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TECHNOLOGY AS AN EFFECTIVE TOOL FOR WOMEN'S EMPOWERMENT AND GLOBAL DEVELOPMENT

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Abbreviations

CCK	Communication Commission of Kenya
GSMA	Groupe Spéciale Mobile Association
KEMRI	Kenya Medical Research Institute
KWFT	Kenya Women Enterprise Fund
MFI	Microfinance Institutions
MNO	Mobile Network Operator
M-pesa	**M** for mobile, ***pesa*** is Swahili for money
M-Shwari	Swahili words: shwari, **meaning** ' calm' or 'cool'

Introduction

Technology has been heralded as the great liberator of the 21st Century. The impact of technology has been felt in all spheres of life including industries, health, education, travel, communication and even sports. This has led to a great increase in information availability, sharing and knowledge creation. Various types of uses of the same technology have been discovered. Within this sphere, as women's rights activists we must ask ourselves, what does this advent of technology mean for women's access and empowerment. What impact, if any, can be felt through the role that technology has played in the 21st century? As African women's rights scholars, we must then ask if it makes any difference in the lives of African women. How have the lives of African women, be they rural women, young women or women in the formal work force been impacted?

For the full value of technology to be derived, we must seek to draw the correlation between technology and the access that we seek for women. We must look at the advent of technology as an opportunity for women to change the dynamic within which they live and work.

This paper seeks to draw out concrete, African examples of the impact that technology has had and can have on women's rights and access to better livelihoods. We will look at examples of technology such as Mpesa, Mhealth, Mcow and review how each of these has revolutionalised the lives of African women.

We must also be alive to the limitations of technology, recognizing that it is not the panacea for all the problems that Africa faces. The use of technology must be tempered with the recognition of its capabilities and its limitations. Examples of countries like Kenya that are implementing a laptops for schools program in a country where more than 50% of the population does not have access to electricity, must be included in this discussion. What impact, negative or positive, do such expensive programs have on the livelihoods of the poor?

In conclusion we will review a number of proposals for action by African countries to ensure that countries are able to derive the value that can be tapped through the use of technology.

1.0 Mobile Technology and Financial Services

Today, half the world's adult population of 2.5 billion people lacks access to basic financial services and the majority of them are women. Being financially excluded means relying on cash, where a simple task like paying a bill or receiving money from a family member can be risky, costly and time consuming. This exclusion from financial services also reinforces the cycle of poverty and slows economic growth.

In Kenya, mobile phones have already begun playing an important role in expanding access to financial services, including ways to send, receive and save money. At the end of 2012, an estimated 1.7 billion people in the world will have a mobile phone but not a bank account, but thanks to advances in mobile banking technology, these are no longer mutually exclusive (Aleitha, 2013).[1]

The African continent is currently undergoing a technological boom, with mobile at the center, and this entrepreneurial spirit lends itself well to mobile money adoption.

According to Mobile burn 2001, the GSM Association[2] is a trade group that represents network operators that use GSM technology for their networks. The GSMA also counts a number of manufacturers and suppliers that provide the GSM technology as associate members.

GSMA Mobile for Development brings together a number of mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. They identify opportunities for social, economic and environmental impact and stimulate the development of scalable, life-enhancing mobile services.

Since the creation of the GSMA Mobile for Development it has partnered with 35 mobile operators, rolling out 53 services, impacting tens of millions of people across 30 countries.

[1]Aleitha.L.2013.Empowering Women One Mobile Phone At a Time.Accessed on July 3 2013 from http://blog.usaid.gov/2013/02/empowering-women-one-mobile-phone-at-a-time

[2] GSMA association 2012

The program is in Kenya through its mobile money for the unbanked which is helping mobile operators and the financial industry collaborate to deliver affordable financial services that provide safety, security and convenience to millions of previously unbanked customers. Since the Mobile Money for the Unbanked programme was founded, the industry has increased in size five-fold, with over 100 mobile money deployments active in the world today – 80% of which are in developing markets (GSMA 2012).

