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Climate control

Datacentres are potential victims of and contributors to climate change - action is needed on both fronts
Research explores the economic benefits of local full-fibre and 5G
The benefits of 5G are not expected to be felt uniformly across the UK, with research commissioned by the Broadband Stakeholders Group suggesting location-specific factors will dictate how much areas gain from having access to the technology. The research, carried out by consultancy Oxera, draws on existing empirical studies and reports on the impact of full-fibre and 5G connectivity.

Male coding salaries overtake female earnings, according to data
Many firms are starting female junior coders off on a higher salary than male coders at the same level, but men go on to earn more as their career progresses, according to data from Makers Academy. Since it began in 2012, Makers Academy has trained more than 1,800 software engineers, 35% of whom are women, and works with companies to place those with newly developed coding skills into relevant roles.

Dutch banks to work together in fight against money laundering
Five major Dutch banks will work together to improve their ability to spot suspicious transaction activity as they fight money laundering. According to the Dutch banking association Nederlandse Vereniging van Banken, ABN Amro, ING, Rabobank, Triodos Bank and Volksbank are to set up an organisation that will monitor their combined transactions to spot money laundering.

Facebook generates pages for Islamic State and Al-Qaeda
Facebook is automatically generating pages for terrorist groups, including Islamic State and Al-Qaeda, a whistleblower claims. A report by the whistleblower released through the National Whistleblower Centre has identified in excess of 200 auto-generated pages for Islamic State and dozens of pages for other terrorist groups including Al-Qaeda and Ansar Al-Sharia.

Smart meter roll-out delayed until 2024
The deadline for every home in the country to be offered an upgraded smart gas and electricity meter through the government’s troubled Smart Meter Programme is to be put back by four years to the end of 2024, but the government has insisted its targets are still being met. The national roll-out of smart meters was central to the delivery of a smart and sustainable energy system as an element of the UK’s net zero carbon emissions target.
Rural connectivity struggling to keep up with demand

The last five years have seen significant improvements in access to fit-for-purpose broadband and 4G mobile services in rural areas of the UK, but increasing demand for digital services means rural networks are struggling to keep up.

Oracle Open World 2019: Ellison has ‘fully autonomous cloud’ goal

Oracle chief technology officer and founder Larry Ellison said a “fully autonomous cloud” that will eliminate human labour is now Oracle’s main goal, during his first keynote address at Oracle Open World 2019 in San Francisco.

Government relaunches search for chief digital and information officer

The search for a government chief digital and information officer has been relaunched. The role has increased in seniority, with more weight and authority added to the permanent secretary-level post.

Network Rail to use automation and analytics in tunnel examinations

Network Rail will invest up to £3m in two innovation competitions aimed at improving the examination of rail tunnels and station security with data analytics and automation, forming part of Network Rail’s research and development spending plans.

Universities tempting targets for cyber criminals, warns NCSC

As global centres of learning, research and innovation, and key contributors to the economy, UK universities hold a treasure trove of personal and research data, intellectual property and other data assets that make them a target for attacks by cyber criminals.

WannaCry variants accidentally protecting against WannaCry

More than two years after the first global WannaCry outbreak took down a number of NHS trusts in what was later described as a borderline national emergency, detections of the ransomware remain in the millions.
Breach of Ecuador citizens' personal data holds key privacy lessons for enterprises

The mass breach of Ecuadorian citizens' data has potentially alarming consequences, with the risk of long-standing privacy issues – so what caused the leak to happen and what can businesses learn from it? Alex Scroxton reports

With a population of 16.6 million, the chances are good that if you are a citizen of Ecuador, some data relating to you has just been disclosed in a data breach that includes more than 20 million entries.

While far from top of mind for most British residents, the potential impact of the now-patched breach rivals many far larger leaks because of the sheer variety of personally identifiable information it contains, such as government identification numbers, employment records, banking details and car-ownership information.

Initially disclosed to US website ZDNet, the breach was exposed thanks to the work of vpnMentor researchers Noam Rotem and Ran Locar, who discovered a vulnerability on an unsecured Amazon Web Services (AWS) server that appeared to be owned by Novaestrat, an Ecuadorian data analytics and marketing consultancy.

People in the database can be identified by a 10-digit code referred to as “cédula” or “cédula_ruc” – corresponding to Ecuador’s 10-digit “cédula de identidad”, a national ID number similar to National Insurance in the UK.

The researchers found these numbers were linked to information such as name, gender, date and place of birth, addresses, phone numbers, emails, and marital status, among other things. Rotem and Locar were also able to uncover financial information on accounts held at Biess, Ecuador’s national bank, employment information including tax and salary details, and car makes, models, and licence plates, all linked through the cédula codes.

“It’s not just the number of people affected in this leak that concerns me – it’s the extent of data tied to each individual,” said Oz Alashe, CEO of cyber security analytics platform CybSafe.

“Access to details in this database would open the floodgates for account takeover identity theft, SIM swapping, spear phishing and a number of other attack vectors,” he said. “With the exception of banking details, the data here represents a jackpot for cyber criminals; the possibilities for malicious activity are pretty much endless.”
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LONG-LASTING PRIVACY ISSUES

Although the breach has been closed since 11 September, vpn-Mentor said the result could be “long-lasting privacy issues” for virtually everybody in Ecuador, exposing them to a wide range of online and offline security threats, including email scams and phishing attempts, identity theft, financial fraud and even car theft.

Beyond this, Rotem and Locar said the breach would have implications for those companies whose employees’ details were disclosed, putting them at risk of fraud or even industrial espionage by unscrupulous rivals. They said that even though the data is already exposed and may be in the hands of bad actors, it was still worth implementing more thorough cyber security measures.

