Online Discussions

Draft ICT Policy 2016

Online Discussions Report

22nd June - 6th July 2016

Acknowledgments

We wish to thank the Ministry of Information and Communications Technology, Strathmore University Law School and KICTAnet (Kenya ICT Action Network) for supporting the Online Discussions on the draft national Information and Communications Technology (ICT) Policy. Special thanks to KICTAnet members who made this particular Online Discussion one of the most lively and informative in recent times. We are sure your contributions will inspire each Stakeholder in a special way and provoke them to action that that will strengthen the Information and Communications Technology Industry.

J. Walubengo, Barrack Otieno (Moderators)
KICTANet, Online Collaboration Programme.
jwalu@yahoo.com or Otieno.barrack@gmail.com
12th July 2016

Executive Summary

The Government of Kenya through the National Communications Secretariat embarked on a process to review the ICT policy that was developed in March 2006 through a multiStakeholder approach. The review of the policy is inspired by the need to align it with the new constitutional dispensation in Kenya and vision 2030 that seeks to transform the country into a leading Information and knowledge hub in the region.

The review is also meant to provide a proactive policy and regulatory framework that is not only in sync with contemporary technological realities and dynamics, but is also expected to guide the orderly development of the ICT sector so as to ensure maximum developmental impact for the benefit of all Kenyans.

This revised policy is expected to provide a clear and compelling roadmap to drive social, economic, cultural and political transformation through the effective use of Information and Communications technology 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.

It is against this background that the Kenya ICT Action Network (KICTANET) conducted an online discussion on two platforms that is the KICTANET List Serve and the Jadili platform courtesy of the Strathmore University Law School.

The ten day discussion was structured along the following thematic areas:

How to Develop ICT infrastructure (Day 1-Wed 22nd June 2016)

Telecoms, broadcast, broadband internet, postal
Investment incentives (foreign direct Investment, equity Shares)
Open Access
Infrastructure Sharing (masts, ducts, way leave)
Spectrum Management
Postal/National Addressing System
Data Centers, IXPs, CDN

How to Develop ICT Info-Structure (Day 2-Thursday 23rd June 2016)

Local Content,
Broadcast content, diversity, Cultural Identity
Access to Information/OpenData
Local Application Development

How to Develop Skilled Human Capital (Day 3-Fri 24th June 2016)
ICT integration in primary, secondary, tertiary levels,
Specialized Skills (Software /Engineering)
Research & Development Capacity
literacy for citizens/public

How to enhance Universal Service & Access (Day 4-Mon 27th June 2016)

Universal Access (Infrastructure)
Universal Service (people with disabilities)
Affordable Internet broadband Services

Affordable User Devices

How to develop the local ICT Industry (Day 5- Tue 28th June 2016)

eCommerce, National Addressing System

Local eBusiness,

Business process outsourcing

Investment incentives (Equity Shares)

ICTs in SME, (Small Medium Size Enterprises)

ICT regional export incentives

Local device manufacturing

How to accelerate eGovt Services (Day 6- Wed 29th June 2016)

eHealth, eAgriculture, transport, eGovt, eLearning

ICT regional (county) incentives)

ICTs in Society, Culture

How to enhance Cyber security (Day 7) – Thursday 30th June 2016

Online citizen safety

Child protection

Privacy issues

Security business transactions (Info-Security)

Security & Reliability of Critical ICT infrastructure

Emerging Issues (Day 8) -Fri 1st July 2016

Internet of Things, M2M

Net Neutrality & OTT

Big Data

Virtual money/Block Chains

Institutional, Legal & Regulatory Framework (Day 9-Mon 4th July 2016)

Role of Regulator, USAC, CERTs, NCS, ICTA, PCK, CSO, Professional Bodies etc

Needed Legislation, Data Protection, e Transaction, Intermediary Liability etc

DAY 10, Tue 5th July -Wrap up Closure

Introduction

Background

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 ICT's were at infant stages of development in Kenya. Since then the country has experienced new developments and convergence of ICT technologies hence the need to review the ICT policy 2006 to ensure it is in sync with current trends in Information and Communications Technology.

Program Setting & Description:

The Ministry of Information Communications and Technology initiated the review of the ICT policy 2006 through a process of public consultations. 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.

The draft ICT policy was subjected to further scrutiny on the Kenya ICT Action Network List serve, Strathmore University Law Schools Jadili Platform through a ten day online discussion that gathered views from members of KICTANET.

Program Design (Data Collection, Data Processing)

Data Collection:

The Online Discussion was structured along the following themes that were discussed electronically over a period of 2 weeks according to the following schedule:

How to Develop ICT infrastructure (Day 1-Wed 22nd June 2016)

Telecoms, broadcast, broadband internet, postal)

Investment incentives (FDI, Equity Shares)

Open Access

Infrastructure Sharing (masts, ducts, way leave etc)

Spectrum management

Postal/National Addressing System

Data Centers, IXPs, CDN

How to Develop ICT Info-Structure (Day 2-Thursday 23rd June 2016)

Local content,

Broadcast content, diversity, cultural identity

Access to Information/Open Data

Local Application Development

How to Develop Skilled Human Capital (Day 3-Fri 24th June 2016)

ICT integration in primary, secondary, tertiary levels,

Specialized skills (Software /Engineering)

Research & Development Capacity

eLiteracy for citizens/public

How to enhance Universal Service & Access (Day 4-Mon 27th June 2016)

Universal Access (Infrastructure)

Universal Service (PWD)

Affordable Internet broadband Services

Affordable User Devices

How to Develop local ICT Industry (Day 5- Tue 28th June 2016)

eCommerce, National Addressing System

Local eBusiness,

Business process outsourcing

Investment incentives (Equity Shares)

ICTs in SME, (Small Medium Size Enterprises)

ICT regional export incentives

Local Device Manufacturing

How to Accelerate eGovt Services (Day 6- Wed 29th June 2016)

eHealth, eAgriculture, eTransport, eGovt, eLearning

ICT regional (county) incentives)

ICTs in Society, Culture

How to enhance Cybersecurity (Day 7) - Thrs 30th June 2016)

Online Citizen Safety,

Child Protection

Privacy issues

Security business transactions (Info-Security)

Security & Reliability of Critical ICT infrastructure

Emerging Issues (Day 8 -Fri 1st July 2016)

Internet of Things, M2M

Net Neutrality & OTT

Big Data

Virtual Money/BlockChains

Institutional, Legal & Regulatory Framework (Day 9-Mon 4th July 2016)

Role of Regulator, USAC, CERTs, NCS, ICTA, PCK, CSO, Professional Bodies etc

Needed Legislation, Data Protection, eTransaction, Intermediary Liability etc

DAY 10, Tue 5th July -Wrap UP Closure

Data Processing:

The various contributions from the Participants were analyzed and collated into a report.

Aim: To present the draft ICT policy 2016 to KICTAnet members for further feedback as well as collection of input from the ICT community and other e-participants in Kenya. The ediscussion was also extended to the ISOC_Kenya and Skunkworks mailing lists that have close to 1500 participants.

Objectives

The Objectives of the e-Discussion were:

- To share the draft ICT Policy 2016
- To obtain input from e-participants
- To begin to build consensus on the policy implications

Main Outcomes/Deliverables

The key outcomes of the exercise included:

- Summarized participants contributions
- Final report for subsequent dissemination to members and other stakeholders

Tools

Online Tools (email, list server, internet)

Resources

Moderator (Online)

Participants (Online)

Web Resources

Day 1 of 10, How to develop ICT Infrastructure

Focus was on the following issues:

Telecoms, broadcast, broadband internet, postal
Investment incentives (FDI,equity Shares)
Open Access
Infrastructure Sharing (masts, ducts, way leave etc)
Spectrum management
Postal/National Addressing System
Data Centers, IXPs, CDN

The moderator sought input from listers on action required to ensure a robust Telco/ Internet, broadcast and postal environment from and infrastructure perspective.

The following feedback was received from list serve members:
Ali Hussein:
The performance or utilization of the National Optic Fibre Backbone (NOFBI) must be brought into review. According to the ICT Authority website:- The ICT Authority is implementing Phase 11 of the National Fibre Optic cable. The construction begun in September 2014 and is expected to be complete by June 2016. The second phase will build 1,600 KM of fiber linking all the 47 county headquarters and an additional 500KM dedicated for military use. This is in addition to the existing 4,300 KM of NOFBI I completed in 2009. NOFBI phase1passes 58 towns in 35 counties. To date: 1200Km out of the 1600KM civil works are completed, 900Km of fiber has been laid in the backbone section.
The backbone section is now complete and fiber installed in all the 47 counties (Kajiado County fibre in NOFBI I was damaged by road construction) and capacity to connect Kajiado County headquarters will be sourced from other operators whose fiber is along the power line to Namanga.
Metropolitan fibre civil works has been completed in 35 of 47 counties.

