



Mobile Health

Market Entry Toolkit

Mobile Health Service Development: Key Design Considerations for Mobile Health Service Development

Kyla Reid, Knowledge Manager, Mobile Health, GSMA – kreid@gsm.org



Contents

Introduction.....	2
Key Questions for Mobile Health Service Design Development	Error! Bookmark not defined.
Service Definition: An Approach	3
Service Definition: In Practice.....	4
Establishing the Service with Respect to the Health System.....	4
Design Options for Consumer Hotline.....	5
Customer Profiling.....	6
Developing the Service around the Larger Consumer Value Chain	9
Role of the MNO?	10
Next Steps and Future Research	11

Introduction

Mobile Health technologies and services are proliferating as both the healthcare and mobile industries become increasingly aware and interested in their potential to improve efficiencies and access while reducing costs. The number of wellness and health related applications has grown exponentially as consumers incorporate health and fitness information and tools into their mobile lifestyle. Health professionals are harnessing the power of mobile to improve their work flow, manage their patients and provide peer-to-peer support. Health systems specialists, multi-lateral organisations and National Health and ICT Ministries are working to understand what impact Mobile Health will have on existing eHealth and teleHealth strategies, while the development community is trialling the application of devices and services to increase access and health outcomes, particularly in low-resource settings.

While the pace of innovation and engagement across sectors is promising, it can also produce confusion as different stakeholders in the Mobile Health space struggle to define and understand the variety of ways that mobile can be applied in healthcare, and in turn, conceptualise these uses in ways that make sense for them within the larger health value chain. Despite the myriad of perspectives that different stakeholders perceive regarding the purpose, value and application of different Mobile Health services, fundamental considerations and common questions exist across the development phase of all service types. This discussion document proposes an approach to Mobile Health Service Design and Development that is reflective of these commonalities, including universal questions across services, market and service selection, value chain considerations, technical functionality, target market and partnership and regulatory decisions. These components of service design are brought to life through the application of these dimensions to a hypothetical example of a health hotline. The paper concludes by identifying key messages and next steps for research in this area.

Key Questions for Mobile Health Service Development

The way a service is designed has implications for the entire lifecycle of service development and will influence and define important decisions that have to be made before taking a service to market. Universal points of departure in service design for any Mobile Health service include:

1. Market analysis to assess the needs of the total health system
2. Internal and external competitor analysis to assess synergistic services, support or displacement of services in the existing market
3. Consumer profiling, consumer segmentation approaches and consumer expectations of the service
4. Health system integration and consideration of how the new Mobile Health service or intervention will impact the quality and type of total health system delivery and the points of value that can be extracted from different applications of a service for different stakeholders
5. The technical and physical infrastructure and architecture required to enable the service
6. The partnerships that are required to deliver the service and what role an MNO will play
7. The branding and marketing of a service
8. The regulatory and legal classification that a service will be subject to and the resulting distribution of liability
9. Reimbursement from the various payers of health care services

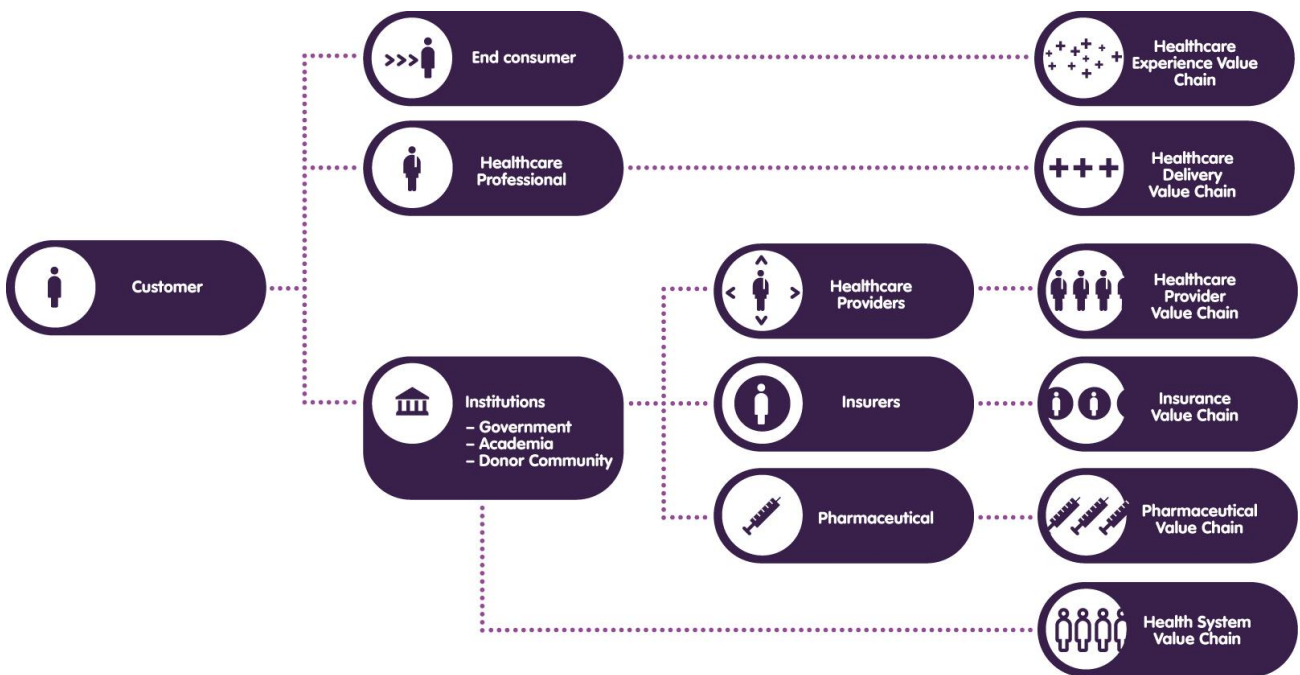
Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Over the course of our research, and as a core component of our Market Entry Toolkit, we will explore different methods and approaches that can be used to answer the above questions and bring sustainable Mobile Health services to market.

