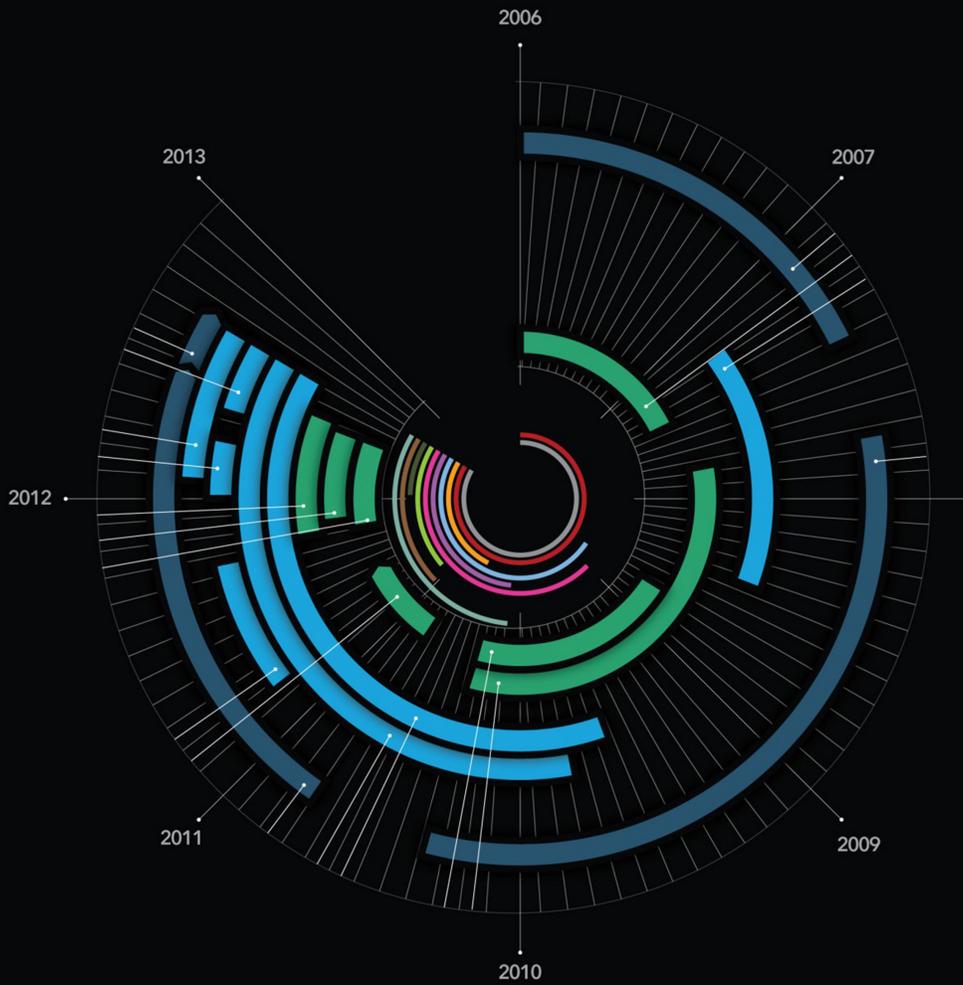


# iQuarterly

IHUB RESEARCH



For our first iQuarterly issue this year, the iHub Research team offers our take on the new year by surmising, theorizing and inferring on what the year might look like from a tech perspective.

Together with the new year, we are sharing some of our new projects being undertaken this year, made possible by the accomplishment of past projects. We also release two reports from such past projects in this issue.

Finally, as we introduce new structures for improved performance and continued innovation, we officially introduce our products with the hope of facilitating greater interaction with our community.

I was told that till the next holiday, one can still proclaim the previous holiday. In that case...

Happy New Year!!