NOFBI Phase 1 is already in use in the national government, Telkom, Safaricom, Jamii Telecom and KENET are utilizing more than 3,000KM of the cable.

The operations and maintenance of NOFBI Phase 1 is being handled by Telkom Kenya.

Read more:-http://www.icta.go.ke/national-optic-fibre-backbone-nofbi/

We must now move to the next stage of critical evaluation of this Critical Infrastructure.

a) What are the learning's?

b) What could we have done better?

c) What are the bottlenecks to last mile connectivity?

d) Why haven't our connectivity costs reduced considering that most of the telco's are using this backbone which is a national resource?

We are stepping on the shoulders of giants who envisioned this resource for the country. We must make absolutely sure that we squeeze every ounce of the advantage it has given us.

e) Why are we not in the top 50 global internet penetration rankings? Make no mistake about it. Our competition is not Africa. It is global.

The **Universal Service Access Fund** is a commendable initiative but too often there hasn't been much information on the impact the critical resource is having. My suggestion would be to have an interactive real time map showing its impact and why certain regions are chosen to receive a bigger allocation and not others. This should be linked with Infrastructure sharing and last mile strategies to provide connectivity from the NOFBI.

Way Leaves. There has to be robust engagement with counties to ensure that ISPs and Telcos are not held to ransom by short term county revenue hunting at the expense of spreading ubiquitous broadband connectivity. This is so critical that a clear strategy paper needs to be put together by all stakeholders to guarantee its implementation.

We need to examine the road blocks that hinder us from achieving universal broadband connectivity.

Alex Watila

Data Centers – How does GOK plan to utilize the cloud? Should the building of data centers be left to private sector and GOK MDA's procure the services? In the US agencies such as CDC are now using Amazon cloud instead of building their own ICT infrastructure.

Infrastructure Sharing – Data Centers can also be shared among GOK MDA's. In Liberia, MOH and MOE are looking at using each other's data centers as disaster recovery centers.

John Walubengo

We talk of infrastructure sharing, when one of the biggest infrastructure project, the National Fiber Optical Cable remains quite underutilized. It may be reaching all counties but how many counties use it beyond accessing government IFMIS services?

There seems to be little leveraging on this cable beyond mandatory government services with private sector largely preferring to duplicate their own fiber. The question is what Policy intervention do we need to increase usage?

Perhaps a redefinition of the management structures? Or serious incentives for private Telco's - if they light/use NOFBI as the backbone (which they will not unless they are sure of the stability of the operational /management issues).

This also brings in the Equity /Shareholding issues. TEAMS (submarine cable) seems to work better since the Shareholding and Operational management issues seem to be more spread around.

Data Protection laws required to make Kenya an attractive data centre destination.

Cost of energy and reliability needs to be addressed to make Kenya a competitive data centre destination.

Barrack Otieno(BO):

Packaging, marketing or branding of NOFBI to citizens is important.

There is need to fix the trunking issue, we need a solution. We can have trunking provided by County governments for use by all operators at uniform rates. Some county governments have discouraged the spread of the Internet with ridiculous requirements for laying fiber.

Including a provision for Internet Infrastructure in the building code to make it easier for Infrastructure Service Providers to provide connectivity to clients.

John Gitau

The idea for **community broadband initiatives** should be revisited and NOFBI should not lie idle. It should be used to offer free or very near free backhaul. When we discuss content we may even find that

if enough content is generated locally, then it’s up to whoever needs it to figure out how to get it from that 'local community'.

The above will drive a need for CDN and even local exchange points.

Infrastructure sharing is something that should be encouraged. Other areas like wifi roaming etc are not very popular here but there is a limit to the number of ssids i can authorise on my phone.

Other areas in systems that require quick action are general systems design in areas like DNS, load balancing parental controls etc that never get mentioned but are critical.

IPv6 - hard to discuss infrastructure without how it’s addressed. This is so important for the near future we should probably form a taskforce immediately to come up with recommendations and an implementation plan. There are countries where governments are taking charge of their IP address management as an LIR.

Day 2 of 10 : How to develop ICT Info-structure

The second day focused on the following issues:

Local Content,

Broadcast Content, Diversity, Cultural Identity

Access to Information/Open Data

Local Application Development

The moderator enquired from participants the steps required to develop a vibrant local content industry.

The following feedback was received from participants:

Barrack Otieno

We need to enforce the airing of local content as way of promoting uptake of the same. This has been a subject of debate recently in the media.

We need to promote a culture of documentation, there is need to strengthen Kenya News Agency in this regard.

We need to strengthen Synergies between all the actors in the content industry, not sure if this role should be given to KFCB or KNA.

Mildred Achoch

Incentives for content creators:

Reduce the license fee required to make a film and maybe even waive it for non commercial and student films.

Embed content creation into the school curriculum.

Toepista Nabusoba

Most media houses emphasize fresh and new content and may regard archive material as old yet archived material can be repackaged and replayed after months even years (I like what foreign media do with their archives) while Kenyan media have units on almost all social subjects they score dismally on archival material which inform our past and future in all almost all aspects.

When it comes to archiving of content especially broadcast some media houses are still grappling with the use of ICT's. Media houses need a policy on archived content (if lacking-KBC's is hazy and adhoc), if they have such a policy then obviously it's not functional and needs revamping. Individuals and institutions in need of archived content (from media houses) have a difficult time accessing that content even when they have the money to purchase and often forced to resort to dubious means to access.

Network for non formal educational institutions:

With regard to broadcasting we have a big challenge with startup cost. More companies should be given licenses to put up infrastructure. We are still taking content by hard disk to upload to a server in Limuru or at KBC.

We don't have infrastructure to broadcast in some part of the country like Northern Kenya. Some companies have been licensed by the Communications Authority but are still waiting to get a channel from PANG or SIGNET.

The cost of broadcasting is too high which is the reason why most of the broadcasters are in one region. To promote local content development, the government will need to invest in studios and broadcasting space and equipment that can be hired at a small fee to upcoming broadcasters and content developers.

Michuki Mwangi:

Research & Developement is the bedrock of innovation. We need to invest more in R&D both from private sector and public sector. ICT organizations need to have R&D budget or make it a part of their Corporate Social Responsibility. Perhaps there should be fiscal incentives for private sector that invests in R&D. Government t needs to set aside budget for R&D in ICT. Huawei has over 70,000 staff members in R&D spread across 16 centers in 9 countries (none of which are in Africa). In your spare time read up on the WEF info on top countries for R&D or the Fortune report on top R&D companies.

We need to ensure that the content ecosystem exists and thrives. For the ecosystem to exist, all the barriers i.e policy, capacity building, infrastructure, etc should be tackled. Here is an example, Chama soft is a well used local solution - question is why is it hosted abroad? Why can't local solutions compete? Or what do we need to do to make local solutions compete with similar international hosting platforms that host most of our local content?. If we brought M-PESA home, we can clearly bring everything else back.

We need to build trust and confidence that when the content is available, especially online, it will be accessed by all and at all times. For instance, decisions to block Internet access do not encourage e-

commerce in any way.

Toepista Nabusoba:

Unfortunately so some parts of the country and specifically North Eastern do not receive broadcasts and actually attend to broadcasts from neighboring countries. Last year i had an opportunity to visit West Pokot and the residents complained that the digital migration did not favor them because they were actually switched off. N.E is particularly disadvantaged with few stations. KBC in such regions continues to broadcast on shared frequencies i.e Rendille, Borana, Burji, and Turkana(radio stations) and some in Western share the same frequency with each station broadcasting for only four hours. In some instances the signal is even off for whatever reason. Although some people from N.E (who are financially able) listen to radio on their digital platforms. N.E is one of the regions where people listen to radio in groups (groups is probably a culture thing but it's also a fact that many do not own a radio). Let me also add that KBC has been in the process of placing some of the stations on their own frequency so they can broadcast 24/7 such stations that moved from shared frequencies include; Maasai (Nosim FM, Somali (Iftiin FM) Luo (Mayienga FM) etc. The national broadcaster however still has challenges with infrastructure. I am not a technical person but i wonder what the ministry has been doing since the digital migration to ensure more access to information. Of course there is the move by the ministry to divide KBC into three entities but this is yet to happen.

Grace Githaiga:

KBC holds a lot of historical content that should be digitized and made available to those interested. I know many people in the diaspora who would want to have old music that is not easily available and footage that goes way back to 1963.

Is it possible as a strategy to compel the National broadcaster (assuming it still gets support from the exchequer) to digitize content that is of national and cultural value to this country, and make it easily available to the public and local broadcasters at a subsidized cost to cater or administration costs?

