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ISSUE 02
FEB/2019

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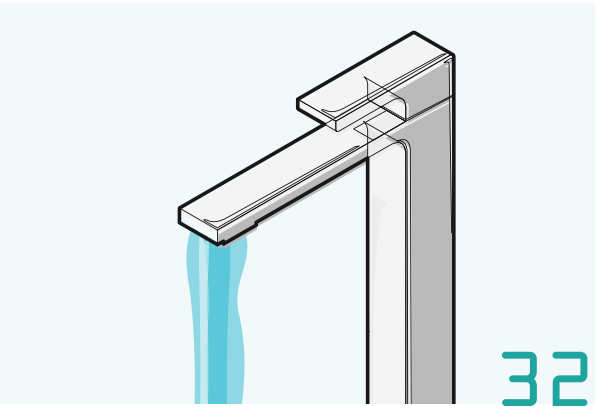

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Utility Week fLeX

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Flex is published quarterly with Utility Week by Faversham House.

ISSN: 1356-5532. Registered as a newspaper at the Post Office.

Published by: Faversham House Ltd, Windsor Court, Wood Street, East Grinstead, West Sussex RH19 1UZ

Printed by: Buxton Press, Palace Road, Buxton, Derbyshire SK17 6AE.

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No-one wants to eat in a restaurant that's been panned on TripAdvisor, or sign a contract with a mobile phone supplier that overcharges. What the customer says goes, and utilities are having to play catch up.

In this, our second issue of *Flex*, we look at the power of the consumer and how water and energy firms are responding to greater expectations and regulatory demands. Integral to this is the role technology can play in delivering better service and building trust – if you get it right.

In the world of apps, voice assistants and AI, utilities have a dazzling array of new tools at their disposal but a difficult choice selecting winners. What developing technologies should they invest in and which will pay dividends? How can they embrace a culture of "super speedy, no fuss" digital transactions while not abandoning those who want to pay their bills traditionally rather than with the swipe of a screen?

These issues are explored in our feature pages (Smarter tech = happier customers, page 20) and in our interview with Mike Young, the global chief information officer driving digitalisation at Centrica (page 14). With 25 million customers and a legacy culture to flip, his aim to match best-in-class retailers like John Lewis is ambitious. But that's the name of the game today.

Technology's ability to help vulnerable people is another growing and laudable trend as firms like EDF team with start-ups to extend connected home services for elderly relatives (page 34).

Consumer power is not a one-way street. Water companies have realised it can work both ways and are harnessing a new consumer force – citizen scientists – to help protect the environment (page 28).

Arguably, the ultimate in consumer power is the rise of the prosumer – customers who actively manage their own energy production, storage and consumption (page 10). Costs can still be prohibitive and there are technical challenges to overcome. But be warned, the customer of the future is closer than most might think.

People power in all its guises is an unstoppable force.

Denise Chevin
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Taking data to task

By David Blackman

Energy and clean growth minister Claire Perry recently launched a new task force on energy data. The Energy Data Task force, which has a remit to look at how unlocking the value of energy data could drive innovation and cut consumers' bills, will be run by Energy Systems Catapult.

Flex' spoke to Laura Sandys, former MP and chief executive of Challenging Ideas, for a progress report on the task force's work.

What problem is the task force seeking to tackle?
It will be looking to establish a set of overarching principles for energy system data, including recommending common standards and security measures.

There is a lot of data in the energy sector but it's all over the place, the housekeeping is not great and the skills (for handling it) not tremendous.

There are serious people in energy who say it can take three to four hours to find the data asset that is useful even if you absolutely know what you are looking for.

All sectors face the same challenge but energy is pretty far back.

How will the task force solve these problems?
We are investigating how to create a data index, not a library, but an index of all energy data with clear metadata standards and the ability to search, discover and understand what is out there.

We are particularly excited about housing it (the index) outside the energy sector so we can crowd in all sorts of other data sets, like Land Registry and the Ordnance Survey, that inform the energy sector.

Energy data is fine but it's the interaction with the wider world that provides the value.

How will the index help efforts to optimise the energy system?
Across the network there is a lot of data that needs to be utilised more effectively.

It will reveal where the assets are needed and where they are not. We are going to have to demand a lot more data when it comes to [making decisions about] infrastructure.

Are you looking at any overseas models?
Australia has mapped a digital model of its whole energy system so you have all the infrastructure and assets, etc.

It's not a digital twin because that requires all the operational data, but we are talking about moving towards a digital twin.

What business opportunities will greater access to data deliver?
We see innovators using it in quite an extensive way. We feel it will deliver new markets, facilitating locational and just-in-time markets.

How will the task force encourage the industry to give up its data?
There are a lot of gaps and with the FiT [feed-in tariff] coming to an end, there's going to be more.

We are proposing a platform that will allow these assets to be registered. If you want an equable price and want to be able to export [electricity on to the grid], you will have to register.

The stuff that is regulated data I see as my data, it's the state's data. I feel it is a perfectly reasonable proposition to have other data: if we are paying a subsidy to an onshore wind farm, I see that as my data too.

I don't believe these assets should be hidden if we are serious about optimisation. There will be an incentive for those a little further way from the subsidised or regulated sector to provide their data so they can benefit from decentralised balancing, but without providing that data they can't get access to the market.

This is for government to mandate: it needs to help optimise the system, and across the network there is a lot of data.

What will this mean for consumer data?
We are focusing on energy system data rather than consumer data. It's nothing around GDPR, it's to do with optimising the system.

Infrastructure data isn't too sensitive but operational data is more sensitive. We think there are quite a few proxies for demand data, making smart meter data less important.

Is the group looking at lessons from outside the energy sector?
We have people from outside the sector. It's a pretty interesting group of people who are stretching us further than the sector is used to.

This is a journey and we're not going to crack it in one go, but hopefully the sector will be unrecognisable in five years' time.

> **We are investigating how to create a data index of all energy data with clear metadata standards and the ability to search, discover and understand what is out there**
>
> Laura Sandys, chief executive, Challenging Ideas

Data analytics will drive transition

Data analytics will have the biggest impact on the industry's transition, according to a survey conducted for Utility Week Live (UWL).

Respondents were asked to rate technologies on a scale of 1 to 10, with data analytics receiving the highest average score of 7.6, the research carried out by Insight Advantage found.

The UWL survey looked at the current impact of technology in facilitating transition. Respondents were asked to rate 13 technologies and data analytics came out on top, while blockchain technology was considered to have the least impact.

Across all the technologies tested, the average tipping point for mass take-up is expected to be 2027. For data analytics, take-up is expected to be ahead of the curve in 2023. But many energy firms are already taking great strides to streamline their data processes.

The use of "big data" systems to monitor, analyse and automate production, management and demand is not a new concept for the energy industry. In addition, the rise of customer-centric products and services for energy monitoring and automation provides utilities with further data, capabilities and insights.

To read the full report on technology and transition or to find out more about **Utility Week Live**, which is taking place on **21-22 May 2019 at the NEC in Birmingham**, visit **www.utilityweeklive.co.uk**

	TECHNOLOGY	AVERAGE SCORE
1.	DATA ANALYTICS	7.6
2.	SMART ASSET MANAGEMENT	7.0
3.	ENERGY STORAGE	6.7
4.	SMART METERS	6.7
5.	THE INTERNET OF THINGS	6.7
6.	SMART GRID TECHNOLOGY	6.6
7.	ELECTRIC VEHICLES	6.4
8	ARTIFICIAL INTELLIGENCE	6.4
9.	LOW CARBON HEAT	5.5
10.	ROBOTICS	5.4
11.	WATER METERING	5.0
12.	WATER REUSE	4.9
13.	BLOCKCHAIN	4.7

techno file

Sara Bell

In the second interview in our series, Sara Bell, founder of Tempus Energy, talks us through the important tech in her life – and bigs up Pippi Longstocking

By Adam John

Sara Bell founded technology company Tempus Energy in 2012. She hit the headlines in November 2018 when the European Court of Justice ruled the UK's £1 billion capacity market illegal and the government was forced to suspend it. Bell started the challenge in 2014 in a campaign to force the government to design an energy system that reduces bills by incentivising customers to use electricity in the most cost-effective way.

Tempus uses artificial intelligence (AI) and smart algorithms to control and optimise when flexible assets use energy.

Bell has previously had a financial markets systems risk career and has worked in energy system innovation.

She is a member of the high level group of i24C, the Industrial Innovation for Competitiveness initiative, is an innovation ambassador for Innovate UK, and is a member for energy on the Scientific Advisory Committee for the Engineering and Physical Sciences Research Council.

What is Tempus Energy currently focusing on?

We remain focused on ensuring that electricity customers get the financial incentives they need to become flexible with their electricity consumption so that we decarbonise in the cheapest possible manner.

The Tempus technology uses smart controls working with our machine learning (AI) to predict market prices and automatically adjusts non-time-critical energy usage to achieve the lowest cost.

Flexible electricity customers make the electricity system cheaper for all of us and the more flexible customers we have, the more secure our energy system is.

What technology, piece of kit or process advancement has excited you most in your working life and why?

The opportunity to combine tech innovation like the internet, mobile communications, sensor and control equipment with machine learning.

This enables us to automate customers' electricity consumption seamlessly so we manage a renewable grid securely and cost-effectively and is by far the most exciting development of my working life.

Flexible electricity customers are incredibly powerful because they control the cost of the energy system and control which generation is used, moving away from dirty, polluting fossil fuels.

What bit of technology couldn't you be without at work?

My iPhone.

And at home?

The Xbox.

Who do you most admire in the technology sphere?

Emily Kirsch, founder and CEO of Powerhouse in Oakland, California.

Who inspires you?

Pippi Longstocking – brave, strong, honourable, independent and compassionate with an extraordinary sense of fun – a blueprint for all of us.

What motivates you?

Outrageous optimism. It is one of the greatest weapons we have to fight the challenges we face. It drives determination and courage and enables a joyful fight.

How did you feel when the European Court of Justice's judgment on the capacity market came through?

I always thought we would win because the scheme is clearly unlawful, but I was unprepared for the elation of actually winning – it was an extraordinary feeling. We have one planet that all humanity relies on and our only option is to do everything we can to protect it. We cannot let a small minority who benefit short-term from perpetuating climate change to destroy our future.

Where do you see yourself in ten years' time?

I hope that I will have contributed my creativity, determination and sheer hard work to galvanising people to act in ways that solve climate change. That I have helped the enlightened self-interest and creativity of all of us to come together for our mutual gain and we have changed direction because we still have time.

Technology can never replace...

The human touch.

HERE'S AN IDEA...

SUN IN A BOX

Engineers at the Massachusetts Institute of Technology (MIT) in Boston have discovered a way to store enough renewable energy to power a small city of 100,000 people.

The new method stores heat generated by excess electricity from solar or wind power in large tanks of white-hot molten silicon, and then converts the light from the glowing metal back into electricity. The team behind it are calling it "sun in a box".

MIT claims the system is far cheaper than lithium-ion batteries, which have been seen as the leading method to date for storing renewable energy. It also estimates that the system would cost about half as much as pumped hydroelectric storage – the cheapest form of grid-scale energy storage discovered so far.

The new storage concept stems from a project in which the researchers looked for ways to increase the efficiency of a form of renewable energy known as concentrated solar power. Unlike conventional solar plants that use solar panels to convert light directly into electricity, concentrated solar power requires vast fields of huge mirrors that concentrate sunlight onto a central tower, where the light is converted into heat that is eventually turned into electricity.

"By focusing the light to get heat, you can store heat much more cheaply than you can store electricity," says Professor Asegun Henry of the MIT Department of Mechanical Engineering. "The technology has been around for a while, but its cost could never compete with natural gas."

Concentrated solar plants store solar heat in large tanks filled with molten salt, which is heated to high temperatures of about 1,000 degrees Fahrenheit. When electricity is needed, the hot salt is pumped through a heat exchanger, which transfers the salt's heat into steam. A turbine then turns that steam into electricity.

The system could be paired with existing renewable energy systems, such as solar cells, to capture excess electricity during the day and store it for later use.

"This is geographically unlimited, and is cheaper than pumped hydro, which is very exciting," says Henry. "In theory, it is the linchpin to enabling renewable energy to power the entire grid."

CustomerMinds
PSI
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Leveraging digital customer journeys to improve arrears and collection processes

Amy Keith, business development, Versari

Debt is a growing problem for customers and suppliers within the utility industry. As energy prices continue to rise and we experience large fluctuations in weather conditions, an increasing number of customers are falling into arrears.

In fact, a GoCompare survey estimated that 1.4 million people in the UK have utility bill debts. To compound the problem, only 11 per cent of those customers have contacted their supplier to discuss the situation. Of those who did contact their supplier, 15 per cent felt pressured to pay more than they could afford. Debt owed to suppliers in October 2018 hit £393 million, which was an increase of a quarter on the same period in 2017.

The customer experience collection conundrum

Suppliers face the challenge of complying with stricter regulations, price caps, and rising customer demands – while also ensuring they deliver a customer experience that is engaging, compliant, and takes account of a person's situation in every interaction. Therefore, it is key to have a well-thought-out customer journey.

Visibility on issues earlier in the arrears process provides more control, making it easier for the customer to resolve. In this early phase, debt is typically small, so the ability to repay is higher. If we leverage digital channels to engage with the customer early on, we can alleviate embarrassment by allowing the customer to have control over what payment options they can manage, while reducing the impact on operational costs.

The benefits of a digital approach

Mapping customer journeys with the correct digital solution for arrears and collections can enable your business to deliver a great customer experience even in a difficult situation. And there are benefits for utilities:

- **Reduce the cost to collect by digitally enabling your customer and removing the need for collection letters.**
- **Build customer loyalty and drive retention by providing two-way communication to debt resolution.**
- **Decrease outstanding days as a result of creating alternative digital payment options.**
- **Increase brand reputation by identifying vulnerable customers early and targeting them with support.**

For more information on how you can approach digital transformation across your business, contact Amy Keith akeith@versari.com or call +44 117 313 8240. Versari is working on behalf of PSI Mobile and CustomerMinds.

App aims to cut the energy bills of small businesses

By Adam John

While domestic consumers are all too familiar with energy switching services, small business consumers may not realise they represent a growing commercial market.

Energy Bill Kill is one such service, which hopes to take advantage of an ever-increasing small business energy retail market.

Founded in April 2017, the London-based company has launched an app that is designed to help small business owners reduce their energy bills, as well as offering customers tailored tariffs such as green energy only, for example.

