

## ***Water Utilities and the Smart Grid***

### ***Case Study: The District of Columbia Water and Sewer Authority (DC WASA)***

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From the November 30<sup>th</sup> airing of “Inside the Mind of Google” on CNBC, RAI’s staff learned of the Washington DC Fire Department’s use of a customized version of the Google Earth application and cloud hosting services integrating much of the City’s own data with the application. The result is a real-time infrastructure monitoring system that supports the Fire Department in responding to emergencies.

The system that the Fire Department is utilizing is really just one part of an evolving effort to identify and integrate technology solutions on the part of the DC Water and Sewer Authority (DC WASA). The Google Earth coupled with IBM MAXIMO and ESRI GIS solution to monitor the status of DC fire hydrants exemplifies the opportunity that exists for technology providers to supply utilities – and utilities customers – with a host of new products and solutions as the trend develops.

#### **DC WASA’s Initiative and the Opportunity**

By using technology to monitor the flow of water, equipment function, weather and environmental impacts, for example, DC WASA is better able to take preventive action, avoid costly problems, and provide better service to customers. These are substantial benefits, suggesting that as cities at the forefront of the effort like DC uncover these solutions and demonstrate success, wider adoption could follow.

DC WASA is now working with IBM as their key partner to develop and identify solutions. According to a November 19 press release from IBM, “The project with DC WASA is part of IBM’s first-of-a-kind (FOAK) program, which pairs IBM’s scientists with clients to explore how emerging technologies can solve real world business problems.”<sup>1</sup>

The systems utilize IBM Tivoli Maximo Enterprise Asset Management software and ESRI ArcGIS enterprise GIS (Geographic Information System) software. The “emerging technologies” that either have been, or will be identified and utilized constitute what we see as an opportunity for third party vendors, analogous in some ways to the Apple iPhone phenomenon.

Third party vendors for smartphones like the iPhone range from software application developers to hardware manufacturers. In the case of integrating city infrastructures dating over 100 years with state-of-the-art technology platforms, there is an opportunity for the provision of new Smart Grid solutions for outdated city infrastructures, also ranging from software to hardware.

#### **Discussion with WASA Chief Information Officer**

Mujib U. Lodhi is the Chief Information Officer (CIO) at DC WASA. He explains that the partnership with IBM actually came after DC WASA had already demonstrated itself as the water utility at the forefront of technology innovation and its application. The utility is well beyond the phase of automation and now very much focused on analytics “Making our Assets Intelligent.” This will be a primary of focus for DC

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<sup>1</sup> IBM and DC WASA Flow Technology into Washington DC’s Water and Sewer System.  
<http://www.prnewswire.com/news-releases/ibm-and-dc-wasa-flow-technology-into-washington-dcs-water-and-sewer-system-70454857.html>. November 19, 2009. Accessed May 3, 2010.

WASA and much of the utilities sector over the next 10 to 15 years. As Mr. Lodhi explains, “It’s all about data insights as part of the ‘out data management strategy’, which sits on three pillars... I call [the] 3 A’s (Acquire, Analyze and Act). This will not only help us gaining operational efficiencies but also with the investments efficiencies, in the long term, a much bigger payoff.”

IBM seized the opportunity to work with DC WASA and help to develop water utility advance analytics. The joint research partnership focuses specifically on the development of analytical technologies focused on the following priorities:

- Customer Service
- Water Management
- Demand Management
- Preventive Maintenance

Mr. Lodhi drew further and particular attention to what he called “predictive analytics”, used to identify risky assets. In other words, technologies that enable the utility to develop models to more accurately predict when assets will break. He recommended a review of the PBS documentary “Liquid Assets”, which, in part, focuses on this subject.

The cost savings for a utility if asset failure could be more accurately predicted is quite significant. This is not only the case for the utility, but also for the customer. One unique analytics service that DC WASA has now had in place for many years that illustrates this value is the High Utilization Notification Alerts (HUNA).

If a customer’s water usage goes to defined levels outside of their typical usage, a HUNA and email and a voicemail message goes out to the customer informing them that they need to check their plumbing. Mr. Lodhi relayed to us one instance wherein a customer who was travelling in Europe received a HUNA notice on his PDA device, and then called a neighbor to check on the matter. The problem turned out to be a leak in his basement. He was able to save his property by then ensuring that the appropriate actions were taken to fix the problem.

Mr. Lodhi explained that Smart Grid technologies among utilities are typically adopted first by electric utilities, then gas, and then water utilities. This is due largely to the nature of the infrastructure itself. The greatest limitation on the further and wider adoption of Smart Grid technologies can be attributed to battery life for the edge device. In order to valves, meters and hydrants to be “smart”, there is also a corollary need for them to have batteries or other source of power.

Despite the limitations, the value and the direction of technology innovation at DC WASA and other water utilities is clear. And, just as companies providing the products and technologies that depend upon smartphones have tapped into previously non-existent markets, there will be companies that thrive from harnessing the kinds of innovations presently in the works at DC WASA under the leadership of George S. Hawkins, General Manager, DC WASA.

**Key Terms:**

- Smart Grid
- Predictive Analytics

- High Utilization Notification Announcement (HUNA)

**Other Resources:**

DC WASA Website: <http://www.dcwasa.com/>

Liquid Assets Documentary – <http://liquidassets.psu.edu/> (includes some focus on predictive analytics)