Mobiles in development

**Stories, questions and answers
to help you navigate choices in platforms
for mobile data collection, management and outreach**

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What can mobile do for you?

This report focuses on the integration of mobile tools into processes like data collection and dissemination in the fields of advocacy and development. Smartphones, GPS trackers and other pocket-size gadgets can provide powerful solutions for collecting data in far flung communities with poor connectivity or bad infrastructure. They can be very helpful for deploying surveys in remote areas, taking stock of supplies, communicating inventories and patient data through simple and cheap SMS (especially when the alternative would be hours of walking). They can be used for election monitoring, real-time reporting of corruption and government inefficiency, or for sharing the latest market prices with fellow farmers. In short, having a device in your pocket that can instantaneously connect you with networks and sources of information is as powerful as it sounds. A number of organizations have spent the better part of the last decade to find better and more robust ways of capitalizing on this opportunity to improve livelihoods and empower individuals.

Who is this report for?

This document gives a broad, general overview of the current status of mobile data collection in development. It is meant to be an entry point, and a way for readers to acquaint themselves with the possibilities of mobile data collection in technical and practical terms. The intended audiences are organizations and activists thinking about their **first mobile project**, as well as anyone interested in **understanding how mobile data collection works**, what it means for the development sector (how it helps, how it's used, and how it shapes its dynamics), what are the main possibilities and where to go for more information.

Mobile all the way down

Mobile devices are at the forefront of ICT4D discourse, and have been for years. The reasons for this are obvious, well researched and largely intuitive:

- mobile penetration, as well as cellular and broadband network coverage, is growing at breakneck speed all over the world;[1]
- prices of mobile devices are constantly dropping; and
- there are many fully developed, well-tested and well-used software platforms built for mobiles that support data collection, monitoring, reporting and campaigning.

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1 Mobile penetration is following a seemingly unstoppable growth curve: according to the International Telecommunication Union 2014 fact sheet, mobile-cellular subscription (SIM cards, not users) grew from slightly above 2 billion in 2005, to almost 7 billion in 2014 (http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf).

Scope and structure

This report is not comprehensive: it cannot include all the use cases, platforms and solutions out there. The field of mobile for development is diverse and complex — because the nature of the problems it's facing is complex and nuanced. For a deeper understanding of the mobile landscape, many high-quality, in-depth studies are already available.[2]

We believe showing is always better than telling. We present some stories that give a broad overview of what types of mobile integration exist. The stories will try to cover methods of implementation, show how it's used for a variety of issues (environmental, human rights, government accountability), as well as different technical solutions (open source, commercial, custom-built, etc).

The first part of the report presents an overview of questions to ask and considerations to make before embarking in a mobile data collection process. It builds on previous research and technical considerations (types of tools, learning curves, etc).

The second part tells four stories of projects with mobile technologies at their core, showcases technology decisions and resulting impact. For every story, there is a summary box with the main aspects and learning points of the technical implementation.

The third part draws conclusions, and gives recommendations for resources and communities that can provide you with more in-depth knowledge about integrating mobile technology.

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2   Knowledge Programme's "Learning Study on 'The Users' in Technology for Transparency and Accountability Initiatives" (http://hivos.org/sites/default/files/ids-userlearningstudyont4tais.pdf) is a good example, as well as the World Bank's "ICT for data collection and Monitoring and Evaluation: Opportunities and Guidance on Mobile Applications for Forest and Agricultural Sectors", (http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2013/12/16/000442464_20131216122704/Rendered/PDF/833050WP0ICT0Report0Box0382086B00PUBLIC0.pdf) and UNDP's Mobile Technologies and Empowerment: Enhancing human development through participation and innovation (http://www.undpegov.org/mgov-primer.html).

Part 1 - Questions to ask

Why mobile?