Michael Rossman, co-founder of Energy Bill Kill, claims it is the only app that enables businesses to switch their energy provider end-to-end.

The app was created in an environment of rising UK energy prices and, according to the company, "combines the latest technology with decades of experience to provide the quickest and easiest energy switches for business owners and managers".

Recently industry regulator Ofgem announced it would be conducting a strategic review of the microbusiness retail market in 2019 to "understand market challenges and consumer experience".

> "Lots of switching services ask you how much you spend but that is less of an indicator for switching. You can be spending lots of money because you have a terrible deal but not be using a lot of energy."

"The review will identify the case for short and medium-term actions," a spokesperson said.

Yet the Energy Bill Kill app seeks to allay industry concerns; it even claims to save customers 50 per cent on broker fees.

Rossman says the app was launched in response to two opportunities in the UK business market – namely, it is a time-consuming process to get a business service, and using energy brokers means paying a large commission so the customer won't' always get the best price.

"The background is to make life easier, for people to lower their costs and to make it as simple and as friendly as possible so you don't have to spend too much time doing it", he says.

A key feature of this app, Rossman says, is the fact it only asks for essential information and is not interested in retaining extra details for marketing purposes. Instead the app asks for energy usage, as opposed to the current price being paid.

He explains: "We show the prices immediately to the users so we don't collect data up front. What you see in a lot of business switching services is they want to know your name, your email, your phone so they can bombard you with cold calling. From a business owner perspective it is very painful.

"Lots of switching services ask you how much you spend but that is less of an indicator for switching. You can be spending lots of money because you have a terrible deal but not be using a lot of energy."

While Energy Bill Kill's business service is not currently automated, Rossman says the company plans to go down the auto-route.

"We have an automatic reminder in the background which we intend to roll out. When the fixed deal expires we will ping the user," Rossman explains. "In due course and as we build trust with our customers, we will have a function for auto-switching."

HERE'S AN IDEA...

QUICK FIX

HOW DO YOU INVEST IN INNOVATION? PAGE 26

Southern Water is aiming to improve the efficiency of its maintenance operations by bar-coding its equipment and assets. "If people need to report an issue with a piece of equipment, it's more onerous than we'd like to identify the asset, raise the request, and get someone along to fix it," explains Hazel Maxwell, Southern Water's innovation manager (pictured).

"When you scan the QR code, it automatically pre-populates the form that they need to fill in to raise a work order, which reduces the time it takes to raise a work order from 15 minutes to about two," she says.

The innovation is currently being trialed as part of the water company's drive to digitalise field force operations. New digital processes are being devised by its Bluewave team, which is helping to deliver £50 million-worth of efficiency savings through innovation. The trial is being done as cost effectively as possible with off-the-shelf technology.

"We're running a test in one wastewater plant. We've deployed QR codes to 10 per cent of the site, they went live last month and we ran it through to the end of January. So it was quite a long test, but we can go through the way this was being used with lots of different users on site, and optimise the process in a very small scale way, to de-risk it.

"Then once we know that it works, then we're in a position where we've got a really good business case to scale up," she says.

The formula for utility collections success: manage compliance, increase revenue and raise customer satisfaction

Jon Hickman, chief executive, Flexys Solutions

www.flexys.com

Looking forward while being held back

Technology has always been good at the automated processes that all utility providers rely on. With the latest regulation concerning customers in vulnerable circumstances, many in the sector have been wondering if these rigid processes are fit for purpose in the new regulatory environment or if indeed these systems are themselves an inadvertent cause of detriment.

According to the Money and Health Institute one in ten people who have experienced mental health problems find it difficult or very difficult to manage accounts with their essential service providers.

In one of the most sensitive areas of the business, that of collecting debt from customers in arrears, people experiencing a period of vulnerability can be particularly disadvantaged by clumsy and inflexible processes. It is important that technology keeps pace with best practice and regulation without disrupting services. An agile, microservices based approach allows innovation without the risk, delays and spiralling costs of the past.

How digital technology can aid compliance and serve customers better

The first consideration is accessibility. Voice calls are declining. What was once the standard communication tool is now seen as the most annoying and intrusive method of contact. The telephone is even less popular with people who are experiencing mental health challenges, with over half saying they find it hard to make a call.

"I find it extremely difficult to hold a conversation on the telephone and retain enough information to make a good judgement."

Crisis organisations like The Samaritans and Childline already provide a popular online alternative in light of these findings. It makes sense to engage with customers using their preferred means of communication, this reduces 'avoidance of contact' that can lead to worsening debt. Online, customers can have instant access to a low-stress, collaborative space to engage with their creditors. Meanwhile, those customers who require a phone conversation get quicker access to an agent.

Will customers in vulnerable circumstances engage online?

There are several ways that the needs of customers experiencing a period of vulnerability can be met online. Firstly, to calm 'admin anxiety' by providing a self-paced, private and secure space to make a declaration of vulnerability or to signal that an agent, carer or relative is helping the customer in the process. Secondly, by ensuring a non-confrontational, smooth customer journey that avoids 'information overload' and minimises drop-out rates. As standard, it should accommodate browser accessibility settings and be compatible with aids such as screen readers to make sure the process is not frustrating or demoralising.

Take account of fluctuating circumstances in uncertain times

State-of-the-art digital solutions are considerably more flexible than the basic payment portals of old. Customers can pay in full, offer a promise or make a tailored repayment arrangement based on verified income and expenditure information. Collaborative arrangements like these are considered to be more sustainable and generate positive customer satisfaction ratings. Meanwhile, the newly-engaged customers begin contributing and moving toward resolving their arrears.

Machine learning and intelligent segmentation

Machine learning is particularly useful in detecting both 'self-cure' and 'won't pay' customers and channelling them directly to the appropriate action. By intelligently filtering out customers who don't need an agent's direct input, staff can focus more on the quality of the outcomes for those who do need help. Reducing pressure on resources means average handling times can be measured more productively against desirable outcomes such as first call resolution.

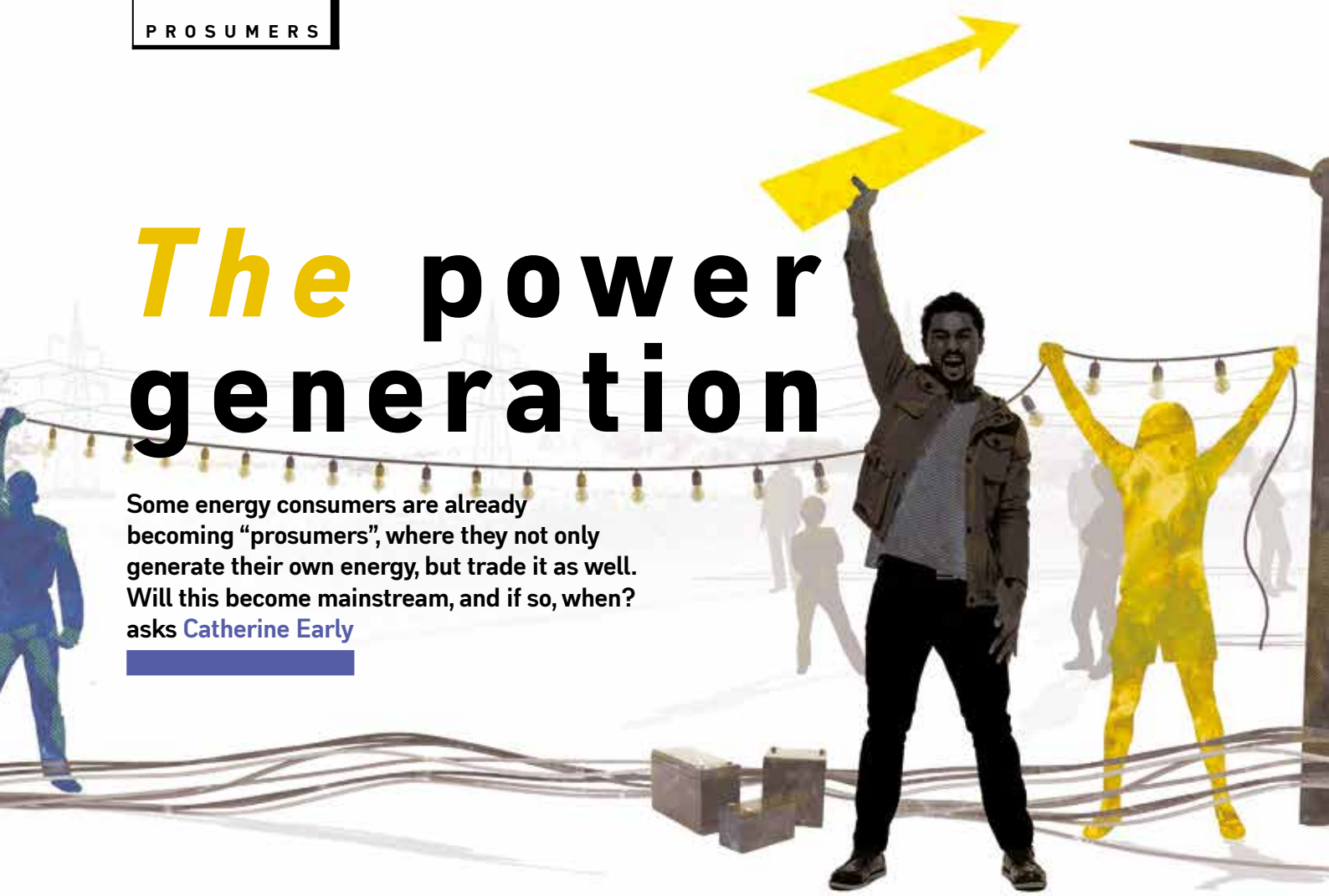
Machine learning can also be used to detect sentiment as the customer goes through the online resolution process. If an unacceptable level of negative emotion is detected, the customer can be offered recourse to an agent if they so wish. This helps to reduce dropout and seamlessly provides intuitive real-time customer support.

Moving forward

The latest technology is designed to be flexible and fair, with all customers in mind. When it comes to resolving arrears, by providing a digital solution that customers will prefer to use, on any device and at a time and place of their choosing, whatever their current financial or social circumstances, technology can be part of the solution. When that also results in a lower cost to serve, more debt resolved and more revenue collected, it makes financial sense as well as being socially responsible and simply the right thing to do.

One in ten people who have experienced mental health problems find it difficult or very difficult to manage accounts with their essential service providers

Money and Health Institute



The power generation

Some energy consumers are already becoming "prosumers", where they not only generate their own energy, but trade it as well. Will this become mainstream, and if so, when? asks Catherine Early

The concept of "prosumers" – where consumers move from being passive users of electricity to actively managing their consumption, production and storage of energy – is fast becoming reality, with technology start-ups pushing regulators and policy makers to catch up.

The driving force behind this is technology. Roof-top solar, home batteries, electric vehicles and other distributed energy resources are forcing the UK's power system through a fundamental transition.

Meanwhile, technology entrepreneurs are developing systems using algorithms, artificial intelligence, satellite imagery, blockchain and social media to both enable the sale of the energy generated, and even develop peer-to-peer trading. In Cornwall, for example, Centrica is just over two years into a £19 million flagship community energy project comprising development of a virtual marketplace and the installation of new technology into more than 150 homes and businesses.

Randolph Brazier, head of innovation and development at the Energy Networks Association (ENA), which represents energy networks, is optimistic that prosumerism will be mainstream within "a few years".

"The tech companies and start-ups are moving quickly and they're going to put pressure on our members and the regulator in general to catch up, so I think it's closer than a lot of people might think," he says.

Until now, householders' main route to trading energy they produced themselves was via the export tariff share of the feed-in tariff. The government has announced that this will be closing from April 2019. It is now consulting on replacing this with a "smart export guarantee", where households and businesses generating their own energy can sell what they do not consume to energy supply companies.

Some technological innovation is required, says Brazier, not least of which would be to control systems, and in some cases the grid equipment itself, which was designed with an assumption that energy flowed in one direction only, and will now need to accept energy flows in various directions, and between different parties.

Ryan Gill, chief executive of start-up Social Energy, whose technology enables householders to participate in firm frequency response (FFR) markets, whereby electricity generators are paid by National Grid to help it balance the frequency of the grid, says the constant fall in the costs of renewable energy will lead to more and more generators being connected to the grid. Combined with the growth of electric vehicles, this will result in an even greater need for flexibility.

"Through Social Energy, households can generate additional revenue while solving the problem of flexibility. We absolutely believe that this will become a mainstream offering, not just in the UK, but globally," he says.

Think tank the Green Alliance also believes the transformation will occur much faster than many people realise. In a report published in 2017, it pointed out that small-scale distributed generators are capable of rapid technology change, unlike the fossil generators they are replacing.

With the costs of solar PV falling by 90 per cent between 2009 and 2015, and those of batteries by 65 per cent, the

> **The tech companies and start-ups are moving quickly and they're going to put pressure on our members and the regulator in general to catch up, so I think it's closer than a lot of people might think**
>
> Randolph Brazier, head of innovation and development, Energy Networks Association

report predicted that the cost of the two technologies used together will have a payback period of below 15 years by 2020. Individual households and commercial buildings could operate off-grid for months at a time by 2025, it added.

Technological changes needed to enable this transition include greater automation of demand response, so that consumers do not have to change their habits in response to grid requirements, the Green Alliance believes. Its senior policy adviser Chaitanya Kumar points out that several energy companies are now trialling new technology such as time-of-use tariffs that can use automation.

"This creates a condition where consumers don't have to work out when to switch the washing machine on, the system will do it for them," he says.

The idea of someone controlling equipment externally may be too much for some, and would inevitably raise a lot of questions, he says. However, the same questions could apply to other technologies we have already accepted, he points out.

Kumar believes many people working in the energy sector are not willing to come to terms with the fact that the transition to a prosumer model is already under way. "This distributed energy system is coming whether we like it or not, so the best thing to do is to work hard towards managing it, not try to stop it," he says.

ENERGY TECHNOLOGY ENTREPRENEURS

CHARLES BRADSHAW-SMITH

Chief executive and co-founder, SmartKlub

SmartKlub is pioneering several business models and technologies in partnership with cities, helping citizens to form community energy groups. During a previous role at Eon, Charles Bradshaw-Smith had first-hand experience of the issues surrounding the development of community and smart energy systems in other cities in Europe.

"The reason community energy hasn't taken off is because it's costly to do so in comparison to the value you can create, so unless you can snowball it and get lots of services and communities paying homogeneously for many things, it probably isn't going to work," he says.

