CLOUD FOR BUSINESS

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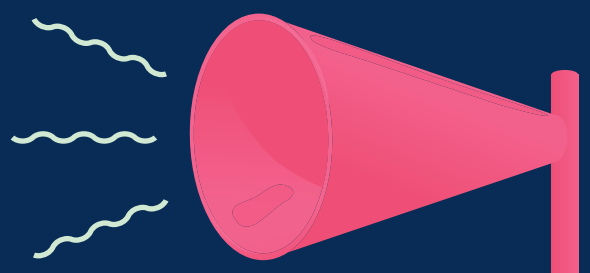

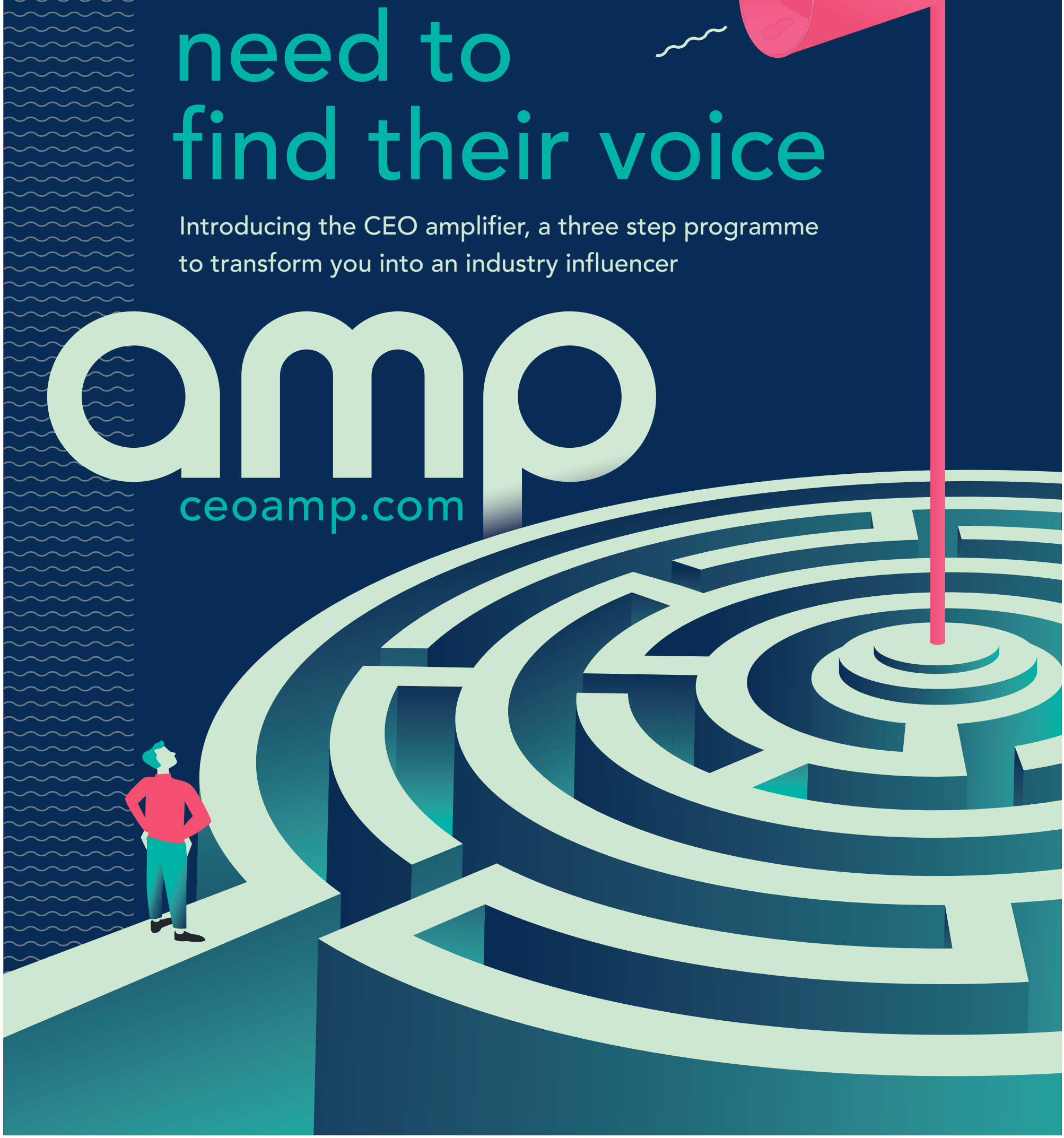

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STRATEGY

Why adoption still misses the mark

The impact of cloud computing can be transformational, but finding the strategy that works for your business is not always clear cut

Mark Samuels

Using cloud for business can create major advantages, from being able to scale IT resources on demand to launching new business models quickly. These advantages mean the cloud has become the go-to platform for adopting digital services in almost all organisations.

