Maximising technology use

Alan Titchall talks with **Richard Coulter** (pictured), national sector manager, water/industry business at Schneider Electric about technology's role in water quality.

As a water & wastewater segment manager involved in water technology, Richard Coulter has a birds-eye view of our country's water infrastructure.

"Amongst the industry challenges we're facing, the one that's on the top of mind is the obvious reduction in population in certain areas, while it is increasing in others.

"In many areas we have an aging water asset with no expansion of income to support rebuilds or new infrastructure, yet in other areas they face huge new capital infrastructure investment to meet growth projections ahead."

So how is new technology going to help that problem?

"Technology is only one part of the solution; how are we going to best share this new technology across our water industry is to me, the question.

What's the situation now?

"In short, we as an industry could be doing more. There is a certain amount of collaboration, but it's reasonably informal in certain areas. In others, such as national standards for meta data in water, it's been formalised with a project currently being worked on by LINZ, MBIE and local councils with seed funding by Treasury for the development of shared data standards.

"In terms of assets and their locations, this will then need to be applied not only to the asset management systems with a geo spatial context, but also to the customer management, hydraulic modeling, SCADA and control systems, as well as all historicised data, so as to get the costs down and to achieve the real tangible advantages of deploying a standards framework."

How do we compare with what is going on in the rest of the world?

"In some ways we're in a better position, in others we have some way to go.

"Shires and local councils around the globe are now starting to realise the need for the 'specialisation' that is already deployed in our cities.

"Unfortunately, in New Zealand we don't have the investment levels necessary or the high level expertise in the geographic locations to achieve that. To share this urban expertise and standards at local council would require a different model, and be driven at a higher level.

"From a technology point of view, there are other options that can be explored, such as the software as a service model (SaaS), a very cost-effective model for the management of data and information systems.

"The cost of having IT service technology on premises, with the necessary IT support people, is a high burden on small councils.

"Whereas farming that to a cloud service provider results in substantial savings with what they call the SaaS model.

"We as an industry need to encourage and embrace these types of options."

Specifically, what technology options will achieve this?

"First and foremost you have to have information; you can't manage what you don't measure. Accessing this information through SMART field device data, then using existing infrastructure with the likes of the telcos to get this information back has never been easier, or the cost to entry lower!

"Instead of a council having to invest in their own infrastructure which becomes in some cases, once deployed, 'a stranded asset', they can deploy this using existing data acquisition infrastructure and bring that information back for a very low cost.

"Currently collected field data – wastewater, freshwater, stormwater, weather services data, GIS and hydraulic modeling – sits in vertical silos to some extent. It can now be integrated so that you have a more holistic and customer centric system overview with analytics providing real innovation and insight.

"Where Schneider Electric has been putting a lot of investment and time is in the analytics layer so you can gain insight for better informed decisions. By effectively integrating big data with technology solutions, the water industry can optimise all aspects of its systems. Not only does the use of data help

"This principle is not new and has been expressed as an expectation by central Government, where local authorities are to 'actively seek' to collaborate and cooperate to improve effectiveness and efficiency.

This in turn encourages councils to look for ways of collaborating and working with other bodies to better achieve the outcomes that their communities want and need.

"This sharing of best practices among councils and water authorities must also be matched with the appropriate funding model and capital programme to invest in modernisation and new technology.

"The cost of reinventing the wheel is just not an affordable or efficient model for this country. Establishing across 68 councils some form of standardisation that can be shared, simply makes good sense."

organisations understand their customers but it can also help optimise efficiencies, improve longevity of assets and predict future trends."

Is there an example in New Zealand where this has been implemented?

"It's a very new technology, and we're currently deploying it in the agriculture sector.

"This sector doesn't have the same constraints as local authorities and can be more agile in adopting new technology very quickly.

"We have over 300 installations on farms across the country running on this type of system, which involves things like effluent proof of placement tracking, and water monitoring and compliance.

"Effectively, this technology places the power of what was an industrial SCADA system in the palm of someone's phone with virtually very little capital outlay, thanks to the power of the cloud with a SaaS subscription model.

"Because of the nature of local government it will take some time before it deploys this technology."

How is the company involved in the industry's drive for efficiency?

"In the area of efficiency, one of the innovations we're bringing to the market at a low entry cost is the ability to measure an energy pump used for water distribution or wastewater networks.

"This is pumping energy consumed by the volume – say how many kilowatts per cubic metre per metre of head – towards a national benchmarking.

"Then you can look at your benchmark against your neighbour's benchmark in an easy to understand user format using a traffic light style perspective; red, amber or green.

"With a transparent system ratepayers understand what is required to efficiently delivery water to their door.

"If you're in a council where the pumping stations are percentage-wise more in the red, then there could be an argument that it's better for central Government to provide assistance programmes to get them more efficient. Because all it's doing is putting more drain on your rates dollar to go into an inefficient system as opposed to capital works to make it more efficient long-term.

So it all kind of points towards a national standard?

"Yes and benchmarking. At the moment you've got no benchmarking to say 'how is my delivery of water and wastewater done from an efficiency perspective. Is it good, bad, ugly?' But soon we will know.

"We're fortunate that now the cost point for data driven decision making has come down, thanks to new data acquisition technology, and reduction cost of the products as global volumes have increased volumes.

"You couldn't afford to put an energy meter on every pump in the past because it cost thousands of dollars and people would question the value of that.

"Well, now we supply variable speed drives that have energy metering in them as standard.

"Local regulations say that you need to measure extraction rates, so now you have to install a flow meter. With this, it now means you've got two very useful variables, energy and flow, by adding a pressure gauge, you know at what head you're delivering, and suddenly you've now got the metrics to have analytics that tell you, from a benchmark, how efficiently you're delivering water."

"Globally around 80 percent of all energy consumed in the water and wastewater segment is through pumping.

"So people are always asking, 'how can I pump more efficiently?' I only want to pump to meet my demand and no more? How do I know when my pump is becoming inefficient, and it's time to spend some money and find out why, then remediate or make the required improvements to the system?"

Is such pump data increasingly achieved through wireless technology?

"Yes, this will be the next big industry step change, by leveraging off the multinationals' R&D technology spend, local organisations get the benefit without having to realise upfront capital investment.

"For example, not having to spend on communication infrastructure because they can leverage on a telco such as Vodafone is a classic example, they've invested hundreds of millions with the forthcoming narrow band IoT and broadband roll-out nationally, and what that now means is that smart devices like IoT connected pumping systems can connect to their SCADA systems.

"So all that data can be sent for a few dollars a month from any device, anywhere. "Whereas you couldn't do that five years ago, the technology just wasn't there, nor was the price point.

"Now for a few hundred dollars you can get this device and for a few dollars a month you're measuring those critical assets.

"So there's some pretty exciting stuff out there and if councils are wanting to embrace that there's certainly some substantial savings that can be made.

"As a nation, we have a huge opportunity to invest in the future of our water through people, processes and technology.

"With the challenge of a growing population and aging water infrastructure, it's more important now, than it ever has been that we work together to ensure adequate access to fresh water for the economic growth of our industries and the well-being of our citizens." **WNZ**