**Rhoda Omenya**  
iQuarterly Editor

## TEAM

### DEVELOPER

Jacob Chench

### DESIGNER

Zack Adell

### CONTRIBUTORS

Angela Okune  
Leo Mutuku  
Nanjira Sambuli  
Anne Salim  
Wachira Ndaiga

# IHUB RESEARCH'S 2014 TECH OUTLOOK

## PREDICTIONS, CONVICTIONS... AND QUESTIONS

Compiled by Nanjira Sambuli

New year, new things. We at iHub Research are enthusiastic about the prospects and challenges ahead in the tech scene. We put together our thoughts: predictions, convictions and questions about what the year might have in store for tech, locally and regionally. Here is a compilation of those ideas:

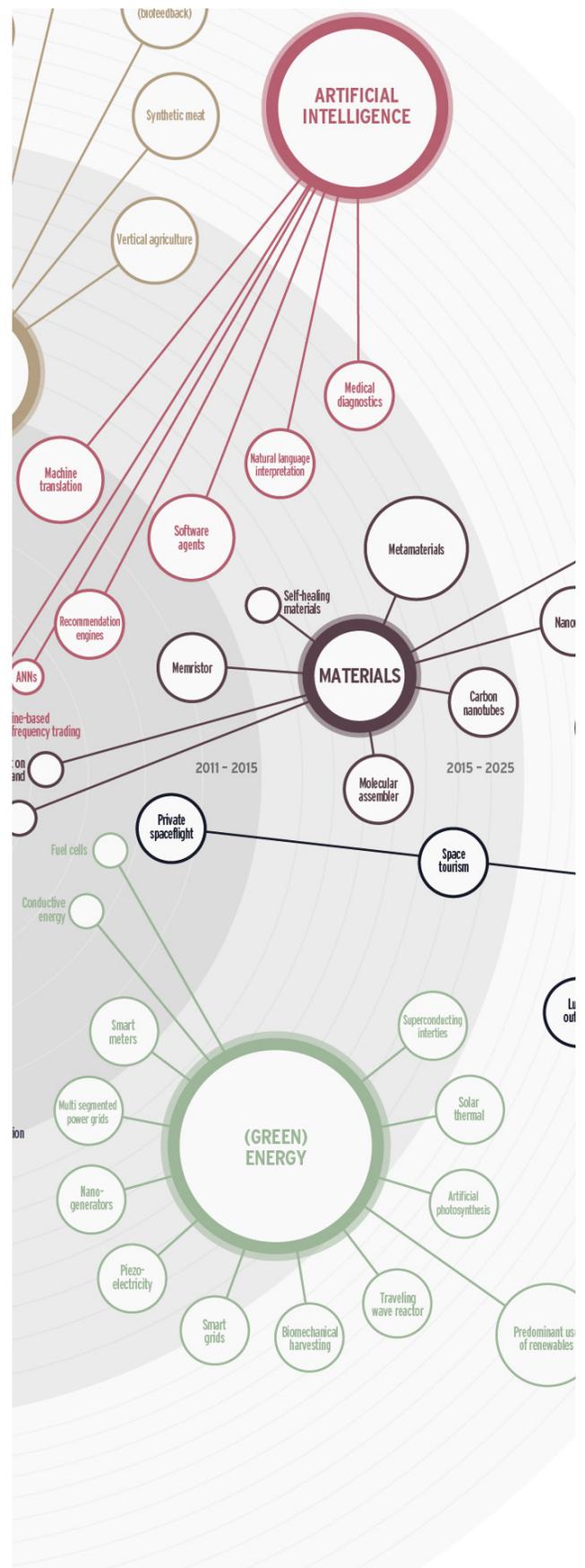
### ICT FOR GOVERNANCE:

#### TECH FOR EDUCATION

How ICTs are used in the education sector will be most interesting to follow. The government plan to roll out ICT hubs in each county will, at its core, tie to education. However, have the architects of this ambitious plan done any evaluation of the previously rolled out *Pasha Digital Villages* by the ICT Board (now the ICT Authority)?

A question raised at the *Education World Forum* (or Bett) that we also would like to ask is:

"What would be the 'ideal' educational technology device for use in schools, and by teachers and students, in developing countries? In the past laptops and PCs have been presumed, however, this year, the eye in on the tablet." - **Michael Trucano**



Different corporations like Microsoft, Intel and Samsung are customizing the tablet for educational purposes. It will be interesting to see if this will be the technology of choice for classroom use in 2014.

Beyond the hype around providing (solar-powered) laptops for Std 1 students, interesting opportunities abound in content creation and production for these devices (Kshs. 500 million has been set aside for digital content in the current financial year's allocation to the project). We'll be looking out for what emerges on this front.