As mentioned in the introduction, the ubiquity of mobile devices is a boon for any kind of project that requires connecting and interacting with a diverse population quickly, easily and accountably. We are walking around with impressive processing power in our pockets: even the low-end, entry level smartphones can provide high computing horsepower, 3G connectivity and the ability to install new software. There are a number of capable smartphones that run Android, Google's (relatively[3]) open source mobile operating system, with prices in the low $100s.[4] Mozilla, the makers of the famous Firefox browser, presented in early 2014 a smartphone running their custom Firefox Operating System, that will retail for about $25.[5] The tendency here, as Moore's law suggests[6] and our own experience confirms, is to safely expect next generation smartphones that are even smarter, cheaper, and more powerful than the last.

As feature phones go, the entry point is even lower: for example, Nokia's best seller in lower-income countries, the Nokia 105, is sturdy, functional, and touts more than a month of standby battery power, and costs about $15.[7]

Looking at these numbers, one would assume that going mobile for data collection is a no-brainer. However, there are some considerations to make before going the mobile route.

- **What is the project about?** Shiny is appealing. Being able to tout a "mobile integration" on your website and your donor report is great PR. It is, however, important to think critically about whether a mobile data collection or outreach project will really provide the project with information it needs to grow and reach its goals.

- **Sometimes paper is the best choice.** After critical thinking, the organization decides that the project will clearly benefit from a data collection process. After the organization determines what

3   http://arstechnica.com/gadgets/2013/10/googles-iron-grip-on-android-controlling-open-source-by-any-means-necessary/
4   http://www.wired.com/2014/05/cheap-smartphones/
5   http://www.bloomberg.com/news/2014-02-23/mozilla-spreadtrum-introduce-25-firefox-phone-in-barcelona.html
6   An observation stating that the number of transistors in a dense integrated circuit doubles approximately every two years, fuelling the concept of exponential growth of computing power http://en.wikipedia.org/wiki/Moore's_law
7   http://www.nokia.com/global/products/phone/105/

data is going to be collected and what resources are available, the next question to ask is, "Is mobile deployment really necessary"? It might be, for example, that the community being surveyed is easily reachable, small in numbers, and the organization has enough operators on the ground to manually implement the process in a couple of days, effectively saving time and resources. Don't spend the money for mobile if it isn't worth it.

- **Resources - human, financial, technical.** You may save time and resources by using technology for data collection: there is no transporting car-loads of paper surveys, manually digitizing them, etc. However, make sure you don't miss the hidden costs. There might be a need for different, more specifically trained personnel such as IT managers, programmers and designers. There are different mobile platform solutions out there and each has different demands: naturally, the products that are more hands-off tend to cost more, so then it becomes a financial consideration.

- **Learning curves.** In addition to design and implementation, mobile data collection platforms require learning by those who use them. It is important to factor in the time it will take to explain the new processes, technologies and methodologies to the operators or the community. It is important to plan for enough training and uptake time. It is also crucial to make sure there is enough time for deep absorption and understanding to take place, to avoid the risk of misuse and lack of uptake due to sheer intimidation.

- **Mobile security is inherently flawed** - so sensitivity of information should be a consideration. Depending on the level of risk and sensitivity of the information being collected, keep in mind that it is not possible to secure data on a phone from an adversary with significant resources. For example, SMS texts travel in the clear and get routed through a number

It will work because I say so: questioning assumptions

The previous section provided food for thought when deciding whether or not to go mobile. This section looks at some general assumptions that data collection processes might suffer from in the design phase, with a highlight on mobile data collection.

- **Consider your audience.** While using mobile devices can facilitate data collection, there are questions of the type of data and audience mobile data collection will provide. In an SMS polling project, for example, we are assuming that the mobile phone coverage is representative of the population and will give us results that largely correspond to existing social structures. However, it might be that mobile phones in a marriage unit are owned, or controlled, by the husband. This would mean that the results would have a bias towards **"safe answers"** or be overly representative of the male population.

- **Conduct preliminary interviews.** The problem with presentation will obviously bias context-specific surveys, and makes it impossible to ensure the overall collected data is representative of the community. A mitigating solution might be to conduct informal preliminary interviews and have conversations with communities to understand the power structures around mobile access.

