-commerce by allowing more efficient delivery of products and services including home delivery of mail and other postal/courier articles-this will enhance quality of services delivered by the postal licensees and a satisfied consumer so as to:
 - (i) Facilitate the reach of social and utility services (health, telephone, electricity, water, education etc) thereby promoting universal services;
 - (ii) Give equitable access to communication and other services to all Kenyans ;

- (iii) Enable authorities to provide and deploy emergency services(such as fire and hospital) faster and more efficiently;
- (iv) Enable development of data bases for customer management and marketing campaigns for better regulation;
- (v) Allow greater financial inclusion of individuals in banking and other services in a more secure atmosphere with ease of traceability. One of the reasons why small and microenterprises fail to access funds is the question of traceability;
- (vi) Lead to economic growth by reaching all sectors of our society;
- (vii) Enable maximization of the value of address for service planning, delivery and reporting in government service delivery which is becoming increasingly digitally based.
- (viii) Promote identity management as an increasingly necessary tool for emergency management/counter-terrorism, and for service delivery in the nation.

9.6.2 Policy Objectives

- a) Enable the National and County governments to combat corruption, use as location identifiers for state/public/businesses, help individuals secure a legal identity e.g. Identity Cards(IDs) or passports, facilitate planning/research/mapping/routing and implementation of public policies and services, fight against national disasters like fires and diseases, reinforce national/international security, better tax levy and critical for essential functions/ emergency services;
- b) Enable Businesses acquire accurate addressing systems to provide utility services like telephone, water, electricity, develop new markets, approach clients, access products including those ordered via internet, send mail, develop marketing campaign;
- c) Enable the People to be formally recognised as members of their communities, take on rights and obligations attached to their social role, have a simpler access to national/international markets.
- d) Enable the private sector to participate in the development of a national addressing system with distinct roles of various stakeholders under a private public partnership (PPP) approach.

9.6.3 Strategies

Development of a National Addressing System in collaboration with all stakeholders (such as Communications Agencies, County governments, Revenue Authority, National Registration Bureau, Urban Public Transport System, National Land Commission and the National ICT Backbone; Kenya Roads Agency ;Central Bank of Kenya, Students Loan Board, Kenya National Bureau of Statistics among others) by creating synergies between these agencies to:

- a) Better understand the problem, define a common action plan and implement it efficiently with a specified project team leader/chair preferably at Principal Secretary level;
- b) Project set up and concept building;
- c) Development of addressing standards
- d) Review and harmonization of Addressing and numbering works for Nairobi and other local authorities/counties;
- e) Integration of National Postcodes with Physical Addresses within Nairobi and the rest of the country;

- f) Review status of Nairobi and other county maps with a view to upgrading for the purpose of the addressing system;
- g) Review of the existing Geographic Information System(GIS)status for the pilot and other priority areas;
- h) Assessing the need for upgrading the GIS capacity at Survey of Kenya, Ministry of Lands;
- i) Development of the IT Databank;
- j) Sensitization and public awareness;
- k) Training requirements for groups managing the project including relevant benchmarking;
- l) Development of project monitoring and evaluation system.

9.7 Public Postal Service (by PCK)

Globally the traditional postal service sector is undergoing reform, fuelled in the main by the advent of the digital economy. The proliferation of electronic mail as well as other communication mediums, poses challenges for growth in the postal services market. The critical issue for postal service operators is how to respond to these new technological challenges.

Electronic substitution of traditional mail is accelerating as both consumers and businesses adopt electronic processes across multiple domains. Mail users are shifting from traditional hard copy distribution models to a variety of new ways to digitally communicate, advertise, or transact. The emergence of digital methods of communication has, however, not diminished the role and importance of postal services. The advent of modern networks, and broadband internet in particular, have provided new opportunities for the traditional postal services sector.

The digital revolution presents an opportunity as a disruptive innovation to the traditional business of postal services, and as such there is room for out of the box thinking to build new business models, which leverage off a thorough understanding of the evolving needs of citizens. A postal system can help to provide logistical solutions to integrate data flows, physical flows and financial flows.

Considering the services rendered today by the Postal Corporation of Kenya (PCK), the Government is supportive of PCK's continued mandate in terms of ensuring universal service.

The Corporation will be encouraged to modernise and utilise its extensive network and presence to support the delivery of government services, including e-government and Internet services to especially far flung rural communities and use them as service enablers rather than impediments.

9.8 Objective and Strategies

The policy focus is aimed at creating an environment that attracts increased investments in the postal and couriers services sector and allows the development of postal infrastructure and services that support national development goals. The postal market will be divided into the exclusive and non-exclusive market segments. The policy objective is for the Public Postal Service provider to focus more on logistics or provision of services through the following strategies;

- (a) Leveraging PCK infrastructure for government services such as tax filing, small business support, and Internet cafe services ;
- (b) Providing Internet services, delivering books and medicine ;
- (c) Providing basic internet services through wireless media ;

- (d) Harnessing PCK broadband infrastructure as the first touch point for government and other services, particularly in remote and rural areas.
- (e) Setting aside space and resources for training, airtime distribution, sale of end-user equipment; rolling out Wi-Fi hotspots in rural and semi-rural areas; and supporting cross-departmental rollout of further government services through PCK's extensive network.

10 COMPETITION

The Government will continue to review the existing ICT market structure to foster a competitive operating environment. The Government will further strengthen the regulatory frameworks and introduce measures to promote robust competition in order to ensure realization of the national policy goals.

11 RADIO FREQUENCY SPECTRUM

11.1 Introduction

Radio frequency spectrum is a public resource that must be focused on delivering public value. The optimum and effective utilisation of spectrum from social, economic and technical perspectives to enable the achievement of the developmental goals in our Vision 2030 will be the first consideration for the policy options which are expected to support the National Broadband Strategy and its positions regarding broadband for all.

Radio frequency spectrum is a limited natural virtual resource where, in certain frequency bands, the demand for spectrum far exceeds the amount of spectrum that is available. The radio spectrum is available equally in every country, and is a resource limited by technology and management capability. It is not a consumable resource.

