



case practices from southern india





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introduction

India has more than 930 million mobile subscriptions. This is up from about 300 million in year 2002 and is expected to reach 1.35 billion subscribers by 2016. The mobile penetration rate is more than 50% and there is room for further growth. The reach and penetration of mobile phones is almost universal and all-inclusive. The BoP segment has also not been left untouched. The latest data suggests that more than half of the total mobile phones sold in the previous year were smart phones. This suggests that technology is reaching the entire population faster than imagined. This technological surge has also resulted in innovative uses of mobiles for social and developmental impact.

There is a rising demand for communication network, access and services in the rural areas as well. This is substantiated by the TRAI data on growth rate in mobile usability indicators and mobile penetration data, which suggests that the rural wireless subscribers increased from 350.37 million at the end of Sep-13 to 359.67 million at the end of Dec-13. In addition, the rural subscription increased at the rate of 2.65% in Dec-13 as against the decline rate of 0.21% in Sep-13. The share of rural wireless subscription increased from 40.25% to 40.58% in total wireless subscription in this quarter. It is estimated that by 2015, more than 90% of the total population will come under the "coverage gap". This will further enhance the services and access networks including demand for 2G and 3G services. In the given scenario, the stakeholders have set their eyes on themes like network extension in the rural areas, network upgrading, innovative and customized applications, and convergence. The intra- and inter-departmental focus under the National Mobile Governance Framework is expected to spur the service delivery. The onus has shifted to the public agencies like Universal Service Obligation Fund (USOF) to step up mobile networks and coverage.

In this context, it might be interesting to note that rising mobile reach has a new meaning in the social empowerment. Mobiles have become an effective tool for social and behaviour change. The digital inclusion has raised the social position of underserved populations like women. Many mobile-based interventions by the government, non-government organizations (NGOs), bilateral agencies and private sector players have provided local solutions in locally suitable context to many problems. This scenario has resulted in elevated status of mobile phones as an instrument for social and behaviour change. A review of 20 practices for this paper indicates that the mobile phones have emerged as an effective mechanism to derive project impacts in areas like- information dissemination, training of frontline workers and interpersonal communication, and project monitoring and tracking. The case studies are drawn mostly from practices in the Southern India. These practices and projects have been effective on various aspects, whilst have also faced multiple challenges like the inertia against the social and behavioural adjustment vis-à-vis age-old conventional practices.

In this context, there is a need for policy support for the priority sectors like rural based projects. The key to success and greater good can be in collaborative support from the government and other key stakeholders. There is also a need for considering and establishing the mobile phone as an essential utility device and as a potent tool for bringing about social and behaviour change. The need of the hour is to establish a central corpus to support such projects, for research and development aspects and for policy support. This paper on various projects presents the key areas of emphasis in the mobiles-for-development space in India. The challenges against which these practices were conceptualized and devised and the results they are yielding are also discussed here. The paper is expected to emerge as a guide for various stakeholders regarding the various ways in which mobile phones are emerging as a tool for social and behavior change, and the manner in which mobiles hold relevance to support the efforts for development globally.

health management information system (hmis)

Mobile technology for accurate data collection and better disease management by frontline health workers



the challenge

With rising population, the country is facing an acute shortage of expert health professionals who can properly diagnose and treat the masses. The problem is worse in rural areas where well-qualified doctors do not like to venture, because of various reasons including poor infrastructure and lack of urban facilities.

the solution

SughaVazhvu Healthcare has developed a Health Management Information System (HMIS), which is a cloud-hosted application, built on an open source platform. Located in Tanjore District, Tamil Nadu, SughaVazhvu comprises of doctors, nurses and field coordinators who work as a team for making access to healthcare a reality for rural populations. The application has both web based and mobile based versions to enter the data of patients. The web version is used at the clinics accessed over laptops by physicians, while the mobile version is used in the field by community health workers and accessed over low cost android phones. During the enrolment exercise where the entire catchment population demographics are recorded at the household level, down to the GPS co-ordinates through a mobile based intervention, the HMIS is instrumental. The enrolled population is issued bar-coded identity cards

sughavazhvu healthcare has developed a health management information system (hmis). which is a cloud hosted application on an open source platform mobile phones are deployed in community and to the health workers for accurate data collection and better disease management.

and these form the seed database for the clinic. Additional modules built within the HMIS are used to document patient visits, maintain diagnostic information, schedule follow-ups and help in disease management. Other than capturing a detailed history of patient-physician interaction, HMIS has fully functional units for inventory and supply chain management, human resource management, inclusive of training and integration with android based mobile platforms for data integrations. Modules such as monitoring and evaluation, clinical audit, clinical data analysis and community disease mapping aided by geo-visualization have also been developed. Hand-held android phones are deployed within the community to aid in screening interventions for different diseases like Cardio Vascular Diseases, conducting socio economic surveys and for enrolment activities. Mobiles are given to the field level functionaries for patient data collection, which empowers them to function better and with more accuracy.

the result

As a result, there have been over 50,000 patient footfalls; almost 2000 women have been screened for cervical cancer. The service has touched over 10,000 lives through school programs and screened over 6,000 adults for cardiovascular risk factors using android phones. The programme was started with a flagship partnership with UPenn, School of Nursing. It holds the potential of training 700,000 India medicine providers to competently provide first-line primary care in the rural India. The teams were successful in delivering healthcare services to 6003 patients through various channels such as Community and Vision Camps, school based Anaemia Screening and household rapid risk assessments. Theme-based days are also organized regularly for the patients.

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e-toilet

Mobile technology for clean, effective and eco-friendly sanitation



the challenge

UNICEF estimates that about 594 million people, who constitute nearly 50 per cent of India's population, defecate in the open, with the situation particularly acute in impoverished rural areas. But the problem is equally acute in urban slum areas, and also public facilities in urban areas are meagre. The lack of private toilet facilities is also a problem recognised across the country. The existing facilities also face neglect, and this is one of the main reasons why the existing structure is not in use by the public.

the solution

Eram developed India's first electronic public toilet, the 'eToilet', with unique automated features to maximize user experience (e.g. payment mechanism, doors, washing mechanisms). In this project, Eram proposes to refine the eToilet by minimizing water requirements, improving sterilization mechanisms, and reducing necessary power consumption. The venture has taken up the challenge of addressing public sanitation by developing a product that is portable, hygienically maintained, and eco-friendly. eToilet is India's First Electronic Public Toilet. The insertion of a coin opens the door of the eToilet for the user, switches on a light, thus saving

e-toilet is a result of a convergence of electronics web and mobile technologies. it features an automated door opening power flushing automatic closet washing and sterilization and automatic platform cleaning mechanism all backed by sms alerts to inform the control room about the status of water tank and bio gas plant in the event of any errors or failures.

energy also, and even directs the person with audio commands. The toilets are programmed to flush 1.5 litres of water after 3 minutes of usage or 4.5 litres if usage is longer. It can also be programmed to clean the platform with a complete wash down after every 5 or 10 persons use the toilet. After use, in case one forgets to flush, the automated flushing turns on and sterilizes the commode too.

