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m-Enabled Inclusive Business Models: Applications for Health

PRIMER

SHOPS
Strengthening Health Outcomes *through* the Private Sector

Summary: The SHOPS project funded a 16-month study conducted by the Monitor Group as reported in *Promise and Progress: Market-based Solutions to Poverty in Africa*. The study identified mhealth (mobile applications for health) business models enabling enterprises to successfully engage with the poor in Africa, primarily in Ghana, Kenya, Senegal, South Africa, and Tanzania. This primer aims to (1) highlight key practices that will assist m-enabled enterprises in reaching commercial viability in the near term, and (2) assist funders interested in business model principles that enable sustainable impact. Presenting four case studies on m-enabled solutions and 10 lessons for consumer-facing and systems-oriented mhealth projects, the primer shows that inclusive businesses in all sectors are still in their infancy and that much can be learned about how they work, why many struggle, and why only a few succeed.

Keywords: Africa, market-based solutions, m-enabled solutions, mhealth, sustainability

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Project Description: The Strengthening Health Outcomes through the Private Sector (SHOPS) project is USAID's flagship initiative in private sector health. SHOPS focuses on increasing availability, improving quality, and expanding coverage of essential health products and services in family planning and reproductive health, maternal and child health, HIV/AIDS, and other health areas through the private sector. Abt Associates leads the SHOPS team, which includes five partners: Banyan Global, Jhpiego, Marie Stopes International, Monitor Group, and O'Hanlon Health Consulting.

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m-Enabled Business Models in Health

There are 5.9 billion mobile subscribers across the globe, of which 4.5 billion reside in the developing world. Wireless signals are now estimated to cover 87 percent of the world's population (ITU World Telecommunication/ ICT Indicators database, 2011). The mobile phone has become the most widespread communication technology platform and the most inclusive, reaching further into the base of the economic pyramid than other technologies and infrastructure (see Figures 1 and 2).

Figure 1. Penetration of Digital Telecommunication Technologies in Sub-Saharan Africa

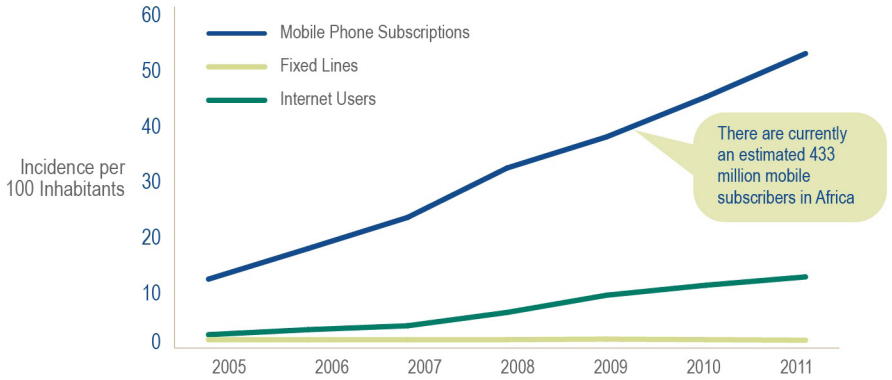
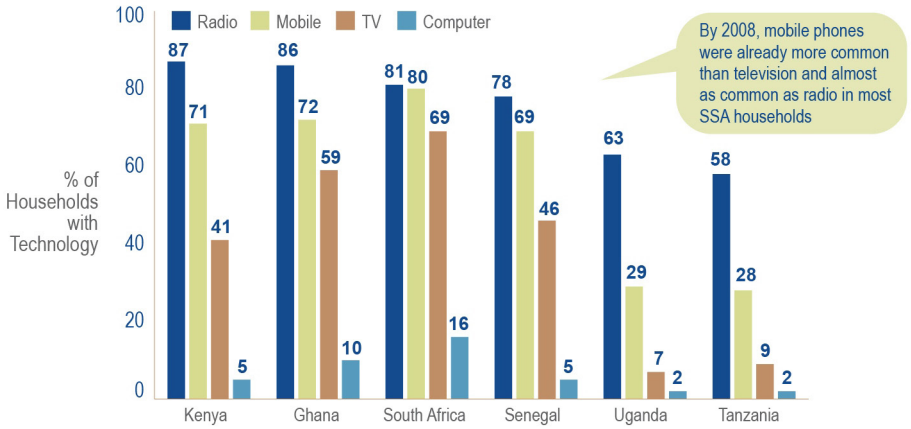


Figure 2. Proportion of Households with Information and Communication Technology in Select Sub-Saharan African Countries (2008)



Note: Subscriptions per 100 inhabitants are population weighted across African countries. Data for Kenya and Ghana from 2009 AudienceScapes National Survey.

Sources: International Telecommunications Union, 2011; Ovum research; AudienceScapes National Survey; Monitor analysis

In Africa, the mobile phone is a particularly promising channel, offering shared infrastructure, networking, and connectivity to millions of otherwise inaccessible low-income consumers, producers, and distributors.

Several factors, including the growth in mobile phone users, significant expansion of mobile networks, declining mobile phone costs, and innovation in mobile technology, have contributed to the creation of a new class of enterprises that deliver goods or services via mobile-enabled platforms. In Africa, where there is a lack of formal infrastructure to reach base of the pyramid (BoP) populations, the mobile phone is a particularly promising channel, offering shared infrastructure, networking, and connectivity to millions of otherwise inaccessible low-income consumers, producers, and distributors.

The use of mobile technology in development initiatives is a topic that is attracting considerable interest by companies such as Nokia and IBM, development funders such as USAID, the U.K. Department for International Development, GSMA,[1] and universities such as the University of California, Berkeley. Many of these organizations have invested substantial funding in research and have already piloted multiple projects in developing countries. Today, m-enabled solutions drive development outcomes in sectors from financial services to agriculture to livelihood support (see Figure 3).

Figure 3. Mobile-Enabled Platforms in Africa

WIZZIT
(South Africa)

Full-service cellphone-based banking facility unrestricted by various networks, type of SIM card or age of cellphone, with a customer base of over 50,000 South Africans

M-Kilimo
KenCall Farmers' Helpline
(Kenya)

Agricultural Information, advice and support over the phone to up to 12,000 smallholder farmers on topics from land preparation to harvesting and marketing of produce

Mobenzi
INTELLIGENCE
(South Africa)

Software service that empowers people to be rewarded for completing research and data capturing tasks on mobile phones; 25 agents in pilot phase and growing

Sources: Kigali, 2008; Mobenzi, 2011

[1] The GSMA, an international trade organization representing the interests of mobile operators, launched a new service, Mobile and Development Intelligence. Through an open-access portal, Mobile and Development Intelligence offers data and analysis to support business decisionmaking and clarify the evidence of the socioeconomic impact of the mobile industry in the developing world (GSMA, 2012).

In the health sector in particular, there has been excitement about the potential of mhealth, a relatively young field that covers the provision of health services and information via mobile technologies (mobile phones and personal digital assistants) to improve quality of care and enhance service delivery efficiency within health care systems. The extensive reach of mobile phones, combined with the ability to digitally process information in real time, will add value in attempts to sustainably engage the poor in pursuit of improved health outcomes (see text box). mHealth technology can help reduce the cost of delivering health goods and services to the BoP by overcoming the impact of low-density populations. Additionally, m-enabled solutions can remotely access a vast installed base of consumers and engage in two-way communication with consumers or intermediaries. This will allow health services information and practitioners to become more accessible to the BoP, particularly among hard-to-reach population segments. Finally, many have funded mhealth work out of a belief that, via mobiles, the BoP can access higher-quality health service or information than previously available. For example, compliance with tuberculosis medication schedules may be monitored remotely, eliminating the need for a health worker to be present to physically observe a patient taking medication.

mHealth Benefits for Base-of-the-Pyramid Consumers

- Reduce cost to serve the BoP
- Enhance quality of service delivered to the BoP
- Increase access to the BoP

mHealth interventions offer great potential to address a range of health care challenges in the developing world, including the shortage of skilled health care professionals, poor treatment adherence and compliance, lack of timely and actionable disease surveillance, inefficient drug inventory and supply chain management, prevalence of counterfeit drugs, limitations of medical diagnostic treatment, general consumer health education and demand creation, and slow rates of information and reporting flows.