Mwendwa Kivuva:

We have concentrated more on broadcast media and entertainment while talking about local content. Michuki has tried to balance the debate. I would like to hear from an ISP perspective, or even the IXP

on what type of content passes through their network. The most popular services in Kenya are google.com, youtube.com, facebook.com, yahoo.com, twitter.com, instagram.com, wikipedia.org. Throw in local news websites like nation.co.ke and standardmedia.co.ke.

Apart from the ubiquitous MPESA, and local news, we are generally not generating any local content of any value. What opportunities do we have for local content? We have had extensive debates on the case for local hosting, latency, keeping local traffic local, etc. local content would entail low hanging fruits like no government official sends an official email from a yahoo account.

There has been positive effort by various stakeholders on local content. I want to credit the government and other players like Google for the wonderful work they have done, in digitising the Kenya gazette, and the Kenya national archives. kenyalaw.org is a shining star on how local content can be made available for the masses. The Africa ICT Policy database by CIPIT at Strathmore http://ictpolicy.org/ is also something we should applaud. The Universities in Kenya especially the University of Nairobi has an extensive repository of all their dissertations, thesis, publications, speeches, etc http://erepository.uonbi.ac.ke/

We can start and continue with the low hanging fruits, then build on them. There is still an extensive amount of information out there that can be converted to meaningful local content.

Local content is tied at the hip with local hosting. There are still areas that can be improved to ensure we have quality affordable local hosting. These are affordable and reliable power supply (for powering and cooling), affordable reliable broadband (the undersea cable is our saviour here), multihoming, physical security, and economies of scale. To put things into perspective, the Utah data center in US require 65 megawatts of electricity to run annually. Kenya's current effective installed grid electricity capacity is 2,200 megawatts. For that reason alone, colocation costs in Kenya re still 10 times more than those of Europe and US.

Day 3 of 10: How to develop skilled Human Capital

The third day focused on the following issues:

ICT integration in primary, secondary, tertiary levels,
Specialized Skills (Software /Engineering),
Research & Development Capacity,
ELiteracy for citizens/public.

The moderator enquired from discussants proposals for policy interventions that would ensure that the country churns out a constant supply of skilled manpower necessary to drive the digital society. The following feedback was received from discussants:

Ahmed Mohamed Maawy:

There should be endorsement and support to setups like SwahiliBox - which are hubs and innovation spaces - finding ways to make it easier to not only train, but also certify and expose individuals. Policies should make it easier for such organizations to equip themselves, to get access to government incentives and support. Especially in an Internet enabled global marketplace.

Hubs are also strategic opportunity building venues, they create opportunity spaces for individuals whom they skill and who get exposure to the programs they offer. Recently, for instance, a program SwahiliBox did known as the Code Challenge transferred skills more than 10 individuals on real life app development scenarios. The next stage is developing opportunity spaces for the individuals and for the hub.

Ali Hussein:

Human resource development and training. The policy document mentions the establishment of ICT Centers of Excellence. I propose the government goes one step further and Establish The Kenya Institutes of Technology (KITs) fashioned around the Indian Institutes of Technology.

The Indian Institutes of Technology (IITs) are autonomous public institutes of higher education, located in India. They are governed by the Institutes of Technology Act, 1961 which has declared them as institutions of national importance and lays down their powers, duties, and framework for governance etc. Each IIT is an autonomous institution, linked to the others through a common IIT Council, which oversees their administration. The Union HRD Minister is the ex-officio Chairperson of IIT Council.

The IITs have a common admission process for undergraduate admissions, called IIT-JEE, which was replaced by Joint Entrance Examination Advanced in 2013. The post-graduate level program that awards M-Tech, MS degrees in engineering is administered by the older IITs (Kharagpur, Bombay, Madras, Kanpur, Delhi, Dhanbad, Roorkee, Varanasi, Guwahati). M.Tech and MS admissions are done on the basis of Graduate Aptitude Test In Engineering GATE). In addition to B.Tech, M.Tech and MS programs, IITs also award other graduate degrees such as M.Sc in Maths, Physics and Chemistry, MBA, PhD etc. Admission to these programs of IITs is done through Common Admission Tests (CAT), Joint Admission Tests for Masters (JAM) and Common Entrance Examination for Design (CEED). IIT Guwahati and IIT Bombay offer undergraduate design programmes as well. Joint Seat Allocation Authority 2015 (JoSAA 2015) conducted the joint admission process for a total of 18 IITs, ISM Dhanbad.

John Gitau:

Specific to service providers and general internet practitioners; I have found that network operator groups and community driven initiatives in partnership with various institutions and government add a lot of value. I am talking the likes of nanog,menog,eanog,tznog,various user groups etc. Most are sponsored by the likes of ISOC, CISCO, service providers, governments and volunteer trainers like myself and a few other people lurking in this group and across the globe.

For a while now there has been no effort compared to 10 years ago to train good systems and network engineers. We have people who can 'write apps' but don’t understand how the internet really works or DNS or how to set up a web server, how to load balance, how to scale their infrastructure, or how to set up a wireless network - properly.

Extending those to all counties starting from basic training on how the internet works to advanced topics would in a couple of years ensure each corner of this country has people that can run and

support the infrastructure we are working so hard to build. In some areas we have to start at the basics probably/hopefully from primary school

Wangari Kabiru:

Many often we have ICT related initiatives for students/pupils but very silent on teachers/lecturers. End result is ZERO output.

High levels of dropouts; do we have ICT training programmes for those who do not make it to University? This is a large pool of talent that should be participating in the knowledge economy and may often no one remembers them.

Let's start very early. Not just teaching how to use technology but how to develop new technology. High school at the very minimum. The approach matters too: passing ICT exams doesn't necessarily mean top tier software. Design thinking, critical thinking, right work ethic all matter.

Internships, apprenticeships. Formal learning only goes so far. Folks need experience. Many people I know doing pretty well in ICT started out as internships, grew and learnt new things, took on more responsibilities over time.

Grace Bomu

I would like the policy to cater for the issue of transfer of technology and knowledge. While it is a given that many government/public sector ICT tenders may be given to large corporations and multi nationals, ICT sector should lead the way in transfer of technology and knowledge in these projects. This may be structured to take in young graduates from youth polytechnics, colleges and universities as well as other Kenyan professionals. The ICT policy must help us to get to the point where we can measure in terms of number of people who gain useful skills for Kenya's economy from every ICT project whether at national or county level.

Dorcas Muthoni:

May I suggest starting very early. With the laptop project, I hope some computer studies curriculum is now starting in standard one. If not, let the computer "anatomy" begin here.

Having said that, may I propose a National Tech Congress for primary, secondary schools and teacher training institutions similar to the National music festivals or the Science Congress.

This will allow students and teachers who take special interest to pursue projects and be noticed right

from the school systems to national level.

I think this can allow kids to feel encouraged to be innovators and inventors.

Kelvin Kariuki

More and more government services are getting online, i.e citizen, HELB, KRA e.t.c. The truth is Citizens are having a great deal of trouble in accessing and using these services due to ICT illiteracy. That is why they are flocking to Cyber Cafes to seek these services.

My suggestion is Universities and other middle levels colleges should offer free basic ICT training to the communities living around them in form of a CSR. I don't know how possible this is but in my view it can greatly improve the ICT illiteracy problem.

Universities and other tertiary institutions should be used to train and increase citizen e-Literacy. I however disagree on the 'free' part.

Perhaps we could find a way (Policy or Strategy clause) for Universities/Colleges to get a bit of the Universal Service Fund to do eLiteracy training for the public.

Collins Areba

Technology changes at an astounding rate, this means playing as we have in matters education, by the time a curriculum is developed, materials prepared, teachers taught and schools prepared, the technology to be taught is obsolete. (I learnt PASCAL in engineering school when CNC was obsolete)

Most computer concepts can be taught at Kindergarten. I am supporting a school with kids as young as Kg2 starting to learn about computers, playing with tux** games and having a feel of the environment around computers. With the proliferation of mobile phones and tablets as gaming devices, maybe we need to rethink how to introduce structure to the learning process, and not to rigidly set the content.

I feel like we seem to be emphasizing on a certain subset of IT when learning / teaching kids, maybe we need to develop a platform agnostic approach. A few years ago introduction to computers had the basic parts of a computer that honestly, are hard to use today in an era of monitor / cpu fused into one. With touch devices, Input / output devices are one.

The challenge is two faceted. There needs to be an upgrade program both on the teaching front, and on the learning front. It may take a continuous learning process akin to the CPD in medical industry, meaning certifications for computer teachers might have to be on a quarterly (or annual) basis. Because

what was taught last year can't be what would be taught next year.

I would love for us to draw lessons from France Vs England re: the Industrial revolution. One was top down, the other was opened up environment for exploration and experimentation, we all know what happened.

