Photo: Global Health Media Project

ORB

ESTABLISHING A GLOBAL END TO END MOBILE CONTENT DISTRIBUTION PROCESS FOR HEALTH WORKERS

mPOWERING
FRONTLINE HEALTH WORKERS

CONTENTS

EXECUTIVE SUMMARY

This report represents an initial "blueprint" to create a scalable, locally sustainable, 'end-to-end' content distribution process that uses mobile technology to provide frontline health workers (FLHWs) access to relevant health content.

The core of the proposed process aims to: (1) increase content contributions to a centralized content management platform; (2) reduce duplication through collaborative content production and adaptation; (3) shorten the time and reduce the cost required to implement solutions for specific contexts and geographies by making the design process more standardized and systematic; and (4) establish an open collaborative model for the ongoing refinement of the process that can evolve independent of specific technologies. Establishing this process is a first step towards creating a common delivery system that allows organizations to focus on content creation and adaptation in order to accelerate the development of knowledge and skills for FLHWs and the communities they serve.

Despite significant milestones in the use of mobile devices by FLHWs, the inability of mobile health (mHealth) programs to go to scale without an ongoing infusion of external resources continues to challenge the global health development sector. One factor is the lack of evidence of the effectiveness of mHealth, which for government and donors diminishes the value of the investment in mHealth:

The phenomenal growth in the number of new [over 1300 mHealth] services has not, unfortunately, seen a parallel growth in the evidence base of these services, particularly economic (cost) proof points. 90% of services are reliant on donor funding and/or a consumer payment model, both of which we would argue are unsustainable, given the short term nature of funding and the inability of consumers at the bottom of the pyramid to contribute significantly to out of pocket health expenses.[1]

With increasing affordability of smartphones and steady improvements in wireless telecommunications infrastructure, the failure to scale mHealth solutions will become increasingly hard to explain. If the existing technology already lends itself to scale what are the barriers to achieving that goal, and to do so in a way that is sustained beyond initial donor investment?

In proposing an end-to-end process for content distribution, this report directly addresses the challenges to sustainable scale of mHealth programs.

THE GLOBAL END TO END MOBILE CONTENT DISTRIBUTION PROCESS

What do we mean by an 'end-to-end' mobile content distribution process? Simply put, it is the creation, curation, localization, packaging and distribution of content in a form that is readily usable by FLHWs. Figure 1 illustrates each of the separate but linked stages in the process.