It is evident that the considerations listed above are highly interconnected, yet how they are approached will differ, as each type of service serves a purpose as it reflects the perspective of the stakeholder defining it, and the objectives, drivers and expertise that they bring to the space. For example, it makes sense that a Mobile Network Operator may delineate services in terms of the type of mobile technology they use (i.e. voice, text-based, or IVR), while a development organisation may consider them based on health needs met (i.e. maternal health services, HIV/AIDS services, health worker support services). Conversely, a medical practitioner may consider and classify services along the continuum of care or by work flow function (i.e. prevention, promotion, diagnosis, treatment). The question of service segmentation remains debated, but clarity can be brought into this space through addressing the commonalities and questions that exist between all services regardless of how they are categorised.

Figure 1: Customer Group and Value Chain



Service Definition: An Approach

Drawing from an analysis of existing service segmentation and design and development exercises, we propose the following framework for the mobile industry to begin conceptualising Mobile Health service definition. It takes at its core the customer, then considers the value chain which is relevant for that customer group, and finally maps out the key design features of a particular service, using the example of a health hotline to bring this approach to life.

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Figure 2: Key Design Features

User	Consumer Health Professional Institution
Information Provider	Automated Health Professional
Disease Coverage	General Specific
Synchronicity	Synchronous Asynchronous
Format/Technology	Voice/Text/Image/Data/Video
Continuum of Care	Prevention/Diagnosis/Treatment/Referral/Monitor

This framework captures the components of all of the other typologies of services discussed above, yet allows for a more comprehensive approach to service design, incorporating development phase considerations all the way through to go-to-market service delivery. It requires reference to health system analysis to define needs and opportunities (as outlined in the GSMA's Decision Support Toolkit) including disease burdens, national health priorities, literacy levels, population demographics and mobile network infrastructure and penetration.

Service Definition: In Practice

Establishing the Service with Respect to the Health System

By utilising the GSMA's Decision Support Toolkit (DST) and examining a number of key health and economic indicators, the mobile industry will be better able to determine whether there is demand for a service such as a health hotline, and begin assessing which health needs to prioritise, and how to do so in a particular market. For example, the data from Kenya below indicates that there is high out-of-pocket (OOP) spend on healthcare, low private insurance, and a low physician to patient ratio. When mapped against other indicators some broad conclusions pertaining to a service can be made. In the case of a health hotline in a Kenyan market, the high OOP spend suggests a willingness to pay, but this assumption must be qualified by the reality that the per capita spend in Kenya is relatively low, and therefore a service must be priced accordingly and made as accessible as possible (i.e. 24/7) if it is to supplement in-market alternatives such as a visit to a local clinic (which in Kenya may be additionally difficult given to low physician/patient ratio).