## TRANSPORT

The National Transport and Safety Authority's proposed adoption of ICTs to regulate the public transport sector could be a game changer. Of particular interest will be the proposed cashless system for fares, to become effective on July 1st 2014, that could influence other sectors such as the retail industry to follow suit, depending on the successes, perceived benefits, challenges and 'threats' as ICTs are implemented in the public transport sector.\*

## DIGITAL GOVERNMENT

Will the 'digital government(s)' (national and county) go beyond tweeting and Facebook status updates? We sure hope so! Crowdsourcing initiatives such as Usalama Watch and corruption reporting (via the President's website) are interesting steps towards increasing Kenyan e-governance. It will do the government well to understand that crowdsourcing, in its best form, entails mutual benefit, with the crowdsourcer (the Government in this case) obtaining information desired from a vast number of people (Kenyan citizens online), in (near) real-time. In turn, sharing back findings informs participants, and the value system that follows builds a virtuous cycle that allows for future crowdsourcing deployments. (We recommend our 3Vs Crowdsourcing Framework for more on crowdsourcing for information!) The Government also launched an integrated public service delivery system, Huduma Kenya, whose online/digital component is yet to be realized.

We will also be looking out for innovations and adaptation of ICTs for governance at the county and ward level. (As always, Chief Kariuki remains an administrator to watch!)

## MOBILE: POLICY, TECHNOLOGIES

Companies like Tecno and Mi-Fone may make smart phones ubiquitous, the VAT imposition on ICTs notwithstanding. The relatively low cost of smartphones from these two companies, for instance, may serve and drive demand for smarter, cheaper, higher quality phones.\*

Is this the year M-PESA finally releases an API? Developers have been waiting for this! It could add a new chapter for M-Commerce innovations, upon its roll out.



Image Source: <http://www.computerworld.com/> - Courtesy of Computerworld

## BIG DATA AND ANALYTICS

Big (and/or open) data is here to stay. Big data analytics has moved beyond the preserve of financial institutions and we will see more use of data for social development as well general business intelligence in Small and Medium Enterprises (SMEs). There has been a lull in the local open data movement. However, it is our hope and expectation that with the reconstitution of the ICT Authority, and potential passing of a Freedom of Information Act, that the necessary institutional frameworks will be set in place to kick start the Open Data Initiative. Moreover, advocacy for open data will move from a push for transparency and accountability to a more pragmatic approach of deriving commercial, economic benefits and increased efficiency as we prepare the post-2015 development agenda. We also expect governments, private sector, civil society and donor organizations will be actively looking into the data they have been collecting to influence their program directions. The Kenyan tech sector is not being left behind either in the global movement to make sense of social media and unstructured data (images and text mining) and we hope to also see more of these kinds of big data initiatives.

Vision 2030 may still seem improbable, but the pieces are slowly falling into place. In line with the move to streamline, formalize or digitize sectors such as transport, agriculture, weather and education, we anticipate that we will begin producing atypical data sets. There are foreseeable opportunities in these areas to make data-driven decisions, and the country will be looking to the technology sector to not only set up the appropriate structures, but also build in necessary intelligence mechanisms.

Thanks to the Internet, we will see more self-taught data scientists emerging in the space. We anticipate some universities, however, to begin reassessing their curriculum to create hybrid computer scientists, mathematicians and designers. Courses to this effect are already surfacing.

## 3D TECH

3D Printing will change everything from food to guns, and that's just a teaser. Envision any process that could involve the fabrication of goods, and you'll be closer to grasping how big additive manufacturing is going to be. So much so that Dell, an arguably struggling PC giant in recent times, has jumped on the bandwagon and is going to be selling 3D printers from their own home web stores. And they're not the first either!

3D printing represents a frontier that has, for ages, been defined by the break-evens and profit-margins of industrial manufacturing giants - that pair of shoes you thought you could buy later? Well it's out of season now and no longer available on the shelf. With a 3D printer, it doesn't matter, you can print yourself that same pair of shoes (that are actually wearable!). The key word here is customization, and it's a powerful word because we are slowly learning that designing for the average could in fact mean designing for no one.

Is 3D printing the next revolution in industrial manufacturing? Maybe not yet, but watch this space closely!

