# Modernizing Management

## Applying the Internet of Things to water resource management

Interview compiled by Amy McIntosh

Chris Spain co-founded HydroPoint in 2002. He has more than 20 years of experience managing emerging growth technology and information services companies. Before founding HydroPoint, he was the president and founder of Shaman Corp., providing mission-critical IT data services. Prior to Shaman Corp., Spain was president of Accelerated Media, a digital and broadcast media company that produced interactive projects. Spain can be reached at 401.525.1775.

Monitoring has commonly been an effective way to proactively mitigate water loss by pinpointing leaks and vulnerabilities in a distribution system. As advancements are made, Internet of Things (IoT) technologies are emerging as even more efficient means of monitoring. W&WD Associate Editor Amy McIntosh spoke with Chris Spain, president and CEO of HydroPoint, about how these emerging technologies are modernizing water resource management.

**Amy McIntosh: What is IoT?**
**Chris Spain:** IoT is basically being able to communicate in real time with sensors and communication devices anywhere, any time, 24/7 and find meaningful data that can then be turned into knowledge through analytics. It is not just the IoT collecting data in and of itself; it is assembling, accumulating and collecting a huge amount of information on a real-time basis and the analytics that are put upon that. That has given rise to other terms, like "big data," which is basically sifting through huge amounts of information to make meaningful knowledge out of it. Intelligent actions can be derived [from the data].

**McIntosh: What impact is IoT having on water resource management?**
**Spain:** There are two sides to the water piece. As complicated as the water network is on a variety of perspectives, it is really just three segments: supply, treatment and end use. On end use, there have been a number of opportunities to use IoT to realize not just information collection, but huge amounts of savings, reduction of risk and avoidance of damages.

On the treatment and supply side, there is just as much opportunity, in the form of leak detection, elimination of non-revenue water loss, and greater specificity in response to threats as far as treatment and the ability to keep water at acceptable standards. It has been expensive, time consuming and difficult to gather information in a real-time basis that could provide enough information to allow you to act. Companies could see that they were losing a lot of water from one point to another, but being able to quantify, locate and respond to the leak in a timely fashion was limited to a manual or onerous process that added a lot of cost and time to the process of figuring out where that leak would be.

**McIntosh: How are environmental factors affecting the modernization of water management?**
**Spain:** As climate change and drought occur and resources get more scarce, it becomes all about eliminating waste. We have more people needing water, fewer resources and more dynamic stresses that require us to be able to act intelligently.

**McIntosh: What do you see for the future of IoT?**
**Spain:** I think the future has two components to it. On the technical side we are still at a sort of Tower of Babel where everyone has different standards and protocols. Having the "things" of IoT talk to each other in a seamless fashion is still a bit bumpy. It is typical when a new technology comes out. It will finally settle into one, two or three standards hopefully.

The second technical issue is the security of IoT. What is wonderful is that IoT gives you access to environments far beyond your corporate headquarters, water agency or facility, but the bad news is it gives hundreds of areas access into your facility. It represents as much as an opportunity to gain data as it is a conduit for someone to get your data. From a technical perspective, there are almost these contradicting forces. One is, make it more seamless so you can efficiently talk with your things. At the same time, make sure when they are talking that it is who you want talking to it, not somebody else.

On the features side, I think we're finding that when you start doing any sort of IoT project, you pretty much suffer from eyes bigger than your stomach. In other words, you tend to overload the customer or the user with too much data. You can just numb a person to death with too many alerts or observations that are not meaningful or compelling to the user as far as adopting the technology. It is very powerful to allow a person who cares to dive into these fine details, but what is really important is that you don't overwhelm everyone with the fine details. They might become blind to what's important and what should be tended to first. I think that the feature set we will see is more simplified, compelling, actionable data presentations that are supported and backed up with compelling and visual analytics that make intelligent decisions easier and more productive and accurate. w&wd

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## Hidden Threat

As drought continues to take hold of California and other arid states, Spain offered examples of how IoT technologies can help end users manage and conserve water.

According to Spain, the bulk of water loss stems from lack of visibility. When water is wasted, it is often because it is out of sight. He said that irrigation is one application that could benefit from real-time data retrieval.

"Until IoT came along, there wasn't really an affordable infrastructure you could place that would let you know what was leaking, where it was leaking and how to apply water in an efficient fashion because it changes so much," Spain said.

Weather-based IoT systems can monitor weather data down to within a square kilometer of a site and automatically adjust irrigation settings based on the need. As the weather changes, the amount of water applied also changes, saving water and money.

"IoT is a very powerful tool to allow us to intelligently eliminate waste and strategically use our resources at a level that allows us to navigate through all the different challenges that we have ahead of us," Spain said.