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Figure 3: Comparison of Health Financing Indicators in Selected Countries

2009 Figures from WHO	Brazil	Kenya	Bangladesh	S. Africa	Mexico	India	Spain
A. SELETED RATIO INDICATORS* FOR EXPENDITURES ON HEALTH							
1. Expenditures ratios							
Total expenditure on health (THE) as % of GDP	9.0	4.3	3.4	8.5	6.5	4.2	9.7
Financing Sources measurement							
External resources on health as % of THE	0.0	36.1	7.9	1.9	0	1.1	0
Financing Agents measurement							
General government expenditure on health (GGHE) as % of THE	45.7	33.8	32.9	40.1	48.3	32.8	72.1
Private expenditure on health (PvtHE) as % of THE	54.3	66.2	67.1	59.9	51.7	67.2	24.7
GGHE as % of General government expenditure	6.1	5.4	7.9	9.3	11.9	4.1	15.2
Social security funds as % of GGHE	0	11.8	0	2.9	54.6	16	6.7
Private insurance as % of PvtHE	41.2	8.8	0.3	66.1	7.7	2.3	20.7
Out-of-pocket expenditure as % of PvtHE	57.1	77.4	96.5	29.6	92.3	74.4	77.0
2. Selected per capita indicators for expenditures on health							
Total expenditure on health / capita at Purchasing Power Parity (NCU per US\$)	943	68	48	862	862	132	3,150
General government expenditure on health / cap x – rate	335	11	6	195	253	15	2,218
Private insurance as % of THE	22%	6%	0%	40%	4%	2%	5%
Out-of-pocket expenditure as % of THE	31%	51%	65%	18%	48%	50%	19%
Physicians per 1000	2.06	0.14	0.26	0.77	1.50	0.60	3.20

Given the data above¹, an MNO or other stakeholder may determine that a health hotline is a service they would like to offer in a particular market. We will use that assumption to illustrate the application of the service design framework to a health hotline below.

Design Options for Consumer Hotline

Based on our framework, the following are some of the main dimensions for consideration in health hotline service design:

User: Whether the target market for a health hotline is an individual consumer, health professional or Institution (government, pharmaceutical, insurer, hospital, etc.) will influence the specificity of the information provided, how it is delivered and by whom through the articulation of the need and expectations that surround it. Fundamentally, this decision will impact and alter the business model that frames the service.

¹ This table represents a sample selection of indications that may be used to assess market needs and opportunities. For a more complete discussion of this, please see the GSMA South Africa Decision Support Toolkit and similar forthcoming DSTs.

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Information Provider: Is it essential that information and advice delivered by a health hotline come from a health professional? Or can automation be used for any portion of a call (i.e. IVR for triage)? Is it personalised and tailored to the caller by a health professional, or is assistance given standardised, requiring less expertise?

Disease Coverage: Is the health hotline providing information for a specific disease or set of conditions (i.e. HIV/AIDS, STIs), or does it address a variety of health concerns and provide basic primary care?

Synchronous/Asynchronous: Is the health hotline facilitating an immediate direct conversation? Or does it collect and store symptoms by another means (e.g. via SMS) and then call an individual consumer back?

Technology: A health hotline would be primarily delivered via voice technology; however there may be follow-up messages by SMS, or an opportunity to send images for some conditions for diagnosis (i.e. mobile tele-dermatology) in more sophisticated health hotlines.

Continuum of Care: By considering where a service fits in along the continuum of care, assumptions can be made about points of value extraction and needs met, and the specific products that underlay the service. This will be elaborated on in the section below.

The following is a summary of the design options one might choose for a health hotline in Kenya², based on the above considerations:

Figure 4: Sample Design Features for a Consumer Health Hotline

User	Consumer Health Professional Institutional
Information Provider	Automated Health Professional
Disease Coverage	General Specific
Synchronicity	Synchronous Asynchronous
Format/Technology	Voice/Text/Image/Data/Video
Continuum of Care	Prevention/Diagnosis/Treatment/Referral/Monitor

Customer Profiling

For a consumer service, we also recommend an additional exercise to profile the customer. Through engaging in this process, MNO's will be better positioned to profile their customers and target market and their needs, drivers and barriers to adoption. Additionally, it allows for an analysis of end-user expectations surrounding the service, helping to define what can and should be included and excluded in the service design process. It also allows an MNO or other Mobile Health service provider to consider what the introduction of their service will compete with, complement, replace or support in the market by defining the treatment pathway and health seeking patterns (or lack of) of the target market in order to understand how a service will fit into a consumers "mobile lifestyle." This is an important component of the service design process because it illustrates how different consumers may use the same type service in different ways, thus impacting the value chain and the different points of value that can be extracted. By considering the gender, age, occupation, location and mobile usage patterns of target consumers and pairing these profiles with other consumer research assumptions about needs met and expectations of quality, availability and cost can be drawn.