Chris Morales, head of security analytics at Vectra, said the breach raised questions over how and to what purpose Novaestrat had collected it.

“Why is that level of personal data from a government given to a marketing analytics company? What purpose does it serve? The number one rule of data protection is to not have the data – especially when it’s private data a government has shared with a third-party private company. That in itself is a bit scary,” he said.

“Furthermore, the exposure of this data isn’t much different than what was leaked by Equifax, showing that we haven’t
learned from previous breaches, as this information was all in a searchable, online database that anyone can use.”

**Risk in the cloud**

More widely, Morales highlighted the fact that the server vulnerability uncovered in this case, which was found in a **misconfigured** **AWS S3 bucket**, is a very common one.

“We know that poorly configured servers in AWS is something many administrators struggle with understanding, including how to properly limit access to the data they store there,” he said. “This is not even about company size or maturity. **Elasticsearch databases in AWS** are known to be publicly accessible, and as this is a common setup, it’s important that organisations work with their partners to ensure their data is secure.”

Morales said that while the ability to do instant provisioning and scale were valuable benefits to using the cloud, administrators needed to take time to understand why and how to put in place appropriate access controls to protect their data.

“As no system or person is ever perfect, the ability to detect and respond to unauthorised or malicious access to platform or infrastructure cloud services can make the difference between a contained security incident and a full-blown breach of the magnitude that these Ecuadorian citizens are now facing,” he said.

CybSafe’s Alasha added: “The moral of the story here is to keep a close eye on your cloud database instances and to make absolutely sure that public access is disabled. This looks like it was totally avoidable. Organisations have to be vigilant about where their sensitive data is stored.”

David Higgins, EMEA technical director at CyberArk, said Ecuador was clearly not alone in moving citizen data and critical applications into the cloud. However, he said, when going down this route, enterprises and government organisations alike need to be aware that their cloud providers will only provide security up to a point.

“**Around half of global organisations don’t have a strategy in place for securing privileged data and assets in the cloud**”

**David Higgins, CyberArk**

“Public cloud providers supply straightforward guidance on their shared responsibility models for [security and compliance in cloud environments](#),” he said. “However, many organisations ignore this; around half of global organisations don’t have a strategy in place for securing privileged data and assets in the cloud. This represents an open door for anyone who might wish to access them.”

Ed Williams, TrustWave’s SpiderLabs EMEA director, said he continued to see businesses bypassing critical security controls and foregoing the kind of due-diligence they would normally
enact with data housed on-premise, thanks to their enthusiasm for going all in on the cloud.

“When transitioning to the cloud, we would recommend appropriate steps to ensure data is held securely and follows best practice recommendations – in this instance, ensuring that cloud buckets have appropriate permissions applied to them,” said Williams.

“Additionally, regular scanning and monitoring to quickly pinpoint misconfigurations or potential malicious activity, along with vulnerability management to ensure new patches are quickly adopted, are also encouraged.”

**Lack of awareness**

Ezat Dayeh, systems engineer manager for the UK and Ireland at Cohesity, lamented that some very simple messaging around cyber security messages is apparently not getting through.

“This lack of awareness is what causes situations like the one in Ecuador, and organisations that use increasingly sprawling and complex infrastructure will continue to be caught out if they’re not adequately assessing that infrastructure,” he said.

“Scanning systems, including backup data, for exposures, permissions and configurations issues, as well as other vulnerabilities, must form a key pillar of any organisation’s data protection strategy.

“When it comes to data management and processing in big government, there is work to be done. The reality between what should be done and what is happening is significant,” concluded Dayeh.”
Tech leaders need to source skills and learn to speak up about the voice channel

Voice assistants represent the next frontier for businesses to create a seamless customer experience, but it’s clear that a range of new skills will be needed to move beyond pilot projects to a true voice channel. Cliff Saran reports

Businesses are seeing the benefits of voice assistants and chatbots to provide new ways to engage with customers, according to research from Capgemini.

More than three-quarters of businesses (76%) said they had realised quantifiable benefits from voice or chat assistant initiatives, and 58% said those benefits had met or exceeded their expectations. Benefits included a reduction of more than 20% in customer service costs, and an increase of over 20% in the number of consumers using digital assistants.

The report, Smart talk: How organisations and consumers are embracing voice and chat assistants, was based on a survey of 12,000 consumers. It forecast that by 2022, customers will increasingly prefer to use voice assistants across the consumer journey.

Capgemini found that almost three-quarters of consumers (74%) said they used conversational assistants for researching or buying products and services. But although a large majority of organisations (74%) said conversational assistants were key enablers of their business and customer engagement strategies, the importance attached to this concept is not yet reflected in deployment levels.

Steve Hewett, global lead for retail customer engagement at Capgemini, said: “We started doing research into conversational commerce in 2017. It will be the next major channel in retailing and service business for consumer engagement.”

Learning to talk

According to Hewett, voice assistants such as Alexa from Amazon, Google Assistant, Microsoft Cortana and Apple’s Siri offer businesses a key link between human-based customer support and digital commerce platforms.

Hewett said the study found that companies were mainly playing around with voice technology to prove the concept. The challenge companies face in production environments is how voice assistants can be integrated with their technical infrastructure.
For example, said Hewett, the support infrastructure is not yet there to enable a customer to ask something such as: “Hey Waitrose, what did I order last time I shopped? Can I order this item again?”

Another issue for organisations is that there is very little understanding of how to develop a seamless voice-based user interface. “Humans have talked forever, but most professionals have built things for a screen,” he said. “There is a skills gap.”

