I2O™
Intelligent water networks

Smart Networks Organisation Design
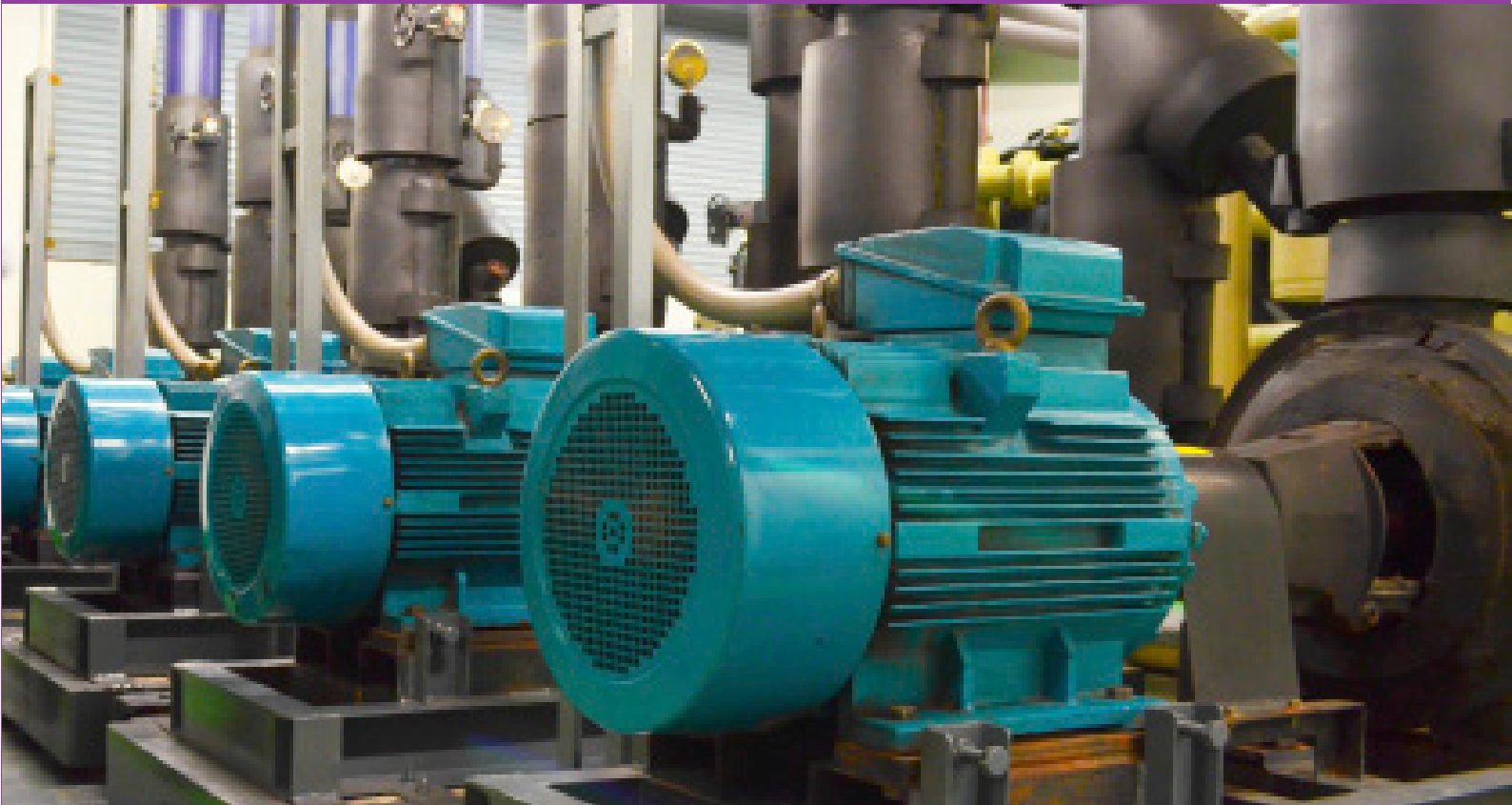
This thought piece helps senior executives to consider what the best organisation design is for managing a clean water distribution network in the 21st century.

Water company organisation design is out of date. Four major issues need addressing:

- Tactical orientation around regulatory targets needs to be replaced by a more strategic approach
- The long view has been neglected because of the compelling demands of the short-term
- Technology is changing how the network is monitored and operated from a largely manual to a remote and automated paradig
- Large amounts of data are becoming available and this has to be used to the greatest effect

TACTICAL vs STRATEGIC

The UK has had a fairly effective regulatory regime in place since the industry was privatised. The regulatory requirements have included a number of specific metrics, and organisation design has tended to orient around the achievement of regulatory targets. This is most obvious in the creation of the role of Leakage Manager.

The downside of this approach is that targets become an end in themselves. Each department pursues its own separate agenda and there is no easy mechanism for reconciling conflicting aims or assessing opportunities for solutions which have wider benefits.

Network monitoring and pressure management are good examples of solutions whose benefits cut across a range of regulatory targets.

It appeals to the Leakage Manager and to the Energy Manager and to Customer Services and to the Finance Manager and to whoever is unfortunate enough to feel responsible for customer minutes lost. But only in the most enlightened water companies are these people likely to come together and spontaneously pool time and budget to specify and procure such a solution.

Organisation design needs to take much more of a process view of water distribution, and a holistic view. Regulatory targets need to be shared responsibilities to which many people can contribute. Someone with a financial background who understands the network needs to assess the return on investment of projects for the whole network not just an individual department.

