ICT & WASH

Fall 2013

A synthesis of conference presentations for mobile technology in the water, sanitation, and hygiene sector

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Introduction

Information and communications technology (ICT) is quickly changing relationships in the WASH sector. Distances are becoming shorter and ICTs are now being used to facilitate the measurement and monitoring of interventions with data from customers, operators and government. Using these new rich sources of data promises to guide decision making for the equitable WASH services.

Despite this promising outlook, several challenges exist to use the full potential of ICT. Is there sufficient knowledge to apply the new technologies effectively? What has worked and how? Who has access to the information and are incentives in place for using information to improve services?

Multiple events and workshops have been held during the fall of 2013 to bring implementers and experts together to answer these questions and share lessons learned in this growing field. This paper brings together the common themes and challenges identified during the Stockholm World Water Week conference, the University of North Carolina Water and Health 2013 conference, and the International Water Association Development Congress. The conveners of each workshop have summarized the key messages of their event and provide a snapshot view of ICT in the WASH sector.

From the perspective of the end user customer to governing agencies, local implementers to bilateral donors, these events discussed a myriad of topics related to technology and WASH projects:

- Open data and IATI
- Web dashboards and mobile applications
- SMS, IVR, and 3G
- Mobile billing and banking

- Remote sensing and metering
- Fully automated systems
- Sustainability of hardware and software solutions

Through the use of ICTs, we can improve our data on WASH services and improve the evidence on the impacts of WASH projects. These technologies are becoming ever more integrated into the daily way development organizations are working and will continue to provide unique and innovative ways to improve our efforts in bringing clean water and safe sanitation to the world.

Mobile Solutions for WASH Services

Reflections on ICT at 2013 IWA Development Congress

Author: David Schaub-Jones

Nairobi, Kenya was this year's venue for the International Water Association (IWA) Development Congress and Exhibition; a biennial event addressing urban water management issues. Between October 14 and October 17 the Congress hosted around 1,000 water professionals who came to engage in discussions around the governance, technical and financial aspects of water management particularly in low and middle income countries.

Whilst both water resources and rural water supply featured in the discussions, the Congress focused heavily on the sharing of experience and good practice around improving and sustaining access to urban water and sanitation services. The objective of the organizers was – in the context of developing countries across the globe - to focus on "practical solutions" rather than merely regurgitate the numerous challenges and problems faced by the sector. Given this, along with the fact that the conference was in Kenya, a noted hub for ICT innovation, a good portion of the discussion touched on the actual and potential contribution of ICT tools to the sector.

Plenary discussion aplenty

A local media mogul, Mr. Patrick Quarcoo, was invited to give a keynote address to the IWA congress. He focused on the evolving use of ICT, from radio to mobile phones, as a public engagement tool –citing the ways that Nairobi Water has used SMS and other means to harness the widespread popularity of cell-phones in Kenya. Inge Wallage of the IWA spoke about how social media is being adopted by the sector as means to more proactively engage society and Ilana Cohen of the GSMA (Global Mobile Phone Operators Association) reflected on the need to test the different ways in which mobile tools can be used to improve water services, and to explore the business case for employing such tools.

Discussions around ICT also permeated the many parallel sessions, weaving a thread throughout the conference that was sometimes hard to follow. Yet there appeared to be four main ways in which ICT innovation was being discussed in Nairobi:

1. Facilitating more frequent and informative discussion between water utilities and their customers
2. Improving the effectiveness and efficiency of service providers' own internal operations, ranging from mobile payments to meter-reading via smartphone application.
3. Cut-out the 'human element' altogether and focus on fully-automated systems.
4. Using the rapid growth of diverse data sources to permit more effective urban planning and to develop more responsive approaches to service delivery.

Communicating with customers

Nairobi Water has been an early adopter of a range of ICT tools (for instance in allowing customers to pay by mPesa or to use SMS to communicate on billing issues or service interruptions) and has recently, with support from the World Bank's Water and Sanitation Programme and the Kenyan Water Services Regulatory Board have been trialing an ICT platform called Majivoice. Majivoice offers an integrated complaints, feedback and response platform that allows customers to register a range of problems they face with service provision and permits the utility to more simply co-ordinate its own response and communications. Customers can use use USSD, SMS or the internet to report. A slightly different initiative, this time active in India, was presented

by Nextdrop, an Indian based social enterprise. They discussed how a subscriber-based cell-phone service provides customers with real-time information about water rationing schedules via SMS. Nextdrop is in the process of further developing an internal dashboard for the water service provider to better track when and where the water is turned on around the city. Other possibilities they are exploring are to provide two-way communication for customers to report specific problems to the utility via SMS, an Interactive Voice Recognition (IVR) systems and other means.

