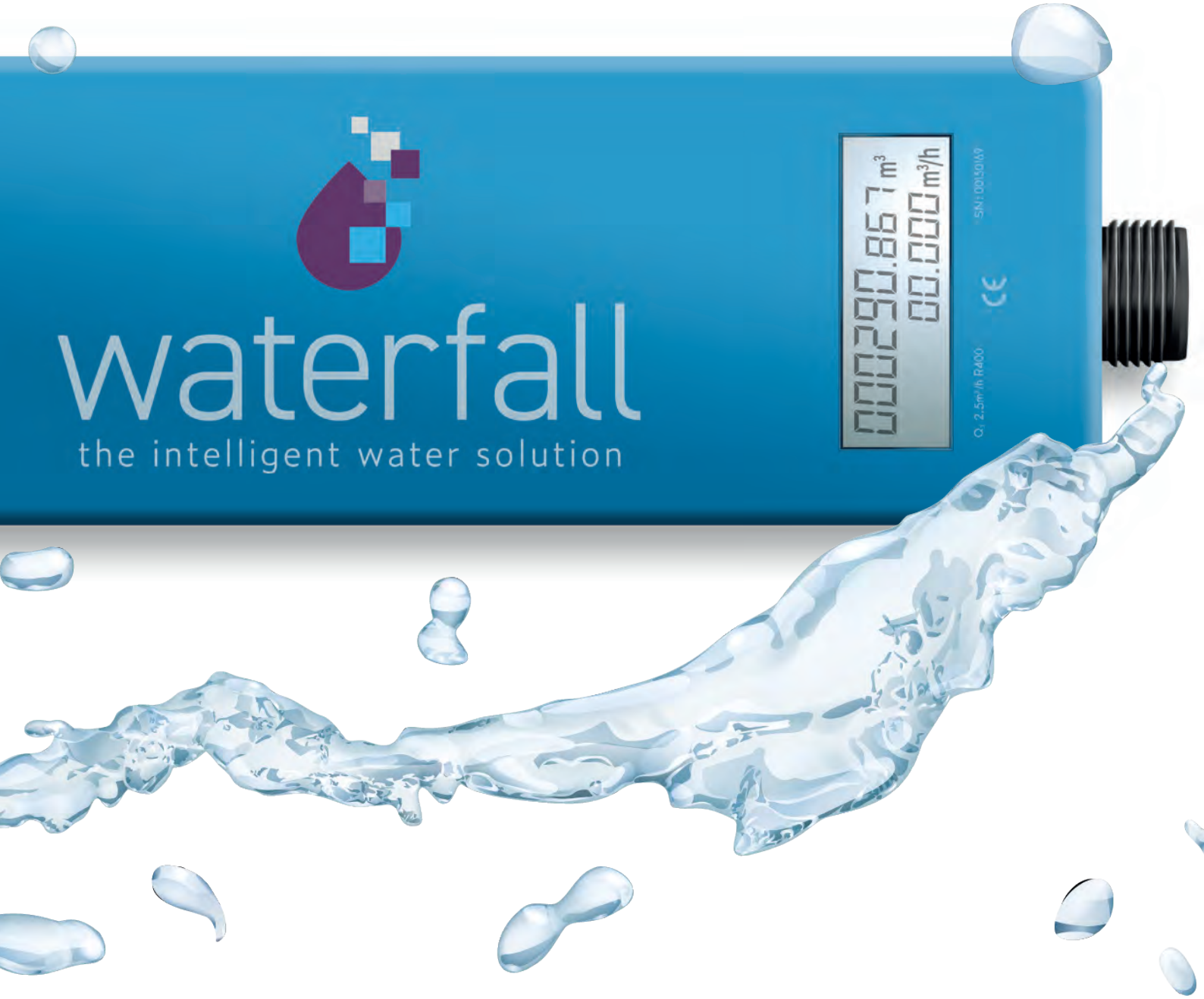
Creative EC

Driving PR19-led water conservation innovation

TECHNOLOGICAL ADVANCES ARE SATISFYING THE RISING PRESSURE FOR CHANGE



Microsoft ARROW

FORWARD

The water industry, the government and regulators look to innovators to dream up breakthrough ideas and game-changing strategies. One topic currently dominates the agenda: how do we ensure we deliver on Price Review 2019 (PR19) commitments by reducing water escapes and per capita consumption (PCC) over the next five years and beyond?