Mercy Njue:

The government should come up with a council that helps regulate the curriculum, standards, infrastructure etc which will in return help Universities main industry standards. I have seen and interacted with Council for legal education(CLE), and they thoroughly help propel legal profession standards, to the extent of defining the admission requirements, facilities of the university that should exist for you to offer the program, curriculum, practical sessions, publications by students. I find it very holistic.

Day 4 of 10: How to Enhance Universal Access and Service

The discussion focused on the following topics:

Universal Access (Infrastructure)

Universal Service (PWD)

Affordable Internet broadband Services

Affordable User Devices

Public e-Literacy

The moderator sought feedback from participants on ways of utilizing the Universal Access fund to serve underserved areas. The following feedback was received from the discussants:

Ali Hussein:

The Universal Service Access Fund is a commendable initiative but too often there hasn't been much information on the impact the critical resource is having. My suggestion would be to have an interactive real time map showing its impact and why certain regions are chosen to receive a large portion and not others. This should be linked with Infrastructure sharing and last mile strategies to provide connectivity from the NOFBI.

Way leaves in my humble opinion are a major stumbling block to achieving Universal Access. Some counties think that this is a major income earner. We need to dissuade them from this myopic thinking. There has to be robust engagement with counties to ensure that ISPs and Telco's are not held to ransom by short term county revenue hunting at the expense of spreading ubiquitous broadband connectivity. This is so critical that a clear strategy paper needs to be put together by all stakeholders to guarantee its implementation.

What are the roadblocks that hinder us from achieving universal broadband connectivity?

Grace Githaiga:

Apart from the Interactive map, it would be useful to have half yearly reports showing the exact disbursements, not just as a matter of transparency, but also for encouraging the Telco's that have to contribute to this fund.

Further, clear criteria on how to arrive at who gets funded would be useful. I have in mind projects that may be supported due to political patronage (my MP insisting), but do not warrant such funding.

In addition, the need to have public interest representation in that USF board.

Timothy Oriedo:

Universal Access entrench public institutions and corporations to expand availability. Initiatives like the now defunct Posta satellites be relaunched to drive penetration of the usage to the rural areas. Kenya Power company be mandated to carry fibre infrastructure on the poles to match the electricity penetration footprint.

Universal Service: People with disability have a better opportunity now than ever before to have their needs mainstreamed. Government to make a provision that makes it mandatory for the product developers and devices owners to allocate funds for R&D to improve the service offerings. Braille technology could be provided on digital platform more cheaply, speech recognition software's for Cerebral Palsy children, Voice automation solutions for Blind and a host of other learning materials that Innovators be encouraged to develop. A special incentive be given to spur the development.

Affordable devices: Innovation for local product developers and tax concessions for importers of mass market phones.

Public E-Literacy: Creation of multimedia learning content to drive literacy at different levels from adult education to early childhood education. Delivery format for educational learning ought to be through devices.

Affordable Internet Broadband Innovative pricing by Telcos that will be tied to consumption and geo tagged to locations. Increase momentum on initiatives like internet.org by partnership with corporates to sponsor villages and sectors to access affordable wifi connection.

John Walubengo:

Universal Access (infrastructure);

We must resolve the shared infrastructure challenge. All operators know it is silly to dig across the

road, only for the competitor come over the following week do re-dig over the same road as they lay cable. Unfortunately this policy issue goes beyond ICT and the Road/Public works and County Gov must be willing to participate/enforce this.

Affordable Services.

Theory says that if the cost of infrastructure goes down (e.g through sharing), then the cost/price to the consumer will drop - at least in a competitive environment. But competition in contemporary digital services is complex, dynamic and continues to evolve.

For example, are mobile operators competing with other operators or they are competing with Banks and Broadcasters (TV, Radio Stations)? Perhaps the correct answer is that mobile operators simultaneously compete and cooperate with all of the above. We need new approaches to effectively deal with pricing of communication services since competition alone will not bring down prices.

Persons with Disabilities (PWD).

Very few TV stations have sign-language speakers. Most government websites have no provision/options for the blind and deaf. I think we need a specific policy statement on this so that effort/funds can be subsequently allocated for those who are challenged one way or the other. In developed economies, you find traffic lights designed to be 'seen'(heard) by the blind. That might be V2030 for us but we need to start seeing evidence of this in government documents.

Public eLiteracy:

Currently most utilities (Power, Water, Land Rates, Parking, etc) have adopted electronic mode of payment. I have to travel 400Km away from Nairobi to upgrade my dads e-Skills on this so that he can continue to execute these tasks. These new services are convenient, but we must make provision for what the developed countries call continuous learning. Let's make (budgetary) provision for local tertiary institutions to increase our eLiteracy rates. I heard someone say we use Universal Service

Funds, but others argue that one should not access funds they never contributed to. Either way this needs to be sorted.

Day 5 of 10 : How to develop the local ICT Industry

The following topics were discussed in day 5:

ecommerce, National Addressing System

Local eBusiness,

BPOs

Investment incentives (Equity Shares)

ICTs in SME, (Small Medium Size Enterprises)

ICT regional export incentives

Local Device Manufacturing

The moderator enquired from participants the policies and strategies needed build new ICT enterprises whilst integrating ICT's in existing enterprises.

The following feedback was received from participants:

John Walubengo:

National Addressing System: We may need to have a multistakeholder approach for setting up the National Addressing System. It seems PCK is not demonstrating sufficient 'oomph' to see this through. Get courier guys, technology partners to work this out, including sorting out the management and operation of the same in a mutually beneficial basis (ref: TEAMs setup).

BPOs: Need to review this strategy and think of IT enabled services. We want accountants, doctors, teachers, architects offering their services remotely to developed nations.

ICTs in SMEs:-How can we get the jua-kali artisan automating their accounts. An opportunity for cloud-services right here to allow these guys to use online accounting systems, along the spirit of the Safaricom M-Ledger (keeps records of your money records in the cloud at minimal cost.

Regional Export: Apart from Seven Seas who have tried to reach regional markets, we need to see more indigenous ICT companies being supported by the government to venture abroad. In other words we need a policy framework for encouraging this rather than leave it to :- 'whom do you know in government' type of environment.

Local assembly/Device manufacturing: We need an EPZ model for the light manufacturing industry. I suspect there is a comprehensive government paper on Special Economic Zones on the same even though it never seen the light of day. What could be the bottleneck? Lets find out and unlock it.

Timothy Oriedo:

eCommerce, National Addressing System - Fastrack the process by leveraging on the existing governance instruments e.g provincial administration, census reports and nyumba kumi initiatives. This foundation will be critical to open up e-commerce .Only a small linkage is needed if the different government organs can communicate to each other.

Local eBusiness: Develop contemporary regulatory space for the e-business by synergising global trends to local legal environment.

BPOs encourage Universities to set up hubs for BPOs as product extensions of their academic offerings. This centers will also serve to provide Internships to students reducing the load on seeking internship opportunities outwards.

Investment incentives (Equity Shares): Create a culture of encouraging local investors to adopt a mentorship attitude rather than competitive attitude by coming out to support start ups acceleration with a view of benefiting from equity.

ICTs in SME, (Small Medium Size Enterprises) Partner with Ministry of Industrialization and entrench a continuous training program for the SME sector that will create a digital posture of the sector. Rebates and concessions granted to spur interest as a sizeable proportion of the operators in this category are laggards.

ICT regional export incentives: Cross border trade agreements and pacts to leverage on our leadership position.

Local Device Manufacturing: partnerships of device manufactures with research oriented institutions **to create labs for R&D of devices:** Especially for products targeting the low end of the pyramid.

Mwendwa Kivuva:

National addressing system: Let us talk about building standards, and better city planning going forward, especially for the new counties. There is a point where we will have to get organized. It cost

the same amount of money to have better planned cities and unplanned neighborhoods like Rongai. It's actually more expensive to be disorganized. We will one day bring down all those structures as we did in Mlolongo and Thika highway. There was a regulation that was being discussed asking household owners to pay an annual fee for the national addressing system. Is that still on? Is it viable?

BPOs and ITE: There are local successful players in this industry including daproim.com, adept-techno.com, samasource.org, and Techno Brain. The University of Nairobi offers a BPO-ITES short course to kickstart the industry. These guys in collaboration with Kenya IT and Outsourcing Services (KITOS) can give us very valuable input on the ITES industry.

There are many services that the ITES industry can do like Impact Sourcing, Transcription, Data entry, Creative writing, Proof reading, Online research and content management, Social media management (online presence), Email copy, Uploading online posts, re-purposing, Email copy, Image creation, Book keeping, Website maintenance, call centers, Sentiment analysis, and content moderation. The Industry in worth several billion dollars, with a virtually insatiable market. This is an industry that can bring the unemployment levels for our youth to zero. I am happy that Konza Silicon Savannah has put ITES in the front of the Queue

Kenya, let us wake up and smell the coffee. In 2008, India had revenues of US$10.9 billion from offshore BPO and $30 billion from IT and total BPO. Other locations like Philippines, and South Africa have emerged to take a share of the market. The BPO Industry in the Philippines is employing 1.2 million workers with $25 billion in revenues, while the South African call centre industry has grown by approximately 8% per year since 2003 and it directly employs about 100,000 people, contributing 0.92% to South Africa's (GDP). Is Kenya on track?