GSMA is also driving commercial mobile services in the key areas of health, agriculture and learning in remote areas. In addition the M-women program is leading the reduction of the mobile phone gender gap.

1.1 Mpesa in Kenya

M-Pesa (**M** for mobile, ***pesa*** is Swahili for money) is a mobile-phone based money transfer and micro-financing service for Safaricom and Vodacom, the largest mobile network operators in Kenya and Tanzania. Currently the most developed mobile payment system in the world, M-Pesa allows users with a national ID card or passport to deposit, withdraw, and transfer money easily with a mobile device. The account is opened and remains tied to the cell phone number to which it is ascribed. Users can easily transfer money from one phone to another using the Mpesa system or application that is encoded in all their phones.

M-Pesa was first launched by the Kenyan mobile network operator Safaricom, where Vodafone is technically a minority shareholder in March 2007. M-Pesa quickly captured a significant market share for cash transfers, and grew astoundingly quickly, capturing 17 million subscribers by December 2011 in Kenya alone (CCK, 2012)[3]. Currently, other mobile providers including Airtel, Safaricom's greatest competitor have joined the mobile money movement with their Airtelmoney Service.

M-Pesa was originally designed as a system to allow microfinance-loan repayments to be made by phone, reducing the costs associated with handling cash and thus making possible lower interest rates. But after pilot testing it was broadened to become a general money-transfer scheme. The growth of the service forced formal banking institutions to take note of the new

[3] CCK 2012

venture. In December 2008, a group of banks reportedly lobbied the Kenyan finance minister to audit M-Pesa, in an effort to at least slow the growth of the service. This ploy failed, as the audit found that the service was robust. The initial concept of M-Pesa was to create a service which allowed microfinance borrowers to conveniently receive and repay loans using the network of Safaricom airtime resellers. This would enable microfinance institutions (MFIs) to offer more competitive loan rates to their users, as there is a reduced cost relative to dealing in cash. The users of the service would gain through being able to track their finances more easily. But when the service was piloted, customers adopted the service for a variety of alternative uses and complications arose with Faulu, the partnering MFI. In discussion with other parties, M-Pesa was re-focused and launched with a different value proposition: sending remittances home across the country and making payments.

M-PESA has since been extended to offer loans and savings products, and can also be used to disburse salaries or pay bills, which saves users further time and money (because they do not need to waste hours queuing up at the bank). One study found that in rural Kenyan households that adopted M-PESA, incomes increased by 5-30%.[4] In addition, the availability of a reliable mobile-payments platform has spawned a host of start-ups in Nairobi, whose business models build on M-PESA's foundations. Mobile-money schemes in other countries, meanwhile, have been held up by opposition from banks and regulators and concerns over money-laundering

M-Pesa is a branchless banking service, meaning that it is designed to enable users to complete basic banking transactions without visiting a bank branch. The continuing success of M-Pesa in Kenya has been due to the creation of a highly popular, affordable payment service with only limited involvement of a bank.

Services

M-Pesa customers can deposit and withdraw money from a network of agents that includes airtime resellers and retail outlets acting as banking agents. M-Pesa is operated by Safaricom, a mobile network operator (MNO), which is not classed as a deposit-taking institution (such as a bank).

[4] The Economist 2013

The service enables its users to:

- Deposit and withdraw money
- Transfer money to other users and non-users
- Pay bills
- Buy goods
- Purchase airtime
- Transfer money between the service and a bank account in some markets

Notably, M-Pesa was not a programme designed for women, but the gain for women has been enourmous. In households where women are not allowed to open bank accounts, they have been able to keep money on their phones without fear of it being taken away the way cash would.

Secondly, small scale farmers and women who work in informal sales sectors such as vegetable vendors etc are able to maintain the funds and use them to transact with each other. They can call the vendor in the main market, make an order, send the payment and await the delivery in their small local market without having to travel long distances to collect the goods and pay for them in the main market.