Without action, water demand in the UK is predicted to soon outstrip water supply, whilst around 30% of water leaks are reported to occur inside the property[1]. As the vast majority of homes don't have intelligent water monitoring, we often only find out when the customer calls to ask about their increased bill or report a flood. At the same time, we must do a better job of raising awareness and educating users as to the importance of water conservation – understanding how to save water and money. It's our role to provide the tools that trigger these light-bulb moments.

So, how do we achieve more proactive, insight-led water management, while forging and maintaining closer customer relationships? This paper offers a practical innovative solution to meet such pressing challenges.

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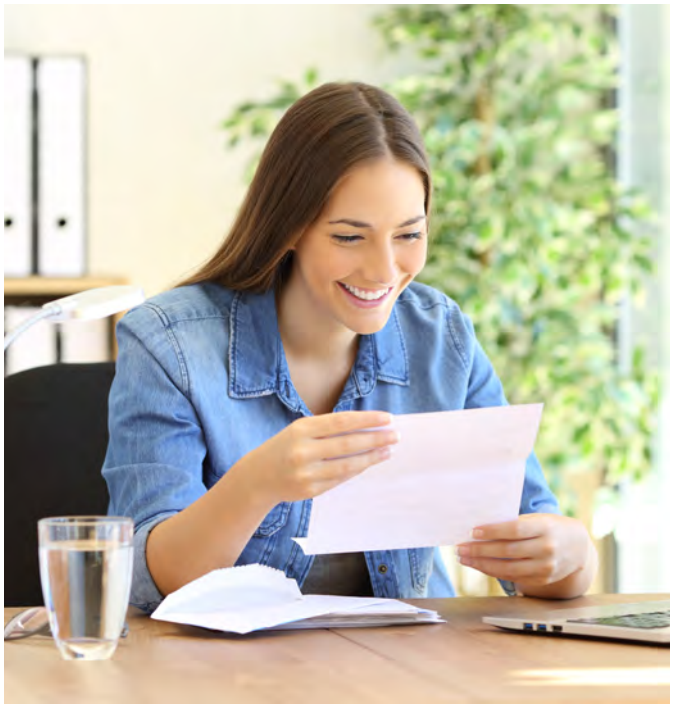
CURRENT PRACTICE AND INNOVATION BARRIERS



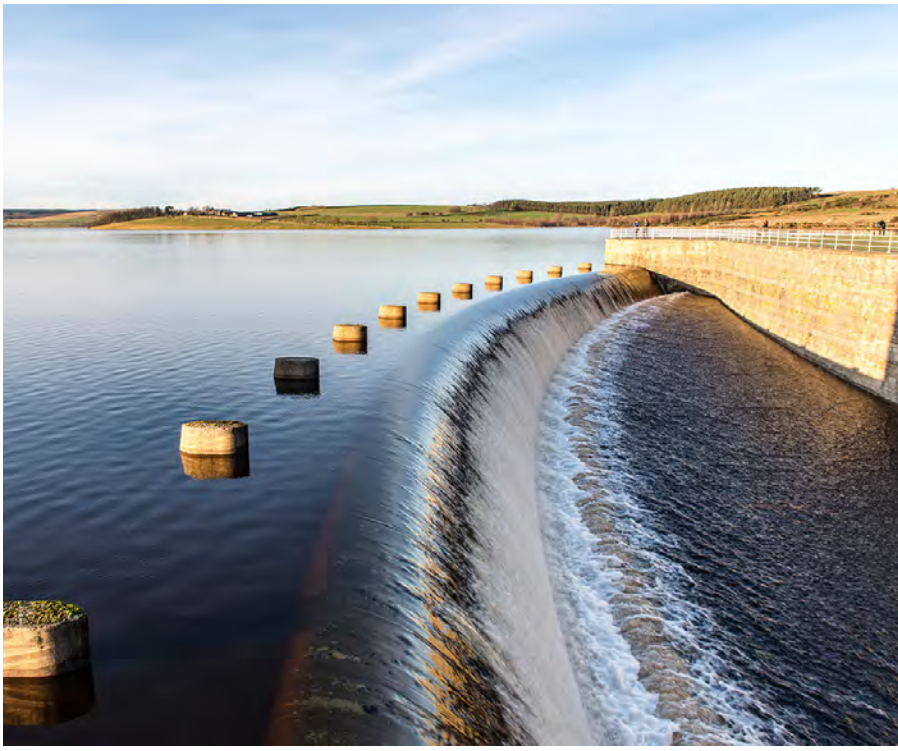
As part of PR19 proposals water companies have made a number of commitments on areas such as consumption and leakage reduction, affordability and customer service. These commitments are backed by spend plans and performance reporting. The challenge is knowing where to invest to get the best solutions and achieve these target outcomes.

