Content List

Section One .............................................................................................................................................. 1
  SPARC Working Paper Brief .................................................................................................................. 1
  Mobile Technologies – Development Trends ......................................................................................... 1
Section Two .................................................................................................................................................. 3
  Using Mobile Technologies for Communication and Information Sharing ........................................... 3
  Examples of Use of Mobile Technologies for Development ............................................................... 3
Section Three ............................................................................................................................................... 5
  Mobiles in Government ......................................................................................................................... 5
Section Four ................................................................................................................................................ 6
  Conclusions and Recommendations ..................................................................................................... 6
Appendix One ............................................................................................................................................... 7
  References ............................................................................................................................................... 7
Appendix Two ............................................................................................................................................. 8
  Online Resources on Mobile Technologies for Development ............................................................. 8
Appendix Three .......................................................................................................................................... 9
  Quick Guide: Start Using SMS for Information Sharing .................................................................... 9
    Types of SMS information sharing systems: ...................................................................................... 9
    Ways of implementing an SMS system: ............................................................................................. 9
Section One

SPARC Working Paper Brief

- Research options for potential uses of mobile phone technology for information sharing, communication and m-governance related issues for SPARC programme and Lead State key partners;
- Produce a summary brief of findings, including links to relevant websites and other programmes.

Mobile Technologies – Development Trends

Information and Communication Technologies (ICT) are playing an increasingly important role in meeting a wide range of requirements throughout the world. There is also a growing recognition that mobile technologies present a unique opportunity to provide comprehensive services to all sectors of society. This is particularly important in developing countries that lack fixed-line telephony infrastructures as mobile technologies help to bridge the digital divide.

The International Telecommunication Union (ITU) reported in February 2010 that the number of mobile cellular subscriptions was expected to reach five billion globally in 2010. This growth and associated focus on types of mobile technologies is different throughout the world, with developed countries looking for the latest, fastest, most advance technology and developing countries enjoying low-cost and low-tech solutions.

Developing countries leapfrog the West with two thirds of the mobile cellular subscribers and the highest growth rate is in Africa1. The use of mobile broadband subscriptions is also growing both in developed and developing countries and is expected to exceed one billion in 20102. In the last few months there were more Google searches done via mobile devices than fixed line PC.

Telecommunication and connectivity statistics3 for Nigeria:

- Fixed telephone line penetration rate4 - 0.86 per 100 inhabitants;
- Mobile phone subscriptions – 42 per 100 inhabitants;
- Ratio of mobile cellular subscriptions to fixed telephone lines is 48.2 : 1;
- Internet penetration in Nigeria - 7.4%, or 11 million users (June 2009).

Nigerian Communications Commission’s (NCC) latest subscriber data shows that as of February 2010 there were over 67 million active GSM connections in Nigeria5. This however does not represent the full picture as some subscribers will have more than one handset, and there is also a tendency to share phones and/or SIM cards with family members, friends and neighbours6. The access to mobile phones is believed to be considerably higher.

Cellular networks are becoming faster and more reliable, GSM coverage is increasing and wireless data connections are getting better. Nigeria’s telecom market was liberalized in 2003, which paved a way to enormous growth rates and has bought in new operators. According to the Wireless Foundation, the Nigerian telecom market grew by 23% last year7. NCC’s report on “The Impact of Mobile Services in

---

1 http://www.guardian.co.uk/business/interactive/2009/mar/02/mobile-phones
2 http://www.itu.int/newsroom/press_releases/2010/06.html
3 Data from ITU statistics database for 2008 and NCC quarterly stats for Q1 2010
4 Penetration rate – the number of subscriptions per 100 inhabitants
5 NCC subscriber data, http://www.ncc.gov.ng/
6 Jeffrey James, Mila Versteeg, 2007
7 http://wirelessfederation.com
Nigeria" by Pyramid Research USA published in March 2010 expects that over 55% of mobile subscriptions in the world will be using 3G+ in the next three years.