An e-toilet occupies around 20 square feet and has two doors - a sliding door at the front, and a normal door ahead of the toilet. As soon as the coin (entry charge) is dropped, the sliding door opens and the light and the exhaust fan come on. Inside the toilet there is a bucket, mug and all other items. In case the user does not flush the toilet after use, the system automatically does all the cleaning operations.

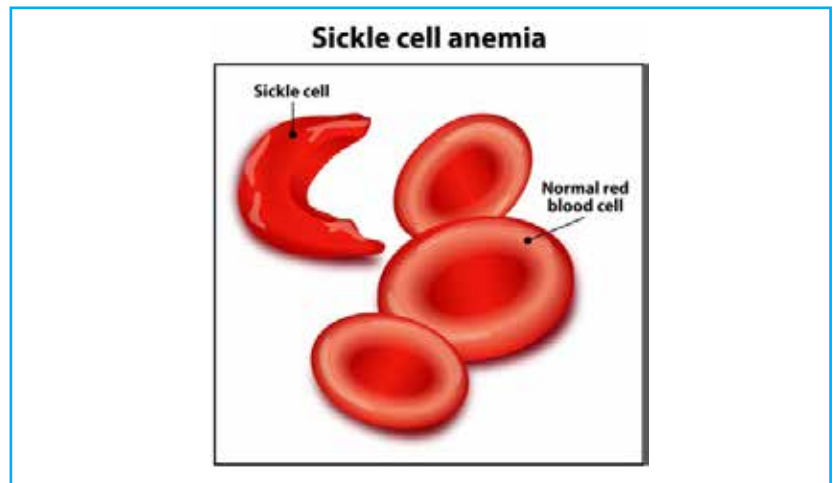
the result

Eram Scientific has deployed over 600 e-toilets in 11 states in the country, out of which more than 200 are in schools, the release said. Till date, over 200 Sewage Treatments Plants have also been set up across 13 states in India.

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mobile app to detect sickle cell anaemia

Mobile technology for accurate and inexpensive detection and diagnosis of sickle cell anaemia



the challenge

Sickle cell anaemia (SCA) is a very common blood disorder found in the tribal areas of India's central and southern parts like Odisha, Madhya Pradesh, Jharkhand, and Andhra Pradesh. There has been no cure found for the disease, but a treatment could help reduce the complications that arise due to crescent-shaped red blood cells that block the blood flow through vessels. About five per cent of the children affected by sickle cell anaemia die before they reach the age of two. Currently, the disease is detected in clinical settings by expensive techniques. Timely detection of the disease remains a challenge in this case.

the solution

Debjani Paul, Ninad Mehendale and Ammar Jagirdar from the Indian Institute of Technology, Powai are all set to revolutionize the use of mobile phones by developing a low-cost and portable lab-on-a-chip diagnostic kit that could detect sickle cell anaemia. This affordable kit can be used even by relatively untrained health workers. The kit will consist of a microfluidic chip combined with a mobile phone-based diagnosis platform which could be used effectively in areas where there is no access to advanced diagnostic equipment. The tiny channels in the chip will trap

the diagnostic kit will consist of a microfluidic chip combined with a mobile phone-based diagnosis platform for sickle cell anemia which could be used effectively in areas where there is no access to advanced diagnostic equipment.

blood samples in such a way that the sickle shaped blood cell is preserved for the next step. The chip is disposable which reduces the chances of transmission of blood from one infected person to another. The patient will add a drop of blood, to a plastic microfluidic chip that is pre-loaded with reagents required to detect sickle cell anemia. The reacted blood will then flow to a detection zone within the chip where the red blood cells will be imaged by a mobile phone camera.

the result

Paul and her team are planning to develop the kit in the next 18 months. The project was funded through a collaboration of the Bill and Melinda Gates Foundation with the Indian government's Biotechnology Industry Research Assistance Council (BIRAC). This particular project was funded through a collaboration of the Bill and Melinda Gates Foundation with the Indian government's Biotechnology Industry Research Assistance Council (BIRAC) through the IKP Knowledge Park at Nalgonda in Telangana. It is one of the good examples of radical innovations which also harness the increasing use of mobile phones for a greater good.

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Governance at the fingertips of citizens



the challenge

The citizens are bound to use governance services like paying electricity bills, property tax, booking tickets and even applying for driving license, passport, pan card, etc. Various channels are available for these services, however attempts are being done to improvise this system, and make it more and more user-friendly.

the solution

On December 8, the lives of the people of Karnataka had been simplified by a new mobile app launched by the government which brought many government services to their fingertips. From paying utility bills, taxes and traffic challans to even applying for passport and registering complaints regarding non-active administration, the MobileOne app is expected to ease the citizens' work to a great extent apart from enabling them to get associated with government services more closely. MobileOne will enable citizens to pay electricity bills, property tax, traffic challans and even apply for driving license, passport, pan card, etc. Users can also book train and bus tickets with the help of the app. The payments can be done through debit/credit cards and online wallets. Government has also launched "Karnataka Wallets" to simplify the mode of payment. The app is available on iOS, Android and, for the

mobile one is a new mobile app launched by the government which brings many government services to fingertips. from paying utility bills taxes and traffic challans to even applying for passport and registering complaints the mobileone app is expected to ease the citizens' work to a great extent apart from enabling them to get associated with governance.

non-smartphone users, the facility can be availed by dialling 161 or *161#. You can also give a missed call on 1800-425-425-425 to activate the service. The service can be accessed from anywhere in the world and will be available throughout the year. The interesting tool will also allow people to be more interactive with the authorities. Users can click pictures of the potholes, dysfunctional street lights, etc. and bring them to the notice of relevant officials. Users can avail the facilities of this app without even downloading it through the website mobile.karnataka.gov.in, where after registering their number they can select the category they want to use.

the result

Launched by President Pranab Mukherjee in Bangalore, the facility claims to have over 4,000 services integrated in it. The application includes 637 government services and 3,644 private services, making Karnataka the first state to provide a single platform to citizens to avail both private and government services. This also makes it the world's largest multi-channel mobile service. Although it is new and there are lots of bugs to be fixed yet, it is mostly useful for residents of Bengaluru as of now. But it certainly is a giant step in transparent and interactive governance, so citizens are applauding the initiative.