Spectrum being a scarce public resource that can go to waste if not used optimally. The frequency spectrum will, therefore, be managed in line with public policy objectives, with a view to making it available to all users under specific and clear conditions.

This process will maintain a balance between the public and private interest. In the event of conflict, public interest shall prevail. Radio Frequency Spectrum (hereafter Spectrum) generates concerns about spectrum pricing, the fact that spectrum demand will inevitably increase as society moves through the "information age", creating a need for ever more "Information Bandwidth". In planning and allocating radio frequency spectrum, Kenya must take into account the outcomes of the International Telecommunication Union (ITU) World Radio-communication Conferences (WRCs). Spectrum management takes place within a regulatory framework comprising policies, legislation, regulations and procedures. Spectrum policy must provide for the harmonisation of spectrum bands to ensure spectrum efficiency and regional economies of scale in radio equipment.

Use of the radio frequency spectrum should contribute to the promotion of national interests, development and diversity, including increasing the amount of spectrum available for assignment, improving sharing conditions among different radio communication services and increasing the number of licences dedicated to community services.

11.2 Spectrum Policies

The Government may from time to time review plans for the use of specific frequency bands to ensure optimal utilization of the frequency spectrum. Spectrum will be allocated in an equitable manner.

11.3 Policy Objectives

The Government's objective in the utilization and management of the radio frequency spectrum is to achieve, inter alia:-

- (a) Transition to the next generation of mobile broadband networks such as deployment of LTE, and other advanced mobile broadband Networks;
- (b) Enhanced national security and defence;
- (c) Enhanced emergency preparedness against disasters;
- (d) Efficient national and international transportation systems;
- (e) Sustainable conservation of natural resources;
- (f) Efficiency in the dissemination of educational information and entertainment; and
- (g) Nationwide availability of efficient and affordable ICT services.

11.4 Realization of Policy Objectives

The ICT sector regulator shall be vested with the responsibilities of originating, planning and implementing the objectives through the relevant instruments such as rules and regulations governing the allocation and assignments of radiofrequency spectrum resources.

This shall include but will not be limited to originating and enforcing the relevant regulations for allocation and assignment of radiofrequency spectrum resources for rollout of broadband services to the county governments, as and when the resources are available. To encourage ICT infrastructure deployment across the country the CA shall consider reviewing spectrum charging methodology as well as consider providing appropriate spectrum fee rebates and other incentives on use of spectrum-efficient equipment.

To enhance public safety, security and emergency preparedness, spectrum fees may be waived for public institutions that provide critical life-line support services. The institutions may also include those that provide critical public services such as national security, public safety and emergency services. Such institutions shall be determined by the ICT regulator.

12 UNIVERSAL ACCESS

12.1 Introduction

The Government is committed to ensuring that ICT services are available throughout the country and will support the universal service availability and the widest access to such services. In order to increase the level of access to ICTs, the Government will provide the enabling environment for the private sector to play a complementary role towards achieving universal access targets.

12.2 Policy Objectives

The universal access policy objectives are:

- (a) Ensuring prudent management of the Universal Service Fund in accordance with its established objectives;
- (b) Ensuring that all citizens have access to ICT services (including Mobile, Internet, postal/courier and broadcasting) in accordance with agreed guidelines;
- (c) Encouraging efficient access to and use of communications systems and services throughout the Republic of Kenya, focusing on rural, remote and under-served areas in order to promote social and economic development;
- (d) Ensuring reasonable availability and affordability of basic and advanced communications systems and services to persons with disabilities, at the household and individual levels, particularly where the market is unable to deliver such services in a financially viable manner;
- (e) Supporting the development of Information, Communications and Technologies, including related human capacity and technological innovation;
- (f) Supporting the introduction and expansion of communication services to schools, health facilities and other organizations serving public needs;
- (g) Facilitating development of infrastructure and access to local and relevant content while ensuring that basic ICT services are made available at an affordable price; and
- (h) Strengthening the governance of USAC by the inclusion of licensed operators and/or industry professionals.

13 ACCESSIBILITY

13.1 ICT Accessibility by Persons with Disabilities

Kenya is a signatory to the United Nations Convention on the Rights of Persons with Disabilities (PWDs), which was adopted by the UN General Assembly on 13 Dec 2006 and came into force on 3 May 2008. The Convention stipulates that Persons with Disabilities have a right to access to information through different mediums with Article 9 covering accessibility including ICTs while Article 30 covers television programmes, films, theatre and other cultural activities.

The World Health Organization estimates that about ten per cent of the world's population has some type of disability, hence the need to take into consideration accessibility aspects for persons disabilities when designing ICT public policy.

13.2 Strategies

The main objective of this policy guideline is to provide a foundation for an accessible ICT environment in the country in order to enable persons with disabilities to take full advantage of ICTs. In this regard, the Government will where appropriate take measures to:

- (a) ensure that ICT services and emergency communications made available to the public are provided in alternative accessible formats for persons with disabilities (PWD);
- (b) review existing legislation and regulations to promote ICT accessibility for PWDs in consultation with organisations representing PWDs among others;
- (c) promote design, production and distribution of accessible ICT at an early stage;
- (d) ensure that persons with disabilities can exercise the right to access to information, freedom of expression and opinion;

- (e) require both public and private entities that render services to the public to provide information and services in accessible and usable formats for persons with disabilities;
- (f) Require content producers for distribution and public consumption in Kenya to produce such content in accessible format such as audio description, audio subtitles, captions and signing for access to persons with disabilities.
- (g) ensure that websites of government departments and agencies comply with international web accessibility standards and are accessible for persons with disabilities
- (h) provide incentives to providers of accessible technology solutions including software, hardware and applications
- (i) take such measures that will lessen the burden of acquisition of accessible technologies and associated gadgets by PWDs through fiscal means such as tax exemptions, subsidization, funding acquisitions, etc.
- (j) ensuring that licensed ICT service providers offer special tariff plans or discounted rates for persons with disabilities
- (k) Ensure that licensed providers of telecommunications services make available services and supporting technologies for persons with disabilities including emergency services, accessible public phones and relay services to enable persons with speech, hearing and seeing disabilities communicate with the rest of society.

