Reflections on MobileActive 2008 and the M4D Landscape

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Abstract: This paper revisits presentations at the MobileActive08 conference in Johannesburg to critically examine the current diversity of projects and approaches in mobiles for development (M4D). We identify four common choices facing individual M4D projects (intended users, technical accessibility, informational links, and market links) which collectively mark the current landscape of M4D. Discussions of M4D projects have tended to be delineated by traditional development domain (health, education, agriculture, etc). By focusing on choices that cut across domains, we highlight elements which vary across M4D projects, but which to date have not been observed to correlate with project success. We discuss these four choices in light of the broader course of the field of "information and communication technology and development" (ICTD). Further, we argue that choices made at the project level may create different M4D landscapes, with implications for the breadth and depth of the technology's impact on development.

Introduction

The number of users of mobile telephony in the developing world has increased dramatically, exceeding all expectations. In the past few years, we have seen a corresponding rise in enthusiasm for projects applying mobile telephony towards economic and social development. Events such as this "M4D" conference in Karlstad are a testament to the wide diversity of such activities found around the world. This brief paper revisits presentations at MobileActive 2008 in Johannesburg in October 2008 in order to illustrate and critically examine this diversity of M4D projects and approaches.

Examining this diversity is helpful for various reasons. It can illustrate commonalities across traditional development verticals like health, education, and agriculture. It can disaggregate and bound our expectations about what can be accomplished though mobile development projects, and provide indications of what choices might be more likely to lead to successful outcomes. And finally, it can help us draw linkages between current efforts to deploy 'M4D' and the broader set of ICTD initiatives of the last decade. To illustrate this diversity we identify four choices made by all M4D projects.

What is an M4D project?

In this paper, we do not describe the myriad ways in which the use of mobile telephones can impact social, human and economic development (Donner, 2008). Rather, we focus on the choices made by those involved in a wide variety of applied M4D projects. Each element in the compound term "M4D project" helps bound our task.

- A ***project*** is a "specific plan or design", a "planned undertaking" (Merriam-Webster, 1990). In this sense, software applications, protocols, campaigns and initiatives are all projects.
- ***Mobile*** refers to mobile telephony. For this paper, we restrict discussion to the GSM and CDMA enabled handsets and networks used by billions of people every day around the world. We exclude, for clarity's sake, wi-fi, laptops, older non-telephony

PDAs, MP3 players, handheld GPS units, pagers, RFID tags, and a whole host of other technologies which, although 'mobile' in some way, are not part of the core mobile-cellular boom. Linking mobile and project, we suggest that some projects have mobile telephony at their core; take away the mobile communication at a distance and the project is unrecognizable or impossible.

- We take a broad view of ***development,*** including improvements to social, human, and economic conditions. These changes can be brought about by people working on behalf of other people, or by communities working on behalf of themselves. Linking terms, a mobile development project is a specific plan, design or set of activities, undertaken using mobile telephony, which brings about an improvement in social, human, or economic conditions.
- Even ***'4'*** has a role, signaling intentionality in the minds of those undertaking a project. It suggests an implicit or implicit theory of how mobile telephony is addressing a development need. The inclusion of the '4' helps separate projects which *happen* to bring about positive development outcomes from those *which set out to do so*. With this nod to intentionality, we'd further argue that most of those involved with M4D projects *know* they are involved in M4D projects, and that conversely, almost anyone who describes themselves as involved in an M4D project is probably correct. An analogy is the emergence of self-identified 'social entrepreneurs' who have mixed profit goals with other stated social or developmental objectives (Bornstein, 2004).

By these boundary criteria, Grameen Village Phone (Aminuzzaman, Baldersheim, & Jamil, 2003; Bayes, von Braun, & Akhter, 1999) is perhaps the single most well-known example of an M4D project. Begun in Bangladesh and replicated around the world, it was (and is) a project which sets out to use mobile phones to create livelihoods for individual microentrepreneurs. Its self-described development impacts include improved revenues and livelihoods for the phone operators, and improved access to telecommunications for underserved villages. The mobile is central to the project's identity, and there is a working model of how the use of the mobile will bring out desirable outcomes for the community.

A brief look at supporting technologies and activities adjacent to the Village Phone can illustrate important activities which are not M4D projects by our admittedly stringent criteria. For example, Grameen Telecom supplies the airtime and the network connectivity to the village phone operators, but it is mainly a commercial mobile operator, with millions of users in Bangladesh. As such it is no more an *M4D* project than was the creation of the handset or the GSM standard itself. The core technologies, tools, protocols, and services broadly available in the mobile telephony landscape clearly play a role in development, but they are not M4D projects.