International Data Corporation (IDC), a global provider of market intelligence for the information technology, forecasts further strong growth for the African telecoms market in 2010 despite poor economic conditions, "with further regulatory developments that are already gradually opening up the market for increased competition and advanced services."

This phenomenal growth in mobile telecommunications in the developing world is attributed to:

- Availability and accessibility, with increased network coverage and improved connectivity;
- Affordability (Reliance Communications (India) offers 1 cent a minute phone and text messaging service with no monthly charge, with handset prices starting at $25);
- Usability and functionality, with minimum level of technology competency required, adequate performance and speed, reliability and scalability;
- Appropriateness to local environmental conditions;
- ICT regulatory policies and frameworks, including collaborations between Governments and Industry leaders.

Some thought-provoking facts on mobile technologies:

- Text messaging is the most widely used technological data transfer method in the world;
- The Nokia 1100 mobile phone, a very simple and basic handset launched in 2003, with a dust-proof keypad and built-in flashlight, sold over 200 million units worldwide, making it the bestselling consumer electronics device ever;
- The United States ranks below 71 other nations in its level of mobile phone penetration, even though it leads in other areas of connectivity (World Economic Forum statistics);
- Some experts believe that less than 20% of mass email messages are opened and read by intended audiences, where as almost all delivered text messages are read;
- The White House released President Barack Obama’s speech to the Muslim world, in Cairo, in 13 languages via text message;
- With every 10 mobile phones per 100 people in a typical developing country, GDP increases by 0.6% points.

---

8 http://www.pyr.com/downloads.htm?id=20  
9 http://www.idc-cema.com/?showproduct=38350&content_lang=ENG  
10 http://www.celularis.com/noticias/nokia-1100-el-electronico-mas.php  
11 True for western societies; here in Nigeria users seems to be flooded by unsolicited SMS which are often deleted without reading.  
12 Waverman, Meschi and Fuss, 2005
Section Two

Using Mobile Technologies for Communication and Information Sharing

The main usage of mobile phones is for straightforward communication purposes. Voice and text messaging (SMS) are still the most common applications of mobile technology, followed by photo and video, data collection or transfer, multi-media messaging (MMS). However, mobile technologies are being increasingly used for many services, such as banking, retail, entertainment, education and awareness building, healthcare, humanitarian assistance, environmental conservation and ‘info-activism’.

The simplicity and availability of mobile technologies allow users to quickly and easily communicate information, as well as save time, mobilize and organize individuals and activities, reach wide audiences, gather and transmit data more accurately and quickly. In the research conducted by the Pyramid Research group (“The Impact of Mobile Services in Nigeria” report, 2010), Nigerian mobile end users reported that mobile services positively influenced every aspect of their lives, connecting them to clients, co-workers, relatives and friends, thus helping people access information, creating business opportunities, lowering transaction costs and enhancing social interaction. The report demonstrated several examples of mobile applications in the areas of agriculture, health, education, productivity, transport, and how these services were generating interest and participation from end users thanks to their tangible impact on day-to-day lives.

One of the simplest and most effective ways of using mobile technology for communication and information sharing is through mass broadcasting of voice and text messages. There are many applications available that help to set-up an SMS system for mass broadcasting which vary in design and complexity. How one chooses the SMS system depends on the aim of the system, target audience, available technical and financial resources.

MobileActive.org\(^{13}\), a global network of people using mobile technology for social impact, has several ‘How-To’ manuals on setting up SMS systems, which are summarized in Appendix.

Examples of Use of Mobile Technologies for Development

The field of mobile technologies for development is new, with first pilot projects initiated in 2003. Most of these projects are delivered in collaboration between NGOs, government agencies and private service providers.