While mobile technology has attracted widespread recognition of the enormous opportunity for its application to development challenges, few (if any) of these m-enabled solutions, outside financial services, appear to be commercially viable, although mhealth interventions are still in their early days (see Figure 4). Overall, mobile technology remains relatively young; changes and advances in available technology continue in parallel with the development, testing, and refinement of today's m-applications. At a macro level in the health sector, research suggests that several issues prohibit greater scale and sustainability:

- A lack of common building blocks and frameworks for mhealth prevents system-wide solutions that translate into meaningful extensions of existing health systems. For example, there are no common standards for voice and data services across health systems, resulting in "stove-piped" applications that are limited to specific diseases, behaviors, or processes.
- In many projects, a lack of meaningful, consistent indicators and the absence of measurement and evaluation as standard practices restrict growth of the evidence base and the investment case needed to inform future mhealth initiatives and attract private investment.

- Insufficient collaboration with governments and national health systems, fellow mhealth programs, and the m-sector beyond health.
- The scarcity of business models that serve to enable scale.

Figure 4. The Need for Business Models that Support mHealth Scale

Sources: Vital Wave Consulting, 2009; Earth Institute, 2010; Lemaire, 2011

Terminology

B2B: Business-to-business, referring to trade conducted between businesses as opposed to between a business and a consumer

Base of the pyramid (BoP): People living on less than $2 a day in purchasing power parity terms

Enterprise: An organization involved in the trade of goods and services; includes nonprofits and for-profits

Inclusive businesses (market-based solutions): Initiatives that offer socially beneficial goods or services to poor consumers or provide improved incomes to small producers, agents, or distributors, at scale, and in a way that is commercially viable

mHealth: The provision of health services and information via mobile technologies (mobile phones, personal digital assistants) to improve the quality of care and enhance the efficiency of service delivery within health care systems

Push product: Product that does not enjoy pre-existing customer demand and can include so-called "grudge purchases" (e.g., insurance) where the benefit to the purchaser is not realized immediately

SMS: Short message service; a communication method that sends text messages between mobile phones, or from other electronic devices to mobile phones

In 2010, the SHOPS project co-funded a 16-month project to identify successful inclusive business models that enable enterprises to engage with BoP populations in Africa, with a primary focus on five countries: Ghana, Kenya, Senegal, South Africa, and Tanzania. The study mapped over 430 inclusive businesses and thoroughly analyzed five inclusive business models based on commonalities across the sample set. The in-depth analysis included a study of m-enabled enterprises and looked primarily at consumer-facing models delivering information or services to the BoP via mobiles in the health and agriculture sectors.

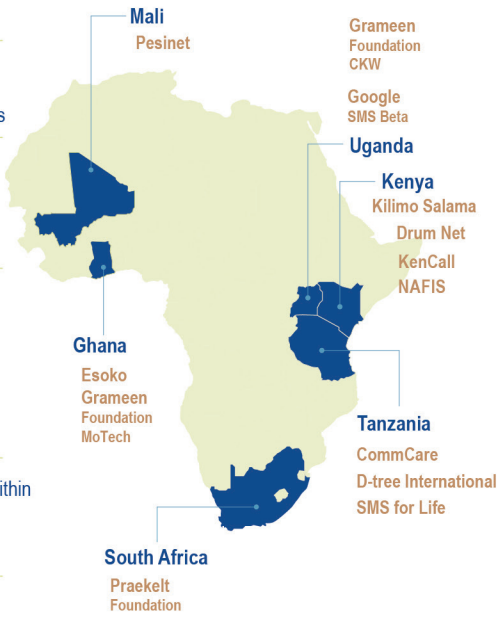
Most of the m-enabled models that the research team encountered in Africa are at the pre- or post-pilot stage of development and, on average, are no more than three to four years old. Accordingly, it was too early in the life cycle of these efforts to draw many conclusions. There were relatively few examples, besides M-Pesa,[2] of models that were profitable or even commercially viable. Therefore, the analysis focused on models in the health and agriculture sectors with considerable potential to contribute to poverty alleviation. The research team analyzed 12 enterprises, interrogated M-Pesa as a base case, and created detailed, field-based case studies of four m-enabled solutions to learn what was working, what was not working, and why (see Figure 5).[3]

[2] M-Pesa is an m-enabled banking service for low-income individuals in Kenya and other countries. Using mobile technology to provide a more convenient, secure money transfer service to mobile subscribers, M-Pesa has attracted over 8 million subscribers in Kenya and accounts for almost 16 percent of mobile operator Safaricom's revenues.

[3] For more on the enterprises studied in detail, see "About the Study" at the end of this primer.

Figure 5. mHealth Enterprises Studied

Organization	Description
Kilimo Salama	Uses mobile technology to facilitate insurance of farming inputs
Pesinet	Health monitoring system enabling access to early stage diagnosis and treatment of common childhood diseases
Drum Net	Offers a low-cost solution for facilitating interactions between value chain partners using mobile technology and a web-based portal
CommCare **D-tree International**	Scheduling software enables community healthcare workers to manage follow-ups Diagnostic decision trees for more accurate diagnosis and appropriate treatment
Esoko	Provides current market data via text within agriculture and trade sectors Platform to facilitate buying and selling
Google **SMS BETA**	Text-based marketplace where consumers can buy and sell a range of items
KenCall **NAFIS**	Voice-based services providing agricultural information to farmers via mobile phones
SMS for Life	Generates information on stock availability of malaria medication
Praekelt **Foundation** **Project Masiluleke**	Uses 'Please Call Me' messages to disseminate HIV/AIDS awareness messaging
Google **SMS BETA** **Tips/text Search**	Google Tips: Allows user to search for health and agricultural information via text message Google SMS Search: enables a user to search Google via text message
Grameen **Foundation** **Community Knowledge Worker Initiative**	Uses individuals in rural communities as conduits for agri-information from various sources
Grameen **Foundation** **MoTech**	Provides health care information to pregnant women, encouraging antenatal care



This primer summarizes the findings of the m-enabled case studies and insights from the 439-strong multi-sector research sample set to shed light on business models that work to engage the BoP at scale and in a commercially viable way. It looks at enterprises targeting the poor for services and payment, serving this population in a way that will cover costs and have significant reach. Given the lack of data on commercially viable, large-scale business models in mhealth, the aims of the primer are to:

- Highlight the key practices that will assist m-enabled enterprises in potentially reaching commercial viability in the near term.
- Assist funders with a perspective on business model principles that enable sustainable impact.