Hewett believes user interface designers will need to rethink their approach to creating new experiences for the voice channel as the technology is not there yet there to enable the voice assistant to fully engage in a conversation.

However, Google’s artificial intelligence (AI) chatbot Duplex has shown that it is entirely possible to use a voice assistant to make a restaurant reservation on behalf of the user.

In a blog posted in March, Scott Huffman, vice-president of engineering for Google Assistant, wrote: “All it takes is a few seconds to tell your Assistant where you’d like to go. Just ask the Assistant on your phone: ‘Book a table for four people at [restaurant name] tomorrow night’. The Assistant will then call the restaurant to see if it can accommodate your request. Once your reservation is successfully made, you will receive a notification on your phone, an email update and a calendar invite so you don’t forget.”

In effect, Google Duplex demonstrates how a piece of technology could be used in the future to trigger a call and interact with a human.
Hewett said such technology may one day find its way into the call centre, where a voice assistant is used when people request a call back. “Voice assistants will also create a much more fluid interactive voice response system in the call centre,” he said. “In the customer service arena, it will be able to achieve the business goal of being able to handle lower tasks that are less complex.”

For instance, at the end of 2016, Santander introduced a service in the UK to enable its customers to use voice assistants to make payments.

“In customer service, voice assistants will be able to achieve the business goal of handling tasks that are less complex”

Steve Hewett, Capgemini

Stan Sthanunathan, executive vice-president at Unilever, said: “The biggest experience we've had is to not look at conversational interfaces as a cure for all the problems you have, but instead to use them to augment human intelligence. This makes human intelligence a lot more productive.

“Voice assistants or chatbots can communicate with multiple people simultaneously. They therefore help in reducing the amount of stress and strain on our human agents who are responding. These interfaces eliminate between 20% and 30% of issues reaching the human agents because they are answered then and there. Even when the issue is guided to a human being, it is a lot more purposeful.”

Rising in retail

Capgemini’s study found that retailers are playing with voice and automating messaging using chatbots that integrate into their e-commerce platforms, with Hewett saying: “There is not a business out there that does not believe voice will be an important channel.”

In the report, Matt Kelleher, online director at Morrisons, explained the significance of voice assistants in retail. “It is important to follow this emerging trend and make Morrisons an easier and more accessible place to shop. It’s exciting that our customers can now shop without even needing to log in to a computer or mobile phone.”

The idea of using voice rather than a computer or smartphone enables people to multi-task. Capgemini found that in the automotive sector, manufacturers are using voice assistants to allow drivers to control the vehicle and access concierge-driven services.

In the report, Henrik Green, senior vice-president of research and development at Volvo Cars, said: “Soon, Volvo drivers will have direct access to thousands of in-car apps that make daily life easier and the connected in-car experience much more enjoyable for all.”
How Figleaves uncovers a data Eden

Online lingerie business that started out at the height of the dot com boom is now making use of advanced analytics to reveal data insights that will support its continued evolution. Cliff Saran reports.

Online lingerie company Figleaves is celebrating its 21st anniversary. Now owned by N Brown Group, the online retailer has, over the past few years, updated both its business and its technology stack.

It has moved away from an in-house-developed e-commerce platform and, from a business development perspective, Figleaves is actively growing its own brand of lingerie products. Becoming a data-driven business has become a key requirement as the company evolves.

Angus Jenkins heads up e-commerce at Figleaves. He joined the company two years ago as part of a drive to refresh its approach to technology to support a new business strategy.

“One of the big changes is that we’ve been building our own brand,” says Jenkins. “Instead of just being a retailer, our growth is in our brand. This means we need to occupy different types of digital marketing arenas and spend a lot more cash on social media and digital presence.”

**Time for change**

When Jenkins joined Figleaves, the technology it was using dated back to 1999, and the company was actively moving off
Figleaves sought to change its approach to data and reporting to get a consistent, trusted view across different emerging business processes. In the past, Figleaves relied on customer relationship management (CRM) and e-commerce platforms that it developed itself. But the world of e-commerce has moved on, and the company has been rethinking its approach.

“One of the things that occurred to us was that we were in a 21-year-old business,” says Jenkins. “This is a mindset shift. Over the years, we’ve seen a fundamental change in how businesses adopt and bring in third-party technologies.”

Figleaves took a strategic decision to stop supporting its in-house e-commerce platform and migrate instead to Salesforce Commerce Cloud. Jenkins says this had a knock-on effect on how the business operates, how it uses newer technology and what technology it develops in-house.

One of the areas it wanted to focus on was changing its approach to data and reporting to get a consistent, trusted view across different emerging business processes. In the past, the company’s data had been quite siloed, and it was a challenge to pull the right data sources together to make data-driven business decisions.

One of the drivers that led Figleaves to rework its data analytics was a blip in trading. “We saw trading changes and didn’t understand why,” says Jenkins.

It took the team three days to figure out that the blip was caused by competitive pricing on a particular product range. To understand competitive pricing on a subset of brands on Google, the analytics team needed to assemble the data manually.

Beyond competitive analysis, Jenkins sees metrics as fundamental to the development of the Figleaves brand digitally. “We spent quite a lot of time understanding how we could use YouTube instead of traditional TV advertising,” he says, adding that Figleaves wanted to correlate audience intent with platforms such as Facebook.

“Playing in wholesale means we think about stock and merchandising,” he says. “So we have to build these metrics into business models with rafts of data we didn’t have before.”