## ONLINE SURVEILLANCE AND PRIVACY

Cybercrime is an online menace that the Kenyan Government is intent on addressing. Both the Director of Public Prosecutions and the ICT Cabinet Secretary have indicated that they're in the process of ensuring there are legal measures in place to address the issue that was projected to cost the country about Kshs 2 billion in 2013. One law that the Presidency is ready to ratify is the Draft African Union Convention on The Confidence and Security in Cyberspace that was set to be in this month's African Union Summit agenda. While cybersecurity laws are necessary, the proposed convention has some problematic clauses that have been highlighted at length, such as the lack of consultation with stakeholders in its drafting. While voting on the convention has been postponed, its problematic clauses highlight the need to remain aware and involved in the review process of any laws proposed to ensure that our cyberspace is secure. We will soon be forced to have conversations on the implications of such laws given the surveillance revelations that took the world by storm last year.

One overarching question is likely to be whether there such is a thing as online privacy.

## SOCIAL MEDIA: INFORMATION, CONVERSATIONS... TOWARDS COLLECTIVE ACTION?

In 2013, iHub Research was able to conduct groundbreaking research that tapped into Kenyans' adoption and use of social media. Umati: Monitoring Online Dangerous Speech, and 3Vs of Election-Based Crowdsourcing, were viable endeavors in part because Kenyans are getting online and sharing what is happening around them, essentially making them citizen journalists. We also continue to see opinions, convictions and thoughts on various matters shared. Social media was also instrumental during the Nairobi Westgate Mall Attack as a source of information, misinformation and disinformation alike, but it was the primary pulse through which many stayed updated, asked questions and collectively processed the tragedy of it all.

In 2014, we expect to see many more conversations covering wide issues affecting Kenyans' lives - with the devolution process and other governance issues driving many a narrative, alongside alternative commentary on events that transpire throughout the year. As a result, we could see online conversations leading to organization of offline action along many fronts, towards strengthening civic engagement.

## OPEN SCIENCE

We anticipate that the concept of openness will be embraced more in the field of science, technology and innovation, setting the stage for new discoveries on the benefits, opportunities and challenges in embracing open and collaborative science for development practices and theories. Particular thrilling prospects are citizen science and open hardware.

## STARTUPS...AND THE (FORMER) HYPE SURROUNDING THEM

With the hype around startups serving the retail consumer space starting to dwindle, a lot more maturity will go into the creation of new ones. We might also see a rise in B2B tech (tech solutions for enterprise level), as well as local investment into tech startups. Financial markets, too, are likely to start seeing an uptake of technology. We will also see more established companies and government playing a role in building local capacity and providing training services centered around soft skills, leadership and technical skills.\*



Image Source: <http://www.pinterest.com/pin/165296248794401982/>

## INNOVATION SPACES

2014 will be a good time to start defining and monitoring the successful hubs and accelerator programs. Many pre-incubators will be looking at how to strategically position themselves to remain competitive and attractive to high growth startups, as well as coming up with sustainable models that do not rely on donor funding alone. Moreover, we will see more accelerator programs centered towards specialized services and support and less pre-incubators. More universities will start cultivating the entrepreneurship culture through university-based labs and initiatives.

We may also see many medium-sized and large organizations adopting the open innovation concept. This will be achieved by incorporating a mix of external and internal ideas to facilitate a creative and open environment at the work place. Innovation has also become a key component of their growth to ensure competitive advantage.

Will we start seeing more collaborative efforts between hubs and also scalable models to extend their services to the rural tech communities? Will we start seeing more innovation spaces centered around other diverse sectors and not only technology? This, we shall be looking out for.

## THE KENYANIZATION POLICY...AND TECH TALENT:

Building the Silicon Savannah will surely entail a mélange of local and international talent. The terms and conditions tied to long term work permits under the 'Kenyanization' policy, have raised quite a buzz in the tech scene, some useful insights here, here and here. A tough balancing act, it will be, to effectively cement Kenya's status as Africa's 'tech hub'. The government's policies may be met with intense lobbying efforts that will make 2014 an interesting year for the Kenyan tech industry!

## A WILD CARD: DREAMING ON...BECAUSE WE MUST!

Send someone to the moon? Okay, maybe let's start by putting up a satellite. The Kenya Parliament has already passed a motion calling for the creation of a space sector for the country. Professor Calestous Juma explains what the benefits of such a venture would be for Kenya's long-term economic transformation through technological foundations (Geographic Information Science and Mobile Technology).