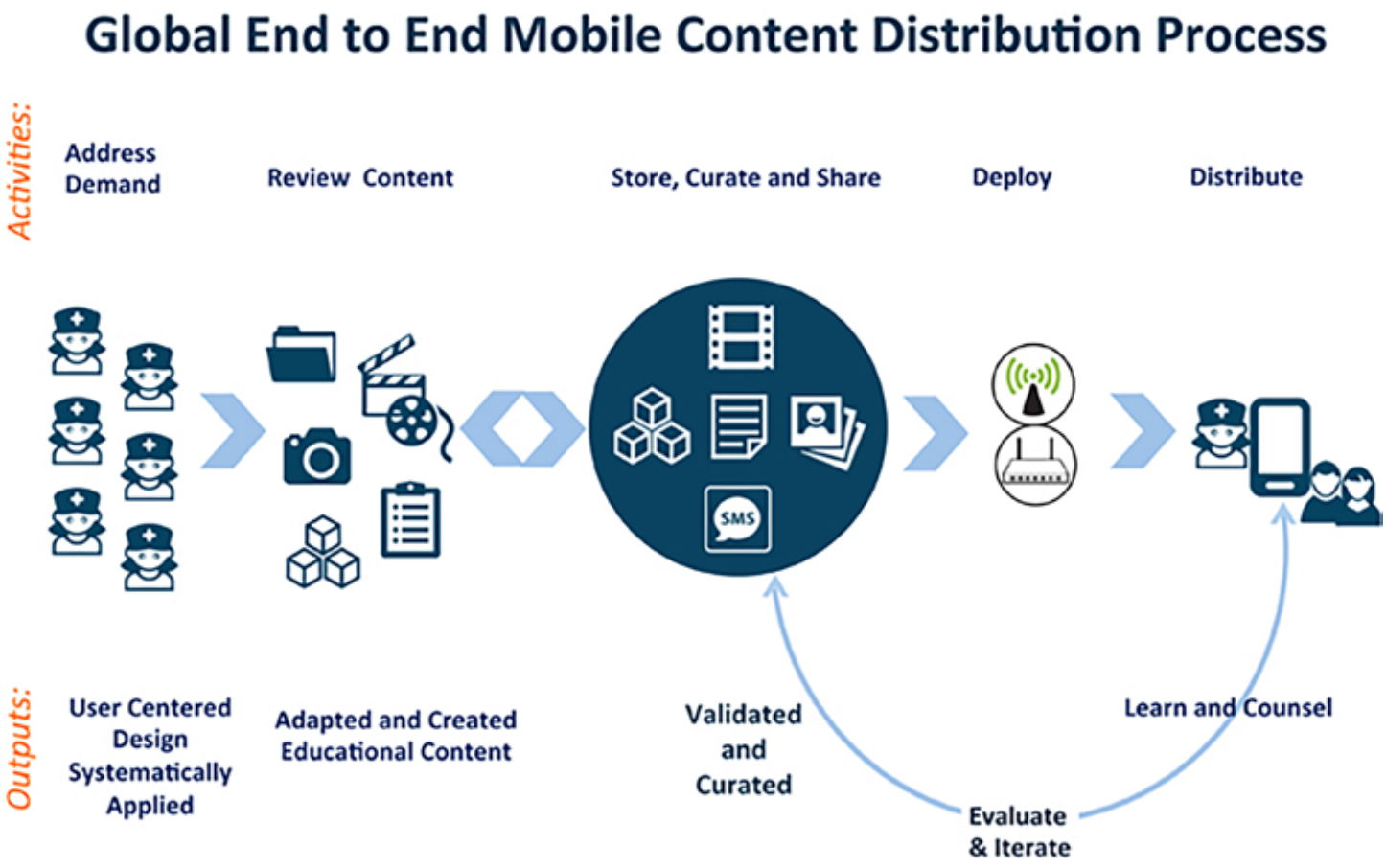

Figure 1: The stages of the Global End to End Mobile Content Distribution Process

STAGE 1: ADDRESS DEMAND

There is a critical need to get high quality, relevant health information into the hands of every frontline health worker. They are usually the first point of contact in the health systems for millions of people in developing countries. The content should be easily accessible and available for sharing amongst peers or to facilitate meaningful dialogue with patients.

Every year, over 292,000 women and 6.3 million children die from preventable causes, many related to pregnancy and childbirth. Nearly 3 million children die in the first month of life and a third of those die the day they are born[2,3] . Contributing to these figures is the fact that more than half the childbirths in developing countries take place at home with the assistance of traditional birth attendants who have limited or no formal training.

In India, for this reason (amongst others) there has been an attempt, through a cash incentives program, to encourage women to choose facility births. The expectation was that this would lead to improved quality of care and fewer deaths of women and newborns. A study of the program concluded that institutional delivery by itself does not ensure safer births in terms of maternal mortality, if a skilled attendant is not also present at the birth.[4]

These and other studies suggest that a focus on properly training and equipping birth attendants can have a positive impact on health outcomes for pregnant women and newborns[5]. Access to high quality, low cost and properly designed training materials is critical, in particular for those health workers for whom attending trainings is difficult (e.g. too far from their home, it leaves the health post without a health worker, too expensive, etc.). Making these materials available via a mobile device, such as a smartphone that does not require a continuous connection to a network, would enable every health worker to access the information she needs, when she needs it. Continuous network connection may provide additional benefits like recording the progress of the learner, allowing for real-time supervisory support, and regularly updated content.