Wangari Kabiru

eCommerce - Growth highly tied to financial services as it is about exchange of value; innovation, convenience, security

National Addressing System - building codes as a regulation; may be caught up with new construction works with a requirement to be "digi-compliant" as part of the standard code.

Keep in mind in all urban cities and townships of rural areas, there are sprawling informal settlements and slums - how to apply this otherwise masses are left behind.

Academia front; what courses are ongoing or to be created to support this

With the massive infrastructural developments, tie up e.g the road works with the fibre works or any other visionary works that support ICT developments so that we do not have double work done, e.g airport works, SGR railway works

Back to inter ministerial relations on policy matters

Ali Hussein:

A review of the ICT Start-up ecosystem is totally lacking in this policy document. It is imperative that we do a deep dive of this ecosystem and ensure that private and public/government efforts are aligned. It is nonsensical to think that this sector will become world class without private, public and government working in tandem.

Some of the areas to look into:-

a) Capacity building for entrepreneurs

b) A regulatory environment that is super conducive to the ecosystem while protecting the public good.

c) Access to markets outside the country

d) Access to cheap capital.

One thing that is glaring is that a lot of these work in silos. A mash up of higher learning institutions, hubs, incubators, accelerators and businesses need to be prioritized to achieve true breakthroughs.

Of all the learning institutions I can single out Strathmore as the one closest to achieving true synergies between government, private sector and the start up community. This needs to be emulated by the rest of the country.

Wangari Kabiru:

For something to have an effect, it needs to be part of the "day to day"; part of school life, workplace, shopping experience, eating time experience.

-One-off Hubs i.e what we have now have got their place; flexible, responsive, trend setting

-Hubs to become part of the life experience; even with specialization

-Academia and Community hubs funding from public kitties; not just reliance on donors

Intrapreneurship;

Too much experience and talent by persons working in organizations with resources is going wasted

Incentives to Private Organizations to promote; This may be through the Membership organizations and associations

Back to R&D

Private Sector; Training &

Development

We have a few still great ones. While we fail here with many firms

Most of private sector cannot stand up to be counted in HRD through training

This is the way to keep growing the skills of the people

Government

Public interest is held by the Government

Allocate competitive funds for bids by organizations to manage incubation programmes

Is there something like a National ICT Skills inventory?

Like the way we know the number of Opticians in the country and their specializations

This would apply to higher order ICT skills

While forecasting into future needs and skilling for the future needs

So TIVETs plug in to release skills not just by number of people.

Mildred Achoch:

Awards, prizes, competitions can be a good way of developing the local ICT industry. Academic institutions can be at the forefront of this. Here is an example: http://www.raeng.org.uk/grants-and-prizes/international-research-and-collaborations/africa-prize

Day 6 of 10 : How to accelerate E-government services

Participants focused on the following topics on day six:

eHealth, eAgriculture, eTransport, eGovt, eLearning

ICT regional (county) incentives)

ICTs in Society, Culture

The moderator sought to understand the bottlenecks that prevented the public from utilizing electronic services offered by the government. The following feedback was received from participants:

Timothy Oriedo

Its commendable that some of the government projects and initiatives have taken off, case in point is Huduma centre, which over and above operating an E-platform, prides itself in customer service excellence which goes a long way in winning the public confidence.

The question then is what makes is the barrier towards replicating the success of such projects across the ecosystem?

This one question if answered will provide a framework for the implementation of a successful system across board.

One key gap that sets us back is cultural in nature, the silo mentality that Government departments operate in. To create a successful ecosystem there needs to be a shift. This cultural shift will not be won by hardware nor system installation but active engagement with the players to shift mindsets. This can then be followed up with policy regulation framework to funnel into singularity of purpose.

This recognition ought to inform the policy decision to gear towards a conscious mindset transformation that will entrench culture shift alongside the other policies.

Mercy Njue:

As the government automates there is need to look into business continuity. For example, when sending emails to some of the government bodies you find that the mailbox is full, or mail server is down for quite some time. During peak times when returning tax returns, website accessibility becomes as an issue. As it(Government) automates, there is need for compliance in business continuity.

Grace Gitahiga:

"ICT insofar as they have a direct impact on the way cultural expressions are created, produced, disseminated and accessed and play an increasingly pertinent role in the safeguarding and transmission of cultural heritage, can respond to major global challenges through the exercise of freedom of expression and the promotion cultural diversity."

http://www.unesco.org/new/en/media-services/singleview/news/culture_and_ict_as_drivers_of_sustainable_development/#.V3Nuz_TXenM

ICTs are an important reservoir in the urgent work of archiving Africa's traditional knowledge and traditional cultural expressions. But more than that, ICTs are sites and drivers of new cultural expressions (from animation to memes; film; e-books etc.) and as such, there is need to recognize, protect and promote the widespread use of ICTs in our new creative industries whose value in social and economic development is priceless. You just need to check #KOT on twitter on a day there is a hot topic in this country to see the creativity.

Is there a way we can use ICTs to protect the original work of Kenyan innovators in terms of legislation and technological infrastructure? Can these creative's on twitter start earning from their work?

This contribution can also be moved into the content part but I am looking at ICTs in culture and society.

Muchiri Nyaggah:

I believe egovernment suffers most when the silo mentality is not addressed and when it is itself yet another silo. From the more mundane issues of lack of interoperability at the hardware or software level to the unwillingness of departments to collaborate across ministries due to perennial turf wars and the disconnect between those in technology planning/acquisition and the real world.

For instance, Agriculture, Health, Education, Transport, ICT, Labor and Finance have to coordinate. Nutrition sits in two ministries (Health and Agriculture) and is affected by all the others. Agriculture relies on all the others for infrastructure, human capital and financing while being joined at the hip with the non-communicable diseases department of the Ministry of Health. Policy guidance on government programming and coordination therefore provides the state with a framework for implementation of its development agenda and guidance for implementation and support of eGovernment. Everything is

interconnected/interdependent and that acknowledgement should be evident in how egovernment is implemented as well as the sector strategic plans.

The Kenyan government has made strides towards better coordination, especially with the program-based budget approach and adherence to the medium term planning framework but a lot more needs to be done to ensure systems and personnel are on the same page as those developing policy for coordination and integration. With minimal political interference. One way to make things better is to ensure those in the ICT Authority responsible for eGovernment have a seat at the table in the Medium Term Plan committee, the MTEF committee and the intergovernmental coordination institutions like IBEC and the Intergovernmental Technical Relations Committee.

It is important to recognize county governments in the draft ICT policy. This is not the case at the moment.

Rosemary Koech-Kimwatu:

It would be great if there was increased information sharing between the various government agencies especially from a customer service perspective. This will reduce the red-tape involved in the handling of basic information about citizens in the various state agencies. Making applications in various agencies is tedious and repetitive, once the government has a Citizen's ID and PIN everything else should be smooth sailing no matter the entity.

There is need for harmonization. A good entry point would be the Council of Governors committee responsible for ICT. Being non-techies and already keenly aware of the development agenda they are implementing in the counties it would probably help to ‘de-silo’ the eGovernment conversation at the sub-national level. Thereafter convening the CECs for ICT together with their national government counterparts (Ministry and ICTA) into a policy forum would create an opportunity to bring the public sector actors together to agree on harmonization of standards, priority areas, timelines and to explore financing options. The CECs probably already convene under the Council of Governors so there would be no creation of a new body as such. The input from the forum would be presented to the Intergovernmental Budget and Economic Council via the CoG Committee responsible for ICT and hopefully inform resource allocation down the chain.

Network for non formal Educational Institutions:

For e- learning. I would wish to have the role of KICD very well stated as facilitative rather than policing. The policy should encourage teachers to invest in e-learning. It is very sad that our teachers retire as farming ,small business etc. I think teachers can build a goldmine if only they were well facilitated and trained in content development and have portals where they can upload to and make money and continue teaching .

I would wish to see the Government set up studio space in every county for teachers to digitise content at highly reduced cost.

Day 7 of 10 : How to Enhance Cyber Security

The following topics were discussed in day 7:

Online Citizen Safety,

Child Protection

Privacy issues

Security business transactions (Info-Security)

Security & Reliability of Critical ICT infrastructure

The moderator sought to understand policy interventions that would assist in mitigating Cyber attacks against digital national assets. The following feedback was received from participants:

June Tessy:

Do we really need another 'specialized' agency yet there are already existing units in Government and Regulators that are mandated to deal with these like the National Intelligence Service, ICTA, CA Perhaps building onto the already existing units in terms of resources and capacity may be more sustainable

Sam Oduor:

On the subject of data retention - can this be expounded with regards to duration, accessibility of retained data - how fast and also impact on budget for providers to meet the cost of retaining data.