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Technology-enabled community based monitoring system of Primary Health Centres



the challenge

Under the ambit of National Rural Health Mission (NRHM), there are many institutional set-ups designed with an intention to create awareness about the health care services. These set-ups also play a role in empowering the communities to have knowledge of their entitlements. At the village level, these institutions may be categorized into Aarogya Raksha Samiti (ARS) and Planning and Monitoring Committee (PMC) at the Primary Health Centre (PHC) level, and Village Health and Sanitation Committee (VHSC) at the revenue village level. Certain barriers like information asymmetry, power imbalance, inefficient decentralization, and excessive bureaucracy hinder the proper functioning of these institutions.

the solution

A technology enabled community-based monitoring mechanism was devised by GRAAM with the objectives of developing a sense of ownership among the community. The technology also aims at reducing the information asymmetry and enabling local representatives to have a voice and look for local problems and solutions. This can thereby help in achieving sustainable outcomes with respect to Primary Health Centres. In order to implement this, a questionnaire was developed with 79

arogyashreni is a technology-enabled community-based monitoring mechanism that utilizes interactive voice response system (ivrs) for ensuring sound monitoring of facilities and services at phcs and for reviewing phc progress.

questions on various aspects of PHC functioning and it was installed on a toll-free Interactive Voice Response System (IVRS). Any selected community member can answer the questions for his respective PHC.

the result

The responses generated by IVRS are validated by physical verification. On the basis of these responses, district-wise ranking of PHCs was generated. Such ranking helps in community monitoring. Further, the changes due to community monitoring are documented. So far the project has been implemented in seven blocks (*taluks*) of Mysore district where there are 139 PHCs. Out of 139 PHCs, 119 exist in the rural areas of Mysore district and remaining 20 are in the urban areas. Rural PHCs were the focus of the project. The project reached out to at least 565 community members who were part of the Planning and Monitoring Committees of the PHCs serving their villages. Out of these 233 were women. The project demonstrates the use of low-cost technology in minimizing data integrity issues, and enhancing community ownership over their own resources. The monitoring process is a joint assessment because of the sense of ownership by the community, rather than a mere inspection.

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category	m- Health

Mobile Technology based health information system



the challenge

There is a gap witnessed in the health information system and diagnosis patients. The increased amount of administrative paper works and referral system reduced the efficiency of the health benefits.

the solution

The solution is designed to extend the existing telemedicine and HIMS systems to mobile technologies. This system uses the mobile communications services to develop generic Body Area Network and a generic healthcare service platform for monitoring the following parameters: ECG, EMG, Pulse rate, Respiration Rate, Skin Temperature, Blood Flow, and Saturated Percentage of Oxygen. mSwasthya also covers various mobile health applications for home care and are available freely for download at mGov store.

arogyashreni is a technology-enabled community-based monitoring mechanism that utilizes interactive voice response system (ivrs) for ensuring sound monitoring of facilities and services at phcs and for reviewing phc progress.

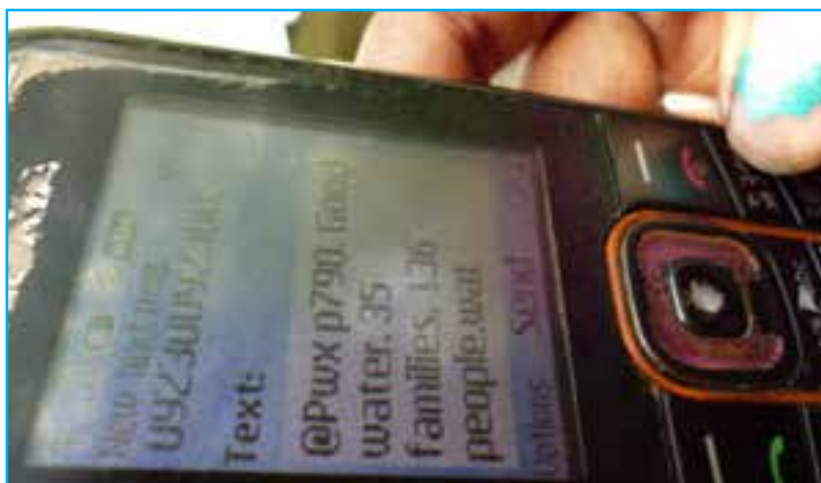
the result

The system has been employed to screen 450 mothers in Mukhtsar, Punjab and app has enabled a 400% increase in number of antenatal care visits. The usage has reduced paperwork, and can be for multiple purposes, like patient history recording, diagnosis and treatment referral, decision support system, antenatal, intra and post natal care delivery and monitoring, ASHA training also.

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category Health

sms reporting tool for wash projects

Mobile-based reporting tool for effective monitoring and tracking of the project



the challenge

As Blue Planet Network CEO Lisa Nash explains, the challenge in the water, sanitation, and hygiene sector is that a great deal of attention is paid to project implementation. But unfortunately up to half of these projects may not be very successful within the first five years, not because of poor implementation, but because there wasn't enough thought about sustainability at the outset. Therefore, in the WASH sector, it becomes crucial for any project to be viable, while also catering to people's needs, and with cultural acceptability. Continuously monitoring the indicators for sustainability guarantee the success of a project.

the solution

Blue Planet Network created an SMS reporting tool to help its members improve their effectiveness while making it easier for anyone anywhere to engage with their work. Various organizations, funders, academics, governments and community members around the world may be connected to plan, implement, monitor, and collaborate on safe drinking water projects. Field notes are automatically added to projects to ensure that all staff is updated, can identify and resolve issues quickly, and can build on great new ideas wherever they emerge.

the sms reporting tool developed by blue planet network is a tool to help project implementers in monitoring and tracking the project and thereby help in improving its effectiveness.

the result

Since deployment, 5 of the member organizations: Ekoventure, Gram Vikas, Palmyra, Project Well and Watershed Organisation Trust (WOTR) have utilized the tool to increase the impact and sustainability of more than 13 water and sanitation projects across India. Project Well utilizes Blue Planet Network's SMS reporting tool to provide status reports on water projects that use modern bore-dug wells. In 2012, Blue Planet Network began a pilot of its SMS-based monitoring system in India. Blue Planet Network's service enables communities, and the member organizations equipped with basic cell phones, to monitor and report on safe drinking water and sanitation installations.

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Mobiles for health care service delivery to the doorstep'



the challenge

India lags far behind in the development indicators, and more so on the health related indicators. On indicators like infant mortality, child malnutrition and maternal mortality, it fares worse than some Sub-Saharan African countries. We have just one hospital bed for 879 individuals versus World Health Organization recommendation of 1.9 beds per 1,000 citizens. The Indian government spends just 4 per cent of the GDP on healthcare, leading to out-of-pocket expenditure from the individuals, comprising about 61 per cent of the total expenditure on health. There is even greater disparity in low-income communities, where there is limited access to primary healthcare. In rural areas and smaller cities, the main source of primary care is government-run primary healthcare centres, which are understaffed and laden with inefficiencies.

the solution

Sevamob utilizes mobile technology to transform the delivery of primary health-care and insurance to low income consumers in the developing countries. At a small monthly subscription, SMSs are sent on basic primary care and medicines and prescriptions are delivered on-premise by mobile clinics with the help of mobiles.

sevamob harnesses mobile technology in a sustainable manner to deliver primary health care at the doorstep. mobiles are used for delivering health care services and medicines with a subscription model and for also maintaining patient records.

The full-time mobile teams have B.D.S. doctors and sales representatives who carry android tablets with mobile software installed in them. Once a patient is subscribed to Sevamob's scheme, the teams pay a visit to their homes with Android tablets. These tablets have mobile software which can operate even without a wireless network so that it can be accessed in the remote rural areas. For advanced care, the teams are supported by MBBS doctors, a 24x7 call centre and a network of third party service providers like hospitals and diagnostic centres. In addition, basic primary care is performed for the subscribers at their doorstep. The services include dental care, vision screening, checking blood pressure, blood sugar, pulse, temperature, nutrition planning, etc. Medicines are also dispensed for common ailments. An integral part of the venture is the mobile app used by field officers, which captures patient demographics and maintains electronic medical record on sign-up. The complete workflow can be monitored without network.

the result

Sevamob has signed more than 2100 subscribers and is covered by 4 field teams. It also claims a monthly subscriber retention rate of 80%. Up until mid-2012, Sevamob was mainly targeting rural areas, but the program is now looking at moving more into urban areas, selling bulk subscriptions to schools, employers, women's organizations and labour unions. With this model, Sevamob expects that each field team will be able to cover 1000 patients. By 2016, they plan to have 1, 20,000 subscribers. The model has been replicated by a partnering organization in Liberia which has established contact with 44 schools and 30 churches.