- **Gauge literacy levels.** Another factor to consider is the ability of the community to use mobile phones for the way it was intended by the NGO or advocacy organization. Literacy is the obvious red flag when conducting SMS-based surveys. Especially if we consider various degrees of literacy, gauging the correct level of complexity in the language of the app can make the difference between a vibrant poll and no response.

- **Consider all costs.** The roadblock to an effective implementation might be financial: the cost of sending SMS texts might be too high for the community, and the project might not be perceived as being "worth the cost."

- **Build relevant capacity.** Lastly, if the project expects the community to provide the organization with specific information, training becomes very important: making sure the community has enough knowledge to format answers in a way that is usable for the program.

For more information around program design and how to avoid roadblocks (or, better, how to consciously incorporate them in your project design), the engine room[8] collected thoughts about their experience and dialogue with experts around **planning a pilot project[9]** to inform the implementation of the main initiative. The blog post presents a list of experience-based suggestions on areas such as **scope** (making sure the project is specific and achievable in the available timeframe and with the available resources), **audience, budget and narrative.**

What data?

There are many types of data that can be collected. Some considerations are practical and necessary: for example, if the project is meant to facilitate calls for help in an emergency response situation, it will need **location information**, as well as **type of emergency** (persons trapped in a house, person wounded or unresponsive). If the project is a polling survey, it should collect **basic information** on the respondents to be able to correctly map and distribute the responses. When deciding which data should be collected, it is important to think about what the campaign is meant to achieve.

Quality and quantity

The world of data collection methodologies, operations and standards is complex, massive in scope and, for most people, pretty boring. To keep it short and sweet, we will underline the main difference between quantitative and qualitative data, because the choice of one over the other will influence many aspects of the subsequent collection and analysis and publication (reports, campaigns, outreach etc).

- ■ **Quantitative data** can be collected methodically and through specific predefined question-answer structures. Defining indicators is critical for effectively collecting quantitative data. This means that the organization can structure the data collection to be as useful as possible towards achieving their perceived goal through a precise initial definition of indicators (for example, "number of children" or "on a scale from 1 to 10, how important for your family is having easy access to the radio"). The word "perceived" is important here: sometimes over-structured data collection projects realize quickly that the initial indicators were too rigid or slightly off the mark, and aren't able to adapt to this reality quickly enough in an agile way.

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8   https://www.theengineroom.org/
9   https://www.theengineroom.org/fail-smart-8-points-for-pilot-plannin/

- **Qualitative data** collects open answers, or any kind of unstructured, unconstrained data. It adds texture and important context to research efforts. This type of data collection can give a broader perspective, unhindered by the constraints of a structured process — however, it is more difficult to analyze and make sense of, even if there are software solutions that can help.[10]

Ethics and privacy

Protecting privacy and maintaining an ethical approach to collecting personal data requires an intricate juggling act that warrants deep thought.[11] For example, if a project is soliciting police violence reports through SMS, data from those reports includes the submitter's phone number. That is personally identifiable information (PII): if the number is saved in a database together with the report, and that database gets seized by the police, it might put the submitter at risk. But PII isn't always bad to collect. Project organizers might want to follow up with people reporting and can use the phone number to get in touch with submitters directly. Considering all options is important, and projects should find ways to involve the data collecting communities in the decision-making process.

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10 like the proprietary Atlas.ti (http://www.atlasti.com/index.html) or the open source CAT – Coding Analysis Toolkit (http://cat.ucsur.pitt.edu/)
11 For more information around responsibility in data and development, visit the Responsible Data Forum website: https://responsibledata.io/

Part 2 - Case studies

Now that we've discussed some things to consider in the abstract, and why mobile data collection tools may be right for your organization, we will showcase a number of actual projects that have made use of mobile data collection tools, management or outreach platforms to improve or inform their strategies. We paint a picture of the broad landscape of areas, themes, processes and platforms out there, to help readers ground their knowledge in real-life experiences.