Similarly, a farmer who checks prices using a village phone (and now happens to make more money) is using a mobile phone in a way which results in desirable outcomes for him and his family and employees, but he isn't involved in organized body of work (a project) with a broader intent towards "development" beyond his immediate social and economic circles.

Finally, researchers who seek to assess and describe just how the addition of connectivity to a village changes agricultural prices or village social structures are certainly studying the role of mobile phones in economic development, and are providing the research and policy communities a valuable service by doing so, but are not necessarily engaged in M4D *projects*.[1]

[1] Indeed one of the authors of this paper (Donner) presented in three sessions at MobileActive, describing research about how small enterprises use mobiles, on intentional missed calls, and on the social factors influencing m-banking. Each presentation described an element of mobile use which impacts economic development, but none of them described an M4D project. By contrast, other presentations on two of the panels, by Praekelt, who found a way to insert pro-social messages into

For the sake of this paper, we're looking at a relatively small set of projects—organized units of work by development practitioners, NGOs, companies, and researchers with which we are familiar with and which were represented at MobileActive08—which seek to apply mobile telephony in ways which they believe will directly improve social, economic, and human outcomes. By no means should this selection be considered definitive or comprehensive. It is, by definition, limited and should be considered a commentary rather than a definitive segmentation.

Viewing M4D projects as a set of choices

To reflect on the M4D landscape, we looked back over the 36 M4D projects presented at MobileActive 2008[2]. MobileActive08 convened a variety of stakeholders—NGOs, researchers, technology companies, operators, and donors—engaged in using mobile phones for social impact. Clearly, the presentations at the conference are neither a random nor comprehensive list of all M4D projects, but they do represent a range of 'state of the art' approaches within the emerging community of interest. As a gathering, the conference hosted 30 people in 2005, 100 in 2007, and nearly 400 in 2008—evidience itself of a growing interest and diversity of approaches in the field.

As "specific plans or designs", M4D projects are, like any projects, essentially defined by hundreds of choices, large and small, made by their participants about how to approach a problem and achieve a goal. Some such choices are relatively well-understood. For example, we are all familiar with basic domain choices—the differences between a health project or an education project— and also choices between organizational structures—between establishment as an NGO versus as a corporation. A myriad of other choices add uniqueness to any M4D project. However, given our parameters for this paper, they are not a focus of attention here. Instead, two other classes of choices require further discussion.

First, there are a set of choices which the ICTD literature has already identified as being correlated with project success[3]. Some designs, quite frankly, are more likely to succeed than others. Like other ICTD projects, successful M4D projects are likely to be evolutionary (vs. revolutionary), more aligned with existing practices, and more focused on intended outcomes (Heeks, 2002; Kuriyan & Toyama, 2007; Rogers, 2003). A more detailed list of choices which the existing ICTD literature suggests are more likely to lead to success, includes:

- Embedding the mobile element is into an otherwise ongoing development effort, versus casting the mobile service as itself the development effort or otherwise asking the technology to "lead" the effort;
- Using the mobile technology to reduce transaction costs or increase productivity of existing practices, versus introducing entirely new behaviors via the mobile;
- Requiring only basic literacy or skills from users, versus requiring additional technical knowledge or support.

Second, however, there are other fundamental choices, unique to the context of M4D projects, about which (a) the existing ICTD literature provides less of a guide and (b) we

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millions of please-call-me notifications, and by WIZZIT (an m-banking provider in South Africa with tens of thousands of users) did describe M4D projects.

[2] There were 58 scheduled presenters at MobileActive08, but only a subset described M4D projects. Others presented research analyses, practitioner perspectives, brainstorms, or plenary comments which were not tied to specific M4D projects. A total of 36 M4D projects were discussed. See http://mobileactive08.confabb.com/conferences/MobileActive08/sessions

[3] The 'dataset' of presentations at MobileActive08 is not a good place to assess success factors, since most presentations focused on success stories and growing, thriving projects.

know less about their relationship to the probability of a project's success over the long term. Based on our ongoing participation in the M4D community, and on an iterative discussion of the various M4D projects presented at the conference, we have identified four of these choices which we believe confront virtually all M4D projects[4]. A careful discussion of these choices illustrates both the diversity of approaches currently at work in the field, and some difficult trade-offs many projects face.

Choice 1: Who is the intended user?