Take the example of European Tour chief technology officer (CTO) Michael Cole, who is using the cloud to develop what he refers to as the "tournament-as-a-service". This approach helps his IT team deal with the transient nature of professional golf. Everything the team does involves a temporary build as they run a tournament for a number of days, they decommission services and then move on.

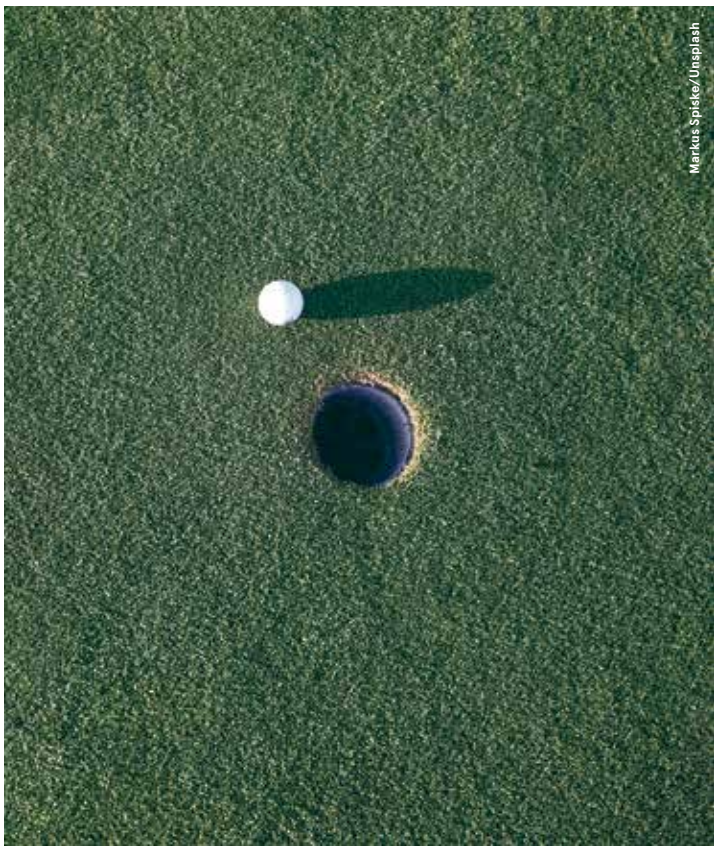
Mr Cole's team stages and supports 49 professional golf tournaments in 29 countries across a hectic annual sporting calendar. Using cloud for business across a series of data-led applications is helping his team to deliver a consistent technology experience quickly at every venue.

"Our employees can literally be anywhere in the world at any time, helping to stage, run and promote tournaments," says Mr Cole. "So we need an ability where we're able to make data accessible, wherever people are in the world, and the cloud gives us the degree of accessibility and flexibility to do that."

But while the European Tour is using cloud for business processes, there is still some way to go before on-demand IT is the norm for all enterprise applications. Analyst Gartner says that, while cloud is now the default platform for managing data, many businesses still use on-premise systems and some legacy technologies will remain long term.

That's even true in the most technologically advanced enterprises. Mark Holt, CTO of transport specialist Trainline.com, says his firm is a heavy user of the cloud. It runs a data lake in Amazon S3 and uses the open-source tool Apache Kafka to move information around the business. However, some data resides on older platforms.

"We have bits of legacy technology floating around still, much like everybody else. That can be a little bit painful sometimes. We're great when it comes to moving stuff to the cloud, but some of the legacy stuff that's an issue for us includes datastores," he says.


Markus Spiske/Unsplash

Yet Mr Holt is also a pragmatist. While small pockets of resistance remain, he believes it is sensible for his staff to focus their attention on using the cloud to develop game-changing innovations on behalf of Trainline's customers, rather than spending too much time on removing every trace of legacy technology from the business.