Some of the examples of these projects are:

- **m-Education**: Learning about Living is a multi-stakeholder project in Nigeria run by OneWorld UK\(^{14}\) and Butterfly Works (Holland) with collaboration from Nigeria Education Research and Development Council (NERDC), Federal Ministry of Education and Federal Ministry of Health and involvement of several NGOs. The project aims to develop and implement e-learning and m-learning tools to teach Nigerian teenagers about sexuality and HIV/AIDS prevention;

- **m-Health**: Medical professionals are using mobile technologies to monitor patient health, to send targeted health advice and tips, digitally coach patients, access electronic health records (California HealthCare Foundation reports, various medical technology reports). In developing countries, medical consultations by mobile are transforming health care especially to those living without access to primary health care centres (m-Health systems \(^{15}\)in Rwanda and Peru by Voxiva;  

\(^{13}\) [http://mobileactive.org/howtos/how-set-sms-system](http://mobileactive.org/howtos/how-set-sms-system)  
\(^{14}\) [http://mobile.oneworld.net/](http://mobile.oneworld.net/)  
\(^{15}\) [http://www.voxiva.com](http://www.voxiva.com)
Citizen Participation: Sudan Vote Monitor\(^{16}\), a pilot project led by the Sudan Institute for Research and Policy (SIRP) that uses ICT to support the independent monitoring and reporting of the election process and results. The initiative is implemented using an open source software platform that allows anyone to gather distributed data via SMS, email or web and visualize it on a map or timeline;

m-Banking - Phone-to-phone payments: M-Pesa\(^{17}\), a service by Safaricom in Kenya working to make the cellphone the hub of personal finance. With M-Pesa one can convert cash into cellphone money through local grocery shops, and this money can instantly be wired to anyone with a phone. Mobile money is formalizing the informal economic sector (unbanked) by providing accounts for the first time and enabling financial services to those out of reach of banks;

Mobile public broadcasts: Gaon Ki Awaaz is a twice-daily news alert that is delivered via voice call directly to subscribers’ phones in rural Uttar Pradesh, India. Subject matter for the Gaon Ki Awaaz\(^{18}\) broadcasts can include alerts such as when health camps are coming to a nearby area, farm tips, events in the village such as religious and/or community-oriented celebrations, or local-centric government announcements;

In India, Nigeria, Kenya and many other countries around the world, mobiles are used to allow citizen election monitoring and to equip voters, via text message, with information on candidates;

Agricultural Services – Agriwatch\(^{19}\) provides Indian agricultural market information and technical information to subscribers via SMS messages;

Job hunting services: Souktel\(^{20}\) is a cellphone-based service that uses SMS technology to link young people with jobs (JobMatch);

Humanitarian Relief: Souktel also connects aid agencies with people who need help (AidLink), by giving people key information on food distribution over their mobile phones.

\(^{16}\) [http://www.sudanvotemonitor.com/](http://www.sudanvotemonitor.com/)


\(^{18}\) [http://gaonkiawaaz.wordpress.com/](http://gaonkiawaaz.wordpress.com/)

\(^{19}\) [http://www.agriwatch.com/](http://www.agriwatch.com/)

Section Three

Mobiles in Government

The role of mobile technologies in the field of governance (m-governance) and public service delivery by Governments (m-government) are emerging areas that are currently being explored both in developed and developing countries. Ability to connect with previously unreachable audiences, relative low costs of mobile technologies, ease of use, wide accessibility, higher data transfer rates are all contributing to the big potential for mobile-enabled development.

World Bank’s Governance Matters blog\(^ {21}\) offers the following areas where m-governance initiatives are being tested by various governments and public groups:

- Public Service Delivery: information consultations, public service announcements, payments for services, etc.;
- m-health – using mobile phones for health related matters;
- m-education (based on e-learning);
- m-voting and participatory decision making;
- Voice and Awareness Campaigns;
- Tax, judicial and legal system services;
- Social Participation and Advocacy;
- Crime reduction and reporting;
- Economic empowerment.

Other areas that are being explored include tackling corruption, monitoring absenteeism in civil servants, monitoring and visualizing water supply to name a few.