Some M4D projects choose to target broad swaths of end-users—a general public. Others are intended for niche populations of end users, such as small business owners or students. Still others target development professionals. The contrasts between projects which choose to target the general population and projects or applications targeting professionals are quite apparent. The former borrow from mass-communication paradigms and are generally consumed/used/experienced as part of users' daily lives, in diverse and uncontrolled situations. The latter are intended to support development activities by specialized users in specific roles, such as data gathering by community health workers or loan processing for microfinance lenders. In the sample of projects presented at MobileActive08, 16 targeted 'niche' populations while 20 targeted general populations.

The extremes present trade-offs, of course: mass-public approaches offer scale and breadth of impact, while targeted interventions with professionals promise depth of impact, empowering a smaller number of users to better pursue their development activities. Projects designed for niche-but-lay users, and applications for very narrowly targeted professionals in a specific field, also hold both promise and peril. Promise, because targeted applications or projects such as "agriculture prices for farmers" or "math training for high school girls", can be narrowly tailored and richly supported. Peril, because the links to sustainability and scale can be challenging, as niche and specialized users must both see the value and be able to afford the cost to sustain these specialty projects (Rogers, 2003).

Choice 2: How technically accessible is the solution?

Some projects pursue a mobile solution which offers near-universal compatibility with all handsets; others require feature or 'smart' phones or have other technical constraints. Among the MobileActive08 project sample, 18 projects were accessible to any handset; the others had hardware or application constraints requiring fancier phones. Again, the choice often involves breadth vs. depth. SMS- and voice-based interfaces are familiar to users and relatively consistent across handsets and networks, but they offer experiences of limited richness, and text and voice offer their own constraints—text requires literacy, and, in the case of some more complex SIM or multi-screen interfaces, the skills to navigate soft keys and nested hierarchies (Jones & Marsden, 2006). Voice is more intuitive, but places higher demands on back-end systems to perform tasks of voice recognition or text-to-speech encoding, and can offer limited discoverability to users seeking new functionality (Boyera, 2007). Conversely, higher-end handsets offer larger screens, photo and video, better graphics, more processing power, more memory, and sometimes better input methods, like text keyboards or a stylus; each offers increased flexibility to M4D projects, but at the cost of affordability and broad compatibility.

Similarly, there are choices about how, if at all, the application or project exchanges information over the mobile network. Voice, SMS and the USSD channels are accessible on almost any handset. Voice is relatively rich but expensive in most parts of the world– someone needs to pay for the calls. SMS, in particular, is more flexible than was first imagined. SMS servers such as the ones presented by Microsoft, UNICEF (RapidSMS), and

[4] This was not a formal content analysis. Rather, we used an iterative approach among the three authors to develop the categories and to assign the various projects to the categories.

FrontlineSMS, can allow users to asynchronously access databases, and coordinate groups. But SMS is limited to 160 characters at a time, and on a per-bit basis tend to be orders of magnitude more expensive, compared to GPRS and 3G. The USSD channel is managed by carriers and is thus not as widely available. Thus while the appeal of GPRS is clear, either to link to WAP sites or increasingly to mobile internet sites, so are its constraints; not all handsets support GPRS or data connectivity, and those that do require data plans or pre-pay data to be enabled.

Choice 3: Does the project link to other platforms or content?

Some projects are self-contained, requiring no input from other media or content sources, save perhaps a back-end database for serving content; others have more extensive interdependencies with other information and media sources such as the Web. For example, an SMS-based agricultural information system may draw content from weather resources on the internet, or a health-information system might offer dual modes of operation to its users, across mobile and PC-based channels. 26 of the 36 projects presented at MobileActive08 were self contained.

Of course, standalone projects can be valuable, and can be tailored in the short term to provide essential content or experiences to the project's users/beneficiaries. On the other hand, linking to external sources is technically and organizationally more difficult, but can offer richer experiences to users, and can create new hybrid media experiences (Jenkins, 2006) and remove barriers to information often faced by resource-constrained users (Cartier, Castells, & Qiu, 2005; Donner, in press).

Choice 4: What does the project require from manufacturers or operators?

Some projects function independently or with third-party applications; others require the cooperation of network operators, or handset manufacturers. The operators and handset manufacturers provide two points of concentration in the market landscape (Andrew & Petkov, 2003; Whalley, 2004). Operators determine which applications are pre-loaded on SIM cards, can make the USSD channel available for some purposes, can offer price discounts to certain applications, and can feature some content on GPRS home pages in 'walled garden' approaches. Handset manufacturers and the creators of mobile operating systems have a similar influence on which applications are easy to find and easy to use.