1.2 Mshwari

This is a paperless banking service offered through M-PESA that enables the customer to operate an M-Shwari bank account through the mobile phone, through M-PESA, without having to visit any bank to fill out bank account opening forms[5].It provides the user the ability to move money in and out of the M-Shwari savings account to M-PESA account at no charge. It gives the user an opportunity to save as little as Ksh.1 and earns interest on your saving balance. This cash is moved into the savings account using the handset via the M-PESA Menu.

Advantages

[5]www.safaricom.com

Enable the customer access micro credit product (loan) of a minimum of Ksh.100 anytime and receive your loan instantly on your M-PESA account**.** The minimum amount that you can keep in your account is Ksh 0 (zero) balance. In case of loss of a handset the Mshwari account is safe because your M-Shwari account is protected by your M-PESA Pin. An interest is paid on the savings balance whereby interest is calculated daily but paid out at the end of each calendar quarter.

The advantages here are clear. Firstly, it helps women without bank accounts to bank their money via the phone as a way to save money. Secondly, it has security through the Mpesa Pin service in which only the user can transact money via their phone. Thirdly, it is accessible and reliable due to allowing the user transact money at their convenience without having to travel long distances. It also helps small scale traders to save up their money.

The Mobile devices can act as mass communication tool for potential employees who could use the technology to apply for jobs. Breast feeding mothers and pregnant women can use the mobile technology without moving long distances.

2.0 Technology and Information

2.1 Ushahidi

Ushahidi", which means "testimony" in Swahili, was a website that was initially developed to map reports of violence in Kenya after the post-election fallout at the beginning of 2008. Since then, the name "Ushahidi" has come to represent the people behind the "Ushahidi Platform". Its roots are in the collaboration of Kenyan citizen journalists during a time of crisis. The original website was used to map incidents of violence and peace efforts throughout the country based on reports submitted via the web and mobile phones. This website had 45,000 users in Kenya, and was the catalyst that made the organization realize there was a need for a platform based on it, which could be used by others around the world.

Ushahidi is a web and mobile platform that allows to create, visualize and share stories on a map. It allows individuals to share their stories on their own terms using the tools they already have. Crowdmap is Ushahidi in the cloud. It's a free and easy way to setup a crowdsourcing

map without the hassle of knowing the technical stuff. It's important because getting a feedback pulse from the ground helps you make better decisions and enhances coordination efforts.

Advantages

The app supports loading of multiple deployments at one time. It quickly helps in filtering through incident reports. It helps in exploring incident locations on the map. It helps in viewing incident photos, news article, media as well as sharing incident reports via email, SMS or Twitter.

2.2 IHub

Nairobi's Innovation Hub for the technology community is an open space for the technologists, investors, tech companies and hackers in the area. This space is a tech community facility with a focus on young entrepreneurs, web and mobile phone programmers, designers and researchers.

It is a part open community workspace (co-working), part vector for investors and VCs and part incubator. It has also a number of initiatives designed to build an ecosystem around the Kenyan tech entrepreneur: iHub Research, iHub Consulting, iHub Supercomputing Cluster, and the iHub[6] User Experience (UX) Lab. It's in the move to create the place where seeds are planted and are easily found by the people with money to help them grow.

It is a paradigm shift towards the areas where technology approaches a barrier, and new technologies emerge to cross it. This is achieved through the idea of Open Innovation, which is the process of combining internal and external ideas as well as internal and external paths to market to advance the development of new technologies.

2.3 I-Cow

It is a service developed by women, who have made their mark in the Kenyan technology sector in recent years.

[6]IHUB. 2010.To catalyze the Kenyan community growth. Accessed on 8th July 2013 http://www.ihub.co.ke/community

The I-Cow is a mobile phone app for cattle farmers created by Su Kahumbu-Stephanou, an organic farmer who was inspired by her own challenges and experiences.[7] Currently used in 27 counties in Africa inclusive of Kenyan, I-Cow was created initially to help farmers track the fertility cycle of their cows, but it now incorporates other services like helping farmers gain access to veterinary officers and animal feeds. It also collects and stores farmers' milk and breeding records and sends farmers best practices for dairy management. The innovation received first prize in the 2010 Apps4Africa competition sponsored by the U.S. Department of State.

