

LESSON 7

BE DATA LED

Digital technologies – from sensors to smart pumps to machine learning applications – are driving sustainability and resilience objectives across the water sector.

New technologies and the data insights they can generate are bringing unprecedented real-time clarity to the water sector. The emergence of digital twin technology over the last decade is helping utilities to optimize operations, drive innovation and inform strategies by providing immersive and integrated visualizations of previously siloed information.

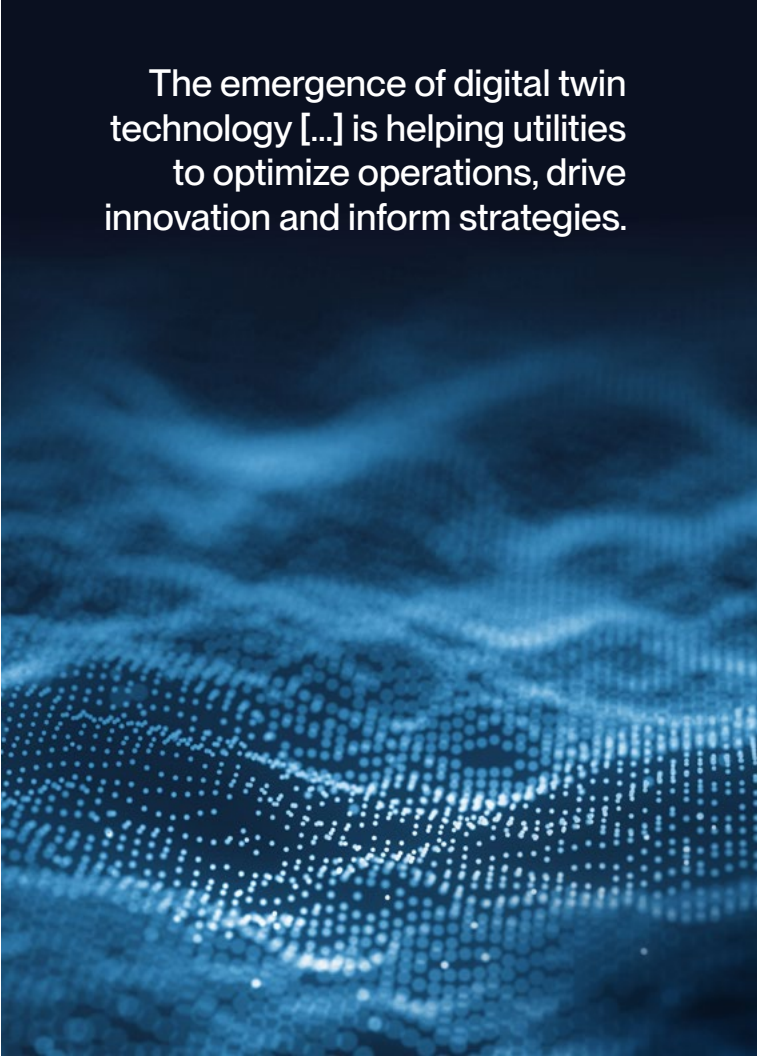
But whether it is to better understand consumption patterns, identify and pinpoint water losses, or to monitor quality, the goals need to be rigorously defined and the data meticulously analyzed to build actionable strategies. Without clear parameters and objectives, data will only provide, at best, part of the picture, and at worst, a misleading one. Data needs to be at the centre of decision-making, not driving it.

Start small and scale up

While data may well be ‘king’, to truly harness the potential, it needs to be focused and consistent. By implementing smaller but comprehensive pilots, utilities can first test, evaluate and then refine approaches before scaling them up. It also enables them to start identifying and acting upon the consumer behaviours, best practices or risk factors that they uncover sooner.

For example, smart meters are delivering remarkable insights into consumption behaviours and leakage. But the installation of potentially millions of smart meters across entire communities is likely a multi-year, multi-million-dollar investment, and utilities are keen to start applying the learnings as soon as possible.

In Auckland, New Zealand, a city of 1.7 million people, Watercare’s phased smart meter roll out program will run until 2034. In the meantime, the utility has created a smart District Meter Area (DMA) focused on the Remuera residential area of the city, with comprehensive smart metering on 2,000 connections across 34 km of pipework. Serving as a test bed, the DMA will enable Watercare to start gathering insights around consumption patterns and service provision immediately and begin applying them city-wide even while the installation program is still at an early stage.



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Data doesn't have to be 'high tech'

'Data' doesn't necessarily have to mean super computers or major investments or complex analytics. Even the humblest digital technology can have an immediate impact.

In the UK, Portsmouth Water trialed an established IoT-enabled water leak detector solution to reduce household demand amongst its customers. The LeakBot device, costing just £149, is clipped on to the mains water pipe by the consumer and can alert householders to leaks as small as one teaspoon per minute. It's a cost-effective way of raising awareness of customer-side leakage, motivating householders to repair them. Not only is it helping cut consumption in the trial group, but it's also helping to confirm Portsmouth Water's own assumptions around the level of leakage in household properties.

Leverage data internally and externally

Despite the widespread media coverage during water scarcity events and utility-led educational campaigns around the need to conserve water, many consumers continue to take an unlimited supply of safe drinking water for granted.

In New Zealand, Wellington Water has been actively engaging with its customers over the risks of water shortages for the city due to water loss, climate change and rising demand. However, while a recent survey carried out by the utility showed that 54% of those polled were attempting to reduce consumption, 34% still thought it was plentiful in the city, and only 5% wanted information on how to conserve water and reduce wastage.

Furthermore, in some instances, the messaging around shortages can seem at odds with what consumers are perceiving. This was the case in Sydney, Australia, when major flooding in November 2022 caused the Warragamba Dam, the city's largest source of water, to spill. However, high sediment levels and algae presence, linked to earlier bushfires and resulting erosion in the catchment area, meant that less than 10% of the dam's water was suitable for treatment and cleaning, putting the city's water filtration system under immense pressure.

Data can provide irrefutable evidence to debunk

misconceptions and reinforce messaging, ultimately helping consumers to understand the need for change. And once consumers are on board, data can also demonstrate the impact their actions are having, motivating them to continue working towards a shared goal.

Data was a major part of Cape Town's response to the Day Zero crisis, not just in tracking the crisis but equally in communicating the severity of the situation to the city's residents. Online water dashboards were deployed to share a range of real-time data, including rainfall levels, water quality, dam levels, consumption levels, and even the city's progress in establishing alternative water sources. It all helped to validate the increasingly draconian water restrictions – down to 50 litres per person per day at the height of the crisis - building trust amongst the population and incentivizing the behaviour change that ultimately helped avert the total shut down of the city's water supplies.

Data democracy

Regardless of the initiative or its intended objectives, ensuring that all stakeholders are engaged with the processes and can access and act upon the outputs is critical. This applies to utility employees and customers, and more broadly for investors, public sector bodies, and other interested parties such as NGOs and technology partners. This will maximize the opportunities for leveraging the insights and achieving greater efficiency and resilience within the water industry and interconnected global priorities around food and energy.