Gideon:

On today's important topic how to enhance Cyber security, i will zero in on the awareness of the end user. Most of the time the end user may not know that they are a subject of an attack and that boils down to the need for basic knowledge sharing on what constitutes a cyber attack and how to secure your own system from viruses, malware and lately ransomware among other attacks.I believe many users need a constant reminder to update their system protections and also know what and where not to click, this could help a lot. On the issue of privacy, i did a paper on social media and privacy, and from my small survey, i discovered not many users of these platforms had read or knew about what their rights as regards privacy, personal data among other key implements. Therefore again I call for constant

efforts for awareness

Henry Maina:

I can attest that there is an inter-agency team working on a Computer and Cybercrime Bill, 2016. I joined the team after we analysed a draft that was developed by the ODPP. While a Zero draft is yet to be finalised. I know that we agreed that it will not address itself to hate speech issues. I was therefore taken aback by the CS Mucheru position yesterday which seemed to make references to the 2014 Draft Bill developed by the ODPP other than the one being developed by the Inter-agency committee. See a link to our analysis of the old 2014 Bill

https://www.article19.org/resources.php/resource/37652/en/kenya:-cybercrime-and-computer-related-crimes-bill

The inter- agency Bill is looking at five main areas/offences:

1. Unauthorised access including unauthorised disclosure of access codes/passwords;
2. Unauthorised interception and unauthorised interference
3. Computer fraud and forgery
4. Child pornography
5. Cyber-stalking and cyber bullying

Alex Watila:

As I read through the policy I wonder how much work has been done to link with other policies.

For example, KEBS has been pushing for the adoption of ISO 27001(Information Security Management Systems) standard by Kenyan Organizations.Applying a best practice like ISO 27001 would prevent organizations from having to reinvent the wheel.

Ahmed Mohamed Maawy:

It is worth noting that service providers (software, etc) in Kenya pay very little attention to providing content on Privacy Policy and upholding such policies - if ever they did develop them in the first place. The fact that end users have no idea they are entitled to privacy is not a small issue. It's tied to consumer rights and abuse of these rights because there is no policy around it. I think policy needs to make any publicly available service provide a privacy policy at the least. And this should be applicable

throughout the board - including on e-government sites and services.

Civil society organizations should also be encouraged to train consumers on consumer rights and privacy. Because I know for a fact people outside these forums have no idea what it is really about.

Maryana Nandeche Munyendo:

Child online protection has largely been dominated by players from the non-profit sector (more so due to the funding aspect) and I strongly feel the business sector should actively participate. Global Compact Kenya through the Kenya Association of Manufacturers (KAM) has been spearheading the Children's Rights and Business Principles (CRBPs) – a joint initiative of the Save the Children Sweden (SCS), UNICEF and the UN Global Compact. The CRBPs are the first comprehensive set of principles which guide companies on the full range of actions they can take in the workplace, marketplace and community to respect and support children's rights, and this extends to the cyber space to address things like privacy, exploitation and data collection.. Some Kenyan corporates are already signing up on the Charter and I think they would be more receptive to joining policy mobilization for child protection on the online space as well.

Ali Hussein:

There is need to simplify online agreements

Day 8 of 10 : Emerging Issues

Day 8 focused on the following issues:

Internetof Things, M2M
Net Neutrality & OTT
Big Data
Virtual Money/Block Chains

The moderator sought the opinion of discussants as to whether the new policy should recognize and facilitate further development of emerging technologies. The following feedback was received from participants:

For the first time Net Neutrality is being given a voice. But not far enough. We need clear direction on this important issue. Where do we stand on:-
Ali Hussein:
Net Neutrality
1. Third party liability?
2. Fair and equitable treatment of Internet traffic?
3. Zero rating of services?
4. I understand that Tespok did a study that showed an increase in data revenue from OTT and messaging services like YouTube and WhatsApp. It would be interesting if we could see that report or failure of which (as Tespok is a member based Organisation and may choose not to share it with the general public) CA may need to step in.
5. Finally can the new regime tell us once and for all whether Kenya finally signed WCIT12 and what prompted the change of heart?

Mobile Money and the new reality of Blockchain Technology. Let's not beat about the bush here. The

very leadership position that has been achieved by our adaption of Mobile Money is at risk by burying our heads in the sand when it comes to Blockchain Technology.

We need to stop thumping our chests about the phenomenal success of Mpesa. The reality is that Mpesa is only successful here in Kenya and a few other countries. Mpesa stopped innovating in this space years ago. It's time for a new reality. Mpesa is yesterday's news. Let's start creating a new narrative. We need a Global Champion. The likes of PayPal, eBay, Google etc. and we have it in us to do it.

Kenya, and Africa are again at risk of being left behind. No other than the Governor of the Central Bank is on record saying that we shall wait and see what the West does before jumping in. I respect the man alot but I think engagement with the nascent Fintech Space in Nairobi together with the ICT Ministry is long overdue. We MUST chart our own path - And it needs to be a pioneering path not a follower path. We need a clear policy statement from the ICT Ministry on this.

I'm reliably informed that the ICT Ministry and the Central Bank has formed or will form a joint committee to look into the adaption of BlockChain Technology. I may have missed this but is there a representative(s) from the private/banking/Fintech space? Sometimes I get the feeling that this country's leaders still don't get the spirit of the New Constitution we promulgated in 2010. I would like to humbly remind ourselves of this:-

The constitution was presented to the Attorney General of Kenya on 7 April 2010, officially published on 6 May 2010, and was subjected to a referendum on 4 August 2010. The new Constitution was approved by 67% of Kenyan voters. The constitution was promulgated on 27 August 2010.

In the spirit of Uzalendo and moving this country forward let us share more and consult more extensively. This exercise of subjecting the new ICT Policy to this level of public scrutiny and intellectual discourse on a list like Kictanet is unprecedented. And highly commendable, This certainly shows the willingness and openness of the leadership of CS Mucheru. It's not a coincidence that he and

PS Victor Kyalo are founder members of Kictanet. Intellectual discourse, sharing and engagement is in their DNA. I must however caution them that they must shine daylight into EVERYTHING that involves the public good. This new discussion on Blockchains is good for the public and the nascent FinTech community. We CANNOT and MUST NOT let vested interests prevail in the corridors of power at the detriment of the country at large.

It may well be that this country decides that BlockChain Technology will do more harm than good to us. However, I humbly suggest that decision should not be left to a few individuals. No matter their station in life or government. A robust platform of discussion and consultation spearheaded by the ICT and Treasury Ministries must be held.

We've entered the most profound era of change for financial services companies since the 1970s brought us index mutual funds, discount brokers and ATMs.

No firm (or country - my addition) is immune from the coming disruption and every company must have a strategy to harness the powerful advantages of the new financial technology ("fintech") revolution.

The battle already underway will create surprising winners and stunned losers among some of the most powerful names in the financial world: The most contentious conflicts (and partnerships) will be between startups that are completely reengineering decades-old practices, traditional power players who are furiously trying to adapt with their own innovations, and total disruption of established technology & processes:

Traditional Retail Banks vs. Online-Only Banks: Traditional retail banks provide a valuable service, but online-only banks can offer many of the same services with higher rates and lower fees.

Traditional Lenders vs. Peer-to-Peer Marketplaces: P2P lending marketplaces are growing much faster than traditional lenders—only time will tell if the banks strategy of creating their own small loan networks will be successful.

Traditional Asset Managers vs. Robo-Advisors: Robo-advisors like Betterment offer lower fees, lower minimums and solid returns to investors, but the much larger traditional asset managers are creating their own robo-products while providing the kind of handholding that high net worth clients are willing

to pay handsomely for.

As you can see, this very fluid environment is creating winners and losers before your eyes…and it's also creating the potential for new cost savings or growth opportunities for both you and your company.

Timothy Oriedo:

Internet of Things, M2M This calls for convergence of technologies. A curriculum change at Higher Institutions of Learning will be able to adopt to a new posture of enabling traditional courses like mechanical, electrical engineering innovate along those lines.

Net Neutrality & OTT: Support content development due to low barrier to entry on OTT. Appreciate OTT platforms as alternative channels to leverage on and encourage budding broadcasters into it.

Big Data appreciation is needed across different segments on applications of big data in solutions provision guided by harnessing the information contained herein the data hindsight, insight and foresight. Government to deploy enough resources to better utilize big data in making planning. Allow open access to certain extend to encourage innovators to develop algorithms that can provide insights that can change our future.

