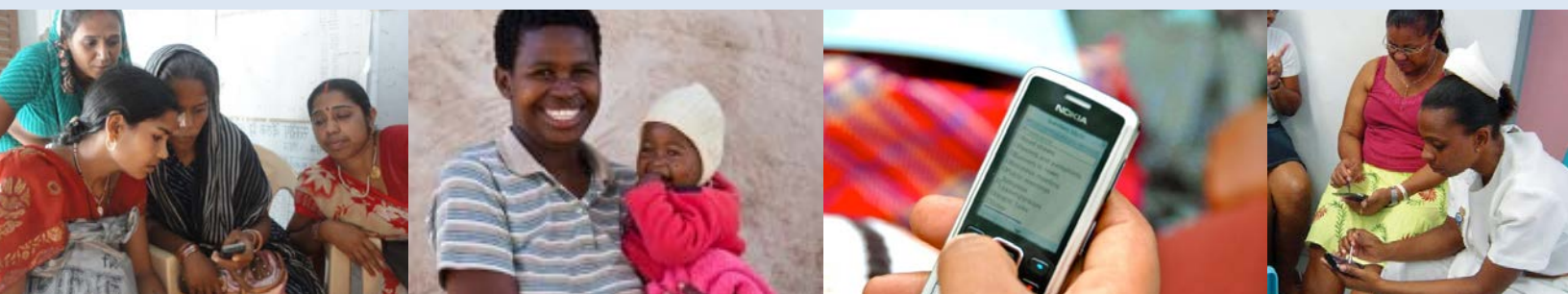


Sustainable Financing for Mobile Health (mHealth): Options and opportunities for mHealth financial models in low and middle-income countries





The mHealth Alliance champions the use of mobile technologies to improve health throughout the world. Working with partners in multiple sectors, the Alliance convenes stakeholders across the mobile health (mHealth) community to overcome common challenges. To accomplish this, the mHealth Alliance facilitates the sharing of tools, knowledge, experience and lessons learned as well as advocates for more and better quality research and evaluation and informed policy making. The mHealth Alliance also builds capacity throughout the ecosystem, promotes sustainable business models, and supports systems integration goals by advocating for standardization and interoperability of mHealth platforms.



Vital Wave engages multinational corporations and development organizations to provide actionable solutions to scale-up businesses and programs in emerging markets. Working across diverse global markets and sectors, the firm is a recognized leader in the fields of health and technology, with a particular focus on mHealth. Vital Wave draws on decades of field experience and research in low and middle-income countries, proven analytical methods and world-class professional services to achieve sustained impact and growth for its clients at the global, regional and local levels.

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Message from the Executive Director



mHealth presents a critical opportunity to re-envision how health information and services are consumed and delivered. In maternal, newborn and child health, we are witnessing the game-changing effects that mobile technology has to offer through services such as pregnancy and birth registries, immunization and nutrition tracking. While there is no longer doubt that mHealth is a viable strategy and tool for improving access, coverage and quality of care, as well as generating cost savings, the question of financial sustainability and ultimately “Who pays?” poses persistent challenges and barriers to scale and investment.

I am convinced that the findings in this report will provide valuable insights across all facets of the mHealth community. The report outlines prospects for each and every member of our diverse community to seek and support opportunities for mHealth initiatives to become financially sustainable. As with other aspects of mHealth, it is through the collective action of governments, industry, NGOs, academia and the many private philanthropies and bilaterals that have catalyzed mHealth that we will reach our goals of providing sustainable services that improve the health and well-being of millions and increasingly billions of people throughout the world.

With the growing urgency to advance our thinking and discussion in this area, I welcomed the opportunity to engage Vital Wave to undertake the investigation that led to this report. Specifically, I asked for answers to following questions: 1) which aspects of mHealth are most likely to be taken up by commercial forces; 2) how will mHealth benefits be valued in the absence of commercial involvement; 3) how can donors complement government investment; 4) how can ecosystem actors overcome gaps to reach later stages of maturity; and 5) what can we learn from current financial models in mHealth?

The heart of the mHealth Alliance mission is to catalyze a movement towards the scalable and sustainable mainstreaming of mobile technologies for improved health outcomes and wellbeing. This report provides a platform through which we can begin to answer the questions “Who pays, and at what stage is their investment most needed and appropriate?” It is my pleasure to share the results of this analysis with you. We look forward to continuing to work with all of our partners to help ensure that more initiatives achieve financial sustainability and reach the scale required for game-changing impact.

Best regards,

A handwritten signature in cursive script that reads "P. Mechael".

Patricia Mechael

Executive Director, mHealth Alliance

Acknowledgements

The mHealth Alliance and Vital Wave would like to first and foremost express our appreciation to the Norwegian Agency for Development Cooperation (NORAD) for their generous support and Tore Godal for posing the challenging questions, “For those mHealth applications in which there is no commercial interest: Who should pay? What is the role of the government and what is the role of the donors?”

In addition, we would like to thank the mHealth community, case study representatives and colleagues in Nigeria for helping to ground this work in the various programs and movements that are ongoing to improve maternal, newborn and child health.

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Executive Summary

The consumption and delivery of health-related services via mobile communication devices, known as mHealth, is fast becoming an essential component of global health. Today, the global health community enjoys unprecedented levels of scientific knowledge and technical ability, and the rapid expansion of mobile technology means that the vast majority of adults, even in rural and remote regions, possess the means to access health information and services through personal devices.

“[In global health] the issue is a failure to deliver. We have the money and the ability . . . the problem is an implementation bottleneck.”

— Jim Yong Kim,
President of the World Bank

Yet, concern is growing within the global health community that despite this promise mHealth implementations are challenged to sustain scale at a national level in low and middle-income countries. The lack of viable sustainable financial models for mHealth contributes to the challenges that implementers face. While there are a variety of financial models currently in use for the hundreds of mHealth projects active in low and middle-income countries, there is general consensus that most of these projects rely too heavily on short-term grant funding from government, foundation and private-sector entities. In addition, fragmentation in the delivery of global health care has led to a lack of holistic systems thinking in both the design and delivery of mHealth solutions. Frequently, this leads to misalignment between ecosystem players and produces models that are not financially sustainable or scalable.

The growing urgency to resolve this circumstance in order to scale a greater number of implementations has prompted key players in the mHealth community to focus on financial modeling. This *Sustainable Financing for Mobile Health (mHealth)* report, commissioned by the mHealth Alliance and delivered by Vital Wave, uses a value chain analysis framework at the stakeholder level to evaluate five financial models that exist today in priority mHealth areas. In this report, the value chain¹ is defined as the sequence of transactions that bring a product from its raw inputs to the final consumer. Each member of a given value chain has a unique perception of the costs (or the “give”) and the benefits (or the “get”). In order to achieve long-term financial sustainability, the balance for each member must be tilted in favor of the benefits. The fundamental conclusion from the various value chain analyses contained in this report is that to achieve financial sustainability implementers must successfully transition from operational dependence on *funding* to reliance on *economic buyers* (i.e., “payers” or “purchasers”). This requires organizations and individuals that are motivated to purchase the mHealth product or service and value chains that are designed to include members that

¹The value chain concept was first introduced by Michael Porter in 1980. Since 2001, Porter has been focused on research related to health service delivery. Whereas the value chain analysis in this *Sustainable Financing for Mobile Health (mHealth)* report focuses on stakeholders at the implementation level, Porter’s efforts have focused on creating care delivery value chains for specific medical conditions.

have incentives to remain part of the delivery process. Importantly, achieving financial sustainability is not a one-time event. It requires proactive monitoring and rebalancing of the value chain.

As an additional framework for analysis, this report uses the recommendations of the United Nations Commission on Life-Saving Commodities for Women and Children (or the Commodities Commission). The Commodities Commission was created in response to the UN Secretary-General's call to increase access to medicines, devices and supplies that address avoidable causes of death during pregnancy, childbirth and childhood. The Commission's report², published on 26 September 2012, identified 13 essential commodities that have the potential to save the lives of millions of women and children and made 10 recommendations for how to get these commodities to those who need them most. Given the cross-cutting nature of the recommendations and the focus on scale, the mHealth Alliance derived five priority mHealth application categories from the Commodities Commission report, which are further explored in this report. These categories are: 1) Demand & Awareness; 2) Performance & Accountability; 3) Quality Monitoring; 4) Supply Chain Awareness; and 5) Financial Barriers.

After examining these five categories, this report concludes that sustainable financial models are contingent on a deep understanding of ecosystem players, market dynamics, and each value chain members' incentives specific to each application area. In particular:

- Applications that address **Quality Monitoring** or **Supply Chain Awareness** are likely to be attractive to private-sector organizations in addition to public-sector actors. The products and services that fall into these two categories facilitate the free flow and proper use of health-related goods and services, as well as address pain points that have very near-term impact on the ability of health systems and markets to function effectively. Improving communication between health care providers, identifying counterfeit drugs and preventing stock-outs of needed medications not only have a tangible impact on health outcomes, but they also present opportunities for private-sector players like pharmaceutical companies to increase and diversify revenue streams by improving their distribution logistics and the reputation of their products.
- Applications that address **Demand & Awareness** and **Financial Barriers** pertain primarily to the ability of end users to access health services. These categories present an opportunity for public and philanthropic-sector organizations to leverage successful platforms, business models, and services from other sectors to deliver health services and information. For example, applications that leverage gaming or entertainment platforms might allow demand generation applications to reach populations more cheaply, while services tied to mobile money platforms could facilitate the payment of services by end users. Donors and funders

²UN Commission on Life Saving Commodities for Women and Girls, Commissioner's Report (September 2012)
<http://www.everywomaneverychild.org/resources/un-commission-on-life-saving-commodities>

may be apt to participate in projects in these categories if their investments yield desired health outcomes, access or behaviors.

- Applications that address **Performance & Accountability** pertain mostly to health workers. Due to the large government role in paying health workers in many low and middle-income countries, governments need to see the value in improving performance if they are going to be incentivized to be an economic buyer of these services. Donors and funders may need to play a role in financing the development and implementation of solutions until that value is recognized.

The various facets of analysis in this report are brought to life through an examination of Nigeria as a use case. Nigeria's national leaders enjoy an active role in the Commodities Commission, and the country's *Saving One Million Lives* program is aimed in part at leveraging mobile technology to improve the availability of lifesaving medicines and supplies. As Nigeria and its partners make a concerted effort to reach ambitious goals in maternal and child health, it can provide a test case for putting into practice the recommendations for each of the five mHealth application areas explored in this report.

Examples of current mHealth projects, as well as the evolution of mHealth in Nigeria, suggest that there are several options for achieving financial sustainability. Some options improve the perceived benefits to value chain members by attracting new buyers through additional services, revenue sharing, monetizing other assets (such as data), or providing better evidence of a solution's value through monitoring and evaluation (M&E). Other options for achieving financial sustainability promote reducing the perceived costs of mHealth products and services by unlocking new sources of revenue or introducing new payment models.