² Illustrative only

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

The following basic consumer profiles are sample typologies of potential health hotline consumers in a developing market. We recommend that further research involving ethnographic study, user testing, focus groups and in-depth interviews be undertaken during the service design phase to ensure a thorough understanding of end user wants and needs and the key enablers to service adoption. This type of consumer profiling will be explored further in the next chapter of the GSMA Market Entry Tool Kit.

Profile 1³: Rhonda, Expectant Mother

Gender: female	Expectations of Household	Service Substitute	Lifestyle
Age: 25	<ul style="list-style-type: none"> ■ Low cost or free ■ Easy to use ■ Voice or text based max ■ Access to basic medical and diagnostic information ■ Availability of ante/ postnatal care and child health info 	<ul style="list-style-type: none"> ■ Community health worker ■ Traditional healer ■ Peer-to-peer advice 	<ul style="list-style-type: none"> ■ Works in the home ■ Unable to travel easily ■ Uses mobile mainly for voice/SMS
Marital status: married			
Low income			
Uninsured			
Basic phone			
Pre-paid mobile user			
Semi-urban dweller			

Profile 2: Patrick, Taxi Driver

Gender: male	Expectations of Household	Service Substitute	Lifestyle
Age: 32	<ul style="list-style-type: none"> ■ Low cost ■ Faster than seeing a doctor ■ More reliable than asking friends ■ Less loss of productive time and money than alternative 	<ul style="list-style-type: none"> ■ Peer-to-peer advice ■ Self-medication ■ Local clinic (but may be crowded, inaccessible or poor quality) 	<ul style="list-style-type: none"> ■ Works away from home often ■ Stays in a dormitory ■ High mobile user ■ Uses mobile money service
Marital status: single			
Low income			
Uninsured			
Basic phone			
Pre-paid mobile user			
Urban dweller			

³ Profiles are illustrative only.

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Profile 3: Charles, Office Administrator

Gender: male	Expectations of a Household	Service Substitute	Lifestyle
Age: 45	<ul style="list-style-type: none"> ■ Already has a doctor but looking for out-of-hours support or help with embarrassing health conditions or chronic disease management 	<ul style="list-style-type: none"> ■ Clinic or specialist at public hospital 	<ul style="list-style-type: none"> ■ Sedentary ■ More tech savvy -high mobile user
Marital status: married			
Middle income			
Partially insured			
Basic phone			
Contract mobile user			
Urban dweller			

This preliminary customer-profiling approach serves several purposes. First, it helps articulate the consumer journey and value proposition through identifying wants and needs and therefore facilitating the customisation of a service (such as a health hotline) to meet a variety of different consumer expectations, allowing for more dynamic and adaptive service. For example, while Charles may be prepared to pay a small monthly subscription to a hotline for out-of-hours chronic condition advice, Patrick may want a free service that doesn't require any registration and can be used as a one-off in an emergency.

Importantly, by mapping potential expectations as a primary part of service design, an MNO can anticipate some of the regulatory challenges that a service may face from the earliest stage. For example, for many consumers, calling a health hotline may carry an assumption of a conversation with a doctor and perhaps more importantly with the ability to get a diagnosis and/or a prescription. Depending on the regulatory environment, risk appetite and the availability of resources and capabilities, this expectation may be in direct conflict with prevailing legislation in some markets. In such cases, the early identification of these conflicts and limitations can create a space from which to innovate and adapt services to meet consumer needs and expectations in other ways. For example, if it is not possible for a diagnosis or prescription to be provided over the phone in a particular market, an MNO can seek out partnerships to create a strong referral process that facilitates diagnosis following a call or may only need to employ certain kinds of health professionals (or none at all) to deliver the degree of expertise required to triage, refer or provide general health advice.

Second, this process helps identify and define market competition, disruption or opportunities for complementing existing health services by defining how different types of customers currently consume and experience healthcare. For example, Rhonda may use a hotline to verify advice she received on an antenatal issue from a traditional healer, while the hotline may refer Charles onwards to a clinic for a cardiac test. Charles may prefer to receive an SMS message with advice following the call, while Patrick only wants to speak directly to a health practitioner.

When combined with the expectation mapping outlined above, this information provides significant insight into how a service should be developed and delivered by considering what is assumed and expected of a health hotline vis-à-vis what is possible in a market, and therefore what the value-add of the service might be. For example, Rhonda may hope that a health hotline provides a diagnosis, however if her primary concern is to get guidance or reassurance for her child's fever in the middle of the night, then general triage and advice or a referral may be significantly valuable to her based on what the alternatives (or lack of) are in her particular context.