Legacy systems aren't the only factor; governance is another concern for IT chiefs who are using cloud for business. Gary Foote, chief information officer (CIO) at Haas F1 motor-racing team, says his firm uses the cloud whenever it can and it has adopted Microsoft's Azure platform. But he says there's still a lot of instances when the firm chooses not to use on-demand services.

"Our strategy is about being cloud sensible; we use the cloud where it makes sense operationally," he says. "Part of the challenge we have is that some of our workflow is restricted by the sport. The public cloud doesn't lend well to that model; it's quite hard to get the metrics out that you need to be able to report back in regard to governance."

Mr Foote says the team has recently gone out to tender on a communications matrix. This infrastructure includes multi-path redundancy and dual last-mile networking. He says this approach will help the team to boost resiliency and might allow his firm to start putting more critical services in the cloud.

The complex mix of cloud solutions and internal datacentres in many enterprises means the right cloud strategy involves a careful balance of priorities. While there are significant benefits from moving to the cloud, getting the best approach means focusing on the main concerns for the business over the long term.

Rana Bhattacharya, CTO at Atom bank, the UK's first mobile-only bank, is using Google Cloud to help support rapid delivery times. Mr Bhattacharya says one of the best-practice lessons from his firm's implementation of the cloud is the importance of developing internal capability to support new ways of working.

"Making sure we had the talent available was a big piece for us," he says. "This journey is not just about technology, but also about people and culture. Basically, we want to be controlling our own destiny, and we don't really want to be beholden to consultancies and third-party agencies."

Other IT leaders also stress the significance of cultural change. Lisa Emery, CIO at Royal Marsden NHS Foundation Trust, says working with partners can help organisations overcome skills challenges. Ms Emery has worked with various partners, including the Institute of Cancer Research, to source advice or consultancy.

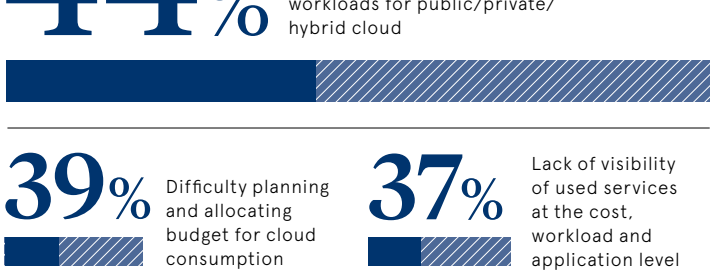
"In my team, you'll find some very skilled individuals, but perhaps more skilled around legacy systems," she says. "I think it's about taking the step as quick as you can to secure the right expertise to get you the right recommendations. I'm no cloud expert and, therefore, I'll go and seek the right people to give me that."

Using cloud for business, therefore, involves a significant amount of management effort, both in terms of dealing with internal expectations and choosing a cloud provider. Yet the good news, as Dubai Airports CIO Michael Ibbitson reports, is that going on demand is helping CIOs create a meaner, leaner IT capability.

"The transition to the cloud has allowed us to reinvest our people's time, so they're working with data to solve problems, rather than working with email systems and print servers and all that boring stuff that is the generic IT stuff every company has," he concludes.

TOP CHALLENGES FOR MANAGING CLOUD SPEND

Survey of IT decision-makers across Europe



Insight Enterprises 2019

CLOUD PROVIDERS

Competition cumulates in the cloud

With cost no longer the sole differentiator, cloud services providers must offer customers a lot more in the battle for top spot


Laura Vinck/Unsplash

Oliver Pickup

War clouds are gathering. The big three hyper-scale public cloud providers – Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP) – are preparing to do battle, with one another and challenger organisations, for territory in the second stage of the technology's maturity.

The first shots have already been fired by key personnel in the financial services industry. Is reputation dead? In September, a remarkable statistic, presented by YellowDog, a Bristol-based software company, revealed 81 per cent of information technology business decision-makers at financial services institutions in the UK and America describe their cloud procurement preferences as "agnostic". In other words, more than four fifths have not set up their systems to suit any single cloud provider and are open to newcomers.

Other eye-opening findings, in *Cloud Busting: Dispelling the Myths Surrounding the Future of Cloud in Financial Services*, a report that draws data from 200 respondents in the UK and United States, include that 94 per cent of those interviewed believe multi-cloud will save their respective organisations huge sums of money and the number of companies using four or more providers will double in the next five years.

