Three Keys to a Secure Water Future

By **Amir Cahn**, Director of the Smart Water Networks Forum (SWAN)

The Smart Water Networks Forum (SWAN) brings together key players in the water sector to promote the global development of water networks, making them smarter, more efficient and sustainable. By fostering cross-industry collaboration, SWAN has the unique ability to share its members' diverse experience, develop its own research, and help shape industry standards. On April 2016, SWAN held its sixth annual conference titled "Accelerating Smart Water", highlighting cutting-edge topics in the water industry. The Conference featured over 180 attendees from 24 countries and included speakers from 20 global water utilities and top technology companies such as IBM, Cisco, Qualcomm, Sierra Wireless and Microsoft. This article will focus on three, critical Conference themes and discuss SWAN's role in advancing the water sector.

Cities becoming smart and resilient

By 2050, the global population living in cities will increase from 50% today to 70%. Cities now face increasing water stress with demand expected to outstrip supply by 40% by 2030. This is compounded by an aging infrastructure, limited city budgets and rising customer expectations. To cope with these challenges, many cities strive to become smart cities to integrate city functions, utilise scarce resources, and improve the citizens' quality of life.

A smart city links multiple systems within a network to share data across platforms and enhance public services from energy, transportation, building, healthcare, public safety and water. The Smart Cities Council defines a Smart City as a city that "uses information and communications technology (ICT) to enhance its liveability, workability and sustainability." Smart Cities represents one of the fastest growing global sectors, and has been projected to be worth over $3.3 trillion by 2025 (SWAN 2014).

Water is a significant aspect in all smart city efforts. A Smart Water Network allows cities to better anticipate and react to different types of water network issues, from detecting leaks, theft and water quality incidents to conserving energy and tracking residential water consumption. By monitoring real-time information, city operators can stay informed about what is going on in the field at all times and respond quickly and appropriately when a problem arises. This results in a city becoming more efficient, which in turn reduces the overall cost of service for the customer.

In the future, becoming smart may not be enough as cities will need to become resilient as well. The UK water regulator, Ofwat, defines resilience as "the ability to cope with and recover from disruption, and anticipate trends and variability in order to maintain services for people and protect the natural environment, now and in the future" (SWAN 2016c). Cities may need to become resilient due to climate change, drought, seismic events, system hacks, or water quality threats in order to protect their citizens. Resilient goals include economic and social sustainability, quality of life, efficiency, and citizen participation. Funding a resilient city will require sound business plans and likely public-private partnerships (PPP), which SWAN can assist in through its network of solution providers and industry experts.

Industry collaboration

Collaborative partnerships are essential to delivering value to utilities and enabling solution providers to expand their offering. As stated by a speaker from Suez Environnement, the innovation chain can be shortened by identifying the right partners at the right time, such as academic partners, industrial partners and marketed products and services (See Figure 1). Anglian Water reaffirmed this notion that the key to innovate is to form alliances and collaborate with those who understand their problems.
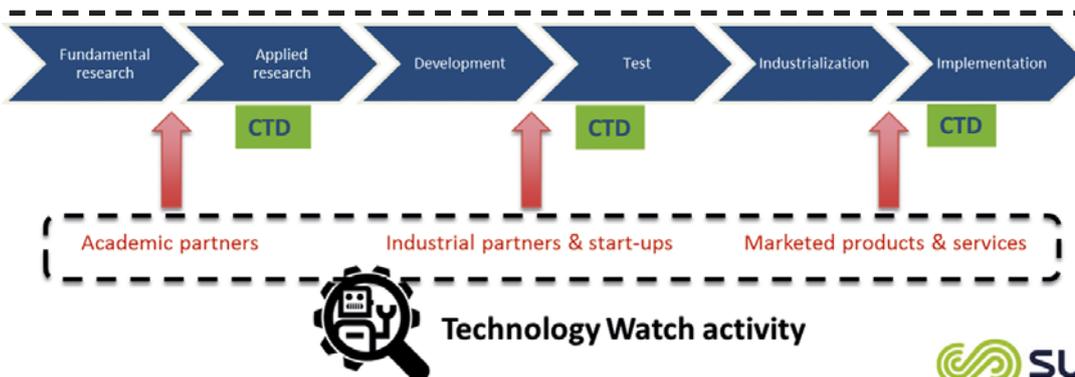

Figure 1: Suez's innovation chain from research to product. This process can be shortened through the "Technology Watch" activity of Suez's Centre Technique Distribution (SWAN 2016a).

Another good example of the power of industry collaboration is in Brazil, which now needs US$75 billion to invest in water and wastewater networks, but does not have that sort of cash flow. Through its SWAN membership, AEGEA, a Brazilian water group was able to get in touch with technology providers outside of the Brazilian market to find solutions to their particular challenges. AEGEA funded these projects through joint-pilots and subsidised loans from development banks. Furthermore, AEGEA was able to change the mindset of its stakeholders through internal workshops and business plans for non-technicians. Today, AEGEA is representative as one of Brazil's leading innovators and shares its experiences with other sanitation companies.

Making data personal

A central theme of SWAN 2016 was turning data into information. Mariano Blanco, Director at FCC Aqualia, stated that "data management is the foundation for change." A UK water utility stated that they want to avoid "DRIP," or becoming "data rich, information poor." Instead, there is a need for "business now," processing only the pertinent information to make timely business decisions.