Meaningful data in one place
Figleaves has begun using Avora to obtain meaningful insight from the data it collects. The Avora machine learning augmented analytics platform gives Figleaves one set of reporting in a single system that lets different departments look at key areas, such as products, promotional activities, traffic, customer behaviour, stock availability, rate of sales and returns.
The company generates millions of bytes of session data each day and has more than 200 variants of size and colour for a single product, including its own range and numerous other brands. Avora provides reporting over granular data, such as stock availability, rate of sale, type of traffic, level of intent to purchase, and a slew of other data points.

Previously, this could only ever be seen from a macro perspective. As well as having all its data in one place and putting algorithms around it, Figleaves’ data analysts can now spend their time more strategically to better support the business.

Avora fits Figleaves’ strategy to buy off-the-shelf software. The platform provides 350 built-in integrations for ingesting data from external sources into its hybrid cloud database architecture. The pre-built connectors for ingesting data from common database platforms and social media sites means Figleaves does not have to maintain custom integration to connect to those sites.

The Avora software replaces the company’s data silos with a single data warehouse that provides a snapshot of the social media data feeds and a read-only view of Figleaves’ internal transactional systems. Jenkins hopes Avora will draw attention to discrepancies, detect anomalies and identify positive and negative changes in particular marketing campaigns. “If some parts are not performing very well, we can see what is not working,” he says.

Moving from data silos to a single data analytics platform will support Figleaves in its future plans. It no longer sees itself purely as an online lingerie retailer, and Jenkins hopes Avora will help the company make informed decisions on pricing based on what its competitors are doing, its stock position and its margins.
There really is nothing new in IT

Once a new technology becomes mainstream, the IT industry needs to find a new thing to sell to its customers. It’s been this way since IBM provided big metal boxes with integrated software and called it a mainframe. The recently introduced z15 is the latest version of this approach to IBM computing, with a single, highly integrated enterprise server to run application workloads.

But vertical integration relies on highly resilient, high-performance hardware and software systems, and these tend to come at a high cost. So the alternative is distributed computing, where workloads can be organised to run across farms of low-cost servers. These servers used to be physical, then they were virtualised, and now everyone in the industry talks about containers and using Kubernetes for container orchestration. Then there is the public cloud, which is providing a template to show IT departments how they can build internal IT as a service, which mimics the ease of provisioning of infrastructure, platform and software as a service (IaaS, PaaS and SaaS).

All these things are welcome additions to the IT toolbox. But enterprise IT is renowned for hoarding old tech – nothing ever really gets thrown away. Consider the legacy acronyms from the last few decades. Each promised to revolutionise the way software systems were developed. There was the common object request broker architecture (Corba) from the Object Management Group, service-oriented architecture (SOA) and enterprise service bus (ESB). Each offered an industry vision for another three-letter acronym – EAI, or enterprise application integration.

These days, EAI is often considered too complex and costly a programme to run. The gaps between business processes running on different IT systems is now addressed by digital transformation. And rather than re-keying, or cutting and pasting from one IT system to another, robotic process automation (RPA) does this re-keying under the control of a bot running a script.

What is fascinating is that the approaches taken for RPA are not dissimilar to how legacy green-screen systems used to get a shiny new Windows front end that re-keyed user input into a terminal session, or how online price comparison sites in the late 1990s screen-scraped pricing data. The z15 may be the latest incarnation of what IT people used to call the legacy “mainframe” system, but legacy is embedded everywhere in modern IT. The DNA inside SOA, ESB and even RPA have much in common with modern cloud architectures.

Cliff Saran, managing editor (technology)
By 2025, public blockchain will provide a core interoperable foundation for global decentralised identity management, according to research from Gartner.

In the Gartner 2019 CIO Agenda survey, 60% of CIOs said they expected some level of adoption of blockchain technologies in the next three years.

RV Raghu, a director of Isaca, the international professional association focused on IT governance, believes that since it offers a way to manage records without any central control, blockchain will find plenty of uses to support the always-connected nature of society.

“One of the simplest things that can be done is to identify what data is to be recorded for each transaction,” he says.
Raghu says that by using blockchain, all relevant details will be recorded for posterity, establishing an audit trail, which will withstand necessary scrutiny within the enterprise and from a regulatory perspective. “Add to this mix the fact that the data is encrypted and cannot be changed by any one entity, and an iron-clad forensic trail can be established with the right configuration of the blockchain,” he says.

The validation process ensures high integrity. Mike Yeomans, a research analyst at the Information Security Forum (ISF), says: “Validation depends on the distributed nature of the network, making a blockchain highly available and resilient. Provided just one node remains available, the blockchain continues to function and the ledger can be viewed by any stakeholder.”

**Real-world uses of blockchain**

Such “guarantees” of integrity and high availability make blockchain well suited for supply chains. For instance, Maersk and IBM have partnered on a blockchain platform that records and tracks shipping manifests across global supply chains. Volvo also uses a blockchain to track and verify ethical sourcing of rare earth minerals used in vehicle production.

Due to the global nature of Maersk’s trade, fraud and complex information management are considerable challenges. “By using a single, centralised ledger that is deemed immutable and is available to all authorised stakeholders, such obstacles are significantly reduced. Five of the world’s six largest shipping companies (and many smaller suppliers) now participate in Maersk’s blockchain platform,” says Yeomans.

The logistics company says its platform offers greater trust, transparency and collaboration across supply chains and helps promote global trade. The single, shared platform at Maersk is designed to streamline the supply chain and removes the need for endless spreadsheets and programmes, easing logistical administration and saving money.

“The distributed and consensus-driven approach to validating blocks protects against tampering or adding fraudulent transactions to the ledger,” says Yeomans. “Even if a node is compromised, attempts to falsify the digital ledger to conceal theft or cargo smuggling will be detected and prevented by the validation performed by other nodes, as they will reject fraudulent blocks.”