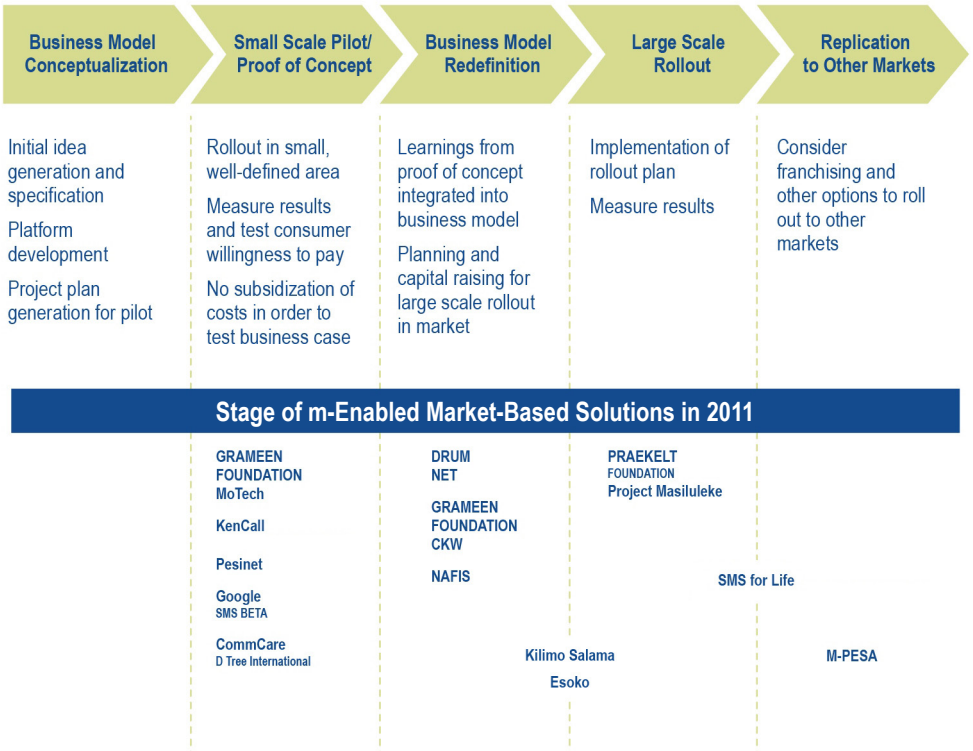
Inclusive Business Models

During the past 15 years, interest in private sector approaches to poverty alleviation has been growing as more than 2 billion people worldwide—including half a billion in sub-Saharan Africa—struggle to subsist on less than $2 per day (World Bank). The persistence of poverty on such a massive scale and its resistance to traditional solutions—government expenditure, official development assistance, and private philanthropy—indicate the need for alternative or additional ways to move masses of people up the income scale. These challenges and trends have prompted donors and investors to support solutions that address the causes, not just the consequences, of endemic poverty. One promising approach is an inclusive business or market-based solution model—ways of doing business that improve the lives and livelihoods of those at the bottom of the economic pyramid (see the implementation process for an m-enabled market-based solution in Figure 6). Inclusive businesses demonstrate the following traits:

The persistence of poverty and its resistance to traditional solutions indicate the need for alternative ways to move masses of people up the income scale.

- **They are financially self-sustaining**, if not profitable. In other words, inclusive businesses do not depend on the continuing generosity of donors for their survival.
- **They are scalable** and able to reach significant numbers of low-income people.
- **They provide tangible social benefit to low-income people**; that is, they deliver a product, service, or employment opportunity that provides direct social benefit to the poor, typically in categories such as health care, food and agricultural products, water and sanitation, education, financial services, insurance, clean energy, and telecommunications.

Figure 6. Process to Implement m-Enabled Market-based Solutions

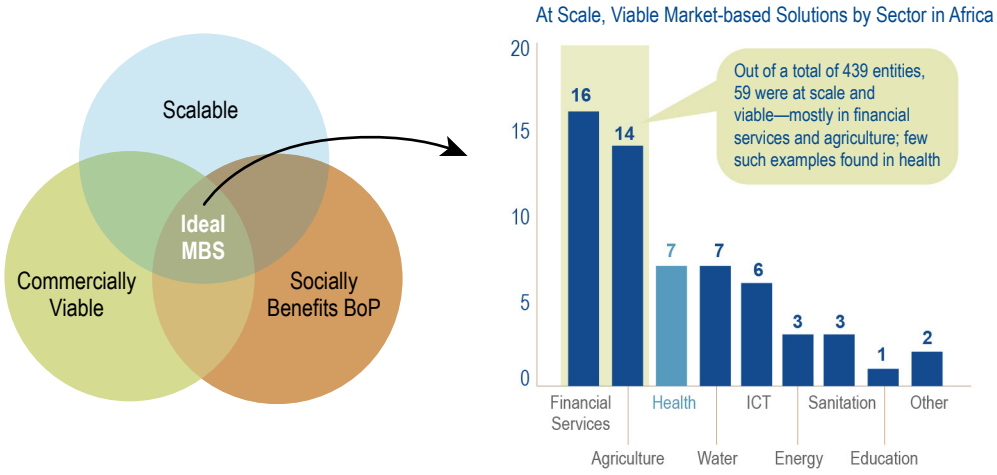


Note: Process developed based on interviews with management and perspectives gained from experts
Sources: Management interviews and Monitor analysis

For inclusive businesses to succeed, they must operate with business models suited to the extreme conditions of low-income markets (Kubzansky, 2011 and Karamchandani, 2009). When the business model is sound, inclusive enterprises can gain independence from funders and donors and achieve self-sufficiency. Enterprises may then operate at or near scale and reach enough people to make an impact on poverty rates. However, business models for trading with the poor are far less established than those which target the urban middle classes in high-income countries. Not surprisingly, developing such business models is often difficult and time-consuming.

The research in Africa surfaced 439 initiatives in nine sub-Saharan African countries, active in 14 sectors and aiming primarily at the $2-a-day (or less) population. A significant number of these entities were making a difference in the campaign against poverty—but many market-based solutions still struggle to break even or, at best, operate with razor-thin margins (see Figure 7).

Figure 7. Market-based Solutions by Sector



Data set n=439; at scale and commercially viable and socially benefits BoP n=59.
Sources: In-country interviews, Monitor analysis

mHealth: Broader than Market-based Solutions

Careful consideration of the definition of mhealth—the provision of health services and information via mobile technologies (mobile phones, personal digital assistants) to improve the quality of care and enhance the efficiency of health service delivery—makes it clear that not all mhealth initiatives are intended to be inclusive businesses. Many mhealth interventions serve only middle- and high-income consumers, support health systems in developed countries, or depend on a system where insurers offer the service or drive the mhealth activity. Some mhealth interventions are not financially self-sustaining by design and form part of public health or aid-driven development programs, such as mTrac in Uganda and Childcount+ in Kenya, Tanzania, and Ghana.* Further, some mhealth interventions may be deliberately niche-oriented such that scale is not a consideration. In contrast, this primer looks at mhealth market-based solutions that target the poor for services and payment, aiming to serve the BoP population segment in a way that at least covers operating costs while reaching a significant number of people. The SHOPS research focused on this subset of mhealth initiatives to uncover important lessons for success, and learn if there could be a market where consumers paid for such services directly.

**mTrac is a data collection tool that enables health workers at district health centers to submit weekly reports, with a focus on disease outbreaks and essential medicines. The goal is to support the efforts of the Ugandan Ministry of Health to digitize the country's health information management systems. ChildCount+ is a community health events reporting and alerts platform that empowers communities to improve child survival and maternal health. Using standard mobile phones, community health workers send text messages to register patients and to submit health reports to a central web dashboard that allows a health team to closely monitor a community's health and reduce gaps in treatment.*

Given that inclusive businesses in almost all sectors are still in their infancy, much needs to be learned about how they work and why many struggle and only a few succeed. In particular, the sector economics of health exacerbates the difficulty of making mhealth-focused inclusive businesses work. Unlike the credit offered by microfinance institutions or improved price realization and incomes achieved through smallholder farmer participation in inclusive business schemes, the benefits associated with health businesses serving the poor are much less immediate and tangible. Moreover, any commercial business in health, not just mhealth, often asks low-income patients to pay for services they do without or receive for free or at a discount. As such, the lack of sustainable business models for mhealth interventions in the developing world is not surprising. Furthermore, analysis of inclusive businesses in India revealed that it can take as long as 10 to 15 years for social enterprises to reach scale, suggesting that the proliferation of pilots in the mhealth field today is an important contributor to the evolution and maturation of m-enabled solutions over time. The insights and lessons from today's pilots will inform and improve the future self-sufficiency of mhealth projects. In addition, the business model lessons surfaced from market-based solutions in other sectors that have achieved scale and sustainability can provide further valuable insights.