Thus, applications which ship on the handset or SIM card, or are supported and promoted by the operators may face lower hurdles to adoption; conversely, the current fragmentation of operating systems and relative difficulties of loading software may create hurdles for third-party projects and applications. In addition, interacting with corporations can be a daunting undertaking, while it's relatively easy to set up servers and downloadable services that interact directly with the user. Eight of the 36 projects presented at MobileActive08 required some level of collaboration with operators or manufacturers; the rest were independent.

Examples of projects

Projects with virtually all permutations of these choices were represented at MobileActive08.

Souktel

Souktel is an SMS job-matching service in the Palestinian Territories. It is aimed at young, unemployed people in the Territories but accessible and available to anyone in the world who has a mobile phone with SMS. The technology is simple: It's an SMS-based system that allows for general use without any specialized application. It operates with a backend data service/database that is maintained by Souktel. It does not require operator involvement but as many of the projects that may generate significant SMS traffic, buy-in from the operators is very helpful to ensure reliable delivery. Souktel is not multi-media and is delivered solely

through SMS messages currently, though it might benefit from a multi-modal approach in the future.

WIZZIT

WIZZIT is an application enabling mobile payments. Unlike some other systems, it is operator-independent but geographically focused on South Africa and requires collaboration with a bank. It is available on and compatible with all South African carriers. It is available on all phones utilizing USSD.

To set up a WIZZIT account, a customer needs to subscribe to the service and deposit funds into their account by going to a bank or post office. A WIZZIT account costs roughly one-third less than a traditional bank account. Rather than relying on traditional advertising, WIZZIT markets its services through so-called Wizz Kids who earn a commission by signing people up for the service.

Integration into back-end banking systems, call centre and cell phone networks, etc., is critical to the overall success of the project. Debit cards and account web access are available to customers, and cash can be obtained at ATMs and local mobile shops.

WIZZIT's choices include a focus on general users; it offers a technical solution available to virtually any mobile phone owner, ties in to bank-account databases, and works in cooperation with all three of the operators in the country.

Java Rosa

Java Rosa is one of many mobile data collection applications presented at Mobile Active 2008. It is aimed at collecting medical data but it can be configured and used in many disciplines with configurable forms. It is in its early stages and is being tested and developed in Tanzania, for example. It is an open source project that aims to apply Xform standards as part of the Open Rosa group, an open source consortium. Java Rosa operates on Java phones. It is targeted at niche users – medical professionals or community health workers collecting health-related data. It does not require cooperation from operators nor is it dependent on a particular handset manufacturer, though as a Java-based application, it will work only on JME phones. Data is parsed through a back-end platform. It is not a multi-media project; and it is mobile only at this point, though collaborations with web-based apps are being discussed.

Ushahidi

Ushahidi is an incidence-reporting and mapping platform to which anyone can text, email, or upload on the web incidences of any sort (though the project has been focusing on incidences of violence). The platform is being rebuilt now after trials in Kenya last year. It is multi-modal with web mapping, and data entry via three channels. The project incorporates web and mapping applications, in addition to SMS. As such, it will be accessible to as many users in the general public as possible, essential for a system that will reply on crowdsourcing information. It is operator-independent.

MyMsta

MyMsta is a mobile social network developed by LoveLife, a South African NGO focused on pro-social and pro-health messages for young South Africans. MyMsta is a custom WAP platform developed by LoveLife targeted at young people under the age of 20. Users maintain their own profiles on the mobile site, can join chat groups, and access health, job, and scholarship information maintained by LoveLife. Users can also upload and download pictures and music though the site, ask questions about HIV/AIDS and sexual health, and accumulate points by solving quizzes. MyMsta functions on all four operator platforms in South Africa and is optimized for phones that run Opera Mini.

Freedom Fone

Freedom Fone is an SMS/IVR application developed in Zimbabwe and combining Asterisk and Frontline SMS, two applications, to deliver SMS and voice information and media content. It was developed in the context of accessing news of other information (such as health information, for example) but is built to deliver any kind of information content to a mobile device. It is targeted to the general public but especially suited for people with limited literacy. It combines a voice/IVR open source application (Asterisk) with an SMS-delivery application (FrontlineSMS). Users can request a call-back with information delivered by voice through an SMS, or can access voice information through a menu system. It works with all phones with voice and SMS as the lowest-common denominator and does not require operator cooperation.

