



Reservoir at
Edinburgh, Scotland



Scottish Water Scotland

Scottish Water

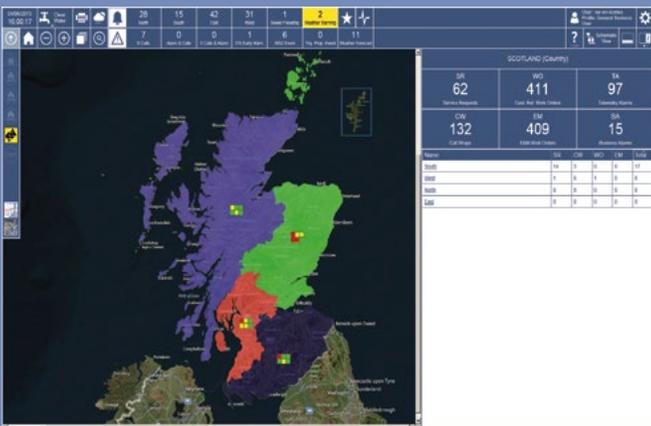
“While we continue to develop our Situational Awareness system, we have already seen significant benefits through the early identification of business events and thus the protection of our service to our customers. As we move forward, the functionality developed to date will not only continue to improve our reactive response, but fully support the delivery of a more proactive service from our ICC to both our internal and external customers.”

Bernie Rodden
Manager of the ICC

would revolutionise the way in which they could understand business events and ensure effective response arrangements for many years to come.

A group of individuals within the ICC considered a number of options, ranging from replacement of existing telemetry systems to procuring a new integrated solution that would improve the visualization of data with a clear view of both supporting their Overall Performance Assessment (OPA) and enhance the management of business events. By applying an “Internet of Things meets Big Data” approach, the team invented a data-driven software solution based upon ICONICS GENESIS64™ software that supports Scottish Water on its journey to becoming a trusted and leading organisation in Scotland. Scottish Water is now in a better position to understand its data and respond effectively to customer service events throughout the country.

The ‘Situational Awareness’ application has been so successful that Scottish Water and ICONICS are now help-



The Situational Awareness Application

Introduction/Overview Synopsis

Scottish Water provides clean, safe and high quality drinking water to 2.45 million households and 154,000 business premises across Scotland. Every day, they provide 1.3 billion litres of clear, fresh drinking water and take away 842 million litres of waste water, which they treat before returning to the environment.

In 2010, Scottish Water established an Intelligent Control Centre (ICC) to serve as their central hub for all their operational activities across Scotland. The vision was that the ICC would allow Scottish Water to respond quicker and more effectively to emerging business events. In turn, the ICC would ensure that Scottish Water’s response was appropriate and would protect Scottish Water’s reputation.

Scottish Water embarked on a partnership with ICONICS that was going to allow them to build a solution that

ing operational teams around the world to consider implementing a similar data-driven solution.

The software that Danny Rodden, Duty Manager of the ICC, and his team have built intelligently unites telemetry, customer data, engineering data, weather data, fleet and work management into a single integrated view, harvesting millions of data points per week. That data, supported by business rules and logic, has given the team deep insights, enabled better diagnostics, and has allowed for far more intelligent customer-focused decisions.

The ICC’s Business Problems

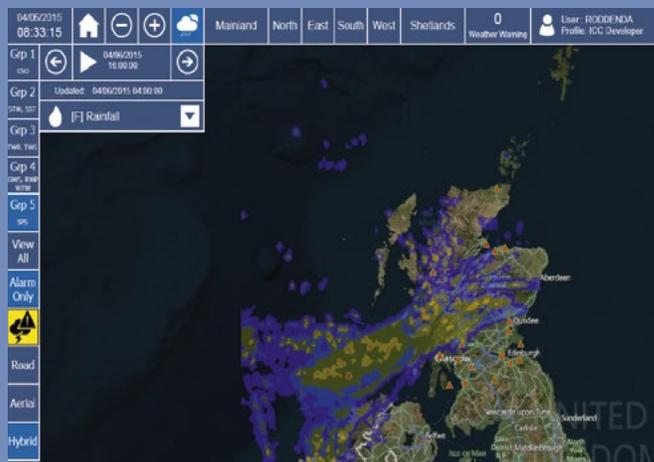
Bernie Rodden, Manager of the ICC explained to us that, “At the commencement of the ICC, Scottish Water had a

- Support the delivery of operational efficiency costs (£3.8 Million).
- Provide the ability to proactively intervene or solve ‘interruptions to supply’ within 6 hours. In other words, they need to ensure that all premises across Scotland do not experience unplanned interruptions to supply lasting more than 6 hours.