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category m-Health

Voice based information transaction system deployed for ICDS



the challenge

ICDS is one of the world's largest programs for pregnant women and early childhood development providing supplementary nutrition, immunization, health check-up, referral services etc. The success of the ICDS program is hampered by enormous amount of data generated and distortion in government records. National Research Development Corporation (NRDC) approached Prof. Jhunjhunwala, a well-known lecturer at IITM, directing the Telecommunications and Computer Networks group (TeNeT) to suggest a solution for the success of Integrated Child Development Scheme (ICDS). He found out that the focused population is mostly illiterate so a voice-based solution available in their local languages would be successful. He asked Uniphore to assist for this purpose.

the solution

Uniphore's VoiceNet system Personalized Voice based Information Retrieval and Transaction System (PVIT), integrated with mobile phones with verification and local-language voice-recognition was deployed to aid medical care distribution in India. Initially, the program was implemented in the Anganwadi centres in Madhya Pradesh, where ICDS executes its functions. The work process was very simple. Af-

voicenet system is a personalized voice-based information retrieval and transaction system which is being deployed for an ambitious use in integrated child development scheme (icds), for supplementing the scheme in a literacy-neutral manner.

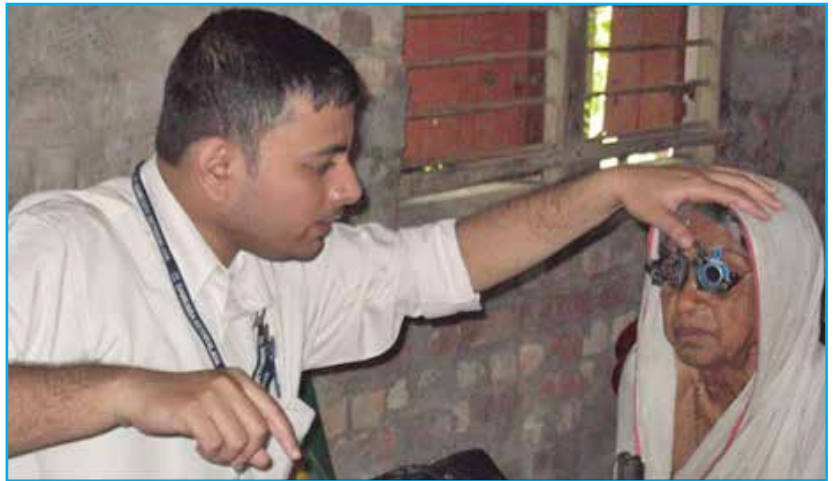
After identifying herself in the voice biometrics system, a mother accesses the system by calling through her cell phone. All this can be done vocally, making the program literacy-neutral. After verification of her identity, she can get access using voice to more details about her kid's health and advantages she has obtained from ICDS. This information is instantly submitted on a web portal, where the administrators can view it in real time. This web portal stores all the information regarding the child's weight, supplementary nutrition packets received, immunization schedules, growth charts, etc.

the result

The use of Voice Net in ICDS was designed as a lead effort to analyse the effect of such technology on non-urban growth and welfare schemes. It has received many achievements and popularity now. The information was accurate, the process was transparent, and the follow-up was immediate. Also, the enhanced data collection process enabled better service delivery and more efficient operations. This proven technology was used to collect maternal and child health information and monitor the delivery of ICDS services in Madhya Pradesh, where malnutrition-related mortality is higher than sub-Saharan African countries. About 589 mothers, 702 children, 9 Guardian and 3 supervisors had registered themselves between the months February 2010 to June 2010, enabling immediate analysis of health information and monitoring delivery of services. The data collected using Voice Net was viewable on the ICDS web portal by various stakeholders, state and central government officials ensuring transparency. The users, most of whom were Below Poverty Line, rural and tribal mothers with little or no education, were comfortable in using the voice based system as it was in their local dialect and the system proved successful in health data collection and monitoring.

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category Health

A customised mobile application to overcome eye care challenges in remote areas



the challenge

Sri Kanchi Kamakoti Medical Trust has been providing quality eye care facilities to the poor since 1977, through the Sankara Eye Care Institution. Their vision is help people get freedom from curable and preventable blindness at affordable prices. They face multiple challenges on their way to provide better eye health to everyone. The project addresses multiple challenges faced in outreach programs in remote areas such as lack of network connectivity and electricity, field workers' accountability, apathy of rural poor, dropout issues and data accuracy.

the solution

To make the service delivery easier, they launched an Android mobile app Eye-Connect, to automate community eye care. The field workers from the institution use mobile phone to identify people in the villages who need eye care. The identified patients are referred to the medical camps organized at a nearby location using a Decision Support System. This smart app also provides information about eye-donation, eye-care facilities and various audio-visual tools to make the information more interactive and comprehensive. The application also promotes awareness of eye ailments, eye do-nation and availability of eye care services by showing audio-video

eye connect is an android-based customised mobile application to overcome eye care challenges in remote areas. it also provides information about eye-donation eye-care facilities using various audio-visual tools.

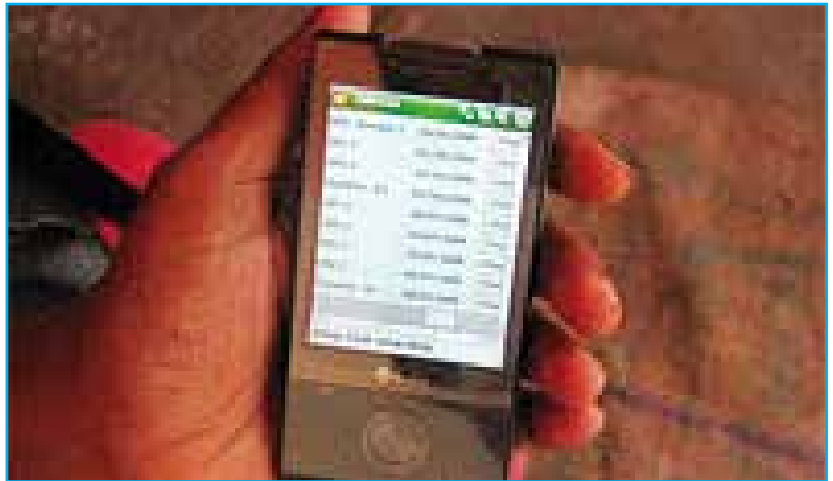
educative tools to rural households. Furthermore, the application screens individuals and refers them to base hospitals for surgical interventions, guides identified individuals to forthcoming nearby camps through a geo tagging feature and uses captured information to plan future eye care service delivery activities.

the result

The pilot project launched in 2013 has benefitted over 700 users so far. Established in 1977, The Sankara Eye Care Institution today has 13 eye hospitals across 6 states of India and provides eye care to the poor.