Discussion

These choices illustrate the variability of approaches employed by M4D projects. This is in addition to the variability across development verticals, such as health, education, agriculture, governance, livelihoods and social activism (Acumen Fund, 2007). Clearly there is not one approach that fits all, nor even dominant model of M4D project. Indeed, it is clear from the diversity of approaches that M4D is in a period of rapid growth and experimentation—a period of punctuated equilibrium (Donner, 2004; Loch & Huberman, 1999) in the ways organizations process and exchange information via mobile devices. It is equally clear that not everything will succeed; individual projects will come and go, morph and prosper. Gatherings like this M4D conference and MobileActive08 accelerate the learning and innovation process in the field. We close with two sets of observations about the current M4D landscape, and the role of M4D projects in shaping ICTD more generally.

Choices and the current M4D landscape

Our focus on the common choices facing M4D projects has implications for our understanding of the M4D landscape.

First, we can explore the extent to which these choices can be correlated with the success of individual M4D projects. At this early experimental stage, none of the four choices which we have highlighted have 'right' answers—individual projects seem as likely to succeed with almost any configuration. That said, there are significant biases within this (admittedly non-randomly chosen sample) towards projects that required no dependency on other information sources or explicit cooperation from operators. This likely reflects the relative ease of deploying such projects, in contrast with the alternatives.

One fruitful path for future research would be to assess the relative success of M4D projects making each of the choices outlined in this paper. It is certainly possible that such research would be able to isolate the impacts of discrete choices—finding perhaps that niche applications yield greater development impact than general applications, or that projects with operators' support outperform similar independent applications. However, it is more probable that these choices are too interdependent, and too context-specific, to be broken down so easily. In this case, we believe that future research designs could instead examine whether different *combinations* of choices are associated with success. Put another way, further research might try to isolate modalities or clusters of choices among successful M4D projects. For example, we might find one mode of 'mass' applications which work closely with operators or handset manufactures and work well on low-end phones, while another configuration might consist of projects targeting niche users, on smartphones, drawing on hybrid content, but without the engagement of operators or handset manufacturers. The identification of these clusters would improve the discussion of 'best practices' in M4D.

Secondly, although the data is not available at this stage to associate any of these four choices with the success of individual projects, we can imagine impacts on the aggregate

M4D landscape. Essentially, we can describe how multiple micro-level projects might drive macro-level outcomes (Berger, Giesen, Muench, & Smelser, 1987; Huber, 1991). For example, the choices across hundreds of projects to address low-end phones, vs. mid-range-feature phones, vs. high-end smartphones will shape the degree to which the world's poor will be able to benefit directly from M4D projects. Although the proportion of feature-rich handsets in use continues to rise, tens or hundreds of millions of the current 'dumb' handsets will remain in service for a long time (Edgerton, 2007); it is important for the M4D community to remain cognizant of what phones its various target communities are likely to carry.

Similarly, on the matter of content, we are of the opinion that, at the aggregate level, it is important for the M4D community to build links between the content it generates and the broader worlds of community, national, and global content available on the internet and on other information sources. If individual projects choose to pursue "standalone" content there is of course no harm done, but as a whole, an environment with lots of applications and projects which link low-end handsets to the internet and to other media will be more diverse and probably richer than one which creates second-class information users and sources. We're intrigued by applications and projects which seek to leverage other sources and reduce differences between the info 'haves' and 'have-less' (Cartier et al., 2005).

M4D projects in the context of ICTD

Though space and scope constrain a full treatment of the linkages between M4D and ICTD, we conclude by raising some issues and further questions about the linkages which this exercise has helped bring into focus.

First, it is important to separate enthusiasm from hype (Heeks & Jagun, 2007). The introduction of mobiles cannot solve all the problems of development (not even just the ones that prior ICTs could not solve), nor are mobiles always 'better' than other ICT solutions. For example, the delivery of effective m-education via a three-inch mobile screen is at best a difficult proposition. Instead, mobile-based development interventions must function within an information landscape which includes landlines, books, blackboards, shared computers, community radio, etc. And, as the choice of whether to link to outside content illustrates, at times the best M4D projects will not replace but rather *complement* other information sources.