Virtual Money/BlockChains: Awareness within the regulatory space environment of the emerging technology will go a long way in creating an enabling environment by attenuation of its resistance. Block chain application beyond fintech be encouraged to support big data.

Ahmed Maawy:

I think there is a huge statement being made by Samsung with their move to Tizen, and apparently bold statements being made with regards to Android (and that Tizen will be the platform of choice). Outwardly the world will tell Samsung that they cannot openly compete with Google on this.

But then there's something we are not seeing in this whole equation - the future of technology and computing.

Major players are all looking to invest in IoT and Big Data. Because in a world of 6 Billion people in the Information and Knowledge revolution, IoT is not something that may happen. It will. Because according to IBM - Every day, we create 2.5 quintillion bytes of data. And this is why Samsung might win big. They are not building for now. They are building for the next 2 to 5 years to come.

Kenya faces a magnitude of challenges home made technology can solve. And technology does exist for us to create sustainable solutions - and create markets for sustainable solutions, as SwahiliBox had demonstrated close to a year back when we had very much earlier predicted the marriage between Big Data and IoT and we had developed prototypes that were even open sourced to demonstrate how easy and sustainable it can be to develop next generation solutions making use of both Big Data and IoT.

As a market this is one of the major areas we need to focus on - and that we are seriously neglecting. We can not keep on innovating on top of ERPs and M-Pesas and that is just it. Silicon Valley's innovative potential does not just encompass systems like Adobe Photoshop, but also innovations on top of IoT and Big Data. We need to innovate hardware that can be relevant within the African Context - Hardware that can then hook up with the ERPs and M-Pesas, and maybe bring to life a whole different export channel to other countries and governments looking for sustainable hardware solutions. And Kenya can do this.

We need to push more resources into innovating around Big Data, Cloud and IoT. As a market we can only achieve maximum innovative potential in adopting the trends that players like Samsung, Intel, IBM, and the likes are investing billions of dollars to get right.

Steve Mutuvi:

The recognition and inclusion of Big Data and IOT in the ICT policy is a great idea and particularly at such a time when data analytics is increasingly becoming a critical component in decision making. Data are fundamental building blocks of information, knowledge and innovation and without doubt the new factor of production.

To actualize this portion of the policy, perhaps a brief initial study needs to be undertaken with a view of building preliminary understanding of the landscape for big data for development in Kenya, and Identify key research questions and priorities. This initial study could focus on the following aspects:-

1) Value - What value is being created and who are gaining this value?

2) Innovation - What is be the nature of innovation being done by the use of big data? Who are the key actors in this innovation process?

3) Implementation - what are the enablers and constraints being faced, throughout the data value chain

4) Ethics - What are the emerging ethical concerns with regard to data quality and privacy?

It would be desirable to have a national big data strategy in place and hopefully not too far in the future.

Grace Githaiga

The issue of virtual Money/BlockChains is gaining traction all over the World. I was in a meeting recently and one question that most people asked me when they learnt I was Kenyan was on what were my thoughts around block chain technology disrupting our famous mpesa. Unfortunately I had no answer for them but it got me thinking. I am glad that someone on this list shared this link https://followmyvote.com/online-voting-technology/blockchain-technology/ which explains clearly how it works, at least for those who are not conversant. It is a worthy read.

My questions:

1. Considering that Kenya has taken a lead in issues of technology, should we be concerned about block chain technology considering it kinda provides a platform where no one organisation owns the data? And in light of KRA wanting to compel safaricom to share the data of its subscribers?
2. Will it disrupt Mpesa?
3. Where is Central bank in this matter? Is central bank concerned that technology is about to change the way it does business or will it wait to make some unfortunate comment like it did recently on bloggers being responsible for the withdrawals at Chase Bank?
4. And where is Treasury in this debate? Is it concerned with financial technology?
5. Considering that this might be an idea whose time has come, do we need policy direction on this issue?

I believe we have an opportunity with this ICT policy to be futuristic.

Eric Mwangi:

Block chain is a decentralized ledger that maintains unalterable record of transactions between parties and serves as the foundation of Bit coin - however I am sure the link did help. This is and will be a game changer I guess we should all take note. Issues around identity, security of assets have plagued out country and its this in mind that I can see why discussions around Block chain might prove to be difficult.

Despite the success of M-Pesa in Kenya, the average transaction size over this service remains at $27.

Carrying high minimum fees, the most frequently occurring merchant transactions (under 1 dollar) carry a transaction fee of up to 10% when executed digitally across these services. Well I don't think we can experience financial inclusion with this model?

A closer look at today's usage patterns reveals that two thirds of all mobile payment subscribers, and half of all registered agents, are inactive within 90 days.

Of the active subscribers—those using mobile payment services at least once within 90 days —we find that very specific behavioural patterns are followed. Roughly 3 out of 4 the dollars transacted on mobile money systems are dollars cashed-in to mobile money at an entry point, transacted via the mobile network, and immediately cashed-out again on the receiving end: a classic case of remittance. On average this type of 'remittance via mobile money service' is used by active users twice a month—generating 6 out of their average 11 transactions per month. The remaining 5 transactions are merely airtime topups. Merchant and bill payments, which represent the most obvious and frequent potential daily use cases, are practically inexistent.

Four out of these six 'remittance' transactions require the broad availability of an extensive agent network. Data from the 2015 Industry report suggests that, on average, today's mobile money ecosystem requires one active agent per 80 active users. No wonder that 54% of all revenues generated are eaten up maintaining this abundant agent network. (Report on Mobile Money issued last month by GSMA Mobile4Development, the Bill and Melinda Gates Foundation, The Mastercard Foundation, and the Omidyar Network)

While Treasury, CBK et al will be key in this discussions, alternative thinkers will be needed for traction but the future is indeed bright.

Regarding Compliance

1) Compliances are aimed at bringing accountability to the profession (keeping clients interest ahead)

2) Rules are directed at objective thinking over discretionary management (this is where Mandates are

prestated)
3) The initiative is North American and adopted by other markets, taking global policy standardization into account

So the point of regulation in my opinion does not conflict with the idea of delivery or solution whichever it will be.

The point of regulation, rather enhances the theme of global one stop shop, which has not happened yet more because of fragmented markets and lack of universal system thinking.

Mwendwa Kivuva:
As you can see from the sentiments, the pioneers of tech want to hear the governments voice on the same. **I hope after this public consultation, we will see a paragraph about block chains in the draft.** It can be a high level paragraph that read

x) Blockchains: We acknowledge the tremendous potential of the blockchain technology in transforming various sectors of our economy and their application in governance especially smart contracts. As the innovations progress, Kenya is committed to adopt the technology in our society.

It has been said before that "That blockchain technology will have an impact equal to the creation of the Internet ..."

The Harvard Business Review conducted a two-year research project exploring how blockchain technology can change the way we securely move and store host "money, titles, deeds, music, art, scientific discoveries, intellectual property, and even votes" It states that blockchain is the first native digital medium for value, just as the internet was the first native digital medium for information. And this has big implications for business and the corporation. https://hbr.org/2016/05/the-impact-of-the-blockchain-goes-beyond-financial-services.

Muthoni Masinde:

From the Research & Development (R & D) angle, if Kenya is to benefit from the 'IoT Boom', we need to develop capacity in R&D; to reclaim, re-tell and re-write the Kenyan story; we need to be able to set the agenda for ourselves. For instance, successful implementation of IoT demands for new and different skill sets such as data and analytics. The dynamic and diverse nature of skills required will not be met by traditional one-off degrees and technical courses; instead, online, continuous and collaborative learning platforms will suffice. This is what is referred to as connected learning; it is anchored on four pillars: people, process, data and things (quoated from Cisco). Having been a trailblazer in a number of technological innovations in the Africa, Kenya has a great chance taking leadership in this area.

I am part of an IoT Working Group working on IoT agenda for Africa; the Group's proposals will be featured in the 2016 IEEE 3rd World Forum on Internet of Things (WF-IoT) (http://wfiot2016.ieee-wf-iot.org/). My personal hypothesis in this agenda is that Africa has unique challenges and opportunities that should influence the R & D for IoT agenda. This way, we might succeed in reversing the trend where we tend to become consumers as opposed to innovators and creators of technological solutions and services.

As regards the IoT as a revolutionary technology, some concerns worth being addressed are:

- What are the energy efficient technologies that can be put in place to ensure that the sensors and IoT platform in general does not utilise a lot of power.
- As IoT is implemented on the cloud, can we come up with a standard for CloudIoT especially given that we have many standards for the IoT cloud.
-How are security and privacy issues being addressed as we adopt big data and IoT.

Ronald Ojino:

Day 9 of 10 Institutional, Legal & Regulatory Framework

The following topics were discussed:

Role of Regulator, USAC, CERTs, NCS, ICTA, PCK, CSO, Professional Bodies etc

Needed Legislation, Data Protection, eTransaction, Intermediary Liability

The moderator sought to understand whether the various regulatory bodies were effective in discharging their mandate or if there is need to define and bring in specific roles for professional bodies and civil society organizations.