1. AMPATH home-based HIV counseling and testing

The Project
AMPATH wishes to improve home-based HIV counseling and testing (HCT) in western Kenya.[12]

The challenges
- effectively reaching out to over 2 million people
- secure, effective on-the-fly testing, consulting and records management
- a product that scales and is customizable

The tech solution
Open Data Kit, an open-source data collection and management suite.

In Kenya, as in the rest of sub-Saharan Africa, HIV has for decades been at the forefront of health emergencies. UNICEF estimates that in Kenya 6.1%, or more than 1.5 million people, are reportedly living with HIV.[13] The main problem with this figure is that a large number of HIV-positive individuals has never been tested, so the numbers, while already troubling, don't really tell the whole story.

In 2009, the Academic Model Providing Access to Healthcare — AMPATH,[14] in partnership with USAID, was conducting an ambitious project: home-based HIV counseling in an area covering 2 million people in western Kenya. Hundreds of health care workers would go directly to peoples' homes to collect basic health information, offer rapid HIV testing, collect sputum for individuals at risk of tuberculosis, and offer focused care services when needed.

At the time, the health workers would use PDAs tethered to a GPS unit to collect information: miles ahead of the pen and paper approach, but still an often unwieldy and cumbersome process, because of user interface issues, the unreliability of the hardware and incompatibilities of PDA software with OpenMRS[15], the open source medical record system in use in most hospitals in that part of Kenya. That is when AMPATH turned to University

12 http://www.ampathkenya.org/our-programs/communicable-diseases/home-based-counseling-
    and-testing-(hct)/
13 http://www.unicef.org/infobycountry/kenya_statistics.html#116
14 http://www.ampathkenya.org/
15   http://openmrs.org/

of Washington's Department of Computer Science and Engineering[16] (CSE) in hopes of finding a better, more reliable solution.

The CSE researchers developed and implemented for the health care workers the first instance of what would later become the **Open Data Kit**[17]: an open source mobile data collection and management tool (more info in the box). The hardware platform of choice was an Android smartphone, which provided health care workers with much more bang for the buck (and bulk): in a single device, it provided GPS tracking, a photo camera that could act as scanner for MRS records (barcodes assigned to each care individual), and direct integration with OpenMRS over the air, or by offline downloading upon return.

The solution proved successful for health care workers' effectiveness.[18] In the years to come, the AMPATH project continues to grow, in large part to the fact that the software/hardware solution is very scalable and customizable. In May 2014, AMPATH reached one million individuals[19] for consultations and testing.

Dr. Yaw Anokwa, CEO of tech company Nafundi, is one of the original designers and developers of ODK. Together with fellow ODK developer Dr. Carl Hartung, they founded Nafundi to provide services of implementation, customization and strategic counseling to organizations wishing to deploy ODK for their mobile data projects. Yaw remembers the AMPATH experience as ambitious, but facilitated by the fact that AMPATH knew how to get things done: they had clear vision and knowledge of the practical challenges awaiting them. ODK was polished and developed on the ground, in tandem with the roll-out of the AMPATH pilot: health workers reaching out to communities during the day, developers writing code and fixing bugs by night. It was a fast and streamlined process that yielded a functioning tool, and the seed for ODK, in just a couple of weeks. The iterative loop of constant feedback between users and programmers is the main lesson here: it made for the development of a tool that closely responded to expectations and was adaptable to new challenges.

16   http://www.cse.washington.edu/
17   http://opendatakit.org/2012/01/ampath-improving-care-at-scale-with-odk-and-openmrs/
18   http://jamia.bmj.com/content/early/2012/02/23/amiajnl-2011-000476.full
19   http://opendatakit.org/2014/05/ampath-reaches-one-millionth-person/

Open Data Kit

The Open Data Kit[20] is more than just an app. It is a collection of tools, an ecosystem of open source solutions for a mobile data collection project. It is also part of a strong community developing open source collection management tools and ensuring their compatibility[21]. Core development of ODK is based in the the University of Washington's Department of Computer Science and Engineering[22]. Other organizations provide development of complementary or alternative tools. An example is **FormHub**[23], an alternative cloud-based data collection repository that integrates seamlessly with other ODK products and provides a more fluid server setup process.