Unlike the credit offered by microfinance institutions, the benefits of health businesses serving the poor are much less immediate and tangible.

Ten Business Model Lessons for mHealth

mHealth solutions cover a wide spectrum of health categories and offerings. The SHOPS research considered one group of mhealth solutions directly serving consumers (consumer-facing) as distinct from m-solutions with no direct consumer interface (systems-oriented). Consumer-facing mhealth includes m-enabled education and demand stimulation initiatives, diagnostics and treatment support, and health payment, insurance, or savings schemes. Systems-oriented mhealth includes m-enabled health program management, intermediary support, and business systems, or business-to-business (B2B) solutions. While enterprises across the two categories share characteristics, they differ in critical respects, such as metrics of success (number of customers reached versus health system savings incurred), expectation of who pays, and time to scale. At present, while few consumer-facing m-solutions outside financial services cover their costs, several systems-oriented m-solutions have reached or are well on their way to commercialization.

Given these differences, lessons for consumer-facing mhealth applications are outlined in the following table. Some of these lessons also apply to systems-oriented mhealth—approaches that drive efficiency, quality, and productivity in health service delivery.

Lessons for mHealth

Lesson	Consumer-facing mHealth Education and demand stimulation; diagnostics and treatment support; health payment/insurance/savings	Systems-oriented mHealth Mobiles for program management; health intermediary support; business systems/B2B solutions
1. Use trusted intermediaries	X	
2. Balance ease of use and cost considerations	X	X
3. Carefully consider affordability and ability to charge	X	
4. Stimulate demand	X	
5. Sell services and bundles	X	
6. Explore alternative revenue streams	X	X
7. Diversify the customer base	X	
8. Engage in partnerships	X	X
9. Enlist government support	X	X
10. Leverage existing at-scale platforms and available applications	X	X

1. Use trusted intermediaries

Any purchase decision for the BoP is risky because of the extreme volatility of incomes and cash flows, particularly for intangible goods such as insurance and m-enabled services for which it is difficult to demonstrate benefits. Given that intangibility reinforces risk aversion and skepticism, trusted intermediaries are essential in establishing personal contact with BoP customers. For products and services that require education, such intermediaries also help drive adoption and are a critical element of successful business models. From an mhealth perspective, this is an important but surprising finding given that much of the promise of m-enabled solutions is the enhanced accessibility of hard-to-reach populations that are increasingly covered by mobile networks and handsets. An ongoing

assumption of many mhealth enterprises (or any m-enabled enterprise) is that it is possible to reach and serve the poor inexpensively by relying on direct communication via voice or data on the handset. However, many m-enabled enterprises studied for this primer reported that they cannot reach the BoP directly via handsets and need to engage trusted agents to move the product or service to BoP customers.

In part, trusted agents are needed because the technology is new, and information communicated remotely is difficult to verify or assess. In Kenya, Farmers' Helpline, a call center supporting 12,000 registered farmers in two districts, deploys its operators to attend occasional events. At the events, the operators meet the farmers they advise remotely to create personal relationships and trust. Personnel at m-enabled enterprises often noted that health information needs to be communicated by community-based health workers rather than through a phone from an unknown remote worker. Pesinet in Mali is an mhealth enterprise that serves low-income families in Bamako and equips its agent network with mobiles to manage basic data collection and doctor visit scheduling. While the initiative is small, Pesinet is the one mhealth application in the study that covers more of its costs than any other. One reason for the uptake of this service is that the interaction on key health questions occurs between a mother and a community health worker (equipped with a mobile), not between a mother and a mobile phone.

Given that intangibility reinforces risk aversion and skepticism, trusted intermediaries are essential in establishing personal contact with BoP customers.

The experiences in Kenya and Mali demonstrate that customer acquisition costs of m-enabled enterprises tend to be high, particularly at the inception stage. This tempers the promise of mobile applications as ultra-low-cost, deep-reach platforms.

In addition to breaking down trust barriers, intermediaries are important vehicles for demand stimulation (see Lesson 4).

Intermediation: Critical M-Pesa Success Factor

The growth of M-Pesa, an m-enabled banking service for low income individuals in Kenya and other countries, is one of the most-chronicled stories in the world of market-based solutions. M-Pesa accounts for almost 16 percent of Safaricom's revenues in Kenya, representing half of the company's non-tariff revenues (Safaricom, 2012). It exemplifies how the power of mobile technology may be harnessed to improve the lives of BoP individuals.

M-Pesa brought together several business model elements that have driven success in other market-based solutions. Unlike other services, M-Pesa's service requires little customer education. The value proposition is self-evident as it provides a lower cost and more secure process of sending money to relatives, replacing either expensive formal services like Western Union (M-Pesa is about half the price), or the risky approach of sending cash via public transportation on Kenya's poor-quality roads. Additionally, a well-known and trusted bank and mobile operator backed the venture, enhancing credibility with BoP customers. A recent survey showed that 98 percent of respondents said they believed M-Pesa to be faster, safer, less expensive, and more convenient than alternative ways to transfer funds (Eijkman et al., 2010).

Less obvious, another key to M-Pesa's success is the use of personal contact. The venture relies on a network of nearly 40,000 agents across Kenya to sell its product. Customers interviewed place great importance on the agents as trusted parties who can confirm that a virtual transaction actually occurs, assist users to make transactions, and address questions that may arise. Parent company Safaricom has invested substantially to create and maintain this customer interface. Among its management strategies, three were critical to nurturing the quality of its high volume agent network: outsourcing agent training and oversight to a local training firm; matching agent growth to customer growth to ensure agent profitability; and creating a hierarchical "agent aggregator" model in which master agents recruit and manage retail agents to facilitate rapid scale-up (IFC, 2010).

Note: For an informative account of M-Pesa, see the draft paper "Three Keys to M-Pesa's Success: Branding, Channel Management, and Pricing," Ignacio Mas and Amolo Ng'weno, Bill & Melinda Gates Foundation, December 2009, available at www.bankablefrontier.com (accessed January 30, 2013).

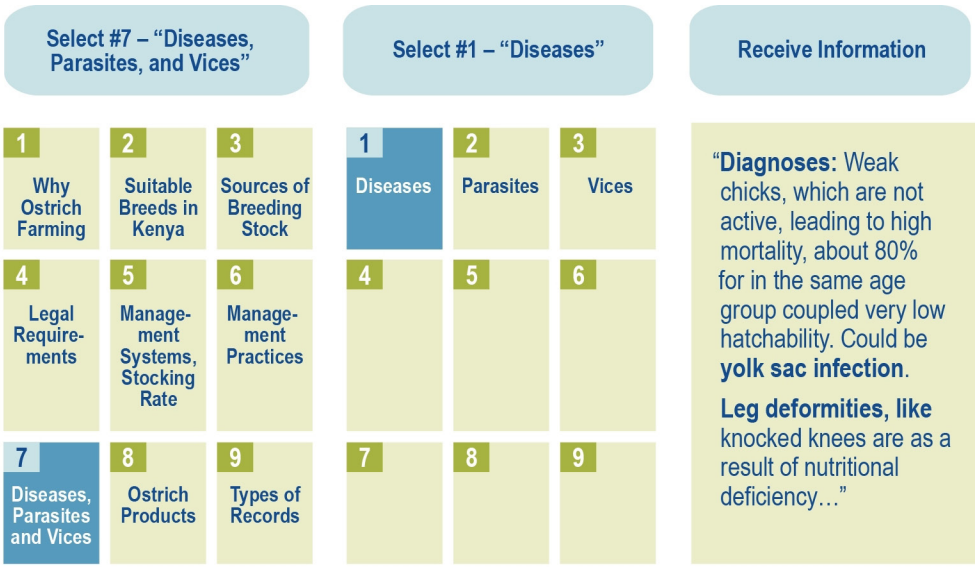
2. Balance ease of use and cost considerations

Studies show that it is critical to design m-enabled solutions with the end-user in mind and focus on the simplest technology already available. MoTech is a Ghana-based service that distributes antenatal and postnatal information via voice or SMS and enhances the quality of nurse services through a reminder system and mobile-based visit forms. MoTech has earned acclaim as a best practice for the extensive formative research it undertook to ensure that its product would appeal to women. Other examples illustrate that solving for ease of use, as MoTech has done, can introduce prohibitive costs. This suggests the need to carefully balance these considerations (see text box on page 14).

