ComputerWeekly

18-25 MARCH 2024

A costly can of worms

We look at what went wrong with Birmingham City Council's Oracle Cloud implementation

MIRAVISION/GETTY

TechTarget | ComputerWeekly.com

UK gets funding boost through EU Horizon chip initiative

The government has announced a joint undertaking with the European Union (EU), which it says will result in a £35m boost for British semiconductor scientists and businesses in international chip research.

Microsoft AI-powered cyber service to go live in April

Almost a year after its debut, Microsoft has announced it will be bringing its Copilot for Security artificial intelligence (AI)-backed cyber offering to general availability in early April. The service aims to harness Microsoft's security expertise.

Cellular IoT connections to grow by three billion in next four years

A study by Juniper Research has found the global number of cellular internet of things (IoT) devices will increase from 3.4 billion in 2024 to 6.5 billion by 2028. The research firm anticipates that global cellular IoT data generated will grow to 46PB in 2028.

Industry partnerships and data key to better public services

Digital secretary Michelle Donelan said the success of government plans to digitally transform public services will rest on industry partnerships and the ability of public bodies to better utilise data.

TechUK calls for next government to introduce AI 'industrial strategy'

Tech companies have urged the next government to adopt an "industrial strategy" to accelerate the take-up of artificial intelligence across UK businesses. The recommendation is one of seven urgent policy interventions identified by TechUK.

Shadow tech secretary: Labour will use AI to grow economy

The shadow secretary of state for science, innovation and technology, Peter Kyle, has said the Labour Party aims to boost productivity growth by 0.5% by enabling businesses and the public sector to deploy AI technology. ■

British Library opens up over ransomware attack to help others

The British Library has published extensive details of its devastating experience at the hands of the Rhysida ransomware gang, revealing how the cyber criminals likely accessed its systems in the first place, the effects of the cyber attack, its response and the lessons it has learned.

LEON NEAL/GETTY

- *Patch Tuesday throws up two critical Hyper-V flaws.*
- *UK and Germany sign up to greater R&D collaboration.*
- *Government not facing up to CNI cyber risks.*
- *UK government reconfirms satellite programme.*

Catch up with the latest IT news online.

What went wrong with Birmingham City Council's Oracle Cloud implementation?

The council swapped out a heavily customised SAP ERP system for Oracle Cloud, but since going live in 2022, it has encountered numerous technical challenges, leading to spiralling costs. Cliff Saran reports

Birmingham City Council is one of a number of local authorities facing a financial crisis. Local services are being cut and council tax is being hiked. None of this is good news for the communities and residents who rely on these services, or those households struggling with ever-increasing bill payments.

In Birmingham, the financial issues the council faces are being compounded by a failure to implement an Oracle Cloud-based enterprise resource planning (ERP) and human capital management (HCM) system. These replace a highly customised SAP implementation that was originally deployed in 1999.

Birmingham City Council's financial issues are being compounded by a failure to implement an Oracle Cloud-based ERP and HCM system

Like many long-term SAP customers, the city council had a choice: either engage with SAP to work out a migration plan to the latest S/4Hana cloud ERP system, or move to an entirely different platform. It chose the latter, and selected Evosys to implement the Oracle Cloud ERP and HCM system. Since going live in 2022, the Oracle system has required manual remediation to fix accounting issues. The council's 2024 financial report shows a budget of £5.3m for continued support and manual intervention on the troubled Oracle system.

What came before Oracle Cloud?

In the late 1990s, Birmingham City Council began the implementation of an SAP system to transform local government services. It was once claimed to be the world's largest local authority SAP implementation, and by 2010, the council embarked on a major overhaul of IT, which required SAP applications to replace a significant number of internal systems. This implementation included a change to a shared service delivery model and a new integrated application suite model based on the SAP

SAKHANPHOTOGRAPHY/ADOBE

Birmingham City Council is one of a number of local authorities facing a financial crisis

software suite to support the council's financial, procurement and operational performance management process.

The SAP implementation was completed on time, to budget and according to an executive briefing at the time, there were expectations it would deliver £100m in savings and a 15% increase in productivity over a five-year period.

Birmingham City University also got involved, collaborating with SAP on an MSc Enterprise Systems Management course designed around SAP certification. At the time, deputy leader of Birmingham City Council Paul Tilsley said: "This will be an invaluable local resource to support the development of our digital economy and reinforce the depth of ICT skills necessary to support modern local public services. I also believe this is a blueprint for future collaborations between business, academia and the public sector."

The council's 2016/17 accounts show that £5.5m was set aside for SAP system technical and software updates between 2016/17 and 2018/19. These upgrades were justified to ensure the system remained current and aligned to the strategic direction of the council and the downsizing of support services.

How Birmingham prepared for the ERP migration

By 2018, Birmingham decided to review its future requirements of finance, procurement, human resources and payroll systems. It hired Socitm Advisory as part of the process to help procure a new cloud-based ERP system.

The contract was awarded to Insight Direct (UK) Ltd, in partnership with Evosys, on the basis that the pair would deliver what Birmingham City Council's 2021 report to cabinet described as "a new solution" based on the Oracle Cloud ERP.

The project appears to be a new implementation. Birmingham recognised the pitfalls of adapting the new enterprise software rather than adopting the best practices built into the new Oracle systems it was implementing. It also acknowledged that regulatory issues in local government would mean that data from the old SAP system would need to be made available to external auditors, which would potentially mean it would have to keep the old system running for a lot longer once Oracle went live.

One of the business benefits of moving to the cloud is that day-to-day operations and technical issues are managed by the cloud provider, which meant Birmingham would need a team of SAP administrators.

The financial business case for the upgrade, as of 2021, showed that the SAP system, being run by Capita, was costing the council £5.1m per year. Over the nine years between 2022/2023 and 2031/2032, this would amount to £46m. For the same period, the Oracle system was meant to save £563,000 in 2022/23 and £788,000 in 2023/2024, with the savings accumulating over the nine years to £10.9m.