We are intrigued, and hope that the legal provisions will be in place soon enough to facilitate implementation and experimentation in this space.

Onwards, 2014!

*\*Additional insights from **Joel Macharia** and **Shikoh Gitau** while visiting **iHub Research**.*

# INSTITUTIONALIZING RESEARCH INNOVATION THROUGH NEW IHUB PRODUCTS

*By Angela C. Okune, iHub Research Lead*

Many of you have witnessed and contributed to the growth of the research arm of the iHub since we launched at the one-year anniversary of the iHub in March 2011. We have, over the years, experimented with different research methods and tools; worked with a wide variety of clients and partners; opened our first office space (1st floor of Bishop Magua) before moving to an even bigger office space (2nd floor of Bishop Magua); and have grown from a core team of three people to now almost 20 people (consultants and staff). With such growth, growing pains are expected. Luckily, with the iHub core values at heart, we have been able to stay nimble and amend our game plan as we go.

For those who may not be as familiar with our work, iHub Research has three major research areas or “pillars” – Governance & Technology; Mobile & Web; and Innovation & Entrepreneurship. Under these research areas, we have associated Research Fellows and staff who are specialists in their particular subject matter. All grant-based projects fall under one of the three pillars and are managed by a relevant research manager.

However, early last year, we increasingly noticed that as our specialists and managers became more focused on their area of expertise, very little inter-“pillar” exchange was occurring. That is, slowly, silos were starting to form within a small part of a relatively small organization! Not only that, but with more heavily structured research projects coming on board, we found less opportunity for room to “play” with original research projects stemming from our own, raw and unbridled curiosity.

Well! You can be sure we quickly looked at how to adjust our structure to solve the “silo-ing” we were witnessing.

Enter, our new iHub Research products. These are not necessarily new services or products, but rather, have been reorganized to consolidate and strengthen the services already being offered to the community and public. These products are designed to be crosscutting across our existing projects and pillars to provide value not just externally, but also internally to our own researchers.



## DATA SCIENCE AND VISUALIZATION LAB

Our **Data Science and Visualization Lab** innovates around the entire data process, from collection, storage, analysis, to visualization in order to provide greater insights into and practical application for local problems.



Image Source: [iHub Research Design](#)



## USER EXPERIENCE & MARKET RESEARCH

User Experience & Market Research pushes the envelope beyond traditional surveys and consumer-focused research. With the **iHub User Experience Lab**, we study context, content, and users using a variety of methods in order to best advise our clients and community on whether or not a product provides what the customer needs and wants.

## + R&D GROUP

The R&D Group explores and experiments with low-cost tech hardware and software to derive, define and document best practices and techniques to address global South challenges with a focus on marginalized communities.



Image Source: <http://www.flickr.com/photos/iHub/11187174924/in/set-72157638311241474>

Over the next months, we will share further the work being done under these products and the opportunities for you to engage with them. Through these products, we will continue to provide value to you, our community, in 2014 and beyond. As always, feel free to send us your thoughts and opinions at [research@ihub.co.ke](mailto:research@ihub.co.ke).

# NEW IHUB RESEARCH PROJECTS FOR 2014

WITH THE NEW YEAR COMES NEW PROJECTS THAT IHUB RESEARCH IS UNDERTAKING. A BRIEF DESCRIPTION OF EACH PROJECT IS GIVEN BELOW:



Image Source: <http://www.bbc.com/future/story/20130205-t-is-for-tablet-computer>

## The Power of M-Learning

The Power of M-Learning is a 15-month monitoring and evaluation (M&E) project looking at the deployment of tablets and interactive education software in a primary school in Nairobi. The overall objectives of the M&E project are:

- i. To evaluate learning outcomes of students using tablets and the eLimu interactive learning content in: test scores, standardized assessments, cognitive thinking skills, social and environmental consciousness, absenteeism rates and IT literacy;
- ii. To understand how the technology is being used by the students and perceptions about eLimu content;
- iii. To evaluate the relevance of the technology for the learners, and the frequency of usage/activities being done on the tablet.