Improving the internal function of water utilities

The event marked the official launch of a joint survey by the International Water Association and SeeSaw, a South African organization focused on ICT and the WASH sector. This survey is focused on African water utilities and aims to better understand what ICT tools exist, what demand water utilities have for such tools and where the overall market is headed [if you wish to engage with the survey or its findings, go to www.greenseesaw.com/IWAsurvey.htm]. An hour-long engagement with water utility representatives and other stakeholders confirmed that whilst there is great interest in the topic, there is also debate and uncertainty over what tools are out there, which add value and what specific types of ICT innovation to adopt. Although some early adopters have reported success, others want to see a stronger 'business case' to be sure that the investment will result in more cost effective services and service improvements. Given the specific context of developing countries, there was also a clear sentiment that, despite all the talk around 'smart grids', it is unclear how exactly utilities in developing countries should invest time and effort in ICT innovation.

Given this, SeeSaw's short presentation on existing experiences categorizing how different utilities are adopting ICT across their operations was broadly appreciated – giving rise to more questions than could be fitted into a short lunchtime slot. Particular interest was shown in the use of cell-phones to improve billing efficiency as well how ICT can bring more accountability and efficiency into certain areas of field operations (such as meter reading, fault

reporting, etc.). SeeSaw's work with the City of Harare (part of a broader package of work supported by the World Bank) garnered quite some attention from the lunch-time participants. This focuses on ways to harness both normal and smart-phones to collect and report on operational data such as reservoir levels, pump performance and chemical usage – as well as the digitization of a large scale customer enumeration process. Particularly appreciated was the example of how an urban utility can 'start small' and 'learn by doing' before undertaking more ambitious innovations.

Full automation

Another area of discussion was on how cell-phone networks, allied with other low-cost innovation, can remove the 'human factor' from monitoring. The presentation that best represented this was perhaps that on the "smart handpumps" initiative, pioneered by Oxford University and presented by Dr. Rob Hope. Currently being piloted in Kenya, this system uses accelerometers, with local SIM-cards placed inside handpump handles to provide real-time monitoring of hand pump functionality. Although early days, this initiative seems to encapsulate a growing interest in shifting to fully-automated systems (for which an urban parallel would be the interest being shown in affordable 'smart meters' that automatically relay meter readings).

Among the plethora of questions that arose, many were asked about whether such systems ask more in terms of 'maintenance' than simpler systems that still rely on people to send data. Others focused on how the cost-benefit analysis plays out (given that the capital expenditure is often greater but there are perhaps savings in operational costs). Some asked how responsive existing institutions are to the mountains of data that automated systems can generate (a discussion that led into debate around how to best sequence any institutional reforms that need to accompany ICT-related innovations).

Smarter Cities

In keeping with the Congress title, "Catalyzing Urban Water Transitions", the final strand of discussion revolved around 'smarter cities' and the

role of ICT in collecting and interpreting the full range of 'urban data' that is out there. IBM, which has set up a regional office in Kenya, is particularly focused on the need to better harness ICT so that as urban growth continues, cities expand and megaopolises develop, planners, service providers and others can cope. Their presentation looked at how existing data sets on water resources, spatial development, customer information, etc. could perhaps be combined to permit more informed master planning of cities.

In this session – entitled "Preparing the African Cities of Tomorrow" – there was however a definite tension between those who advocated for a master planning approach to dealing with urban development versus those whose preference lay with creating and supporting dynamic systems that can respond as urban growth plays out. Both camps are keen on using ICT, but the different approaches imply different answers to questions such as:

1. Who needs to invest in data collection systems?
2. How much the integration of existing data sources is an issue? and
3. Who is going to use all the data that can be collected (and how this can be turned into useful and 'actionable' information)?

Conclusions

Although there was not a dedicated stream at the Nairobi Congress looking at ICT, it was agreed that this is a growing issue and that the topic likely warrants specific attention at the next Congress, in two years' time. Given the focus on urban transitions, the issue of collecting, analyzing and acting on data was a cornerstone to much of the discussion, whilst being in Kenya, a noted hub of ICT innovation, only served to sharpen the focus on the use and potential of ICT tools to support the sector.

The diversity of those presenting on the topic, from Indian social enterprises, to multinational corporations, from urban water utilities to South African start-ups, was fascinating and prompted an active exchange of views and perspectives. Yet it was also noticeable that the sector still has some way to go in applying such innovation at scale and in adapting global experience to local circumstances.