The following feedback was received from members:

Barrack Otieno:

1. How do we rate/ gauge the effectiveness of these Institutions?

2. Can we have quarterly updates to the public on the performance of this Institutions, I think ICTA can avail this?

Ali Hussein:

I have always found it very confusing to remember all the various players and their roles in the ICT Ministry. Might there be a justification to rationalize them? Like the process that the eGovernment Dept and the predecessor to the ICT Authority went through?

The other issue is one of independence and confusion of the different players in the sector. We see the CA sometimes dabbling in policy and the Ministry in regulations. Sometimes the line is murky true..but we must endeavor to respect those roles.

How does the policy address this issue?

Alex Watila:

Could the representatives of egov, ICTA, CA, Ministry of ICT clarify and share their main mandates to make the discussion more informed.

Relevant bodies need to be roped in so that the policy is aligned .e.g.

Standards – KEBS is the custodian of ISO related standards that include many with impact on ICT. E.g. Information Security Management Standards, Record Management Standards, IT Services Management.

Archiving – we discussed the role of KCB but also Kenya National Archives has a mandate and needs to be encouraged to provide this archived information in a digital format.

The policy should encourage the adoption of standards.

John Walubengo:

On KEBS, I would say they do have various and serious ICT standards as adopted from the global ISO standards. However, these standards would be useful from a regulatory level. Perhaps at a policy level we just need to throw in a clause to point the regulator to enforce these standards as and when applicable. The other challenge is that the ISO standards tend to be optional - except those that are health/safety related. So in some cases, a trade-off may need to be acknowledged by the regulator.

1. Minstry of ICT: deals in all ICT Policy, Legal, Regulatory & Implementation matters. The ministry has specialized in some cases semi-autonomous agencies to help it carry out this huge mandate.

a) National Comm Secretariat (NCS): Advices ICT minister on ICT Policy matters.

b) Regulator: Develops and enforces ICT regulations

c) Universal Service Advisory Council: Works with regulator to achieve universal service

d) ICT Authority: works with ministry to spread ICTs within government/public sector, while marketing Kenya as an ICT destination.(ref: took over eGov+ICT Board functions)

e) PCK: National Postal Service provider

f) Parliamentary Committee on ICT (not sure if still combined with Transport) but this committee deals with anything and everything ICT in the country. If you have scandals to report or a bill to propose, you have to start here and treat the MPs otherwise you are headed nowhere :-)

Some other relevant bodies:

g) Media Council of Kenya:-self-regulatory body for the media, they have a complaints committee in case u feel aggrieved

h) Multimedia Appeals Tribunal:-mostly used by operators who feel aggrieved by the regulators rulings.

One thing that seems to be missing out is ofcourse is the role (if any) of ICT professional bodies and

Civil Society Organisation (CSO) in the ICT sector. We do have several ICT professional bodies such as ISACA-Kenya, ICT Assoc of Kenya, Computer Soc of Kenya, KEPSA - ICT Forum?, KITOS amongst others.

The Civil Society groups I have come across in this space so far include KICTAnet, Article 19, Mzalendo etc.

How these groups link up and contribute to the national ICT discourse seems to be left to how well they know the incumbents at the ministry. Perhaps we may need to formalize this relationships at a policy level to avoid future ministers deciding how well to engage or ignore these groups.

Day 10 of 10 :Vision , Mission, Objectives

Participants focused on the Vision , Mission and objectives of the draft ICT Policy.

The following feedback was received from participants:

Alex Watila:

Current Vision - A prosperous and competitive ICT-driven Kenyan society.

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

From COK 2010

6. (1) The territory of Kenya is divided into the counties specified in the First Schedule. (2) The governments at the national and county levels are distinct and inter-dependent and shall conduct their mutual relations on the basis of consultation and cooperation. (3) A national State organ shall ensure reasonable access to its services in all parts of the Republic, so far as it is appropriate to do so having regard to the nature of the service.

Wangari Kabiru:

Will that make Kenya a prosperous and competitive ICT –driven society. ? No

The mission should focus more on benefitting from the benefits of ICT

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

Current Vision - A prosperous and competitive ICT-driven Kenyan society.

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

Proposed Vision: A country where ICTs are enabling prosperity through creativity and competitiveness in all sectors and levels of society

Grace Bomu:

Proposed Mission - All ICT professionals, practitioners and relevant stakeholders will work together to improve the availability and accessibility of secure, efficient, reliable and affordable ICT services in/to

all parts of the country.

Florence Ettah:

Current Vision - A prosperous and competitive ICT-driven Kenyan society.

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

My contribution!

Proposed Vision: A country where ICTs are enabling prosperity through creativity and competitiveness in all sectors and levels of society

Proposed Mission - All ICT professionals, practitioners and relevant stakeholders will work together to improve the availability and accessibility of secure, efficient, reliable and affordable ICT services in/to all parts of the country.

Esther Nyambura:

The Vision should reflect not just consumption but also production and the same should be reflected in the overall strategies applied in the policy.

Example: Vision: "A Kenya that is an ICT Consumption and Production Powerhouse"

A little ambitious but we have to dream big if we are serious about becoming an ICT driven society.

Find attached brief comments already submitted for further clarity on this.

Proffesor Timothy Waema Mwololo:

I have the following observations which should be integrated into the consolidated:

1) Evaluation of the 2006 ICT policy. No attempt was made to evaluate how useful the 2006 policy was in guiding the industry. What was achieved/not achieved? What did we learn? There was a section 4.2 on rationale but it is too weak. I propose a substantive section on this in the Introduction.

2) Reference to other policy documents. There are a number of documents that could be considered at policy level, e.g. the National ICT Master Plan and the National Broadband Strategy. No reference is made to these documents yet they have very key policy statements, outcomes and targets. For example,

in the National ICT Master Plan, there is a recommendation to create ICT as a stand-alone sector with its own ISIC classification standards. This is something I would have expected the policy document to pick up because it is so important for growth of ICT in this country.

3) Section 6 is derived from the draft Science, Technology and Innovation (STI) policy. No reference is made to this document, which unfortunately was not formally adopted because it was presented just before the last election and everyone was in a hurry. At the same time, most of the material in this section 6 comes from the STI policy document without value addition. Given that the draft STI policy was developed in 2011/12, I propose we make amendments to the proposed Kenya National Innovation System (KNIS) given that a lot has changed since then and a lot is likely to change in the life of this document. The Ministry of ICT, ICT Authority, the various tech innovation hubs and KoTDA are key actors now or in the future and should be recognised in the KNIS.

4) Policy outcomes. The document contains policy objectives, which is fine. However, it is very difficult to evaluate the accomplishment of objectives. I propose that for each area, we develop policy outcomes. This way, we can measure the achievement of this new policy. We would also be providing direction to the various strategy documents that would need to be developed at a lower level.

5) Hurried. Reading through the document, one gets the impression that it was hurriedly put together. If it is going to serve us for > 10 years, we need to give it time and produce a good document. So let us not be in a hurry to push it for approval when there are glaring problems. In any case, we have a policy that still continues to guide us, approximately.

Wainaina Mungai:

Overall, we need to ensure we are writing a policy document that goes beyond "keeping abreast with current ICT the current ICT technology." For the ICT sector, things get obsolete the moment they are accepted as being "current". So let us go beyond that and plan for "emerging and futuristic" by

facilitating innovation.

As Prof. Waema stated, the drafting of the document seems to have been rushed. I noticed the section without any comments/annotations titled "ICT Professional Bodies" and which stated:

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.

Apart from the comments made elsewhere on the "ICT Practitioners Bill", the policy should make it clear that this section does not call for a single 'umbrella' body as ICTAK attempted to have enacted but rather the recognition of the roles of the various professional bodies and multi-stakeholder forums.

A similar approach applies to Broadcasting professionals especially the ones involved in "technical aspects of broadcasting" who have to deal with convergence but are always caught up in fixing the crisis created by the public broadcasting or media owners failing to adopt convergence, not just in terms of 'converged technology', but also convergence in their operations:

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

Lastly, there is no mention of Freedom of Information as a concept. Only "Access to Information" is covered and in reference to making government websites accessible and sharing government content with private sector for reuse.

Evaluation & Feedback

Technical

There was excellent technical reliability of the listserver with no reported incidents of technical failure.

eParticipants

During the eDiscussions, the KICTANet listserver had around 926 (nine hundred and twenty six) subscribers with about twenty five of them contributing actively during the eDiscussions.

Moderation

The discussion was moderated by two people, there was lively interaction and sharing of information from the participants and it was not only easy but enjoyable to moderate such an audience. The Synthesis (short summaries) posted before each them may have helped and inform participants contributions.