"I had a kind of Eureka moment that the key to more community energy was to realise that the focus should be on business models, not just the technology," he adds. Innovations in the business model and role of the community will enable the benefits of the technologies to be maximised, Bradshaw-Smith says.

Consequently, SmartKlub is working on several different services. The most advanced is its Energy Service Company – dubbed the Easy ESCO – which is up and running at Trent Basin in Nottingham. The community energy scheme will enable residents of a new 250-acre brownfield land development on the edge of the city centre to generate, store and use solar electricity.

SmartKlub will manage the energy assets and provide energy services to the residents, including storing and selling locally generated energy to the grid at peak times. Profits made by the ESCO cut energy bills for residents who opt in to join the scheme.

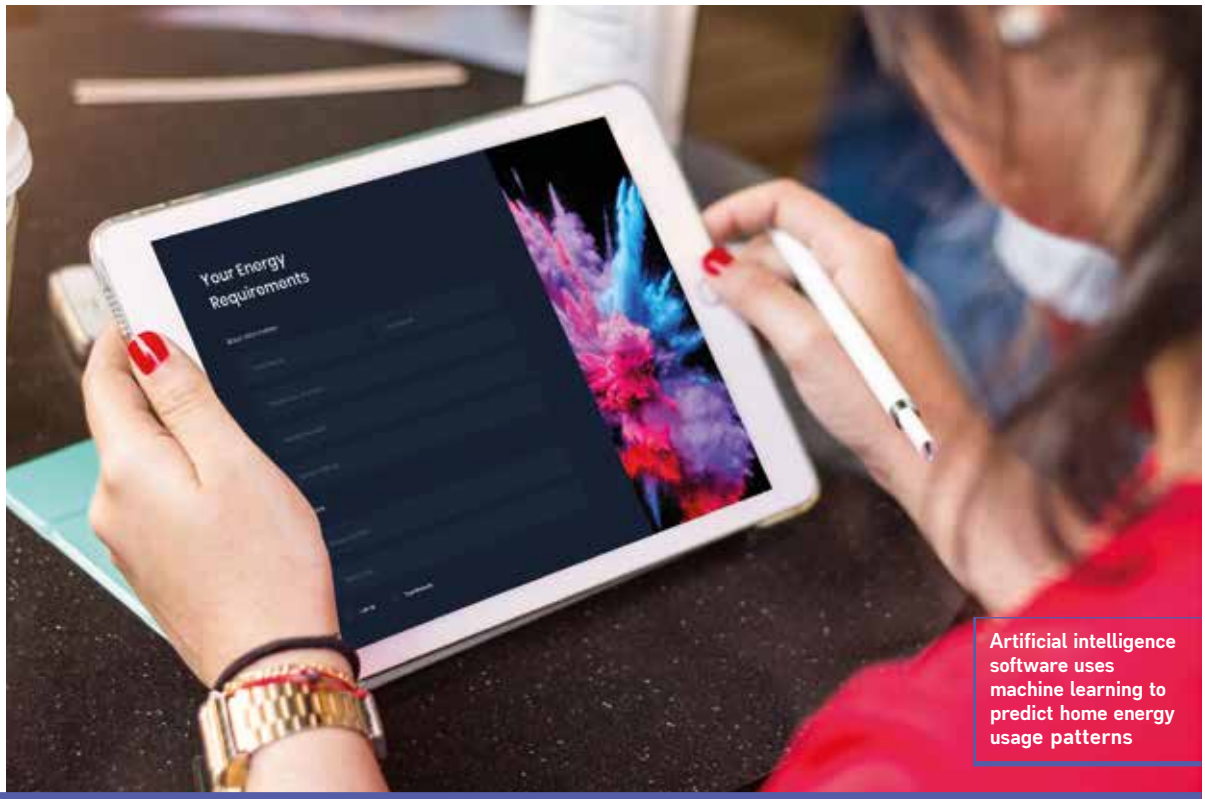
> **I had a kind of Eureka moment that the key to more community energy was to realise that the focus should be on business models, not just the technology**

The project boasts the largest community energy battery of its type in Europe, supplied by Tesla. This can store 2.1MWh of energy, delivering 500kW of power. The project is a collaboration with the University of Nottingham, where professor Mark Gillott from the faculty of engineering is leading the work. The project aims to make the technology commercially viable through new business models in order to drive adoption, he says.

Monitoring technology will be installed in the homes when residents move in, Bradshaw-Smith says. Residents moving into the development are well aware of the ESCO, and for 80 per cent of them it's part of the attraction of moving to Trent Basin, he says.

SmartKlub is also working on a platform that will use satellite imagery to calculate how much PV energy any home or business could generate on its roof. Thermal imagery will also be used to understand the energy efficiency of a building, and opportunities for improving it.

The firm's platform links to social media, so communities can easily set up a Facebook page to organise a community group, and put out tenders to local technology suppliers. "It needs to be easy so normal people can do it around normal lives," he says.



Artificial intelligence software uses machine learning to predict home energy usage patterns

RYAN GILL

Chief executive, Social Energy

Social Energy will put consumers at the heart of the energy system by providing the technology to turn their homes into a virtual power station, and a platform on which the energy can be traded, according to Ryan Gill, chief executive of Social Energy.

The firm's platform has won a contract with National Grid to provide FFR services. Its customers so far are mainly those who already have PV panels on their roof, and are keen to maximise their value, Gill explains.

They can buy energy storage products from manufacturers Social Energy works with, such as Duracell Home Energy Storage, and a hub containing meters that measure the frequency in the house and artificial intelligence (AI) software. This uses machine learning to predict home energy usage patterns, allowing customers to use their own reserves first before taking from the grid.

The hub also connects customers to cloud storage, where functions to generate the savings are carried out, which are then passed on to the customers. It effectively creates a residential virtual power platform (VPP), Gill explains.

"We have the ability to sell the energy generated to the utility, and give householders access to all the markets, such as ancillary services, or balancing, or saving through time of use. Once we generate those savings, we pass them on to the customer via a credit on their bill, and that reduces their energy by up to 70 per cent," he explains.

"We have the ability to sell the energy generated to the utility, and give householders access to all the markets, such as ancillary services, or balancing, or saving through time of use"

To gain accreditation to provide FFR services, Social Energy had to provide 11.2 billion datapoints from real-life solar and battery storage connected via its software.

"Frequency markets are essentially balancing markets – within the battery, you have to store and dispatch or absorb power to keep the grid on the balance it requires. Every tenth of a second we measured the frequency in homes via the meter, then we passed that data on to illustrate that we could carry out that service within a residential property," he says.

Gill reports that the equipment is being installed at a rate of around ten a day. Nationwide, the firm expects to have 4,000 homes a quarter installed by the third quarter of 2019.

The only technology constraint at the moment is that customers will need a second-generation smart meter to access some of the revenue streams. Rollout of these is currently held up by industry-wide software delays.

LOIC HARES

Chief executive and founder, Resilience Energy

The latest entrepreneur to emerge in this market is Loic Hares, the founder of Resilience Energy. The firm aims to become the "Uber of the electricity industry" by giving customers the hardware, software and contracts they need to produce, store and sell renewable energy, and an app to monitor the system's performance.

"Resilience aims to be the largest decentralised renewable energy generator – and cut the electricity bills of homeowners by up to 80 per cent," says Hares.

> The value of the electricity generated by the customer will always be higher than the price at which it is sold back to the grid

Hares has already won the support of Virgin Start Up – which has agreed to provide Resilience with a loan – and has formed partnerships with BRE, where the system is being demonstrated, Plug-in Solar, GB-Sol, Powervault and aggregator Kiwi Power.

Hares is seeking to sell his system through housing providers and constructors, energy suppliers, and electric vehicle and charge point manufacturers.

The Resilience system will cost between £7,750 and £13,500, will have an eight-year payback and will return in the region of £6,000 over the system's lifetime, according to Hares, who has previously worked for big six suppliers and smaller energy retailers.

Hares says: "Currently we have access to the firm frequency response market through our aggregator Kiwi Power and to the new generation tariffs announced by the government, which will be coming in to play soon.

"We will be looking to add the ability to sell on the balancing market in the coming months. What is important to Resilience Energy is to maximise the savings to the customer. We've designed our platform to ensure that customer savings are prioritised – the value of the electricity generated by the customer will always be higher than the price at which it is sold back to the grid. This also ensures that our customers use the clean energy they generate, rather than it being sold back to the grid for a low price.

"Grid services and selling power on the cashout market will be bonuses to the customer, not the driving force behind the solution. We pass on all income from the generation tariff and grid services to the customer. We just charge a £10 a month subscription cost for managing the system."

Solar panels installed
Green energy generated flows to the battery

Battery installed
Storing electricity for use as required and sending to the grid

App access enabled
App monitors and controls the system, maximising homeowner savings

ENERGY TECHNOLOGY ENTREPRENEURS

JAMES JOHNSTON

Chief executive and co-founder, Piclo

Piclo is "essentially a match-making service for providers of flexibility", according to its co-founder James Johnston. The firm has developed a platform for flexibility trading, where owners and operators of batteries and renewable energy generation will be matched with requirements from distribution network operators (DNOs) who have congestion and constraints on their network that they would otherwise have to pay to reinforce, Johnston says.

The six DNOs have signed up to its government-funded trial, along with more than 100 aggregator firms, suppliers and electric vehicle (EV) charging operators. This will be completed at the end of February 2019, after which the firm is hoping to provide its services on a commercial basis.

The firm's website, picloflex.com, publicises all the locations where DNOs have flagged up that they need flexibility services. The types of assets that are being added to the platform range from residential battery systems and EV charging units, to industrial factories and mini power plants, and "everything in between", Johnston says. "We're completely agnostic in terms of technology that's added," he says.

> Some energy suppliers can provide a battery as part of their offering, which then means they can give the consumer a lower tariff in return for controlling their battery

Piclo supports prosumers indirectly, by allowing the operators of their equipment to obtain a better price for the energy they generate. "For example, some energy suppliers can provide a battery as part of their offering, which then means they can give the consumer a lower tariff in return for controlling their battery. Their role is to get as much out of these assets for their customer as possible," he says.

"Our strategy is very much to look at the low-hanging fruit for the industry towards the local market prosumer model. For us it's to provide the functionality to help the DNOs manage congestion by procuring services from providers who have technology such as batteries. This isn't the vision of the future energy market, but it's a first step," he says.

The platform can help solve the problem of grid constraints that is blocking the connection of new distributed energy sources, but over time could support the concept of a local marketplace, he says.

"It's very much a journey and not something that's going to happen overnight," he adds. The UK is leading the world in much of the technology development surrounding the prosumer model, Johnston believes.

"The rest of the world is watching the UK and thinking that they need to do this too," he says.

Mike Young

Centrica's global chief information officer on beating John Lewis at digital transactions, partnering with Microsoft, and using smart meter data to tell customers when their freezer is about to break down

By Denise Chevin

Mike Young is two years into one of the biggest digital transformations in the sector. "It has scale, and complexity... it's not for the faint hearted," says Centrica's group chief information officer (CIO), with dry understatement.

Since he arrived, Young has been overhauling Centrica's IT systems to ensure everyone who rings one of its 14 call centres, goes online or needs help from one of its 15,000 engineers in the field comes away feeling satisfied – not put on hold, passed from pillar to post or asked to come back later as in the not so distant bad old days.

His biggest move of the dial has been at British Gas, still the dominant brand in the portfolio with more than 12 million of Centrica's 25 million customer accounts. Young has set his sights on Centrica not only being best of breed in energy, but the equal of big-name retailers too, up there with John Lewis.

"The IT leadership that I inherited was the British Gas team. I've had to help them think of the world in a much bigger way than they were used to. This is a big company with a history that does not necessarily lend itself to implementing digital the way we need to," says Young, who controls a team of 1,700 technology and IT staff.

"It carried a lot of legacy technology and process, and a capability that has been very loyal to the brand over the years but was not necessarily digitally fluent.

"So one's being asked to change a culture, and that's largely why I came."

Young joined Centrica in November 2016, from a group CIO role at the media and marketing group Dentsu Aegis Network, to work with chief executive Iain Conn, the former BP executive appointed in 2014. He's on the board that has restructured Centrica from operating as a series of semi-autonomous brands – including British Gas – to a group structure that has three operating divisions.

The £28 billion turnover firm, which operates in 14 countries – but mainly in the UK and North America – is split operationally into Centrica Consumer (including British Gas and Hive), Centrica Business, and Exploration & Production.

By his admission, Young is an operations veteran rather than a tech wizard. Before Dentsu Aegis Network he was chief operating officer at the Post Office, and held senior executive positions at Orange Verizon and BT. His early career was in the services – 11 years in the special forces and seven as a police detective sergeant. He entered the tech world on the security side at Orange, then a fledgling mobile start-up. "I went from that into IT pretty quickly, more at Orange's instigation than mine – they gave me IT ops and it really went from there.

"I've enjoyed the stretch it's given me, the chance to really learn about new technologies, and what part they can play in changing a company's profile as it engages with its customer base."

Centrica's leadership has a lot on its plate, growing the business in new areas such as connected homes, battery technologies, and repositioning away from large centralised power stations. Then there's the job of making another £500 million in efficiency savings each year and the ongoing rollout of digitalisation and improving customer journeys.

Centrica, like all the big energy players, has had to learn the hard way the customer is king. With more than 70 energy suppliers in the UK, and record numbers switching to challenger brands, the market has never been more competitive.

But while tough competition might risk investment at some companies, Young says the opposite is true at Centrica, which is quickening the pace of digitalisation and will be investing more in IT in 2019 than it did in 2018, though he won't be drawn on numbers.

"I'm not going to discuss the politics of the UK price cap, but it clearly affects the whole industry. It now means anything you do to become more efficient as a corporate can't in any way compromise customer engagement. So it just makes us move faster and faster to become more efficient."

> **The end goal for anyone doing my job is to ensure that any interaction an employee has with the rest of the employee base and any interaction the customer has with the corporate should be entirely end-to-end digital. When you reach that point, I would argue that from where I sit, the job is complete**

Q What is Centrica's destination in digital terms?

The end goal for anyone doing my job is to ensure that any interaction an employee has with the rest of the employee base and any interaction the customer has with the corporate should be entirely end-to-end digital. When you reach that point, I would argue that from where I sit, the job is complete. After that, it becomes a question of 'Do I replace this piece of digital architecture with a newer piece?'.