Water companies have historically been unable to introduce smart control networks and granular water usage insight, because the necessary technology enablers either haven't been available or have been cost-prohibitive to deploy.

Over recent decades, major investment in core distribution infrastructure has reduced water escapes and increased supply reliability. These improvements have shone a brighter light on water lost within the property boundary, which now accounts for an estimated 30% of total leakage. As such, it's now the subject of greater scrutiny.

Accordingly, water companies are putting even more focus on reducing on-premise leaks and overall consumption as part of their PR19 commitments. Advances in technology, along with growing consumer awareness of the environmental impact caused from inefficient water use, are key enablers in this process.

To date, the main tool available to water companies to help control consumption has been a water meter. Typically, these devices are mandated in some water stressed areas of the South and East of England, or supplied upon request by customers, usually in the hope that fitting a water meter will reduce their water bill. In reality, water meters tend only to be read every six months and provide little practical insight to help customers change their usage or identify leaks.

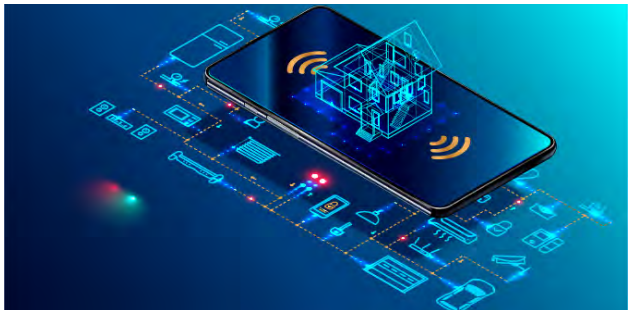


More recently, we've seen the introduction of drive-by meters and the first smart meter roll-outs. However, neither of these solutions engage consumers effectively or foster a culture for innovation.

Communication is another barrier. There isn't a natural platform for water companies to reach out and connect with the communities they serve. They usually contact customers twice a year when they provide a bill. Buy-in is also less likely if consumers receive contrasting smart meter and billing information that can't be linked to past events and actions. When that happens customer service organisations have to accommodate the fallout, stretching resources and increasing costs.

TECHNOLOGY TIPPING POINT

So, how do we move beyond smart meters and enable the next wave of innovation? What are the key technologies to consider when designing an intelligent water management platform? The big three that stand out are:



INTERNET OF THINGS (IoT)

Creating a sensing network with any-to-any connectivity

CLOUD

For simplicity, reach and scalability

ARTIFICIAL INTELLIGENCE (AI) AND MACHINE LEARNING

Automating big data modelling and analysis to deliver valuable insight

Recently these complementary technologies have become more attractive to water companies in terms of their proven maturity, commercial viability and affordable price tag. The breakthrough effect occurs when they are combined to:

Generate and analyse real-time, property-level water data (e.g. pressure and temperature)

Establish regular use patterns and signs of anomalies

Use these previously unavailable insights to enable consumers, water companies and other service providers, such as insurers, to take positive action.