For a value chain analysis to be truly actionable it must be executed in the local context. The analysis requires a deep understanding of the incentive structures and constraints faced by value chain members in situ. This analysis must also be continually refreshed to account for changes in health conditions, market environments and technological improvements that may alter these structures. Regular, ongoing analyses of the “gives” and “gets” for each stakeholder will allow mHealth implementers to adjust the value chain model in order to maintain financial sustainability in the long term.

Definitions

Channel organizations: intermediaries aiding the delivery of goods and services to customers

Commodities Commission: UN Commission on Life-Saving Commodities for Women and Children

Component providers: entities that develop or provide essential component parts of the mHealth solution (e.g., mobile operators, handset makers, application developers and content providers)

Demand & Awareness: an mHealth application category that refers to the widespread dissemination of mobile phone-based messaging to promote demand and utilization of health services and products

Economic buyer: also known as “payers” or “purchasers”, individuals or entities that are willing and able to pay for, or purchase, specific products or services; the economic buyer may or may not be the end user

End user: the individual(s) that need and are intended to be the user(s) of a product or service

Financial barriers: an mHealth application category that refers to the use of mobile phone-based technologies to remove or address financial barriers in accessing health services and products

Financial sustainability: the point at which projects or implementations transition from financial dependence on funders to dependence on economic buyers (i.e., “payers”, “purchasers”)

Freemium: a business model most commonly used for digital goods and services whereby a basic version of the product is provided free of charge, but a premium is charged for advanced features or functionality

Funders: organizations or individuals (i.e., donors or investors) that provide funds to set up or grow programs and organizations

“Get”: the sum of all forms of utility (i.e., benefits or value) received from products or services produced and delivered in the value chain

“Give”: the perceived price of products, services or payments contributed to the value chain

Health workers: individuals that are engaged in actions whose primary intent is to enhance health, including: doctors, nurses, midwives, pharmacists, laboratory technicians and community health workers

Influencers: individuals and entities (e.g., policy-makers, government regulators) that play a critical role in influencing the development, delivery and uptake of mHealth solutions

MNCH: Maternal, Newborn and Child Health

Performance & Accountability: an mHealth application category that refers to the use of mobile phone-based point of care support tools for health workers

Project implementer: the entity, or collection of organizations working in partnership, that develop, initiate and manage an mHealth project

Quality Monitoring: an mHealth application category that refers to mobile phone technologies used to monitor essential commodities to reduce the number of counterfeits on the market

Single point of failure: any part of a system that, if it fails, will stop the entire system from working

Supply Chain Awareness: an mHealth application category that refers to evidence-based mHealth solutions that identify where stock-outs are occurring and improve forecasts

Systems thinking: a process of understanding how the components of an ecosystem influence one another within a whole; a solutions approach where individual problems are viewed as parts of an interconnected system

Value added services (VAS): a term commonly used in the telecommunications industry to refer to all non-core services

Value chain: the sequence of transactions that bring a product from its raw inputs to the final consumer or end user

Value chain analysis: a framework for understanding the relationship between entities in a particular industry; an examination of the overall performance or governance of a value chain and identifying the conditions under which it would better perform

Introduction

In less than a few decades, mobile phones have become a vital, practical tool in the hands of millions of new users in low and-middle income countries. In the area of mobile health, or mHealth, the past few years have witnessed the spread of innovative applications and solutions that have demonstrated the potential to overcome some of the biggest problems in global health, from the shortage of trained health personnel to persistent stock outs of medicines and vaccines. Yet, the attention devoted to mHealth in the media and in the global health community belies the fact that mobile solutions receive a tiny fraction of health funding, typically in the form of short-term grant funding, a situation that has impeded their ability to reach the level of scale at which meaningful impact on health outcomes can be fully realized. While this state of affairs can be partially attributed to the relative newness of mHealth as a field, decision makers in global health are increasingly in agreement that more robust, sustainable financing models are needed if mHealth is to turn promise into reality.

The mHealth Alliance champions the use of mobile technologies to improve health throughout the world. To accomplish this, the mHealth Alliance facilitates the sharing of tools, knowledge, experience and lessons learned, as well as advocates for more and better quality research and evaluation. The mHealth Alliance also builds capacity throughout the ecosystem, promotes sustainable business models, and supports systems integration goals by advocating for standardization and interoperability of mHealth platforms.

The UN Commission on Life-Saving Commodities for Women and Children (Commodities Commission) aims to increase access to life-saving medicines and health supplies for the world's most vulnerable people. As part of the *Every Woman Every Child* movement and efforts to meet the health-related millennium development goals (MDGs), the Commission promotes efforts to reduce barriers that block access to essential health commodities. The Commodities Commission recently released the UN Commission on Life-Saving Commodities for Women and Children report, which indicates that mHealth has a significant role to play in increasing access and demand to quality care and essential commodities.

A brief note about methodology

The findings and case studies within this report are based on three sources of data: resident knowledge, in-depth interviews and third-party secondary data. Seventeen in-depth interviews were conducted with leaders of non-profit and philanthropic organizations, executives in the mobile telecommunications and pharmaceutical industries, and key stakeholders in Nigeria.

The Commodities Commission report provides a good use case for this *Sustainable Financing for Mobile Health (mHealth)* report, as it addresses a cross-sector stakeholder audience, the continuum of care for maternal and child health in multiple countries, and is oriented for scale. As such, the mHealth Alliance determined that 5 of the 10 recommendations identified in the Commodities Commission report are addressable by mobile solutions. Fit within the mHealth applications

taxonomy, the five categories of opportunity are: 1) Demand & Awareness; 2) Performance & Accountability; 3) Quality Monitoring; 4) Supply Chain Awareness; and 5) Financial Barriers.

There are a number of technological, regulatory and organizational challenges that have slowed the march to scale, but the lack of viable financial models that would allow innovative programs or implementations to reach national or regional scale has been consistently cited as one of the biggest barriers. The vast majority of mHealth implementations have cost and revenue structures that would be unsustainable if they were to expand beyond a pilot stage, as well as rely too heavily on short-term, grant-based funding.

This *Sustainable Financing for Mobile Health (mHealth)* report focuses on the use of mobile technologies to improve health care; it is *not* an exhaustive list of projects and potential applications of mHealth solutions. Rather, it is an assessment of how mHealth products and services in a specific set of application areas can be financed sustainably. It offers practical guidance for project managers and donors who see the real (or potential) value of an mHealth solution, but are struggling to keep it alive. New mHealth products and services face many challenges that can lead to failure; they can be too complicated, incompatible with other systems, under-funded, unsupported by a key government agency, or lacking a corporate champion that is willing to fund an expansion from a small pilot project to a national or regional service. Fortunately, there are many ways to help a new mHealth solution thrive. This report provides a clear view of best practices and strategies for financial models of mHealth in low and middle-income countries and analyzes the actual or potential use of mHealth with respect to the Commodities Commission recommendations.

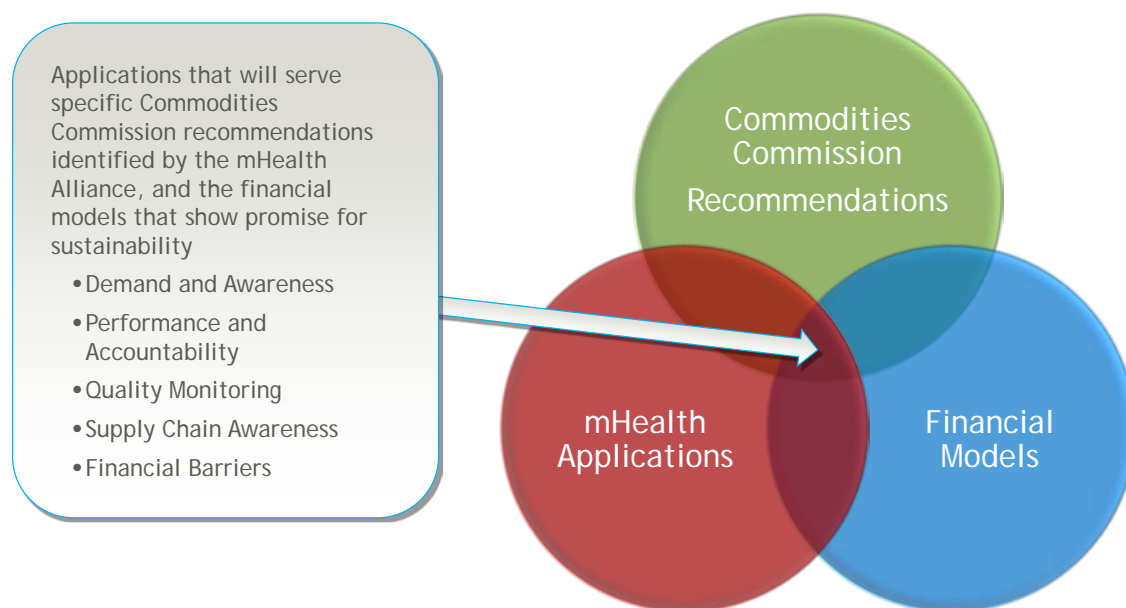
Section 1 of the report explores the definition of financial sustainability in the context of a value chain analysis, at the stakeholder or implementation level. Section 2 defines critical success and risk factors for achieving financial sustainability and scale. Section 3 investigates sustainable financing case studies for each of the five mHealth application categories identified. Given the pioneering role that the Nigerian Ministry of Health has played in both the work of the Commodities Commission and the use of mobile phone-based technologies to improve health outcomes, Section 4 explores Nigeria as a use case. Section 5 builds on the cases explored to detail strategies for implementers that are seeking to attain financial sustainability. The Conclusion summarizes actionable recommendations from the report for implementers, funders and various economic buyers through the lens of the solution development lifecycle.

SECTION 1: Financial Sustainability and Value Chain Analysis

At present, the vast majority of mHealth implementers in low and middle-income countries are dependent on short-term, grant-based funding to develop their applications, launch their activities and continue to operate. This model of financing is typically viewed as unsustainable because of the lack of certainty that funding will be renewed when the current grant cycle is over, and because the amount of funds committed is usually designed to allow a project to operate in its pilot phase, not in a fully scaled state. All too often, mHealth implementations – even those showing positive changes in behaviors or health outcomes – do not survive because of their dependence on this form of financing.

This *Sustainable Financing for Mobile Health (mHealth)* report provides a clear view of the options and opportunities for strengthening and improving financial models of mHealth in low and middle-income countries. Through an analysis of the actual or potential use of mHealth with respect to Commodities Commission recommendations, and in the context of Nigeria, the report identifies and describes financial models and frameworks that may advance the financial sustainability of mHealth activities. Figure A provides a graphical representation of the focus area of analysis that is documented in this report.