14 Consumer Protection

The Government will:

- (a) Facilitate the protection of citizens at all levels through the development of relevant legislation and government policies. In addition, a series of policy measures will be prioritized to establish self-adaptive regulatory mechanisms in order to build a secure and reliable cyber space;
- (b) Develop and participate in cross sector and cross-border initiatives to further foster international cooperation and policy implementation; of consumer protection initiatives;
- (c) Recognise consumer rights and interests, which include but are not limited to: access to publically available information and services over the Internet, quality of service, consumer choice of ICT services, privacy, safety and security;; and intellectual property rights.
- (d) Support multinational cooperation and harmonization of regulations and initiatives are required in order to deal effectively with cross-border phenomena such as issues related to content and services;
- (e) Collaborate and cooperate with regional entities to deal with cross-national matters.
- (f) Encourage the development of Codes of Practice for service providers, including OTTs, to ensure that content, promotion and operation of services comply with all necessary consumer protection conditions;
- (g) Support the drawing up transparent rules on the terms and conditions for concluding contracts online, the form of such contracts as well as the related procedures;
- (h) Encourage the drawing up of complaints handling procedures that specifically encourage consumers to first seek redress with service providers and increase service providers' awareness of consumer needs, rights and responsibilities;
- (i) Take measures to ensure consumers including people with disabilities have easy and reliable access to ICT services;

- (j) Take measures to protect and educate consumers with different access needs who may be particularly vulnerable to deceptive commercial practices or have difficulties fully understanding terms and conditions of service.

15 SECURITY

15.1 Cyber Security

15.1.1 Introduction

Technological innovation and increased adoption of the electronic platform in the delivery of services has moved the Internet and related platforms from the periphery to the core of deliberations on the efficient utilization of technologies. Cyber security spans a wide range of technologies, systems, and users and it has become a national priority for the articulation of new integrated and comprehensive strategies for issues arising in this domain to be approached in a holistic manner.

Globalization and the pervasiveness of the Internet have given rise to new types of needs, rights and vulnerabilities. For secure electronic transactions to occur, an environment of trust must be created and sustained through the legal and regulatory apparatus. Cyber-criminals around the world are constantly seeking loopholes through which to perform illegal or illicit businesses. Any country that has inadequate cyber-law is essentially offering a safe-haven for cyber-criminals to act with impunity. The Government will create and sustain a secure cyber-law environment, in addition to already existing legislation.

15.1.2 Policy Objectives

- (a) Establish cyber security as a key objective of national security and establish sufficiently empowered office/agency to cover it;
- (b) The new generation of national cyber security strategies aimed at driving economic and social prosperity while at the same time protecting cyberspace reliant societies against cyber threats;
- (c) Support the development of a new generation of technologies that will lead to measurable, available, secure, trustworthy, and sustainable computing and communications systems, as well as associated management and policy tools that enable successful utilization of the new technologies;
- (d) Development information security standards for the ICT sector which are to be adopted and applied by all government agencies and recommended as best practices to private sector business. Sensitization and awareness of citizens will enhance the adoption of information security approaches and point towards the adoption of new attitudes and culture;
- (e) Development of appropriate legal and regulatory frameworks, technical solutions, law enforcement strategies within which diplomatic and intelligence related mechanisms will be called upon as appropriate for the detection and prevention of cyber threats given the extra territorial nature of cyber threats;
- (f) This policy recognizes that vulnerable populations such as children will require special focus to ensure that they are safe and derive value from the cyberspace;
- (g) Make the delicate balancing act of ensuring the efficient mitigation of cyber threats in order to promote trust and confidence with the objective of preserving the openness of the Internet as a platform for innovation and new sources of growth;

- (h) Establish an enabling legal framework and skills building within police and judicial system, aligned with Kenya's constitutional provisions, legislative and regulatory environment, and consistent with regional and global best practices;
- (i) Ensure that Kenya does not become a haven of cyber-crime.

15.1.3 Policy Challenges

- (a) Lack of skills in cyber security
- (b) Lack of awareness by community of issues
- (c) Mould the present legal framework and related institutional infrastructure, as it is not yet conducive to ICT development and application.
- (d) Address the inadequate regulatory capacity, especially in the face of convergence of networks and services.
- (e) Lack a culture that fosters adoption of internet security standards in certain sectors
- (f) Enacting specific and effective legislative instruments on privacy, security, cybercrimes, ethical and moral conduct, encryption, digital signatures, copyrights, intellectual property rights and fair trade practices.
- (g) Create capacity for research in ICT-related legal and regulatory issues.

15.1.4 Strategies

The Government will promote confidence and security in the use of ICT and will undertake not only appropriate legal measures but also, organizational structures, capacity building and international cooperation. These measures will have a positive impact including the following broad areas:

- (a) Network security and combat against spam;
- (b) Migration from IPv4 to IPv6;
- (c) Internet policy issues including cyber-security strategies and consumer protection;

15.2 Network Security and Reliability

The telecommunications infrastructure and networks are critical components of the national infrastructure. Operators will be required to ensure that such infrastructure and networks are robust and resilient and have adequate security, redundancy and backup arrangements.

The Government will in this regard, draft legislation to provide for network security and reliability protection of critical infrastructure in the country.

15.3 National Security

National security is of foremost importance in the attainment of all social, economic and political objectives necessary for stability and progress of the country. The Government and industry players will work together in ensuring that the Government's national security imperatives are met and will put in place necessary legislation to support this initiative.

15.4 Information Security

The government will develop information security policies and guidelines to ensure protection of the confidentiality, integrity and availability of information in accordance with Articles 31 and 35 of the Constitution.

15.5 Child Online Protection

As the Internet permeates every aspect of the economy and society, it is also becoming an essential element of our children's lives. While it can bring considerable benefits for their education and development, it also exposes them to online risks such as access to inappropriate content, harmful interactions with other children or with adults, and exposure to aggressive marketing practices. Children online can also put their computer systems at risk and disseminate their personal data without understanding the potential long-term privacy consequences. For the purpose of this policy:

- (a) "Children" encompass every human being below the age of eighteen years, recognising that a lower age threshold might be appropriate in providing certain legal protections; "parents" encompass children's parents and carers;
- (b) The "protection of children online" encompasses content risks, contact risks, risks related to children as consumers as well as information security and privacy risks faced by children on the Internet;
- (c) Stakeholders" encompass governments, businesses, civil society and the Internet community and other entities involved in maintaining a safe Internet and educating children.

