

IoE-based Application Helps *Water For People* Boost Accuracy and Efficiency, Cut Costs



EXECUTIVE SUMMARY

Objective

- Provide clean water and basic sanitation services to people in disadvantaged communities around the world in a uniquely sustainable, scalable, replicable, and non-competitive way

Strategy

- Leverage smartphone technology to integrate and automate the collection, analysis, and reporting of data pertaining to the condition of water and sanitation projects

Solutions

- Akvo FLOW is an open-source Android smartphone application used by 116 community support organizations globally for collecting and transmitting survey data

Impact

- Faster, more accurate data collection
- Reduced costs and effort
- Improved ability to compare data across years and projects

Background

In January 2014, Cisco released the results of an in-depth analysis of the economic benefits of the Internet of Everything (IoE) for the public sector. Cisco's model revealed that some \$4.6 trillion in "Value at Stake" would result from the adoption of IoE capabilities across 40 key public sector use cases over the next 10 years, including smart water, smart buildings, smart energy, smart parking, and more (<http://bit.ly/1aSGIzn>).

As a next phase of its analysis, Cisco engaged Cicero Group, a leading data-driven strategy consulting and research firm, to undertake a global study of IoE capabilities across these 40 use cases – how the best public sector organizations are "connecting the unconnected," as Cisco terms it. To that end, Cicero Group conducted interviews with dozens of leading public sector jurisdictions – federal, state, and local governments; healthcare organizations; educational institutions; and non-governmental organizations (NGOs) – to explore how these global leaders are leveraging IoE today.

The research examined real-world projects that are operational today, are being delivered at scale (or through pilots with obvious potential to scale), and that represent the cutting edge of public sector IoE readiness and maturity. The aim of the research was to understand what has changed in terms of the jurisdictions' people, processes, data, and things, and how other public sector organizations can learn from (and replicate) the trail blazed by these global IoE leaders. In many cases, these jurisdictions are Cisco customers; in others, they are not. The focus of these jurisdictional profiles, therefore, is not to tout Cisco's role in these organizations' success, but rather to document IoE excellence, how public sector entities are putting IoE into practice today, and to inform a roadmap for change that will enable the public sector to address pressing challenges on multiple fronts by drawing on best practices from around the globe.

FLOW is open source, operates on Android smartphones, and is currently used by 116 community support organizations around the world, including the governments of Liberia and Sierra Leone, and in parts of India.

About Water For People

Water For People is a next-generation nonprofit working in water and sanitation programs in many of the world's most disadvantaged communities. It was founded in 1991 in Denver, Colorado, by Ken Miller and John Mannion, former American Water Works Association executives; and Wayne Weiss of Black & Veatch, a global engineering and construction firm. It is dedicated to providing clean water and basic sanitation services to people in disadvantaged communities around the world in a uniquely sustainable, scalable, replicable, and non-competitive way. The organization has been involved in more than 40 countries, and currently oversees water and sanitation service improvements in 10 countries.

As part of its international development efforts, Water For People has a 10-year monitoring and collaboration program with each of its assisted districts, encompassing thousands of communities. In order to strengthen and empower these efforts, Water For People utilizes a system called Akvo FLOW that has the potential to transform water and sanitation development work worldwide by offering an integrated way to collect, analyze, and report monitoring data regarding the condition of water and sanitation projects.

FLOW is open source, operates on Android smartphones, and is currently used by 116 community support organizations around the world, including the governments of Liberia and Sierra Leone, and in parts of India. It has been adapted to a variety of monitoring systems, including sanitation, health, and agriculture and fisheries, and is providing a new model for data gathering and analysis in the global community.

Ned Breslin joined Water For People as director of international programs in January 2006, and was appointed CEO in 2009. Mr. Breslin focuses on results-driven sustainability and accountability in each of Water For People's development initiatives. He was the recipient of the 2011 Skoll Award for Social Entrepreneurship for his work with Water For People.

Prior to his association with Water For People, Mr. Breslin spent close to 20 years working on water and sanitation projects in Africa. He holds a master's degree in political science from the University of the Witwatersrand in South Africa, and a bachelor's degree in government and African studies from St. Lawrence University.

Objectives

While many service organizations work to upgrade community drinking water and sanitation systems, Mr. Breslin believes the factors that distinguish Water For People are its long-term involvement in each area of service and its commitment to improving processes based on feedback. "We're constantly looking back, reflecting, building on strength, identifying weaknesses or challenges, and adjusting our programs to address those challenges," Mr. Breslin said.

FLOW is a program for Android smartphones, which FLOW staffers (“Monitors”) use to enter survey data. Surveys are customized by area, and the program also takes advantage of the smartphone’s GPS mapping and camera functions to include associated coordinates and visual data.