A Tale of Two Helplines

Voice applications are inherently easier to use, but even m-solutions that concentrate solely on voice services can go awry. The National Farmers Information Service in Kenya developed complex interactive voice response (IVR) software that provides a phone tree for questions about seeds, soils, pests, fertilizer, irrigation, and other factors related to nine commodities and crops. The service is expensive to develop and time-consuming for small farmers to use because it must account for differences in climactic regions, soil types, necessary equipment, and local pests. It must also offer advice in both English and Swahili. Creating such an application is costly, especially in setup, and it must overcome other barriers such as lack of trust, distribution issues, and user unwillingness to pay voice call rates while navigating the system. Figure 8 illustrates the number of options available for just one farming example and the complexity of the service. The localization of information to region and district makes the system even more complex. NAFIS launched its voice application in 2007 (National Farmers Information Service, 2012).

Figure 8. NAFIS Phone Tree for Ostrich Farming



Sources: "National Farmers Information Service," www.mobileactive.org; management interviews; Monitor analysis

The Kenya Farmers Helpline, launched in 2010 with support from the Rockefeller Foundation, Alliance for a Green Revolution in Africa, and the Bill & Melinda Gates Foundation, offers a different solution to the need to provide customized advice to small farmers. Experienced operators answer farmers' questions either in real time, via a callback after a few minutes, or after posing questions to experts. Kenya Farmers Helpline partners with various agricultural experts to provide high-quality advice tailored to the needs of the individual farmer.

However, a system designed for ease of use presents a cost trade-off. The easier-to-use Kenya Farmers Helpline relies on call center agents (not interactive voice systems) and callbacks, where agents dial customers of the service (not the other way around), and these agents are more expensive on an operating basis than an automated system.

The trade-off becomes more apparent when considering the preference for voice-based services as noted by older, more rural BoP customers in many African countries. Interviews with customers in several countries suggested that 84 percent of rural consumers preferred voice to text; other surveys have found nearly a 100 percent preference for voice services.[4] Text (SMS) is a much lower-cost delivery option, but, for the BoP population segment, voice is the easiest-to-use mobile interaction. mHealth projects are now experimenting with graphics to overcome illiteracy barriers, so voice applications may no longer be the only alternative to text.

3. Carefully consider affordability and ability to charge

BoP households spend disproportionately high amounts on mobile services.[5] As a result, they are discerning users, and their willingness to pay for services beyond connectivity should not be taken for granted. Consumer interviews revealed that the cost of a call or an SMS is a relatively significant investment. Accordingly, given cash flow constraints, low-income customers require a high burden of proof that a service is worth paying for regularly. In the early days of service use, low-income customers reported that they often independently verified that the information received on their mobile phone was correct. Farmers using agri-information m-services often confirmed price information by calling relatives with access to the affected markets.

Low-income customers require a high burden of proof that a service is worth paying for regularly.

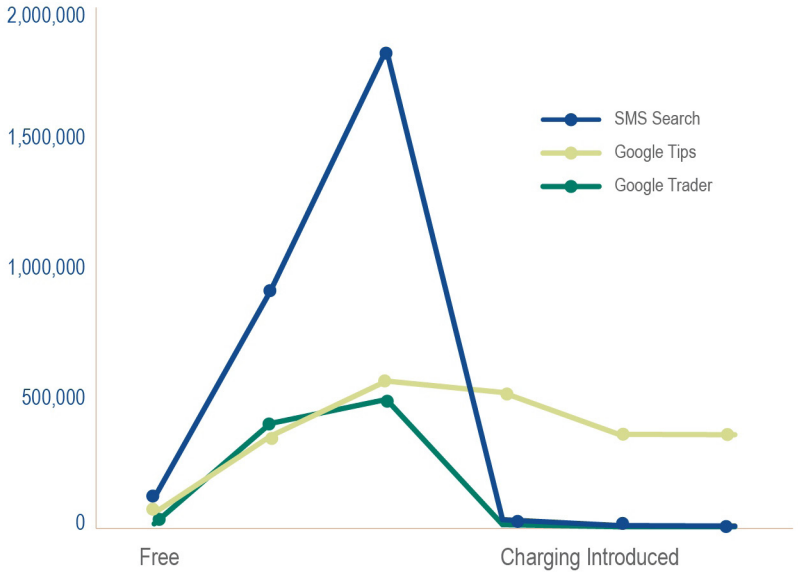
The Free Trial-Hook Gamble

In some markets, it makes sense to introduce a product or service free of charge with the goal of charging for it once it becomes established. When targeting the BoP population segment, such an approach is risky, especially when the product or service provides no immediate payoff or offers intangible benefits to the consumer. In Uganda, Google launched a range of information-based m-services aimed at the BoP, initially free of charge as a pilot. Once Google introduced pricing, hits per month dropped dramatically (see Figure 9). Only Google Tips, a service offering health and agriculture information for which there was no real substitute, managed to retain a meaningful customer base (hits per month stabilized at a sizeable 360,000 from more than 500,000 at its peak).

[4] In the research survey, younger users were more comfortable with SMS- or data-based services, which require a higher degree of literacy. Most rural BoP consumers encountered through the research possess low technological proficiency and are comfortable using only basic voice applications, despite the low cost of text and SMS services.

[5] On average, surveyed households spent $4.75 per week—nearly 20 percent of their income—on mobile services.

Figure 9. Google Suite Number of Hits per Month



Sources: Primary research in collaboration with MTN AppLab, Monitor analysis

The Google Tips experience highlights that, when value is on offer, a service will draw customers.[6] To successfully charge for mhealth, entities should consider:

- **Market gaps for m-enabled services, particularly information.** Many developing countries face a lack of reliable information on reproductive and sexual health despite a youthful market armed with mobile phones and eager for such information.

- **Ways to increase the appeal and relevance of the product or service offered.** Promising developments involve the delivery of health education or demand-creation messages via mobile phone quizzes, contests, and games that offer prizes.[7]

- **Ways to match payment models to the inconsistencies of user cash flow.**

In addition to the sustainability benefits derived from cost recovery (even just in part), there is a case to be made for the enhanced impact of services for which consumers opt in and choose to pay.

[6] Existing literature frequently cites mDhil in India as an mhealth example that operates on a for-profit business model. mDhil is an enterprise that offers information in the form of text messages with 40 or fewer characters on various health topics not commonly discussed in India. Topics include diabetes, H1N1, maternal health, and human reproduction (Earth Institute, 2010).
In Bangladesh, the award-winning BBC Janala mobile phone service provides three-minute audio lessons on a daily basis to paying learners. Within 12 weeks of its launch, 1 million mobile lessons had been accessed, increasing to 9 million by December 2011.

[7] Text to Change provided HIV/AIDS awareness via an SMS-based quiz to 15,000 mobile phone subscribers during three months in Uganda (Vital Wave Consulting, 2009).

4. Stimulate demand

Do not overlook the importance of demand stimulation. Inclusive businesses, particularly those selling push products and services (see text box on page 5), often falsely assume that the availability of their much-needed product or service via channels suitable to the BoP will be sufficient to raise customer awareness and drive demand. However, experience shows that unfulfilled need is often insufficient to ensure customer uptake, making it critical to engage in demand stimulation activities.

