Background

South West Water (SWW) is based in Exeter, England and provides drinking water and waste water services throughout Cornwall and Devon to 1.7m customers in 715,000 households and 75,000 businesses, using over 30,000 km of pipes. SWW is also responsible for bathing water quality along over 650 miles of coastline. On the waste water side, SWW has over 650 waste water treatments works, over a 1200 pumping stations and over 9000 km of public sewers to manage on a daily basis.

The UK water industry is undergoing significant change

In April 2017, under the market regulator’s Open Water initiative, all business customers and public sector, charitable, and not-for-profit organisations in England began to be able to choose their water and sewerage retailer for the first time, and water companies have had to separate wholesale and retail activities to support this directive. Discussion is ongoing about whether to open up the market for domestic customers in the future as well.

In addition to introducing competition into the retail space, the market regulator also has a set of key KPIs called Outcome Delivery Incentives (ODIs) that work on a reward/penalty basis. Each water company must report performance to the market regulator on a regular basis and progress against ODIs is publicly reported at the end of every financial year as part of an annual performance report.

To support the opportunities and challenges that industry-wide change creates, Hitachi and SWW will work together over the next three years to bring the power of near real-time analytics to SWW and make company processes more agile.

Business Challenge

Siloed data inhibits organizational performance and agility

Regulatory change in the water industry and limited ability to alter prices means operational efficiency is key. Worldwide, water networks tend to operate using aging infrastructure, often 50-100 years old and have regular maintenance and upgrade cycles that can lead to large capital investment programs.

Network failures can lead to leakage, pollution incidents and supply interruptions for customers due to unforeseen problems. Utilities today are excellent at reacting to challenges across the network infrastructure and providing rapid maintenance when it is cost effective to do so.

Summary

Background

- South West Water is a UK water utility and leader in water services and environmental sustainability
- Provides drinking water and waste water services to 1.7 million customers in 715,000 households and 75,000 businesses, using over 30,000 km of pipes

Challenges

- Stringent regulatory standards
- Aging infrastructure
- Siloed data

Solution

- Cloud-based IoT analytics and business intelligence platform to inventory, integrate, value, and prioritize data from across its operations
- Leveraging tremendous amount of existing data to gain insights and make informed decisions

Results

- Faster response to three pollution incidents
- Improving regulatory compliance and avoiding penalties
- 24% reduction in customer leakage cases
- Predicting equipment failure
- Near real time decision making
and compliance targets. For SWW, it is important to capitalise on existing investments and data held in SCADA, GIS, sensors, telemetry, and IT systems to minimise infrastructure investment. As SWW already collects a tremendous amount of data on its water network, the key area of focus is not collecting new data but rather better leveraging the data it already has.

Using Microsoft’s Azure cloud platform to reduce upfront investment required, Hitachi is helping SWW inventory, integrate, value, and prioritize data from across its operations. Cloud technologies are enabling SWW to quickly and affordably centralize this data in a data lake and then visualize it in near real-time with easy-to-use interactive dashboards. These dashboards then enable SWW decision makers to become more agile, with actionable insights and improved decision-making capabilities to increase operational performance and better track KPIs against targets. “We’re leveraging the power of the Microsoft Azure platform from both an advanced analytics and data collection perspective. That helps us get up and running much quicker and innovate rapidly together.” – Claire Thomas, Business Development Director, Hitachi Consulting

Hitachi and SWW are creating an industry data model to store information in a central location for re-use across various use cases, creating a single version of the truth and automating some of the decision making processes. This model will provide the foundation for future use cases, including predictive maintenance. By applying advanced analytics to SCADA and telemetry data, SWW aim to more accurately predict events that impact operational performance and act accordingly, reducing maintenance costs and increasing customer satisfaction.

Key Result #1
Complying with regulations at a lower cost
With the help of Hitachi, SWW is increasingly able to deliver near real-time analytics and centralised information to operational end users and management teams to improve company performance. One key area of increased performance is cost reduction and increased efficiencies along the value chain.

With a more automated data collection and integration process, SWW is able to reduce the cost of managing and monitoring key assets such as waste water treatment plants and pumping stations. It is also able to more efficiently highlight exceptions and take action, such as detecting and managing water leakages, with greater situational awareness of its network.

Improved management of waste water operations using one of the solutions delivered has allowed SWW to respond to three pollution incidents faster. Centralised insight across 165 sites using signals every 15 minutes from over 3000 telemetry points analyzing 57 million rows of data allows these faster responses. This covers the top 10% of sites so far and about 5% of telemetry points, so there is enormous potential to expand the solution together.

“We have been able to respond to three pollutions [events] much faster than we would have been able to in the past.” – Michael Wigmore, Head of Waste Water Service Improvement, South West Water.

Solution
Leveraging data as a strategic asset
Hitachi Consulting is working with SWW to develop a cloud-based IoT analytics and business intelligence platform that will help SWW make faster, more informed decisions to improve customer service, predict operational performance, deploy maintenance solutions more effectively and comply with industry regulations.

Water utilities must always balance cost of service with customer satisfaction and compliance targets. For SWW, it is important to capitalise on existing investments and data held in SCADA, GIS, sensors, telemetry, and IT systems to minimise infrastructure investment. As SWW already collects a tremendous amount of data on its water network, the key area of focus is not collecting new data but rather better leveraging the data it already has.

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Key Result #2
Addressing problems before they happen

One key objective of SWW’s engagement with Hitachi is to reduce maintenance costs and increase network performance by leveraging predictive maintenance practices. Maintaining equipment or infrastructure on a regular basis, whether it needs it or not, can be costly. Performing unplanned corrective maintenance when infrastructure components have already failed can also be costly. Using sensor data and proven industry algorithms can predict equipment failure and optimize maintenance in a cost-effective manner. The goal is to tackle problems before they happen.

SWW is working to reduce repair costs across the board, reduce leakage volumes and reduce the (already infrequent) number of events that impact the public. Increased availability of network performance data and altering when KPIs change puts decisions in the hands of operational teams. Workforce planning teams will be able to prioritise jobs based on quantified impact and deploy operatives more effectively. So far, SWW has seen leakage reductions of up to 24% across the network delivered through actions prompted from better operational insight.

SWW is also working to reduce customer contact costs. With fewer service disruptions, SWW should need to field fewer incoming customer calls.

Conclusion
Hitachi and SWW have teamed together to co-create innovative solutions that leverage SWW’s data as a strategic asset and Hitachi’s expertise in analytics, business intelligence and the water industry to improve operational performance, increase customer service levels and ensure regulatory compliance.

“We had the domain knowledge, [SWW] had a very specific knowledge on the local market and jointly, we really built something that makes a difference.”
Itay Inbar, SVP Sales & Solutions, Hitachi Consulting

About Hitachi Consulting
Hitachi Consulting is the global solutions and professional services organization within Hitachi Ltd., a global innovation leader in industrial and information technology solutions and an early pioneer of the Internet of Things. Hitachi Consulting is a business integrator for the IoT era and a catalyst for digital transformation. Using our deep domain knowledge, we collaborate with clients to help them innovate faster, maximize operational efficiency and realize measurable, sustainable business and societal value. As a consulting-led solutions company, we can help you leverage data as a strategic asset to drive competitive differentiation, customer loyalty and growth. Visit hitachiconsulting.com