It was this focus on monitoring and feedback that prompted Water For People to develop FLOW. Because Water For People implements a 10-year plan for each area it serves, regular monitoring is key. “We go back to the areas that we have worked in, and do a basic questionnaire exploring questions like, ‘Is water flowing? Are people using toilets? Are the toilets hygienic? Is there money in the account for repairs? How long does it take for repairs to happen if a problem emerges?’”

Strategy

Mr. Breslin described the previously cumbersome monitoring of projects, saying the process included obtaining GPS coordinates, photographs and video, detailed questionnaires, and much paperwork. Data was then compiled manually and uploaded for analysis, a process that might require months to complete. Mr. Breslin said that the advent of smartphone technology, even in poorest countries, has revolutionized the process, making development of a comprehensive and user-friendly monitoring program possible.

FLOW was developed as a platform on which to conduct these surveys. “We sat back and said, ‘Wait a minute: actually, a phone does all of this. I can geo-locate anything on my phone. I take pictures all the time with my phone. Doing a questionnaire with my phone is not unheard of. Surely we can do this,’” Mr. Breslin explained. Water For People teamed with a developer and developed the first edition of the FLOW program.

“In all of our programs, we actually work very closely with district governments,” Mr. Breslin said. “We work with their ministry, their district department, [whomever] is responsible for water. We work with the mayor’s office. Frankly, they’re also the main enumerators. They go out and do the analysis. They go out and do the data collection, then we do the analysis together in something we call Re-Imagining Reporting, where we sit down and look at results.”

According to Mr. Breslin, Water For People receives roughly 35 percent of its annual budget from foundations, 30 percent from corporate sponsorships, and about 15 percent from the water and wastewater community, utilities, workplace giving programs, and other similar programs. Additional funding comes from individual donations and other sources.

Solution

FLOW is a program for Android smartphones, which FLOW staffers (“Monitors”) use to enter survey data. Surveys are customized by area, and the program also takes advantage of the smartphone’s GPS mapping and camera functions to include associated coordinates and visual data. Once a survey is complete, the data is transmitted back to Water For People servers for analysis and recording. Analysis of the data is conducted jointly with local officials, vesting them in the successful outcomes of their communities.

FLOW Monitors, who work locally for Water For People on monitoring water and sanitation conditions, are provided Android smartphones preloaded with the

relevant FLOW surveys. Although not a downloadable “app” per se, the program looks and functions similar to one. Ease of use was one criterion that Water For People used in the development of FLOW to allow deployment in many different locations and cultures around the world.

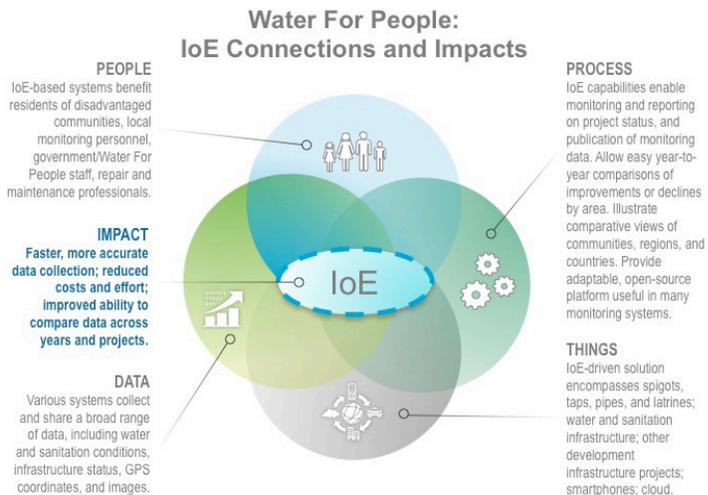
The program collects images and user-entered data on basic water and sanitation infrastructure, such as status of household taps and connections; level of usage; and maintenance conditions. Because many survey areas are remote and without cellular coverage, the program is designed to store the surveys with corresponding photos and GPS coordinates. Surveys are automatically transmitted to a cloud-based database when a cellular service area is reached.

Mr. Breslin said that uploaded information can be analyzed in real time, and results are displayed on Water For People’s website under the Re-Imagine Reporting section. Significant research went into the design of the reporting program, with efforts focused on creating easy-to-understand, graphic-oriented displays. “We spent a year talking to staff and partners around the world,” recalled Mr. Breslin. “We basically said, ‘How do you learn, and how do you try to understand things?’ Not surprisingly, nobody said by reading a 60-page donor report. It’s all visual and color-coded.” Now a year into the reporting function’s introduction, Mr. Breslin is again conducting field research, and Re-Imagine Reporting 2.0, based on a new round of feedback, is soon to be released.