That said, the distinctions between M4D and ICT4D projects will continue to blur. The arrival of increasingly affordable data connectivity and increasingly affordable data-enabled handsets is bringing the mobile internet into the development arena. ICTD theory and practice addressing the developmental utility of high-end devices will 'converge' along with the devices themselves, particularly in applications for professional and niche users where the higher per-unit equipment and connectivity costs may be supportable. However, at the low and middle positions on the affordability/technology spectrum, where browsing at 3G speeds remains prohibitively expense, theory and practice of mobile-internet use will have to account for far different use cases. The choices facing M4D projects outlined in this paper—about intended users, technical capabilities, linking to other media sources, and the nature of coordinated action with manufacturers and/or operators—will persist. Current guides to designing internet-based development projects are not sufficient for M4D projects targeted at populations whose first and only means of contact with the internet is via a mobile screen and a 10-key numeric keyboard. New approaches to M4D design (Jones & Marsden, 2006) and strategy are warranted. Yet with every M4D project, more knowledge accumulates about the appropriate choices to make; over time, these M4D 'best practices' will play an increasingly central role in ICT4D in general.

Appendix: M4D Projects Presented at MobileActive 2008

Project	Description	Intended User	Technical Accessibility	Infoscape	Marketscape
DigitalIS:	Mobile Data Collection for Rural Cooperatives	Niche	Application	Web	Neither
Learning About Living	Pro-Social text Messaging	General	All	Self-Contained	Neither
M4Girls	multimedia educational content, preloaded on handsets	Niche	Feature	Self-contained	Handset
Columbia Millennium Village's	Mobile health messaging and health worker support	Niche	n/a	Self-contained	n/a
Cell Life	Patient monitoring with SMS	Niche	All	Self-contained	Operator donation/ Neither
Easy Capture/ Impact Consulting	Data collection for health information with mobiles	Niche	Application	Self-contained	Neither
Rapid SMS	SMS messaging and data collection with forms/web-back-end	Niche	Application	Web	Neither
Frontline SMS	Desktop-based SMS messaging	Niche	Application	Self-contained	Neither
The News is Coming	SMS News via SMS	General	All	Web	Neither
Freedom Fone	SMS-audio information	General	All	Audio	Neither
Love Life: MyMsta	Mobile pro-social social network	Niche	Application	Self-contained	Neither
Tradenet	Agricultural pricing information platform	Niche	All	Self-contained	Neither
Datadyne: Episurveyor	Mobile data collection	Niche	Application	Self-contained	Neither
MPedigree	SMS-verification system to authenticate drugs	General	All	Self-contained	Neither
Ushahidi	Web and mobile incidence reporting system	General	All	Web/maps	Neither
INSTEDD: SMS Geo Chat	Incidence reporting system	General	All	Web/maps	Neither
Souktel	SMS job-matching service	General	All	Self-contained	Neither
Project Zumbido	SMS group text messaging service	Niche	All	Self-contained	Neither

Project	Description	Intended User	Technical Accessibility	Infoscape	Marketscape
Java Rosa	Mobile data collection	Niche	Application /Standard	Self-contained	Neither
Isis: Sex Info	SMS sexual health information	General	All	Self-contained	Neither
Big Board	Bluetooth information system	General	Bluetooth/all	Multi-media	Neither
Praekelt: Social Txt	USSD PCM social messaging	General	Where PCMs/all	Self-contained	Operator
Praekelt: Txt Alert	SMS reminder system	General	All	Self-contained	Neither
Greenpeace Argentina	SMS/mobile activism alerts	General	All	Self-contained,	Neither
Hello Citizen	SMS news service via SMS	General	All	Self-contained	Neither
Mozambique Health Information Network	Health information for health workers via PDA/mobile data transfer	Niche	Application/ special hardware	Self-contained	Neither
Games for Life	Pro-social games	General	Application	Self-contained	Neither
Wizzit	Mobile banking	General	Application	Multi-modal	Bank, Operator
NDI: Mobile Election Monitoring	SMS for election monitoring	General	All	Self-contained	Neither
Streetwise	Content and news services to lean terminals via mobile network	General	Application /hardware	Multi-media	Neither
Nokia Mobile Data Collection	Mobile data collection	Niche	Application	Self-contained	Handset
Microsoft MIDAS	Mobile data collection	Niche	Application	Self-contained	Handset
Microsoft: Oxigen	Mobile banking service	General	Application	Backend	Both
Microsoft: Warana	SMS news service	General	All	Self-contained	Neither
Regional Hunger and Vulnerability Programme	Cash aid via mobile airtime	General	All	Self-contained	Neither /operator helpful
BROSDI	Agricultural price information service	Niche	All	Self-contained	Neither

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