Issues facing the Oracle Cloud deployment

There are reports that suggest the council had originally planned to change its existing business processes to fit the new Oracle system. But this changed, and Oracle was customised to support Birmingham's existing business processes. This shift in emphasis from adopting Oracle business processes out of the box would have required a business transformation, adapting the Oracle system to the council's existing business processes. It is believed this decision severely impacted the council's ability to properly implement the Oracle system, resulting in delays and additional costs.

The ERP and HCM replacement, which was originally earmarked to cost in the region of £19m, has now cost Birmingham City Council well over £100m

Oracle eventually went live in 2022, but the council has faced configuration issues since it was deployed. In April 2023, city council leader John Cotton gave an interview to the *Birmingham Mail*, in which he described the "disastrous" Oracle system that has left taxpayers with a £100m bill. The ERP and HCM replacement, which was originally earmarked to cost in the region of £19m, has now cost the council well over £100m.

Since going live, the Oracle system has been plagued by problems. For instance, Birmingham City Council has had to stabilise and improve the operations of the software. In particular, the ERP system posted transactions incorrectly, which meant significant manual work was required to maintain the accuracy of the council's finance system.

There were also delays in the implementation of system modules that would have enabled budget holders to view and forecast their budget spend more easily.

By the start of 2024, the council reported that a further £45m would be needed to fix the problems – on top of the £85m it had already spent.

This inability to get accurate financial data led to an additional six-month delay in closing the prior year's accounts, as the finance team needed to manually adjust inaccuracies. Its 2024 financial report showed the council experienced a deterioration in bad debts of £12.5m. While this shortfall is due, in part, to the cost-of-living crisis, the report states that "issues with the implementation of the Oracle ERP finance and HR system also delayed enforcement action".

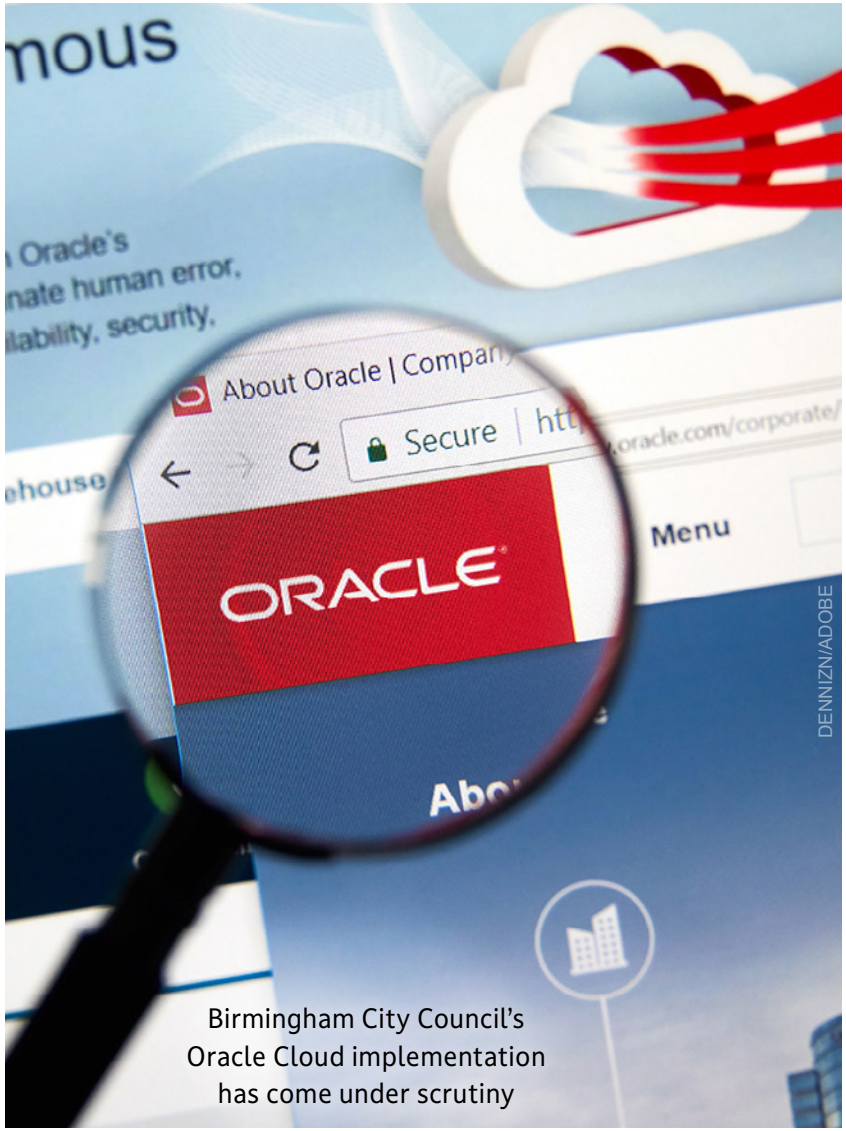
What went wrong with Birmingham's Oracle Cloud?

Birmingham City Council's report to cabinet in 2021 discussed the problems the council faced in implementing the Oracle Cloud ERP system at the time.

The report illustrates the challenges in migrating from an older version of an ERP system to a rival product. It highlights staff turnover issues, which affected the level of Oracle knowledge available, and shows deficiencies in the programme delivery processes, which resulted in an Ernst & Young-led assurance review that called for changes to governance.

It also points to the delays to the Oracle go-live date. This meant the council needed to migrate the old SAP system to newer hardware and software, and pay a further £1.1m to SAP for continued maintenance and support.

Overall, it would seem the council underestimated the work required to implement the Oracle system in the way it wanted. ■



Birmingham City Council's Oracle Cloud implementation has come under scrutiny

Birmingham City Council: Key takeaways when upgrading ERP systems

Do not customise: While there are numerous reasons to avoid changing existing business processes, the first thing to consider is the importance of resisting temptations to customise the new system. In a meeting on 31 January 2024, the council stated its commitment to adopting Oracle best practice processes and configuration for the re-implementation.

Difficulties in re-implementation: In light of Birmingham's experience swapping out SAP for Oracle, it's clear that no IT leader should lose sight of how difficult such a project is to implement successfully. Analyst Gartner urges IT leaders to evaluate their current business metrics observable in ERP applications to determine the need and priority for replacements. Most enterprises implemented ERP suites years (or decades) ago but, according to Gartner, business decision-makers have never revisited the original business case to determine whether the ERP applications are delivering the intended business value.