We've got digital channels that allow us to interact with our customer base in real time. It's taken many millions of pounds of investment to make that happen.

We looked at what John Lewis is doing in its digital channel. We timed how long a transaction took and looked to do it in a shorter time.

The more time customers spend dealing with an engagement they might not necessarily want to do, the more likely they are to become disenchanted. The more at ease they are acting and engaging in that digital channel, the more likely you are to end up with a customer that feels quite satisfied.

I'll give you another example. My wife would get very frustrated whenever she went onto the M&S site to order something, because she'd go through a process where she went through many pages, got to the end where she wanted to pay for the item, only to find it was out of stock. And she's already spent 15 minutes in that process.

Our digital journeys are designed not to work that way, and we test them with customers. We bring customers into a digital studio here, and we interact with them, and ask them 'does that work better, or does this way work better?'

So it's real interaction to make sure that their interaction in that digital space is as streamlined and engaging as we can possibly make it. Everything is timed to its nth degree – and we are in fact now faster than John Lewis.

Q What are the barriers to achieving digital transformation? Have you done the hard work now?

Like everywhere else these days, it's a work in progress.

I try to keep abreast of where my colleagues are in their own

WHO KNEW?

What tech were you hoping to buy in the sales?

I've asked my wife to buy me a Bluetooth speaker.

Business hero?

Colin Powell. I like the fact that he has been successful in a number of careers; his military career, his political career, and now he sits on a number of boards, he's a public speaker, and he has some leadership principles that resonate with me, they echo right back to his time in the army. When I think about how I apply myself in my corporate role, there are some points in that leadership principle piece of his, where I think "I recognise that, I do that, I got that learning from the military too." So he's a particular hero of mine.

What did you want to be when you grew up?

A pilot; my father was a pilot in the RAF, and I would have been a pilot, but I'm colourblind in one eye to the colour red. I love my career, I love what I do, but I know I would have liked a career as a pilot.

What do you do to switch off?

I have a Watt bike at home, which is a big static bike, it's the one the Sky team use when they're not out on the road. I use that every day. I go to the gym at the weekends, and I'll do two or three triathlons in the course of the year. And if that makes it sound like I'm a superhero, they're quite slow triathlons.

Favourite places in the world?

With my wife it would be the Seychelles. On my own it would be diving in Belize.

Gadget I couldn't manage without?

Smartphone.

transformations with their businesses. I think we are ahead, though not that far ahead, but I don't see us behind anyone, and I do see us probably at the forefront of most.

As CIO, I would argue there are three things you need to have working in harmony. You need the technology to be the right technology – which is quite a skill picking the right solution. You need the right business process to wrap round that technology, so that you can get the best out of it. And you need the right people capability to get the best out of the process and the tech.

Fail to get any of those right, and you'll never get to the end game of end-to-end digital. I work very hard with my business colleagues and my team to ensure we're doing the best we can in all three of those.

One of the things I'm proudest of is the digital academy we set up that will give our people the knowledge and capability they need – it's open to everyone in the business. We also sponsor many PhD students and graduates.

Q How are you working to take on board new technology?

We've got a strategic partnership with Microsoft. They're clearly a big partner across any corporate, and they were a big partner in my previous company. The one thing I like in all our strategic partnerships, and we only have three or four of them, is that they start from the CEOs down. There is a handshake with the partner that allows us to talk about common issues and the ways that we might help each other in the marketplace.

I like the fact that Microsoft has a deep and rich portfolio and covers all the areas an entity like Centrica would be interested in: cloud platforms, the focus on data and so on. The collaboration stack they've got with Office 365 I think is unparalleled in the market. Their CEO Satya Nadella has changed the nature of how they look at their services. One of the technologies we've implemented with Microsoft is to move our operations to the cloud (Microsoft Azure in the UK) to again give ourselves a little more agility, elasticity and speed. Because it's always there, you tend not to suffer infrastructure problems, so you can be guaranteed that you've got an operation that's always going to be up. Working with Microsoft over the next couple of years will transform how we plan and dispatch work for our teams of engineers across the country.

Q What are you planning to do with your data?

Another area we are looking at with Microsoft is the collection and use of data. I'd like to think we've learnt from one another in that space, which is what partnership means to me.

When I arrived here, I inherited a sophisticated team that has a pretty good lead in this space [around data]. We've had a data lake for a number of years now, and we're moving that data lake into Azure. As you know, a data lake takes structured and unstructured data, and it takes it at volume in real scale, and then it allows you to use tools to scan that mass of data to draw out the analysis that you're looking for.

For example, we have rolled out in the UK some six million smart meters, half of all those installed in the UK. This has given us unique data sets for our consumers. And almost all that data goes into our data lake for analysis.

We are able, thanks to analysis, and some complicated algorithms that we have IP-ed ourselves, to establish whether a consumer's fridge or freezer has a condenser that is about to fail.

We're able to ring up and say: "We've been looking at your smart meter, and it's telling us that your condenser is failing on your freezer – can you test the temperature just to confirm that that's the case? We can have an engineer to you tomorrow morning if you need one."

That's one example of the nirvana of where we're trying to get to in the data space.

The other thing is that we've put intellectual property on data that we've been using for a number of years now in a separate company we own called 'Io-Tahoe', which provides GDPR discovery tools to blue chip type corporates. Whoever thought a utility company would own a data company?

Q What technology will make an impact in the future?

There are three that I think will make a big difference in our sector. Firstly, cognitive assistants are going to change the way that we are going to engage with the customer. Secondly, the emergence of blockchain as a vehicle to aid renewable energy sources and to support electric vehicle charging; and finally, AI/machine learning to further enhance the personalisation of products and services to the customer.

Q Is there anything that has surprised you about the utility sector?

It's slower than you think. And then you find out that slow is not necessarily bad. Because obviously slow in the energy sector also takes into account the safety parameters within which you must work. Most industries are safe in that regard, but in the energy arena, you can't afford to do some things quickly.

And some of the processes aren't as fluent as I thought they might be. And then, of course, there are regulatory and other aspects to what we do that genuinely slow things down as a consequence.

And it's a bit clunky too.

Q Finally, you've had a wide-ranging career – has anything you'd learnt in previous careers helped you in this role?

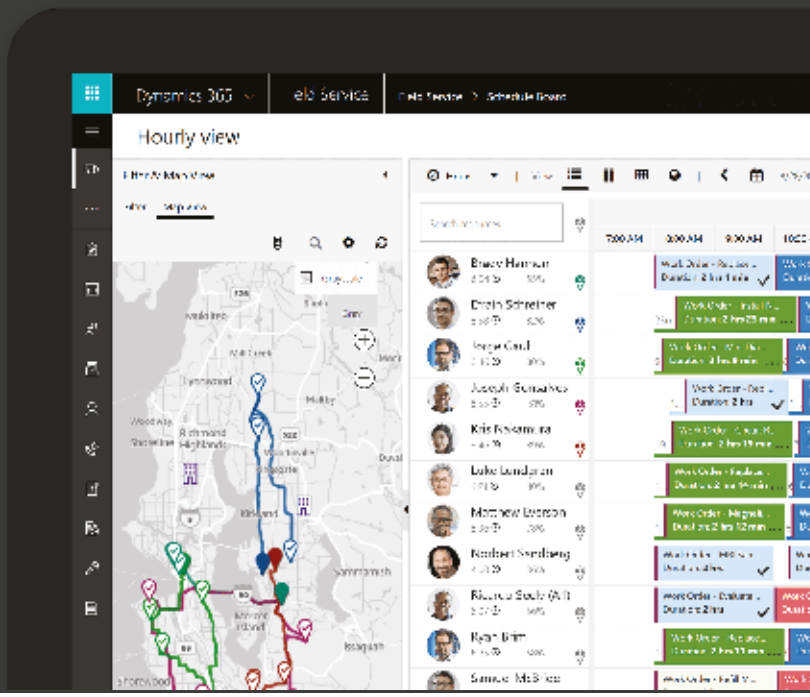
Discipline! Keeping your chin up, trying to be constructive, and a team player. One of the things I've tried not to do, which I probably did earlier in my career, is to appear too authoritarian. It would be very easy to revert to being a soldier and say "I'm not asking for a discussion, go and do this, etc...". You have to recognise that with the capabilities in some corporates, this one included, often there are secret skills you're not aware an individual has. So, I've had to shape my interaction with people.

Microsoft

Redefine customer experiece through Connected Field Service

Microsoft Dynamics 365 for Field Service enables businesses to move from reactive to proactive customer response by bringing together IoT and AI.

"By utilising the three Microsoft clouds we will build a stronger picture of what our customers need and ensure that they can be kept up to date with accurate and timely information."
Mike Young, Group CIO, Centrica



Dynamics 365 for Field Service helps businesses enhance their service experience by proactively detecting, troubleshooting, and resolving issues, so a technician is dispatched only when necessary.

It leverages advanced analytics, machine learning, and the Internet of Things to move organisations from a costly break-fix model to a never-fail service model.

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Redefine service with Dynamics 365 for Field Service.
Visit the Dynamics 365 for Field Service website today to learn more.

https://aka.ms/D365FieldService

1. Gartner, Magic Quadrant for Field Service Management.." September 2017. 2. Gartner Survey, December 2015 to December 2016. 3. Gartner Field Service Report, 2017.

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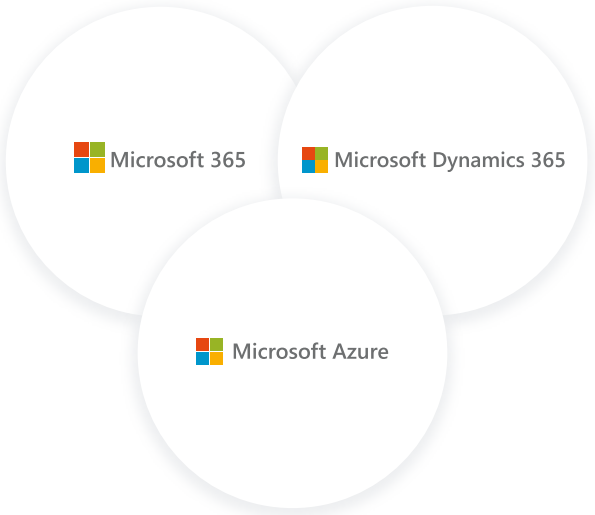


"By utilising the three Microsoft clouds we will build a stronger picture of what our customers need and ensure that they can be kept up to date with accurate and timely information."
Mike Young, Group CIO, Centrica

"The dream has always been to transform the way that work gets done. Microsoft Dynamics 365 is the next generation of intelligent business applications in the cloud that breaks down the silos and incorporates the familiar productivity tools that you use everyday. We also harness the power of advanced analytics, PowerApps and IoT with the strength and security of Microsoft Azure."
Matt Jackson, Business Applications Lead, Utilities, Microsoft

Please contact katie.armstrong@microsoft.com 07901 331044

Microsoft

smarter tech = happier customers

Which technologies have the best chance of winning over customers and increasing trust?

By Lois Vallely

When it comes to engagement and trust, utility companies have a long way to go. Although trust is increasing gradually, research carried out by *Utility Week* early last year found that less than half (49 per cent) of respondents trust their energy supplier.

Customer expectations are changing as service and innovation in other sectors improves, and regulators are constantly pushing for higher levels of customer service, through Ofwat's proposed WaterworCX incentive programme and Ofgem's ongoing supplier licensing review.

That's not to say there's not been progress. Energy companies have spent large sums to bring in new digital systems to replace their legacy ones as they look to smooth customer journeys by providing better support and interaction. Others have gone further, capitalising on the smart meter rollout to optimise energy usage, developing apps for bill paying and adopting smart home technology as part of their offering. Some are even taking cautious first steps into the world of artificial intelligence (AI).

However, the sector is a distance yet from a "utopia" in which a customer experiences a seamless journey. Firms also face the problem of ensuring that in a bid to embrace the latest digital wizardry, they don't leave behind those who would prefer to pick up the phone.

At *Utility Week*'s customer conferences held in Birmingham in January, many of the speakers and participants spoke about the need for utility companies to "get the basics right", before attempting to take on the mountain of new tech. Another consensus at the event was that utility companies should not be pioneers of new tech and should instead "let other sectors make the mistakes".

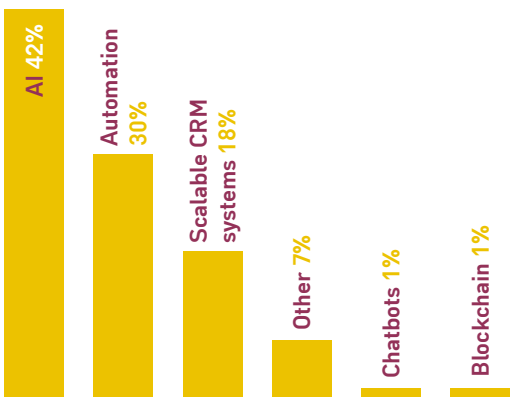
But Ted Hopcroft, energy and utilities expert at PA Consulting, holds a different view. He tells *Flex* energy companies are still "too focused on price and the basics", whereas success now depends on a "sophisticated response" to empowered customers and a "clear understanding" of their priorities and the choices they have. Companies will need to increase their use of technology to drive this kind of change in the sector, he adds.

Matthew Vickers, chief executive of Ombudsman Services, says the sector has seen some major improvements and innovation in recent years, but there is still a "long way to go". And, he warns, technological development mustn't be just for the sake of it. "For me, the most successful and impactful technological innovations will always be those that are built with customers and their needs in mind and improve the customer journey and experience," he says. "Otherwise, it's just tech for tech's sake." And this could do the opposite of what technology is supposed to, thereby decreasing engagement and damaging trust.

In the future, who knows – perhaps customers will use their intelligent robots to manage their entire household, from controlling their heating to walking their dog. Maybe they'll have no need for a traditional utility company at all.

But in the meantime, we pick the technological developments that are making, or have the potential to make, the biggest impact on engagement and trust in the utility sector.

What digital technology is most important in improving customer service? Source: Utility Week poll



Apps

Apps can be a great way to drive engagement with customers, many of whom will prefer to check their bills or interact with their water or energy company via their mobile phone for convenience. They perhaps hold the greatest potential for utility companies in the short term.

Vickers says the sector is seeing some "excellent" innovation on the apps front – both within the big six and outside it. He suggests financial services has been a leader in smartphone engagement through apps, but there is the potential for energy to compete.