The historical process within Scottish Water required the manual checking and consolidation of data from a number of disparate systems in order to develop a complete view of events occurring in a District Metering Area (DMA). The ICC saw this as an environment that had the



Scottish Water Call Centre



Live Weather Data with Business Alarms

number of key aims associated with the development of our Situational Awareness requirements including:

1. The ability to improve the speed of identification of various business risks that had the potential to impact on the service to our customers.
2. Ensuring we had the capability to link various sources of business intelligence including telemetry, customer, weather and workflow activity data, etc. to support the early identification and response to business events.
3. Having a system that was flexible enough to both develop and enhance in house to meet future business needs.

The ICC’s success has, to date, been measured by their ability to influence a number of business problems including:

- Protection of OPA points, particularly in relation to interruption to supply events.

potential to cultivate human error, encourage increased decision frames and, ultimately, endorse decisions that weren’t representative of the ‘complete’ picture.

The Vision and Selection of ICONICS

It’s important to note that Situational Awareness wasn’t some sort of long-term master plan, or Scottish Water’s SR10 ‘secret weapon’ to achieve a leading OPA score. No, the development of Situational Awareness was very much an evolutionary process that started all the way back in 2012 when Scottish Water decided to upgrade their water network schematics. At the time, the team needed some way of connecting their new state-of-the-art schematics with their customer and enterprise data. Remember, the goal of the ICC was to protect Scottish Water’s reputation with customers by providing improved service. So the ICC team asked, “What if we are able to make our customers part of every decision? What if we

can somehow unite our asset with our customer calls?”

A high level set of around 60 capabilities went out to market and, soon enough, 20 leading software suppliers were whittled down to a handful of providers. But the truth is, no one could really do everything that Scottish Water wanted.

“It is typical of a lot of functional specifications taken to market in the industry, that nothing can do everything you want it to,” said Michael McMullen, Project Manager.

The evaluation period came and went, and Scottish Water changed their approach and scaled back their requirements. As result, ICONICS was chosen based on the agility, power and connectivity capabilities of their product suite.

Phase 1 and the Benefits of SA

Danny Rodden and his team had managed to tie the elusive gap between ‘the event’ and ‘the customer’, but they weren’t finished there. While Phase 0 was busy being deployed, the ICC and the ICONICS consultancy team had already made plans for a second phase, ‘Phase 1’. At this point, Phase 0 had already proven the simplicity of building an ICONICS-based solution.

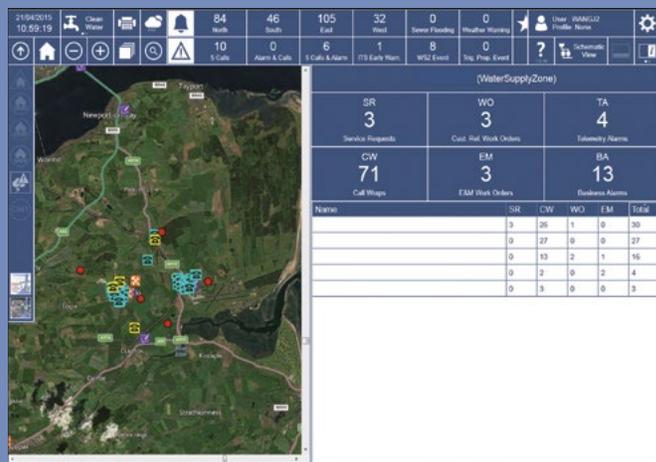
“It was clear for us that the power of the solution lay at our fingertips: the end-user,” Rodden said. “We proved that you don’t need to be an IT expert to build with ICONICS; some of the team had geography and science degrees, but the simplistic nature of the tool set, enabled even the novice to develop something of value quickly.”