Figure A: Area of Analysis



The framework for analysis in this report is the *value chain* – the full range of activities by individuals and organizations to bring a product from its conception to its end use. For each of the five application categories described by the Commodities Commission, stakeholders and their associated set of contributions (“gives”) and benefits (“gets”) are identified and mapped across the value chain during the development, delivery and use of mHealth products and services. These stakeholders

include: end users, implementers, funders, influencers, economic buyers, component providers and channel organizations.

The **end user** is defined as the individual(s) that need and are intended to use the mHealth service. For example, end users may include individuals, households and health workers. mHealth value chains often have a **project implementer** who develops, initiates and manages a project. This project manager can be a single entity or a collection of organizations working in partnership.

Key Link in the Value Chain: The Economic Buyer

- Funders pay to set up mHealth operations
- Economic buyers pay for, or purchase, the actual mHealth products or services
- While mHealth projects usually involve funders at the formative or early stages of service development, long-term financial sustainability requires viable economic buyers

Influencers are not directly involved in the delivery of mHealth but may play a critical role in influencing the development, delivery or uptake of mHealth solutions. For instance, regulators shape the rules that mHealth providers must follow, affecting the price of a mobile service or the possible uses of health data. Policy makers can promote or stifle the delivery of mHealth through budgeting and official support.

Component providers develop or provide essential component parts of the mHealth solution. This can include mobile operators, handset makers, application developers and content providers, among others. **Channel organizations** are intermediaries aiding the delivery of goods and services to customers. In the M-PESA model in Kenya, for example, a network of 40,000 agents form the channel that registers customers and handles cash deposits and withdrawals for the end user.

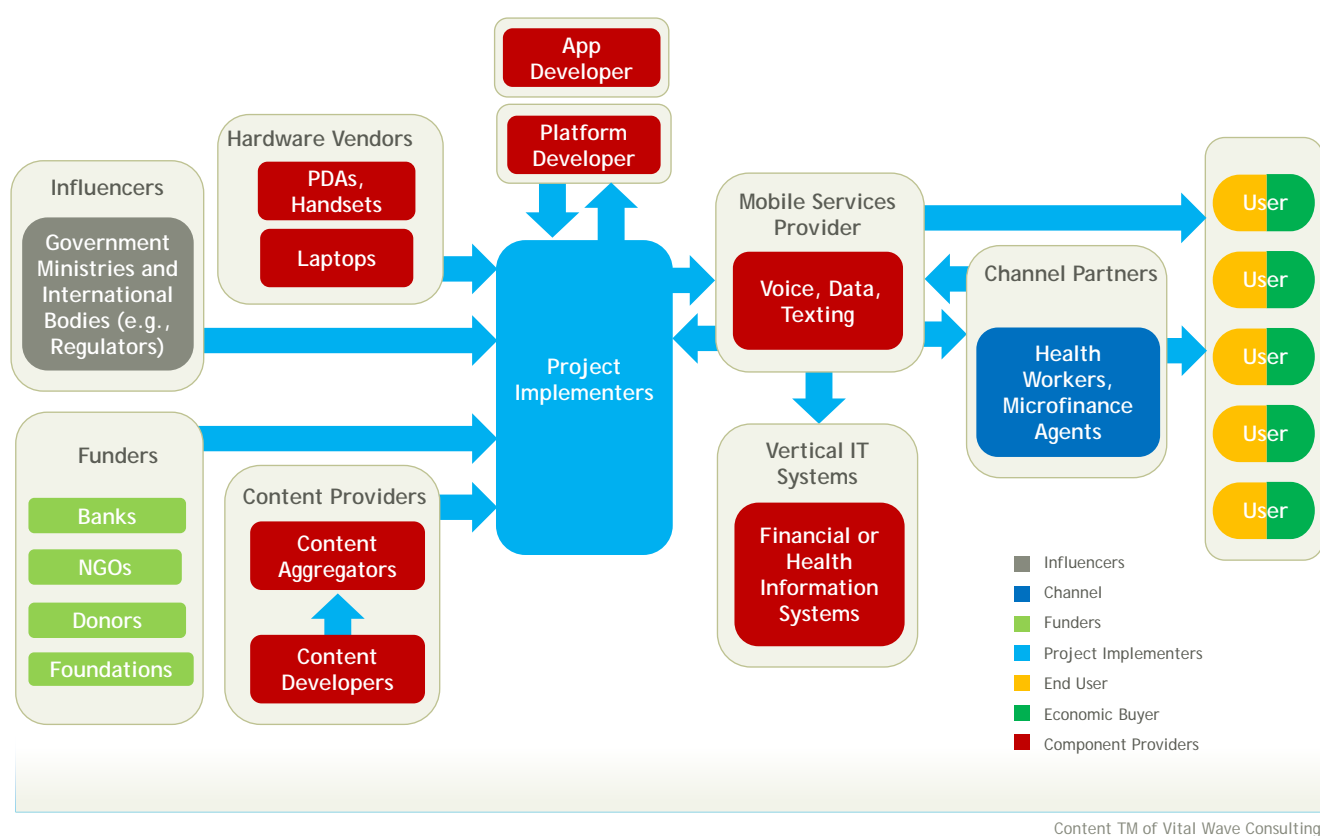
In considering the financial sustainability of mHealth solutions, it is important to consider the activities of both funders and economic buyers. **Funders** pay to set up mHealth operations. **Economic buyers** (who can also be thought of as “payers” or “purchasers”) are individuals and entities that have the willingness and ability to pay for the actual products and services delivered through the mHealth application, usually because of the potential for the application to improve health outcomes. While mHealth projects usually involve donors or funders at the formative or early stages of service development, long-term financial sustainability requires viable economic buyers.

It is also important to distinguish between economic buyers and end users. For instance, Voxiva sells its TRACnet service to the government of Rwanda, the economic buyer, who in turn provides services to health care workers, the end users. In some cases, the economic buyer is also the end user. For instance, in Switchboard’s closed calling network for health workers, the workers play both functional roles.

Playing more than one role across the broader value chain is also fairly common for companies, governments or non-governmental organizations (NGOs). Figure B, below, illustrates the different

type of public, non-profit, for-profit and commercial entities that may be involved in the delivery of mHealth initiatives and the roles that they typically play in the value chain.

Figure B: mServices Value Chain™



Long-term financial sustainability rests on the balance of stakeholders’ “gives” and “gets” across the value chain. The “get” is the sum of all forms of utility (benefits or value) received from products or services produced and delivered, and includes financial, operational, social or political returns. The “give” is the perceived price of products, services or payments contributed to the value chain. The perception of actual value of the stakeholders’ contribution will depend on factors such as the relative cost of the contribution to the stakeholder, the payment terms and the initial outlay vs. total cost of ownership. The “gets” most often associated with mHealth implementations, especially for economic buyers and end users, are improvements in health outcomes or increased efficiency and cost savings in the delivery of health services. Typical “gives” include outright financing or financial contributions, the cost of component parts or services (including “in kind” contributions), the provision of technical or managerial support and training, and costs associated with partnerships or relationship development. The “give” also includes foregoing the next-best opportunity. When organizations commit resources to a project they forego investing these resources in another project or opportunity.

$$\text{Get} - \text{Give} = \text{Comparative Net Utility}$$

(aka Value Proposition)

Net value compared to all substitutes, direct competitors, and the option to do nothing.

Impacted by:

- Level of country development
- Overall budget and resources for health
- Perceived scarcity of alternatives
- Cultural values

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The field of mHealth is relatively new and the application of mobile devices to health care has expanded so rapidly that it has been difficult to accurately measure the resulting social returns and cost savings. What is clear, however, is that many organizations that invest in mHealth applications have done so because of the potential to increase access to health services and improve efficiencies due to the rapid, wide-ranging spread of mobile networks. For many funders and economic buyers, this has tipped the balance of “gives” and “gets” – increasing the value and benefits of a solution while reducing the perceived price of a solution.

This introduces the concept of *comparative net utility*. This is the “get” minus the “give,” factoring in the perceived value and price of the contributions and benefits of engaging in mHealth value chains.

The comparative net utility – also known as the value proposition – is the net value compared to all substitutes, direct competitors and the option to do nothing. It is the various forms of value that a product or service provides the stakeholders and is impacted by the level of country development, the overall budget and resources for health, and the perceived scarcity of alternatives.

Entrepreneurs and innovators determine and promote the value proposition of their offering. But they do not always ask themselves if the net value of their offering is higher or better than the net value of competitive options (or of doing nothing). The fact that a given mHealth application has a compelling value proposition in the market is important, but financial sustainability will require that it has the right and highest value proposition (or net utility) for *each player* in the value chain.






Improving health outcomes is a primary motivating factor many value chain players and is one reason that building an evidence base for mHealth is such an area of focus. However, comparatively little attention has been paid to the other “gets” among players in the value chain. This scarcity of analysis contributes to the lack of balanced and sustainable financial models.

If, within a value chain, all players believe that they get more value out of the exchange than they put in, and what they get is greater than what they could get from investing their resources elsewhere,

then the financial model is by definition sustainable – justification for continued participation and investment exists. Problems arise when the “give” is bigger than the “get” for at least some stakeholders in the value chain, or when stakeholders do not understand or are unable to identify the true value of their “give” and “get.”

Figure C, below, identifies the common value propositions for public-sector players, non-profit players, for-profit players, health workers, patients and their families, while Figure D summarizes the “gives” and “gets” across the mHealth value chain.

Figure C: Common mHealth Value Propositions TM

Stakeholder					
	Public	Non-Profit	For-Profit	Health Worker	Individuals & HH
Comparative Net Utility	<ul style="list-style-type: none"> Improved health outcomes (e.g., longer life, higher quality of life) Efficiency gains and cost savings for health delivery Higher productivity levels for the overall economy 	<ul style="list-style-type: none"> Improved health outcomes Efficiency gains and cost savings in achieving mission Increased donations/sales/revenues 	<ul style="list-style-type: none"> Increased sales/revenues Efficiency gains and cost savings in delivering products and services Improved health outcomes Note: Improved branding/PR is not a driver for long-term participation 	<ul style="list-style-type: none"> Improved health outcomes Efficiency gains and cost savings for health delivery Reputational benefits (i.e., standing in community) 	<ul style="list-style-type: none"> Improved health outcomes Efficiency gains and cost savings in seeking health care Reputational benefits (i.e., standing in community) Higher productivity levels for household

Content TM of Vital Wave Consulting

Figure D: “Gives” and “Gets” Across the Value Chain

	“Get” (benefits or value received)	“Give” (contributions or value provided)
Definition	Sum of all forms of utility (benefits or value) received from products or services produced and delivered in the value chain.	Perceived price of products, services or payments contributed to the value chain, considering: <ul style="list-style-type: none"> Relative cost (e.g., % of total budget), Payment terms (impact on cash flow), Initial outlay vs. Total cost of ownership
Examples	Social returns <ul style="list-style-type: none"> Health outcomes Social value or impact Financial returns <ul style="list-style-type: none"> Direct payments: one-time or ongoing Service revenues Operational returns <ul style="list-style-type: none"> Operational efficiency Cost savings Productivity levels Marketing/Political returns <ul style="list-style-type: none"> PR/brand equity Political equity Market intelligence 	Component parts provision <ul style="list-style-type: none"> Hardware Software Content Infrastructure Value-added service provision <ul style="list-style-type: none"> Mobile services Advertising Capacity or technical support provision <ul style="list-style-type: none"> Capacity building Technical support Partnership/relationship development Financing provision <ul style="list-style-type: none"> Short or fixed-term Perpetual (or beyond fixed period) Foregoing next-best alternative

The importance of health outcomes as a “get” for many players in the value chain emerges when looking at these summaries. Indeed, improving health outcomes is a primary motivating factor for value chain players including economic buyers, funders and end users. It is one of the principal reasons that evidence supporting the impact of mHealth on health outcomes is such an area of focus among promoters of mHealth (and speaks to the inability to identify the true value of the “get” discussed above). However, comparatively little attention has been paid to the other “gets” among players in the value chain, and the resulting scarcity of analysis contributes to the lack of balanced and sustainable financial models.