What does it mean?

As is usually the case with open source projects, the cost-benefit scale of usability versus openness skews towards the latter. This means that ODK, in its raw form, can be a daunting proposal[24] for a non-technical organization wishing to deploy their first data collection project. Fortunately, the ODK community embraces this complexity: there is a strong global community of companies that work with ODK and develop custom implementations to assist organizations with rolling out their own instances[25].

If the organization already has a strong ICT team and a need (or a wish) to have complete control over customization and development of their data collection project, ODK might be the right fit.

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20 http://opendatakit.org/
21 The OpenRosa consortium – additional info here (Enketo is one of the partners): https://enketo.org/openrosa
22 http://opendatakit.org/about/
23 https://formhub.org/
24 To get the feeling for the installation and deployment process, visit the ODK installation pages: http://opendatakit.org/use/
25 Visit http://opendatakit.org/help/help-for-hire/ for an updated list of companies.

2. PACT survey on child labor in mines

The project:
Collecting reliable quantitative evidence on child labor in mines in THE DRC for better and more focused program design.[26]

The challenges:
- Mines are remote and hard to reach
- Limited staff capacity
- Paper-based approach would take too long

The tech solution
Magpi[27] (formerly Episurveyor)

Pact is an international development NGO whose projects span a variety of thematic areas and global regions, from capacity development through governance and policy work to microfinance, natural resource management and strengthening of local economies.[28] In the Democratic Republic of Congo, Pact is working on developing and implementing a due diligence mechanism for tracing of conflict-free minerals. As part of that larger process, Pact's researchers studied in 2013 the main aspects of the worrying phenomenon of child labor in Congo mines.

Because of many logistical difficulties hindering the data collection process, such as the extreme distances between mines, the Pact team turned to Magpi to create a mobile-based survey. They found that a survey that is created and managed through a web browser, and is location-agnostic (i.e. it can be managed from any internet-enabled computer in the world), is a very good fit for a globally distributed team (US, DRC). In addition to a simple, easy to manage user interface and the straightforward implementation of the mobile app (based on ODK), the team saw an increase in surveys that was even higher than expected, due to team members on the ground being positively influenced by the added ease this system brought to their workflow.

Pact's workflow was positively influenced by the introduction of mobile data collection systems; so much so that they decided to document their experience, and were awarded in Magpi's 2013 case study contest.[29] The

26   http://www.pactworld.org/blog/breaking-chain-child-mining-democratic-republic-congo
27   https://magpi.com
28   http://pactworld.org/how-we-work
29   http://www.datadyne.org/2013/11/magpi-awards-pact-drc-mines/

final report where the collected data was used is called Breaking the Chain: Child Mining in the Democratic Republic of Congo.[30]

Magpi

Magpi, formerly Episurveyor, is a commercial freemium (free to use up to a certain quantity of queries, or deployments) data collection tool. Magpi was born out of the need to scale up digital and mobile data collection processes, following what co-founder Selanikio defines as "the Hotmail" model: creating a cloud-based service that is easy enough to use that on-site training becomes unnecessary. Magpi offers a streamlined, easily accessible online form building service and takes care of all the heavy lifting behind the curtains. The users only need to visually create their forms and deploy them. It currently offers a free tier[31] that covers up to 20 forms, with up to 100 questions per form, 6000 data uploads per year and online storage of 500 records. There are different premium tiers for greater capacity needs, starting from $500 per month.

What does it mean?