2.4 M-farm

M-farm is a tool used by use of the SMS and web-based application which uses SMS short code 3535 and disseminates agricultural information to farmers.[8] Farmers also use the platform to access real-time price information on different products at different markets and locations. This has eliminated the need for them to go through middlemen to make sales, potentially increasing the farmers' earnings.

3.0 Technology and Women Empowerment

The proliferation of mobile phones in the developing world has been both rapid and remarkable and it opens up possibilities to engage with the most vulnerable and marginalized in societies, which in many cases are women and girls.

3.1 Mobile devices are improving access to financial services

The move towards mobile banking in developing countries opens up opportunities for women to have more control over their finances. This is particularly relevant in developing countries where the purse strings are traditionally held by men. Mobile payments from work can be made directly to a woman's phone which offers an additional level of financial control and independence, as well as assurances that the full salary is paid.

[7]Kenya's Female Entrepreneurs Make Their Digital Mark.2011
[8]http://www.audiencescapes.org/kenya-women-anne-ikiara-icow-mfarm-aaps4africa-ipo48-technology-nairobi-women-ict-akirachix

Mobile banking systems, such as Kenya's hugely successful M-PESA, open up financial access to millions of the 'unbanked', a large percentage of which will currently be women. The ease with which a mobile bank account can be opened up is vital in allowing women to gain financial control and independence, particularly in countries without access to traditional 'bricks and mortar' financial institutions. KenyaWomen EnterpriseFund (KWFT) is giving women loans to do agricultural business through mobile phone technology.

3.2 Mobile technology, in particular SMS systems, are improving access to healthcare

Mobile technology circumvents geographical obstacles . It sounds almost too obvious to say, but the mobile device of course removes the need to travel to receive information. In a huge continent such as Africa, which often lacks traditional transport infrastructure, the mobile device can act as an excellent tool to disseminate information from malaria SMS warnings to maternal healthcare and advice. Nothing can replace seeing a doctor, but regular communication via SMS is the next best thing in providing potentially life savinginformation.South Africa uses text messaging to improve Maternal Health Access.

3.3 The mobile phone evokes a feeling of connectivity and independence amongst women

People often refer to 'the next billion' when it comes to internet access, and how a large percentage of these users will be from the developing world and will use their smartphone to access the internet. For the moment the basic feature phone is ubiquitous, but the African continent is currently experiencing a boom in its consumer class who are demanding access to the same technology we have in the west. This demand combined with a potential flood of cheaper, Chinese produced smartphones will open up the internet to millions of people who traditional lacked access. For women, the mobile device will serve as a tool of empowerment and is likely to open up female-focused social networks and stimulate women's rights groups, in areas such as employment. In a continent that is hugely diverse, the mobile tool and the access to the internet it offers will act as an essential portal to access information and act collectively on women's rights.

3.4 Mobile Education and MLearning improves education

On the education front, Mobile devices can be used to provide primary school teachers with regular updates on educational content to assist with classroom teaching. It opens up a far-reaching, easy to implement and cost effective mobile educational tool to teachers allowing them to run their classroom programmes more effectively.

On the employment side, mLearning can deliver basic skills and job-related training via a mobile device by voice, SMS or USSD. The primary audience would be employed workers, where MLearning could offer specific job-related training and updates around product knowledge or health and safety issues. Well prepared and delivered mobile training could enable more people to access education, while reducing the need for costly training facilities. Simple SMS based services give workers a sense of empowerment, independence and improve engagement with the company. As smartphones begin to replace basic phones in the developing world, the mobile training on offer is likely to become a more interactive, one-to-one experience.