United Utilities and mobile technology company Apadmi won the Utility Week Customer Engagement Award 2018 for an app they developed to make it easier for customers to deal with the water company. United Utilities was the first water company to offer a native self-service app, which was innovative in its design and functionality. Since then, more and more water companies are starting to offer this, helping to drive change in the market as well as internally.

Customers can now use the app to pay bills, view statements and check their payment history. They can also take and submit a meter reading. In their awards submission, the companies said the contact hour restrictions associated with contacting United Utilities directly have been completely removed. They claim the mobile experience is more engaging, as it has streamlined the customer journey and removed "time-consuming processes and forms".

Many utility firms, though, are not making the most of apps. Marcus Hadfield, chief strategy officer for Apadmi, suggests energy providers are currently ahead of the water suppliers, but "they're still only getting the basics right".

When it comes to utility company apps, simplicity is key. "The temptation is to think that an app should be all things to all people," says Ben Lind, strategy lead for utilities and energy at Hedgehog Lab. "But I would say that making the most of an app is to clearly define what your users would want from it and making sure it does that perfectly. A good example of this is the app from Octopus Energy – all you can do is submit meter readings and view your account details – it's a great example of simplicity."

Then, there are those who have reservations about the extent to which apps are needed at all in the utility sector. Customers typically don't interact with their water company on a regular basis, says Jacob Tompkins, chief technology officer at The Water Retail Company, and if an app is not used regularly there's a risk it will be removed from a customer's smartphone. "Companies need to focus on solutions which enable digital interactions to work across all customer devices. Even if they get this right, if they don't digitalise all the business processes that make up the overall customer experience, water companies won't be able to deliver personalised services," he says.

Octopus Energy chief executive Greg Jackson, too, suggests the need for energy company apps is not strong currently. "Banking is different," he says, "you need an app for convenience. Security and frequency of interaction are so much greater than energy. Indeed, banking apps also often offer instant payment capability.

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"The case for downloading an energy company app is not as strong, especially with so many web frameworks allowing a mobile website to do pretty much the same as an app. As we move to more and more dynamic pricing and smarter homes, so the app requirements may change again."

For other energy suppliers, an app is central to their model. Pure Planet has taken an app-based approach to energy, and this, sales and marketing manager Phil Edelin claims, gives consumers control over, and engagement with, the energy they use.

The reason the company took this tack is that it wants to make Britain renewable – mitigating climate change and improving air quality. "Our approach to this has been a low-cost digital model, that passes on the benefits to consumers through low prices that make renewables affordable," he says.

"The app provides a simple way to join, manage and engage with home energy as well as a platform to get service through our AI WattBot, community support and dedicated service team. In addition, we are enabling people to learn more about sustainability and renewables through our blogs and forthcoming tools."

Smart meters

The political side of the smart meter rollout is, frankly, a mess. It is rife with delays, which are creating undue problems for energy suppliers.

However, those issues aside, most agree the technology itself will be a game-changer in increasing trust in the energy retail space. As Gillian Cooper, head of retail energy markets at Citizens Advice, points out, much of the government's business case for the smart meter rollout hinges on consumer benefits. "These benefits are based on consumers having a better understanding of and engagement with their energy usage."

PA Consulting's Hopcroft insists smart meters offer a "once in a generation opportunity to change the sector". "They will create new more active relationships between customers and their energy supply that will drive transformation," he says. "They will address the problem of a lack of transparency that has undermined trust and, along with clear and simple tariffs, will help to increase customer confidence."

So far, 13 million devices have been installed across the UK, in a bid to have every home offered a meter by 2020. Studies suggest smart meters do have the ability to increase consumer trust.

Hedgehog Lab's Lind says smart meters are going to play a "much bigger part in the connected home of the future". "The functionality of SMETS1 meters is limited," he says. "You can see your consumption increasing throughout the day but there are no actions that come off the back of that information; they tell you when you're using energy, but they don't tell you why or how to use less."

There are companies that do offer this. Verv, for example, attaches directly to the electricity meter in a home via a current clamp, enabling the hub, and "listens" to the electricity usage of the entire residence.

However, Lind sees a future where the smart meter, which is free to consumers, is the "dashboard of the entire house". "It will be connected to lights, appliances and home assistants, giving customers much greater control over their energy use as well as access to a wealth of consumption data, pricing information

It's good to talk

Voice assistants are the way forward for better customer relations, says Ben Lind.

When was the last time you picked up the phone to your energy supplier? Was the reason for the call positive or negative?

If there are multiple answers to the first question, I would be very confident when betting on the answer to the second. From my experience working alongside several large energy suppliers in the UK and Europe, I know that when the phones ring in their contact centres it is rarely good news on the other end.

People phone for different reasons, but 90 per cent of those will be negative reasons. Perhaps a bill is incorrect, perhaps something has stopped working, maybe there's maintenance on their street which is causing disruption. These are common occurrences and, as inherently frustrating as they are, that frustration is then amplified by having to pick up the phone to try to speak to someone.

Over the past few years, the ways in which people communicate with each other has changed dramatically. We connect more rapidly, interact with more immediacy and do so more short-handedly. Not only do we expect this of our friends, colleagues and family, but also from the companies we buy from.

Alongside this, customers are more digital than ever before and this completely flies in the face of what you'd traditionally think of when discussing interactions in utilities. Previously it's been paper bills, contact centres and handwritten letters, but things are different now. We moved on to laptops and then from there to mobile screens, but as Amazon's Voice Evangelists will tell you, they believe the next evolution is to use our voices rather than our fingers.

This belief has led them to the creation of their Amazon Echo device and their voice assistant Alexa. Alexa allows for the giving and receiving of information in a natural and easy manner of a voice assistant. Normally taking the form of a speaker, this clever tool sits on a bench or worktop and waits patiently for a question to answer. It is here where a huge amount of potential can be found for energy providers to offer a new channel of communication to their customers as well as lightening the load on their contact centre teams.

An early adopter of voice interface technology is our client Northumbrian Water Group (NWG). Working as an innovation partner with Hedgehog Lab, NWG ran a series of workshops to understand what kind of information their customers would want to get from their Amazon Echo.

and behavioural insight. Once this can be coupled with automating algorithms, people will be able to set their appliances to come on at times when energy is at its cheapest, saving money for them and reducing demand on the grid at the same time."

Although smart meters themselves have the potential to increase consumer engagement and trust once installed, trust and engagement will also be vital to the success of the rollout.

"Smart meters have the potential to provide a key piece of enabling equipment for future smart home equipment and services," says Cooper. "Consumers are only likely to engage with such services if they trust the company providing them. Energy suppliers and other service providers need to ensure that consumers are confident that such services are run for consumers' benefit, backed up with easily accessible support and assistance if they experience any problems.

"We know that consumers particularly value transparency and control when it comes to their data. It's important that people know where their data is going, what it's going to be used for, and have the ability to choose how or whether it is used."

Web chat and voice-controlled interfaces

Online chat is the preferred method of communication for many customers. It allows interaction with a real person, but can be used while doing other things, rather than having to stop everything to make a call. Many utility companies are rolling this out, including Scottish Power – for whom it has become the second-most-used contact method for its customers, after calls.

The uptake in web chat has paved the way for a rise in chatbots, and the natural next step is to move to voice-controlled tech. The market has grown since massively, with an estimated 40 million "voice-first" devices being sold by the end of 2017, says Bristol Water's 2020 IT investment programme director Nick Rutherford.

In 2016, EDF Energy became the first UK energy supplier to partner with Amazon's Alexa voice service to create an "Alexa skill". Alexa skills are capabilities, like apps, that enable customers to interact with Echo devices in a more intuitive way using voice. With EDF Energy's Alexa skill, customers will be able to ask Alexa to check their account balance and next payment date, submit a meter reading, and verify when their tariff is due to end.

However, generally in this area, things are moving slowly for utilities. Seb Chakraborty, global chief technology officer at Centrica Hive, warns "it's easy to overestimate where we are right now, as much of what is being designed is still using traditional commands on the back of voice request".

He adds: "They work really well for the smart home, picking a song, or setting the alarm, because the intent is clear and deterministic, and speed is of the essence. Any ambiguity to the request will only serve to frustrate the experience."

Chakraborty suggests that where voice could play a big future role is in the area of "peace of mind" applications, such as "assisted living". "After all, voice is often easier to use for elderly people, who can use it to issue simple voice commands such as calling for help, or being prompted to take their pills," he said in a recent article for *Utility Week*. "No doubt, these will eventually develop into full conversational user interfaces needed to one day play the role of sophisticated companion robots."

Rise of the voice assistants

Given that the majority of calls received were to give meter readings, query bills or check on maintenance work, Hedgehog Lab set about building a library of Alexa "Skills" that would allow NWG customers to submit a reading without needing to call up, order an engineer out to their property or find out what impact local maintenance was having on traffic.

Not only is this a less arduous experience for the customer, it also allows teams in the contact centres more time in which to be upskilled in other areas of their job, which leads to better employee satisfaction and higher retention rates.

Additionally, the fact that is still a fairly new technology suggests there is clearly scope for wider adoption. A report by CapTech stated that 53 per cent of smart speaker owners are aged between 18 and 36 and a further 32 per cent are aged 37-52. Those who have grown up using smart speakers and voice assistants will clearly go on to expect utility companies to make this channel available to them. In addition, Accenture has found that adoption rates for voice assistants are faster than any other technology ever.

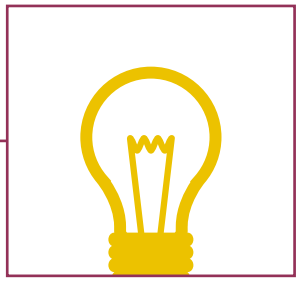
According to reports, customers would be willing to pay up to 16 per cent more and would even be willing to try extra services or products from brands that provide best of breed customer experience – and utilities are no different. You need only look at the ingress energy suppliers are making into the smart home arena to see the correlation between good customer experience, high levels of trust and increased revenue.

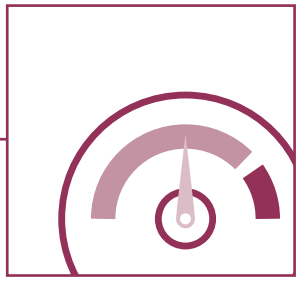
At Hedgehog Lab, we're very excited about the potential that voice-enabled technology has within the energy sector, but it will only make a difference if deployed in the correct manner. There's a degree of worry and fear related to newer technologies such as voice assistants, but when you consider the smooth experience it can offer clients and team members alike, I'm happy to sing their praises until the day comes when they can do it themselves.

Ben Lind is strategy lead – utilities and energy at digital consultancy Hedgehog Lab.

Connected home services

The idea of the "connected home" has gained a great deal of traction in recent years. Now, more and more utility companies are jumping on the bandwagon, and this is dramatically changing the way they are interacting with their customers.





Home services offer a truly promising prospect for energy suppliers to respond to increasing competition, as they allow suppliers "to differentiate themselves to keep customers" and "generate more revenues out of those who stay with them", according to Arthur Jouannic, principal analyst at Delta Energy, when he spoke to *Utility Week* in 2017.

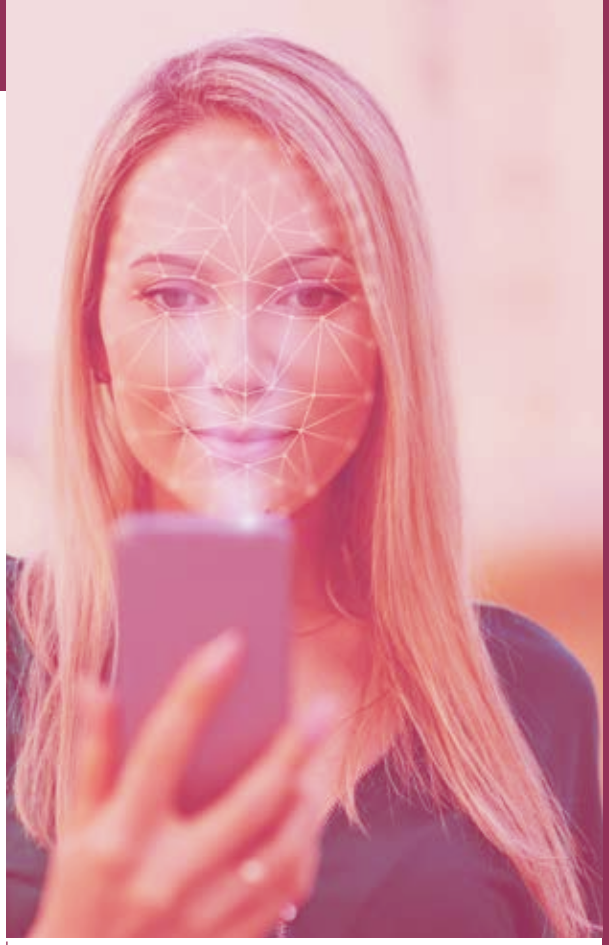
British Gas – the most established utility-home services provider in the market – has consistently seen its services division outperform its retail division both in terms of customer satisfaction and operating margin, despite a falloff in the market for boiler insurance products after 2013.

Now, advances in mobile technology and data analytics, uptake of electric vehicles and the rollout of smart meters, mean that the gamut of home services suppliers can now offer reach far beyond the boiler installation and servicing products that British Gas has dominated for so long.

Not only have other big six firms started to offer smart home technology, some of the larger challenger suppliers, such as First Utility, are also beginning to realise there are opportunities from offering the tech. In October last year, the company began offering free smart home products, for example the Google Home Mini smart assistant, to those signing up to its broadband packages.

A recent *Utility Week* survey, carried out in association with Harris Interactive, found interest in smart technology is on the rise, and it is partly being driven by the uptake of smart meters. A third (31 per cent) of survey respondents said they were either "extremely" or "very" interested, compared with 26 per cent who expressed interest when the previous survey was carried out in June.

Research from PwC last year found ownership of smart devices has more than doubled in the past two years, with households expected to spend £10.8 billion on smart tech in 2019. And the report indicated the growing market could be increasingly lucrative for energy suppliers in the future.



Artificial intelligence

Artificial intelligence (AI) is one of the biggest technological trends transforming every business sector across the world, according to a report by ResearchAndMarkets.com. The report claimed AI is being harnessed to develop innumerable smart applications that can efficiently take critical decisions autonomously and accurately, without human intervention.

Uptake is beginning to creep into the utilities sector. In July last year, predictive field service management company Oneserve commissioned research that found a quarter of utility companies in the UK have integrated AI into their systems. What's more, a further 37 per cent have plans to follow suit in the next five years.