David Schaub-Jones is the co-founder of SeeSaw. His background is in brokering partnerships in the sanitation and water sectors, with a special emphasis on supporting small providers, entrepreneurs and utilities that work in informal settlements and poor communities. David is an urban and small town specialist with a keen eye for how incentive structures influence delivery and the use or abuse of ICT systems. See Saw is a leader in ICT for WASH, analyzing particular project and client context to offer advice or software that is fit-for-purpose.

#ICT4WASH

A workshop at the 2013 UNC Water and Health Conference

Authors: Ben Mann and Henry Jewell

Introduction

In 2010, only 1 out of every 3 Americans owned a smart phone. Very few development organizations were actively using mobile technologies to assist in field implementation, and hardly anyone was using cloud computing for programmatic data analysis and reporting. Most of the tools and apps that are commonly used by humanitarian aid groups weren't even on the market yet.

Three years into the future, the landscape has drastically changed. There is rapid adoption by donors and implementers of information communication technologies (ICTs) as vehicle for improved monitoring and evaluation. This was evident by the participation of over 20 different organizations at the 2013 UNC Water and Health Conference ICT4WASH workshop, many of whom are in the process of selecting and incorporating mobile tools and web dashboards into their program structures.

The Workshop

The ICT4WASH workshop focused on evaluating ICT alternatives and the sustainability of using them in the field. Presentations were given by Tetra Tech on their use of WaterTracker in Afghanistan, an interactive voice response (IVR) system developed in partnership with ArcFinance on the Ushahidi platform for functionality reporting and tracking by the local government; Akvo on the use of Really Simple Reporting (RSR) and FLOW by field partners for improved project based monitoring and reporting; and by the University of North Carolina Water Institute on an ISO based methodology for evaluating and selecting appropriate ICT tools.

For most of the conversations during the workshop, ICT use was primarily focused on mobile monitoring and data collection, with less concern on reporting and analysis tools. Many success stories and illustrative examples have been disseminated by early ICT adopters now that monitoring using mobile phones and tablets are seen by most organizations as a viable investment. Interest has increased greatly, however a key theme emerged through the workshop discussions that available knowledge has not kept pace.

The ICT4WASH workshop wrapped up with a small group discussion session, which gave participants and presenters and opportunity to "get into the weeds" on challenges in using ICTs by implementers. Four themes emerged that highlight the primary concerns of organizations in adopting mobile tools and the challenges that must be addressed for these initiatives to be successful:

Commitment

Like any other investment, organizations must commit the necessary resources to implement new ICT technology. This includes financial backing, identifying a proper manager, and ongoing training of critical users. Without the necessary structure in place, it will not be successful or sustainable post-implementation.

Organizations must also make a commitment to usability of systems. Often we find that ICT use is merely an exercise of "keeping up with the Jones'", a flashy optics piece to show off for donors. However, if we truly harness the power of the data we collect and the capability of these tools, the results will be far more impressive than any infographic or press release could ever be.

Capacity

Building on a strong commitment, organizations cannot go from not doing any monitoring to mobile monitoring without making a plan. Capacity must exist or be built into each project, program, or institution to support a newly adopted technology. Across the sector in general, more work is needed around knowledge of M&E to help partners imbed monitoring and continuous evaluation into their programs.

Participants noted that there are many issues in maintaining capacity of systems, including high turnover of staff, maintaining local knowledge around the use of both the hardware and software, and scaling innovative technologies in the field across different contexts.

Connectivity

Even as cell phone and internet penetration rates are sky rocketing in certain developing countries, connectivity problems are still a bottleneck for many tools to succeed or fail in the field. When working in low connectivity environments, more solutions are needed for using current tools that rely heavily on internet connectivity.

Cost

By far the biggest concern of all implementers and donors is the cost of using mobile technology. Initial investment, long-term financial commitment, and replacement costs were all noted by workshop attendees as challenges in getting approval to use ICTs. There is often a response that there is no budget for software or indirect costs without understanding the benefit of incorporating technology solutions.

Unfortunately, there is not enough evidence surrounding cost of using mobiles for monitoring to understand cost/benefit and quiet these concerns. Narrative examples show that ICTs require less staff time when it comes to data entry and data collection times are reduced in general, but it is unclear for most organizations if the hefty upfront investments are offset by these benefits.

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Henry Jewell is the executive director of Akvo Foundation USA. He is responsible for growing Akvo's presence in the US and is also the programme manager for Akvo FLOW. Henry joined Akvo from the World Bank where he was a geospatial analyst overseeing R & D and implementation of Geographical Information Systems (GIS) techniques within World Bank studies and programmes.