ICC Team Members Evaluating Requirements

Danny Rodden, Programme Sponsor and Control Centre Duty Manager has since said, “Even then, when ICONICS was awarded the scaled back project, we didn’t fully comprehend the software’s true power or flexibility. It’s only as we began to use and experiment with the product ourselves that we realized the potential was there to develop something special; a game changer in the industry”.

This set of 60 capabilities evolved into 200 requirements, which became known as ‘Phase 0’. Requirements grew as the ICC began to see more and more potential, as it was easier to identify the root cause of an emerging event. Engineers were no longer shuffling between multiple systems trying to establish the root cause of a problem. No, after Phase 0, the ICC team were able to view of all their enriched network schematics overlaid with real-time customer data and business rules. True holistic decision making suddenly became possible. The potential was huge!



Geospatial View Displaying Real-time Customer Data with Alarms

The concept for Phase 1 was based around an even bigger question: ‘Now that we know the relationship between events and customers, how do we proactively prevent events from happening?’ Danny’s idea was that by using the platform of Phase 0 (enriched schematics with real-time events blanketed on top), Situational Awareness would now map all this integrated information geo-spatially, and this completed the picture. But the ICC, determined to push boundaries and exploit as much of the capability as possible, decided that more benefits could be achieved if they could overlay current and forecast Met Office weather data with telemetry and asset data. They also talked about incorporating further systems such as Scottish Water’s vehicle tracking technology (Masternaut) and their previous overview system (OpsLog).

The idea became a plan, and the plan became reality, but not before Scottish Water enquired about splitting the Phase into two deliverables to maximize benefits quickly.

So why split the delivery of Phase 1?

Well, one of the largest multi-sport events across the British Commonwealth returned to Scotland for the first time in 28 years in 2014; the Commonwealth Games. To ensure that everything ran smoothly for Scottish Water and its customers during this prestigious event, Scottish Water asked if Phase 1, Release 1, could be completed specifically ahead of Glasgow 2014. ICONICS was agile enough to accommodate their needs and deliver an initial core function only version, on time and of high quality. The timely manner of Release 1 made the project one of the first of its kind in Scottish Water.

Danny Rodden has since said that “ICONICS and the

to geographically position engineers into specific flooding hotspots to prevent homes being flooded. By taking live telemetry of sewer levels and associating this with the anticipated Met Office precipitation levels, preventive flooding action can be taken.

Sometimes, of course, it’s not possible to predict where and when events are likely to emerge from; for example, if a water main bursts. This is where the solution has truly added value. Amongst other data sources and business rules, by allowing alarms to interact with call wrap data geo-spatially, Scottish Water can identify the source problem of hundreds of alarms or customer calls. This can, and will, funda-



*Danny Rodden, Duty Manager,
Using the SA Application*



Danny Rodden Instructing the Team

ICC worked in close partnership to ensure a successful delivery in advance of this event. Unquestionably, ICONICS’ timely project delivery helped Scottish Water ensure that all our customers received the highest quality service during this iconic event for Scotland. Moreover, it was the first IT project ever to have been delivered on time and on budget, representing more value for Scottish Water and the people of Scotland.”

Situational Awareness has allowed Scottish Water to not only respond more quickly and more effectively to the needs of their customers, but it’s given them the ability to proactively respond to scenarios where their assets or customers would have been detrimentally affected. Let’s take the example of flooding. Ahead of high precipitation, and thus potential flooding, the ICC have been able

mentally help Scottish Water.

The potential and expectations now in Scottish Water just keep growing. Will Situational Awareness have a direct impact on Scottish Water’s OPA scores? Danny and the team are confident, but only time will tell.

The evolutionary process of the Situational Awareness project looks to continue. The ICC have upcoming plans to integrate more telemetry systems and to develop a live management dashboard. The more long-term thinking lies around mobility and linking weather forecasts into their business rule logic. But, for now, Danny, the ICC and the rest of the Scottish Water management team are more than content with the level of intelligence, and thus customer service, they can now achieve.

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