Interventions involving health and technology have focused on using mobile phones for collecting data at the point of service, for monitoring system performance or accelerating data delivery. Arguably, these kinds of interventions are designed to improve the performance of the health system not the health worker. Given that in most developing countries the community health worker is the primary conduit to services and health information, focusing on interventions that improve a health worker's performance and facilitate meaningful dialogue between her and her client are more likely to have a direct impact on health outcomes. By addressing FLHWs' basic information needs first and using a development process that can incorporate organic technological trends to address those needs next -- trends that include the affordability and near term personal adaptation of smartphones -- then the delivery of relevant health information on a global scale may be feasible.

Of course, it is not enough to simply provide every FLHW with a smartphone equipped with relevant health information. The primary objective of the first stage in this process is to ensure that content and related applications are aligned with FLHW needs and capacities related to service delivery. Some programs are already piloting parts of the end to end process. In Nigeria, India, Ethiopia and Pakistan, there are programs that are systematically applying user centered design principles for the adaptation and creation of content as well as the customization of existing technology for delivery of that content. For example, mSakhi, an interactive vernacular audio/video-guided mobile application, provides support to Accredited Social Health Activists (ASHAs) in conducting routine activities across the continuum of care. By applying these principles, mSakhi combines the functions of multiple existing paper-based tools, thereby eliminating the need for ASHAS to carry bulky flipbooks, manuals, registers, and other job aids.

Some of best practices to ensure solutions are designed to achieve program objectives include: surveys of FLHWs' attitudes, knowledge and behavior surrounding mobile devices, detailed analysis of an FLHW's existing and ideal workflows, and role play to help FLHWs integrate mobile devices into the client counseling process. As these practices evolve, this stage of the process will require less and less time to implement and, once packaged appropriately, can be integrated into a country's existing training program.

STAGE 2: REVIEW CONTENT

The global health community, including donors, implementing partners and others, should actively promote collaboration around content development, re-use and sharing to avoid duplicated effort and wasted costs.

In 2014 a group of experts including technology providers, user experience design firms, content creators, academics, donors and policy makers gathered to discuss the issues surrounding the development of the end-to-end content solution or 'content value chain'. One surprising admission that emerged from the meeting was the following:

International development is challenged with the fact that the incentives behind, and design of, donor-funded projects dissuade content producers from creating sustainable and wide-reaching distribution and delivery channels, products, and platforms [...] content is often produced on a bespoke, project-by-project basis where implementing partners are dis-incentivized to share or repurpose content across channels, activities, and organizations.[6]

The question is how to change an approach which promotes the status quo of constant content development, to one where content is routinely shared, re-used, adapted and translated to meet local needs. The current content landscape is characterized by confusion about licensing, about the perceived contextual limitations of existing content (i.e. the view that content created in one country cannot be re-used or even adapted in another country), expensive technical production techniques brought unnecessarily into play and an apparently overriding desire by developers and donors alike to produce original material, even where existing content would serve a new purpose perfectly well.

Addressing these issues, the proposed end-to-end content distribution process focuses on taking high quality open content, creating either face to face or virtual collaborative "studios" where content adaptation takes place, and then sharing this content with local FLHWs and their communities. Published under a Creative Commons license, the content can then be reused or adapted in the future. What's needed to facilitate this process is a centralized online platform for content creation/adaptation, storage, and distribution.

Photo: 2013 Chelsea Hedquist, Courtesy of Photoshare

STAGE 3: STORE, CURATE AND SHARE

A global online library of open high quality content, designed to meet the needs of FLHWs has the potential to increase access to relevant information and help improve their performance.

mPowering Frontline Health Workers is a public private partnership launched by USAID. It includes partners such as Qualcomm® Wireless Reach™, GlaxoSmithKline, Intel, UNICEF, and the UN Foundation and other international program partners. mPowering aims to reduce preventable maternal and child deaths by accelerating the use of mobile technologies to improve the performance of FLHWs. A core element of mPowering's work is its mobile-optimized platform, ORB (www.health-orb.org) that provides access to high quality, mobile enabled, open content designed for FLHWs based in low resource settings. The partnership is doing this by collecting and curating content from organizations willing to share their resources freely for the global health community.