According to DataDyne, the LLC behind it, Magpi is being used by over 25,000 people in more than 170 countries.[32] Those kind of numbers denote a product that has successfully found its audience in a crowded space. The two considerations to make are **cost and privacy**. The free tier is an obvious win, and while the premium tiers have a non-irrelevant price tag, they still deliver a system of support and backend management that would have a cost attached to it no matter the type of alternative platform deployment, in terms of support and setup, programming, server hosting and bandwidth. The most important consideration is privacy and responsibility over the collected data, which will reside in a server owned by DataDyne (and not your own). It is therefore advantageous to get acquainted with Magpi's Terms of Service[33] and Privacy Policy.[34]

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30   http://www.pactworld.org/blog/breaking-chain-child-mining-democratic-republic-congo
31   https://datadyne.zendesk.com/entries/21093588-cost-of-episurveyor
32   http://www.datadyne.org/magpi-mobile/
33   http://www.datadyne.org/magpi-terms/
34   http://www.datadyne.org/privacy/

3. MFarmerSMS empowering small-scale farmers

The project:
Use of SMS to connect small-scale farmers in Nakaseke, Uganda directly with buyers

The challenges:
- Real-time information
- Feedback and dialogue capabilities
- Feature phones

The tech solution
FrontlineSMS[35]

Small-scale farmers don't have it easy. Economies of scale dictate that small amounts of produce are harder to market and sell. Usually, it is in this context that middlemen appear, individuals or organizations that purchase produce from small-scale farmers and re-sell it in bulk on the markets. As a system, it can provide improved access and more selling opportunities. On the negative side, the middlemen can dictate prices and position themselves as gatekeepers for communities of small-scale farmers.

The Nakaseke Community Telecentre[36] in Nakaseke, Uganda, decided to break this cycle. They would provide a direct connection between buyers and farmers through SMS, leveraging the ubiquitous feature phones. The project was financed through a UNECA proposal in 2012 of using innovative ideas to empower communities. Peter Balaba from Nakaseke Community Telecentre said they wanted to provide a service using tools that communities already have access to, and it should be as user friendly as possible.

That is when Peter decided to use SMS messaging to establish a direct connection between small-scale farmers and buyers, to help farmers establish their own prices and decide their economy based on direct market needs. After designing a prototype and acquiring the necessary skills from colleagues in Kenya who had experience with systems like the one he wanted to build, Balaba started to establish a trust and training network with local farmers to have their input in the pilot development. Together, they decided that it is best to concentrate on three specific crops

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35 http://www.frontlinesms.com/
36 http://nakasekecmc.blogspot.it/2013/03/mfarmersms-service-links-farmers-to.html

(coffee, beans and maize), to ease communication and have the ability to sell in bulk.

At that point, Peter installed FrontlineSMS[37] on a computer, paired with an SMS modem, and initiated a dialogue between farmers and buyers. Buyers would approach them to publicize a request for produce: farmers would then receive the request on their phones and start a direct negotiation process with the buyer. In this process the Nakaseke Community Telecentre tries to act as simple conduit for information, providing the channel but otherwise letting the community take care of things.

Challenges

The project started in 2012 on what Balaba defines as modest investment - the hopes of reaching up to 600 farmers by 2013 were thwarted by the lack of funding for maintaining the system (SMS costs etc). The Nakaseke Community Telecentre is currently looking into developing a sustainable business model that doesn't depend on development funding to function: marketing opportunities through community radio, for example, or leveraging buyers' interest in supporting the platform.

On the technical level, the fact that FrontlineSMS is hosted on a computer that is relatively accessible by individuals for use other than pure FrontlineSMS work means there is risk of computer virus infection, or software incompatibilities that might negatively affect the platform's performance. To mitigate these risks, as well as to address more in general the risks and best practices around privacy considerations, FrontlineSMS published a Data Integrity User Guide[38] that helps users think through implications and different case scenarios when deploying the software.

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37 http://www.frontlinesms.com/2013/03/14/mfarmersms-service-links-farmers-to-better-markets-in-nakaseke-uganda/

38 http://www.frontlinesms.com/wp-content/uploads/2011/08/frontlinesms_userguide.pdf

FrontlineSMS

FrontlineSMS is a free software, made by Social Impact Lab, that lets users send and receive massive amounts of SMS texts. Its reason for being is primarily to serve public interest organizations, whether government or non-government, but it can be (and is being) used in many different contexts . It was launched in 2005, and became well-known globally for its use during the 2007 Kenyan elections, where it was used for polling station monitoring . The concept of FrontlineSMS was born out of the need to produce an offline SMS-sending platform in a world of web-based SMS software: Social Impact Lab, through Frontline SMS as well as other services, seeks to address that mobile-digital disconnect. Recently, Social Impact Lab closed the circle by launching both FrontlineCloud , a premium cloud-based service that lets users access their FrontlineSMS deployment from any internet-enabled computer, and FrontlineSync, the Android application that gives smartphone-based management and sync capabilities.