Consider whether upgrades are the right strategy: Another fact is to look at whether the current business capabilities are being delivered in the existing ERP applications. Gartner urges IT leaders to evaluate whether their ERP applications are enablers or inhibitors to the business.

Extending support: Commercial enterprise systems do have a finite life. In 2020, SAP said it would be extending support for Enterprise Core Components, the foundation of its ERP system, for a further two years for customers buying standard support, or until 2030 for those purchasing extended support contracts. Those needing to run SAP for an extended period can consider using third-party support, which means they may be able to use their existing ERP and HCM systems until 2035.

Have a realistic ROI: The public data available about Birmingham's Oracle implementation shows it made a financial business case that promised to deliver savings very quickly. As is often the case, if the return on investment figures look too good to be true, they probably are. An existing SAP customer should be able to get continued support and migrate over time to a newer version of the product. This is probably a safer bet than dropping SAP in favour of an entirely different system.

Ensure a good supplier relationship: Finally, given the historical importance of the project as one of SAP's largest public sector contracts, one needs to question how and why the relationship went downhill to the point where Birmingham selected Oracle. A key consideration is to ensure there is a sound long-term supplier relationship.

How Thomson Reuters uses artificial intelligence for problem solving

Cliff Saran speaks to David Wong, chief product officer of Thomson Reuters, about working with AI, protecting against customer data leakage and embedding Microsoft Copilot for Word

Thomson Reuters has been innovating with artificial intelligence (AI) for a number of years. "We launched our very first natural language question answering and search algorithm in the 1990s and we have been incorporating AI tech into products like Westlaw [a legal research platform] and different search algorithms," says the company's chief product officer, David Wong.

Wong joined Thomson Reuters in the midst of the pandemic in 2020. He works alongside the head of engineering and the chief technology officer, who own the engineering and technical teams, as well as Thomson Reuters' labs.

Apart from the Reuters news business, Wong's responsibilities cover all of the company's software and content products. Prior to joining Thomson Reuters, Wong worked at Facebook as a product manager.

Thomson Reuters adopts a multicloud strategy and uses Microsoft Azure, Amazon Web Services (AWS), Google and Oracle. "We try to be as open as possible and work with different technology vendors," says Wong.

David Wong, Thomson Reuters: "We try to be as open as possible"

According to Wong, AI – and more specifically generative AI (GenAI) and natural language processing – has been a core competency within Thomson Reuters.

Recalling the evolution of GenAI, he says: "It is an interesting story. If we play the tape back, GPT 3 feels like a million years ago. It launched in August 2020 and was 'interesting'."

Then GPT 3.5 and ChatGPT were introduced, and then GPT 4. "All came out in quick succession at the end of 2022 and into 2023," he adds.

For Thomson Reuters, these developments were significant because, as Wong points out, GPT 4 in particular has the ability to interpret language and answer questions at post-graduate level. "It marked a point when we realised that the technology is sufficiently sophisticated that we think it can be pointed at problems we solve for our customers," he says.

Product development with embedded GenAI

These problems fall into two categories: they either help with information retrieval or research problems. Wong uses Westlaw as an example, which offers a detailed database of proprietary content that is used by legal professionals to do their job right. The product, he says, gives an answer to a specific legal question.

"The second problem we solve for our customers is generally the production of written work, such as helping people to write a contract, prepare a tax return or a regulatory filing. GenAI happens to be very good at those two problems."

Moreover, he says not applying this technology would mean "missing out on a huge opportunity". There is also the risk that unless Thomson Reuters innovates with GenAI, other companies will produce better products.

Wong sees strong alignments between the GenAI capabilities Thomson Reuters is developing and the GenAI functionality that is being introduced in Microsoft 365 (M365), with its Copilot offerings. "We serve many of the same customers and we both saw the opportunity in the same way. Lawyers, accountants and risk professionals live in Microsoft products. So, there was a strong alignment," he says.

As such, Wong says Thomson Reuters saw an opportunity to integrate with Microsoft 365 Copilot, expanding the plugins and apps it already builds on top of the Microsoft ecosystem: "We were one of the very first companies to get access to M365 Copilot as part of their third-party extensibility programme."

This enabled Thomson Reuters to develop functionality that allows the M365 Copilot to interact with Thomson Reuters' own datasets, as well as other AI agents. "We focused on building out integration with Microsoft Word," Wong adds.

Intellectual property concerns

One of the risks associated with the use of GenAI is data leakage. Wong says Thomson Reuters has a robust privacy policy, which existed before GenAI.

"We've established a clear relationship of how we handle our customers' data, which applies to the way that we operate with AI," he adds. "When it comes to generative AI, we've tried to take our clients' confidentiality very seriously and make that a principle in the way that we operate."

As an example, he adds: "We do not train the AI on our customers' data. We do not enrich any large language models with our customers' information unless they explicitly ask us to or they want to undertake some kind of joint collaboration for AI innovation."

The majority of use cases at Thomson Reuters rely on the AI inference engine, where a large language model (LLM) is accessed via an application programming interface (API). The AI-enhanced products developed by Thomson Reuters take answers from the LLM. "We are not training or enriching the systems with the data that our customers provide," he adds.

> "We are not training or enriching the systems with the data that our customers provide"
>
> David Wong, Thomson Reuters

When working with commercial LLM technology providers, Wong says the company sets out a contractually binding agreement stipulating that the LLM cannot consume any of the input data from Thomson Reuters or data from its customers. The contract also states that Thomson Reuters is able to audit the LLM provider to ensure its intellectual property or data from its customers is not being used for training.

An example of how the integration with M365 Word Copilot works is that it can help a user create a new sales agreement based on a draft agreement, which can be modified using content that Thomson Reuters provides. The user may turn to Thomson Reuters to find a clause that will be suitable and enforceable in California, for example, which can then be pulled into the sales agreement document.

"When we think about the problems that we applied generative AI to, we're typically not entrusting the AI to make decisions. We're really focused on how we provide research and analysis and then automation of a process."