For Yeomans, using a blockchain to verify supply chain ethics also uses the blockchain’s transaction ledger, which is widely available and considered to be of high integrity. He says Volvo’s application of a blockchain makes use of the integrity and availability attributes that the technology offers to trace if products in its supply chain have been sourced from regions of conflict.
“Falsification of documents is commonplace in conflict regions, so blockchain makes that process far harder, while the transparent nature of the ledger makes tracking the often lengthy journey of shipments much easier,” says Yeomans. “Again, this greatly reduces overheads associated with information exchange and streamlines the process of looking to identify if items are being stolen from or falsely added to the supply chain.”

**Public sector blockchain**
In the public sector, blockchain technology has the potential to enable the construction of the digital self – the equivalent of a digital passport. **Richard Hunt**, founder of Turnkey Consulting, believes that once an individual has been through the process to prove their identity, this proof can be reused in other situations where identification is required.

“A digital identity would enable citizens to take back control of their data and their identity, choosing who to share this information with and, perhaps more importantly, who not to,” he says. “It would also allow individuals to both fully understand and capitalise on the value of their personal data.”

Gartner distinguished vice-president **David Furlonger** says governments are looking at ways blockchain can be deployed to improve efficiency.

Efficiency-based initiatives are founded on the idea that decentralised, multiparty transactions can be streamlined using blockchain to solve transactions. Government interests are mostly driven by their need to decrease friction in disconnected processes, interactions or transactions between a variety of
government organisations or involving the broader public/private ecosystems.

“The US states of Vermont and Delaware, as well as Dubai, have shown some of the most visible and ambitious efforts on the use of blockchain for organising government records,” says Furlonger.

**USES IN IT SECURITY**

Blockchain should be far harder to break, according to veteran cyber security expert, Eoin Keary.

“Given blockchain’s distributed ledger, if someone tries to alter the data, the system analyses the entire chain, compares each block of data in the chain and excludes any that do not match up, which prevents unauthorised changes,” he says.

This means it is possible to use blockchain to ensure the integrity of critical IT systems.

Keary believes blockchain could be used to manage DNS records such that unauthorised changes could be performed only by the domain owner. “DNS records would be immutable and distributed, making it nearly impossible to attack,” he says. “The attacker would need to attack all nodes due to blockchain’s distributed ledger.”

Another use in IT security relates to decentralised storage. Since data is not stored in a single place, but rather thousands of nodes, Keary believes this makes it very difficult for an intruder to harvest complete datasets.

For Ovum research director Maxine Holt, blockchain’s peer-to-peer (P2P) architecture and intrinsic security technologies including the encryption/hashing of data, redundant and immutable ledgers, robustness of data to compromised nodes, and use of hardware wallets and chip-level trusted execution environments – bring the potential to increase internet of things (IoT) security.

“These characteristics enable the development of networks of trusted devices, whether in private or public blockchain deployments,” she says.

In terms of IoT security, Keary says blockchain can be used in relation to threat and operational monitoring scenarios. “Using blockchain, devices can work together and agree what ‘normal’ looks like, and as a result, alert or lock devices which are behaving out of the boundaries of normality,” he says. “The beauty of blockchain is the fact that there is no central authority and thousands/millions of nodes collectively control and make decisions based on the blockchain integrity.”

According to Keary, the concept of an immutable ledger can be applied to asset management or data integrity and configuration controls such that history of asset profiles or integrity hashes for

**USING BLOCKCHAIN, DEVICES CAN WORK TOGETHER AND AGREE WHAT ‘NORMAL’ LOOKS LIKE, AND AS A RESULT, ALERT OR LOCK DEVICES WHICH ARE BEHAVING OUT OF THE BOUNDARIES OF NORMALITY”**

Eoin Keary, cyber security expert
software downloads can be stored in a blockchain. “The hashes for a given download or software installation can be compared to the hash stored in the blockchain to help ensure software is not compromised with malware,” he adds.

Keary says identity and access management (IAM) is also a candidate for blockchain. “A blockchain-based IAM solution would render it impossible for hackers to enter a network/system and leave in an undetected manner,” he says. “The attacker can no longer hide their tracks or tamper with access logs to erase records or their unwarranted access due to blockchain immutability.”

**Broken links**

While it offers many benefits, the industry has realised there is still much to be done before blockchain technology becomes mainstream. Almost exactly a year ago, in London, Dean Demellweek, digital innovation strategist at BNP Paribas, said that following the huge hype surrounding blockchain, the technology faced a “chasm to cross” if early pilots were to be applied to real-life business challenges.

The Barclays and Wave pilot of 2016, and more recent pilots at HSBC and ING, have illustrated the possibility of using blockchain for faster, cheaper and more secure transactions.

However, Gareth Lodge, financial services analyst at Celent, believes blockchain is still not properly understood. “It tends to get mixed up with a number of other things, most usually distributed ledger technology and cryptocurrencies,” he says. “As a result, some suppliers are being asked if their solution runs on blockchain. As one noted, ‘Not sure why they’re asking as they didn’t ask me last year if it was running on SQL’.”
Datacentres are without doubt the beating heart of our increasingly digital economy. For proof of that, one only has to look at the havoc and disruption caused when an outage results in a datacentre falling offline – even if it is only for a relatively short amount of time.

Such outages can be caused by operator error, power supply problems and defective hardware, but natural disasters and extreme weather events can also play a part.

And for this reason, there are concerns that datacentre operators and owners are not doing enough to prepare themselves for the havoc that climate change may cause to their facilities.