Water For People chose to make the FLOW program open source. This was done by teaming up with Akvo, a nonprofit organization in the Netherlands that runs a number of data services for international development organizations. Together, Water For People and Akvo have achieved great uptake: FLOW is now an accepted monitoring standard and model for data gathering in many world communities, including health, education, construction, and agriculture.

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Figure 1. Water for People: New and Better Connections.



Source: Cisco Consulting Services, 2014

Impact

Water For People is the AWWA designated charity of choice, and is also endorsed by the Water Environment Federation, the Water Quality Association, the National Association of Water Companies, the National Association of Clean Water Agencies, and the Association of Metropolitan Water Agencies. It collaborates with worldwide water and sanitation organizations, and partners with UNICEF and the Millennium Water Alliance, among many others. Water For People is highly regarded in the worldwide water and sanitation communities as a model to follow for sustainable initiatives.

Mr. Breslin said that development of the FLOW program had a dramatic impact on the way his organization conducted both monitoring and reporting. “FLOW did a couple of things for us,” he explained. “One, it reduced errors dramatically. All the errors from transferring from paper to Excel and to SPSS, we reduced that massively. The second thing is, we increased the speed at which we were getting results from months to days, and we were able to publish it quite easily.”

The impact on the effort and costs involved in data gathering has been dramatic as well. “The burden on our organization has decreased immensely. I would say two-thirds reduction in effort and sweat is probably a fair estimate,” he said.

Mr. Breslin values the increased accuracy and data-gathering efficiency primarily because these benefits support new strategies to improve his organization’s processes. “For us, it’s not about collecting data, it’s about using data that is collected to become a better organization and achieve better results,” he said. “There’s data to show that the places in which we work are trending upwards, and anything that’s going down, that’s not meeting expectations, we’re intervening fairly fast. We’ve become a better organization because of this, and I mean better in the sense that our results are getting better.”

Mr. Breslin sees Water For People as the kind of organization that has the “courage to hear bad news” and adapt to it responsively and effectively, an approach he considers essential. “Reporting is the unique opportunity,” he said. “For us, the really important part is the Re-Imagining Reporting session, where we close the door with our staff, our partners, and government officials. We put the data down, and people dig into it, what’s working, what’s not working, and what do we do differently. Here’s the money that’s on the table, how could we use it better?”

Another advantage of FLOW is that it makes it relatively easy to compare data across years and projects. Mr. Breslin recalled the development of FLOW’s reporting capabilities, saying, “The vision was to basically develop into the program specs, so you could go back and see the results last year, and you fill in the results for this year. You can see what’s improving, what’s not improving, and whether the challenges we identified are actually addressed, or if they’ve gotten worse. You can look at a village, you can look at lots of villages within a particular area and compare those. You can compare different areas. One part of Honduras, you could look at what the results are against another part, and ask why. You can start to compare across countries. Why is it working in Honduras and not working in Guatemala? You can look at regional stuff, like all of Latin America, then you can do it globally. It rolls up really nicely,” he said.

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“It’s become harder and harder for organizations to [use the excuse] that monitoring is difficult,” Mr. Breslin added. “I think what FLOW did is actually take away a lot of the excuses of organizations that, frankly, would rather sit back and say, ‘Well, [monitoring] is expensive.’ We say, ‘Actually, it’s not expensive. Here you go.’” The program is having a widespread effect beyond just the water sector, and Mr. Breslin expressed that he is pleased with the impact.

The FLOW program is changing what Mr. Breslin sees as a tendency of nonprofit organizations to sidestep monitoring activities for fear of unpleasant results, possibly compromising scarce funding resources. He views unpleasant data as an opportunity for improvement, saying, “You have to build an organization that can hear bad news, and see it as a challenge, and respond to it.”

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Lessons Learned / Next Steps

In contemplating the main lessons learned thus far, Mr. Breslin said, “[It] has enabled us to take a hard look at what we do, to ask hard impact questions, and to adjust our program based on results, so that we can actually do better. All these tools are tools that enable us to improve, to serve people around the world in a better way, and to hopefully inspire others to do the same. We have created in a very nontraditional approach – a system that feeds into an organization that is built around not fearing bad news, but actually embraces bad news and poor results as opportunities to innovate.”

Mr. Breslin is enthusiastic about the use of FLOW within governments, the various adaptations for other monitoring activities, and the potential for substantive change that this suggests. He described training as in a “very early stage,” but said, “Governments are realizing that they want this information. It’s really training as much on the analysis, the kind of ‘So, what do you do now with these results?’ FLOW is just a tool to enable us to get to that point, to get to the analysis,” he explained.

“The Internet of Everything is creating an environment where people can see data and respond in different ways, can access things in different ways, and can intervene and support changes in the world that make the world a better place. That’s the potential of it. Water For People, in a really weird way, is modeling that. The more open we make results, data, and things, the harder the questions they ask, and the better we get. I think that’s the power of it.”



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