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Best use of Technology in Tele-health



the challenge

Registration and updating of the beneficiary records in the 'MOTHER' system directly from remote locations, was a big challenge, owing to poor internet connectivity. Field workers started collecting the beneficiary details manually in the prescribed registration forms and in the evening, records are being updated online from the Mandal Headquarters. Voice alerts are being pushed from the system to the beneficiary mobiles and it is unilateral Communication (Push Method). Beneficiary can't call back and interact with the system. To facilitate the beneficiaries, phone numbers of health officials of the PHCs have been circulated to the beneficiaries during registration. In many families, mobile phones are only with husbands and they receive the voice alerts. Most of the husbands are not interested to know about the basic support to be provided to women during pregnancy and child care. They feel that it is the duty of the women. Sensitizing the husbands was one of the major challenges faced by our team. As part of MOTHER project, village level awareness meetings were organized to sensitize the men to listen to the voice alerts and pass the information to their wives. Compared to SMS, voice calls are costlier. Moreover, service providers charge based on call duration and number of calls made per month. So, the voice alerts were designed in such a way that each call will be less than one minute and each alert will be sent two times in a day. Only critical alerts (such as expected date of delivery) will be repeated more than 3 times.

voice alerts are being pushed from the system to the beneficiary mobiles and in unilateral communication (push method), to raise awareness among the people regarding health.

the solution

Any national/state departments implementing development programmes can effectively utilize this system to create awareness among the target group. Sensitizing of gender equality among the community, School Health Programs, awareness on Water and Sanitation, specific programmes related to Adolescent, Reproductive and Sexual Health (ARSH), HIV/AIDS awareness etc. This system can be customized and used as an 'Add-on' with the existing systems, wherein mobile numbers of the beneficiaries is the key parameter. Government of Andhra Pradesh adopted the concept and scaled up across the state of Andhra Pradesh.

the result

Considering the level of mobile penetration in India and literacy level among rural women voice calls (MOTHER) is the best model to reach-out the target beneficiaries directly at affordable cost. MOTHER project could be well adopted in the national or state level programmes to create mass awareness among community through mobiles, particularly in the domains of agriculture, animal husbandry, fisheries, health, education, social welfare, livelihood promotion and disaster preparedness. MOTHER project has been scaled up to all districts of Andhra Pradesh by Health Department with minimal customization. This model can be integrated with Mother and Child Tracking System (MCTS) of National Rural Health Mission (NRHM) at national level. Government of Jharkhand has shown interest to use the 'MOTHER system' for their 'Drinking Water and Sanitation Programme' to sensitize the rural and urban community in all 24 districts of the state.

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peer water exchange programme

Affordable technology to get frequent updates on project progress and long-term operation and impact



the challenge

Around a billion people lack access to safe drinking water while 2.6 billion lack access to hygienic and dignified sanitation facilities. Progress against these global crises has been slow despite several decades of efforts. Many rural water and sanitation projects are plagued by inefficiencies and a majority of them do not meet the initial expectations of success. In addition to tough field conditions, there is shortage of computers, lack of computer literacy and little or no internet connectivity. This scenario creates a high level of opacity in the progress of the project. Long-term impact assessment programs are extremely expensive and virtually non-existent in present times. Therefore, it becomes very difficult to track and monitor the progress of such programmes.

the solution

Peer Water Exchange's (PWX) launched an SMS interface for receiving field reports on water and sanitation projects. This SMS-based reporting is designed for monitoring the implementation and post-implementation of the projects, by the people who are directly affected by it. Field personnel living and working in remote areas can send in SMS notes which are attached to the project reports transparently on

peer water exchange is an sms-based reporting system for monitoring and reporting on the implementation and post-implementation of water and sanitation solutions by the people affected.

the website. Field reports help managers and funders to monitor, track and address the issues. The technology behind PWX SMS Reporting is standard SMS technology at client side; and SMS gateway is txtWeb (by intuit) and Android gateway. The solution is free for non-profit members serving their communities. If the projects generate revenue or the operator is not non-profit, a monthly fee is charged per project. Three organizations have participated in the pilot, which are Project Well in Bengal, and Ekoventure and Humana People to People India in Tamil Nadu. PWX will gather feedback and will attempt to roll out the system across India.

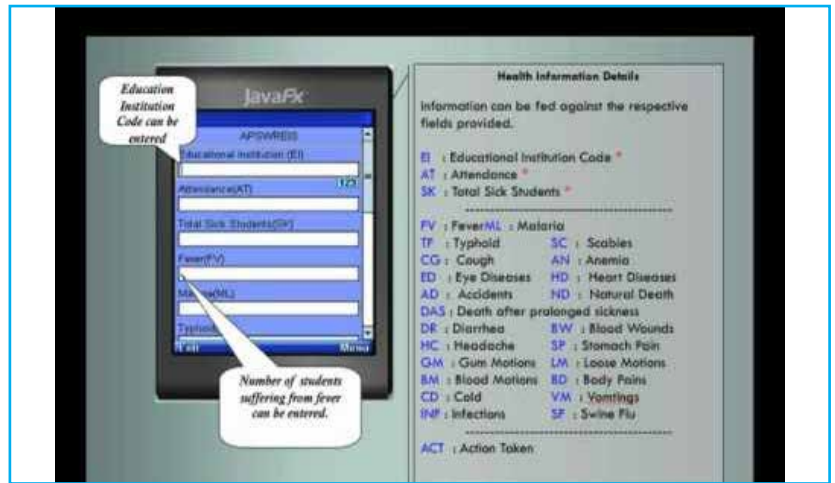
the result

The intervention is already being utilized by four organizations in India, and three more are trialling. This service has helped in connecting the field personnel working in remote areas without internet coverage. PWX converts the SMS received into a status report attached to the main project report on PWX. Field reports help managers and funders who work from far away locations to keep track of progress of the project and any issues and act on them. These reports allow the entire organizations to learn and share since they replace bi-lateral communications with broadly visible storage and distribution channel. The natural extension would be to have beneficiary villagers (the billions without water and sanitation) report on the projects themselves on a regular basis, thus allowing them to share the results of development.