Utility companies lose an average of £78,585 per year due to machine and system downtime, the research found. More than half of those polled said machine and system downtime had also led to a "serious negative impact" on customer loyalty and their company's reputation. Four in ten said AI will support the current utilities workforce, making it more efficient, cost-effective and customer-focused.

This, and other, research would suggest using AI increases the productivity of the workforce by streamlining processes, reducing costs, and overall improving the customer experience – therefore leading to an increase in customer trust.

However, these sorts of innovations are still in the early stages of development and are therefore "fairly blunt". "We're yet to see a good use of AI that starts to advise customers on their own personal energy or water usage," says Apadmi's Hadfield. "The financial sector is starting to get ahead here. Take Plum – the AI/chatbot app that analyses spending patterns and helps customers save more. It's not hard to see a future where energy advice – and even control – is delivered like this."

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Act early to reduce bad debt

Eddie Nott, Managing Director, Intrum UK

The scale of bad debt facing the utilities and telecoms sector requires innovative thinking and an appreciation of the particular challenges facing different services, from smart metering to the use of white data and the difficulty of establishing periods of residence. A common thread, however, is to raise standards as high as possible. Enhancing ways of identifying and working with vulnerable customers is key to that.

Outsourcing or debt sale?

Currently we are seeing revived interest from the sector in debt sale strategies – though a range of options are available to utilities, from the sale of older tranches of debt to more BPO-style arrangements. Using specialists in collection is important as strategies and skillsets differ from those needed for regular billing and account management.

As in financial services, we expect to see utilities businesses moving to earlier outsourcing and debt sale in future as they clear out historic arrears and are able to focus on more recent bad debt. This is the right approach: if a customer is struggling to pay their bills, they stand a far better chance of getting their situation under control if the supplier acts early.

Early intervention

Using specialist debt collection services has too often been seen as a last resort, an option when there are no other options. In fact, using a sensitive approach at an early stage can enable the business to restructure the debt and stop high levels of arrears building up.

This is important given Ofgem's finding in 2017 that the number of customers in debt had fallen but the amount owed had grown, with customers building up an average of £628 in unpaid bills before starting to repay. The barriers to repayment are greater at this stage and the potential distress to customers greater. Get it right at this point and customer loyalty increases.

Technology in collections

In today's digital world, customers are used to handling their finances online and on the go so it is important to offer a range of digital options in the collections process. Not everyone is comfortable discussing their situation on the phone – some prefer to use bespoke collections portals where they can enter their income and expenditure information in their own time; engage with chatbots powered by artificial intelligence; text; or email.

Technology is also adept at identifying vulnerabilities that may have been missed. For example, we use speech analytics to pick up words and phrases that indicate vulnerability and can also detect stress in a person's tone. Real-time tracking of calls and feedback from customers means the collections team can respond quickly, deploying emotional intelligence to ask the right questions at the right time.

Ethical collections: a soft option?

Our experience is that working sensitively with people in debt returns more money than an aggressive approach. We're already working with local councils and utility companies to implement our philosophy, which is backed by a +62 net promoter score – an unprecedented level for our industry.

The benefits of this approach are many:

- ☐ **Better identification and treatment of vulnerable customers**
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- ☐ **Brand loyalty**
- ☐ **Raised collection levels**
- ☐ **Security of going beyond compliance**
- ☐ **Advanced technology offers choice**
- ☐ **Reduction in bad debt levels**

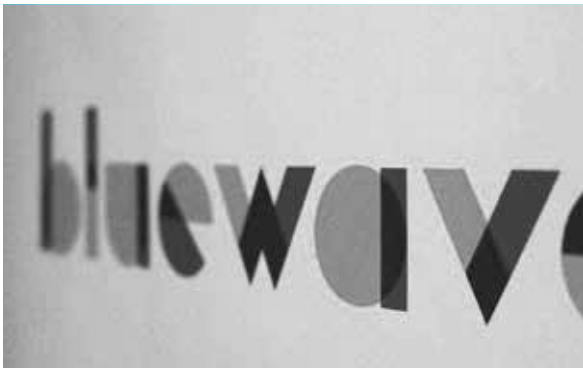
Intrum provides a wide range of credit management services and has a presence in 25 markets in Europe.

For more information, contact Client & Sales Director Ian Davies 07960 580747 ian.davies@intrum.com or Head of Business Development Phil Hickson 07776 513535 phil.hickson@intrum.com

How do you invest in innovation...

...without wasting money on ideas that don't pay dividends? Southern Water's new Bluewave team has a plan

By Denise Chevin



Tucked away in the small backstreets behind Brighton Station is Southern Water's version of a start-up. In shared modern offices with relaxed breakout spaces, a health-food café and funky coloured furniture, a small team of innovation experts and digital engineers is at work. They devise experiments and programmes to test new ideas to ensure that the money Southern invests in innovation gives them the most bang for their buck.

While the company's main bases are in Worthing and Durrington in West Sussex and in Falmer a few miles down the road, this is very consciously a new outpost, says Jamie Ford, Southern Water's director of commercial and innovation. "We wanted to have somewhere we can get people from across our business, and outside, and bring them into an environment that was a little different, where they can leave the day job behind and focus on the activity.

"We meet in the small office, or 'Lab', around one big desk. Walls are plastered with Post-it notes and flow charts, vestiges of the latest 'sprints' and 'ideation' sessions."

Set up in June 2018, this is the base for what Southern Water is terming Bluewave – a catch-all programme for its quick-win, innovation-led improvements, many around digitilisation, and longer-term R&D activities including collaboration with other water companies and a number of universities, carried out in research facilities around its region. There are 13 people in the Bluewave team – seven in the 'Lab' and six in R&D functions.

> **Instead of coming up with solutions and then making these long-term roadmaps and building them out over months, it's about figuring out firstly what problems are worth solving**
>
> Jamie Ford, director of commercial and innovation, Southern Water

Bluewave is also intended to encompass a new way of working. "Instead of coming up with solutions and then making these long-term roadmaps and building them out over months, it's about figuring out firstly what problems are worth solving. So, we're focused on the highest value problems. Value can be financial, value can be about improving our customers' lives, it can be about helping the environment, it can be about all sorts of things – a lot of it's around digitising what we do," Ford explains.

Innovation consultant Jennifer Torry picks up the theme: "It is very much about what's the problem, whether that's an operator on a wastewater site, or whether that's actually customers, and we do what's called a 'rapid start 48-hour ideation session', to bring those people in to help solve the problems.

"We then select solutions that have the most legs, and that's determined by the steering group, and the stakeholders and the exec board here at Southern. After that we do fast rapid experimentation to see if that idea is worth developing in the first instance.

"So you're cutting out those really long roadmaps. It means you avoid building a

solution that wasn't worth building in the first place. You figure out 'is this thing worth building?' very quickly and very cheaply," she adds.

At the moment, the problems Bluewave tackles come from senior management, or are suggested by the operational teams, but the goal is to build a platform for wider staff engagement. The outcome they want to achieve is to improve efficiencies and customer services and bring down bills for customers, in line with Ofwat's edicts. "We're looking at a very broad change. The ultimate strategy is to create a water-resilient future for the South East," says Ford.

Southern is on a quest to raise its performance in a number of areas, driven by new chief executive Ian McAulay, who joined the business in 2017, followed by a number of senior hires from outside the sector to usher in new ideas. Ford comes from a telecoms background; his previous role was managing director of commercial, digital and strategy at BT Business.

It is relatively early days under the new management and business plans have a long gestation period. It's certainly far too early to have a major impact on the business, but a lot is resting on it. Southern was one of the water companies Ofwat asked to rework its PR19 business plan, when it published its initial assessments at the end of January. The water company knows new ways of thinking are essential if it's to regularly get top marks from the regulator in the future.

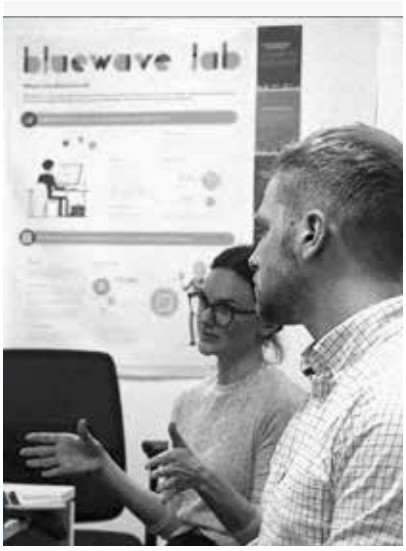
Southern has earmarked £50 million in efficiency savings off the back of innovation. Its Brighton team has a focus on digitalising processes, including those of site officers in the field. It has 25 R&D projects on the go currently, with many directed at improving the environment and resilience in what is one of the UK's water-stressed areas.

Elin Williamson, Southern Water's research and development manager, explains the approach to its removal of phosphorus – one of its compliance factors – which is a huge challenge for the organisation and the sector. The chemical gets into water sources in the catchment from fertilisers used by farmers. It is working to tackle these issues on a number of fronts and different timescales.

Firstly, explains Williamson, they are working with farmers in the catchment to help them change their methods to remove the chemical at source. Secondly, the team is looking at how they can recover phosphorous at various sites across the region – this includes a project with Microvi Biotech Inc, WesTech Engineering Inc and the University of Portsmouth from its Environmental Technology Field

"You're cutting out those really long roadmaps. It means you avoid building a solution that wasn't worth building in the first place. You figure out 'is this thing worth building?' very quickly and very cheaply"

Jennifer Torry, innovation consultant



Station near Petersfield, Hampshire. The goal is to reduce total phosphorus to levels below 0.1 milligrams per litre for wastewater treatment plants.

Southern is also the only UK water company to be working as part of the EU-backed NEREUS Project, which involves collaborating with other water companies, research organisations, consultants and universities across Europe, to find ways of recovering water, energy and nutrients from wastewater – including phosphorous.

Drew Brown, project manager in research and development, says the recovery research is an example of circular economy thinking around the business. "We're trying a technology from the Netherlands for the next three months, looking at the recovering of calcium phosphate and also struvite – which crystallises and blocks pipes."

Another strand to the work is on the operational side to improve the way permits can be monitored digitally by on-site operators. Richard Scott, Southern Water's innovation lead, explains: "The site permit is an outline – it's held on every site, often in a paper format. The metrics we hit are digitised, but to accelerate we want to put this information on tablets for our site officers so they can see what's going on across the business."

The innovation team is using basic off-the-shelf applications – including Google sheets – which it can learn from. Once there is evidence that the methodology is beneficial, it will develop a full rollout with the IT department. It's also looking at similar process improvement around maintenance and weather data.

Williamson's role is focused on longer-term change: "Some of the more progressive things we've been trialling are how we use new sensory technology to make smarter decisions. We've got a device called Smart Ball, which you put down your pipe, and it sends off lots of different sensors to assess the condition of your mains. It can be used on wastewater or the water side to see what condition the pipes are in, without having to actually dig up the road."

At the other end of the scale, and in search of a few key quick wins, Southern Water is trialling an asset scanner. Says Hazel Maxwell, innovation manager: "At the moment, when people on site need to report an issue with a piece of equipment, it's more onerous than we'd like it to be identifying the asset, raising the request and getting someone along to fix it.

"The asset scanner scans a QR code on a mobile phone and pre-populates the form that needs to be filled in to raise a work order. It reduces the time from 15 minutes to about two minutes."

Adds Ford: "Digitalising the task this way means what you start to build is much better, relevant, real-time data insights around which bits of equipment are working most efficiently, and where are you having most repairs – it could be a certain make or type, it could be kit of a certain age."

Going forward, Ford says the biggest challenge for the Bluewave innovation project will be "how we engage the Southern Water employee base to do things differently" while at the same time maintaining a strong focus on compliance.

"Obviously, we've got to make sure that drinking water is of the right standard, so there can be a resistance to change because of the risk of failure. It means that everything we do is researched and carried out in a very controlled fashion."

Does it measure up?

Water companies are mobilising an army of 'citizen scientists' to monitor water quality issues and enhance community engagement. But what are the concrete benefits and is the data reliable?

By Stephen Cousins

Citizen science promises to make scientists of us all by giving people the tools to measure environmental impacts in their local communities. It's growing popularity is being driven by the widespread availability of low-cost digital devices, particularly smartphones, which make it much simpler to perform data collection and analysis.

Water companies are increasingly calling on volunteers to help scope out issues with water pollution or water quality in rivers and tributaries as a precursor to more targeted research and mitigation campaigns. Having large numbers of people on the ground makes it possible to extend the spatial and temporal resolution of data, compared with using just a few in-house scientists. It can also improve

We try to encourage people to be stewards of their environment, to record it and carry out supporting actions that move us towards mitigation or conservation

Steven Loiselle, senior research manager, Earthwatch

engagement by giving people a better understanding of local impacts on watercourses and the means to help improve them.

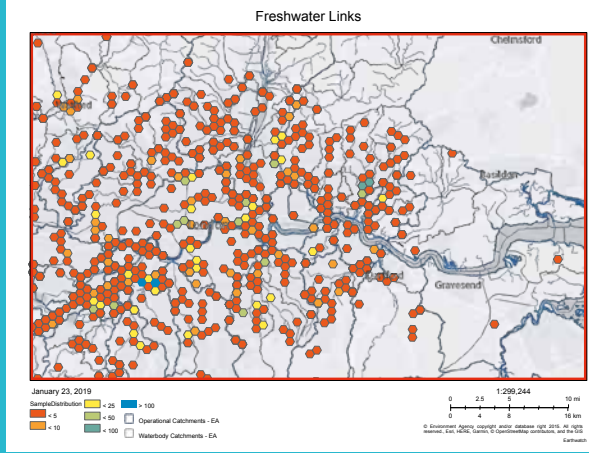
Steven Loiselle, senior research manager at Earthwatch, a non-government organisation whose citizen science kits have been used globally, including in 'WaterBlitz' events involving water utilities, says: "Citizen science is exploding in the western world; the Water Framework Directive and UN sustainability goals tell us that people need to be part of the solution, not just passive observers who simply pay their utility bill without understanding what it is being spent on or why water pollution is such a problem. We try to encourage people to be stewards of their environment, to record it and carry out supporting actions that move us towards mitigation or conservation."

Reaching out

Citizen science is typically a collaborative endeavour and, in the realms of hydrology and water quality monitoring, it involves partnerships between River Trusts, the Environment Agency, agencies such as water utilities, scientific institutions and organisations such as Earthwatch that supply monitoring, training and online data analysis.