To do this, iHub Research will conduct quarterly visits to the school and interview a percentage of the students, teachers and parents to gain insights of how the technology is being used and if it is contributing to meeting the set objectives as well as evaluate the progress of the implementation. This project is funded by eLimu Limited and Qualcomm.

## ICT4GOVERNANCE

Funded by the Swedish International Development Cooperation Agency (SIDA), this 18-month project conducted as part of the ICT4Democracy East Africa Network, aims to carry out an assessment of interaction between governments and citizens using ICT tools, in Kenya, Uganda and Tanzania. More specifically, the project's objectives are:

- i. To identify, describe and analyze conditions under which ICT tools can successfully facilitate two-way interactions between government and citizens to wards reducing the costs of delivering public services, stemming corruption and increasing transparency.
- ii. To evaluate innovative ways in which citizen groups and government institutions are using ICTs to improve participation, human rights, transparency and accountability including user and non-user profiles and their [de] motivations for utilizing ICT platforms.
- iii. Where necessary, make recommendations for amendments to existing and new technology implementations/initiatives used to facilitate citizen groups and government in improving participation, human rights, transparency and accountability.
- iv. To identify and test dissemination methods to influence policy decisions around citizen-government interaction.

To achieve this, iHub Research will conduct surveys and hold focus groups in each of the three countries in two locations (one rural and one urban) to better understand citizens' knowledge, usage and perception of ICT tools created for their civic participation, reporting human rights violations, monitoring government (for instance, in service delivery), tracking corruption, promoting right and access to information, as well as facilitating open governance. We will assess if such tools created by various stakeholders (government, civil society, academia and others) are building networks, facilitating transfer of skills and knowledge, awareness raising and lobbying of legislators as well as other arms of government.

The project will have periodic updates via posts and events, whose details will be shared on iHub's and ICT4Democracy in East Africa's websites.

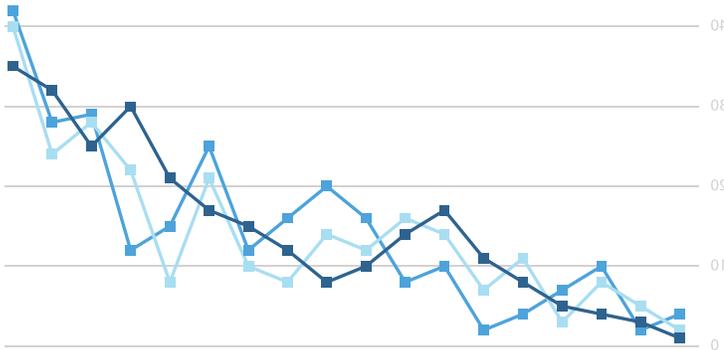
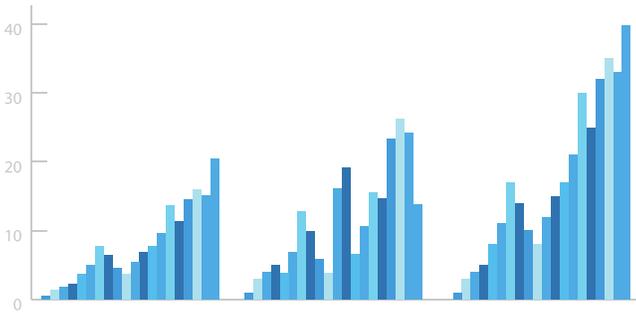


Image Source: iHub Research Design

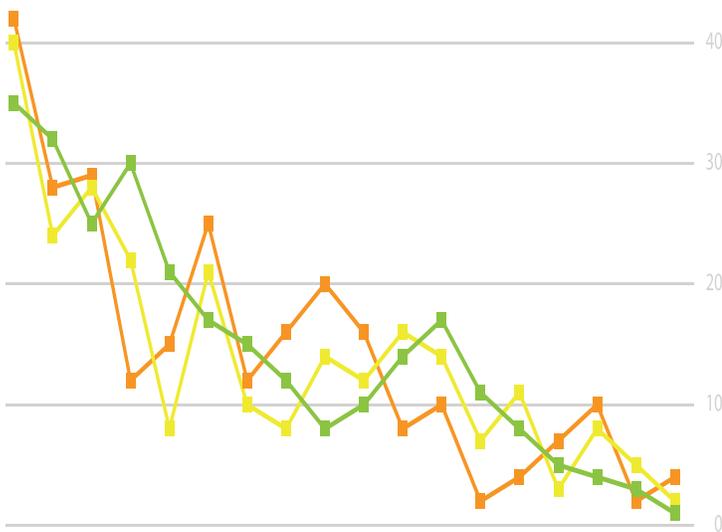


Image Source: [iHub Research Design](#)