From an auditing perspective, the AI system is being used for retrieval-augmented generation. Wong says: "We're able to reference all of the source information."

Augmentation, a reality check

The way Thomson Reuters is working with Microsoft and embedding GenAI in its products is, to use industry terminology, AI augmentation of a labour-intensive task. The AI can provide fast access to domain expertise, which will save people time.

Wong does not believe that artificial intelligence is currently at a stage of development when it exhibits superhuman intelligence. The answers it can provide are not accurate and trustworthy enough yet, so there are caveats to using current technology limiting its use in applications that require very deep analysis. However, that does not mean such AI-augmented systems cannot help people complete tasks such as writing a contract document. ■

Computer Weekly,
10 Exchange Square,
9th Floor (West),
London EC2A 2BR

Telephone: 020 7186 1400

Editor in chief: Bryan Glick
bglick@techtarget.com

Managing editor (technology): Cliff Saran
csaran@techtarget.com

Investigations editor: Bill Goodwin
wgoodwin@techtarget.com

Senior editor, EMEA: Karl Flinders
kflinders@techtarget.com

Senior editor, UK: Caroline Donnelly
cdonnelly@techtarget.com

Security editor: Alex Scroxton
ascroxton@techtarget.com

Networking editor: Joe O'Halloran
johalloran@techtarget.com

Management editor: Lis Evenstad
levenstad@techtarget.com

Storage editor: Antony Adshead
aadshead@techtarget.com

Business editor: Clare McDonald
cmcdonald@techtarget.com

Data and ethics editor: Sebastian Klovig Skelton
sklovigskelton@techtarget.com

International production editor: Claire Cormack
ccormack@techtarget.com

Deputy production editor (UK): Jaime Lee Daniels
jdaniels@techtarget.com

Deputy production editor (EMEA/APAC): Ryan Priest
rpriest@techtarget.com

Vice-president of sales, EMEA: Jat Hayer
07557 433681 | jhayer@techtarget.com

British Library hack holds valuable lessons

Computer Weekly is a big advocate for the practice of being as transparent as possible in the wake of a cyber incident – let's call it "security without shame" – and we're not alone in this thinking. The National Cyber Security Centre and the Information Commissioner's Office have also spoken up about the need to put an end to secrecy and cover-ups in security.

Why so? Well, for one thing, it's far more interesting to read a story about how a plucky victim stood up to cyber bullies than it is to wade through bland statements that have been filtered through legal and PR departments and say essentially nothing. But more pertinently, being upfront about experiences with ransomware benefits everybody. Transparency helps other security professionals learn and improve their resilience, it helps victims realise they are not alone and that there is help available, and it embarrasses criminal, greedy ransomware gangs.

So it was hugely impressive last week to read the British Library's extensive, 18-page report on its experiences at the hands of the Rhysida gang. Not only did the British Library set out precisely what happened during the cyber attack, but also how it proposes to recover its systems, what it is doing to reassure staff and users, and underscored the point that one should neither negotiate with nor pay off ransomware gangs.

Perhaps more crucially, the British Library was open about the internal failings that made it a soft target for cyber criminals. Opportunities to improve resilience before the cyber attack were clearly missed. The British Library could, and should, have taken a stricter approach to multifactor authentication, been more on top of its third-party risk factors, worked harder to refresh its legacy IT estate, and tried to smooth out a complex network topology that almost certainly helped Rhysida cause much more damage than the attackers otherwise would.

Any of those sound familiar with your IT setup? Perhaps it's time to learn from the British Library. That degree of honesty takes guts, it's a rare thing to see, and if it makes just one CISO sit up and think, "Hey, maybe we should look at how suppliers authenticate to our network" or, "That system reached end of life five years ago, we should consider an upgrade", then the British Library's horrendous experience will not have been for nothing.

So let's sing the British Library's praises from the rooftops. Thank you for your candour and your public service. And for readers in London, take time to swing by its St Pancras home and support its exhibitions and events as it continues to rebuild. ■

Alex Scroxton, security editor

How to improve IT sustainability

SAKORN-SUKKASEMSAKORN/GETTY

With every business function being asked to reduce their carbon footprint, Cliff Saran looks at ways to achieve greener IT operations

HOME

Extreme weather events and warnings from experts that limiting temperature rises to below 1.5°C is becoming increasingly difficult have raised public awareness of the impact of global warming.

Businesses and consumers alike are thinking more about climate change, the environment and sustainability. Mattie Yeta, chief sustainability officer at CGI, says organisations have recalibrated their strategies to match changing sustainability expectations. This, she says, shows that businesses recognise they are being observed by consumers, governments, investors and regulators while striving to achieve sustainability.

Corporate governance

Numerous regulations are coming into force that have corporate governance implications. For instance, as Jay Dietrich, research director of sustainability at Uptime Institute, points out, financial-based climate disclosure requirements – such as the European Corporate Sustainability Reporting Directive (CSRD) and other Taskforce for Climate-related Financial Disclosure (TCFD)-based regulations – mandate public reporting of energy consumption, greenhouse gas emissions, and strategies and goals for their reduction across owned, colocated and cloud IT operations.

And under the European Energy Efficiency Directive, he says datacentre operators are expected to "establish an energy management system – ISO 50001 or equivalent – that improves energy performance as measured by work delivered per unit of energy consumed".

This means organisations that are running and operating data-centres need to publish an energy performance improvement plan that specifies improvement projects and reports on their progress and results.

Beyond the figures based on compute capacity, David Pugh, head of sustainability at Digital Catapult, recommends that every IT leader should consider the degree of carbon emissions associated with their organisation's data management and storage. This includes both internal and external digital infrastructure.

"Understanding the environmental consequences of your infrastructure should be driving decision-making on where to manage data and who to work with in this space," he says.

The compliance opportunity

Regulations also offer businesses a chance to innovate. Carmen Ene, CEO of 3stepIT, notes that new regulations mean organisations need to shift their perspective and look at possible growth opportunities triggered by regulatory demands.