The Uptime Institute claims that many organisations are failing to take preventive steps to protect their datacentre facilities from being disrupted by heatwaves, water shortages, wildfires and floods – all of which are on the rise due to global warming.

In a global poll of 900 datacentre operators and IT professionals, the datacentre think tank found that 90% of respondents do not think their organisation needs a flood-related disaster recovery plan and that 71% are not preparing for severe weather events. Overall, the poll reveals that 45% of respondents are “ignoring the risk” of climate change and, in turn, global warming.

This is despite the fact that statistics from Conservation International show the concentration of carbon dioxide in the Earth’s atmosphere is the highest it has been for three million years while an estimated 800 million people are vulnerable to the effects of climate change.

“Datacentres will continue to be at the centre of climate change discussions, not only because of the threats extreme weather
Downtime poses to mission-critical facilities, but also because datacentres depend greatly on utilities such as power, water and telecoms,” says Andy Lawrence, executive director of the Uptime Institute.

**Effects of climate change on datacentres**

Lawrence believes the effects of climate change on datacentres are “significant”, but too few operators are taking protective steps to mitigate them, which could have dire consequences for them in the long run.

“As little as a 1°F rise in ambient temperatures can increase cooling loads and significantly reduce energy savings from free cooling. Larger temperature increases can even reduce computing capacity,” he says. “Recent reports say 3,600 miles of fibre in the coastal [areas of the] US will be underwater in less than 15 years, and changes in climate make previous assumptions about flooding suspect. Models project that the high-water marks of 100-year storms are now typical of 30-year storms,” says Lawrence. “Increased flooding can affect fuel deliveries and staffing, and even reach IT equipment in some cases.”

Because of the variety and severity of potential threats, Lawrence advises datacentre owners and operators to “conduct regular resiliency reviews” and to “confer with public and utility authorities to understand how these agencies are preparing for severe weather events”.

But as well as being at risk of the effects of climate change, there is no shying away from the fact that the resource consumption habits of datacentres could be contributing to its onset too. Research shows that datacentres currently use 200TWh (terawatt hours) of data annually – 1% of the world’s electricity demand. As the connected ecosystem rapidly expands, power consumption will grow exponentially. In fact, a study by Swedish researcher Anders Andrae predicts datacentres will be responsible for 33% of global ICT electricity use by 2025.

**Underlying technology**

John Hammond, a meteorologist at the digital weather service Weathertrending, points out that the underlying technology used by datacentres could be causing many of these challenges. “Despite advances in water cooling, many datacentres still rely heavily on energy-hungry air-conditioning units, which have the dubious honour of being both a way to mitigate the impact of global warming, and a major contributor to it,” he tells Computer Weekly.

Siting datacentres in very cold regions of the world is one way of reducing the need for air-conditioning, he concedes, but it is far from a total solution.
“That ‘free’ cooling from the ambient air is often anything but,” he says. “Quite apart from the energy and cost of building the infrastructure needed to supply these remote locations, putting large buildings on areas that were once covered by snow reduces the amount of solar energy the polar regions are able to reflect back into space, thereby increasing the pace of climate change. “The reality is that many datacentre cooling systems, which will need to be used more intensively as global temperatures rise, still work like fridges. They are heat pumps in reverse, consuming electricity to cool the immediate area and radiating heat out into the atmosphere. So there must be no let-up in the drive to make them less power-hungry and more efficient.”

Dan Johnson, director of global business continuity and disaster recovery at managed services provider Ensono, says there is mounting proof of the impact climate change is having on the world and its weather that operators continue to ignore.

“In certain areas of the world, what perhaps used to be a once-in-a-lifetime event – whether a flood, or a hurricane, or both – now happens once every few years, and sometimes every year,” he says. “Based on projections from research agencies across the globe, the situation could get significantly worse. Of course, in a very small way, datacentres themselves are contributing to the climate crisis, since much of the energy they currently consume comes from non-renewable sources.”

**Increased efficiency**

That said, Johnson notes that datacentres have become far more efficient over the years. “The impact is not nearly what it once was, and efficiency continues to improve. As countries make the shift towards renewable [power sources], datacentre operations will become even greener. In the US, most datacentres have the building strength to
To safeguard vital IT assets now and in the future, it is clear that global warming is an issue organisations need to take seriously.

One example being Digital Realty. “Since 2016, we have signed 288MW of new renewable energy contracts – 104 of which were signed in 2018 alone – demonstrating the issue's rising importance within the organisation,” says Aaron Binkley, director of sustainability at Digital Realty.

“Our efforts are starting to pay off. The power supply we currently use to power our EMEA and US colocation businesses is sourced from 100% renewable energy.”

Industry-wide shift

While Digital Realty is making great strides to improve the sustainability of its datacentres, Binkley says there has been an industry-wide shift on the topic of climate change in recent times. “In fact, companies controlling many of the largest datacentre portfolios in the world are also among the largest renewable energy purchasers. BloombergNEF data shows that more than 120 corporate buyers signed clean energy contracts in 2018 alone, totalling 13.4GW,” he says.

“Ultimately, we must not shy away from climate change, with its effects becoming increasingly more apparent. Extreme weather events, often spearheaded by climate change, threaten two of the very fundamental components of datacentre design and operations: resilience and uptime,” adds Binkley. “And while we will always strive to provide our customers with outstanding...
service, we fully recognise and take responsibility for the role we must play in supporting solutions that reduce the impact datacentres have on the environment.”

As well as ensuring the effects of climate change are on the radar of datacentre operators, Mark Anderson, senior director of global solutions enablement for Europe, the Middle East and Africa (EMEA) at colocation giant Equinix, says it is important that society as a whole also takes the threat it poses seriously.