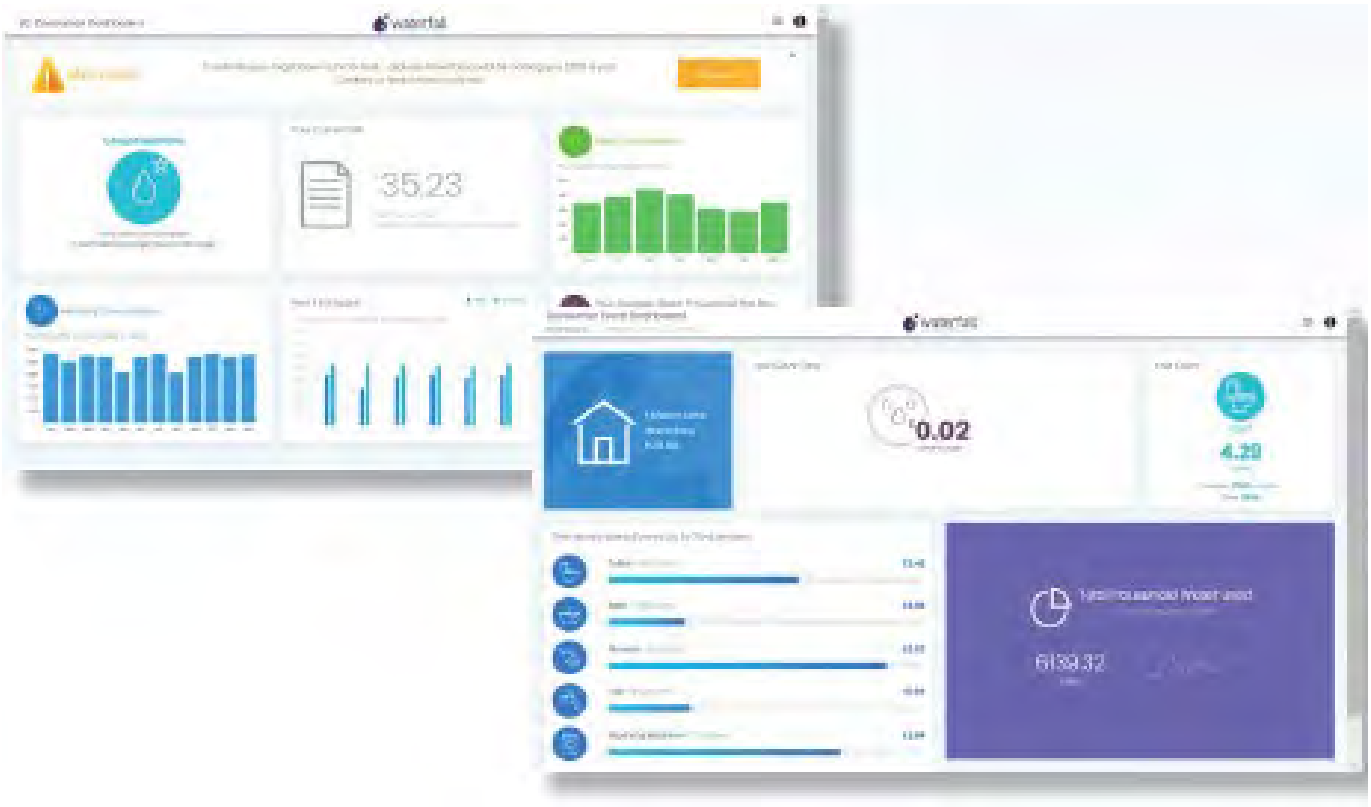
This approach – integrating IoT, cloud, AI and machine learning – is gathering momentum and one particular innovation has quickly moved from theoretical concept to testing in properties.

CASE STUDY

That solution, Waterfall, a water management platform from Creative EC, informs users of real-time water usage. It uses an onsite sensor device fitted at the home to collect data including pressure, temperature and billing grade volume/flow. Through machine learning, it profiles water usage events and looks for anomalies as early warning of water escapes.

In return, building occupants receive a fully itemised bill (see Figure 1) so they can see how to save water and money. They're also alerted to potential problems, safe in the knowledge they can remotely shut down the supply with a mobile app at the first sign of a leak or flood.

FIGURE 1. WATERFALL-ENABLED DASHBOARD REPORTING (FOR WATER COMPANIES) AND DETAILED BILLING (FOR CONSUMERS)



Data library created by early adopters collaboration

DESCRIPTION	USED	CONSUMED
Kitchen Sink	27 times	137 litres
Other Sink	23 times	98 litres
Toilet	81 times	972 litres
Shower	43 times	858 litres
Bath	21 times	946 litres
Dishwasher	14 times	210 litres
Washing Machine	12 times	347 litres
External Tap	20 times	2,084 litres
Other	37 times	634 litres

Results from initial installations of Waterfall have supported the view that greater insight will drive changes of behaviour. Feedback from users includes a change to running dishwashers when full (rather than at a regular time of day) and reducing the length of showers. In addition, leaks have been identified in a number of properties, the smallest of which saw water being wasted at a rate of over 20,000 litres a year. With waste water factored in, that's a cost to the customer of over £50 if not fixed.

For Water Companies the Business Case makes interesting reading. The range and frequency of measurements taken by Waterfall, combined with the intelligence in the Cloud, enable it to perform the roles, and deliver the combined value, of GSM data loggers, smart meters and leak detection devices. It could also be deployed to address challenges in metering properties with shared cold tank supplies.