Leverage the marketing potential of intermediaries. Intermediaries are important in breaking down consumer trust barriers when it comes to mhealth, and are a critical channel for the education and demand creation that drives customer adoption.[8] Where a field force or retail presence is in place, direct sales agents constitute a valuable channel to overcome the difficulty of reaching the BoP through other channels.

Find ways to include mass media marketing in the mix. Several of the most successful, large-scale inclusive businesses use mass media marketing campaigns in support of their business model. These enterprises demonstrate that demand stimulation through mass media advertising, promotion of product and service benefits, special offers, and testimonials (in addition to general awareness campaigns) is essential for marketing socially beneficial offers. For example, the telecommunications companies spend heavily—on average 15 percent of revenues—on marketing to create awareness and demand among all populations, including the BoP. Even midsize companies such as Western Seed in Kenya use a mix of marketing channels to reach the BoP, employing tactics ranging from demonstration days and field days to mass market advertising via radio and newspapers (Western Seed Company).

Marketing to low-income people through mass media appears to be particularly important when an enterprise requires a high sales volume to break even. Arguably, the requirement to break even may not apply to all mhealth initiatives. However, to continue to secure funding and support from external partners, an enterprise must achieve high volumes, and so the role of mass media marketing requires consideration. Although mass media marketing is more cost-effective than relying solely on agents and one-on-one customer interaction, it is still prohibitively expensive such that inclusive businesses must find innovative ways to run mass media campaigns. Accordingly, the study revealed unique bartering arrangements between enterprises and community media and identified enterprises that benefit from donor-funded category campaigns.[9] Examples from other regions highlight the potential of advertising partnerships to sustain mobile-enabled services while building company visibility.[10]

5. Sell services and bundles

Among the most difficult sales to make to the BoP are intangibles such as insurance, agricultural and health information, and preventive health care.

[8] In Kenya and Tanzania, m4RH deployed intermediaries to enroll new users in the service to expand its reach and make the service an attractive platform for potential advertisers.

[9] These examples were part of the broader research sample set and are not drawn from the mhealth case studies. In South Africa, the founder and CEO of Silulo Ulutho Technologies speaks on a community radio slot in exchange for advertising airtime. USAID and the Shell Foundation funded a category campaign to promote the cleaner Gyapa cook stove in Ghana.

[10] The Mobile Alliance for Maternal Action initiative in Bangladesh is exploring co-branding ATL Communications with corporate sponsors and securing in-kind donations from media companies to promote a mobile health service for women (Beximco Pharma, 2011).

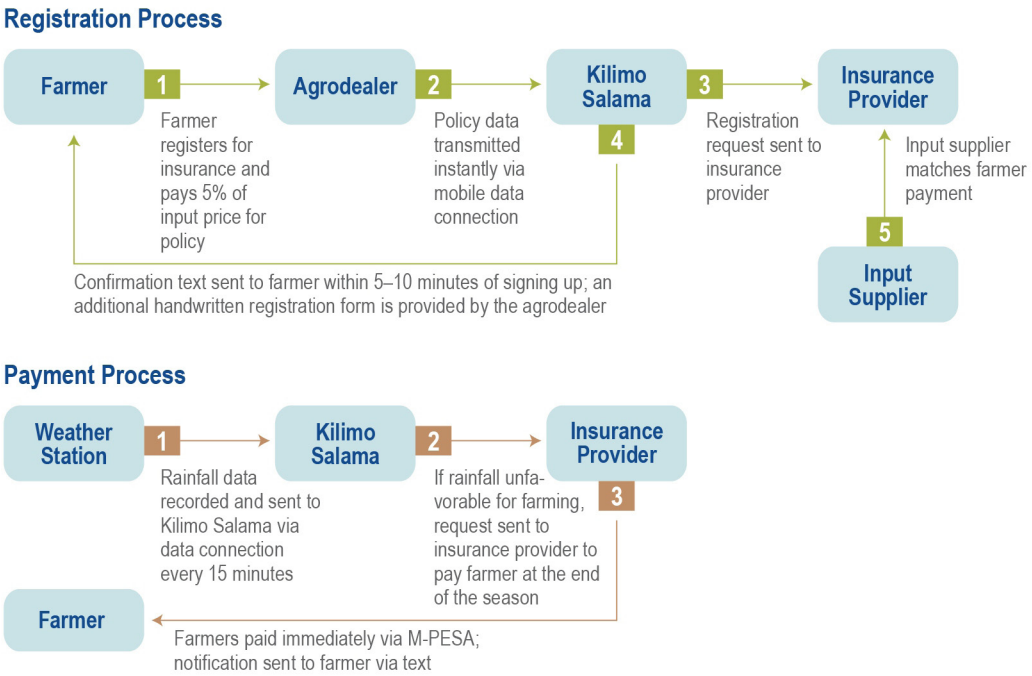
Some market-based solutions have achieved success by adapting their business models to combine such services with other offerings, thereby strengthening the proof of benefit, increasing the focus on portions of the bundle with near-term benefits, and reducing aversion to larger purchases.

Similar applications are possible in mhealth. Pesinet, for example, bundles the cost of doctor consultations with a 50 percent discount on medication into a $1-per-month subscription fee for its m-enabled health monitoring service.

Bundling Insurance with Inputs

Kilimo Salama, run by the Syngenta Foundation, uses mobile technology to offer the BoP market affordable insurance that covers farming inputs (seeds and fertilizer) against drought and excess rain (see Figure 10). Farmers may purchase insurance on their agriculture inputs from participating agrodealers. Registration is done on mobile phones via SMS by the input dealers. In the event that unfavorable weather leads to failed planting, farmers can make insurance claims to repurchase inputs. Payouts are made through M-Pesa. Insurance is a complex and intangible product and therefore a hard sell to smallholder farmers, but bundling the premium with agriculture inputs helps overcome these challenges. The program reached 23,000 farmers by 2012 (IFC, 2012).

Figure 10. Kilimo Salama Insurance Mobile Registration and Payment Processes



Sources: Management interviews and Monitor analysis

6. Explore alternative revenue streams

None of the m-enabled enterprises encompassed by this research, except for M-Pesa, covered their costs from user fees or other sources. Given the difficulty of pricing for full-cost recovery, mobile-based service providers engaging the BoP in Africa face the same fundamental challenge as those selling to wealthy consumers in high-income countries—it is nearly impossible to recoup the full cost of selling information. This challenge is more acute when social enterprises target the cash-constrained poor in Africa. As a result, many enterprises are exploring alternative and supplemental revenue streams to achieve financial sustainability, although the study did not encounter any that have successfully introduced a third-party revenue source.

The alternatives take several forms. For example, intermediaries administer surveys for others and enterprises license or sell proprietary technological innovations, and even make services available to advertisers for relevant products such as agriculture inputs.[11] Advertising is an untapped and promising revenue source, and mobile operators could represent a valuable revenue stream.[12] In higher-income health markets, third parties such as insurers or drug manufacturers with an economic incentive to manage the health of the insured party represent another revenue stream. Even though the lack of affordable health insurance schemes available to the BoP in Africa means that insurance is not a likely alternative revenue source for mhealth enterprises, a few promising partnerships are starting to emerge. In South Africa, mobile operator MTN has partnered with insurer Sanlam to serve the low-income market by delivering medical advice to mobile phone users (MTN Group, 2011).

Access to the BoP offers value to other enterprises—or even government ministries delivering key health messages—eager to engage the low-income market, but mhealth projects need to define how to tap into such alternative sources of revenue in a responsible way, paying heed to consumer confidentiality concerns and ensuring responsible advertising.