Instead of the end goal being compliance alone, she says companies should focus on implementing solutions that improve their environmental, social and governance (ESG) reporting capabilities while delivering business value, reducing their environmental impact, and giving back to the planet and society.

New regulations mean organisations need to shift their perspective and look at possible growth opportunities triggered by regulatory demands

As an example, Ene points out that responsible use of customer data and the material assets a company owns – such as digital devices – is a regulatory requirement. She says assets need to be tightly managed by the procurement, IT and cyber security teams, alongside the compliance team.

"Tech must be sourced ensuring no regulatory and reputational issues with the company supplying it. The devices – and the data they host – then need to be managed and tracked while in use and, crucially, after, ensuring no data is left on them and that they do not become e-waste," says Ene.

Shane Herath, chair of the Eco-Friendly Web Alliance, also recommends that IT decision-makers ensure sustainability transcends operational aspects. "Decision-makers should actively work towards shifting the perception of sustainability from a mere operational expense to a crucial investment," he says.

For Herath, this involves an internal culture shift, where sustainability is integrated into the core values of the organisation. "The speed of this change, resonating within enterprises and influencing consumers, will undeniably shape the future narrative of IT sustainability," he adds.

The IT sector is also beginning to make sustainability targets a core part of product offerings and services. According to Herath,

the faint green shoots indicating a shift in supplier relationships observed in 2023 should blossom into fully fledged partnerships in 2024. "IT decision-makers should resolve to scrutinise supplier practices more thoroughly, seeking partners who not only talk about sustainability, but demonstrate genuine dedication through consistent and impactful action," he says.

Herath suggests the emphasis should be on fostering a network of suppliers that share a commitment to green practices. He believes collaboration with suppliers in developing and adhering to sustainability benchmarks can be a game-changer in achieving industry-wide eco-friendly standards.

Balancing sustainability with changing tech

Technology does not stand still, so organisations will have a roadmap for upgrading IT hardware infrastructure. But with technology and innovation becoming increasingly powerful, CGI's Yeta says organisations need to address sustainability issues precisely and effectively. "Decision-makers need to be taking full advantage of this capability, using modern algorithms to reveal the hidden patterns of usage, streamline processes and prepare for the outcomes of various sustainability policies," she says.

As new IT is procured, and old hardware replaced, IT leaders also need to consider the full lifecycle of the products they buy and dispose of. Herath says IT decision-makers should resolve to go beyond preliminary steps and adopt comprehensive strategies for managing electronic waste. This includes promoting device longevity, enhancing repairability, promoting right-to-repair and embracing modularity in design.

Eco-Friendly Web Alliance's Shane Herath believes collaboration with suppliers in developing and adhering to sustainability benchmarks can be a game-changer in achieving industry-wide eco-friendly standards

SAKORN SUKKASEMSAKORN GETTY

As an example, in 2018, Canterbury Christ Church University replaced end-of-life HPE servers and enterprise storage with Nutanix's hyperconverged infrastructure based on Lenovo hardware. The hyperconverged infrastructure enabled the university to consolidate its datacentre, which reduced its environmental impact. Configured with hot/cold aisle cooling, the exhaust air is fed into a greenhouse on the side of the datacentre facility. The servers have already been running for six years, and Andy Powell, chief technology officer at the university, wants them to run for another year before they are replaced.

> "WHAT GETS MEASURED GETS MANAGED, AND MEASUREMENT GIVES YOUR SUSTAINABILITY ENDEAVOUR SUBSTANCE"
>
> RICHARD BARNES-WEBB, PA CONSULTING

Herath highlights the importance of establishing partnerships with e-waste recycling facilities and incentivising responsible disposal practices. By taking bold steps in e-waste management, he says IT leaders can set an example for the entire industry.

Richard Barnes-Webb, a sustainable architecture expert at PA Consulting, proposes establishing "green tech debt" as a standard project term, in the same way that phrases such as "best practice" and "pipeline" are applied in meetings as everyday business terms. The intention, he says, is for most projects by default to have a parallel stream

Sustainability initiatives must not overlook the end-user experience

Andy Powell, chief technology officer at Canterbury Christ Church University, says when IT leaders introduce green tech initiatives, they should also deliver a good user experience.

For example, with knowledge of a lecturer's schedule, the university's IT team is able to put a laptop to sleep in non-working hours to save power. But, says Powell: "If a lecture starts at 9.00am and the lecturer turns up at 8.55am and logs on, the laptop may take 15 minutes to receive patches and antivirus definitions. That means students have to sit there for 15 minutes waiting for the lecture to start."

To address this detrimental effect, the university is using Tanium's Converged Endpoint Management platform and wake-on-LAN capabilities to push out patches and Windows updates overnight.

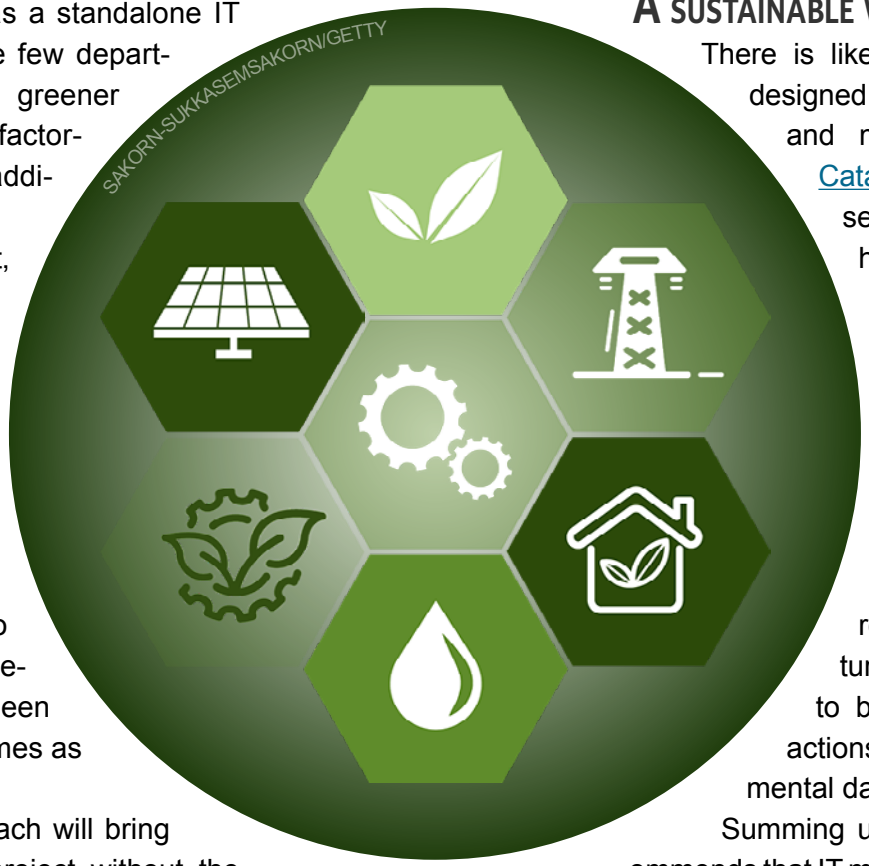
of work running alongside the standard functional delivery and non-functional requirements.