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students health information tracking system (swhits)

Protecting the health of children through mobiles



the challenge

There is a gap witnessed in the dissemination of information concerning students' health, especially school-going children. In the residential schools, there is a gap in the health monitoring of children staying away from home. Andhra Pradesh Social Welfare Residential Educational Institutions Society (APSWREIS) has 353 residential educational institutions with total student strength of 1.54 lakh, funded by the State Government and administered by an IAS officer. Also, the manual methods make the tasks strenuous, expensive and not always yield the expected results.

the solution

Students Health Information Tracking System was developed to fill in the gap witnessed in dissemination of information concerning students' health. It was aimed at providing better monitoring mechanism of the health of the school children, increasing transparency and reviewing whether a hygiene environment is maintained in these residential institutes. The Principals/Medical Officers of the residential schools which are often located in remote areas send daily status of the general health of children as an SMS to the centralized office. A simple software application, using templates to furnish these basic details, is installed and used on the mobile phones

suwhits is a tracking system devised to address and bridge the gap witnessed in the dissemination of information concerning students' health in the residential schools.

of the school authorities to simplify the process of sending the SMS. This is done depending on the health status of the pupils from an institution over a period of time. This is done using a simple software (J2ME application), which is used to furnish the basic details on the mobile phones of the school authorities. MIS reports are developed in various formats including tabular, graphical charts and Google maps. The administrator is alerted with a blinking signal on the Google map when an institution reports more than 10 pupils suffering from a single category of disease. Another facility integrated in the application shows the direction on the Google map from an institution to the nearest Primary Health Centre (PHC).

the result

The innovation here is the use of widely accessed form of simple technology, in bridging the gap of information between the administration and the grass root level institutions. This project is a student health information tracking system that helps in monitoring mechanism and reviewing of the hygiene. Till July 2014, the project has reported information about 353 institutions and about 1.5 lakh students. It has proved to be an innovative scheme in monitoring the health status of poor children from disadvantaged sections of the society enrolled in these residential schools.

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category	m-Health

Mobiles for monitoring and tracking of water availability



the challenge

The problem of shortage and irregular supply of water is prevalent everywhere. With searing temperatures, India is struggling to keep the domestic water supply going and many Indian residents have to rely on water trucks to get enough supply for their homes. Nearly one million people of Hubli get water only every three to five days, for about four hours a day, a situation not unusual in water-starved India. Water is released by valve-men at odd times throughout the day, which means consumers often have to wait by their taps for hours. Most of the people in the area cannot afford large tanks or wells to store water.

the solution

NextDrop has devised a mobile phone-linked system which connects the valve-men to the engineers and customers. A missed call has to be given on 07795590931 to mobilize a phone, and then the system provides information on water availability to residents via automated calls and text messages and provides information to utility engineers through web based dashboard. It serves water utilities by collecting rich data on true water delivery outcomes and making live data accessible to water utility engineers so they can quickly identify and address problems. Valve-men measure

next drop provides information on the water availability to residents via automated calls and text messages and provides information to utility engineers through web based dashboard.

the level of water in reservoirs every day, and then NextDrop calls them every hour to get information on the levels. NextDrop sends the information to the engineers, who decide which areas should get water at what times, and how much, depending on supply. They then text the valve-men, who in turn text the customers and let them know exactly when the water will be released.

the result

The project has minimized the time spent waiting for water and allowed the consumers, who are basically women and children to do other productive activities. The project has brought transparency in the water distribution system. In addition, the project has addressed the problems the households face by using unsafe and expensive water, thereby reducing the risk of water borne illness. NextDrop now charges Rs. 10 per month for their service, and over 25,000 Hubli households have signed up already. Bangalore One, Government of Karnataka has now tied up with Next Drop Smart Water Systems Pvt. Ltd. for delivering the service. Citizens who have already registered with Next Drop for receiving SMS Alerts on water distribution schedule of KWB can pay their renewal fee at all Bangalore One Centres. Four packages are available for renewal based on the period of renewal.

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amrita clinical decision support system

Mobile phone based clinical decision support technology



the challenge

Due to acute shortage of doctors in the rural areas, it is very challenging to deliver health care services to the last mile. In this scenario, most of the rural populace visits unskilled or semi-skilled medical practitioners. These practitioners deliver health care services in the rural areas, where many deliveries are still taking place without institutional set-ups often they might not be able to handle medical cases with the dexterity a skilled practitioner would have. Because of this, training and skill-enhancement of such practitioners becomes very important to solve the problem of health care service delivery in the rural areas. Standardization of practices and procedures may also be instrumental in delivering health care services to the villagers.

the solution

Empowering the semi-skilled practitioners is the most practical solution for delivering health care in remote village areas. With this premise, a team of doctors from Stanley Medical College and a group of engineers from IIT- Madras and NITK started working on a decision-support technology for village health workers. Amrita Clinical Decision Support System is a mobile phone based clinical decision-support technol-

amrita clinical decision support system is a mobile phone-based clinical decision-support technology for the village health providers which enables them to take better decisions with respect to diagnosis treatment, referral monitoring and follow-up of patients illness.

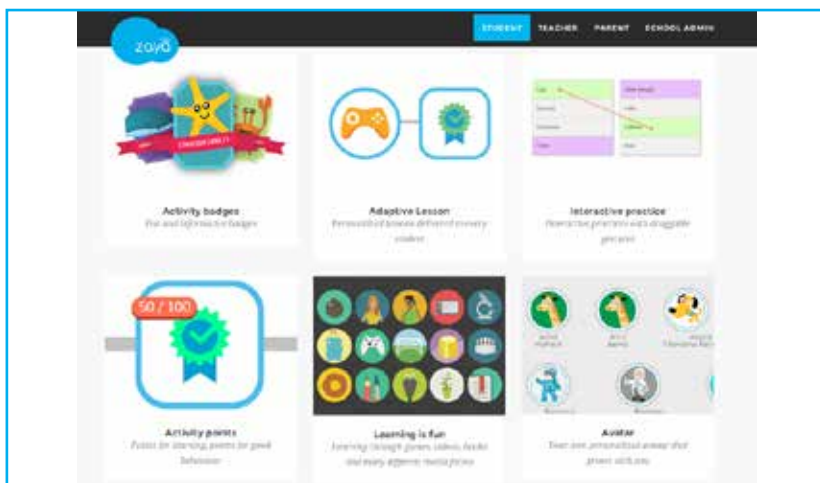
ogy for the Village Health Providers (VHP). It is an antenatal, postnatal and childcare protocol app which can run the Indian languages on low-cost, JAVA-based mobile phones and has no connectivity dependence. The technology is used to provide maternal and child care services, thereby reducing mortality rates, and helping VHWs in accurately diagnosing their patients. This mobile- phone based solution can be supported by any Java, Android and Blackberry mobile phone. The health-provider needs to be trained only once and unless there is a major overhaul in protocols, they only need to update the version of the decision-support from the remote server.

the result

The way technology has been used in this project significantly reduced the pre-requisites for a villager to become a qualified health-provider. This also improved compliance and adherence to medical protocols. It was noted that the mobile phone based decision-support technology in vernacular language helps the village health-worker, in arriving at presumptive diagnosis, treatment plan, filtering cases for referral and follow-up of patients essentially deskilling the job of a VHW. The cost-effective way of investments needed for both technology and human resource makes the solution a scalable one. About 95% of the total number of pregnancies and 75% of the VHPs in the project region in Tamil Nadu were registered and monitored with the help of the app. A drop of 20% in the outpatient costs including drugs was reported as a result of its usage.