“Not only are there concerns around how climate change will affect companies’ infrastructure, but there is also a need for businesses to reduce their impact on the environment now,” he tells Computer Weekly. “As climate change unfolds, the risk of rising temperatures and extreme weather conditions heightens – so it is important for the datacentre industry to be prepared at all times.”

COPING WITH NATURAL DISASTERS

From a structural perspective, Anderson claims Equinix’s facilities are equipped to cope with natural disasters.

“All of our datacentres meet or exceed local structural building requirements for withstanding movements caused by an earthquake,” he says. “And Equinix datacentres even survived Hurricane Sandy – while all other local centres went down during the storm.”

But as well as preparing for extreme weather events, the datacentre industry should also be proactively implementing measures to avoid the risk of increased climate change. “There is still a long way to go when it comes to tackling sustainability issues – but many projects are underway to drive an accelerated improvement,” says Anderson.

“There is a wide range of green initiatives that industry players can look at, including aquifer systems to draw from naturally cold wells to cool datacentre halls, installing solar panels to generate green energy, implementing rainwater collection tanks for further cooling aids, partnering only with green power providers, and many other such programmes,” he adds.

“Companies are aware that continuing to build robust facilities that look to tackle the challenges of today, while also preparing for the future, is critical to the long-term success of the datacentre industry and needs to remain our focus in the months and years to come.”

SUPPORTING OTHERS’ WORK ON CLIMATE CHANGE

The datacentre industry is also playing a central role in supporting the work of others tasked with tackling climate change.

“From calculating GPS mapping to encourage shorter journeys, to video communications across countries removing the need for excessive airline travel, datacentres power it all,” says Anderson.

“Therefore, it is important to ask the question, just how much of a positive impact are datacentres having by reducing energy usage in other sectors?”

Global warming is one of the most serious challenges to humanity today, and it is no secret that it’s affecting a range of industries. The datacentre market is no different.

As extreme weather events continue to occur, there will be increased pressure on organisations to invest in more ecological alternatives to not only protect themselves against these threats, but also to contribute towards creating a greener world.”
While digital technology may have made itself felt across most customer-facing areas of the business these days, payroll – that most vital of internal support functions for keeping employees happy – appears to be lagging way behind.

According to a report by human resources (HR) and payroll services firm NGA HR, which was based on a survey of 2,472 HR and payroll professionals in medium-sized to large organisations, while 33% are using on-premise systems to automate their payroll processes, a further 34% have moved to the cloud.

But the Global payroll complexity index 2019 indicated that 11% are still operating completely manual processes, while the rest employ a mix of tools and methods.

Even among organisations that have embraced automation – two of which we feature as case studies: The Castle Hotel (page 27) and Severn Trent Water (page 28) – the picture is somewhat mixed.

A survey of 251 UK HR and payroll managers in private-sector companies with more than 1,000 staff, conducted by Censuswide on behalf of HR and payroll software and services supplier MHR, reveals that 52% are still using spreadsheets as part of their payroll process, while just over one-third rely on paper-based timesheets. The reason given for this by over half of respondents was that “things have always been done this way”.

**Payment errors**

Perhaps unsurprisingly, given the manual nature of at least some of their processes, 76% of organisations also admitted they have failed to pay employees correctly or on time an average of four
PAYROLL AUTOMATION

times over the past 12 months. The issue, says Pete Tiliakos, principal analyst for HR and technology services at analyst firm NelsonHall, is that traditionally, companies have treated payroll as a cost centre, which means many functions have “limped along with cobbled-together solutions, disparate and outdated, albeit reliable, platforms and a lack of global reporting capability”.

But as more businesses invest in HR transformation initiatives, payroll is starting to be pulled along too.

“Organisations are realising that payroll is a big factor in HR transformation,” says Tiliakos.

“Although the focus has to date been on sourcing, developing and retaining talent, if you don’t pay them on time and accurately, all that doesn’t matter – so payroll is very important and has to be included in the vision.”

This is especially true in the face of growing numbers of gig workers in the economy, who increasingly advocate on-demand pay models that traditional payroll systems are not set up to deal with.

**GLOBAL REGULATIONS**

Other drivers for change include compliance and the rising complexity of global regulations.

The problem here is that enabling reliable, globally consolidated payroll reporting is a big challenge when using decentralised, poorly integrated systems that are often different in each country, which tends to lead to the manual collation of reports.

*continued on page 29...*
Case study: The Castle Hotel, Taunton

The Castle Hotel has been able to boost the efficiency of its labour planning activities by integrating rostering and electronic point of sale (Epos) software with its payroll system.

Last year, the hotel, located in Taunton and employing about 100 people, replaced a standalone electronic till with cloud-based Epos applications from Talech.

The software was also integrated with Deputy's cloud-based staff rota and time clock packages, which replaced a previously manual system and enabled managers to optimise staff rotas based on current requirements.

Employees can use their smartphones to clock in and out and schedule time away, such as holidays.

Jon Peilow, the hotel's financial director, says: “Effectively, in the past, nothing joined up and we had to calculate everything manually using spreadsheets. But the process has now become much more seamless and has saved us a great deal of admin time.”

For example, the time it takes to process payroll has been cut by half a day a month because it is no longer necessary to manually key in how many hours each employee has worked.

Using a CSV file, the information is now uploaded directly to the Castle's BrightPay cloud-based payroll system, which also reduces the likelihood of manual errors.

The new system, which replaced older Sage applications about six months ago, also enables employees to access all their payroll data via a dedicated portal.