7. Diversify the customer base

Research underscores the fact that the BoP is not a monolith. Distinct segments of both consumers and suppliers are differentiated by everything from income level to family status to access gaps.[13] Most enterprises intuitively understand such differentiation, but some, out of a sense of social mission or driven by donor targets, focus exclusively on the lower-income strata within the BoP. For some initiatives, such as sachet or kiosk water, it is feasible to reach the $1-a-day-and-below population, but this population segment cannot afford many socially beneficial goods and services such as budget private schools, agriculture inputs, or high-quality clinical health services. Moreover, the BoP encompasses volatile customers and suppliers, exposing enterprises to additional challenges and risks beyond those faced by other small and medium-sized enterprises. In both India and Africa, few offers succeeded in operating at full cost recovery while serving those living on less than $1 a day.

[11] Decision support tools such as CommCare used by D-tree International in Tanzania to support home-based care workers have many potential uses outside the health sector.

[12] In Kenya, a microsavings program called Changamka partnered with mobile operator Orange to incentivize sales agents from both companies to cross-sell services.

[13] A small but growing literature examines subgroups within the BoP. The World Resources Institute and International Finance Corporation report, *The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid*, painted a portrait of the BoP along income and regional dimensions. Market research firms, particularly in South Africa, have developed working pictures at the Living Standards Measure level and have begun to focus on the population in LSMs 4 and 5, which is at the higher end of the BoP in South Africa.

With respect to mhealth, diversification may be a critical consideration for point-of care support and remote diagnostics or consultation.

In Africa, the most successful enterprises reach the poorest customers sustainably through diversification by serving multiple income segments—a phenomenon observed in the financial services, education, agriculture, and health sectors. With respect to mhealth, diversification may be a critical consideration for point-of-care support and remote diagnostics or consultation. The increasing sophistication of these services on the mhealth spectrum typically also means increased delivery costs. However, consideration of the target market in a more expansive way across more income segments may make it possible to cover the costs of serving people in the lowest-income strata.

Esoko is a mobile- and web-based information and trading platform that provides market updates via SMS and serves as a virtual marketplace for agriculture value chain players. The enterprise targets various entities in the value chain, from smallholder farmers to large exporters, and applies a tiered pricing structure for subscriptions. The arrangement allows Esoko to offer services to individual small farmers even though individual subscriptions are significantly less valuable than large corporate subscriptions. Securing a larger, more stable customer base to allow service delivery to the poor holds promise for many mhealth interventions.

8. Engage in partnerships

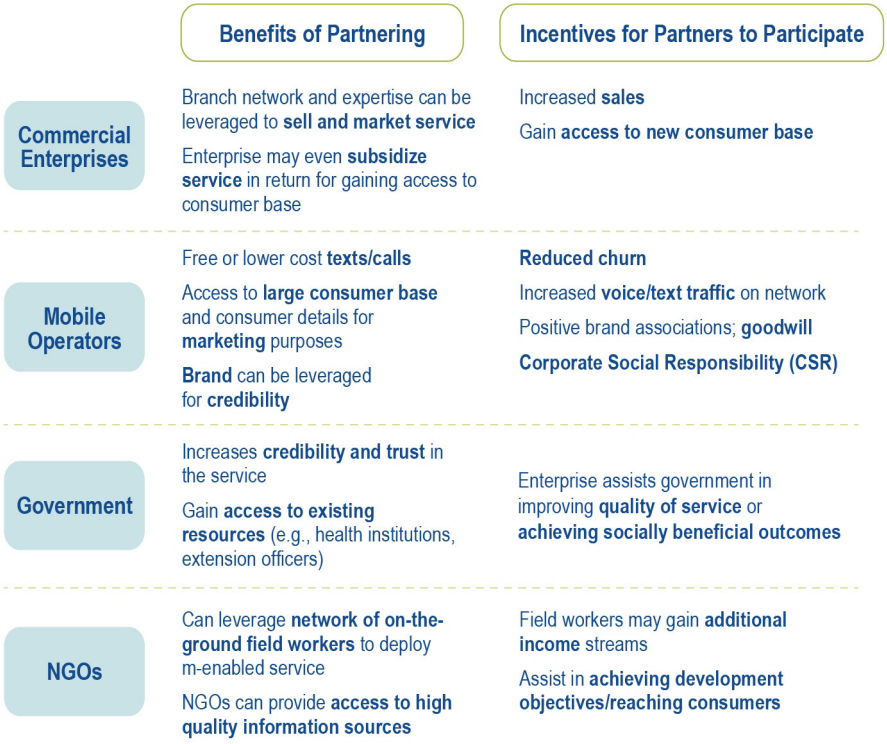
Partnerships offer an important means of organizing processes and systems end-to-end, without the need for any one partner to implement all processes on its own. Partnerships also offer a mechanism for sharing costs and risks. The mhealth literature is rich with references to the importance of partnerships, particularly given the number of entities comprising the mhealth value chain.[14] Understanding the incentives of various partners paves the way for constructive engagements (see Figure 11).

In the case of mhealth, partnerships deliver cost efficiencies, better access to information and credibility, and overall savings and improvements to health systems.

[14] mHealth value chain participants may include any combination of the following entities: patient, caregiver, project manager, equipment provider, service provider, application solutions provider, content management provider, aggregator, platform provider, the government, funding sources, nongovernmental organizations, and industry associations.

Figure 11. Benefits and Incentives of Partnerships

Partnerships can improve commercial viability by defraying costs, increasing access to information, and influencing consumer willingness to pay by fostering credibility and trust in the service. However, partnerships also increase complexity and partners must often manage issues of different incentives, objectives, metrics, and time horizons.



Sources: Management interviews, consumer interviews, Monitor analysis

SMS for Life Partnerships

Started in 2009, SMS for Life (a systems-oriented mhealth solution) provides weekly status reports on the stock availability of malaria drugs at health facilities within a country. Information is collected through SMS data from health worker handsets and is aggregated at a central server. During an eight-week pilot in Tanzania, the number of facilities with stockouts decreased from 77 to 24 percent, significantly increasing drug availability. SMS for Life is a multi-party effort that leverages the strengths of each partner:

- Novartis initiated and led the project, supplied anti-malarials, and provided funding.
- IBM provided management resource support.
- Vodafone created the system and implemented the technical solution.
- The Tanzanian Ministry of Health and Social Welfare coordinated all project activities and aided in obtaining legitimacy and consumer trust.
- Roll Back Malaria facilitated the project and led advocacy activities.

9. Enlist government support

The research revealed several examples of constructive ventures that involve inclusive businesses and governments. In mhealth, if ventures can integrate seamlessly with the existing health care system, they will be more likely to take opportunities to scale, assuming the intervention tackles health care issues in line with a government's priorities and accounts for the existing health care infrastructure.

Aside from looking to government to design meaningful and relevant mhealth interventions, successful inclusive businesses engage with government in three ways to promote scale and sustainability:

- **Anchor buyer.** Many inclusive businesses offer services to the poor that a government is too capacity-constrained or inefficient to provide. However, the government may be willing to fund these services through a third party. Improved effectiveness and efficiency of data collection and disease surveillance are areas where governments may act as anchor buyers, potentially enabling programs to offer additional health services to the poor on the back of such income streams. Ministries of health frequently support D-tree International's CommCare, which provides support to home-based care workers; and the biggest users of NAFIS in Kenya were government agricultural extension officers.
- **Implementation partner.** In South Africa, Project Masiluleke partners with an AIDS helpline funded by the National Department of Health to field HIV/AIDS-related messages.
- **Value chain coordinator.** SMS for Life in Tanzania relied on the Ministry of Health and Social Welfare to coordinate all project activities. Similarly, in Rwanda and Uganda, governments are playing an active role in identifying synergies, opportunities, and gaps in the mhealth space.

In mhealth, if ventures can integrate seamlessly with the existing health care system, they will be more likely to take opportunities to scale.

10. Leverage existing at-scale platforms and available applications

The study found that many inclusive businesses fell short when they attempted to implement their own distribution channels, often from scratch. Such an approach is time-consuming and expensive. The evidence showed considerable value in exploiting existing channels (see text box on the next page). In sub-Saharan Africa, efforts to engage existing channels rely and build on informal and often fragmented channels. mHealth enterprises inherently avoid the trap of developing proprietary distribution solutions by working from the large and growing mobile network base. Yet, the oversight of many m-enabled solutions involves the development of customized proprietary software, platforms, and tools instead of leveraging what already exists in the market.