Changing Relationships

ICT to Improve Water Governance at World Water Week

Author: Nick Dickinson

At the Stockholm World Water Week 2013, the seminar "Changing Relationships: ICT to Improve Water Governance" provided a platform for presentations and the discussion of major questions faced by implementers of ICTs and WASH. It was convened by the IRC International Water and Sanitation Centre; Akvo Foundation; Rural Water Supply Network; UNDP Water Governance Facility at SIWI; Water and Sanitation for Africa; Water and Sanitation Program; Water For People; Water Integrity Network and WaterAid.

The scene of the seminar was set by Jae So, manager of the Water And Sanitation Program (WSP) of the World Bank and Ned Breslin, CEO of Water For People (WFP). Both emphasized that only a tip of the full potential of ICT is understood and that data will change how organizations behave culturally.

Open data and accountability

The sub-topic of 'open data and accountability' was introduced by Thomas Bjelkeman-Pettersson of Akvo. He suggests that open and big data will be transformative in development cooperation since "one data point can change the lives of a whole village" and that this transformation will start in earnest from 2014. While there is not enough transparency and data showing how many has been spent and to what effect, the technology is now available to repair this.

Pontus Westerberg of UN-Habitat presented 'Open UN-Habitat', a web based platform that shows how UN-Habitat spends its project funding. 50% of the UN-Habitat portfolio is now online and public. Key users of that information are donor governments, recipient governments and civil society. IATI is an open format used by UN-Habitat and many other large donors to easily share their project information and financial figures. Some challenges have been an initial fear of transparency, paper culture, and quality assurance of IATI published data.

Ravi Narayanan of the Argyham Foundation presented Project Watch website which provides user-friendly data visualizations based on available water and sanitation data sets to share the story of water and sanitation. The platform enables comparison of the investment with the reality on the ground by looking at different available data sets.

Participation through mobile technology

Maji Voice was presented by Stephen Mbugua, commercial director of Nairobi Water, Kenya. Maji Voice is a mobile-centered platform to help customers voice critical issues using SMS or by dialing *624# and going through text menus on the phone, or by calling. There is a website as well. The system increased customer feedback by 50% and has reduced the time they needed to travel to business centers to report problems. According to Mr. Mbugua, "It is the best thing that has happened to increase the quality of service provision". The system escalates complaints if no action is taken within 48 hours and the commercial director is notified.

Arundathi Vishwanath and Margret Joeji from India presented Video Volunteers to support communities in using video to raise issues with (local) government administrators for social

change. On her own initiative, Margret Joeji used a video from a mobile phone advocate about the human side of sanitation: and the unsafe conditions under, which Dalit people are cleaning dead animals and excrete. A word of caution came from the research of Johan Hellström, PhD student at the University of Stockholm. While mobile phone subscriptions have exploded, there is less evidence that this has increased the participation of citizens. According to Johan Hellström, 80% of ICT for development fails. Common problems are that people do not know about services, incentives to participate are low, and pilots are seldom scaled.

Use of data

Vincent Casey, Technical Support Manager of WaterAid kicked off by stating: "despite good efforts we have not yet managed to make the link between the technology and the use of data for decision making". In the WASH sector, there is a need to shift the focus from data collection to improving the sustainability and quality of rural WASH services using that data. Some recurrent challenges are an inability to act immediately to address clear needs, the lack of funds for analysis, and tools that are not designed to support decision making. Abera Endeshaw of WaterAid Ethiopia described how during their pilot of the Water Point Mapper in 14 districts local authorities were able to use the data in planning, rehabilitation and the extension of water supply services and to mobilize funds. These are tangible benefits although there were challenges with frequent turnover of technical staff.

Fadel Ndaw, Senior Regional Water and Sanitation Specialist of WSP made the case for 'mwater' monitoring of 252 rural piped water schemes in Senegal, Mali, Benin and Niger. Mwater consists of an inventory and cartography service and enables management of water supply schemes by providing feedback data to the operators of the schemes. Providers in Benin were missing as-built asset management plans, but with Mwater they were able to develop plans and manage their expenses. The data can also be used to develop realistic business models and avoid exorbitant tariffs.

Three key lessons

During the synthesis, John Sauer of Water For People, focused on new kind of cooperation and Nick Dickinson of IRC made the case to Keep it to Services Sweetie (KISS) and focus on people & long-term services.

