

Using Data to Fuel Innovation: The Future for Water Utilities

Why it's time to use data to drive innovation

Water is a vital resource for human life, and as a company in the sector, you must provide a safe and reliable service to your customers above all else – adhering to strict targets set by your regulator. So, how well prepared is your business? **Mark Hoyle, Head of Public Sector EMEA at Autodesk**, explains the business benefits of capturing and understanding data across your assets.

The drive for sustainability, increasing competition, public scrutiny over leakages and spills, and management of a vast infrastructure of ageing assets are all challenges you face every day.

Strict pricing caps also mean that increasing prices is not an option. Nevertheless, your targets are ever increasing, and many of the 'easy fixes' to enhance your business may have already been deployed.

It's now time to turn the dial on time-old practices, enhance your digital journey and deploy digital strategies that will help you innovate, work smarter and be more efficient, while meeting customer and public expectations.

A successful digital strategy starts with data. The first step is to capture your organisation's data and store it within a central data management system – this creates a digital thread from capital planning through to workflows, deliverables and people.

This data can fuel innovation through advanced technologies such as machine learning (ML) and digital twins that continuously track data on everything from chemical dosing through to water pressure, enabling you to optimise processes, as well as predict and avoid potential issues.



The business benefits

Capturing and understanding data collected across every asset and process will help you:

- 1** Optimise operations to drive productivity and efficiency
- 2** Deliver more sustainable practices to meet net-zero targets
- 3** Innovate and differentiate the service you deliver to remain competitive

1. Optimisation

Optimising your business starts by understanding the value of the data you own. By centralising asset and infrastructure information and using technologies such as sensors, artificial intelligence (AI) and machine learning to continuously capture and analyse data, you can start to generate predictive insights. Done effectively, this will help you to be significantly more innovative across the whole built water cycle.



Delivering intelligent operations

Use sensors to collect live data about chemical dosing and system performance in water and wastewater treatment plants. AI can then continuously use the real-time data to predict optimal dosing and energy costs while maintaining compliance. This process will help minimise resource wastage and can result in **cost savings of 20% to 30%**.

Reducing water wastage

When assets fail and treated water is lost into the natural environment, it is not only a waste of water, but also a waste of the resources that went into pumping and treating it – a significant drain on operational efficiency. Through smart monitoring and the deployment of a digital twin to improve emergency planning, you can take advantage of predictive maintenance to rehabilitate systems, reducing the likelihood of flooding, driving more efficiencies, and limiting negative impact on margins.

Case study: Wessex Water

Wessex Water used a common data platform to optimise operations and drive more efficient workflows, including design review processes with external contractors, managing documents across teams, and accessing 3D models.