Key points for leveraging existing resources:

- Rely on standardized technology and available applications as much as possible to lower development and operating costs, at least in the early stages. Kilimo Salama payments, for instance, run on M-Pesa.
- Use the simplest, proven technology to benefit from lower initial costs, pre-existing user adoption, broader reach, and ultimately, an easier path toward financial sustainability.

Using an Existing Platform

In South Africa, Project Masiluleke tapped into the massively popular "Please Call Me" message platform to disseminate HIV/AIDS awareness messaging to millions of low-income South Africans already using this system.

CONCLUSION

Given the pervasive and growing presence of mobile networks and handsets, mhealth holds particular promise in the developing world to drive improved health outcomes and poverty alleviation. To reach their potential, at least some of the mhealth projects aimed at the poor need business models that will enable self-sufficiency and scale. To this end, the multitude of pilots currently in the field offers a rich source for learning, as do the findings of SHOPS-supported research into successful business models engaging the poor in Africa. Insights gained from this research reveal lessons for consumer-facing and systems-oriented mhealth projects that can help m-enabled enterprises reach commercial viability in the near term while providing funders and mobile operators with a perspective on business model principles that enable sustainable impact.

The lessons suggest that there are levers at the disposal of mhealth enterprises to improve self-sufficiency and harness the incredible potential of mobiles, even as these entities navigate the highly challenging conditions of serving the poor in a sector with constraining sector economics and needing to develop brand new business models. The lessons also point to roles for funders and supporters of mhealth in assisting enterprises to pull these levers, and suggest that patience will be necessary while many experiment with the right business model until they find one that works.

The development of mhealth applications to serve BoP markets is still in its inception. More experimentation and time are required, especially for pricing and cost recovery of consumer-facing models. Thus far, the applications have shown sufficient potential such that continued trial and advancement are essential for these applications to make an impact in the health and well-being of those in low-income markets.

Lessons for Funders

- Build in support for monitoring and evaluation to add to the body of knowledge on challenges, successes, and best practices.
- Understand the lessons from pilots for incorporation into future initiatives.
- Ensure sufficient time for the model to reach scale and understand that you will almost certainly need to revise the model.
- Recognize the value in systems-oriented solutions and pursue these along, and in combination, with consumer-facing mhealth initiatives.
- Push for the use of existing technology, platforms, and applications; avoid funding new platform development when it is possible to build on what already exists.
- Support upfront research to understand the needs of the target population segment.
- Build in a role for trusted intermediaries.
- Consider demand-stimulation support vehicles to provide cost support.
- Do not insist on a rigid targeting of the $2-per-day-or-below segments.
- Assist in opening doors for partnerships.

About the Study

Monitor Group wishes to gratefully recognize the generous support, both financial and intellectual, of the sponsors of this primer, a group of entities interested in advancing knowledge of market-based solutions and the ecosystems in which they flourish. This group includes the Bill & Melinda Gates Foundation, which provided anchor funding and project design guidance; the Business Trust of South Africa and the Swiss State Secretariat for Economic Affairs, which provided additional major contributions; and the Rockefeller Foundation; the Global Impact Investing Network; Omidyar Network; the USAID-funded Strengthening Health Outcomes through the Private Sector (SHOPS) project; IFC; the World Bank; the World Bank Institute; Actis; and Netherlands Development Finance Company (FMO), all of which provided significant financial support.

The research that underpins this primer profiled 439 enterprises across 14 sectors and nine countries in sub-Saharan Africa. The enterprises all sought to engage customers or business associates in the $2-a-day (or less) segment of the population. The research objective was to investigate the effectiveness and scale of inclusive businesses at the bottom of the economic pyramid. The research involved extensive field work, including site visits and interviews with representatives of the enterprises and their customers, suppliers, agents, and investors as well as with subject-matter experts. The research team also surveyed nearly 50 large African and multinational corporations to learn about their approaches to low-income markets. Furthermore, the research team spoke to more than 50 impact investors in North America, Europe, and Africa to ascertain factors guiding their investment decisions and the barriers they encounter when

attempting to deploy capital to help reduce endemic poverty. A similar study conducted between 2007 and 2008 in India (Karamchandani, 2009) identified seven business models that increase the odds of success when engaging the BoP. The same models were all in evidence in Africa. In addition, the research revealed three successful business models not studied previously and three that are not yet proven but show promise if ways can be found to make them more cost-effective and scalable.

m-Enabled models fall into the category of business models that show promise. As part of an in-depth look at m-enabled models, the research team completed four detailed field-based case studies of m-enabled enterprises that offer services or information in health and agriculture:

- **Pesinet** (Mali, mHealth, service-oriented, direct-to-BoP-consumer) initiated its health-related efforts in 2008 and offers a weekly health monitoring system for children from birth to 5 years, enabling access to early-stage treatment for common childhood diseases. The service operates in urban and peri-urban Bamako and targets BoP mothers. Membership in the service costs approximately $1 a month per child and includes weekly weight measurement of the child, guaranteed access to doctors at the local clinic—within a one-kilometer radius—and lower-priced medication. Data capture (e.g., weight information) takes place through a health worker's mobile phone, with the information uploaded onto a central server so a doctor can decide whether further medical consultation is required.
- **SMS for Life** (Tanzania, mHealth, information-oriented, indirect/supply chain), started in 2009, provides weekly status reports on the stock availability of malaria drugs at health facilities within a country. Information collected through SMS data from health worker handsets is aggregated at a central server. During an eight-week pilot, the number of facilities with a stockout declined from 77 to 24 percent, thereby significantly increasing drug availability. Annual cost of the system is approximately $100 per medical facility.
- **Kilimo Salama** (Kenya, mAgri, service-oriented, direct-to-BoP-consumer) began operations in 2009 and offers affordable insurance on farming inputs (seeds, chemicals, and fertilizer) against drought and excess rain. The service costs the farmer 5 percent of the total input price. Registration takes place through a mobile-based point-of-sale system at an agrodealer, with payment made by using the M-Pesa platform. A weather station equipped with a mobile SIM card monitors weather conditions and automatically transmits rainfall and other information to a central server. Back-end functions among agrodealers, insurers, and input providers are also built on a mobile platform.
- **National Farmers Information Service** (Kenya, mAgri, information-oriented, direct-to-BoP-consumer) began operations in 2007 and provides agricultural information via an interactive

voice response system. The service is intended to complement existing extension service agents by providing information on specific agricultural issues, such as banana harvesting or ostrich farming. In partnership with the Ministry of Agriculture, the service stores static and dynamic information on nine crops and livestock types and periodically updates the information using innovative, low-cost text-to-voice technology. Customers pay for the call, but not for the service, which is provided at no charge.

The analysis also benchmarked in less detail several relevant examples and models as base cases for m-enabled success, including Drumnet, D-tree CommCare, Esoko, Google's mobile-based services in Uganda (Google Tips, SMS Search), Praekelt Foundation's Project Masiluleke, Grameen Foundation's MoTech and Community Knowledge Worker initiatives, and M-Pesa.

Research activities included:

- **Field visits** to Ghana, Kenya, Mali, South Africa, Tanzania, and Uganda to profile 13 enterprises.
- **Stakeholder interviews** with the managers of each enterprise studied, field workers, and consumers. Supplementary interviews involved subject-matter experts. The team also drew on direct consumer data gathered by Esoko (Ghana), Pesinet (Mali), and MoTech (Ghana).
- **Economic analyses of business models** to unpack revenue and cost components and the interrelationships between parts of the initiatives, and to calculate key financial metrics for benchmarking against examples of BoP engagement at scale.

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