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10 Text to Change

Pioneers in using mobile phones as persuasive technology on health in Africa

Hajo van Beijma and Bas Hoefman, Text to Change

Text to Change

Over the last decade, the mobile technology landscape has changed dramatically across Africa and the developing world. As the solitary most transformative technology for development, mobile phones have ignited economic growth and development; and they have become increasingly affordable and accessible – even to the world's poorest. Mobile subscriptions as by 2010 totaled over 5.3 billion worldwide, and access to mobile networks is now available to 90 per cent of the world's population, with at least over 1 billion mobile subscribers across Africa (Orth, 2011). Explosive growth in the mobile sector had meant that, by early 2007, mobile users constituted almost 90 per cent of all African telephone subscribers. At the end of 2007, there were 280.7 million mobile phone subscribers in Africa, representing a penetration rate of 30.4 per cent (McNamara, 2007).

Inspired by an eye opening Celtel Documentary, aired on BBC News Channel, that highlighted the significant growth of the mobile industry in Africa way back in 2007, Mr Bas Hoefman realized the potential to communicate health information to people via a mobile phone. For a while he nursed this thrilling innovation, considering that his employment at ING Bank, where he had currently been working for two years, was unsatisfactory. Bas therefore encouraged himself to explore this new channel of his career, inspired by an inner drive of faith and hope. Over a few drinks with his friend Hajo van Beijma, with whom he has founded Text to Change (TTC), Bas Hoefman shared his remarkable idea. The proposed solution was to take advantage of the boom in mobile telephony in Africa, using the short message service (SMS) as an easy, cost-effective and interactive way to communicate information, collect data, and create awareness on health issues.

After a challenging start and several unsuccessful grant applications, Bas and Hajo were introduced to Merck & Co, an American pharmaceutical company. Their company foundation was keen to fund innovative ideas and had an affiliate

in Uganda (Philips Pharmaceuticals) willing to work with them. Finally, in 2007, the TTC Foundation was born and since then, the combined energy and dedication of the duo has brought TTC well and truly to life.

Starting small: the pilot phase

Research carried out by the Uganda Demographic and Health Survey (UDHS) in 2006 showed that only 30 per cent of women and 40 per cent of men had any comprehensive knowledge of HIV/AIDS. It also revealed that only 71 per cent of women and 77 per cent of men had ever been tested for the disease (Uganda Bureau of Statistics, 2006). With this kind of research proving that HIV/AIDs was a rampant scourge that was eroding Uganda's population, Hajo and Bas thought that the use of mobile phones would then act as a channel to remind people about clinic appointments, taking their medicine and more so, share pertinent information on how to curb the disease.

Also with the rapid growth of mobile phone subscribers in Uganda (approximately 8.2 million in 2008), TTC immediately saw this as an opportunity to reach a large number of people on the HIV/AIDS issue and set about preparing their first pilot project (ITU, 2009). So, in August 2008, the two Text to Change (TTC) founders, together with Marieke Hoefman, a doctor specializing in tropical medicine, flew to Uganda. The trio met with NGOs focusing on HIV prevention campaigns, as well as Celtel Uganda (now known as Airtel Bharti Uganda, formerly known as Zain Uganda, which was one of the dominant Mobile Telecom Operators in Uganda in 2008), who was the telecom provider that was willing to provide text messages (SMS) at a reduced rate.

After numerous Google searches, Bas was surprised that there were not many (large scale) initiatives as he had envisaged, and so he realized the project's potential. He conducted more detailed research through various media such as the internet and local newspapers on several NGOs addressing the HIV/AIDS scourge in Uganda. The determined team identified AIDS Information Centre (AIC), a local NGO, as a potential partner with whom they could establish a pilot project. It was clear through research and subsequent meetings with the partner and the team that AIC had goals to meet with which they were keen to try out new technologies, among these a mobile phone. These goals included:

- 1 To improve knowledge and awareness about HIV/AIDS in Uganda.
- 2 To increase the uptake in HIV Voluntary Counseling and Testing (HCT) in their branches throughout Uganda.