Cooperate on innovative ICT solutions

According to John Sauer, we need a unique form of cooperation for successful ICT: losing your organizational name, working with blurred organizational lines, working together and outside of our comfort zones. Ravi Narayanan put it as "Only when we work with systems, capacities and technologies all together can we achieve change… No one organization can do this. We need a culture of networks. We cannot be lone rangers." MWater and MajiVoice are examples of systems used by operators, which can also provide crucial information for the regulators: asset maps, financial data, and customer reports. With MWater, regulators were able to benchmark water companies and monitor the performance of schemes using the system. Sharing data across organizational boundaries will become a requirement in the future. Open data such as IATI and the Akvo OpenAid are some early examples.

Focusing on people and their user experience

ICT is about people; people who get used to technologies in a gradual way. Acceptability was a common theme across all presentations on participation. The technologies each needed time to get used to and to add value. In Nairobi, it took two years to develop the system with many options and everyone was involved. The Video Volunteers found that some people did not feel immediately comfortable with the technology. Mobile technologies in general do not necessarily spur

participation on their own. It takes a concerted effort and trial and error to scale these technologies beyond the pilot stage. Attention should be given to the user experience and not overburden users with unnecessary tasks. Many people expect to use ICT and the data as a means for communication and advocacy (Project Watch and Video Volunteers) and expect an easy to use interface.

People also only use data they understand and trust. For the use of data, Vincent Casey, WaterAid highlighted the need to involve local government from the beginning in water point mapping. The government must be able to analyze and understand the data locally. People also expect that published information has gone through a certain level of quality control and it is important to be clear about the quality of the data. Strict quality control is one of the reasons UN-HABITAT has not yet put all the project data online. Streamlining quality control and verification can help to ensure that data can be shared quickly and that ICT reaches its full potential.

According to Jae So, Manager of WSP, ICT will provide the quickest and most direct way for governments to be in touch with their constituents. As we collect and publish more data on water users, we must remember to get smart about open data. Policies are critical to ensure that data is not abused and that privacy and safety are respected in an open data landscape. This includes also having addressed how data will be retracted if necessary for security or privacy reasons that only manifested after their publication.

Keeping it to long term services

WASH data must go beyond finance as emphasized by Ned Breslin in his keynote: we must also identify how services are doing in order to be able to take collective action to improve WASH. This means having a firm commitment to act on the problems facing effective service delivery when ICT systems reveal them. For example, Maji Voice in Kenya has become a way of monitoring relatively independent kiosk based operators. Nairobi Water are now exploring how to link the data to their performance management systems and billing systems.

For a full report on this event, visit: http://www.rural-water-supply.net/en/resources/details/536

Nick Dickinson is a Senior Programme Officer with the IRC International Water and Sanitation Centre. He brings his experiences in information and communication technology (ICT), capacity building, and the WASH sector and is channeling these into the ICT for WASH products and services. He has recently published a working paper on using ICT for monitoring rural water services. His focus is on how to apply these technologies at scale so that they lead to improved water and sanitation services. He is currently leading the development of the WASHCost Calculator, an easy tool for both basic and advanced analysis of the life-cycle costs of water and sanitation services.

Final Thoughts

Forums such as these remain crucial for the WASH sector in order to evaluate and revise best practices, and to bring practical challenges around appropriateness, sustainability and scale to what are otherwise important fledgling innovations. We need not only to meet the water and sanitation challenges of today, but those of tomorrow's increasingly urbanized and complex world – and ICT can indeed support us to do that. Technology will continue to play a critical role within the sector, providing support to service provision, M&E, and creating communities of knowledge sharing.

ICT4Services

Just like WASH service provision, ICT should also be seen as a long term service to users with technical support provided when necessary and there need to be constant improvements in these technologies in order to ensure that the data is collected and used.

ICT4M&E

We need to shift our thinking from "what is the cost of monitoring" to "look at the immense added value" when it comes to using data to steer projects and make them more effective and efficient. Yes, monitoring cost money, but what is its true value as the project progresses?

ICT4All

ICT adoption is growing in some areas, however we will soon hit a plateau for technology use in monitoring and must look further down the road for other ways to integrate tools into our programs. What will be needed to get there is increased knowledge sharing of experiences around the use of ICT, specifically on the best practices for adoption and evidence of its benefits. We must harness the experiences of across sectors as well, not just WASH projects, and look at how we can apply these ideas to our own programs to promote equitable services.

Open Doors

Technology today is allowing our organizations to better gather, manage, and analyze the data we need for our programs. However, the real future of ICTs will be in the external use of data across organizations and contexts, providing a richer story for a bigger picture. These workshop events have shown us that people everyone are moving beyond monitoring their own data and are beginning to develop open data sources.

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