Here are some of the examples of m-governance initiatives from around the world that have been documented:

- M-government services in Dubai, mDubai\(^ {22}\), is an innovative channel for communication between customers and Government Departments via SMS introduced by Dubai eGovernment;
- Mexican Government is trying to tackle crime by forcing 84 million mobile phone users to register their identities by text (April 2010);
- m-Singapore\(^ {23}\) is a hub for m-government services provided by the Singapore Government, including citizen consultations, tax renewal, neighbourhood crime watch, emergency advice;
- The Forest Survey of India\(^ {24}\) (Ministry of Environment) is using satellite information to send out instant SMS to forest staff and civilians when a forest fire is detected via the satellite.

---

\(^{22}\) [http://www.mdubai.ae/](http://www.mdubai.ae/)
\(^{24}\) [http://www.fsi.nic.in/](http://www.fsi.nic.in/)
Section Four

Conclusions and Recommendations

There is big potential for using mobile technologies both within SPARC and its key partners for programme implementation as well as by State and Federal Government agencies to deliver public services. This is supported by the evident growth in mobile penetration in Nigeria, large investments in the telecom sector, the variety of existing examples of provision of services using mobile technologies in the financial, health and education sectors, and case studies of successful initiatives from other governments.

Transparency and open collaboration with citizens can help governments to increase accountability, gain recognition and support and improve their service delivery. Some public administration experts believe citizens’ feedback can help to facilitate a step-by-step transformation of the large government apparatus.

The introduction of such kinds of large initiatives must follow standard feasibility studies and development processes. It is important to secure partnerships with the main industry players and involve international organizations. Back-end software development for managing mobile services should be one of the priority areas. The systems should be designed with service beneficiaries in mind and with their involvement from the start.

One suggested application of SMS technologies is using SMS for government contracts monitoring through public engagement campaigns. In these campaigns members of the public are encouraged to send SMS to a dedicated number with latest updates from their locality related to a particular government initiative or project. SMS campaigns can form a part of a growing number of State-level government web sites and help with dissemination of information regarding government services, important publications, new laws and regulations.

A simple way to start using mobile technologies at SPARC is though one of the available SMS software packages such as FrontlineSMS for distribution of security notices or important programme-wide announcements. Urgent security notices can be sent to any number of SPARC staff quickly and easily using a PC or laptop with an identified SMS software programme installed on it and a suitable mobile phone with top-up credit. Mobile phone numbers of SPARC staff can be stored in the database of the application for ease of use. When needed, a designated person launches the software programme on his/her PC or laptop and using a simple application interface prepares a text message that is to be distributed. Mobile phone numbers of people who need to be informed can be selected from the contacts database. This can be a one-way information distribution system or two-way communication system. (For more information on FrontlineSMS and similar packages see Appendix 3.).

Another possible application is being explored with the Nigeria Governors’ Forum, whereby SMS notices can be sent out to key stakeholders when important documents are loaded onto a content management system that is being designed.

For applications of mobile technologies in these and similar instances in-depth research and consultations with all involved stakeholders and mobile technologies experts and practitioners as well as dialogues with intended audiences will need to be organized. There is a substantial library of resources, case studies and a pool of expertise that is available both in Africa and around the world (some of these resources are provided in the Reference section) that SPARC could engage with to introduce m-technologies element into the programme.
Appendix One

References


Appendix Two

Online Resources on Mobile Technologies for Development

- **kiwanja.net** helps non-profit organisations to make better use of information and communications technology in their work. Specialising in the application of mobile technology, it provides a wide range of ICT-related services. Focus areas: Inform - providing mobile-related information to those who need it most; Advise - once they have it, helping them make sense of it; Act - once they understand it, providing the tools to help them act on it.

- **nGOMobile**[^25] is a text message-based competition aimed exclusively at grassroots non-profit organisations working for positive social and environmental change throughout the developing world.