Developing the SMS campaign

The team was to reach at least 15,000 mobile phone users (which was the number of mobile numbers AIC had in the database), in AIC's Mbarara region (southwest Uganda) with an interactive SMS campaign to run for six weeks under the slogan '*Don't guess the answers, learn the truth about AIDS*'. We wanted to reach as many people as possible, without being too intrusive with the messaging.

The use of SMS to influence health behavioral change was a novel opportunity that had not been fully explored in Uganda as yet in 2007. Neighboring countries like Kenya have used this approach and can testify that behavior change was triggered by SMS messages among people living with HIV who were taking anti-retroviral medication for HIV (Hahn, 2011). Furthermore, we wanted to capture HIV/AIDS behavioral change data impacted by the use of SMS that would be used for future analysis and research. Therefore, we set up an interactive SMS quiz to test people on their HIV/AIDS knowledge. Participants would receive multiple-choice questions via their mobile phone as well as messages encouraging them to go for testing. Some of the questions were designed to spark discussions on (often) tabooed subjects, such as condom use.

Sample Question:

1. Do you think a healthy looking person could have HIV?
 - a)Yes
 - b)No

Correct reply: Yes! You cannot tell from someone's appearance whether he has HIV or not. You only know by taking an HIV test. So do the test

Wrong reply: Wrong! A healthy looking person can certainly have HIV. You only know by taking an HIV test. So do the test at AIC Arua and know your HIV

Figure 10.1 Sample SMS quiz question

Quote from one of the participants:

"This is exactly the desired open discussion on HIV/AIDS which is needed to reduce stigma."

Figure 10.2 Quote from a participant

Answer sent back by the participants were immediately followed up with an automated response – a confirmation or a rectification. As a further motivator, the quiz also offered a range of prizes, including free airtime and mobile phones.

The idea of using a quiz developed from the fact that traditional health communication campaigns that had been previously carried out by AIC included radio, television, and print media were all a one-way message with the end-user. We believed that SMS quizzes could provide the perfect channel to directly and timely communicate with their target audience who include especially the youths and all Ugandan citizens and could also be a suitable medium to make existing campaigns interactive. For maximum effect, SMS quizzes work best as part of a package of health communication activities enhancing and supporting traditional communication channels such as radio and posters. Not only will you embed your mobile short code in your marketing materials (on billboards, posters, your website, radio, TV, etc.), but you will decide what confirmation message to send back to people texting in, what frequency you will use to send mobile campaign updates and also build a database that can be used for data collection (Calder Strategies, 2007).

The campaign's primary goal was to demonstrate that mobile phones could be a highly effective tool in creating awareness on health topics in developing countries. We had a 20 per cent response rate on the questions, but more importantly, the demand for HCT services at the AIC in Mbarara rose over 40 per cent during the pilot. In total, 255 participants came for HCT services (183 males and 72 females), which represented a 40 per cent increase (ITU, 2010). In general, the participants were reminded about HIV/AIDS and the need to know one's status. They passed the information they gained onto relatives, friends, and others in the community. The participants were informed of different places where they could access HCT services, and TTC realized the cost-effectiveness and convenience of communication via SMS.

The proof of concept that SMS is a simple and very successful way to transfer health information for the interest and needs of target populations and to increase the uptake in health services was evidence enough for us to continue our work.

Growing from the pilot phase

When we look back, finding support for this initiative was a complex start. Convincing firms and organizations to buy in to this new innovation was also difficult. We arranged several meetings with organizations in Uganda, among these were Air Uganda, Nile Breweries, Unilever, and also the AIC. The idea was exciting for the partners, especially in using mobile to market their activities and products, alongside sharing pertinent health information with their clients but also staff members. Many

partners were receptive about the idea. The duo was hopeful; however, the partners were always ambiguous and nonresponsive.

But a ray of hope beamed their way, when Merck & Co, an American pharmaceutical company, committed a grant of US \$37,500 which was used to work with then Celtel's (now Airtel's) existing text messaging software (designing our own software was too expensive for us at this stage), to launch a marketing campaign for the project and a contribution toward AIC's role. All TTC staff worked voluntarily.