Meanwhile, the hotel's six department heads are saving up to three hours a week on putting together schedules and signing off timesheets. They also have access to real-time reports on costs as a percentage of sales revenue and can see how much is being spent on labour.

“Ultimately, staff are the biggest cost in hospitality businesses and, while that’s going up between 5% and 6% a year, it’s difficult to increase charges accordingly, due to current market conditions,” says Peilow. “So we need to get smarter about labour planning by becoming more efficient – and that means sharing data with department heads on a real-time basis.”

Whereas in the past, such information was shared monthly, the integrated system means it can now be viewed daily at the touch of a button, to optimise how employees are deployed.

“It’s a much more cost-effective approach and gives us what we need,” says Peilow.

“Although we could undertake labour cost analysis before, it was very manual and labour-intensive and so was always at the bottom of the pile. But now we can treat it as a priority because that’s where it is possible to make the most efficiencies.”
Case study: Severn Trent Water

Severn Trent Water’s HR and payroll transformation project is freeing up enough time to enable staff to analyse payroll data and use the insights gleaned to boost the wider employee experience. The utilities provider started its “transformational journey” about a year ago, which has resulted in revisiting its policies, processes and procedures “to de-clutter them and remove the bureaucracy”, says Joe Carter, the firm’s HR manager.

A key objective was to ensure such processes became more “seamless and automated” to make it quicker for the company’s 6,500 staff and managers to undertake HR-related tasks, he says. A second goal was to reduce risk and improve the accuracy of payroll processing, and another was to free up Severn Trent’s payroll team to perform “more meaningful activity that directly supports the business, and ensure there is a human face rather than just a faceless HR function”, says Carter.

Ultimately, though, the aim is to “deliver the best employee experience we can”, he says, and a big part of that is about ensuring people are paid accurately and on time each month. “Payroll is something that people just expect to work and they don’t necessarily see what goes on behind the scenes, but they soon let you know if something goes wrong,” says Carter. “So by increasing reliability, you can ensure employees get a good experience and can focus on the job they’re paid to do.”

Tight integration between Severn Trent’s long-term outsourcing supplier MHR’s cloud-based iTrent payroll system and the utility firm’s in-house SAP HR applications, plus the fact that the “majority of the payroll side of things is now automated”, means that for the past six months or so, it has no longer been necessary for the three members of the in-house payroll team to key in any information manually, says Carter.

Instead, they can now spend more of their time analysing payroll data in order to understand costs better, identify trends and potentially introduce business change.

“It’s about freeing up time for the team to do more advanced analytics during the payroll run, so they can see if things don’t look right,” says Carter.

“But it’s also about spotting business trends, so if there’s a spike in sickness or overtime claims, we can engage with the business, query what is causing the change and see if an intervention is necessary, such as providing more resources.

“While it is still early days here, the aim over time is to focus more and more on gaining strategic value from the careful analysis of payroll data. Using data in this way isn’t just about ensuring people are paid accurately and on time; it’s about exploring what the data is telling us and how we can use it to improve productivity and the employee experience.”
As a result, a common pattern for transformation initiatives is to start with HR and then move on to payroll about 12 months after either initial discussions or the transition itself, although this is not always the case. For example, international expansion or merger and acquisition activity sometimes forces the hand of employers to tackle payroll first.

Melanie Robinson, senior HR director for sales and marketing at payroll services giant ADP, says: “Payroll is a market in transition, but the common thread is streamlining and simplifying manual processes.

“Whether we are looking at single country or global payroll, it’s about leveraging technology to cut costs, increase efficiency and improve the user experience.”

However, that doesn’t mean everything will be plain sailing. Common barriers to change include an inability to make a positive business case that demonstrates a sufficient return on investment, particularly if payroll is simply seen as a cost centre.

Another is fear of what transformation could mean, particularly if things go wrong. Tiliakos says this is linked to the fact that “many organisations lack the skills and capability to successfully manage change in-house for a large-scale transformation programme”.

A global lack of in-house payroll skills is also having an impact and, as a result, is leading some organisations to go down the outsourcing route.

Nonetheless, Tiliakos believes the future looks bright for payroll. “It’s an interesting time in that technology, such as cloud and robotic process automation, is starting to make an impact and organisations are seeing it and wanting to modernise their solutions and leverage some of that,” he says.

A key consideration here is that payroll data, which is among the richest, most accurate but also most underused data in the business, has traditionally been difficult to get at and analyse.

**Cloud and robotic process automation is making an impact. Organisations want to modernise their solutions and leverage some of that**

Pete Tiliakos, NelsonHall

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Pete Tiliakos, NelsonHall
Board yourself before you bore yourself

Gatwick has announced it will become the UK’s first airport to use facial recognition cameras for passenger boarding on a permanent basis, condemning those of us who aren’t quite yet in sync with the technology to kicking off our holidays with an aura of exasperating inadequacy.

In what must be one of the most tasteless lyrics to come from a generation of innocuous, plinky-plonky indie pop bands, Vampire Weekend’s Ezra Koenig once sang, “You got the luck of a Kennedy,” and we certainly felt that during our inaugural facial recognition experience at JFK last year.

The process is undeniably straightforward, but that’s probably what psychs us out. “Even the oldies are breezing through, look,” you think, as the machine counts you down to place your passport on the scanner – then you repeatedly remove it too soon and get ushered into a second queue with all the other divs who need to be seen to by a good old-fashioned sour-faced homo sapien.

Having self-boarding in our own backyard is our chance to finally master modern air travel. It shouldn’t be a big deal anymore. The boiled sweet days are over, and as much as you think it might be cute, there’s no charm in fumbling about like a skittish amateur from an old episode of Airline anymore.