15.5.1 Principles of Child Online Protection

- (a) Policies to protect children online should recognise that all stakeholders share responsibility both to make a safer online environment for children by reducing online threats to children, and to support the primary role of parents in evaluating and minimising risks of harm to their children online as well as offline;
- (b) Policies to protect children online should empower children and parents to evaluate and minimise risks and engage online in a secure, safe and responsible manner;
- (c) Policies to protect children online should be proportionate to the risks, effective and balanced. They should maximise the protection against online risks faced by children without restricting the opportunities and benefits of the Internet for children as well as for other users;
- (d) Policies to protect children online should not undermine the framework conditions that enable the Internet to operate as a global open platform for communication, innovation, economic growth, and social progress. The consistency of policies designed to protect children online with other economic and social Internet policies should be carefully assessed prior to adoption and implementation;
- (e) Policies to protect children online should be consistent with fundamental values of democratic societies as they apply to all individuals including children. In particular, they should support freedom of expression, privacy protection and the free flow of information;
- (f) Policies to protect children online should be age-appropriate and accommodate developmental differences and special vulnerabilities. Where age-based restrictions are established, all stakeholders should strive to ensure that such restrictions are respected;
- (g) Policies to protect children online should be technology neutral to ensure their sustainability in a dynamic environment characterised by rapidly evolving technologies and patterns of usage.

15.5.2 Child Online Protection Strategies

- (a) Develop a legislative framework that embraces CoP comprehensively through a practical multilateral, multi-stakeholder approach (Policy, Law, Technical, Education, Awareness);

- (b) Capacity building - Develop mechanism to equip relevant stakeholders with appropriate information;
- (c) Public awareness - Develop local public awareness information and content targeted at various target audiences;
- (d) Broader cooperation - Development of framework of engagement between local and international organizations and law enforcement agencies;
- (e) Technical measures - Foster the development of technical tools and services in the market that minimize the risk of expose of children
- (f) Research – to better understand the online habits of children and youth and facilitate identification and development of mechanisms to reduce their exposure to risks and vulnerabilities online;

16 HUMAN RESOURCE DEVELOPMENT AND TRAINING

16.1 Human Capital

Kenya is not the only country with insufficient numbers of skilled and experienced experts in ICT and in other professions that rely on ICT. It is therefore necessary to view Kenya’s human capital needs in the global context. Hard choices must be made between importing needed skills, and slowly nurturing them within the country. Other choices are needed on the priorities of realigning the educational and vocational training pipelines to meet the needs of our labour markets.

In addition, there are new opportunities in applying ICT to enhance education, including curriculum development, teaching methodologies, simulation laboratories, life-long learning and distance education and for teaching of not only ICT, but of all subjects and specialisations. If embraced appropriately and supported at all levels, these could transform the country’s human capital.

16.2 Policy Objectives

- (a) Increase the size and quality of ICT-skilled human resource base in Kenya;
- (b) Use ICT to improve the quality of delivery of education and training in all areas including distance learning, as well as to enhance the learning experience itself;
- (c) Expand and improve adult-education, life-long learning and both general and digital literacy programmes, notably for retraining and re-skilling the existing workforce. Making the use of ICT part of everyday life without excluding those that need skills development;
- (d) Encourage and support ICT training for political decision-makers, community and civil society leaders, as well as private and public sector executives;
- (e) Give special attention to providing new learning and ICT access opportunities for women and youth, the disabled and disadvantaged, particularly disenfranchised and illiterate people, in order to address social inequities;
- (f) Develop and deploy a nationwide e-Education system that supports schools, higher education/training facilities across the country by interconnecting them with each other and with relevant knowledge centres, providing curriculum integration while also generating

information to better shape policies, strategic plans and tactical decisions for developing education and vocational training in Kenya;

- (g) To foster interest among Kenyan academia sectors to conduct research and development activities related to ICT;
- (h) Incentivize industry with ICT specialization to conduct their own training programmes and to contribute to institutional training programmes;
- (i) Creating an environment that is conducive to foreign skills and skilled returning diaspora to come to Kenya and add capacity.

16.2.1 Strategies

The realization of the policy objectives will depend on the availability and adequacy of skilled human resource capacity. The Government will support the creation of the necessary capacity by:

- (a) Integrating IT subjects in the curriculum at all levels of education;
- (b) Establishing educational networks for sharing educational resources and promoting e-learning at all levels;
- (c) Facilitate Public Private Partnerships to mobilize resources in order to support e-learning initiatives
- (d) Promote the development of integrated e-learning curriculum to support ICT in education;
- (e) Promote distance education and virtual institutions, particularly in higher education and training;
- (f) Facilitate sharing of e-learning resources between institutions;
- (g) Exploit e-learning opportunities to offer Kenyan education programmes for export; and
- (h) Integrate e-learning resources with other existing resources.
- (i) Encouraging the establishment of ICT Centres of Excellence;
- (j) Encouraging and supporting ICT training for decision makers, community and civil society leaders;
- (k) Creating opportunities and providing assistance for the disadvantaged, people with special needs, women and the youth to acquire IT skills; and
- (l) Enhancing capacity for research and development in ICT.
- (m) Introducing incentives and measures to improve the training in the broadcasting and media to ensure qualitative and quantitative growth of the broadcasting sector.
- (n) Encouraging national professional bodies for media practitioners to participate in setting standards in broadcasting. Also encourage media training institutions to provide structured specialized programmes that cater for people with talent for creative writing, film production, animation creative and technical aspects of broadcasting
- (o) Engaging of women, youth and children, communities in underserved areas, and other disadvantaged groups, including people with disabilities, through e-inclusion and e-accessibility activities and programmes.
- (p) In order to have global competitiveness of ICT products and services the government will encourage universities to establish post-doctoral research fellow positions on contractual and attractive terms in order to attract world-class researchers.

