Big data analytics can aid in better management of water networks

By Eckart Zollner

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Access to clean water is a basic human right, and while government strives to provide access for all, the reality is that South Africa is currently facing a potential water crisis. A shortage of clean water to areas already serviced by municipalities is becoming a growing challenge, as demand outstrips supply, aging infrastructure becomes unable to cope with volumes, and millions of liters of clean and treated water are lost due to leaks, among other problems. More effective management of water networks is key to addressing these and other future challenges.

By harnessing the power of technology in the form of big data and advanced analytics software, water utilities and municipalities alike will be empowered to better manage water networks and as a result, improve service delivery. Technology solutions enable them to address previously unidentified issues, become more proactive about maintaining networks, respond more effectively to the growing demand and to tackle the looming water problem before it can become a full-blown crisis.

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A growing water problem

With the energy crisis being top of mind at the moment, many South Africans are unaware that water is a growing problem and should be on everyone's radar. In fact, according to an article published in Business Day in February 2015, "The 2014 Global Risk Report conducted by the World Economic Forum rated 'water crises' as the third-most significant global risk, two places above that of the failure of climate change mitigation adaption". This is a significant statement, especially when the vast majority of the South African population are not aware of the current state of water services in our country.

In addition, the newspaper reported that "by 2030, it is estimated that water usage in South Africa will have grown to 2.7-billion cubic metres, leaving a 17% gap in supply and demand. Taking into account the current projected population growth and economic development rates, it is unlikely that meeting the projected demand for water resources in SA will be sustainable."

To add to these alarming statistics, it is estimated that 36.8% of the total municipal water supplied in South Africa is lost before it reaches municipal customers, from industry to households, according to research released by the Water Research Commission (WRC). One of the major reasons for this wastage is due to undetected leaks, which are an issue because the majority of the water network is buried underground, and leaks are often difficult to pinpoint until they cause further damage such as sinkholes or collapsed infrastructure.

This wasted water is still undergoing costly treatment to ensure it is clean and potable, however, it cannot be charged for and fails to generate revenue for municipalities. This in addition to the cost of fixing massive infrastructure issues when they occur puts increasing strain on already tight budgets. This in turn takes funding away from government's ability to deliver services to more people and provide access to water for all.

Big Data analytics can help avert water crisis

The upshot of this situation is that municipalities and water utilities face the challenge not only of having to manage the demand for clean water and ensuring there is sufficient supply when already faced a shortage, but they are also losing money too. However, new technology solutions such as big data analytics have the potential to turn this challenge around.

Water utilities by their very nature generate significant volumes of data, which can be harnessed and analysed to provide insight for improved management and decision-making ability. Utilising intelligent data analytics based on past usage data combined with predictive flow modelling as well as real-time information on water levels, weather reports, water flows, pressure and more, significant events can be detected and alerts sent out to highlight potential issues. This type of data analysis can create alerts for water leaks and loss, burst pipes, loss of water pressure and faulty meters as well as usage patterns, water quality issues and much more.

This helps water utilities and municipalities to generate knowledge about network inefficiencies, water loss and other hazards. In addition, it can help to proactively detect leaks for faster resolution, and can help municipalities to prioritise repairs and maintenance based on the likelihood of problems and failures, as well as perform accurate network planning and optimisation.

Providing visibility

This type of end-to-end water network management, delivered as a cloud-based Software-as-a-Service (SAAS), can greatly assist water utilities to avert a water crisis. By providing instant visibility into problematic areas of the water network, many improvements can be made. It provides real-time data and analysis for quicker response to events, allows municipalities to preempt issues and deliver improved customer service, among other benefits.

With a growing population with increasing need for water, both for consumer and industry, improved management and service delivery is essential, and the goal is to reduce non-revenue water losses to between eight and 10%. Technology that assists with early leak detection, proactive maintenance and better management is essential, and ultimately supports the global drive towards the creation of smart cities.

ABOUT ECKART ZOLLNER

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