What does it mean?

If SMS is your game, FrontlineSMS is most probably your best bet. A strong team, almost a decade of constant development, free and open source[39] software, together with premium services that provide additional benefits make it a very strong contender for any project that needs a deployment of text-based outreach or data collection, like election monitoring, market price sharing, emergency communications etc.

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39   http://dev.frontlinesms.com/

5. Tist reforestation monitoring

The project:
Collecting data on growth of trees planted in project areas

The challenges:
- Large geographical areas
- Complex working conditions require robust, reliable solutions
- Budget-conscious

The tech solution
Custom-built

The International Small Group and Tree Planting Program[40] (TIST) started work in 1999 to help subsistence farmers reverse the devastating effects of deforestation, drought, and famine through reforestation. In short, TIST has been assisting farmers with techniques and capacities for planting trees that would bring a number of benefits: from recovering the quality of the landmass, therefore stalling or reverting desertification, to providing farmers with food and produce.

TIST provides farmers with the possibility to generate income through carbon credits: programmes like the Clean Development Mechanism[41] provide standards for recognizing the amount of carbon sequestration of a reforestation project, which can then be defined as sellable carbon credits. Through TIST monitoring, farmers receive annual payments based on how much the trees they planted are considered to have contributed to carbon sequestration.

In order to be eligible for carbon credits, the trees need to be monitored closely and accurately, following international certification standards. For this reason TIST trains groups to monitor and measure tree growth and progress. Monitors, or Quantifiers, as they are called within TIST, are provided with GPS devices and out-of-market Palm devices running a custom software.

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40 https://www.tist.org
41 http://unfccc.int/resource/docs/publications/cdm_afforestation_bro_web.pdf

As the World Bank report on ICTs for data collection states:[42]

> In Kenya alone TIST is tracking 39,000 individual tree groves. The organization states "present models show that the trees planted … should achieve between 500,000 tons and 3,000,000 tons of CO2 sequestration."

Tried and true beats shiny and new

The TIST experience showcases the importance of building solid and robust data collection solutions that are scalable and long lasting. Even if Palm Pilots are not being produced anymore, it is still more convenient enough for TIST to use and search for them in second hand markets than to invest in an overhaul of the entire system. The outfitting is cheap and easy: TIST says a Quantifier can be outfitted for $150 — and that the equipment can be used for a long time. The processes of measuring and capacity building are also in place and have been tested extensively. Of course, the TIST mobile collection infrastructure will become obsolete sooner or later. TIST is already testing out new web-based HTML5 forms that will one day replace parts of their workflow and they will probably find that new solutions to their monitoring efforts will provide them with as much, if not more functionality than their current setup. But until that day, if it ain't broke, why fix it?

42   http://solutionscenter.nethope.org/assets/collaterals/ICT_Report_(1).pdf

Part 3 - Conclusions

- **Pick the right tool for the job.** From the examples above, it is clear that there are many solutions, each with their own strengths and weaknesses. In fact, the number of solutions might make for daunting decision-making. We highlighted a couple of different tools as they are being used for specific project areas. However, that does not mean those tools are the best possible choice for similar cases, or that the utility of those tools is limited to the examples mentioned above. For the most part, the different tools represent different approaches to solving a problem.

- **Consider the platform's community.** The strength and type of a community that supports and drives a particular tool is an important aspect to consider when choosing a certain platform. Platforms like ODK and FrontlineSMS are proud and eager to nurture communities of users (organizations deploying the platform) and contributors (people working to improve the technical aspects).

- **Consider previous research.** Another aspect to consider is the availability of case studies and academic research: since most development projects are financed through charity funding bodies, they are also usually monitored and studied for their impact. Documents and reports about project impact[43] provide a treasure trove of information and valuable insight.