After this initial successful program, we decided to share our experiences with the previous partners we had visited. Reports, white papers, blog posts, website publications, and other material were shared including local news print (Kasozi and Basudde, 2008; Nafula, 2008; Royal Tropical Institute, 2010; TTC, 2010). This opened new doors and opportunities for funding. It built the confidence of the power of using mobile for health and also development. Soon after, a number of programs followed that included:

- **Providing Comprehensive Holistic Care to Clients with TB, HIV/AIDS, and Cancer**, a program implemented with Kawempe Home Care (Hope Clinic Lukuli, Uganda) and funded by USAID between April 2010 and December 2010. The main focus of the program was to use text messages to increase utilization of health services (i.e. HIV/AIDS care, maternal care, and family planning) and communicate about health products available at Hope Clinic Lukuli. The evaluation results showed an increased adherence after SMS use: 87 per cent adherence above 95 per cent at project start and 93 per cent after 3 months. A testimonial from the partner highlights the success of the project: 'A greatly successful project as seen in the evaluation results, the clients adherence increased, their viral load reduced and their CD4 also went up.'
- **Using SMS to provide information on HIV/AIDS Prevention, Malaria, Family Planning, Medical Male Circumcision (MMC), Multiple Sexual Partnerships Health Initiatives for the Private Sector (HIPS – Uganda)**, implemented from August 2009 (TTC, 2010). Under this Initiative, TTC has worked with four Ugandan companies: Kinyara Sugar in Masindi, Kakira Sugar Works in Jinja, Kasese Cobalt KCCL in Kasese, and Eskom Uganda. The program has seen a total of over 1,500 participants receiving about forty HIV/AIDS-related quizzes over a mobile phone, which has been coupled with VCT encouragement and company information sharing. The successes lies in having workers being able to timely and interactively participate in receiving and sharing health information via a mobile phone without leaving their workplaces. A research study is also under way to test the effectiveness of this program.

Many more programs have successfully followed the above that carry interesting results which we have continuously shared on our website (texttochange.com). These programs have attracted a large share of funding with the most recent where TTC will work with Connect4Change (C4C), a consortium funded by the Dutch Ministry of Foreign Affairs that brings together the expertise of five organizations in the field of development and ICT: AKVO, Cordaid, Edukans, ICCO, and IICD. C4C addresses the issues of poverty and exclusion in Africa and Latin America, in the areas of health, economic development, and education – seeking solutions based on the use of the internet and mobile phones. TTC has been identified as the partner of choice to complement these activities. Over the next five years from 2011, TTC will work with C4C and their local partners in Ghana, Malawi, Tanzania, Uganda, Zambia, Bolivia, Burkina Faso, Ethiopia, Kenya, Peru, and Mali.

TTC has, over the past four years, proven that **SMS and Voice**-based applications can be used successfully in various interactive mobile health education programs reaching thousands of people across the African continent. TTC has proved that the use of SMS to encourage behavior change is a highly effective communication channel for health education, encouraging testing and drug compliance and informing people of the choices available to them concerning their well-being. We are currently expanding from providing not only a platform for SMS and voice but also data collection.

Today, TTC is active in Uganda, Kenya, Tanzania, Namibia, Cameroon, and Sierra Leone and in the Democratic Republic of Congo (DRC) and is now expanding outside Africa to South America. We currently have strong partnerships with USAID, Airtel Bharti (formerly Zain), UNICEF, Family Health International (FHI), IICD, Infectious Disease Institute (IDI), Malaria Consortium, Health Child, Jpiegho, and the Dutch Ministry of Foreign Affairs, among others. TTC now employs a team of six employees in Uganda and six others in the Amsterdam office who carry a wealth of experience in program management and implementation.

Opportunities, Challenges, and lessons learned

The mobile landscape in Africa has since evolved over the past decade with 380 million mobile subscribers and one million added every week (Gartner Inc., 2011). This growth has been fueled in a large part by the liberalization effort, resulting in the formation of independent regulatory bodies and increased competition in the market. This has enhanced numerous grassroot efforts to empower the poor and marginalized by providing access to knowledge through

technology, more so a platform for communication. SMS and voice is being used in innovative ways to share knowledge and improve learning in Africa.