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Technology-enabled educational delivery system



the challenge

Internet has penetrated in every aspect of our daily life from shopping to education. Educational experience has been revolutionized with online classrooms and new learning devices like the tablets etc. Nevertheless it is important to see how all this is affecting the people at the base of the pyramid who truly need access to better quality education. Many children do not have access to quality education, despite attending the schools. Despite Right to Education (RTE) act in India, the numbers have not actually resulted in qualitative improvements. The “brick-and-mortar” model of education system has in a way failed to deliver to the bottom of the pyramid.

the solution

Blended learning is a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path or pace. While still attending a “brick-and-mortar” school structure, face-to-face classroom methods are combined with computer-mediated activities. Zaya provides a learning environment using computers and mobiles/ tablets. Also, regular monitoring is done to see if the project has had an impact on the learning experience of the child and necessary support is provided

classcloud is a technology- enabled solution by zaya which aids and supplements learning in the traditional brick-and mortar educational system it is an education delivery system deployed with the help of mobiles tablets and laptops. it also contains mechanisms to monitor the level of learning for the students individually.

to the teachers in terms of using the educational resources. The main products are ClassCloud and Blended Learning. ClassCloud is an online education device, which is a cloud based mobile (2G/3G) wireless toolkit with a learning system that can run online as well as offline. This allows users to connect to the common "ZayaCloud" servers with their mobile phones, tablets, laptops and desktops. The Learning Management System that runs on ClassCloud can be updated locally without Internet connectivity and syncs up to the cloud regularly.

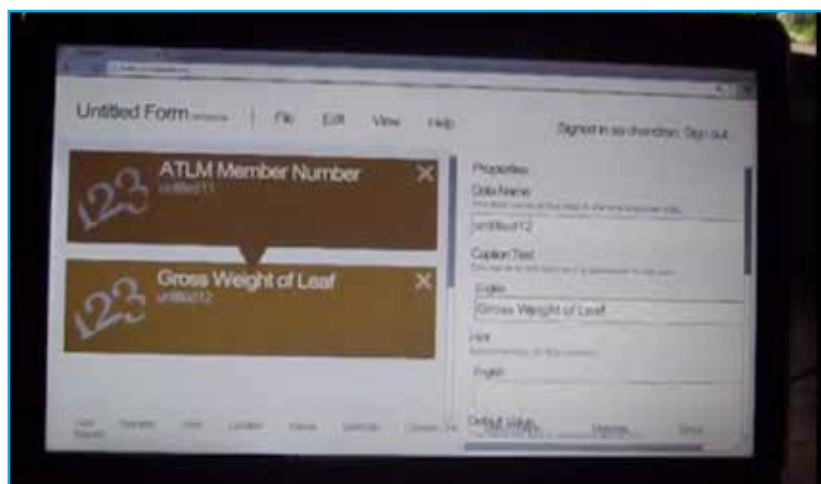
the result

ClassCloud strives to solve the problem of providing access to the last mile of schools, orphanages and learning centres. Since it is a cloud based system, user data is always synced to the cloud and can never be lost even if the system fails. It has reached out to 2 schools in 2 different states in India, and has also spread out to Mongolia and Indonesia.

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category m-Education

adivasi tea leaf marketing (atlm) paperless workflow

A mobile app to make workflow paperless and to empower the local community



the challenge

In the Nilgiris in Tamil Nadu, populations of Tribals (*Adivasis*) tea leaf cultivators have been exploited since years by the middlemen. They could not realize the true and fair price of their produce. There was a need for a 'Community Owned Information Infrastructure' in the Tribals (*Adivasis*) community of the Gudalur Taluk in Tamil Nadu. The larger goal was to first create a successful, mature prototype, which could then be applied across a wide range of communities and situations anywhere in the world.

the solution

ATLM programme enables Tribals (*Adivasis*) tea growers to market their produce at fair prices with the help of a mobile app. ATLM is a working group within a parent tribal organisation called AMS - Adivasi Munnetra Sangam. The AMS was founded by another organisation called ACCORD, which works on tribal rights and livelihood. Both of these organizations are based in Gudalur (Tamil Nadu). This organization buys their fresh leaf and sells to processing companies. ATLM, which earlier used to work with paper receipt books and registers, has successfully implemented a mobile app for processing the orders and ingesting them into the database in a paperless workflow. This project utilized the Open Data Kit (www.opendatakit.org) to craft a

atlm paperless workflow is a mobile-based system to aid in marketing of tea leaf grown by tribals (adivasis). the mobile app developed by open data kit helps in keeping the workflow paperless by processing the orders and ingesting them into the database.

solution. The Open Data Kit is an existing open source data collection software suite aimed at the development sector.

the result

The real achievement here is that the entire solution was designed, tested and rolled out by an all-adivasi team using the Open Data Kit. It was found that modern android devices are quite capable machines, and the ecosystem was thriving with a massive range of apps and capabilities. The main purpose of this project was to demonstrate the positive change communities can bring about, with a little support and capacity building. The project was sustainable because the community was handling it directly. The project has grown quickly and rapidly with little heavy-handed intervention by the organization. By delegating duties such as training to the Adivasis, the programme achieved a level of adoption that usually requires far more extensive hand-holding.

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category m-Inclusion

A Doctor's Clinic on the Go

**the challenge**

Almost everyone today has mobile phones and also access to the internet. There are issues in providing health care in emergency cases, despite such connectivity. Therefore, this connectivity needs to be harnessed for better and faster healthcare delivery. Technological intervention will also reduce the costs of publishing reports and prescriptions.

the solution

Idea Brahma Consulting has produced the clinic management system as 'Vbond Vita' for doctors and their clinics on tablets, smart phones and web. With Vita, doctors can "Carry their Clinic" anytime, anywhere to manage patients, electronic medical record, e-prescription, referrals, appointments, Lab Management among others. Vbond Vita has comprehensive features to manage customer relationships for hospitals, diagnostic centres and health and wellness centre. The solution is based on zero IT Capital infrastructure and compliments maintenance and Value Added Services for patients to improve loyalty and stickiness to the system. The Vbond Vita Clinic management system offers doctors an easy to use dashboard that is both simple and user friendly. It serves as the main portal to access various features. Any doctor can

Vbond Vita is a dashboard for doctors to manage patients electronic medical records e-prescriptions referrals appointments and lab management the dashboard has inbuilt features for managing customer relationships for hospitals diagnostic centres and health and wellness centres.

view his or her appointments for the day, check for any new updates on drugs etc., set their practice's operating hours as well as recharge their credits. In developing countries like India, where there are many unorganized clinics, poly clinics and small hospitals, Vbond Vita can be very helpful for medical practitioners. Since doctors are not much habitual of carrying laptops, technology based on mobile phones is convenient for health professionals to serve the patients.

the result

Not only does the project solves the problem of providing health care in emergency cases, but also reduces the costs of publishing various reports and prescriptions. The project enables these reports to reach the doctor in a record time of less than 30 seconds, even via normal GPRS connection. Within 6 months of launching Vbond Vita, almost 600 doctors are already using it. It receives over 1 lakh unique registrations per month.

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category m-Health

dristhi: development and impact assessment of an mhealth package for rural india

m-Health for Maternal Health



the challenge

The Auxiliary Nurse Midwives (ANMs) work at the community level monitoring and treating pregnant women and their infants. Each ANM serves a rural population of three to five thousand women and children. At present, they use paper-based reporting registries to keep track of all their patients. The paperwork for each patient is considerably burdensome and time-consuming. Each ANM carries a large stack of these paper records around with her, and this gets in the way of treating such high volumes of patients. There is a clear need to get the focus back on addressing infant and maternal mortality.

the solution

The mobile-health app, named DRISTHI, omits the necessity of carrying heavy stacks of paper registers by ANMs and enables them with real-time updating and reporting of patient records. DRISTHI mHealth system builds upon the Mother and Child Tracking System (MCTS) implemented by the National Rural Health Mission and registers all beneficiaries across the RMNCH continuum. Given the thrust towards mHealth in India, a Wellcome Trust funded project titled "Development and Impact Assessment of an mHealth Package for Rural India" is being undertaken by a consortium led

drishti is a mobile app that helps ANMs in tracking maternal and infant health. Moreover, it helps them in counseling of pregnant women and improves coverage rates of vaccinations for children.