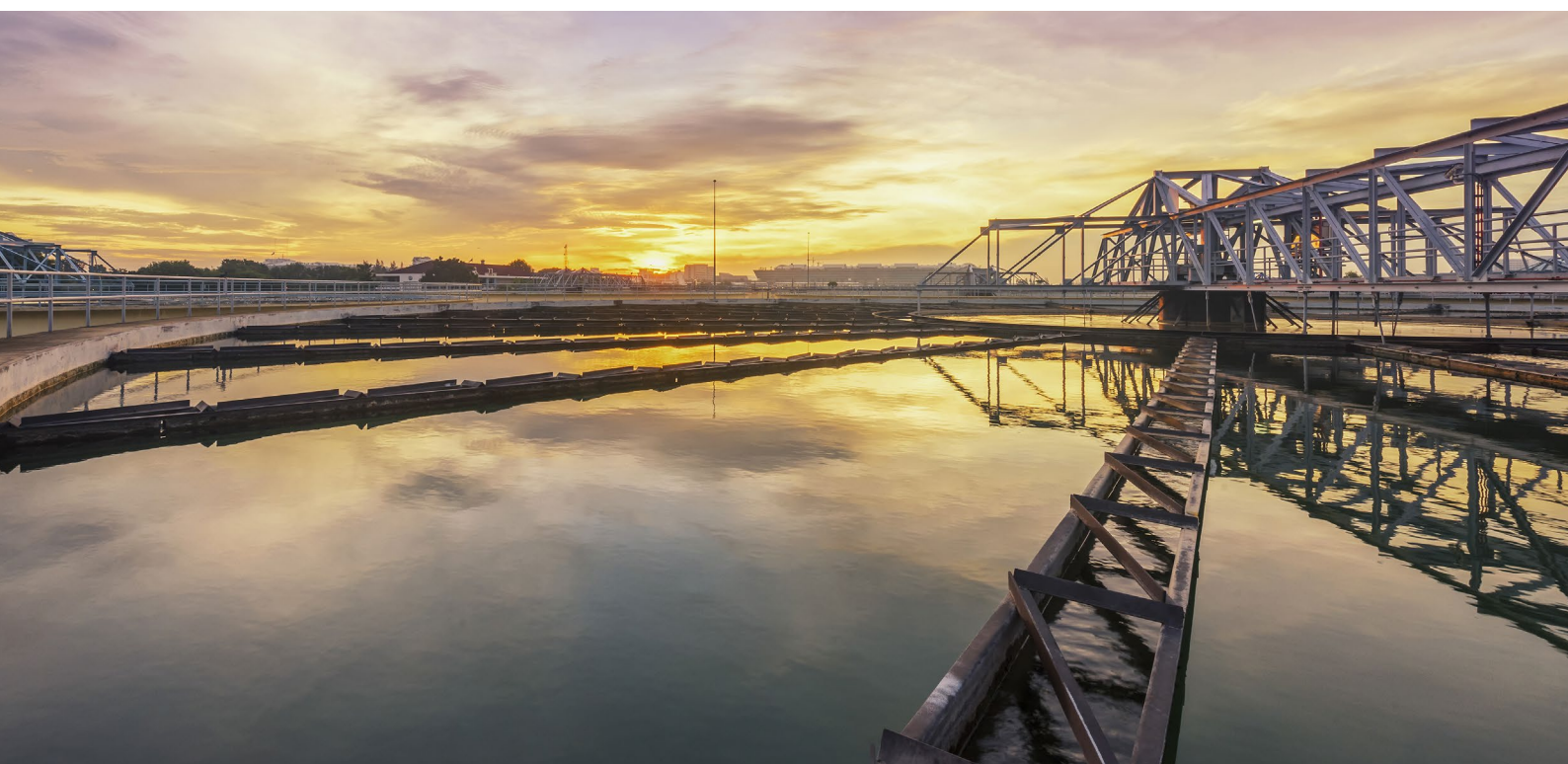
One of the most immediate impacts it achieved was a significant productivity increase in its main-laying team by **slashing the time taken to set up projects from days to minutes**.



2. The sustainable opportunity

Sustainability presents a huge opportunity to drive more innovation, increase customer affinity and have a positive impact on the environment. With access to better data, you can more easily identify areas that are most carbon-inefficient and develop strategies to reduce negative impact.

And, by optimising operations, you can reduce demand on everything from resources used in water treatment through to electricity needed to operate plants. Advanced technologies can also reduce the wastage of water itself.



Case study: Scottish Canals

In Scotland, advanced control system technology is being used to develop a 'Smart Canal' which has successfully mitigated flood risk in north Glasgow without negative impact on the environment. The control system uses remote sensors and rainfall forecasts to feed into the hydrological model. When a storm or heavy rainfall is forecast, automatically controlled sluice valves are used to manage the water levels of the canal accordingly. This creates an **extra 55,000 cubic metres of storage** for surface water runoff, and the canal remains navigable while avoiding the risk of flooding.



In the UK, much progress has been made on sustainability initiatives, but there is still room for improvement.



346,000 kilometres

of water pipes, connecting more than 26 million properties.

(Source: Statista)



45% reduction

in greenhouse gas emissions already realised by the sector between 2011 and 2018.

(Source: Envirotech)



77% of utility leaders

believe that lack of data is hindering their ability to reach net zero.

(Source: Utility Week)



2,266 kilotonnes

of carbon dioxide emitted by the water sector each year – equivalent to 1.5 million annual car emissions.

(Source: Discover Water)



10 million tonnes

of greenhouse gas emissions that could be avoided by reaching net zero in 2030 – two decades ahead of the UK government's legally binding target.

(Source: Water UK)

Data fuels the innovation behind the strategies that improve your environmental impact.

By 2030 the UK water sector is committed to achieving carbon net zero – an enormous opportunity to invest in a digital infrastructure that will help you achieve that goal.

Conserving water



47,000 pipes

burst in an average 12-month period between April 2019 and March 2020.



2,954 million litres

of water lost each day because of burst pipes.