- **m-Government for Development**[^26] Information exchange project by University of Manchester that focuses on the use of mobile and wireless ICTs to support public sector work processes.

- **m-GovWorld**[^27] Knowledge Portal on m-government focuses on mobile applications for inclusive growth and sustainable development.

- **Tactical Technology Collective**[^28] - NGO helping human rights advocates use information and ICT to maximise the impact of their work.

- **App Lab**[^29], the Application Laboratory is an initiative of the Grameen Foundation that seeks to provide easy access to vital information for improving livelihoods to the world's poor via mobile phones.

- **ITU Case studies** ([http://www.itu.int/osg/spu/ni/futuremobile/content/messaging.html](http://www.itu.int/osg/spu/ni/futuremobile/content/messaging.html)) – a collection of case studies from International Telecommunications Union on the use of mobile applications throughout the world

- **m-Banking for the Poor** ([http://www.infodev.org/en/Project.35.html](http://www.infodev.org/en/Project.35.html)), a part of the online resource infoDev.org (World Bank programme) that focuses on bringing financial services to new customer bases via mobile technologies, featuring reports, assessments and case studies.

- **textually.org** ([http://www.textually.org/](http://www.textually.org/)) is the entry point of weblogs devoted to cell phones and mobile content, focusing on text messaging and cell phone usage around the world, tracking the latest news and social impact of these new technologies.

[^25]: [http://www.ngomobile.org](http://www.ngomobile.org)
[^26]: [http://www.egov4dev.org/mgovernment/](http://www.egov4dev.org/mgovernment/)
Appendix Three

Quick Guide: Start Using SMS for Information Sharing

The simplest and most effective way of using mobile technology for mass communication and information sharing is through mass broadcasting of voice and text messages. There are many applications available that help to set-up an SMS system for mass broadcasting which vary in design and complexity. How one chooses the SMS system depends on the aim of the system, target audience, available technical and financial resources.

Types of SMS information sharing systems:

Ways of using SMS systems: MobileActive.org, a global network of people using mobile technology for social impact, has several ‘How-To manuals’ on setting up SMS systems which are summarized below:

Text Blasting or Bulk Messaging: Similar to an email user group, a text message is sent to a group of registered users. These types of messages are best used as information sharing, reminders, etc. It is important to maintain the database of people’s records and have easy options for opting in and out of the system. This can be done either though the SMS system software itself or through the mobile service provider.

Keyword Response and Smart Texting: An automated response is sent to all incoming messages that contain a specific keyword. Example: when someone texts a word “volunteer” to your designated mobile phone number, an automated response is sent to them telling about volunteer opportunities at your organization.

Smart texting is an advance form of Keyword Response, where incoming text messages to your designated phone number trigger more complex interaction with the user. Examples includes databases that respond to a keyword text with the appropriate information, systems that gather text, image and voice messages, and forward received data to designated people.

Premium-rated SMS systems offered by some providers mostly used for fund raising.

Peer-to-peer viral SMS campaigns are an effective way of spreading information to large audiences without any need for a central management mechanism.

SMS-to-email and email-to-SMS services are often freely available from mobile network providers. Email-to-SMS can be useful for sending small numbers of free SMS texts.

Cell broadcast is a service that gives mobile operators the ability to send an SMS-like message to all subscribers in a particular location. This service can be effectively used in disasters and emergencies.

Please-call-me messages, can be used to send another mobile user a message asking them to call you back. The receiving user gets the message as an SMS with the text ‘Please call me’ and the sender's number.

Ways of implementing an SMS system:

Commercial Service Providers:

Many Commercial Service Providers (CSP) offer bulk SMS services, either by specific country or region or internationally. Commercial providers usually offer a simple web- or desktop-based SMS administration software and designated support staff. Considerations when choosing Commercial Service Providers to implement your strategy should include set-up costs and monthly or usage charges, and the sensitivity of the content of text messages.