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

This consumer profiling exercise also has important implications for the rate and likelihood of adoption, the types of marketing, education and promotion required around a service. It will also influence and the types of infrastructure and capabilities required to meet the customer expectations (i.e. in regards to a health hotline, is it expected that a Doctor will answer the phone, or is a Nurse or other healthcare personnel sufficient?). These expectations and their influence on the service design development then must inform the kinds of partnerships that an MNO needs to consider. These topics will be covered in more detail throughout the GSMA's Market Entry Toolkit.

Developing the Service around the Larger Consumer Value Chain

Many services developed for Mobile Health revolve around specific portions of the customer health journey. However, it is also important to consider the *entire* consumer health journey in order to consider future value-added services to complement the service under consideration, and provide support along the broader, more comprehensive, spectrum of healthcare.

Figure 5: End-Consumer Health Journey



Prevention:

Services may include SMS reminders and health “tips”, disease awareness and immunisation campaigns or disease surveillance through the input of caller profiles via SMS (if applicable).

Triage:

A triage service is usually considered a core component within a health hotline and may include registration into a health data system, a referral on to an emergency service or clinic, or a consultation with a health hotline professional (if applicable).

Consult:

A consultative service within a health hotline includes medical advice based on symptoms and caller profile and is also thought of as a core service. A consultation is typically the point at which risk and liability considerations become important in a health hotline, and where carefully constructed partnership development is critical.

Diagnose:

This includes the provision of medical advice based on provided symptoms, concluding in the identification of a specific disease or condition (or lack of). Diagnostics requires a higher degree of expertise and a very close evaluation of the regulatory environment as it will usually carry a higher degree of risk.

Referral:

This may include the seamless referral from a health hotline to an emergency service, clinic or specialist depending on whether a diagnosis or consultation was provided and what course of action is recommended. The ability to send patient information onwards to a referral point may be an additional value-added service that an MNO or delivery partner may wish to explore.

Mobile Health Service Development

Key Design Considerations for Mobile Health Service Development

Emergency:

The ability to triage to an emergency service and transfer the relevant health information as outlined above.

Prescription:

The ability for a health hotline to provide a prescription (or an m/ePrescription) will vary by market based on the regulatory environment. The ability to link into a partner pharmacy or send drugs by delivery following a call may be an additional value-added service which will influence partnership decisions.

Follow-up:

The ability to send out SMS or voice reminders to callers based on course of treatment advised. The inclusion of this product will be influenced by whether a service is synchronous or asynchronous.

Monitor:

In order to monitor the condition of a caller, a health hotline must have technical functionality that allows it to collect, host and forward sensitive patient data. Again, the role of the MNO may just be as a data pipe, or may involve the storage of data.

A consumer-driven hotline typically concentrates on the triage process as core. Beyond that, the hotline can vary greatly depending on the regulatory environment and the service provider's appetite for risk. For example, in Kenya there does not appear to be prevailing regulation around the doctor on the line who is dispensing the medical advice, or even where the person is registered. This solves neatly the issue of health workforce capacity, which is particularly pressing in this country. However, in Brazil, there are very strict regulations around the process of medical consultation where it (currently) always needs to be face-to-face. As a result, the people on the other side of the line can only be nurses, and the service provided can only be that of general medical information.

Role of the MNO?

Depending on the types of service offering, and who it utilising it and provide the back end, (as informed by the customer profile mapping exercise), the business model, payer and the role of the MNO will vary. For example, within a typical health hotline prototype based on the service dimensions illustrated above, an MNO can act as the infrastructure provider, provide the technical infrastructure and billing capabilities, or own the health content, host health data in the form of an EMR, or work in partnership with other health providers to deliver various components. These decision points will be elaborated on in the partnership, marketing and policy and regulatory sections of the GSMA MET and will influence which of the typical services an MNO may offer.

Next Steps and Future Research

The analysis above is a preliminary component of the GSMA Market Entry Toolkit Service Development Section. It is meant to stimulate discussion around service design, and bring to light some of the key considerations an MNO or other Mobile Health service provider may wish to address when determining what type of service to bring to the market, and how to develop it. While a health hotline was chosen to illustrate this process above, other types of services could be substituted and the same framework followed. Next steps for further research include:

- Map various consumer profiles against different business models for specific services
- Undertake ethnographic research to understand key enablers for the adoption of Mobile Health services among different demographics
- Assess the full service development lifecycle, from service design decisions to commercialised market entry for specific Mobile Health services in low-resource settings to glean best practices and lessons