(Source: Statista)



30-40% reduction

in risk of water loss, flooding and pollution that could be realised through pump optimisation, network calming and leakage control.

(Source: Euase)

Reducing energy usage



1.96 metric tonnes

of carbon dioxide equivalent emitted each year by the sector's use of electricity alone – including process emissions, burning of fossil fuels and grid electricity.

(Source: Water UK)



323 million kilowatt-hours

of electricity could be saved annually across Europe if a 5% decrease in water distribution system leakage – saving 1 million m³ per day of water – is realised.

(Source: Digital Europe)

Generating cost savings



25-35% cut

in operating and energy costs thanks to smart water technologies such as data acquisition and management.

(Source: The UK Water Partnership)

3. Using Data to Boost Customer Experience: The Future for Water Utilities

As a company in the water sector, you're likely constantly on the hunt for strategies to help you innovate, work smarter and be more efficient. Data fuels innovation and by capturing and understanding the value of the data you own across your assets, you can improve your customer experience and remain competitive.

Although regional monopolies have existed for a long time in the water sector, competition is now rife, with **66% of European utility retailers** viewing quality of customer service as the most important strategy for driving differentiation. With a growing population and increasing demand for new housing, there's even more pressure to innovate in order to identify and rectify issues as swiftly as possible.



Preventing floods

Climate change is causing both hotter, drier summers – resulting in water scarcity – and wetter winters, resulting in more flooding and combined sewer overflows (CSO). Operational dynamic digital twins, which can analyse weather forecasts and historic system data, can help to continuously monitor at-risk locations and provide guidance on the extent of any potential flooding. Having access to this data means your operations teams can prevent incidents from happening, protecting your customers from experiencing issues in their water supply.

Tackling supply interruptions

The Institute of Customer Service's **UKCSI for Utilities** confirms that reliability of service is the second most important concern for customers. With 3D data models and digital twins, customer service agents are instantly alerted to any anomalies within the network and can pinpoint supply interruptions easily. Teams in the field can then quickly locate and fix the issue, while customer service teams have all the information they need to keep customers updated until interruptions are tackled.

Case study: Bristol Water


In 2018, Bristol Water detected a dangerous pathogen within one of its treatment works. It was shut down immediately, leaving Bristol Water to maintain levels of service to customers while investigating the risk of contamination. Engineers used a data modelling platform to calculate how much more quickly freshwater could move through the network to find the best solution for service restoration. This helped to minimise response time, with Bristol Water later receiving **a 70% customer satisfaction score** for its swift management of the incident.



Evolving to digital twins

Collecting and understanding data within your business paves the way for innovative tools such as a digital twin – a dynamic, digital representation of a physical asset or environment that evolves in real time. For the water sector, there are many benefits of a digital twin.

It can be used to model and monitor the entire operation of network assets, effects on customers and external environmental factors. It can also forecast operational issues, predict future demand, and assess multiple “what-if” scenarios to analyse the best approach for the customer, network and environment. This enables you to proactively plan before issues arise such as flooding or customer supply interruptions.



Five steps to drive innovation by becoming data-driven

1 **Develop a data strategy:**

Digitise your processes to give total visibility across your infrastructure, assets and ongoing operations. The data captured will enable you to model your operations and will provide the foundation for digital twins.

2 **Enable collaboration:**

You must break down silos within your business so your internal systems are connected and can feed into each other. This will improve collaboration across the business by ensuring teams have access to data they need.

3 **Upskill your employees:**

There's no point investing in digital infrastructure if your teams aren't equipped to understand and analyse the data. Upskill your teams so they understand how data will enhance their role and can derive real value from it.

4 **Deploy a digital twin:**

Once data foundations are in place, you're ready to deploy innovative solutions like 3D data models and digital twins. They track information in real time to ensure everything is operating as it should. Using that data, you can then predict any potential issues in the future, and outline actions to address them.

5 **Evaluate for efficiencies:**

Once your data tools have been deployed, the hard work doesn't stop there. It's essential to continuously innovate to identify areas where greater efficiencies can be made. The good news is, the more data you're able to gather, the better the recommendations and predictions will be.

Take charge of your data

Autodesk is ready to be a proud partner in your digital transformation journey. Speak to us to find out how smart use of data can improve transparency, collaboration, quality and compliance across your project teams – and ultimately help to drive innovation, improve sustainability and maximise customer satisfaction.



Let's work together on your data management strategy