Speaking about his own experience, Barnes-Webb says: "I've found selling sustainability as a standalone IT endeavour is not easy. There are few departments that will budget for a greener re-architecture, for example, or refactoring that does not provide any additional business benefit."

He describes "typical" tech debt, as having "a two-birds-with-one-stone benefit" of functional remediation and bringing about sustainable change, which contributes to an organisation's overall emissions targets.

In practice, Barnes-Webb says addressing green tech debt may be as simple as taking the time to add tickets to the corporate issue-tracking platform, which has been configured with sustainable outcomes as one of its metrics.

"This almost trojan horse approach will bring sustainability to just about any project without the need to set up a separate endeavour," he says. "What gets measured gets managed, and measurement gives your sustainability endeavour substance."



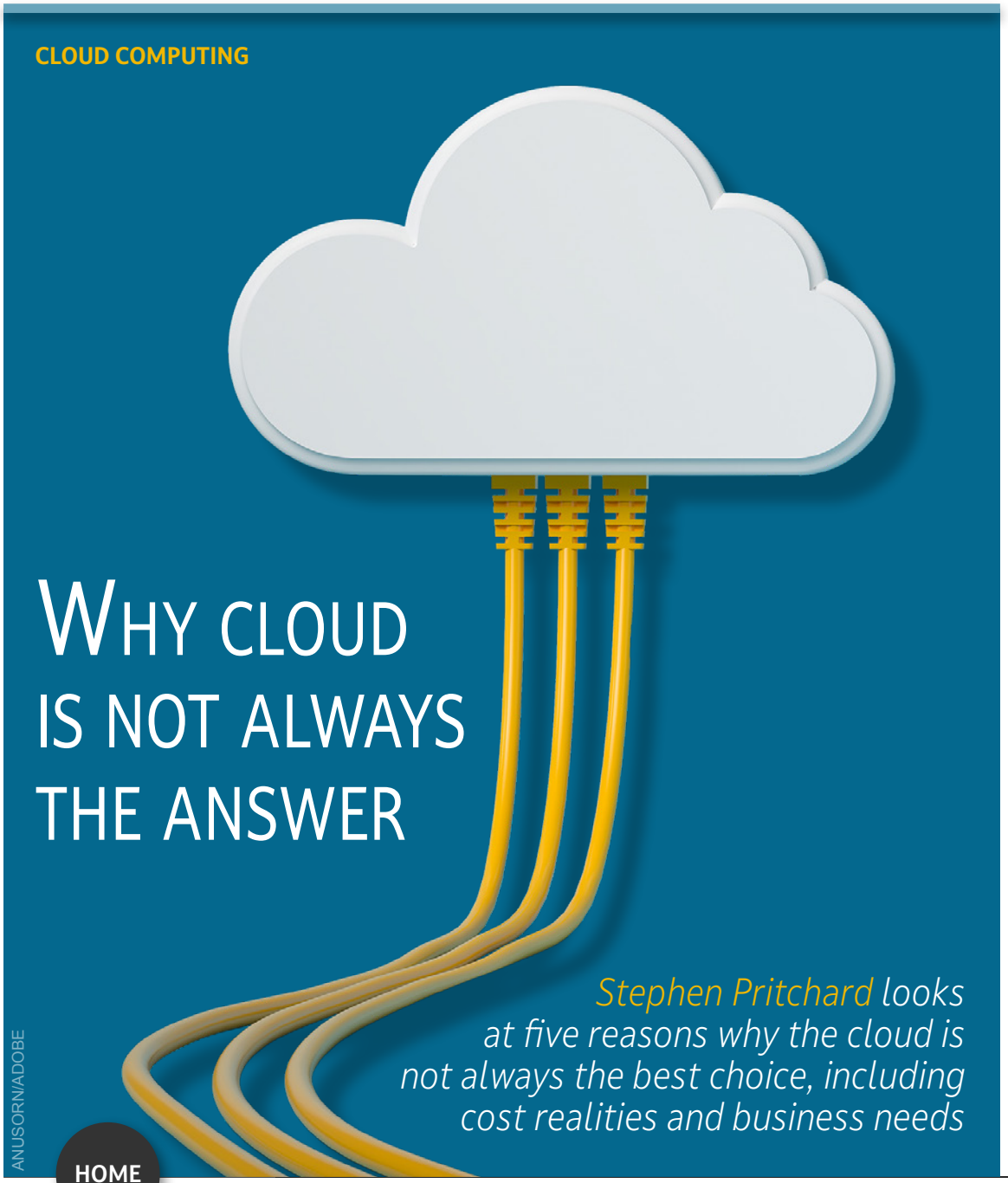
Green tech debt should be added to sustainability reporting or it should be possible to see an impact on existing dashboards.

A SUSTAINABLE WAY FORWARD

There is likely to be a raft of new products designed to help organisations report on and manage IT sustainability. Digital Catapult's Pugh believes this year will see a huge amount of innovation in helping companies measure and reduce carbon emissions through the effective use of cloud services.