BUSINESS BENEFITS

REDUCED ENERGY CONSUMPTION

REDUCED LEAKAGE AND BURST FREQUENCY

INCREASED INFRASTRUCTURE LIFETIME

IMPROVED CUSTOMER SERVICE

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THE LONG VIEW AND THE SHORT VIEW

Anyone who works in the water treatment area can observe a 50 year history of remote and automated operation. But in the network world, this is brand new. Since around 10 years ago, pervasive mobile communications, battery life, and low power electronics have been making remote and automated operation possible.

Pump stations should no longer be the province of control but should belong to the network team. There was a time when the fact that pump stations were mains powered and could be remotely operated and monitored meant that they were unique in the network world and much more akin to the water treatment world. It was logical to include them in the domain of the Control team.

But today battery power means that much of the network can be remotely operated and monitored. It is time for pump stations to return to their logical owners – the network team – so that their role in network performance can be fully assessed, and their contribution to delivering performance and resilience requirements can be optimised.
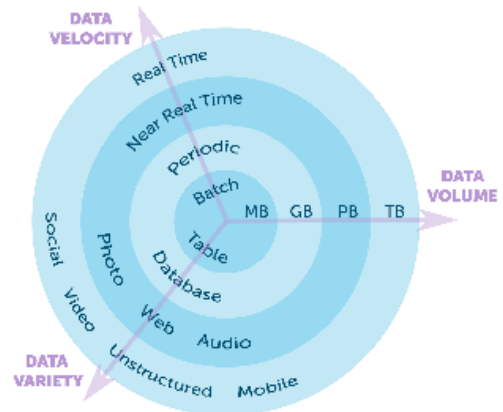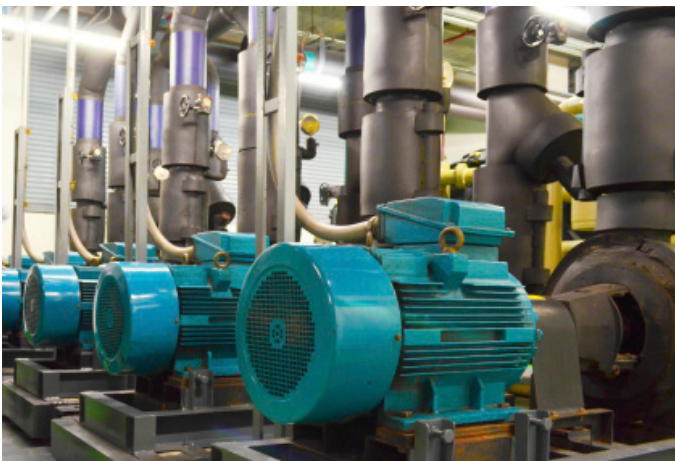
DATA ANALYTICS

The reducing cost and increasing availability of sensors, and their ability to return more data more often is creating a tsunami of data. Historically, network knowledge has often been the province of the longest serving employee.

Technology is enabling data to be processed quickly, effectively and tirelessly at every time of the day and night. If this is to be harnessed with in-house capability then the right skills need to be acquired and housed in an organisation that is not used to the sort of people who can code in R. If this is to be harnessed from suppliers, then the skills to specify what is required are nonetheless necessary.

Another aspect of this change is the requirement of the organisation to become more data driven in its decision making, and less reliant on opinion. This is a cultural change which will need to be championed at the top of the organisation. The organisation design below offers a template for how to organise resources to take account of these 4 issues.

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NETWORK OPERATIONS DIRECTOR				
PROGRAMMES MANAGER	**NETWORK MONITORING MANAGER**	**NETWORK OPTIMISATION MANAGER**	**WORKS MANAGER**	**NETWORK MANAGER**
Forecast demand (people, place, water consumption) and network requirements Programme and project evaluation and selection to meet demand within available budget: • Monitoring schemes • New schemes • Optimisation schemes • Renewal/ replacement • Maintenance programme Supplier selection and approval Input to company budget Report on network performance, management, regulatory	Determine network monitoring requirements Design, specify and propose schemes to improve network monitoring Monitor network performance: • Asset condition, infrastructure, monitoring hardware • Leaks • Pressure, flow, transients • Water quality • Reservoir levels • Valve positions • Network-related customer calls Predict failure Ensure systems of record e.g. network performance data are maintained Conduct analysis to support others as required	Define network performance and resilience requirements Identify opportunities to improve and optimise network design Design, specify and propose new schemes and optimisation schemes for implementation Ensure network model is maintained Report on benefits delivered by schemes	Manage contractor and/or internal works resources Implement schemes and install infrastructure hardware (pipes, valves, pumps, actuators, etc.) Monitoring hardware (loggers, meters, etc.) Ensure relevant systems of record e.g. GIS are maintained Manage and deliver maintenance programme Carry out repairs Report on programme status, efficiency of use of resources	Operate network day-to-day to achieve performance requirements Manage incidents and events Ensure systems of record e.g. event management are maintained Report on day-to-day network performance including events

Two important things need to be said about it.

The first is that no organisation design is perfect. Every organisation design has its strengths and weaknesses, but the question you need to ask is whether, on balance, it offers a better way forward.

The second is that all organisation designs need to accommodate the specific capabilities of a particular company's employees. It may make sense to combine areas and teams, or to split out a particular function, to reflect the skill-set of individuals. Whatever organisation design you choose, you should satisfy yourself that it enables you to deliver your business objectives, and address the challenges you face and the opportunities that you have.