SECTION 2: Success Factors for mHealth Financial Sustainability and Scale

Long-term financial sustainability is not only about finding the right model; it is also about establishing a continual process of balancing the value chain, the “gives” and the “gets.” Regardless of whether value chain players’ incentives are commercial or social – or a mix of the two – the project implementer needs to understand (and continually update) what those incentives are and how much each value chain member needs to “give” and “get” for the project to function sustainably.

Below are critical success factors for ensuring the scale and financial sustainability of mHealth applications.

“If you’re being innovative, don’t be any more innovative than you have to be – especially when it comes to money. Changing behavior is extremely difficult and changing the flow of money is even harder. Don’t reinvent a whole business ecosystem, especially if you can fit into an existing one.”

— Chris Bergstrom
Chief Strategy & Commercial
Officer, WellDoc






1. **Know the Stakeholders:** The characteristics of a value chain partner can influence how (and when) they engage in mHealth solutions and have a strong influence on financial sustainability. These characteristics include:
 - **Organization Size** – Larger organizations are more likely to engage when implementations begin to realize economies of scale.
 - **Sector Membership** – For-profit organizations are most likely to participate in mHealth value chains that can generate incremental sales or revenues. They will need business cases to justify those investments and financial return on investment (ROI) analyses to sustain them. Non-profits and philanthropic organizations will be motivated to engage in projects that help them achieve their mission and will require M&E that shows social or operational returns (including cost-effectiveness calculations) to continue their investments.
 - **International vs. Local** – Organizations with local presence are better suited to adapting models to local conditions and providing implementation support such as training and capacity building. International organizations are better suited to providing value-chain components, such as software or platform development, that are not location-specific.
 - **Repeat vs. New Customer** – New customers will need business cases or a projection of outcomes to warrant initial investments. Repeat customers will need evidence of demonstrated returns – financial, social or operational – to sustain investments.
 - **Short- vs. Long-term Time Horizon** – Organizations that have short time-to-return horizons, such as for-profits, will need to see ROI within a shorter time frame and therefore are likelier to participate when projects have reached scale, whereas organizations with


longer time horizons – such as donors – are better able to participate in early or start-up stages when time-to-return may be a few years out.

2. **Ensure the value proposition for all stakeholders:** Understanding each player's incentives along the value chain is a necessary part of engaging them. Implementers and their partners need to consider not just the player's incentives, but also their strategies. For instance, both public and non-profit sectors need impact assessments, but they pursue them differently. In addition, attentiveness to engaging governments and Mobile Network Operators (MNOs) in critical parts of the value chain is essential. In thinking of the value chain as a system, the national government is a single point of failure in any model, because there are no available substitutes if the government declines to grant approvals or participate. If the government decides not to engage, in most implementations the entire system will stop working. MNOs, for their part, typically need justification that participation in a project will have a positive, tangible and long-term impact on their revenues, market share or public image. Relying on MNOs without providing these types of incentives may present a long-term risk factor to any model that aims to achieve national-level scale.
3. **Plan for a long-term economic buyer:** Anticipating where money is going to come from, early on and later in the solution lifespan, is also a prerequisite for sustainability. Economic buyers will sustain the operation financially, but they need to have a strong comparative net utility when compared to the next-best alternative. For example, Sproxil, profiled below, aggregates their SMS drug verification service across multiple economic buyers – in this case, pharmaceutical clients – making it cheaper for pharmaceutical companies than the alternative (i.e., doing it themselves).

Figure E, shows the potential attractiveness of mHealth applications to different economic buyers. Sustainable revenue will come from economic buyers with the highest comparative net utility. Performance & Accountability, Quality Monitoring and Supply Chain Awareness offer the highest direct or near-direct utility to potential economic buyers. Economic buyer incentives to purchase will ultimately depend on the specific business model, the value being provided and the local market needs and conditions. Donors may be more inclined to provide longer-term support for projects where commercial forces are less likely to take hold, and the attractiveness to MNOs will vary significantly depending on the specifics of the model.

Figure E: Prospects for Stakeholders' Comparative Net Utility in mHealth Application Areas™

	 Public	 Non-Profit	 For-Profit	 Health Workers	 Individuals & Households
Demand & Awareness	If mHealth results in improved health outcomes	May be willing to pay if mHealth yields better outcomes than next-best alternative	Non-pharma advertising to consumers; Pharma outreach to health worker. Will need scale to warrant continued investments	May pay for education or product info that results in better care or increased efficiency or time savings	May pay for education or product info that results in better care or increased efficiency or time savings
Performance & Accountability	If mHealth results in improved operational efficiency	Donor community and NGOs are not likely to become a long-term economic buyer.	Pharma interested in getting closer to target audience (health providers).	Affluent health workers pay to be part of closed network via non-network calls to family and friends (Switchboard model)	Not target audience or stakeholder that directly benefits from category
Quality Monitoring	May be willing to pay if it can be shown that anti-counterfeiting services improve health outcomes		Pharma mfrs and distributors have high pain point for counterfeit drugs and gain revenues from anti-counterfeiting services	Private clinics or pharmacies may be willing to pay for drug quality assurance	Affluent may be willing to pay to authenticate drugs and get peace of mind
Supply Chain Awareness	Willing to pay where stock-out avoidance will improve healthcare delivery in critical areas		Willing to pay where stock-out avoidance will result in increased sales	Private clinics may be willing to pay to reduce stock-outs and improve quality of care	Not target audience or stakeholder that directly benefits from category
Financial Barriers	May be willing to pay if health outcomes are improved through service provision	May be willing to pay if mHealth yields better outcomes than next-best alternative	Insurance providers are a potential participant, but need financial returns at scale to justify continued participation	Private clinics could benefit from higher traffic and improve operational efficiency	The poorest to whom these services are directed have need, but nominal ability to pay for service. Costs to stakeholder should be offset through alternative payers and models



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4. **Localize the business model:** When examining the “give” and “get”, organizations have to look at the environment, specific players and context. For example, a financial model that works in a small, densely-populated country such as Rwanda may not necessarily work in a large and extremely diverse nation like Nigeria. The value chain players and assets that form the foundation of a specific mHealth business model will need to be in place when replicating that model in another country.

“I feel strongly that these solutions should be designed locally. It’s hard to ‘design from a distance’ or ‘lift and drop.’”

— Lisa Felton
Global Governance & Strategy Manager,
Vodafone (SMS for Life)

5. **Plan for capacity building, including monitoring and evaluation (M&E):** Ensuring that there is a plan in place for capacity building will help to overcome the lack of financial, human, time and other resources that limit involvement in mHealth. Ongoing M&E is an important tool to support this effort. Communication of impact, cost savings, efficiency gains and ROI is essential to enlisting economic-buyer support. For-profit stakeholders, including MNOs, need to see a sound business case with a credible analysis on their ROI. Public and non-profit stakeholders must see a compelling impact assessment detailing the operational efficiencies and improvement in health outcomes achieved.

6. **Keep it simple:** Simpler value chain models tend to have better prospects for success. Where multiple players are involved, keeping contributions within core competencies reduces the potential for conflicts of interest.

Lessons Learned from MAMA Bangladesh

MAMA's Aponjon service, launched in 2011 in Bangladesh, provides expectant and new mothers with voice and text messages customized to the stage of pregnancy or motherhood. MAMA has embraced an economic approach and process to building a sustainable financial model. Their process breaks down into five key points:

1. Define the business model, value proposition and business structure
2. Identify demand-side and supply-side factors that influence the model
3. Estimate costs and revenues; be creative identifying alternative sources of revenue
4. Identify challenges and strategies to overcome them
5. Identify the right balance between protecting your business model and fostering partnerships

Through this process MAMA has determined an affordable service cost for mothers and identified alternative revenue streams to make up the difference to reach the breakeven price. These revenue sources include message ads and a mix of philanthropic sources: Development Agency support, Global CSR Support, Local CSR Support and Gifts (Sponsorship) for Mothers.

7. **Understand the particular funding needs of mHealth application types:** mHealth interventions have varying needs for funding depending on the type of application and the evolutionary stage of the intervention. Generally, all mHealth applications will require “seed” funding to support the pilot phase of an intervention and “gap” funding to take the intervention to national-level “scale”. In most cases, “seed” and “gap” funding will be required from donors, whereas “scale” funding will often be provided by – in part or in whole – the economic buyer. For the application categories of Quality Monitoring and Supply Chain Awareness, the value proposition is often quite strong for for-profit entities and they are likely to engage as the economic buyer. In Demand & Awareness and Financial Barriers, private-sector actors and end users may become involved as buyers if health services can take advantage of already successful business models or service platforms, although funding for some components of these programs may need initial or ongoing donor funding. For interventions that address Performance & Accountability, the value proposition is less strong for for-profit entities, and governments or funders may convert to become economic buyers to sustain ongoing interventions with long-term financing commitments (if the value proposition or ROI is strong enough).

SECTION 3: Sustainable Financing Case Studies

This section presents five case studies to examine in-depth each of the mHealth application areas correlated with the Commodities Commission recommendations. Each case is viewed through the lens of the value chain assessment to illustrate best practices for financial sustainability. Figure F provides definitions for the application categories and briefly describes each case.

