The Computerworld Honors Program

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Final Copy of Case Study

Status:
Winner

Year:
2013

Organization Name:
Grameen Foundation

Organization URL:
www.grameenfoundation.org

Project Name:
Mobile Technology for Community Health (MOTECH)

Please select the category in which you are submitting your entry:
Health

Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less.)

In 2011, 6.9 million children died before their fifth birthday and nearly 300,000 women died during pregnancy or childbirth. A lack of trained healthcare professionals working in rural areas make the poor highly vulnerable to disease, debilitating emergencies and significantly shortened life spans. Can information delivered over a mobile phone improve someone's health and the quality of care received in a rural clinic? The Mobile Technology for Community Health (MOTECH) initiative in Ghana is a partnership between Ghana Health Service, Grameen Foundation and Columbia University's Mailman School of Public Health. Funded by the Bill & Melinda Gates Foundation, the project aims to determine how to use mobile phones to increase the quantity and quality of prenatal and neonatal care in rural Ghana, with a goal of improving health outcomes for mothers and their newborns. MOTECH has two interrelated mobile applications: Mobile Midwife and the Nurse Application. A key innovation of MOTECH is linking these components. If a patient misses scheduled antenatal care, the Mobile Midwife service sends a message to remind the woman to go to the clinic. If she fails to attend, her nurse

is alerted via text message enabling the nurse to follow up quickly. Community healthcare providers collect patient data and upload records to a centralized database. Patient records are analyzed to establish personalized care schedules, and reminders are sent to nurses and patients about care visits. MOTECH has worked to overcome several challenges throughout the project's history. A 150-page "lessons learned" report was created to document these challenges. It includes everything from content development to registering users to business sustainability analysis of providing nurses with dedicated mobile phones and the solutions that were found. The full "lessons learned" document can be found here: http://www.grameenfoundation.org/sites/default/files/

When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less.)

The project is updated every day and several new technologies and innovations have been added since its initial deployment including the following examples. First, to streamline data collection for the health workers in rural health facilities, the team created a "simplified register" that gathers the most essential patient data. The simplified registers are a condensed version of the longer prenatal and child welfare-related registers that the nurses were using. The existing registers were analyzed and condensed for efficiency, maintaining only the most relevant fields and reformatted for ease of use. This was to ensure that the mobile interface was being modeled after an efficient patient registration system. The simplified registers also served to consolidate information to better track patients over time. Previously, this data was spread across four separate registers (antenatal care, delivery, post-natal care for the mother, post-natal care for the child) making it very difficult to review. A second innovation was creating the "MOTECH Suite". While the platform can be used for many things, it is best suited for mHealth applications which want to improve health by sending messages to patients and caregivers based on an evaluation of the recommended schedule of care compared to the patient's health-related actions. Some features of typical MOTECH-based applications are: Communicate information to patients via voice or SMS according to a schedule of care defined for the patient's condition. Alert caregivers of the adherence status of their patients. Facilitate communication between patients, caregivers, and administrators. MOTECH has had 2,878 commits made by 79 contributors representing 162,910 lines of code mostly written in Java with a very low number of source code comments. It took an estimated 41 years of effort (COCOMO model) starting with its first commit in February 2011 and ending with its most recent commit.

Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)

The MOTECH system was launched in the Upper East Region of Ghana in June 2010 and was replicated in Ghana's Central Region starting in September 2011. Last year the project was awarded a "transition grant" from the Saving Lives at Birth Grand Challenge for Development, co-funded by USAID, the Bill & Melinda Gates Foundation, the Norwegian Ministry of Foreign Affairs, the World Bank, and Grand Challenges Canada. This funding is enabling the MOTECH program to expand to two new districts and reach

approximately 14,000 pregnant women and 46,000 children under five. To date the project has trained 266 Community Health Workers, uploaded close to 150,000 medical records, reached 20,000+ enrollees including 10,000+ Mobile Midwife Enrollees and delivered close to 60,000 messages. The project is 9 months into the first phase (year one). Year One (March 2012 March 2013): Carry out baseline study, establish monitoring, evaluation framework within a context of leadership, national oversight and involvement of the Ghana Health Service (GHS). Develop culturally appropriate content for third region, translate content into third language, and scale to third district. Transition management of current two district pilot sites to GHS, documenting the required support processes and GHS resources required. Develop a business model for the national scale of Mobile Midwife Test and validate the MOTECH software platform to ensure it can perform at volumes and loads required for provision of nationwide service. Year Two (April 2013 March 2014): Create culturally appropriate content for region translated into fourth language and scale to fourth district. Transition third district to the management of the GHS. Transition the management of the server and call center. Establish a public-private partnership with a major telecommunications company to take to scale.

Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)

Patricia Akologo, a 26-year-old teacher (six months pregnant). Started receiving messages in July 2010, but had a miscarriage in her first trimester of the pregnancy. She conceived again. Here's what Patricia had to say about her experience using MOTECH: "As a pregnant woman I did not know how to handle bleeding and other disturbance sometimes; we are made to resort to local herbs as a remedy. I didn't know what type of food was recommended for me as pregnant woman. I only heard about exclusive breastfeeding but did not know much about it until I started listening to the messages. I did not report the first pregnancy early and I used to do all kinds of hard work without considering my pregnancy. Through the messages I now know fruits and vegetables are good for me and my baby, and I reported my current pregnancy in the first month because I did not want to lose it. I am not worried of missing my antenatal visits because I will always be reminded by MOTECH, and even when I am approaching delivery I will be reminded to prepare so I am sure this time I will deliver successfully. I have decided that I will do anything MOTECH asks me to do because I know it will benefit me. I will try to educate other women and will expect them to also tell others. I would like that the messages are sent through the radio too or the use of agents so that those without phones can also have access to the information."

Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)

MOTECH has taken simple technologies and adapted them to local needs while simultaneously creating a platform that numerous mHealth providers can plug into. It is both an innovation and best practice for how mobile technology for development can be leveraged and scaled. Bill Gates recently referenced the unique power of MOTECH in a blog post. He said, "Digitally-enabled health care, or mHealth, is one area that has been slow to emerge, because it is difficult to build a great platform and then convince

everybody in a health system that it is worth using. If some health workers use cellphones to send information to a central database, but others do not see the value, the digital system is incomplete and thus just as flawed as the current paper system. The most promising mHealth project that I have seen, called Motech, focuses on maternal and child health in Ghana. Community health workers with phones visit villages and submit digital forms with vital information about newly pregnant women. The system then sends health messages to the expectant mothers, such as weekly reminders about good pre-natal care. The system also sends data to the health ministry, giving policymakers an accurate and detailed picture of health conditions in the country. Those working on AIDS, tuberculosis, malaria, family planning, nutrition, and other global health issues can use the same platform, so that all parts of a country's health system are sharing information and responding appropriately in real-time. This is the dream, but it works only if frontline workers are inputting data, health ministries are acting on it, and patients are using the information that they receive on their phones."

If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)

Grameen Foundation's core values include the following: We first seek to form partnerships with those who can advance our mission before acting alone. We respect, invest in and promote local social entrepreneurs and local ownership. We're proud to note that the MOTECH team is comprised of 13 Ghanaians and two expatriate employees who have been working together in close collaboration with Ghana Health Service for the last three years.