---

30 http://mobileactive.org/howtos/how-set-sms-system
Available CSP in Nigeria offering bulk SMS services:

- **Aratext**[^31] is a web-based mobile communications platform operating from Lagos State that allows you to send text messages from your computer to literally thousands of mobile phones at once. Costs: N5.00 for a minimum of 500 SMS, or N2.00 for a minimum of 2,000 SMS per one SMS.

- **LamproSMS**[^32] is Lagos based company that focuses on bulk SMS messaging and provides a high capacity messaging platform to over 700 networks worldwide. This easy to use web-based product offers bulk SMS delivery, customized sender’s ID, message scheduling functionality, history reporting, bulk imports of contacts, contact and group management, and many more advanced features. Prices start at N3.00 for up to 200 SMS.

- **Global Telecom Services (GTS) Africa**[^33] is a private French-owned company that provides solutions web-hosted services in various domains of mobile business including m-Marketing & CRM, m-Enterprise, m-Payment, m-Banking, m-Infotainment, m-Government. Operates in Nigeria through GTS-Infotel Nigeria Ltd based in Lagos.

- Main mobile service operators, such as MTN, Globacom, and Zain offer a variety of enterprise products and Value Added Services, however no reference to SMS systems is available on their web sites.

**Desktop Applications:**

A desktop SMS system usually combines a software package - the SMS equivalent of an email client - with an inexpensive mobile phone or GSM modem that is used to send and receive SMS messages. Some IT companies provide basic programmes for individual SMS systems. More a larger systems, there are several tried and tested applications, such as FrontlineSMS or RapidSMS, both open source platform that can be adapted to meet specific needs project needs.

**FrontlineSMS**[^34] is the first text messaging system that allows instantaneous two-way communication on a large scale using a simple to operate free software. FrontlineSMS was established by Ken Banks, an ICT specialist who focuses on the application of mobile technology for positive social and environmental change in the developing world.

Some of the uses of FrontlineSMS in Nigeria are:

- Monitoring the presidential elections in 2007 by The Network of Mobile Election Monitors (NMEM)
- Environmental protection and awareness
- Communications between rural NGOs via a central NGO
- Village phone and community development advocacy among youth and women
- Disseminating HIV/AIDS information
- Communicating with entrepreneurs and business associations
- Sending farming market data, product prices and planting advice
- Providing breaking news about Nigerian universities and education
- Broadcasting research grants, fellowships and scholarship alerts
- Keeping in touch with members to help solve community-based problems
- Raising awareness around blood donation programs

Also see: “SMS Quick Start Guide”[^35] developed by Ashoka Foundation’s Changemakers initiative and kiwanja.net is a simple quite to help set-up a simple SMS system.

**RapidSMS**[^36], is an open-source SMS-based (text message) framework that manages data collection, complex workflows, and group coordination using basic mobile phones — and can present information on the internet as soon as it is received. So far RapidSMS has been customized and deployed with diverse functionality: remote health diagnostics, nutrition surveillance, supply chain tracking, registering children in public health campaigns, and community discussion. It is an open-source application that can be downloaded and customized.

[^31]: http://www.aratext.com/
[^32]: http://www.lamprosms.com/
[^33]: http://www.gts-infotel.com/
[^34]: http://www.frontlinesms.com/
[^35]: http://www.kiwanja.net/media/docs/Changemakers-kiwanja-SMS-Guide.pdf
[^36]: http://www.rapidsms.org/
Ushahidi\textsuperscript{37} is an open source project which offers a platform that collects information delivered by SMS, visualizes received information and creates interactive maps.

Freedom Fone\textsuperscript{38} is an information and communication tool, which marries the mobile phone with Interactive Voice Response (IVR), for citizen benefit. It provides information activists, service organisations and NGO's with widely usable telephony applications, to deliver vital information to communities who need it most.

\textsuperscript{37} http://www.ushahidi.com
\textsuperscript{38} www.freedomfone.org