Ministries, training institutions, NGOs and others have the skills and infrastructure to both contribute to and borrow from such a platform. Organizations such as Global Health Media Project and Medical Aid Films have that shown content developed in one country can be used across multiple contexts and countries, particularly when dubbing or subtitles are applied to the videos. The film or animation itself can be adapted (although this is a more expensive process) to make it contextually relevant to different cultural contexts (see Figure 2).

From a process engineering perspective, Stage 2 (i.e. Review Content) and Stage 3 (i.e. Store, Curate and Share) are intended to overlap as content providers, trainers and other stakeholders work between the two stages to generate customized content for their users that will meet program objectives. The objectives of these stages are to promote the deliberate sharing of content and to support the development of a repeatable approach towards organizing that content into a usable form for education or counseling. Content Management Systems (such as ORB) combined with a Learning Management System (LMS), such as Moodle, which organizes content into courses or training programs, are tools that can be institutionalized into a country's existing health system to make these stages of the end to end process a reality.

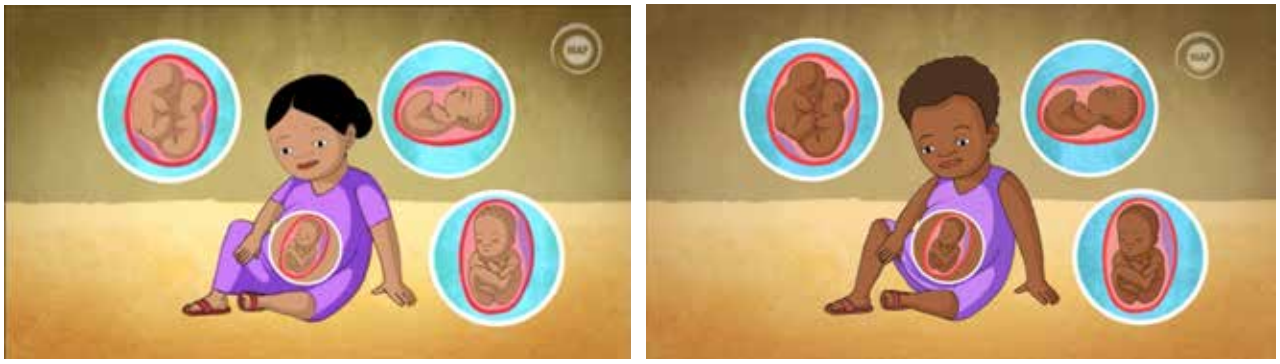

Figure 2: Screenshots from MAF films adapted for Sub Saharan Africa and Southeast Asia

STAGE 4: DEPLOY AND DISTRIBUTE

As well as accessing training content to increase their knowledge, FLHWs could also serve as health information hubs. By developing or adapting content applicable to client counseling and capitalizing on existing community-based mobile information networks, they can use their mobile devices to share critical health information, and influence healthy behaviors in their communities.

Photo: Global Health Media Project

In India, a combination of lack of professional education among the FLHWs, unfulfilled community health information needs and the newfound affordability of smartphones, has led to development of a mobile application called Gyan Jyoti (Light of Knowledge)[7] . Gyan Jyoti was built, in part, by piloting the end to end process and accessing an existing open source, Android-based mobile application called OppiaMobile that is designed for content delivery and to ease the process of customization for specific contextual circumstances. This enabled the developers of Gyan Joti to simply focus on adding specific features that would provide clients counselling support for Family Planning. By working closely with Accredited Social Health Activists (ASHAs) the developers have ensured the app matches their capacity (as well as that of the current health system) to use the tool in their work.

The consumption of content via mobile devices is increasing exponentially. Evidence in India suggests that social networking is one of the top activities for smartphone users and video is becoming the most popular forms of media to share, fueled by the simultaneous growth of social media and smartphone adoption in the country. Trends indicate that traditional approaches to program scheduling will have to change, as users in both the highest and lowest wealth quintiles opt out of traditionally scheduled programs on TV and radio and instead use mobile devices to watch what they want to watch, when they want to watch it.[8]

This has strategic implications for health communication. As more people become familiar with and expect to access content on their phones, FLHWs can use community based mobile media sharing networks to become information hubs, distributors and interpreters of validated health care material. In addition to mobile broadband networks, sharing can also take place through the use of Bluetooth technology (present on smartphones and most feature phones) and through the purchase and swapping of SD Cards. Such a system is ready to go to scale because it exploits the organic presence of smart and feature phones that already meet four basic requirements of a distribution network: (1) asynchronous delivery; (2) sufficient storage capacity so the video can be referred to in the future; (3) a mechanism of transfer to enable sharing and updating of new content, and (4) functionality that supports video and audio playback. See Figure 3 which illustrates the network lines of such a communication system.