The approach can be deployed to tackle a range of issues. Domestic misconnections, whereby properties or appliances are plumbed direct into the surface water system instead of sewers, are a major problem in urban catchments that can seriously pollute water courses.

Water utilities such as Severn Trent and Thames Water have supported various 'outfall safaris' – citizen science campaigns that see small teams of volunteers walk the banks, or in the water itself, of rivers and tributaries looking for polluted discharge



Above: FreshWater Links collates data from a range of citizen science projects. *Left*: outfall safaris in action (Picture: ZSL)

DATA BOMBING AND RIVER HEALTH

The overabundance of certain nutrients in water courses, such as nitrates from sewage or fertilizers used in agriculture, can cause various adverse health and ecological effects.

The scientific method and toolkit FreshWater Watch, developed by Earthwatch, enables volunteers to quickly test phosphate and nitrate levels and observe things such as vegetation cover, sediment levels, or algal blooms, which provide evidence of eutrophication. The data is uploaded to the FreshWater Watch website to give a snapshot of river health, which can be used by water companies, the Environment Agency and others, to direct future mitigation and conservation efforts.

This methodology has formed the basis for numerous WaterBlitz events, supported by River Trusts and water companies. WaterBlitz events on the River Thames typically run for 24-48 hours and attract 150-250 participants. Data uploaded to the FreshWater Watch online database is pinpointed on a map and volunteers get feedback based on what they observed, such as if the water body has unusually high phosphate concentrations and low sediment, etc.

The information is also accessible via the FreshWater Links website, developed by Earthwatch with funding from Thames Water, which collates data from a range of citizen science projects in the catchment run by organisations such as the FreshWater Habitats Trust and the London Wildlife Trust.

Two-week WaterBlitz events run by Bristol Avon Rivers Trust in 2016, 2017 and 2018 also proved popular and had benefits for both Wessex Water and the Environment Agency.

Zoe Hancock, catchment coordinator for the Bristol Avon Catchment Partnership, who set up the initial campaign, says: "The Environment Agency is cutting down the number of rivers and streams it monitors across the catchment as a result of government spending cuts, which means you get local community members visiting water courses that may not have been seen for ages by the agency or the water company – it can be a very useful tool."

from outfalls. This is a key indicator for misconnections and once they have spotted one, they score them based on various visual criteria in a mobile app. The data is fed to misconnection teams who then work with local authorities and householders to resolve them.

Outfall safaris were originally developed by the Zoological Society of London (ZSL) and South East Rivers Trust and a guide on how to run them has been published by Catchment-Based Approach, the organisation set up by Defra to involve local communities in decision making.

Outfall safari campaigns involving Thames Water started on the River Crane and have since expanded to the Ravensbourne, Ingrebourne, Pinn, Hogsmill and Brent, with a total 142km of river assessed to date.

Yvette de Garis, head of environmental regulation at Thames Water, says: "Outfall safaris on the River Brent helped improve the river by a full status class under the Water Framework Directive. It is a hugely significant activity, so significant that Thames Water has moved from supporting it through its Community Investment Fund, as a form of corporate social responsibility, to funding it as part of the operational business."

Outfall safari work supported by a team including Severn Trent in 2017 focused on the urban parts of the Alfreton Brook and Oakerthorpe Brook catchments in Derbyshire. Volunteers photographed 101 outfalls and categorised them based on criteria such as visual discolouration, evidence of sewerage fungus and sewerage rag, odour and impacts downstream.

The resulting datasets and online maps revealed that more than 25 per cent of outfalls were bringing some form of pollution into water courses. Severn Trent followed up the three serious 'red' outfalls identified and its consultants and researchers use the dataset to complement other studies.

Categorising outfalls based on simple metrics can help utilities better target their ongoing research activities and there can be major soft benefits in terms of community engagement.

Volunteers look for polluted discharge from outfalls (Pictures: ZSL)

> **We provide the local community contacts needed to get locals involved in solving the problem. If the community has helped identify issues, that is halfway towards getting them to fix it**
>
> Michelle Walker, head of GIS and data management, The Rivers Trust

Michelle Walker, head of GIS and data management at The Rivers Trust, who coordinated the project under Catchment-Based Approach, says: "We provide the local community contacts needed to get locals involved in solving the problem. If the community has helped identify issues, that is halfway towards getting them to fix it. It is part of a wider drive to get householders involved in sustainable urban drainage systems (SUDs) and rainwater harvesting to prevent surface runoff, which is causing sewer flooding."

Citizen science initiatives can encourage individuals to be more responsible with their water use and how they use the sewer system, discouraging them from disposing of products inappropriately. "Those messages land much more effectively on a community that is already interested in their river and involved in these voluntary groups because they feel they have a stake in it," says de Garis.

Water regulator Ofwat has been pushing for water companies to increase local community engagement, but in the realm of citizen science, focusing on that aspect alone can be detrimental – research must be followed up with feedback to ensure that participants are able to see the benefits. Loiselle comments: "If people feel that their 15 minutes spent doing the sampling was well spent and that someone is going to use the data as part of a programme, they are much more likely to participate again in future. A lot of utilities are jumping on the bandwagon wanting to show they are interested in the environment, but it needs to be part of an ongoing programme."

Fake science?

Citizen science has evolved to become a proven tool for public engagement with the ability to generate large-scale datasets, but questions remain over the usefulness and authenticity of the data and its potential to supplement and support established and legally robust environmental monitoring efforts.

Water utilities have typically found the data useful as a coarse screening technique, to identify problem areas for more detailed analysis, but not as part of their regular programme of detailed research.

"People need to be very clear about their expectations with data collected in this way; it is never going to be as good

as a rigorous academic institution doing detailed samples and taking them back to a lab using accredited techniques for analysis," says Walker.

However, this may change in future as citizen science becomes more widespread. Loiselle points out that data in FreshWater Watch is validated through various checks and balances. Each data point goes through an online filter, if it is "completely inconsistent" with what is expected or with previous measurements by the individual, they receive an instant text message asking if they are sure the reading is accurate. Earthwatch employees also carry out weekly checks on the database.

"Quality control is done prior to sampling to ensure that all methods function, it's our name on the package, we have to guarantee measurements can be trusted in the correct conditions," says Loiselle.

Recent research carried out by Earthwatch in collaboration with researchers from Bath Spa University and Lancaster University found that sampling under FreshWater Watch has clear potential to complement monitoring efforts by the Environment Agency by generating information on freshwater ecosystems, such as small or still water bodies, that would otherwise be under-reported.

Greater support for citizen science as a trusted research tool could help water companies widen their data monitoring and analysis and ensure that communities are more deeply invested in the quality and resilience of local water systems.

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Powering a better customer experience

Richard Billington, CTO of *MatsSoft*, introduces a new way for IT leaders to accelerate customer experience innovation

Is 2019 the year utilities finally deliver on customer experience (CX) promises? Early indicators suggest so. According to Capgemini, the big six have all committed to delivering more personalised, customer-centric services this year[1]. Meanwhile, a recent survey by *Utility Week* has revealed that improved customer engagement is now the number one target for digital disruptors in the energy sector[2].

But committing to change and delivering change are two very different things. And transforming CX demands a solution to an age-old problem – balancing the need for rapid innovation with pressing operational demands.

That's why customer-obsessed businesses such as Network Rail and Nationwide are taking a new approach to CX innovation. They're homing in on the root cause of almost every major CX problem – bad processes – and enabling customer experts to take a much bigger role in solving them.

Low-code platforms sit at the heart of this approach. These easy-to-use tools allow front office teams to take the lead on development. Business users with no coding experience can build solutions themselves, with IT only getting involved to supervise.

As a result, everyone wins. IT has more time to focus on its considerable workload, while customer-facing teams can proactively solve the chronic issues that are slowing them down. All the while, costs fall and the customer experience improves, fast.

This is a new type of CX transformation initiative. One that's collaborative, pragmatic and led from the ground up.

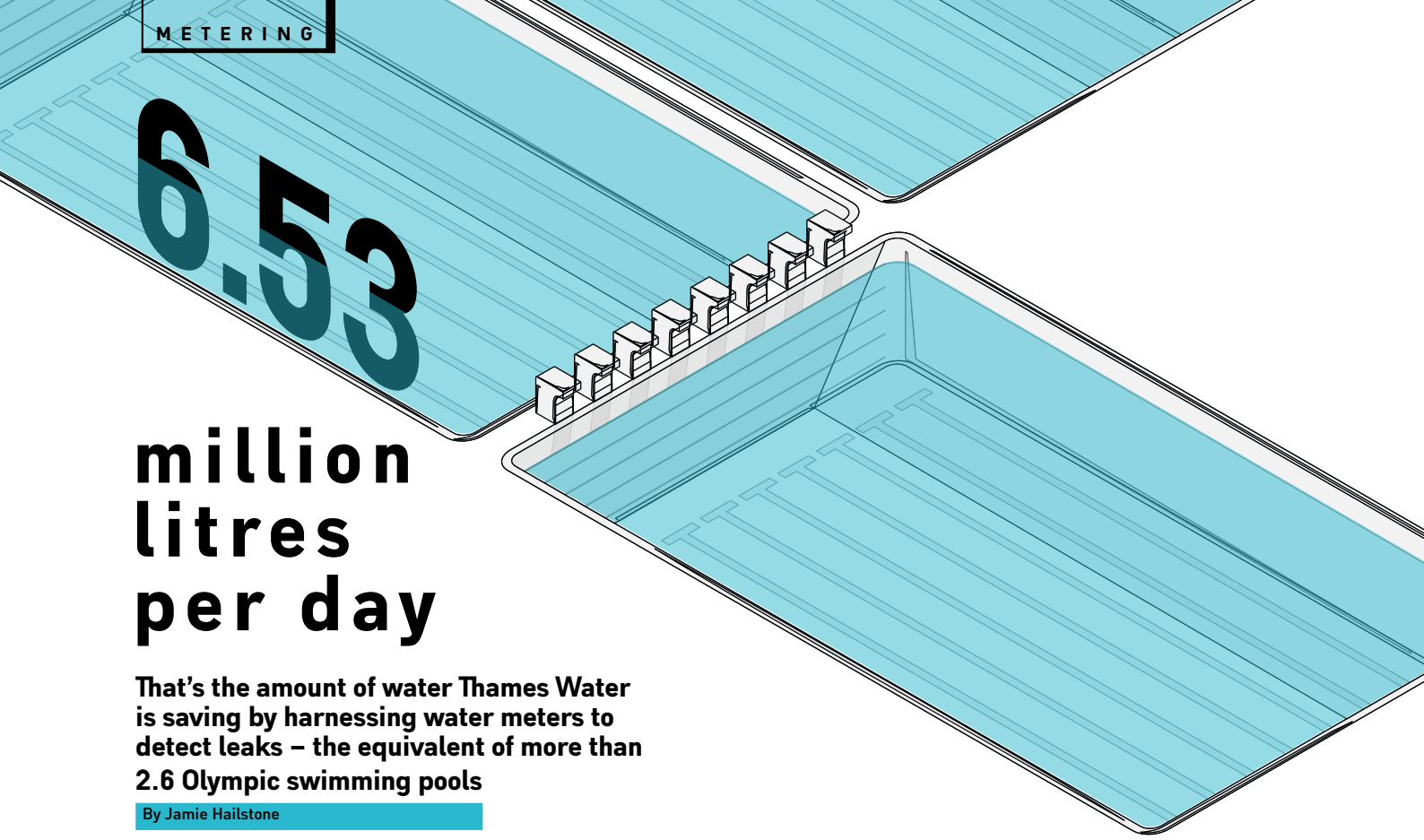
We've invited some of the IT leaders pioneering this approach to tell their story at our breakfast briefing, A Faster Way to Improve CX. Join us on 28 March 2019 at 30 St Mary Axe (The Gherkin) to see what they have to say.

2019 may not see every utility realise its CX vision, but one thing's becoming clear – the CX arms race has started.

Come and meet some of the businesses that are ahead of the pack.

Book your ticket for A Faster Way to Improve CX. Visit https://engage.matssoft.com/fasterCX.html

1. Capgemini, "2019 predictions: Utilities", 2019
2. *Utility Week*, "Understanding Digital Transformation in UK Utilities", 2018



6.53 million litres per day

That's the amount of water Thames Water is saving by harnessing water meters to detect leaks – the equivalent of more than 2.6 Olympic swimming pools

By Jamie Hailstone

While the rollout of energy smart meters continues to make headlines for all the wrong reasons, water smart meters have proved to be far less controversial.

Admittedly, the smart water meter revolution is still in its infancy, with a small number of water companies trialling and rolling out the technology in relatively small numbers. These are mostly by water companies in the water-stressed areas of the South and East.

But as homes and businesses move towards smart systems and the Internet of Things, smart water meters could play a much wider role in all our lives.

According to Thames Water's recent interim results report, it had 265,000 smart water meters transmitting across its network by the end of September 2018, although with more being installed on a daily basis, the figure is rising all the time.

Like many of the other smart water meters currently being trialled, the devices being installed by Thames Water take hourly, automatic readings and send them to the utility firm via radio waves.

"With our meters providing accurate and up-to-date data on water use, higher or unusual readings can be investigated quickly, allowing us to pinpoint leaks on customers' pipes and, in most cases, offer to fix them free," says Thames Water's metering manager, Stephanie Baker.

"We've already proactively contacted almost 8,000 customers about leaks on their pipes, identified using smart meter data, with the repairs preventing 6.53 million litres of water being lost each day."

Anglian Water has also been trialling smart water meters in Colchester, Newmarket and Norwich since 2016.

"Our trials have allowed customers to access near real-time consumption data through an online portal, encouraging them to reduce their water use," says an Anglian Water spokesman.

"This has been supported by a dedicated smart leakage function that alerts customers to internal pipe leaks, helping to save water and reduce the likelihood of unexpected bills.

"We have seen an average reduction in daily consumption of more than 11 per cent across the board, with Newmarket alone saving around 250,000 litres per day, of which 22.5 litres/per person/per day come from plumbing repairs. We are really pleased with the progress of the trials so far and we are confident that the positive trend of results will continue."

Unlike energy and gas companies, there are no set national targets for smart water metering and ministers have not given any direction as to the kind of meter that should be installed.

A report published in April last year by the National Infrastructure Commission (NIC) did highlight the benefits that such devices could bring. In particular, the report claimed smart water meters could help reduce consumption by 17 per cent and could also play a "key role" in identifying leaks across the system.