This is similar to the tools that have been developed to help businesses optimise infrastructure costs. The Digital Catapult Ecometer tool, for instance, is being used to measure the environmental impacts of infrastructure, to baseline carbon intensity and to better understand which business actions will effectively mitigate environmental damage.

Summing up, Uptime Institute's Dietrich recommends that IT managers establish or revitalise their sustainability strategy and increase their engagement with sustainability staff, as continual improvement of IT operations needs to be an integral part of corporate reporting of sustainability. ■



WHY CLOUD IS NOT ALWAYS THE ANSWER

Stephen Pritchard looks at five reasons why the cloud is not always the best choice, including cost realities and business needs

ANUSORN/ADOBE

HOME

For a growing number of organisations, the default option for new IT projects is the cloud and cloud storage, with even the more cautious businesses having adopted "cloud-first" or "cloud-preferred" strategies.

That's because startups and fast-growing firms can build infrastructure in the cloud that would be hard to achieve quickly in any other way. The desire to promote the benefits of cloud can include even the vendors most often associated with on-premise technology – yet cloud is not always the right choice.

CIOs have come to a more nuanced view of IT architecture, with many firms finding that the cloud is not as cheap – or even as flexible – as was once thought. There are situations where the cloud's shortcomings mean it is not always the answer.

DOES CLOUD COST LESS, OR MORE?

A big draw of cloud is its reputation for saving money, but the cloud does not always cut costs. In fact, for some workloads and types of IT operations, cloud can be more expensive than on-premise systems, a conventional datacentre, or colocation.

The problem, says Jon Collins, vice-president of research at analyst GigaOM, centres on a lack of forward planning and low discipline over how the enterprise uses cloud resources.

"Cloud does not save money per se, but it has been historically perceived and marketed as cheaper," he says. "Less suitable workloads have been moved to cloud with associated migration costs, and no necessary gains. Meanwhile, cloud use has caused a proliferation of applications without any real cost assessment upfront, and that has resulted in cloud costs spiralling out of control."

The growth of FinOps shows that CIOs are trying to catch up with financial governance. Firms pay a premium for the cloud's flexibility, but over time this can cost more than on-premise options. The lift-and-shift of entire workloads or virtual machines to the cloud often means paying more without flexibility gains in return.

What makes cloud cost more?

Porting applications that weren't designed for the cloud often causes performance issues and higher costs.

Some applications are just harder to run efficiently in a cloud environment. These include workloads that make extensive use of (non-cloud) databases, are very input/output intensive, or require connections to physical inputs such as internet of things sensors or human decision-makers. If data and processing both happen in the cloud, these issues can be minimised, but problems arise when they are not.

Workloads that need very robust connectivity are usually better running over a local network or in a datacentre than via a public internet connection to the cloud. Examples of such workloads include enterprise resource planning, supply chain management and manufacturing systems, as well as financial, healthcare, transport and critical infrastructure applications.

Performance can suffer when an application has the potential to run in the cloud but is not optimised for it. Rewriting those applications to make effective use of the cloud can be expensive and disruptive

Performance can also suffer when an application has the potential to run in the cloud but is not optimised for it. Rewriting those applications to make effective use of the cloud – especially if they are already running well – can be expensive and disruptive.

When is cloud difficult to manage?

From an IT management perspective, cloud infrastructure needs the right tools and skills to be able to run.

An IT department might, for example, have just the right skillsets to manage its in-house storage infrastructure to maximise uptime and utilisation. They will know in detail how their on-premise arrays and storage area networks work, and how to get the best from them.

With the cloud, users have less granular control over the IT assets they operate. Vendors have improved cloud management tools, but it is still the case that hardware is optimised for the operational requirements of the cloud provider and "average" workloads.

Even if IT teams can fine-tune how they run cloud infrastructure, they face having to do so using multiple tools. They also need to understand how vendor performance tiers, availability and provisioning work. These may vary and be complex when taken together.

Analysts also point out that cloud-native applications can be more complex than conventional on-premise systems, and therefore consume more management resources.

CIOs also have to deal with a loss of control over IT assets, whether in the form of software-as-a-service (SaaS) applications or more complex shadow IT set up by individual departments.

What are the shortcomings of cloud in data protection and compliance?

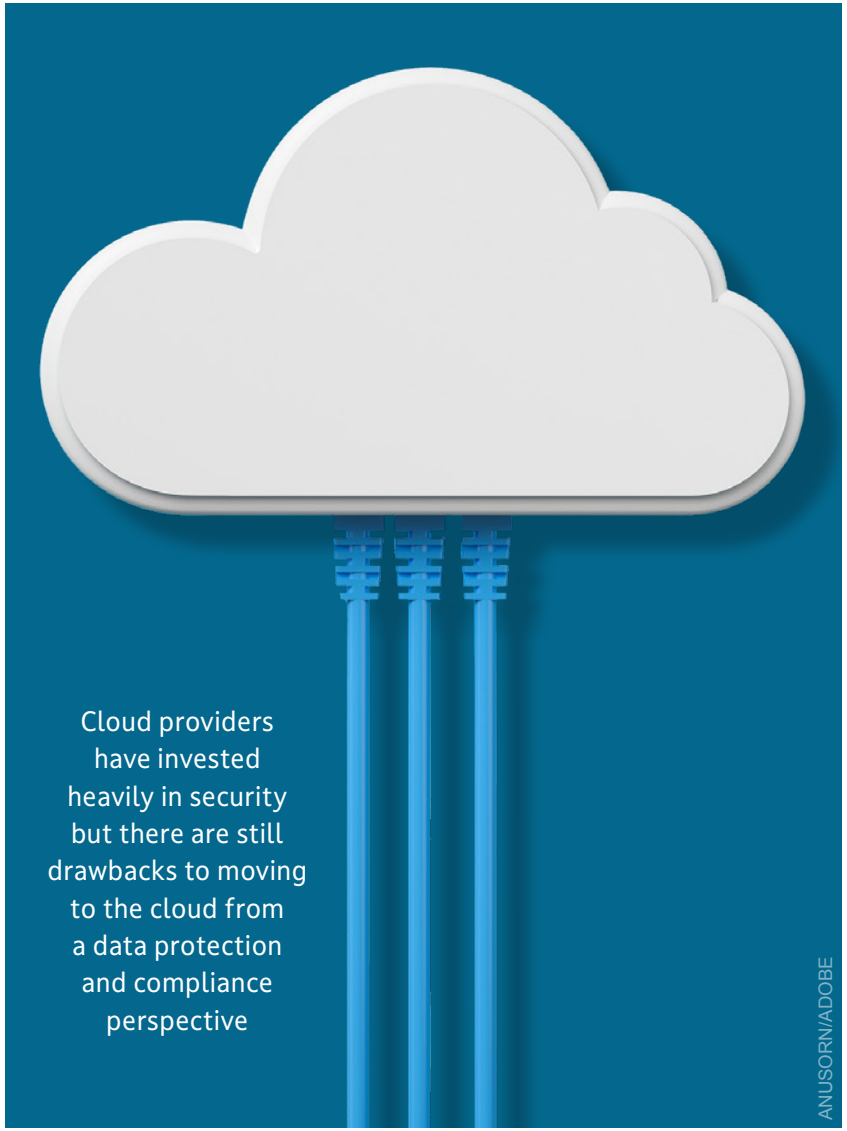
One area where cloud providers have closed the gap with on-premise technology is security and compliance.