Figure F: mHealth Application Categories and Case Studies

mHealth Application Categories	Description	Case Studies
Demand & Awareness	Widespread dissemination of mobile phone based messaging that promotes demand and utilization of health services and products.	Village Reach <ul style="list-style-type: none"> Financial Model: Donor and MNO supported; seeking to evolve Location: Malawi
Performance & Accountability	The use of mobile phone based point of care support tools for health workers (e.g., Checklist and protocols)	Switchboard <ul style="list-style-type: none"> Financial Model: Service revenues from a closed network of health workers Location: Liberia, Ghana, Tanzania
Quality Monitoring	Mobile phone technologies used to monitor essential commodities to cut down the number of counterfeits on the market (e.g., mobile based bar code system)	Sproxil <ul style="list-style-type: none"> Financial Model: Service (drug authenticity, market intelligence, advisory consulting) and ad revenues Location: India, Nigeria, E Africa, Ghana
Supply Chain Awareness	Evidence based mHealth solutions that identify where stock-outs are occurring and improve forecasts. (e.g., Supply chain management)	SMS for Life <ul style="list-style-type: none"> Financial Model: Government pays service fees to system provider Location: plans to scale in Kenya, Ghana, Cameroon
Financial Barriers	Use of mobile phone based technologies to remove and/or address financial barriers	Changamka <ul style="list-style-type: none"> Financial Model: End users or donors pay for health savings and insurance services Location: Kenya

DEMAND & AWARENESS CASE STUDY: VillageReach

Demand & Awareness: Free MNCH Hotline and Mobile Tips and Reminders

VillageReach offers women in Malawi a free Maternal, Newborn and Child Health (MNCH) Hotline and Mobile Tips and Reminders, which fall under the “Demand & Awareness” category. The hotline, known in the local language as *Chipatala cha pa Foni* (CCPF), or health center by phone, provides direct access to information, advice and health promotion regarding maternal, neonatal and child health issues to callers who may be out of reach of the health system. Hotline callers can also enroll in a SMS-based tips and reminders service to receive personalized health education messages regarding pregnancy or child health. VillageReach’s vision is to attract both private and non-profit economic buyers for long-term sustainability. Today this model relies on donor and MNO support, and it seeks to extend its services (e.g., emergency transportation) to bring in additional economic buyers. The project is currently being piloted through Concern Worldwide’s Innovations in Maternal, Newborn and Child Health initiative, and has received funding to begin scaling up nationally.

Critical success factors for VillageReach include:

- *Diversify service to attract new economic buyers:* VillageReach is considering enticing telecommunications companies, transport providers, and enterprises looking to reach the community with products or services (and who have the ability to pay) by making the CCPF hotline service more relevant to them.
- *M&E in order to increase the “get”:* VillageReach also sees potential to entice community groups and the Ministry of Health to pay for services by documenting the comparative cost-effectiveness of the service. By documenting cost gains with the implementation of CCPF such as improvements in health outcomes, time saved and transport costs averted, the Ministry of Health and community-based organizations could become more willing to support aspects of the service.
- *Careful government engagement:* The fact that VillageReach is not relying on the government as sole economic buyer is positive because it mitigates a potential single point of failure. The government is providing trained health workers, which could be a risk factor if the government discontinues this support.
- *Careful MNO engagement:* The MNO should have a strong commercial incentive if it is to be a critical element of the value chain. MNOs are a controlling player in mHealth value chains. They often require demonstrations of revenue enhancement

“We use the term ‘Valley of Death’ to describe the time in between when innovation pilot funding dies off and longer-term financing becomes available. In our experience it is a critical window to build on the momentum of early successes, even before formal M&E results come in, in order to scale.”

— Emily Bancroft,
Director Health Systems Group, VillageReach

(or controlling shares). If they do not, their long-term participation in the value chain is at risk.

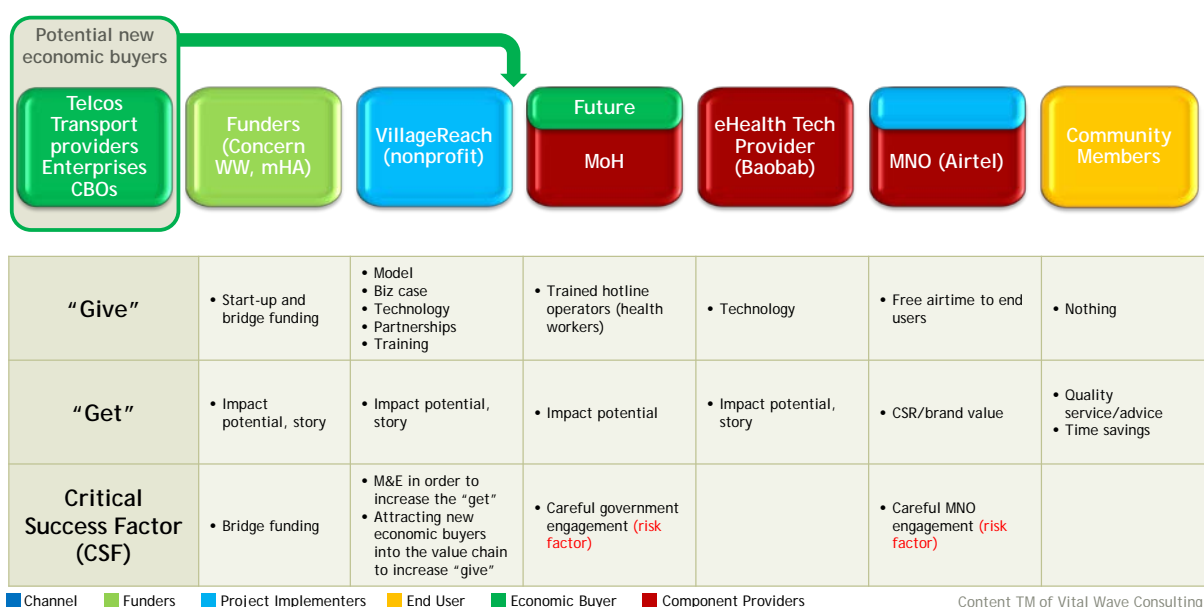
- *Bridge funding is key:* VillageReach is appropriately concerned about the gap between donor funding and the transition to economic buyer participation – a time when many mHealth projects fail.

Success Indications

- In Malawi, 8,251 calls have been received by CCPF between the launch in July 2011 and November 2012 (~500 calls/month).
- A multi-year implementation plan and support (including M&E) is in place.
- The service has high rates of client satisfaction. 77% of users report changing behaviors around pregnancy and childbirth, such as maternal nutrition and complementary feeding, and over 70% of subscribers report learning something new from the messages.

Figure F, below, provides a graphical overview of the VillageReach value chain analysis.

Figure F: Value Chain Analysis – VillageReach™



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PERFORMANCE & ACCOUNTABILITY CASE STUDY: Switchboard

Performance & Accountability: Free Calling Networks for Health Workers

Switchboard is a Free Calling Network for Health Workers and therefore falls into the “Performance & Accountability” category. Switchboard has networked all of the doctors in Ghana and Liberia into closed user groups and is building the largest network of health workers in Tanzania. Switchboard’s financing model has been supported by initial, short-term funding from donors, but the organization is moving towards commercial sustainability through private-sector and end-user revenues.

- *Simple model with well-distributed “gives” and “gets”:* Switchboard has a simple value chain model with relatively few players. Each player has an incentive to participate.
- *Careful MNO engagement:* There is a strong commercial incentive for the MNO. In this model, health workers are also the economic buyer. As nurses, doctors and community health workers join the closed health worker network and get free calls and texts to other health workers, they also pay service fees for calls to family and friends outside of the network. The MNO therefore benefits from these additional revenues generated, reduced churn rates, and a network that may facilitate the delivery of future services.
- *Capturing a high-value segment:* Switchboard is not going after the masses of patients in the health ecosystem; rather they pursuing a high-value segment that includes doctors and health workers.
- *Economic buyer with comparative net utility:* Health workers and doctors get value (they get free calls and texts with other health workers) and they have the ability to pay.
- *Using data analysis to evaluate financial and social impact:* Switchboard uses big data analytics to help build its business case. For instance, they know the value of every doctor to the MNO.

“[Designing for scale] is the most central piece of our mission. You have to design for data collection and analysis up front. We structure our initial agreements with MNOs and the Ministries of Health to include provisions for data collection and analysis. It is a lot more difficult to get permission once things are underway and it is critical to our own internal monitoring and evaluation efforts to have access to this information.”

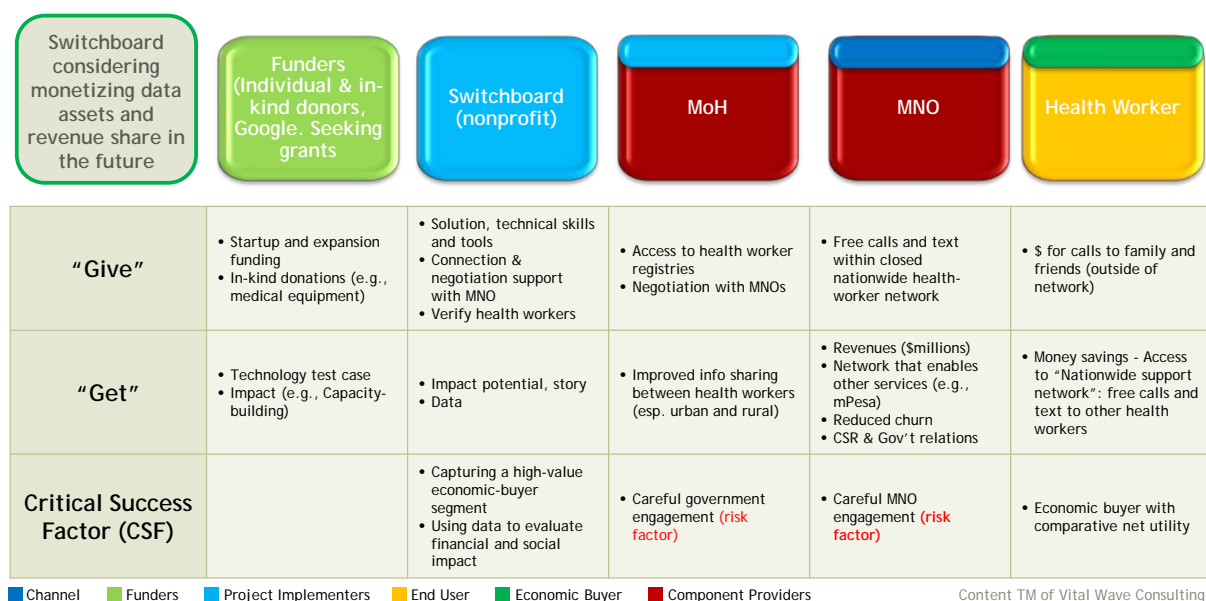
— Eric Woods
CEO of Switchboard

Success Indications

- In Ghana and Liberia: 4 million calls have been made between health workers since 2008. Separately, those same health workers have made paid calls to friends and family who are not practitioners that generated \$1.5 million in revenue.
- In Tanzania, Switchboard will help create the largest network of health workers in low and middle-income countries with 9,000 practitioners.

Figure G, below, provides a graphical overview of the Switchboard value chain analysis.