"We've urged the government to enable companies beyond water-stressed areas to implement compulsory metering and require all companies to consider the

265,000

smart water meters operating across Thames Water's region by the end of September 2018

systematic rollout of smart meters by 2030," a Commission spokesperson tells *Flex*.

"This should be the first step in a concerted campaign to improve our country's water efficiency."

And the Consumer Council for Water's senior policy manager, Karen Gibbs, says it is "clear" that some of the more sophisticated smart meters being developed have the "potential to deliver additional benefits for consumers and companies".

"However, the potential benefits of smart meters can only ever be fully realised if customers are given clear, useful and accessible billing information and support," says Gibbs.

"That must include helping customers to understand the 'bigger picture' and why their water use matters. We are not experts on the technology behind smart meters, but we do know that some people have reservations about metering in general, which need to be understood and sympathetically addressed. That's why we will continue to press companies to consult their customers at every stage and make sure they provide all the support they need during any transition to metering."

Another issue is the amount of variation among the various smart water meters currently being tested.

"There is no uniform standard of meter being rolled out across the industry," explains Terry Noble, a consultant in the energy and utilities practice at Odgers Interim.

"Many so-called smart water meters offer data transfer rates on a daily basis, which is a far cry from the real-time data transfer speeds required to be a truly smart device," he adds. It means that many early stage projects require upgrades to their two-way communication so that they can deliver more frequent readings. Increased collaboration between water companies and the introduction of an industry standard will go a long way to remedying the current disparities in smart networks.

"However, the potential of these devices is huge," says Noble.

17% the amount by which smart meters could reduce water consumption, according to the NIC

"Improvements to data networks and data transfer capacity, coupled with AI and machine learning technologies, means that smart water meters will become a critical component in ensuring the long-term resilience of the nation's water usage.

"For this to happen, water companies will need to overcome the same technological hurdles the energy sector has battled for the past ten years." The expectation that more advanced meters will come along is one of the reasons why companies where water is in more abundant supply are biding their time.

In terms of how smart water meters may develop in the future, Andy Rowland, the technical lead in flooding and drainage at the engineering firm WSP, predicts they could be integrated with other sensors to measure pressure, water quality or acoustic leakage detection.

"Combining remote data collection technology with domestic customer metering would be hugely helpful in understanding and reporting network incidents, network performance and advising network improvement investment," adds Rowland.

Going forward, the importance of data, particularly with the Internet of Things, cannot be underestimated. Jo Lamont, a senior analyst at AI specialist Cambridge Consultants, says the smart meters of the future will carry out more analysis before data is sent to their respective utility firms.

"As we potentially move towards retail competition for all water users, it will be more important for this analysis to offer added value above what is currently done, as customer expectation of service will increase and water retailers will need to be able to react to this," she says.

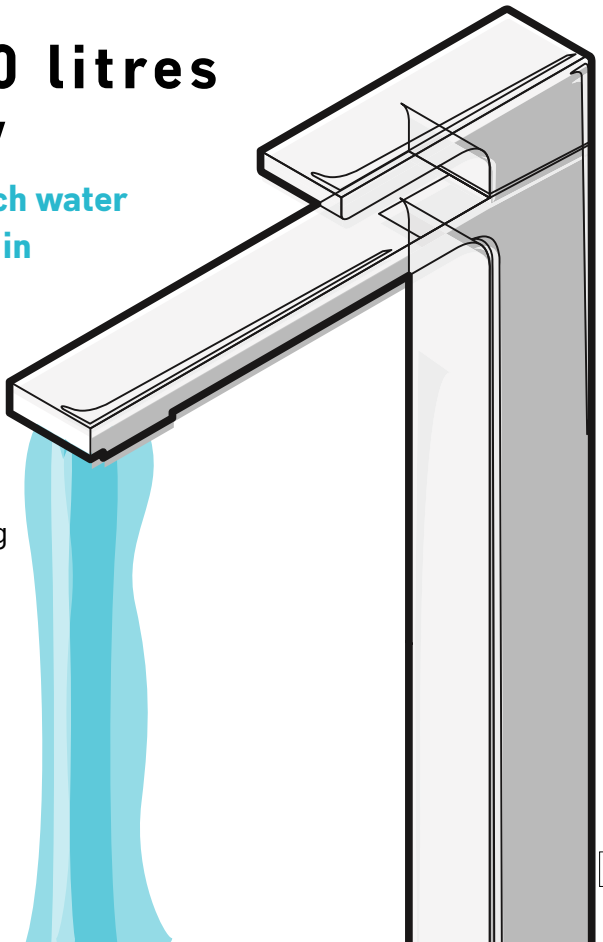
"You can learn a lot about a person from how they use their water and protection of personal data will be a big driver for how this technology and the related services evolve in the future. Through the use of artificial intelligence, smart meters will allow a higher level of granular data to be captured, making it much clearer to the consumer as to where water is being used."

It is still early days for smart water metering. Clearly, a lot of work will have to be done to improve the technology and create a more uniform system. The water industry will also have to tread carefully to avoid some of the mistakes made in the rollout of energy smart meters – but, if successful, these devices could play an important role in improving leakage and restoring the trust of customers.

250,000 litres per day

That's how much water is being saved in Newmarket as part of smart water meter trials by Anglian Water

– equal to leaving the average household tap running for the whole month of February



Take five

Innovations to lend a helping hand to those who most need it

By Jamie Hailstone

Technology and innovation are buzzwords normally associated with the young and upwardly mobile, but they can also play a key role in improving the lives of older or more vulnerable people.

The advent of smart technology and the Internet of Things also comes at a time when utility firms are under renewed pressure to engage with harder-to-reach groups, make them aware of the help that is available and ensure customers do not languish unnecessarily on higher tariffs.

Alex Neill, managing director of home products and services at consumer group Which?, says "basic customer service can be sadly lacking among energy suppliers".

"It's clear that energy companies could be doing much more to ensure customers – especially those who are older or vulnerable – can easily engage with their supplier and that they are well informed about their eligibility for schemes such as the Warm Home Discount and Priority Services Register (PSR)," she says.

Ofgem's 2018 *State of the Energy Market* report, which was published in October, revealed six million electricity customers are on the PSR, up by more than a third (36 per cent) on the previous year (4.4 million).

The report also showed the equivalent figure for gas is 4.8 million, up by 30 per cent since the previous year (3.7 million).

The Ofgem report was followed by a study by water watchdog the Consumer Council for Water (CCWater), which found nearly 345,000 water customers are currently registered for extra help on the PSR, up 37 per cent since 2013/14.

But the CCWater report was also critical of the level of support that many water companies gave when freezing temperatures disrupted supplies last year during the "Beast from the East" and it called on the sector to improve support for customers who need extra help due to unexpected events.

"The failures we saw during the Beast from the East exposed the fact that many customers in vulnerable circumstances remain at risk of not getting additional support when they need it most," says CCWater policy manager Janine Shackleton.

"It's imperative water companies focus on raising awareness of the support available and collaborate with others – including local councils, charities, community groups and emergency services – to make sure more people are aware of what help exists should they ever need it."

But there are several other projects and innovations currently being used and developed by energy and water companies. Here are some of the best...

1 The Howz home monitoring system

EDF Energy and tech start-up Howz

A new home monitoring system that allows family and friends to check the energy usage of elderly or vulnerable customers.

The Howz system monitors how much energy is being used by home appliances and combines this with information from a series of sensors that detect factors such as movement and temperature in a person's home to build up a pattern of daily behaviour.

Using a smartphone app, customers can check in on their family or friends and will receive alerts if the user's normal routine is broken.

"In working with Howz, we have developed a truly transformative solution that establishes users' everyday energy routines so that their families can stay connected with them, wherever they are, and be alerted if something doesn't seem quite right," says EDF Energy's managing director for customers, Béatrice Bigois.

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2

PSR data sharing

United Utilities and Electricity North West

For the first time in the UK, an energy company and a water company are operating a single vulnerable customer database.

The utility companies started sharing new Priority Services Register (PSR) customer data during a 12-week trial period in February 2017, during which 1,500 customers' details were exchanged. Of those, 395 proved to be new registrations.

The agreement remained in place after the trial ended in April and United Utilities' priority services lead, Amanda Phillips, says the two companies are sharing the details of around 200 customers a month.

"It was really a two-way project, that worked really well both for companies and for customers in the region," adds Phillips. "At the end of the trial, it was a no-brainer to continue. It's a great project in the North West and customers have really benefited from registering once and getting cover for both water and electricity."

Electricity North West also has a partnership arrangement in place with the North West gas network operator, Cadent, which provides it with PSR referrals.

3

Big data mapping

Welsh Water

The not-for-profit water company has been using big data to map the area of Rhondda Fach in order to promote social tariffs and ways to help customers.

The data mapping is part of the Rhondda Fach Water Resilient Community project that was set up in January 2018 to help one of the most deprived areas in Wales.

"The work involved collaborative working with the public and third sector as well as customers and community groups, and use of 'big data' for the area (10,000 properties) and overlaying it with our own data to create a picture – looking at income, deprivation, employment and other areas," says a company spokesman.

"We have seen great benefits from the community since we launched this project a year ago – including helping customers save £120,000 in lower bills, carrying out lessons for 2,000 children across the area, and awarding £13,000 to community groups through the Welsh Water Community Fund. This has helped us create a lasting legacy in the area long after we have completed our investment work," adds the spokesman.

4

Website redesign

UK Power Networks

Following consultation with disability groups, UK Power Networks has redesigned its website to make it easier to use for vulnerable customers.

The energy firm worked in partnership with leading digital access charity AbilityNet to test the new website's design and accessibility.

Customers who were visually impaired, physically disabled, deaf or hard-of-hearing all gave detailed feedback and at one stage a sample of more than 500 people were surveyed.

The team worked to make sure the website was suitable for every type of disability and kept improving the design until users consistently rated it nine out of ten. Only then was it relaunched to the public.

"We are delighted that customers find they can easily access our services and find peace of mind. The new website pages are proving very successful and particularly important to help customers sign up to our Priority Services Register," says customer vulnerability manager Kerry Potter.

5

Sign language

Thames Water

Thames Water is piloting a scheme that will see some of its team learn sign language.

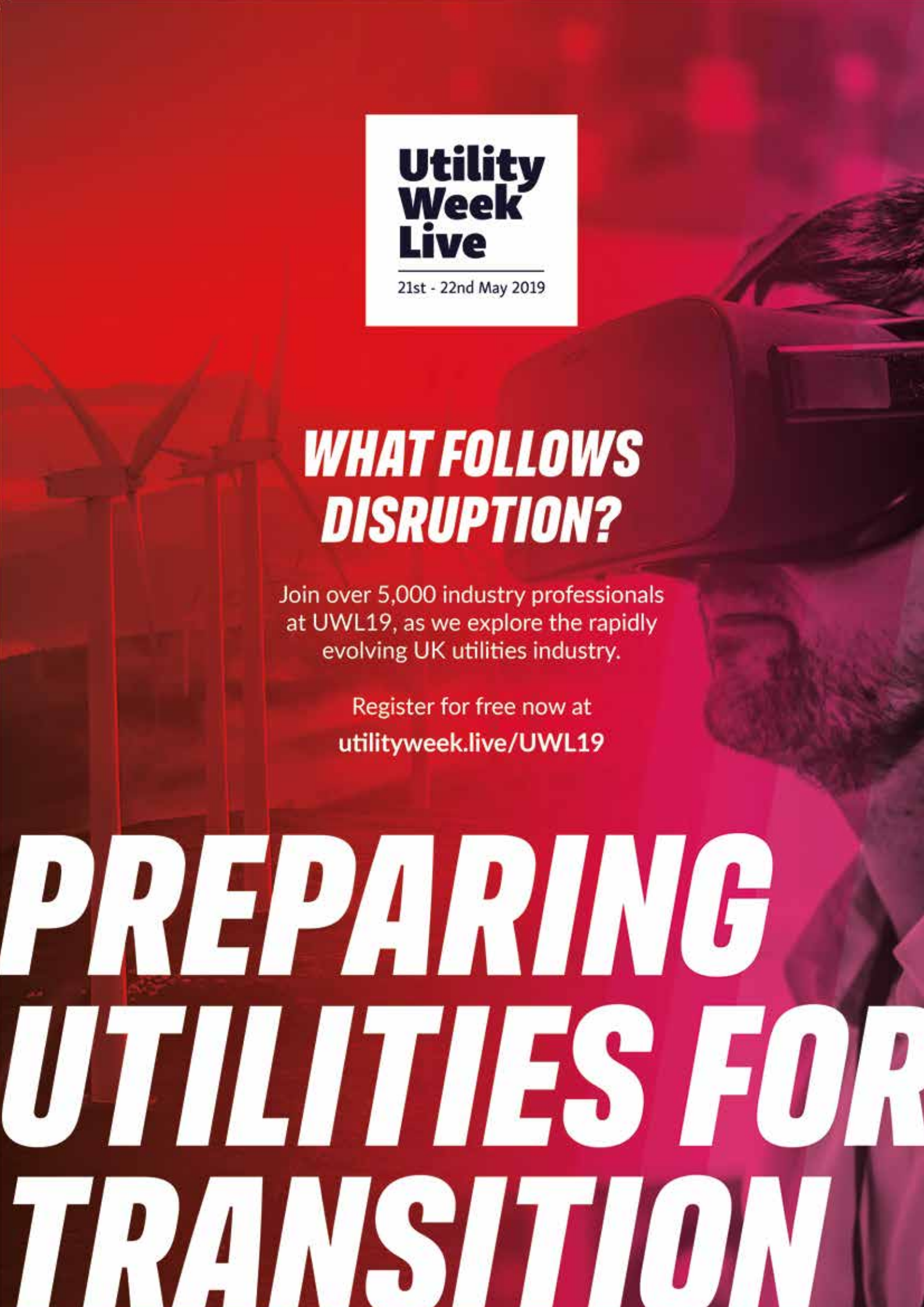
The pilot aims to see staff trained so they can visit deaf or hard-of-hearing customers at their home to provide support on a range of matters, from understanding their bill to resolving operational issues.

They will also be able to find out if there is anything else that can be done to help improve the service received from Thames Water.

One customer service representative is currently taking lessons at a local college, with more expected to start the course this year.

"We have lots of opportunities to communicate with our customers and having a range of options is very important," says Thames Water's Paul Day.

"We would urge anyone with hearing difficulties to sign up to our Priority Services Register so we can ensure they get all the support they need from our team."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