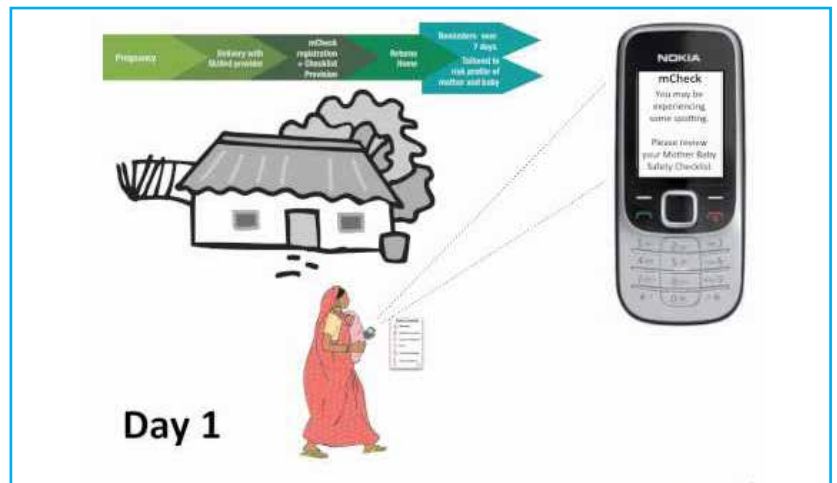
by Foundation for Research in Health Systems (FRHS) and including the Department of Reproductive Health and Research, World Health Organization (WHO), and Earth Institute, Columbia University. The project, which piloted in Karnataka, develops a “mHealth Package” - a strategic mix of mobile technology applications and support materials - to support NRHM’s reproductive, maternal and child health (RMCH) services. Data collected by accredited nurse midwives (ANMs) via digital forms loaded on tablets, is used to assist existing service provision through a suite of mHealth tools on tablets. These range from using multi-media content to strengthen counseling for contraceptive choice for couples of reproductive age; to the use of reminder messages to clients to increase timely antenatal care (ANC) for pregnant women. Alerts for providers are also sent to increase timely antenatal care (ANC) for pregnant women, and improve coverage rates of vaccinations for children.

the result

The project was piloted in Karnataka, and a “mHealth Package” was developed with a strategic mix of mobile technology applications and support materials to support NRHM’s reproductive, maternal and child health (RMCH) services. The technology was very easy to use, was provided free of charge, and is now being developed with the intention of scale-up following rigorous pilot testing, impact assessment and revision. The resulting intervention will empower rural health workers and their clients, assisting them across the range of Reproductive, Maternal and Child Health care, integrating and streamlining data with existing HMIS standards for enhanced provider performance and population health outcomes.

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category	m-Health

Saving lives with the help of mobile phones!!



the challenge

Due to lack of guidance, many-a-times mothers and their family members are clueless on ways to identify danger signs in a woman who has recently given birth or her newborn baby, and about the actions to be taken. This mobile app is an effort to help the mothers and their family members to identify danger signs and also to encourage the mother or her family to seek appropriate care when required.

the solution

The Mother/Baby 7-day mCheck programme was developed by WHO Patients for Patient Safety Champions, a network of patients from around the globe who are committed to improving patient safety by empowering patients. This programme's aim was to help mothers and their family members in identifying danger signs in a woman who has recently given birth or her newborn baby and encouraging the mother or her family to seek appropriate care. The paper checklist was complemented by a mobile phone birth registration and voice message reminder system in order to facilitate both the delivery of the tool and use of the tool after delivery. Upon identifying any of these danger signs in either herself or her baby, the tool can help a mother make an informed decision about the severity and urgency of the

mcheck is a mobile app that helps mothers and family members to take care of their baby. The tool was designed to promote appropriate and timely health-seeking behaviour and ultimately reduce maternal and neonatal morbidity and mortality.

problem and when to access skilled care. This was a pilot project which aimed at assessing the feasibility of implementing this tool and its impact on health seeking behaviour and knowledge of danger signs for women who give birth in three facilities in Karnataka State, India during the study period. FGD was conducted with 20 mothers and their opinion / feedback was taken into consideration for framing the mCheck voice messages and pictures. Pretesting of the questionnaire was done and the pilot testing of this study was initiated in February 2013.

the result

The tool recognized evidence-based danger signs for a mother and her baby in the first seven days after birth to trigger questions that a mother can ask herself during this period. The tool was designed to promote appropriate and timely health-seeking behaviour and ultimately reduce maternal and neonatal morbidity and mortality. Mothers were able to use the tool as a trigger to call an interactive automated system in their local language that further guided their decision-making process regarding seeking skilled care.

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category m-Health

rural health management information system using mobile / tablets

Power of mobile technology to revive health care systems



the challenge

There is a need to shift the focus of community health workers to health care service delivery, from the routine tasks of data collection. For this purpose, the need was felt to empower frontline workers with hand held devices for data collection, follow-up, alerts & reminders using mobiles/tablets. To support the system, a central health database was also needed to help planning, decision makers, managers and researchers.

the solution

The pilot implementation of the system was undertaken in 20 locations at Tirur block (*Taluk*), Malappuram District in Kerala. The project was initiated as an attempt to adequately skill the front line health workers for data collection from the field, enhancing the accuracy of data, minimizing redundant entry and providing reliable storage for health data from the field through the health care reporting structure. It helps in avoiding the cumbersome paper work as per the present practice. The system envisages empowerment of the field workers and a resultant improvement in their health care delivery services. A centralized server is put in place for storing the collected data in a central database and analysis is done using statistical methods.

rural health management information system is a tool for empowering the health care workers with the help of mobile phones. mobile phones are used for accurate and easy data collection while web-based version provides timely data flow.

It is understood that this data will serve as an input for effective health planning and decision making at strategic levels. The system is a web-based one which has helped in providing timely data flow from the health worker to the Directorate of Health Services. It has also streamlined the system for timely and accurate reports to the health administration for efficient decision making. It has helped in reducing the infant mortality rates (IMR) by improving the immunization rates, by early identification of high-risk cases and thereby taking appropriate precautions.

the result

The system has proven to be very useful for timely and accurate reporting and therefore guiding the decisions at strategic levels. The report generation in standard and customized formats helps in the ability of the system to statistically analysing the data. The system can be modified and used for other purposes as well, like various national programs like Malaria Control Program, TB Control Program, etc. and the enormous data can be put to use for greater good. The pilot deployed at 20 PHCs/CHCs of Tirur block (*Taluk*), Mallapuram, Kerala has covered about 120 health workers and has touched a population having a size of about 7.22 lakhs.

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