Figure G: Value Chain Analysis – Switchboard™



QUALITY MONITORING CASE STUDY: Sproxil

Quality Monitoring: SMS Drug Verification Service

Sproxil is an SMS drug verification service, falling under the “Quality Monitoring” category. Sproxil enables end users to scratch off a one-time-use code on drug packages and text the code to verify the drug’s authenticity. In Sproxil’s model, the economic buyers – pharmaceutical manufacturers and distributors – have a high pain point for counterfeit drugs, and they benefit from supply chain visibility and sales recovery from reduced counterfeits. There is a strong comparative net utility for the economic buyers because Sproxil aggregates across multiple pharmaceutical clients, making the service cheaper than it would be if each company did it themselves. Sproxil is sustained by the revenues generated from its drug authentication services, but the organization is expanding its services to include market intelligence or advisory consulting.

Critical success factors for Sproxil include:

- *Simple model:* Sproxil has less need for complex partnerships or getting players to perform activities outside of core competencies.
- *Engages economic buyer with a high pain point (pharma):* Sproxil engages pharmaceutical firms, which lose significant revenues due to counterfeit drugs and have a willingness and ability to pay for the solution.
- *Comparative net utility for the economic buyer:* Sproxil aggregates across multiple pharmaceutical clients, making it cheaper than the alternative of doing it themselves.
- *Careful government engagement:* In the countries in which Sproxil operates, governments are endorsing the service due to their recognition of the problems posed by counterfeit drugs.
- *Careful MNO engagement:* MNOs do not have to engage outside their core activities, yet they still gain revenues from incremental SMS transmission.
- *Service diversification and flexible model for ongoing sustainability:* The current focus is on anti-counterfeiting, but the organization is moving towards monetizing the data obtained from use of its service.

“In five years I do not want to be talking to you about counterfeit drugs. I want to talk to you about our data.”

— Ashifi Gogo
CEO of Sproxil

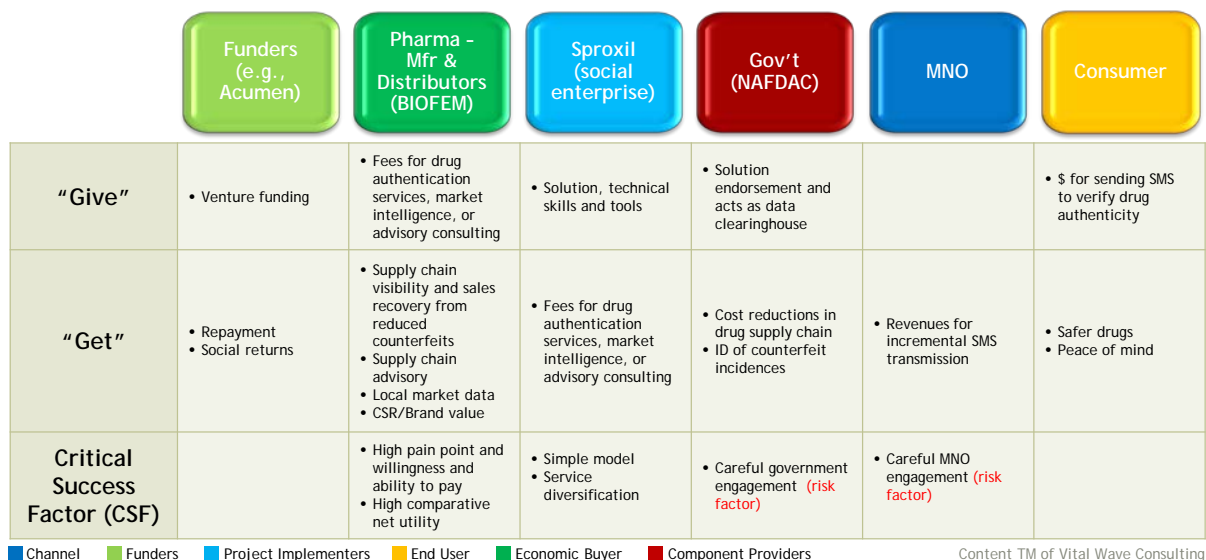
Success Indications

- **Geographic expansion:** Sproxil has a presence in India, Nigeria, East Africa and Ghana.

- Received early-stage equity injection of \$1.8 million from Acumen.
- One distributor saw a ROI of 100% in 3 months.
- Ads increased sales by up to 10% in 3 months.
- Now working with GlaxoSmithKline to protect Ampclox across Africa.

Figure H provides a graphical overview of the Sproxil value chain analysis.

Figure H: Value Chain Analysis – Sproxil™



SUPPLY CHAIN AWARENESS CASE STUDY: SMS for Life

Supply Chain Awareness: Essential Medicine Stock-level Tracking

SMS for Life is a “Supply Chain Awareness” service that employs SMS messaging between the health facilities that dispense anti-malarials (artemisinin-based combination therapies, ACTs and quinine injectable) and district managers who are responsible for medicine availability in their districts to prevent medicine shortfalls or stock-outs. Though private-sector players (e.g., Vodafone, Novartis) are partners, the end goal is to achieve a model driven by government ownership, including funding, at the national level. In the SMS for Life model, governments are the necessary economic buyer. Governments are required stakeholders to provide funding and staff to support the project, and in return receive stock-information that results in better data on drug usage for evaluating health outcomes and forecasting drug use to improve access to essential medicines and avoidance of stock-outs at the point of care. As the program has expanded from Tanzania to other countries, its implementers have recognized the critical nature of government involvement and adapted the scale up model accordingly in new geographies.

Key lessons for SMS for Life include:

- *Economic buyer must commit resources (have willingness and ability to pay):* This model demonstrates the importance of having the economic buyer on board and committed beyond an initial funding period. Despite funding from the development community (e.g., NORAD, Malaria No More) and the private sector (e.g., Novartis, Vodacom, Vodafone), this project must be sustained over the long term by governments (Ministries of Health, National Malaria Control Programs) as the economic buyer. If the government as the system and data owner decides not to participate the entire system will stop working. As a result, best practice dictates the need to secure financial contribution from the government as part of the scale up process.
- *Cross-sector Engagement:* The initial SMS for Life project team was an efficient partnership that brought together requisite skills from a number of different stakeholders – IT and process knowledge from Novartis, a communications expert from Vodafone, a mapping person from Google, and a project manager from IBM. However, government is and will remain the single most important player, which the project cannot proceed without.

“If your system is becoming part of the national health system, you have to involve the government and obtain their commitment. It is important to make sure that they contribute financial resources of their own to scale up.”

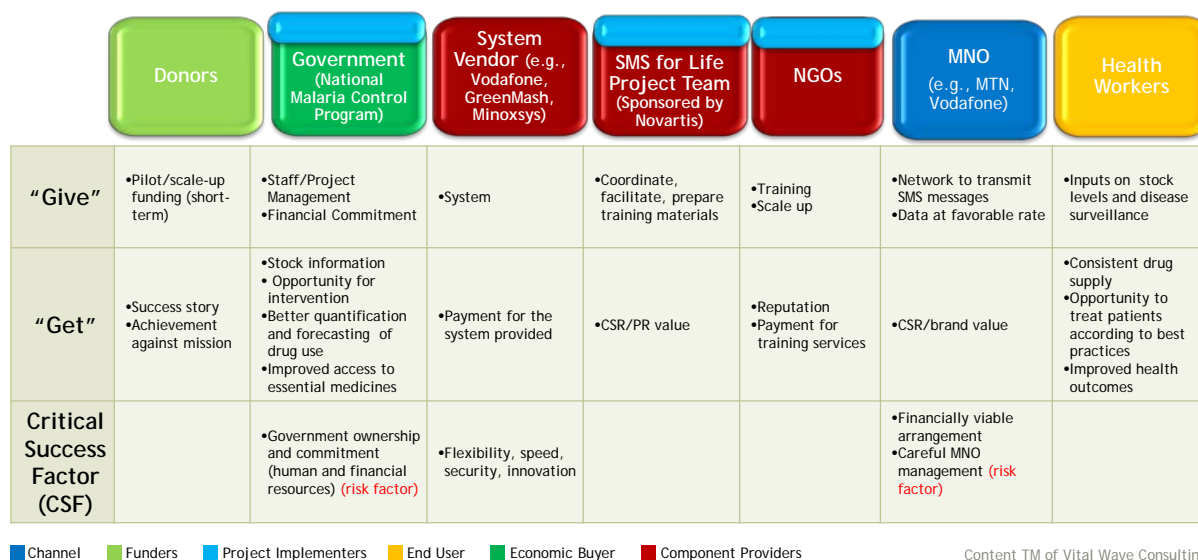
— Rene Ziegler
SMS for Life Project Manager,
Novartis

Success Indications

- The initial six-month pilot program in Tanzania saw stock-outs reduced from 79% to less than 26%; at the beginning of the pilot, 26% of the facilities had no dose form of ACT, and by the end this figure had been cut to less than 1%.
- In Ghana, following a successful pilot in six districts, planning is underway with the Ghana Health Service for a full country scale-up. Financial contribution from the government as an economic buyer is a prerequisite to move forward.
- In Kenya, following another successful pilot, planning is underway with the Division of Malaria Control for a full country scale-up. Financial contribution from the government as an economic buyer is a prerequisite to move forward.
- In Cameroon, planning is also underway for a full country scale up of malaria medicine tracking in addition to collecting patient surveillance data on the use of RDTs. Financial contribution from the government as an economic buyer is a prerequisite to move forward.

Figure I provides a graphical overview of the SMS for Life value chain analysis.

Figure I: Value Chain Analysis – SMS for Life™



FINANCIAL BARRIERS CASE STUDY: Changamka

Financial Barriers: Savings, Voucher and Microinsurance programs

Changamka is a service that makes health care more affordable; it thus fits in the “Financial Barriers” category. The service is evolving to include three components: 1) a savings program for in-patient and out-patient services for maternal health; 2) a voucher program that assists users (poor women) with accessing and using government subsidies for health care; and 3) microinsurance. Changamka intends to be financially sustained through direct and indirect funding sources (via government subsidies for poor women) and end-user revenues.

The Changamka case illustrates how models can be modified to increase net utility across the value chain. In its initial model, the end users were the sole economic buyer, providing savings for outpatient health care. However, Changamka found that the cost of health care is not predictable, adverse selection is a challenge to profitability (i.e., those that opt in are those that need care the most), and that its savings product was not sufficient for in-patient treatments.

As a result, Changamka is expanding the **Health Savings** offering to include in-patient services. The organization also recognized that they needed to offer insurance at scale to overcome adverse selection issues and bring value for the amount of money people were saving. After looking at several models and the challenges to each (lack of understanding, affordability, access), they decided to provide insurance in small pieces. In addition, Changamka now offers **Microinsurance**, promoted on and linked to the M-PESA platform via partnership with Safaricom, which users can purchase up front or over time with their health savings. They also found, after segmenting the market, that there are simply some users who cannot afford to save for their needed care, and these people would benefit from unused government health subsidies. Changamka now offers a **Voucher Program** which provides a channel for governments to deliver subsidies to those who need them. Expanding offerings and changing roles for value chain players has altered the balance of the gives and gets.