- **Think about sustainability.** There is still a clear need to create sustainable models that don't depend solely on development funding to thrive, especially in the current climate of very attentive and ever more limited funding opportunities.

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43 Some of which are referenced throughout this document, like the World Bank ICT for Data report (http://solutionscenter.nethope.org/assets/collaterals/ICT_Report_(1).pdf) or the Knowledge Programme's use case study on T4TAI (http://hivos.org/sites/default/files/ids-userlearningstudyont4tais.pdf)

Sustainability and the ODK example

ODK is completely open source: its core development is led by Gaetano Borriello and his team in University of Washington's Department of Computer Science and Engineering,[44] funded through a Google Focused Research Award[45] and donations. ODK is a very powerful tool ecosystem that anyone can download and use. However, in order to get the most of its adaptability potential, ODK uses customized deployments for a project's specific needs. Core funding can only cover the core development, of course. In the beginning, the ODK team collaborated directly on projects to validate and test the tool against real-life scenarios, but nowadays it makes much more sense to have a core team dedicated to building and improving the tool. Yaw Anokwa told us that this has created strong commercial opportunities for companies like Nafundi: through deployments, customization and strategy consulting, there is now a vibrant marketplace of commercial ODK implementers.[46]

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44   http://www.cse.washington.edu/
45   http://googleresearch.blogspot.it/2010/02/announcing-googles-focused-research.html
46   ODK provides a handy list of commercial companies available for hire on their website: http://opendatakit.org/help/help-for-hire/

Where next?

We hope this document provided you with a broad grasp of the potential and use cases of mobile technologies for data collection, management and outreach. Through these stories and consideration, however, we only skimmed the surface of a rich and complex reality. One of the first projects that started mapping the use of mobile tech in development was called **MobileActive**. It started about a decade ago and was the main go-to website for up-to-date information on mobiles in development. The project unfortunately is no longer active,[47] but their toolkits and mobile platform database collection efforts[48] inspired others to pick up the torch.

- **Humanitarian NOMAD**,[49] for example, is currently mapping 38 platforms and provides a step-by-step questionnaire to help users choose the right platform for their project. Fueled by CartONG[50] and iMMAP,[51] the Humanitarian NOMAD team is currently very active. Up-to-date information on their events and presentations can best be followed on Twitter.[52]

- **NetHope Solutions Center**[53] is collecting information on more than 40 humanitarian organizations in a single, searchable platform. The previously mentioned World Bank study **ICT for Data Collection and Monitoring & Evaluation** chose NetHope Solutions Center to host all information they collected for their case studies. NetHope's goal is to provide a one-stop shop for humanitarian organization to pick and choose the right solution for their technological needs, mobile included.

If you are looking for strategic support, feel free to **get in touch with us**: the engine room[54] is specialized in assisting organizations with integrating technology into their projects, as well as providing mentoring and strategy building.

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47   To get a better idea, multimedia journalist Melissa Ulbricht worked with MobileActive and saved some of the articles she worked with at the time, which can be accessed on her blog http://melissaulbricht.com/mobileactive-org-2/

48   The database is still accessible online, but it is pretty outdated: https://docs.google.com/spreadsheet/ccc?key=0ApuAPTf-vi_1dDdVX1h5VlowRDE0b0xyRFBsdXBfZEE&hl=en#gid=14

49   Access this link for their search questionnaire: http://humanitarian-nomad.org/online-selection-tool-2/

50   http://www.cartong.org/#zoom=2&lat=38.54816&lon=20.39063&layers=BT0000

51   http://immap.org/

52   https://twitter.com/humNOMAD

53   http://solutionscenter.nethope.org/

54   https://theengineroom.org

This report focuses on the integration of mobile tools into processes like data collection and dissemination in the fields of advocacy and development. The intended audiences are organizations and activists thinking about their first mobile project, as well as anyone interested in understanding how mobile data collection works, what it means for the development sector, what are the main possibilities, and where to go for more information.