16.3 Establishment of ICT Centres of Excellence

In order to increase diffusion of ICT knowledge, the Government will establish a national ICT Centre of Excellence with nationwide coverage, to promote capacity building and innovation. The functions of the ICT Centres of excellence will be clearly marked out vis-à-vis the other various centres of excellence in line with the identified ICT gaps in ICT capacity, knowledge and innovation with clear objectives and goals to ensure proper execution and sustainability.

17 KNOWLEDGE ECONOMY (TECHNOLOGY, RESEARCH AND INNOVATION IN ICT)

17.1 Introduction

The digital economy has become one of the most powerful engine to drive Kenya's economic development. The shifting toward the digital economy expected to facilitate Kenya's goal of creating a model of economic growth that is based on productivity, innovation and consumption.

17.2 Electronic Commerce

In recognition of the important role that e-commerce plays in economic development, its use shall be promoted in trade and investments as a means of integrating Kenya into the global economy. To this end, the Government will:

- (a) Support the development of e-commerce by enhancing existing legislation to support e-business including m-commerce;
- (b) Establish the framework for the role of intermediaries within the scope of e-commerce. To this extent, there shall be developed rules on the formal recognition of intermediaries, their role as well as their exemption from liability in e-transactions.
- (c) Support promotional campaigns to raise public awareness on the potential opportunities presented by e-commerce;
- (d) Develop a transparent, stable and effective legal operating environment and legislation that protects innovation and investment in e-commerce platforms;
- (e) Promote collaboration with the international community in developing an equitable framework for e-commerce and
- (f) Promote a secure electronic fund transfer and digital transaction payment system

17.3 ICT Trade & Export

In order to increase the contribution of the ICT industry to the national GDP, the government shall consider the following:

- (a) Adopting Open Data principles: - in order to spur digital innovations around public data held by county and national governments;
- (b) Promote local software industry:- the government will encourage giving preferential treatment to local software developers/solutions when tendering e-Government projects including requiring that a minimum percentage of the contract sum is reserved for local partnerships for skill-transfer purposes;
- (c) Support regional ICT exports:- by subsidizing Kenyan ICT companies to expand into regional markets;

- (d) Attract foreign ICT investments: - by ensuring a predictable institutional & legislative environment supported by good infrastructure (high quality broadband, clean energy, security, etc.).

17.4 E-Services

17.4.1 E-Health Services

Use of ICT in the promotion of e-Health delivery systems reinforces fundamental human rights by improving equity of access to healthcare and quality of life. The Government will promote use of ICT in health delivery by:

- (a) Provide an effective and cost efficient means for distributing health and disease prevention information to the public;
- (b) Build a health network that enables institutions and individuals to exchange electronic records, share information and deliver quality services in both urban and rural areas;
- (c) Assist health care workers by improving health care administration and management;
- (d) Improve the performance of health care facilities through the deployment of Health Management Systems;
- (e) Use electronic systems to ensure an efficient and standardized process for recording patient information;
- (f) Improve accessibility to medical research, information sharing and training through online educational programs and applications
- (g) Providing IT facilities in all public health facilities for administration and management of health processes;
- (h) Providing IT training to medical staff;
- (i) Setting standards and norms for IT in the healthcare system;
- (j) Developing legislation governing telemedicine, health information systems;
- (k) Establishment of national resource centres for IT in the healthcare system; and
- (l) Developing a central database on disease and treatment to be used as a shared resource tool medical personnel in various parts of the country to enhance prompt curative services and better public health management.

17.4.2 E-Agriculture

Agriculture is strategically important as it contributes a greater proportion of Kenya's GDP. The growth of E-Agriculture has the potential to accelerate rural development, promote food security, increase productivity and efficiency, reduce poverty and play an important role in agricultural value chains. However, despite advances in technology, most farmers still do not have access to or the capacity to use ICT in agriculture production and marketing. The global market changes, coupled with the advances in ICT and their impact on Kenya's economy, signal the need for a radical rethinking and approach to E-Agriculture and rural development. In order to integrate E-Agriculture in agriculture and increase its application across the country, the government will:

- (a) Promote local mobile applications targeting farmers in various geographical regions across Kenya;
- (b) Build ICT capacity in agricultural institutions, farmer organizations and groups;

- (c) Ensure use of ICT in agricultural extension and advisory services so as to be able to share information, enhance national food security and empower rural communities;
- (d) Encourage ICT infrastructure deployment across the country by mobile operators to enable access to agriculture mobile applications mostly using mobile phones. Note: Mobile phones are the most affordable forms of ICT even to a rural farmer;
- (e) Promote use of ICTs in agricultural research, development and innovation so as to be more responsive to farmers' needs;
- (f) Promote collaborations in agriculture using ICT among Kenya government agencies, private sector, farmers and other international organizations such as F.A.O and ITU.

17.5 Fiscal Measures

The Government will introduce policy measures to stimulate increased investment and growth in the ICT sector in order to create a favourable investment climate for the development of a globally competitive ICT enabled and knowledge economy. The Government's overall objective will be to:

Promote favourable fiscal policies to ensure that the country's ICT products and services are globally competitive by:

- (a) Removal or reduction of excise duties on mobile money services and airtime to promote financial inclusion and adoption of broadband access.
- (b) Removal of taxes on broadband devices;
- (c) Tax incentives to encourage local manufacture of ICT devices and infrastructure components;
- (d) Removal of withholding tax on ICT training services;
- (e) Support ICT initiatives by private sector through subsidies and/or tax incentives.
- (f) Promote duty free zones and incubation centres to attract ICT investment; and
- (g) Make budgetary provision to spur the growth of ICT.

17.6 Research and Development

The key rationale for marketing Kenya as an ICT destination is that previous focus of the ICT policy had been on liberalization and infrastructure development, but that by 2007 there was infrastructure yet the level of innovative usage had not been created. Consequently, the Government's focus will shift to support initiatives aimed at positioning Kenya as a preferred ICT destination of choice in the region by:-

- (a) Promoting ICT application research to address each policy priority area in the development sector;
- (b) Revamping ICT institutions to market the country as a preferred ICT destination and to facilitate the sharing of information;
- (c) Promoting and encouraging Research and Development (R&D) in ICT;
- (d) Encourage industry to invest adequately in R&D to promote local industrial growth and hasten technology transfer;
- (e) Promote and encourage transfer of technology between Kenya and international institutions and experts and fund the transfer of technology in conjunction with voluntary stakeholders.
- (f) Encourage the development of and stimulate the growth of a market for local ICT products and services;

- (g) Encourage universities and tertiary institutions to establish post-doctoral fellow research posts on contract terms to undertake R&D activities in collaboration with industry players and Government agencies; and
- (h) Establish R&D institutions in the counties to instil the spirit of innovation.