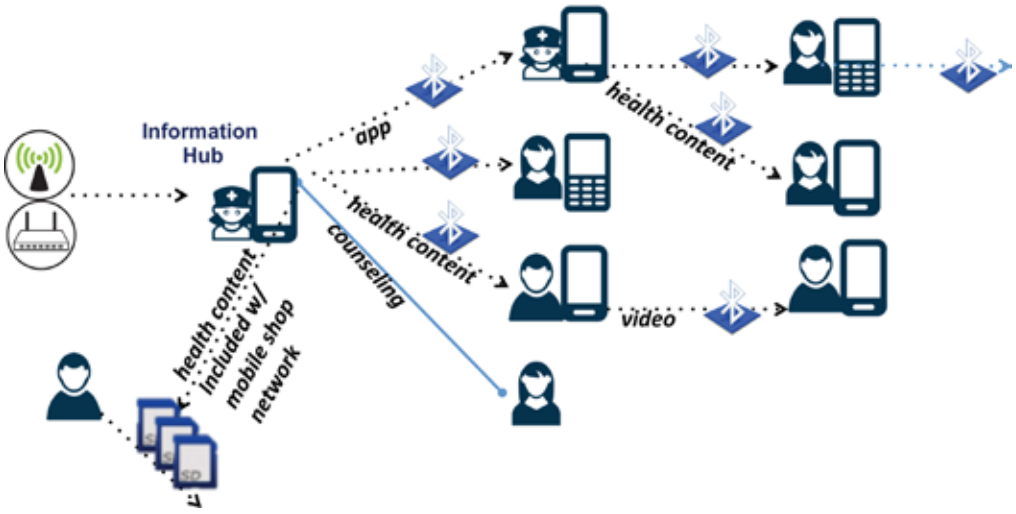

Figure 3: A distribution system for health content

STAGE 5: EVALUATE AND ITERATE

With a single distribution system in place, evaluations would be able to focus on key information from smaller specific changes to an individual process rather than focusing on adjustments to the entire architecture, thereby reducing time and effort and improving content delivery with each iteration.

One advantage to eventually settling on a single architecture for a content distribution system is that rigorous evaluation of the system itself can be completed independent of human subject research, as the focus would be on the cost and efficiency of content generation and delivery. Individual instances of applications that emerge from the process may require an evaluation, but each succeeding program evaluation would be able to build off previous evaluations that used the same process. Thus, future evaluations would be able to focus on specific innovations to the process (manifested in customized versions of each app) thereby reducing time and effort and improving the process with each iteration.

OppiaMobile[9] , one application presently used in the process for content distribution (and a model for the contribution of new technologies to the collaborative network for the future) provides usage statistics that are collected periodically when a network connection presents itself. These statistics reflect what was viewed individually for learning and what content was shared with a client for counseling, for how long, at what time of day and the number of times over a defined period. When combined with some basic data relating to client decisions – say before and after counseling is completed – the application – just through passive monitoring – can begin to tell administrators what media, for example, is leading to positive choices regarding their health. Whether those choices are for appropriate family planning methods, proper hygiene, improved breast feeding practices, or improving routine immunizations, the application can inform decision makers which approaches towards content presentation work and which do not. With a single delivery system in place that information can be acted upon by everyone connected as soon as it becomes available and not only after a lengthy evaluation process.