“We had to involve Safaricom because they have the largest database of subscribers and they have mobile money [mobile money + mobile health = mobile insurance] and they are also in pain from churn rates and they need value added services (VAS) – so we thought this was a way to give them the stickiness they require.”

— Sam Agutu
CEO of Changamka

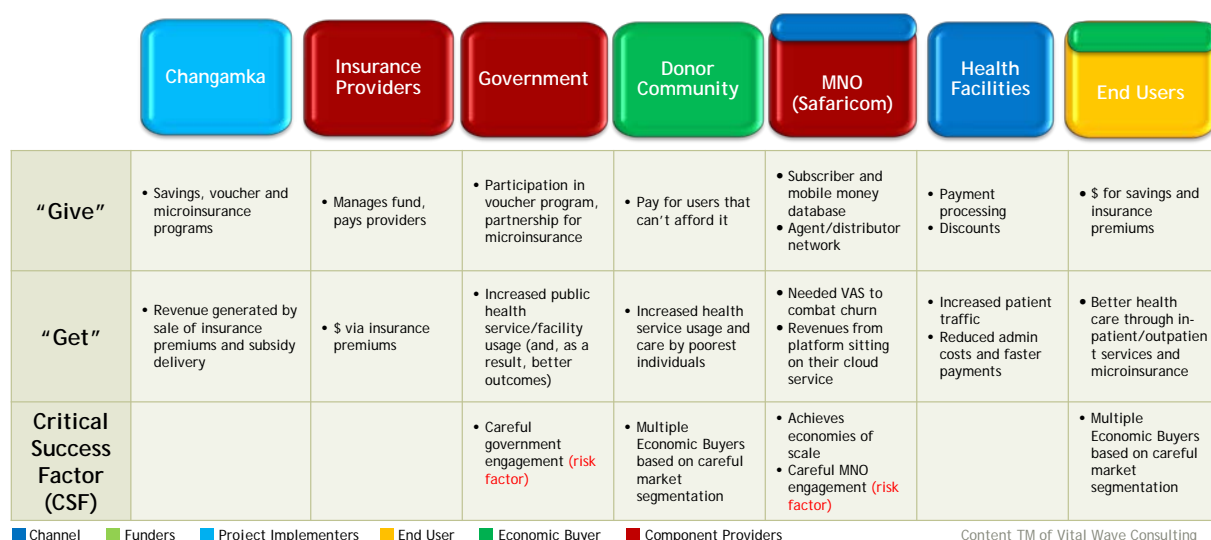
Critical Success Factors for Changamka include:

- *Service diversification and flexible model for ongoing sustainability:* Insurance companies, whose role previously was to manage the funds and pay providers, now not only manage the funds, but they also manage savings. As soon as health savings reach a threshold, they are converted to premiums, bringing income for the insurance company.

- *Multiple economic buyers*: Segmenting users in order to shift the economic buyer from users to donors, in cases where users do not have the ability to pay. Where there is a weaker commercial value proposition Changamka is using mobile technology to replace paper vouchers. Community Health Workers identify eligible women and assign them a registration number by phone. Women can use the number on their phones to redeem vouchers at various health facilities. Donor funding is used to pay the provider. Governments now get a channel for subsidies to reach end users.
- *Achieves economies of scale through strategic partnership with MNO*: The MNO (Safaricom) – who always provided the subscriber and mobile money database, as well as the agent/distributor network – gets a needed value added service (VAS) to combat churn and additional revenues from the platform sitting on their cloud service. Additionally, Changamka gets a platform that will help them to achieve economies of scale required for sustainability.
- *Comparative net utility for the economic buyer*: End users now have better options for their care – including savings and insurance to be applied to in-patient and out-patient care, appointments and reminders, education and awareness.

Figure J provides a graphical overview of the Changamka value chain analysis.

Figure J: Value Chain Analysis – Changamka™



SECTION 4: Nigeria Use Case

As Africa's most populous country and a nation that bears a heavy disease burden, Nigeria is a focal point for efforts to improve primary health care and health outcomes for its citizens. The Nigerian Ministry of Health has played a pioneering role in both the work of the Commodities Commission and the use of mobile phone-based technologies to improve health outcomes. In October 2012, Nigerian President Goodluck Ebele Jonathan, co-leader of the Commodities Commission, launched *Saving One Million Lives*, an ambitious and comprehensive initiative to scale up access to essential primary health services and commodities for Nigeria's women and children.

In December 2012, the mHealth Alliance announced a new partnership with the Nigerian Federal Ministry of Health, GSMA and Intel to leverage mobile computing and telecommunications technologies to support the initiative. For these reasons, Nigeria serves as a use case for the recommendations of this report. Because this new partnership intends to help mHealth applications to reach scale in an immense country, it is especially essential that the best practices and strategies that emerge from this report are used to guide implementations; it is equally important that the lessons that emerge from efforts in Nigeria inform the ongoing development and refinement of sustainable financial models elsewhere in low and middle-income countries.

Figure K, below, provides an initial overview of current Nigerian mHealth Projects that are in line with the Commodities Commission areas of focus and mHealth application categories identified by the mHealth Alliance.

Figure K: Examples of Nigerian Projects by mHealth Application Categories

Demand & Awareness

- *Etisalat's Mobile Baby* – Monitors the condition of pregnancy, allows pregnant women or health extension workers to pay for education material via phone.
- *Abiye Project (Ondo State)* – Pregnant women are given mobile phones to monitor their progress.

Performance and Accountability

- *MADEX (Mobile Application Data Exchange)* – A device is given to health workers around the country. They use the MADEX application to transmit data from rural locations to the central office in the Federal Capital. For example, a rural health worker would report the number of women attended, the number of babies born, the number of pregnancy complications, etc. The application was developed for the Midwife Service Scheme.

Quality Monitoring

- *Sproxil*: SMS-based system to verify the authenticity of drugs. In 2010, the Nigerian government endorsed the use of the Sproxil platform and it has since been used widely in Nigeria, attracting media attention in the process.

Supply Chain Awareness

- *RapidSMS for ITN distribution* – Piloted during the first phase of a 70-million insecticide-treated nets distribution campaign, RapidSMS was used in Kano state to capture and send commodities data from state stores to the Local Government Area (LGA) and distribution points. The program used logisticians in 21 selected LGAs and 4 pilot LGAs for mobilization and distribution of nets. Distributors who were not reporting were able to be identified and contacted immediately to follow up on distribution problems. After the successful pilot, the government recommended the program for scale up.
- *RapidSMS for polio vaccines tracking* – UNICEF Nigeria tested Rapid SMS messaging in its current polio eradication initiative, a regional effort covering 19 countries in West and Central Africa. Text messages could be used to track and enable a fast response to non-compliance and vaccine shortages – both major challenges in the region.

Financial Barriers

- *SURE-P* – Women are tracked through the mobile phone and get reminder notifications about their appointment, when they are due for payment, or to follow up if they have not come in for antenatal visit.

Mitigating Risk Associated with Economic Buyers - The Use Case of Nigeria

As discussed throughout this paper, each player in the value chain needs appropriate and long-term incentives for an mHealth application to be sustainable. Of all members of a given value chain, the economic buyer is the most critical. Other levels of the value chain may be reengineered, if necessary, in order to secure a sustainable equilibrium. However, without an economic buyer the rest of the value chain cannot be sustained. Therefore, it is worthwhile to examine the various ways in which risks associated with the economic buyers of mHealth can be mitigated. The evolution and proliferation of mHealth implementations in Nigeria provide a use case for such a discussion across a variety of mHealth application types.

In Nigeria, there may be opportunities to entice various players into areas where they are able to reap direct or near-direct benefits for participation. Figure L, below, and the detailed analysis that

follows, illustrate where there may be opportunities to engage economic buyers across sectors in Nigeria.

Figure L: Economic Buyer Opportunities in Nigeria™

	Public	Non-Profit	For-Profit	Health Workers	Individuals & Households
Demand & Awareness	Maternal /child health and polio	May be willing to pay if mHealth yields better outcomes than next-best alternative	Value to Pharma limited, but other advertisers may have interest	Etisalat Mobile Baby (already supported)	Etisalat Mobile Baby (already supported)
Performance & Accountability	MADEX (already supported)	Donor community and NGOs are not likely to become a long-term economic buyer.	Pharma for MADEX, Switchboard	Switchboard (open to moving into Nigeria)	Not target audience or stakeholder that directly benefits from category
Quality Monitoring	Of interest, but may continue to let for-profit economic buyers take lead		Sproxil (already supported)	Private clinics or pharmacies may be willing to pay for drug quality assurance	Affluent may be willing to pay to authenticate drugs and get peace of mind
Supply Chain Awareness	Polio vaccine tracking (already supporting)		Pharma or other commodities mfrs for polio vaccine / ITN tracking	Private clinics may be willing to pay to reduce stock-outs and improve quality of care	Not target audience or stakeholder that directly benefits from category
Financial Barriers	Sure-P mHealth to extend subsidy or microinsurance services to poor women	May be willing to pay if mHealth yields better outcomes than next-best alternative	Commercial models that engage insurance sector should be evaluated long-term	Private clinics may be interested but are likely catering to affluent patients who don't need services	Commercial models that engage end users as payers should be evaluated long-term

most ← → least

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Public-sector Participants – The majority of mHealth economic buyers in Nigeria are in the government sector (in many cases, the government is also the implementer). The overarching factor influencing Nigerian government financial support of mHealth is that MNCH and polio eradication are priorities. Any service or solution that can help Nigeria to achieve gains in these areas is of interest to the government, as a buyer whose primary concern is improvements in health outcomes. Therefore, Performance & Accountability, Supply Chain Awareness and Financial Barriers present the most opportunity for engagement because they most directly align with these aims. Nigerian officials say that the government is willing to support Financial Barriers solutions but needs capacity support to carry out programs.

Non-profit Participants – Non-profits, including funders, may in some circumstances act as economic buyers. As discussed in Section 4, in some instances, funders may determine that because of government inability or a chronic lack of resources, they have an interest in becoming a long-term economic buyer for a specific mHealth service or solution. This may result from a funder's interest in a specific disease or health area not supported by other actors. In general, funders and NGOs are not likely to become economic buyers in categories where the private or public sectors traditionally take the lead. Therefore, funders are more likely to participate as economic buyers in projects in the Demand & Awareness and Financial Barriers categories, where market forces may be insufficient to bring an application to scale, particularly if these investments yield health outcomes (impact) that are better than alternatives.