3.5 More empowerment for women leads to more women in the workforce and greater economic prosperity for a country

It is a fairly broad statement, but the engrossing Hans Rosling puts it very eloquently in a TED talk. The birthrate of a country has nothing to do with religion, but is more closely linked to the number of women in the workforce. As mobile devices offer women access to financial services, educational tools, and health care advice, it will also act as a tool to boost the number of women in the workforce and allow them to contribute economically at a personal and societal level. The more women in the workforce, the more the childbirth rate of a country decreases, the less strain there is on a country's resources.

3.6 Payroll and Microfinance improving employee work conditions

Microfinance is the provision of financial services to micro-entrepreneurs and small businesses that lack access to banking and related services due to the high transaction costs associated with serving such clients. The rise of the microfinance industry has been driven by a simple premise; get capital into the hands of those entrepreneurs who are cash starved and don't have access to traditional 'bricks and mortar' financial institutions. The development of

microfinance itself has been hugely beneficial in stimulating small business growth in parts of Africa and Asia.

M-payroll is an extension of microfinance and is a reliable way of using mobile technology to make secure, cost-effective wage payments to 'unbanked' workers, who continue to make up the vast majority of the workforce in the developing world. Their salary can then be delivered securely direct to a mobile wallet such as Vodafone's M-Pesa. This offers the security that workers in developing countries often need and ensures they are paid the full amount by preventing their seniors siphoning off 'tips', which can of course be a huge problem in corrupt businesses

3.7 Mobile technology and agriculture

The mobile phone is in many ways more valuable in Africa than it is in developed countries, simply because of its power in transforming peoples' everyday lives. Development in Africa has traditionally been hampered by a lack of infrastructure (basic roads, transport links etc), and ineffective communications. The humble mobile phone is a way of circumventing these barriers. It is proving hugely effective as a means of a mass-communication tool, and in no area is this more prevalent than in agriculture, traditionally one of the most important areas in African life.

Mobile phones are giving farmers access to vital information about the quality and availability of crops before they travel long distances to buy them, saving people time and money. Mobile SMS alerts can also warn farmers of outbreaks of animal diseases, floods and other natural disasters – allowing farmers extra time to prepare for the event. M-Farm is another SMS based system service that gives farmers access to market prices.

Kenya's i-Cow has had a huge uptake, and allows farmers to register livestock through their mobile phone and receive information on livestock gestation periods and health advice.

4. Technology and Women's Leadership

4.1 Women in Business

In most African Societies, it is a great struggle for women to get into positions of leadership and to have access to control the structures in society. Technology offers an opportunity for women to succeed in this new frontier that allows them to break the glass ceiling. We have seen women take leadership in many Silicon Valley technology based businesses, including the recent hiring of a female CEO for Yahoo. This same space exists for women in Africa. Recently a survey of women in technology listed three Kenyan women as being on the list of Africa's 20 most influential women in technology. The positions that these women hold serve as a good example of how women can rise within national and international corporations on the IT ladder. They included Betty Mwangi-Thuo, Safaricom's general manager for financial services. Safaricom is a publicly listed company in which the government of Kenya has a substantial shareholding. Ms Mwangi-Thuo has been in charge of the iconic mobile transfer service M-Pesa since its launch in Kenya in 2007. She has seen it grow from a product that serves 7.3 million subscribers in 2009 to 15.3 million customers in March 2013, increasing its revenues from Sh2.93 billion to Sh10.3 billion over the period.

Isis Nyong'o former vice president for Africa at InMobi, the world's largest independent mobile advertising network, and Ory Okolloh, formerly a Google executive and now director at an investment firm, Omidyar Network.

4.2 Women in Democracy

Organizers started Barcamp Yangon, an unconference, in Burma in 2010.In a country where gatherings of more than 5 people are illegal, the organizers somehow convinced the government to allow them to hold an event for 3,000 people. In 2013 they featured a prominent human rights figure speaking on youth and technology. In the span of only 5 years, significant changes have taken place in Burma, and technology has helped make this happen.