Data is also becoming increasingly important for customer engagement. Making data personal enables citizens to make educated decisions. Most utilities don't provide customers with many reasons to act to save water. In fact, the average customer only thinks about their water bill for nine minutes per year (SWAN 2016b). Moving from big data to advanced customer analytics allows utilities to provide customers with actionable information to reduce their water and energy consumption and increase their customer satisfaction (See Figure 2). This promotes behavioural change, crucial to sustained conservation.

In her keynote, Jo Causon, CEO of the Institute of Customer Service, highlighted the fact that customer satisfaction drives loyalty, trust and reputation, and data personalisation is becoming increasingly important. For example, instead of being directed to a city's website for a news update such as a water quality incident or blocked road, citizens could receive a personal text on their phone if they desire. In the future, customers could even become a source of data for utilities. However, there are still data privacy concerns which need to be addressed, such as

data ownership and cybersecurity. These issues will need to be carefully regulated with customer data likely anonymised.

SWAN's role

To help guide cities on how to successfully adopt a smart water network, SWAN has developed the Interactive Architecture Tool, available for free on its website. The Tool is based on an international survey of 33 cities. Since each city has unique business drivers and areas of challenges, the Tool enables cities to jump directly to a solution that interests them, such as Leak Detection, Water Quality Monitoring, Customer Metering, Energy Management, Pressure Management, or Water Network Management. Cities can click on individual technology components within the SWAN five-layer architecture to learn about their function, benefits, and system requirements, as well as view solution case studies and benefit analyses. A new Solutions Provider page allows utilities to navigate through a database of smart water technologies by SWAN members. A Social Forum also now allows users to submit questions that will be answered by a SWAN expert.
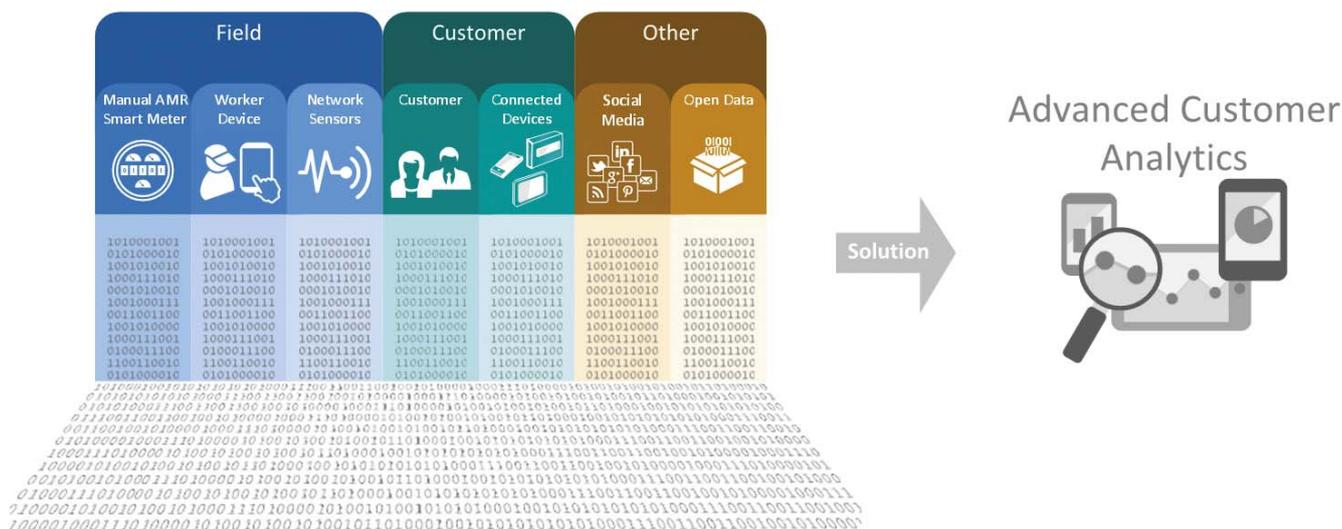

Figure 2: Moving from big data to smart data (SWAN 2016b).

Alongside the Tool, SWAN has devised the SWAN Smart Score, enabling cities to assess their network intelligence by answering 13 multiple choice questions. SWAN also recently published a white paper examining the role that water regulators play in progressing smart approaches (available only for SWAN members).

As a growing community and non-profit organisation, SWAN welcomes new members from across the water industry. Be part of this collaborative effort to secure our water future. Visit their website to learn more.
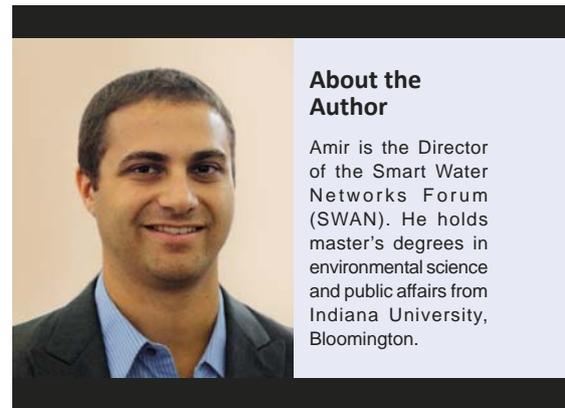
About the Author

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