18 NEW INNOVATIONS AND SERVICES IN ICT

18.1 Introduction

The dynamic nature of ICT's continues to create new and emerging issues which pose new challenges in the governing, administration and regulation of ICT usage. Technological changes in ICT demand that there is corresponding changes in ICT infrastructure, applications, devices, legal and regulatory environment among others. These technological changes come with immense challenges in terms of resources, skills, infrastructure, and other amenities required in order to adapt to the new and emerging ICT technologies. Some of the emerging issues in ICT Include: -

18.2 Internet of Things (IoT) and M2M Communications

The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (IP addresses). IoT will address the problem of capturing data about things in the real world by reducing or even eliminating dependency of computers on human beings for information in favour of a system of interrelated devices with the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

For Internet of Things to be deployed successfully there is need to increase IP addresses, number of smart nodes and the amount of upstream data the nodes generate which is expected to raise new concerns about data privacy, data sovereignty and security.

18.2.1 Policy objectives

- (a) Immediate need for information privacy policy and legislation;
- (b) Ipv6 adoption;
- (c) Cyber/Information security;
- (d) IOT devices with regards to law enforcement;
- (e) Internet mobile and broadband coverage- promote expansion of coverage;
- (f) Create environment for local innovation to solve issues relevant to Kenya;
- (g) Adopt efficient frequency and spectrum management techniques.

18.3 Big Data

Big data is data that exceeds the processing capacity of conventional database systems. The data is too big, moves too fast, or doesn't fit the structures of known database architectures. To gain value from this data, alternative ways to process it must be choose. One of the ways is Machine to Machine communications whereby information is collected and processed by machines rather than human beings. The value of big data to an organization falls into two categories: analytical use, and enabling new products. Big data analytics can reveal insights hidden previously by data too costly to process, such as peer influence among customers, revealed by analysing shopper's transactions, social and geographical data. Being able to process every item of data in reasonable time removes the

troublesome need for sampling and promotes an investigative approach to data, in contrast to the somewhat static nature of running predetermined reports contained in data bases.

However Big Data and M2M communications comes with many challenges such as data of high volume, high velocity, high variety and veracity which requires new forms of processing to enable enhanced decision making, insight discovery and process optimization., privacy and data ownership, authenticity and security of different kinds of data, skills scarcity, and changing the attitudes of data professionals.

18.3.1 Policy objectives

- (a) Develop policy and legislation on information privacy and data ownership;
- (b) Standards on encryption technologies for M2M communications;
- (c) Government data consolidation;
- (d) National addressing policy; and
- (e) Policy around accessibility of geo-location data.

18.3.2 Strategies

The Government will:

- (a) Develop a Big Data Strategy in consultation with stakeholders;
- (b) Promote and accelerate the development, utilization and sharing of big data.
- (c) Promote the construction of a national big data platform and big data centres
- (d) Boost and promote big data collection, storage, processing, analysis, visualization and other key technologies while upgrading big data technology infrastructure;
- (e) Promote big data commercialization as well as the development of hardware and software products for big data applications.

18.4 Over the Top Services (OTTs) and Net Neutrality

Introduction

Over-the-top (OTT) is a general term for services utilized over a network that is not offered by that network operator. It's often referred to as "over-the-top" because these services ride on top of the other services and don't require any business or technology affiliations to the network operator. Often there are similarities to the service network operators' offer and the over-the-top provider offers. Both telecommunications and broadcast infrastructure has adapted over the last 20 years to be carrying data packets for internet distribution. OTT services operate by using these networks as packet transport networks to deliver content between devices, so that the network operator carries the packets but has no real visibility or charging authority over the service.

For instance the OTT messaging and voice services, offer a service that emulates the SMS and mobile voice services offered by Mobile network operators, yet the service is mainly used on a mobile device using data networks to deliver the packets.

Over the Top services run globally across the whole internet. They include both free services and paid services. As a result OTT services form a significant challenge to traditional telecoms operators by competing with traditional voice, messaging and video services that are charged to the consumer and

form the core business model of the operator. OTT services have also competed with and completely overtaken other business models such as the video/DVD rental business which now effectively have ceased to exist in its traditional form. OTT services however are one of the main drivers of internet adoption by consumers. Attempts by network operators to compete back with OTTs by throttling or blocking OTT services has led to a consumer led debate in many countries on the subject of 'net neutrality' where the consumer demands that OTT services will work well regardless of their choice of network operator.

OTT services can also bypass territorial regulations such as regulated tariffs, content control, taxes on services consumed, or encryption services which are invisible to lawful intercept and other regulatory aspects by being used by consumer, in a jurisdiction that can be far removed from that which the service is being delivered. Thus, in the countries where the service is consumed, the OTT service providers may be physically and legally present in a different territory which is not subject to the regulation.

A net neutrality policy may need to be developed to ensure fair competition between different content and service providers. However, a blanket open Internet policy could inadvertently undermine key policy objectives such as the promotion of innovation local content production and universal service

18.5 Policy Objectives

- (a) The policy recognizes that OTTs are largely technologically and legally out of reach of regulation but promote inclusion of OTTs into the Kenyan economy;
- (b) OTT services, both local and global, need to be able to develop in order to promote internet adoption and to allow locally innovated and hosted OTT services to arise;
- (c) Encourage eventual investment and contribution to the local economy by global OTT service providers;
- (d) Encourage local peering, and local content caching partnerships;
- (e) Encourage locally regulated telecommunications operators and broadcasters to develop their business models in order to effectively stay competitive in light of the challenge that OTT brings to their business models, but with awareness of the emerging issue of net neutrality.