## UMATI II

The Umati project was born out of concern that new media may have played a catalyzing role in Kenyan 2007/08 post-election violence. The project seeks to identify and understand the use of dangerous speech in the Kenyan online space. The project monitors particular blogs, forums, online newspapers, Facebook and Twitter. Online content monitored includes tweets, status updates and comments, posts, blog entries, videos and images.

With financial support from the MacArthur Foundation, our online dangerous speech-monitoring project, Umati enters a second phase, for a 2-year period. The primary objectives for Umati II are:

- i. To increase the scalability of the Umati Online Media Monitoring Methodology by automating the process.
- ii. To experiment with interventions for reducing inflammatory speech online.
- iii. To test the Umati Methodology in Nigeria during its 2015 General Elections.

These objectives will be achieved with strong engagement with various experts and organizations in Natural Language Processing (NLP), Machine Learning (ML), election monitoring, and international human rights. We will work especially closely with Professor Susan Benesch and local partners in Nigeria to experiment with methods for reducing hate speech online and testing the Umati Methodology in Nigeria during its 2015 elections.

## UNA HAKIKA?

(A Tana Delta Misinformation Project)

In conjunction with The Sentinel Project, and with funding support from the International Development and Research Centre (IDRC), the Una Hakika (Swahili for 'Are You Sure?') project will use crowdsourced data to map the origins and flow of misinformation within the Tana Delta while also testing the effectiveness of countermeasures in order to reduce the influence of misinformation. Due to the roles of Orma and Pokomo community members in recent violence, these two groups will be the primary audience for this project, though other ethnic groups in the Tana Delta have also been impacted and will be included. The specific objectives are to:

- i. Refine existing methods for verifying crowdsourced data, such as counting and comparing unique user reports with each other as well as information from other sources, and explore the potential for automating this verification process.
- ii. Generate new information about the origins and flow of misinformation among Tana River Delta communities.
- iii. Develop and test misinformation countermeasures which can be applied worldwide.
- iv. Build the capacity of Tana Delta communities to recognize and counter misinformation.
- v. Promote collaborative links between Canadian and Kenyan researchers.



Image Source: <http://openparachute.wordpress.com/2013/07/14/flouridation-an-organised-campaign-to-misinform/>

The project goal will be accomplished by mapping the inception and flow of individual pieces of misinformation throughout the Tana Delta population using anonymized crowdsourced data. This 26-month project will also be used to test different measures for countering misinformation in collaboration with community leaders and volunteers before it can spread and contribute to violence. The outcome of this research will be a model of the development and flow of misinformation, its role in conflict, and a series of concrete, tested measures for countering its influence.

## PANYABOT

PanyaBot - a low-cost robot - envisioned, designed and built to not only be exciting and entertaining, but an interactive learning platform for kids and teens between the ages of 7-18. The platform consists of a suite of tools, from the sustainable hardware it is designed to be built from, to the novel web-base Block programming Integrated Development Environment (IDE).

PanyaBot is made sustainable from the open licenses that it will be held under to the reused materials used for its build. Its frame is made from standard USB PC mice shells, with various components reused from the circuit boards as well. PanyaBot's wheels were obtained from CD/DVD drives. This cost minimization has the added effect of reducing the barrier to entry for low-income demographics. We posit PanyaBot to be an early-phase solution to the overly theoretical learning approaches taken by most standardized curriculums while solving the rising problem of e-waste in third world markets.

The objectives of the platform are:

- i. To create formalized methodologies that leverage the inclusion of open, appropriate and interactive tools in any learning environment; from classrooms to homes.
- ii. To understand and author replicable e-waste reuse practices and techniques for education in third world markets.
- iii. To set up PanyaBot as a viable learning platform for children and teens through directed and sustainable market strategies



The above will be achieved through the reiterative version testing of PanyaBot at the Kids Hacker Camp, a six-day long camp held at the iHub for children and teens between the ages of 7 - 18. We will request, aggregate and analyze data from parents and attendees to qualitatively and statistically model how well open, appropriate and interactive tools can improve learning.