Cloud providers have invested heavily in security over the past decade. Their size and scale allows them to attract strong talent and deploy the best defensive technologies. Cloud providers cannot afford to be victims of cyber attacks, and their security measures now are on par with or exceed those of all but the most security-focused users.

Nonetheless, there are still drawbacks to moving to the cloud from a data protection and compliance perspective.

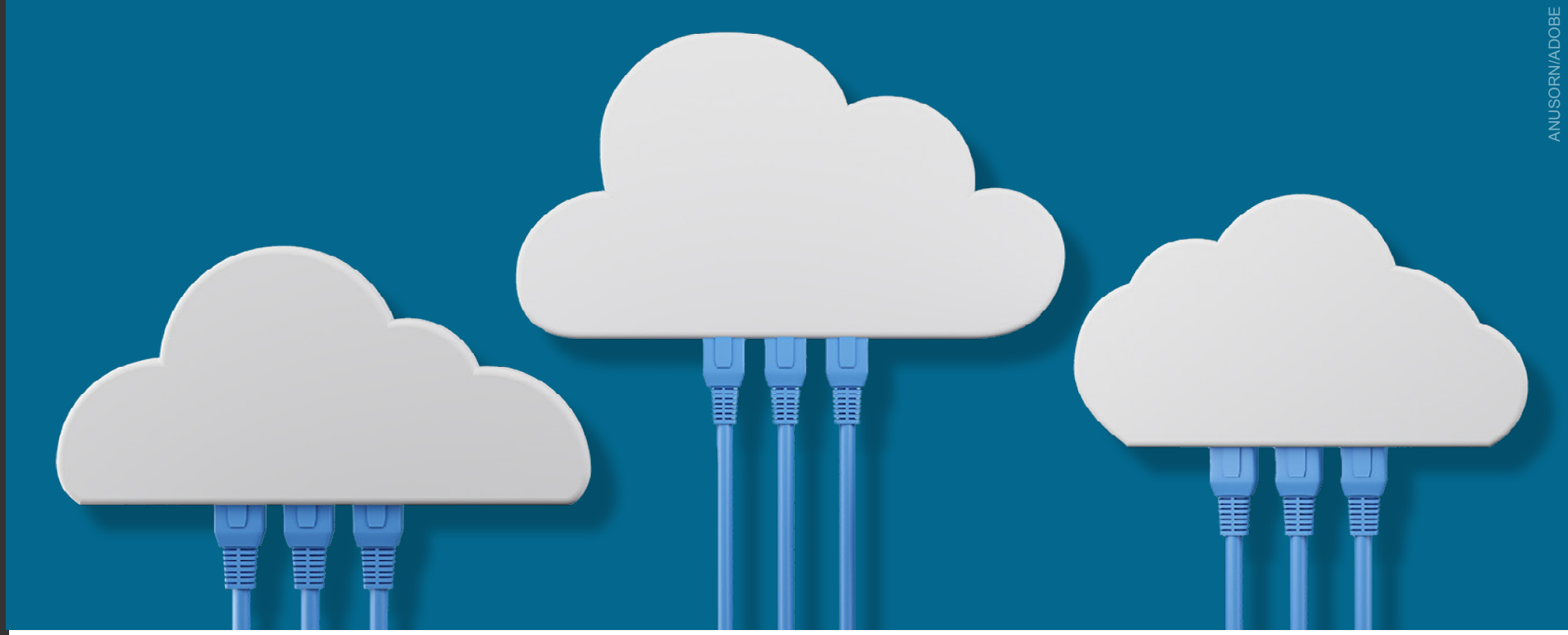
Although cloud providers are built for resilience and offer high levels of availability, that is for the infrastructure as a whole. They provide less protection – or even none – for a customer's data at file level, so firms still need to invest in backup, recovery and local data protection.

Customers also need to consider where data is stored. Geopolitical events, as well as law and regulation, have made data sovereignty a big issue, and not just in industries such as healthcare or banking. Although the hyperscalers have



Cloud providers have invested heavily in security but there are still drawbacks to moving to the cloud from a data protection and compliance perspective

ANUSORN/ADOBE



ANUSORN/ADOBE

responded, there are some applications where it is easier to store the data on-premise, at least for now.

How do I align business strategy and use of cloud?

The biggest potential drawback of the cloud is not technical at all. It is that organisations fail to align use of the cloud with their business goals. This can cause or exacerbate the financial, management, operational and data protection drawbacks of a cloud deployment.

It's not that cloud isn't a good solution, but it is often applied to the wrong business problems and in ways that don't make the most of the cloud's advantages.

"Organisations have seen cloud as a way of driving digital transformation," says GigaOM's Collins. "This could never be true in isolation from business strategy. For cloud to be the answer, it needs to be adopted strategically, which requires business understanding and involvement." ■

> **"Organisations have seen cloud as a way of driving digital transformation. This could never be true in isolation from business strategy"**
>
> Jon Collins, GigaOM