18.6 Mobile Money

Mobile money in Kenya has enabled customers convert cash to and from electronic value (i.e. e-money), as well as use mobile money to perform transfers or make payments. This was borne out of the need to serve low-income customers profitably, particularly in rural areas.

Government has supported a market led approach to enable the thriving of mobile money services particularly by mobile money providers. Further, the Government has encouraged digital financial inclusion amongst Kenyans and this has also contributed to the uptake of Mobile Money services in Kenya. Digital Financial Inclusion has in turn contributed economic growth, offered convenience and consumer protection, and has reduced the vulnerability of a country's financial system by lowering the risks caused by the informal economy and widespread use of cash.

18.6.1 Policy Objectives

- (a) Align the relevant Government Agencies to develop legislation and regulations that embraces local innovation, as well as allowing a new class of financial service providers to sustainably provide digital payments and transfer services;
- (b) Provide an open and level playing field that offers mobile money service;
- (c) Address the risk of money laundering and terrorist financing;
- (d) Provide for protection of intermediaries offering mobile money transfer services;
- (e) Encourage Interoperability between operators offering financial services taking into account different commercial models, technical feasibility, standardisation and different models of mobile money interoperability;
- (f) Facilitate dialogue between providers, ensuring that mobile money transfer services bring value to the customer, makes commercial sense, is set up at the right time, and regulatory risks are minimised.

18.6.2 Policy Challenges

- (a) Interoperability can have a high cost to integrate there are large and small banks as well as MNOs in this arena and it becomes commercially debatable as to who funds the integration;
- (b) Emerging growth of virtual currency technology;
- (c) Scarcity of local software development skills specializing in integration protocols;
- (d) Alignment of banking and telecommunication regulation;

19 E-GOVERNMENT

19.1 Introduction

The overall goal of e-Government is to make the Government more result-oriented, efficient and citizen-centred. The e-Government strategy will focus on redefining the relationship between Government and citizens with the objective of empowering them through increased and better access to government services. The e-Government initiative will be a shared vision between the National and County Governments and the private sector and the implementation process will involve all stakeholders. The broad objectives of e-Government in all aspects of National and County governments will be to:-

- (a) Improve collaboration between Government agencies and enhance efficiency and effectiveness of resource utilization;
- (b) Improve Kenya's competitiveness by providing timely information and delivery of Government services;
- (c) Reduce transaction costs for the Government, citizens and the private sector through the provision of services electronically;
- (d) Provide for access to information held by public institutions, provide for information security and protection of personal information; and
- (e) Ensure automation of Government services and the extension of establishment of "Huduma" centres: one-stop centres for accessing all Government information and services by the citizens; to sub-counties.

19.2 E-Government Applications:

In order to improve productivity & ensure all citizens participate effectively in the information society, the government shall consider the following:

- (a) Automation of Government functions. – by undertaking Business Process re-engineering of government departments in order to identify opportunities for automation (e-Health, e-Transport, e-Agriculture, e-Lands, etc.);
- (b) ICT Integration into the economy - by promoting the use of ICTs across all public and private sectors (within SMEs) in order to increase productivity and competitiveness of the overall economy;
- (c) ICT integration in Education – by reviewing and ensuring that the basic & tertiary education curriculum and teaching methods are geared for the knowledge economy (Digital Literacy Program);
- (d) Digital Villages- by promoting the creation of information centres/digital villages (e.g. Huduma centres) across all counties;
- (e) Providing affordable public internet access points (Wi-Fi) built around digital primary schools.

20 E-ENVIRONMENT

The Government will promote the use of environmentally-friendly IT products to address environmental and cost issues. This will include developing regulations for recycling and disposal of used ICT equipment.

Development of modern broadcasting facilities will be carried out sensitively to minimize their environmental impact. As a prerequisite for grant or renewal of licenses, applicants must demonstrate their readiness to minimize the effects of their broadcasting infrastructure on the environment. This should include provision of appropriate recycling/disposal facilities for waste that may contain toxic substances.

It is important that in development of ICT facilities, due regard is taken so as to minimize their environmental impact. The Government will therefore ensure that ICT players and consumers minimize the effect of infrastructure appliances, machines devices and tools.. To this end, the Government will provide incentives for the adoption of best practices to encourage reduction of carbon footprint, efficient energy management, e-waste recycling, water tower restoration, afforestation and eco-rating of ICT products.

Government will enact laws on sectors of society to enforce environmentally friendly disposal of ICT hardware products.

21 EQUITY PARTICIPATION

The Government will encourage Kenyans to participate in the sector through equity ownership. Consequently, any firm licensed to provide ICT services shall have at least 20 percent Kenyan equity ownership. Licensees shall have 3 years to meet the local equity ownership threshold and may apply to the Cabinet Secretary for an extension with appropriate justifications.

However, for all listed companies, the equity participation shall conform to the existing rules and regulations of the Capital Markets Authority (CMA).

The Government will support upcoming small-scale operators through proactive measures.

22 REGIONAL INTEGRATION

As a member state of the East African Community (EAC) and a signatory to the East African Common Market Protocol, the Government is committed to implement policies and programmes to promote regional integration. In this regard the Government is at the forefront in championing the harmonization of ICT policy, legal and regulatory frameworks within the EAC region. The Government will remain proactive in exploring new areas of collaboration with EAC member states on ICT policy and regulatory issues and related matters that serve to advance the objectives of the EAC Common Market Protocol for the benefit of the citizens of the East African region.

Initiatives will include inter alia:-

- (a) Measures to secure cross border broadband connectivity to enhance cross border trade in goods and services;
- (b) Promote high speed broadband connectivity between the major cities of the East African Community, COMESA and Africa to facilitate electronic transactions between the African Union Member States
- (c) Continue to participate in the “One Network Area” initiative that aims at ensuring a marked reduction in roaming rates for various communications services within the region;
- (d) Inclusion of ICTs as components of all ongoing and upcoming regional projects as has been the case with northern corridor infrastructure projects; and

23 POLICY, LEGAL AND REGULATORY FRAMEWORK

23.1 Introduction

The Ministry of ICT will provide strategic leadership in the implementation of this policy in consultation with other stakeholders.