For-profit Participants – Private companies are most likely to act as economic buyers in the Performance & Accountability, Quality Monitoring and Supply Chain Awareness categories, where opportunities and pain points are most salient. For instance, pharmaceutical companies are often interested in better access to their target audience (health providers), and as such they may be willing to participate in Performance & Accountability solutions that reach health care workers (e.g., MADEX, Switchboard) if they are able to provide services or messaging to health care workers that will result in improved sales ROI. Similarly, counterfeit drugs are a pain point for pharmaceutical manufacturers and distributors, and this issue has typically been a concern in Nigeria. It is therefore rational to expect that these companies will continue to invest in implementations in the Quality Monitoring category. Similarly, the pharmaceutical industry or other commodities manufacturers or providers are logical economic buyers for Supply Chain Awareness projects where stock-out avoidance may result in increased or more consistent sales and improved effectiveness of their products. Vaccine producers may be willing to participate in ongoing polio vaccine stock-out reduction programs in Nigeria, for instance, since these programs could have a positive impact on their profitability and their understanding of distribution issues.

Individuals and Households – Individuals and families benefit most from, and are therefore likely to be consumers and economic buyers of, Demand & Awareness programs. For example, with Etisalat's Mobile Baby and MAMA Bangladesh, end users are paying for education material via their mobile phones. Solutions related to Financial Barriers may also be of interest to individuals and households with some level of disposable income, if there are attractive offerings and clear communication of benefits. The poorest individuals will struggle to fully pay for services, so models should explore offsetting their costs. Individuals with the means to pay for mHealth services can be attracted by new offerings, multiple services or “freemium” models.

UN Commodities Commission Implementation Planning for Nigeria

As noted in a follow up to the Commission's report, detailed implementation plans are being developed for each participating country, in line with existing national planning efforts. The draft implementation plan for Nigeria, released in December 2012, indicates a focus on six essential commodities: Misoprostol, Chlorhexidine, Amoxicillin, ORS, Zinc tablets and Family Planning commodities.

The government's specified commitments correlate to the five major mHealth application areas discussed in this report, and each has potential applicability in improving the distribution and availability of these identified commodities. Proposed action to develop an evidence-based toolkit to assess the impact of financial barriers on access to and use of life-saving commodities could help identify the most appropriate service for addressing **Financial Barriers**. The recommendation to focus on approaches that cut across communication channels such as mass media, community-level activities and interpersonal communication, as well as utilize emerging ICT approaches like new

media and social network interventions, could lead to the development and leveraging of cross-sector platforms to promote **Demand & Awareness**. In **Supply Chain Awareness**, an effort to develop a plan for strengthening supply chain systems in Nigeria by unifying the existing system into a single national service delivery distribution system, which will work both with government authorities and the private sector, could nurture the growth of solutions that could be used to track the distribution of six previously uncoordinated commodities. The creation of an evidence-based guide on supply- and commodity-related checklists and other support systems to promote and monitor the use of clinical guidelines by public and private providers could foster the adaptation and growth of a new or existing checklist-based solution for improving workers' **Performance & Accountability**. In **Quality Monitoring**, promoting certification of quality products through innovative approaches that better identify the quality risks, and help to define the levels of quality that must be enforced by manufacturers, might compel pharmaceutical companies to participate in programs that affect the market for their own drugs and services.

Many of the steps described above identify the innovative use of ICT as a key component. This suggests that the government, with support from actors in the private sector and the NGO communities, could benefit from performing a robust value chain analysis on the commodities themselves. Such an in-depth assessment may itself point to the types of solutions that will best help the country reach its goals in these six commodities, with potential future implications for replicating these services.

SECTION 5: Strategies for mHealth Financial Sustainability

Achieving financial sustainability is characterized by the transition from operational dependence on *funding* to reliance on *economic buyers*. This requires organizations or individuals who are motivated to purchase the mHealth product or service, and the design of a value chain with members who have incentives to remain part of the delivery process. Importantly, achieving financial sustainability is not a one-time event. It requires proactive monitoring and rebalancing of the value chain. As established in Section 2 and reinforced in Section 3, value chain members and market conditions are highly subject to change. Therefore, long-term financial sustainability is not only about finding the right model; it is also about establishing a process of regularly evaluating the “gives” and the “gets” along the value chain to ensure comparative net utility for all essential contributors. As the market evolves, financial models or the value chain members themselves will almost certainly evolve, as well. Managing this process requires a particular discipline and skill set.

As seen in the case studies of this report, there are a number of strategies for both mHealth project implementers and funders who seek financial sustainability. Additionally, there are key questions to address in order to establish and maintain a value chain that is compelling enough to attract the right economic buyers. These questions include:

- Does the application address a long-term challenge or pain point of the targeted economic buyer?
- Does the economic buyer have the long-term resources to pay for the services provided?
- Has more than one group of economic buyers been identified and engaged?
- Are alternative partners available at each level of the value chain? Are there any “single points of failure” in the value chain?
- Has the model been simplified as much as possible to provide the “minimum viable solution”?
- Can the services offered through the mHealth solution be readily diversified in a later phase?
- Is there a favorable competitive environment for the solution? Is the solution the best available solution (mobile or otherwise) in the intended market?

A negative response to any of these questions represents a particular risk to the long-term viability and sustainability of the solution. In such a case, the implementer and its partners would benefit from specific and directed action to address these risks. Best practices for addressing these questions and risk factors include:

- **Development and application of ongoing, specific value chain analyses that provide detailed quantitative and qualitative information on each stakeholder.** Regular analyses reveal changing perceptions of “gives” and “gets” due to regulatory changes, competition from new entrants to the market, the spread of new enabling technologies, falling prices and other factors. Crucially, these analyses also allow value chain players to justify their long-term participation in projects to their own constituents, whether they are voters, shareholders or customers.
- **Development of close and communicative relationships with every member of the value chain.** This allows implementers to anticipate changing incentives and the resulting need to adapt the value chain over time, and provides implementers with a broader view of the market through the eyes of the value chain members. These relationships also allow implementers to understand when the interests of value chain members, which may be aligned at early stages of an implementation, begin to diverge as a program or solution moves toward larger scale.
- **Early, open discussion between implementers and funders about the areas of high risk in the value chain and specific barriers to long-term financial sustainability.** Both implementers and funders benefit from specific plans for mitigating risks and addressing challenges. Changes to political environments, health system priorities or market dynamics can be disruptive but must be accommodated if a solution is to remain relevant. Constructing value chains that can respond to external shocks is necessary to obtain long-term commitments and ensure solution viability.
- **Development of alternative solutions that broaden the value chain when financial sustainability remains elusive.** Looking for ways to broaden the value chain can offer a solution when value chain analyses result in the conclusion that members are unlikely to sustain a program. mHealth solutions that operate on or leverage broader mobile service platforms (as Chagamka does with M-PESA) or existing channels may alter the cost and benefit equation enough to improve the prospects for financial sustainability.

The field of mHealth is entering a new stage. While early phases have been marked by necessary experimentation, 2013 will see focused matriculation to sustainable financing models that can support these solutions in the long-term. Rigorous analysis of the incentive structures and needs of a variety of ecosystem partners must be evaluated along the value chain for each individual mHealth solution. Yet the following holds true for all implementations: if each player in a given value chain believes that they are getting more value out of the exchange than they put in, and what they get is greater than what they could get from investing their resources elsewhere, then the financial model is sustainable. As noted in Section 5, reaching a state of sustainability is not a one-time achievement. It is a state that can only be maintained through a process of ongoing monitoring and evolution. The following recommendations, explored in greater detail in Section 5, can be used to guide funders, economic buyers and implementers – at various stages in the solution maturity lifecycle – to achieve financial sustainability.

- **During the “development phase” of the solution lifecycle, funders and implementers lay the building blocks for achieving financial sustainability.** Generally, all mHealth applications will require “seed” funding from donors or funders to support the pilot phase of an intervention. It is incumbent upon these funders to conduct a due-diligence process to ensure that the solution creates incentives for economic buyers to engage and will be differentiated in a competitive environment. For-profit organizations are most likely to play in value chains where they can generate incremental sales or revenues, while non-profit, public-sector and philanthropic entities will be motivated to engage where they can achieve their missions. However, all economic buyers – regardless of sector affiliation – will require implementers to demonstrate the returns that they are receiving in exchange for their investment. Therefore, during the development phase, funders can support the long-term financial sustainability of an mHealth solution by ensuring that plans and operational structures are in place for the capacity building and ongoing performance management that will be required to demonstrate data-backed value to economic buyers in the long-term.
- **Throughout the “introduction and growth stages” of the solution lifecycle, the economic buyer (or payer) supersedes the funder.** Nearly all mHealth applications will require “gap” funding as part of the efforts to take a given intervention from a pilot phase to ongoing national-level “scale”. In most cases, “gap” funding will be required from donors, whereas “scale” funding will often be provided – in part or in whole – by the economic buyer. This crossover marks the most critical timeframe for any solution seeking to attain financial sustainability. During this formative scale-up process, funders and implementers are wise to ensure that economic buyers are, indeed, buying. Special consideration must also be given to national governments during this time, because they are considered a “single point

of failure” in any model (given that there are no available substitutes if the government declines to participate). In addition, implementers must be able to demonstrate to MNOs that the solution will have a positive, tangible and long-term impact on their revenues. Adeptly communicating the “get” (forms of value) for each economic buyer, based on ongoing M&E and data-backed performance management programs established in the development phase, is critical to ensuring the successful transition from funding to the ongoing engagement of economic buyers.

- **For the duration of the “maturity stage” of the solution lifecycle, implementers must be able to differentiate their products and services in the marketplace as well as measure and expertly communicate the value provided to economic buyers.** On an ongoing basis, implementers will need to justify the continued involvement of for-profit economic buyers through data-backed analyses that help to illustrate the financial ROI. Non-profits, public-sector and philanthropic entities will require M&E that shows social or operational returns (including cost-effectiveness calculations) to continue their investments. All economic buyers will require that mHealth solutions remain differentiated in the marketplace in order to sustain their involvement in the long term. Implementers that received well-conceived support during the development phase will be able to draw upon trusted operational structures that support these core objectives.

Transitioning from donor *funding* to the ongoing engagement of an *economic buyer* (or payer) requires organizations or individuals that have long-term incentives to purchase the mHealth product or service. Designing a value chain with members who are motivated to remain part of the delivery process on an ongoing basis is not a one-time event and requires proactive monitoring and rebalancing of the value chain to ensure long-term sustainability.

Further investigation in the following areas would serve to support ongoing efforts by governments, industry, NGOs, academia and the many private philanthropies and bi-laterals that have catalyzed mHealth to achieve sustainable financing models for mHealth investments:

- Identification of categories, types of evidence and toolkits that help quantify the true and overall utility of mHealth applications to various economic buyers.
- Strategies for *precision funding* for various types of funders along the value chains of different mHealth applications.
- Definition of repeatable, simplified methods of establishing and maintaining the sustainability of mHealth financial models over time.
- Deeper analysis on the various control points in the value chain for the various mHealth application areas.



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