So, while a water company may look to install Waterfall to support one specific business function, the platform can be extended to benefit several others at no extra cost

REDUCING AVERAGE WATER CONSUMPTION PER HOUSEHOLD

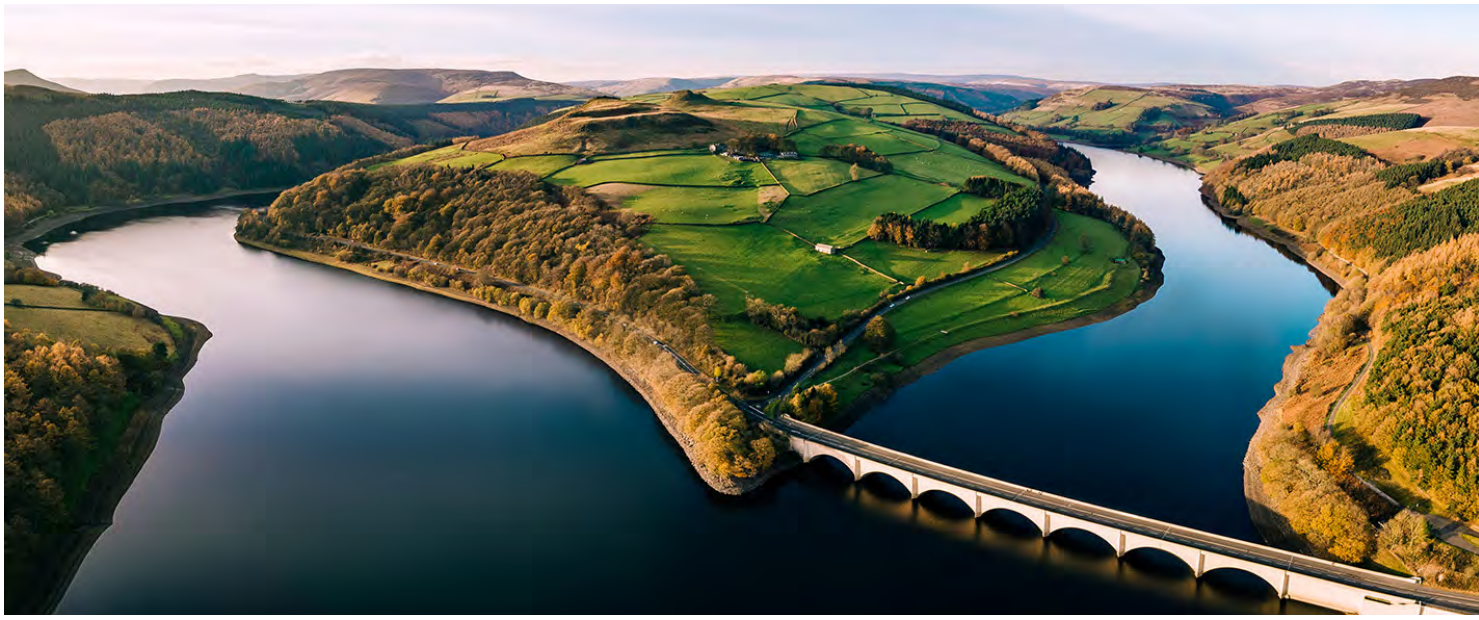
Adopting a solution, like Waterfall, that combines IoT, cloud and machine learning, offers advantages to the entire industry ecosystem.

DEMONSTRATE PROGRESS

OFWAT are looking to water companies to show they are leading the innovation process, coming up with fresh ideas and collaborating across the industry and with partners such as building insurance, property management and construction companies.

FAST DEPLOYMENT

Designed for simple plug and play, the on-premise Waterfall device supports Wi-Fi and cellular connections and can be up-and-running in one hour. Technical support is available if required. It also avoids the timescales and cost associated with installing boundary boxes.



LOW SET-UP COSTS

Waterfall can be installed for around the same price as a smart meter – but you can get much more valuable data from it.

BUILD INNOVATION CAPABILITY

The platform can be leveraged for other use cases, multiplying return on investment. They include, for example:

Sensing and pinpointing a sudden drop in supply pressure on a large housing estate, saving hours or even days of investigation

Messaging building occupants to turn off supplies to outside taps during heavy frosts

Informing customers of dripping toilets and unseen leaks under floors and behind walls

Transforming the way water companies provide information to consumers

DE-RISK INVESTMENT

The ability to de-risk investment is crucial. Water companies considering adoption can draw on anonymised outputs from several previous Waterfall trialists, avoiding the need to start from scratch and repeat experiments. These results can be used to strengthen the business case, along with options for spreading project costs over time. Thereby, removing large capital outlay and accelerating return on investment.

1) based on findings within Northumbrian water PR19 Submission and comparison with the overall industry leakage figures

FOR FURTHER INFORMATION
ON WATERFALL AND THE TOPICS DISCUSSED
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