23.2 Institutional Arrangements

The following will play important roles in the development of the ICT sector:

- (a) Ministry of ICT;
- (a) National Communications Secretariat
- (b) Communications Authority of Kenya
- (c) ICT Authority
- (d) National Cyber Security Agency
- (e) Communications and Multimedia Appeals Tribunal
- (f) Postal Corporation of Kenya
- (g) Media Council of Kenya
- (b) Development partners;
- (c) Civil Society;

- (d) Investors and Operators;
- (e) Consumers/users; and
- (f) ICT Professional Bodies.

23.2.1 Ministry of ICT

The Government's role in the sector will include, inter alia:

- (a) Strengthen existing institutions and assign appropriate ICT priority areas to them to champion and deliver on the objectives of the policy. In particular, specific targets will be agreed upon and reviews made to determine the extent to which they are being realized;;
- (b) Develop, coordinate and implement both the ICT policy and the monitoring and evaluation (M&E) framework across all sectors of the economy to ensure that the implementation of ICT programmes and projects is effective to support the social and economic sectors of the economy; and
- (c) Provision of an enabling environment for investment in the sector.

23.2.2 National Communications Secretariat (NCS)

The National Communications Secretariat which is the Communications Policy Advisory Secretariat, established through the Kenya Communications Act of 1998 will continue to be the policy advisory arm of the Government on all matters pertaining to the ICT sector.

23.2.3 Communications Authority of Kenya (CA)

The CA as the Sector Regulator, established through the Kenya Information and Communications (Amendment) Act, 2013 will play its role as the converged regulatory body for the sector in accordance with the relevant provisions of the Constitution of Kenya, 2010.

23.2.4 Information and Communications Technology Authority of Kenya (ICTA)

The ICT Authority will continue to play its broad mandate of fostering the development of ICTs in Kenya (including businesses, innovation and capacity building), implement and maintain systems and technology for the Government, oversee the development of integrated information and communication technology (ICT) projects, and to develop and enforce ICT standards for the Government. The authority is also tasked with enhancing the supervision of the Government electronic communications.

23.2.5 National Cyber Security Agency

The emerging technologies including but not limited to Cloud computing, Big Data the ongoing research on new technologies and the current wave of connecting everything online thus exposing the country's economic development and security vulnerable to new threats. In view of these new and emerging developments, the Government will establish a national Cyber Security Agency to serve as an institution that shall be vested with the responsibility of overseeing and mechanisms of protecting against these advanced internet based crimes.

The functions of the Agency will include:

- (a) Protection of government communications and information systems against penetration of its databases and systems, securing the network from network warfare. This shall include but not limited to detection, prevention and management of cyber risks and data breaches in accordance with ISO 27001 series of standards and their successors; and

- (b) Decoding translation and information Analysis.

23.2.6 Communications and Multimedia Appeals Tribunal

Disputes arising between parties in the ICT sector will be heard and settled by the Communications and Multimedia Appeals Tribunal (formerly the Communications Appeals Tribunal) which was reconstituted through the Kenya Communications (Amendment) Act, 2013.

23.2.7 Postal Corporation of Kenya

The Postal Corporation of Kenya is a Public Commercial Enterprise operating under the PCK Act of Parliament 1998. The Corporation's mandate includes provision of accessible, affordable and reliable Postal Services to all parts of Kenya as the Public Postal Licensee.

23.2.8 Media Council of Kenya

The Media Council of Kenya established through the Media Council Act, 2013 will play its role of promoting and protecting the freedom and independence of the media, prescribing standards of media practitioners and media enterprises, facilitating resolution of disputes between the government and the media and between the public and the media and intra media and establish media standards and regulate and monitor compliance with the media standards.

23.2.9 Development Partners

Development partners will play a complementary role towards realization of development of the goals and objectives of this policy. Within the ICT policy framework, the Government will foster linkages with various development partners to provide financial, material, technical assistance as well as build capacity for sustainability.

23.2.10 Civil Society

The role of the Civil Society will be to inform the policy making process by making relevant contributions in regard to inter alia, ICT access, e-Education, poverty reduction and e-Governance.

23.2.11 Investors and Operators

Investors, operators and service providers play an important role in the sector, and will be required to:

- (a) Participate in the provision of universal service/access;
- (b) Develop a sector with efficiency, credibility, commercial integrity and good corporate governance;
- (c) Provide quality and sustainable service with pluralism of choice to consumers; and
- (d) Keep abreast with and participate in ICTs both regionally and internationally.

23.2.12 Consumers and Users

Consumers and users will be expected to participate in ensuring:

- (a) Universal access and affordability of ICT services;
- (b) Quality of services is maintained; and
- (c) Continued review of Government policy in accordance with technological and consumer trends.

The Government will support consumer protection efforts in accordance with Section 46 of the Constitution of Kenya, 2010.

23.2.13 ICT Professional Bodies

The Government will recognize and encourage the formation of national ICT professional bodies registered under the laws of Kenya to foster professional ethics, standards and human resource development in the sector.

24 MONITORING AND EVALUATION

Failure to monitor the implementation of ICT policy measures at an early stage can delay ICT developments and reduce the effectiveness of policy measures. Key components of an ICT policy review include: identifying key challenges and solutions; implementing mechanisms for ICT policies, plans and programmes; monitoring and review, coordination mechanisms; and institutional framework and stakeholder analysis.

The realization of the outputs of this policy will require consistent monitoring and evaluation of the outcome indicators that will help policymakers to:

- Quantify achievements regarding the implementation of ICT policy measures as foreseen in national ICT plan(s);
- Identify critical success factors, international best practices and conditions, as well as reasons for failure to be able to adjust and reform ICT policies; and
- Formulate new policy decisions to support and accelerate ICT penetration in government, businesses and the society

The Ministry of ICT together with other stakeholders that includes the Communications Authority of Kenya, National Communications Secretariat and ICTA shall carry out monitoring and evaluation at different levels of the impact of implementation of this policy. A monitoring and evaluation framework shall be developed to ascertain medium and long-term impact of the policy across Government arms. The policy shall receive a mid-term review every three (3) years and a long term review every five (5) years in order to cater for the fast rate of technology innovation and advancement.