HOW TO TRANSFORM THIS PROCESS INTO A SCALABLE AND SUSTAINABLE DISTRIBUTION SYSTEM

If we look at existing mHealth applications used for education, counseling and behavior change, organizations have done a remarkable job of creating stand-alone interventions where content is produced (e.g. messages or videos created), new technologies created or adapted (often phones are acquired or provided with new applications) and individuals are trained to use the technology. However, these projects have had difficulties sustaining beyond the pilot. The technology and materials produced are not shareable (or not shared in a deliberate manner) while the technology and training are designed for the project and seldom based on a common process. In other words, despite a wide range of organizations proving the viability of mHealth, scale and sustainability remain elusive.

The challenge is to take accepted best practices at each stage (such as user-centered design; high quality educational content optimized for mobile viewing; etc.) and build these into an integrated content creation, adaptation and distribution system supported by the services and technologies that promote moving to scale.

One individual organization or production firm alone is unlikely to be able to design and implement each element in the system to realize distribution at a global level for multiple contexts. Given the lack of financial incentives for many production firms to address problems associated with health systems in the developing world, and the lack of resources and coordination among NGOs involved with providing long term solutions, the open collaborative model may be the most logical approach towards the development and sustainability of an end to end media distribution process. This model seeks to involve individual contributors in a coordinated fashion in pursuit of the development of an innovative product or service.[10,11]

Probably the largest up front cost to an open collaborative approach is the creation of a comprehensive modular architecture that supports distributed innovation across geographical and organizational boundaries.[12] However, the end to end process described in this paper essentially already exists, as portions of this process have already been successfully piloted in some programs. What remains is to work collaboratively to convert this process into a system that that could go to national scale in the near term (within 2 years). With basic guidelines outlining the 'how to', interested stakeholders could contribute technology, services and content to the system. Once a dominant architectural design is established, the components of each stage can be improved and adapted for specific contexts (e.g. integrating case management functionality, diagnostic algorithms, etc.). In that way, participants can focus on improvements in the individual components within the framework of a stable architecture.[13]

SUMMARY

How can customized services for specific country contexts be delivered by a standardized process or put another way: how can customization be delivered at scale?[14] This is essentially the challenge before health systems struggling to realize the apparent potential of these new technologies beyond the concept or pilot stage.

Nigeria, Ethiopia, Pakistan and India are all piloting mHealth programs that, at the individual project level at least, are successfully applying many of the stages that make up the end to end content distribution process depicted above. These include user centric design practices during needs assessment, targeted educational materials produced to address specific health worker educational requirements, and adaptation of existing content for counseling with clients and sharing with the community leading to customized deployments on mobile devices. Despite these different locations and contexts, these programs can provide a basis on how collaboration can leverage the cost of existing investments in technology and content.

What is needed is a collaborative effort to convert the principles of this end to end process into a system for content delivery. This effort will consist of two broad components: technical specifications that define the relationships between each stage of the process so that developers can add new, or enhance existing, functionality, and guidelines to enable training and support organizations in developing countries to easily institutionalize the content adaptation and distribution process. This reconfiguration of the stages of the process into an integrated system for content delivery can help countries move away from the fragmentation that plagues most efforts surrounding mHealth implementations and towards a scalable, cost effective approach that can respond to local needs on a national scale.

Photo: Global Health Media Project

ENDNOTES

[1] GSMA :The Next Frontier: Digital Health for Scaled Impact Published: September 23, 2014 | By Craig Friderichs

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[9] Oppiamobile Overview. Source: https://digital-campus.org/oppiamobile/overview developed by Digital Campus

[10] Baldwin, Carliss, and Eric von Hippel. "Modeling a paradigm shift: From producer innovation to user and open collaborative innovation." Organization Science 22.6 (2011): 1399-1417.

[11] Successful variations of the open collaborative model are well established in the private and non-profit sector as well as hybrids which involve both sectors. The development of the Linux operating system and Wikipedia, the collaborative online encyclopedia, are classic examples of the open collaborative approach but organizations such as IBM and P&G (formerly Proctor and Gamble) have made open collaboration a part of their business model.

[12] Baldwin, Carliss, and Eric von Hippel. "Modeling a paradigm shift: From producer innovation to user and open collaborative innovation." Organization Science 22.6 (2011): 1399-1417.

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