We will liaise with various interested parties, both academic and industry, on how best to market PanyaBot as well as how to improve on the base build. In e-waste reuse for education, we will work in conjunction with iHub Research's Data Lab to look into its viability and how best to leverage it.

# REPORT RELEASE

By Leo Mutuku, iHub Research Data Lab Manager

## EXPLORATORY STUDY ON E-COMMERCE IN KENYA, UGANDA AND TANZANIA

In this project, we looked into how to improve data collection on Exploratory Study on E-Commerce In Kenya, Uganda And Tanzania.

According to the World Trade Organization, 300 million online users were online in 1999 and about 75 million of them purchased goods and services online worth \$110 billion. This amount has now grown to \$1.25 trillion in 2013. Africa's mobile phone penetration and Internet growth rates have seen impressive growth in the last few years. In Kenya alone, estimated mobile and Internet penetration rates are at 76.9% and 47.1% respectively.

### DIGITAL PAYMENTS -IMPLICATIONS FOR E-COMMERCE

If this trend remains constant, e-commerce could take up about 10% of retail sales in Africa's larger economies by 2025 according to a recent report by McKinsey & Company. E-commerce is an exciting growing sector that has already spanned a few businesses locally such as Cakes.co.ke and TravelStart. Trends in this sector were the main focus of a recent conference, AFRIKOIN, an annual forum that brings together players in the digital payment space in Africa. In contribution to conference proceedings iHub Research did an exploratory study aimed at understanding the African online consumer, support players in the space and help them take advantage of this growing population. The study was mainly concentrated in major cities in Kenya, Uganda and Tanzania.

[Download Full Report Here](#)

### KEY FINDINGS

- Mobile commerce is dominant with citizens in major cities in the three countries are buying goods that can be delivered wireless such as airtime, as well as physical goods that can be mailed or delivered. Most of these goods were accessed on mobile platforms and mobile money was the dominant form of payment.
- Cash and card payments are most preferred for larger or bulk transactions such as airline tickets.
- Majority of online shoppers were between the ages of 18 and 25 and were mostly students or university educated.
- High costs of using payment platforms, lack of streamlined payment processes, fraud and payment security, were concerns raised by business interviewed.

Better financial policies and favorable government regulation will greatly deal with these issues and encourage further growth in this field. As more customers use and are satisfied with e-commerce transactions, a greater sense of trust will be developed. This however has to go hand in hand with increased security in digital transactions. This study was the first step in mapping out the African digital space and we aim to conduct a more extensive study to surface new information on e-commerce and digital payments in the continent.



## LAUNCHING INVESTMENT RE-SEARCH STUDY SERIES

Over the past few years, several mobile and web-based technology inventors and innovators have emerged from Africa and most of these are seeking financial-backing of sorts to move their ventures forward. iHub Research regularly follows how different start-ups and companies in Silicon Valley are closing deals, be it seed funding or Initial Public Offerings (IPOs). The rapid growth and the billion-dollar valuations of social media websites and apps, such as Instagram, Facebook and Twitter, have inspired the drive to develop our own local mobile and web-based businesses and hope for similar success.

### LET'S NOT EVEN START ON M-PESA!

The furore of activity in the emerging tech sector in Africa has attracted both international and local investors. Governments have also set aside funds for technology entrepreneurs. That said, there is still limited information available on financing technology businesses in Africa and we would like to bridge this gap. To do this, we have to ask questions such as who the players in the ecosystem are and how they each contribute to funding technology ventures in the region. Similarly, we need to define and identify what different financing structures exist for entrepreneurs in tech to tap into.

For instance, what may be considered seed funding in the US or Europe may be in the environs of USD 100,000 but economies of scale may dictate that the same threshold may not be necessary locally. Therefore, what is seed funding for Africa? Can tech start-ups hope to do IPOs or list their shares? How soon and under what conditions?

iHub Research has been preparing a framework to study how local ventures in tech are financed and through a series of studies in investment research, we hope to address or at least start filling in the gaps to form the basis for increased deal flow in the region.

You can find a draft of the framework [here](#).