Sixty per cent of people in Africa are currently under the age of twenty-four. This is a population that is knowledgeable about new technologies (growing to the use of smartphones) and demanding it. The end-users are booming with lots of enthusiasm to explore and learn any technologies at their disposal in schools and communities. They like to learn and are inquisitive (Hoefman, 2011). Bas says his idea is keeping it simple to encourage knowledge sharing. He has since also observed that mobile is still a more affordable technology compared other information-sharing tools for the masses seeing that service providers always have subsidized packages that accommodate various classes of people.

At the beginning of 2008, the 'mHealth' (mobile health) scene barely existed. TTC took advantage of this and piloted its SMS health campaigns in Uganda, on a large scale. Though the pilot was successful overall, 'everything that could have gone wrong, did go wrong...', including the fact that TTC had registered a short code with the number '666' that roused a negative impact among the clients. They saw this as a number of the devil and discouraged people from joining this campaign. This was the first major setback as we had to acquire a different figure for the short code. We used '777' instead. However, changing the short code number from 666 to 777 was not communicated well, which led to some participants pulling out because the activity was not clear to them. A lack of an introductory message about the service hindered the understanding of the program and affected participation. All the messages were sent in English, which created problems for non-English-speaking participants. The participants who selected the wrong answer to the multiple-choice questions were not always given the right answers. As the service provider, AIC, Mbarara branch, was not mentioned in the messages as the destination for the HCT services, and this led to some participants going elsewhere.

Above all, however, the results of the pilot established TTC as a major player in mHealth in Africa as well as paving the way for many others. TTC has along the way explored mobile growth opportunities to create brands such as the Mobile for Reproductive Health (M4RH) that has inbuilt innovative reproductive health packages. These packages have now become strong household names that have attracted opportunities for scale up to other countries. The opportunities of using mobile as a tool for health are currently numerous and endless. TTC has seen the rise of many mHealth competitors along the way but these have only made them think outside the box and explore new ideas – like presently data collection over a mobile phone and mobile marketing.

The rollout of mHealth has equipped us with various lessons that we share with enthusiasm:

- **Low literacy levels, especially in rural Africa.** SMS is often coupled with literacy – it requires the ability of the end-user to at least be able to read and write. Most times we have encountered mixed feelings from partners in this regard. However, TTC has encouraged that since an SMS is viral, an end-user can be assisted by sharing the information with another who is more literate.
- **Mobile operators are always seeking a win-win market situation.** How then should we package mHealth programs to make them interesting to the mobile operators? We also need to ask ourselves, can the people pay for health information? Mobile operators seek to make profits. At the moment, all TTC programs are funded by the responsible partner and that is why we can be able to sustain the cost of SMS. TTC has partnerships with most major mobile operators in East Africa from which we get subsidized tariffs. Our short codes run on all networks in Uganda, Kenya, and Tanzania. For example, Orange is providing us with technical support in countries where they have operations; however, the partnership does not demand exclusivity – we are open to work with other existing operators within the region.
- **Africa is characterized by too many mHealth pilots,** of which most have not materialized to ongoing, impact-generating programs. Many pilots in developing countries are currently donor funded and have created vast impact. The question is: *If they are successful, how do we plan to scale them up nationally or even all over Africa?* TTC has carried out numerous pilots and we are happy to note that a few have been identified for scale up to as far as other African countries. The secret lies in creating a program that can easily be scalable to other countries and communities. TTC has always worked with a model where the end-user is not paying for the services and the organization issuing the demand is responsible for part of the funding. TTC has established long-term funding agreements with Western agencies to secure a sustainable future for small programs that are being requested for by African organizations.
- **Low rural mobile penetration still remains a constant factor.** Much as we recognize and celebrate the growth of mobile presence, the reality is still a myth to rural populations in Africa. We found out that families in rural areas shared a mobile phone unit of which, more often than not,

ownership is bound to the male. This becomes a challenge in instances where information must be disseminated to the male, reminding her about her antenatal care appointments to the clinic. Cultural norms such as these are still a strong and respectable factor in the African setting that cannot easily be reversed. Even when mobile unit presence would be improved, this would still be hampered by the scarcity of electricity availability in rural areas. TTC has found that in implementing some of the programs, we have to provide a solar charger together with phones so as to ensure smooth continuity of the program's activities.