Digital Democracy also works with women's groups in Haiti, including photography trainings which were done before the earthquake hit and Issues to do with Rape and sexual assault which also skyrocketed in the tents. In the Haiti Case women had already organized a group of about

3,000 members to fight back against rape before the earthquake hit. They've raised awareness and funds with photography exhibits. Their blog is written in Creole and translated into English. Women coordinate in the camps using FrontlineSMS, and have created a database of stories. They've also launched a free 572 support line to direct women to social, medical, and psychological support resources.

Witness, is an organization training people to use video safely and effectively for human rights change. They've interviewed women in the Democratic Republic of Congo, where rape is commonly used as a weapon of war. Documentation is one way to fight back against rape, but those who document are targeted, and technology's reach is limited in the region.

There is an increasing range and scope of the use of technology to document human rights abuses. George Holiday is the accidental human rights witness who shot the video footage of the LAPD beating Romney King in 1991.

The professional journalists, including Al Jazeera and CNN's Report, have also expanded the number of locations and players documenting human rights abuses. Video is used as evidence at the International Criminal Court. Organizers bring projectors to screen films in communities.

Witness partners with organizations and hackers like the Guardian Project to create applications that incorporate privacy and identity as well as informed consent. The recently released ObscuraCam, available on Android, uses facial recognition technology to find and pixelate the faces in your photos. It can save and encrypt an original image, but it's designed to be used on the fly while you're at a protest and can't realistically ask everyone to consent to their face being filmed. The app enhances your own privacy but also that of the people in your photos. It currently works on still photos and will soon work on video, as well.

The Silicon Valley Human Rights Conference (RightsCon) was organized to educate the engineers at Google, Facebook, Yahoo!, and other tech companies about human rights concerns.

In the Arab Spring, there are democratic revolutions that depend to some degree on software built by engineers in California. Google and Facebook's real-name policies, for example, pose major challenges to the personal safety of human rights organizers.

5. Limitations of Technology Use

1. Lack of access to the gadgets needed to transact using technology.

2. Lack of access to electricity.

3. Insecurity brought on by the value of mobile phones, laptops etc

4. Apps and technology are popular, but often put the users on the ground in physical danger which leaves Analog methods like pen and paper which can help prevent data from falling in the wrong hands.

5. Technology puts us at security alert where loss of a phone can lead to tracking and therefore put the individual and others at risk simply by having information.

6. Fraud is a common case that several people lose money through fraudsters who claim that they have won money through promotions and awards.

7. Countries such as Kenya have proposed to provide laptops for use to children in primary schools. The Kenyan proposal is set to cost approximately 12Billion shillings. This is in a country where a large population does not have access to electricity and many schools still have insufficient classrooms leading to students learning in the open. [9]

8. Internet connectivity is also important in the proper harnessing of technology. Countries that do not have proper internet networks will hold back their populations in being able to access the full value of the internet.

6. Recommendations

1. Educating women on security measures with regards to pin numbers, secret code words which can beef up their mobile security.

[9] http://www.standardmedia.co.ke/m/?articleID=2000095760&story_title=Standard-One-laptops-project-faces-setback

2. Customers need to be advised on the methodologies use by mobile fraudsters to avoid being defrauded money. Female customers need to be made aware on the need for checking to see if the text message they receive is actually from the mobile service providers logo or name and being aware of their account balance.

3. The mobile service providers need to provide programs that might assist special populations, such as the elderly, illiterate or visually impaired into having positive experiences with their services

4. Most importantly, sensitizing women and training them on the use and advantages of technology will increase their uptake and usage. Only then can they be able to harness the advantages provided by technology.

5. Advocating for the government to put in place data networks that allow for wide network coverage which will ease access for the population including women.

6. Lobbying network providers who have not taken up mobile service banking technology to do so as this will boost the national economies as it allows more women to participate formally in the economy.

7. Women activists to utilize existing frameworks including social media to mobilize for networks, resources and ideas sharing which will enrich the movement.

8. Better understanding is needed between various regions in Africa, we can all learn something new from each other on the value of technology and the developments that have been made in the various areas.

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