- **Nonexistence of a central referral health content/facts database.**

TTC on several instances has been challenged with finding a 'one stop shop' for suitable health content. Even so, designing content that can be shared with the limited 160 characters of an SMS is a tedious process. Even after a program has commenced, we find that it would take at least a few extra months before we actually begin because we have to go through a content collection and revision process. TTC has now resorted to create and store a databank of any relevant information that we come across at conferences, on the web, in books, and in magazines. After working with European research institutes and universities on health content to be sent out in Africa, all our post-pilot programs contain content that is developed by African organization, localized with regard to cultural, religious, and demographic differences.

Reflections and recommendations

Africa is currently a hotbed of mobile phone activity. The mobile phone is the new and exciting technique to reach out to people in Africa and that is why it cannot be flouted anymore. The continent has grown over the years to be mobile and this will only expand to include various uses. That was different when TTC started in 2007/2008, when only a few hundred people owned and maintained a mobile phone. Organizations enthusiastic to implement mHealth should ask themselves: *What problem is mobile going to solve for us? And what has already been done by other organizations?* Do not just use mobile because it is fashionable. We have learned that mHealth is not just about adding an mHealth component to an existing program or campaign; however, this needs to be integrated and planned from conception. One of the biggest challenges we have faced is the creation of content and the actual management of mHealth programs. The advice we always give to some of the organizations: do not think about the technology but let us know your challenges so that together we can decide if mobile will act as a

solution. The challenges are: *How do you get people to work with it? And who is going to pay for it in the long run?*

The future of ICT/mobile phone deployment in health is encouraging and growing steadily; however, this cannot be substituted for a weak health economic system – a good quality and fully equipped health sector is vital. It should be understood that ICTs/mobile phones are just a tool or an enabler to economic development. We believe the biggest opportunities lie in the access to quality and timely health information and knowledge.

In our view, government should not be mandated to implement mHealth, but act as the overseer giving support and guidance as much as possible. They should also create an auspicious environment to deploy mHealth by putting policy frameworks and avail essential information and knowledge as often as they can. Approximately four years ago, TTC gave an eye-opening presentation about the potential of using mobile phones in health communication to senior management at the Ministry of Health in Uganda and from there on it was decided that mHealth was going to be used in their programs. We are afraid that this idea is a ‘still born’ birth culminating from long bureaucratic tendencies that run through ministries and governments.

Development of a strong regulatory framework involving a range of stakeholders with accent on end-user involvement will bring us far. For example, in Uganda a technical working group is in place with the aim to bring different stakeholders together to accelerate ICT implementations in Uganda. A national ICT policy is in place and a health sector ICT policy (eHealth) is already operational. The Uganda Ministry of Health is taking steps to coordinate ICT development and has allocated resources to support implementation of its ICT strategy. Nationwide deployment of an mHealth application program could only be successful with the inclusion of government having a dedicated budget. That said, mHealth applications have the potential to improve and strengthen the current health system if integrated into an existing ‘well-functioning’ structure.

Since 2008, TTC has seen widespread success, reaching hundreds of thousands of people via their mobile phones with health information which has undoubtedly contributed to an increase of knowledge and behavior change noticeable in the uptake of people going for health services (HIV counseling and testing, circumcision, and antenatal care) after receiving our messages. TTC will be gradually shifting from a nonprofit organization to a social enterprise. We will continue to expand our mobile services to serve communities around the globe with (health) information. TTC will still be recognized as one of the leading players in the field of mobile for development with a strong brand but in a more adventurous structure. To ensure sustainability, a combination of nonprofit work will be interwoven with profit-generating assignments, while prohibiting a conflict of interest. We are at a helm

of this venture and the future of mHealth and mobile phones for developments lies within public–private partnerships. A challenge still underlies in moving from a donor-funded pilot phase to commercially viable products. *Who is the owner of mobile for development and who is going to pay?* Constructing a sustainable ecosystem is fundamental. Mobile technology is a strong and affordable technique that will foster tangible development. Nothing can stop an idea whose time has come.

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