YellowDog's study highlights the shift in dynamics in the cloud market, which it values at $200 billion (£160 billion). "It's interesting to see financial services organisations develop their cloud strategies as they discover what works best for them," says Gareth Williams, chief executive of YellowDog.

"AWS had a huge head start on the competition and many organisations felt they had become the mandatory choice as cloud provider. With GCP and Azure plus some challenger clouds investing heavily to catch up, it's not a surprise large financial services organisations are looking at multiple factors when designing their cloud strategy. The outcome is more commonly now to use more than one cloud provider."

Emma Roscow, intelligent cloud infrastructure lead for Accenture in the UK and Ireland, agrees.

> **Businesses have become savvier in their cloud operations. Cost is still important, but quality, agility and resilience in a crisis are equally valuable**

"Businesses have become savvier in their cloud operations," she says. "Cost is still important, but quality, agility and resilience in a crisis are equally valuable.

"Now that cloud is widely accepted as more secure, relying on one cloud provider alone seems risky. The question will now be who else to involve. With the playing field effectively levelled, a fierce competition is growing."

This chimes with John Starling, UK cloud engineering consulting lead at Deloitte, who is unsurprised that financial services organisations are agnostic about their cloud procurement preferences. He says: "There is often concern around vendor lock-in – being tied to just one cloud provider – which can be both limiting and costly.

"Over the last few years organisations have moved away from an overly simplistic cloud-first approach, meaning they are not simply moving to the cloud regardless of the use-case, to a more thoughtful cloud-right strategy, where they are being more considered about whether it makes sense for that process.

"At the heart of this is the realisation that moving to the cloud can be much harder than first expected, as well as increasing impatience for cloud to return real business value


Syda Productions/Shutterstock

Empowering the customer's customers

Unilever, a global giant worth $55 billion (£45 billion) and operating in 190 countries, has undergone a major digital transformation and turned to Azure, Microsoft's cloud computing service, for support.

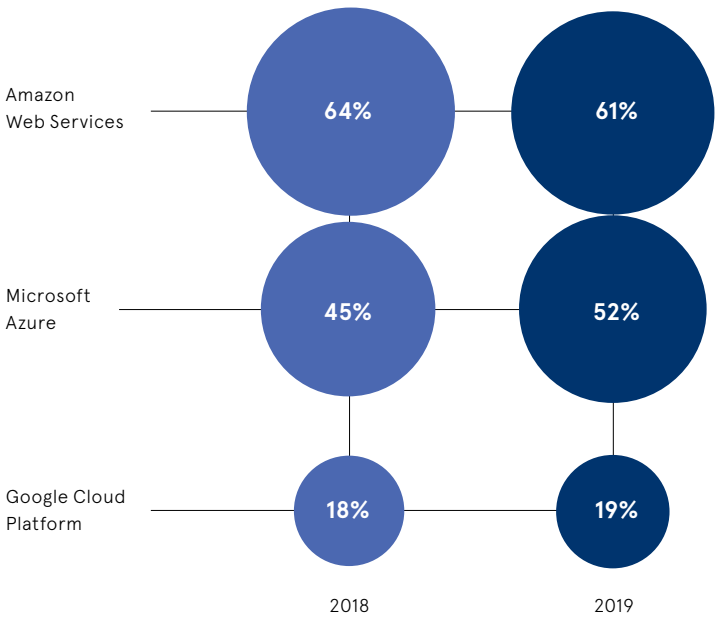
"What's transformative is the way we're connecting people, making data accessible to a broader employee base, and giving them the skills to analyse data to make better-informed decisions," says Jane Moran, chief information officer for Unilever, whose iconic brands include Dove, Vaseline and Ben & Jerry's. "That can have obvious benefits, like increasing efficiency, but also an impact on topics central to our business, such as sustainability."

Atom bank opted to use Google Cloud Platform for assistance. The mobile-only bank, authorised in 2015, aims to empower people to own their financial futures, with the desire to embrace the best technology to deliver an outstanding customer experience.

"As a challenger bank, every penny counts," says Atom bank's chief technology officer Rana Bhattacharya. "We need to do more with less. That's one reason why embracing the cloud helps us so much. This whole journey is really around removing obstacles, keeping costs low, and having more control and velocity around creating the right products, propositions and experiences for our customers."

PUBLIC CLOUD ADOPTION

Percentage of global IT professionals who use the following



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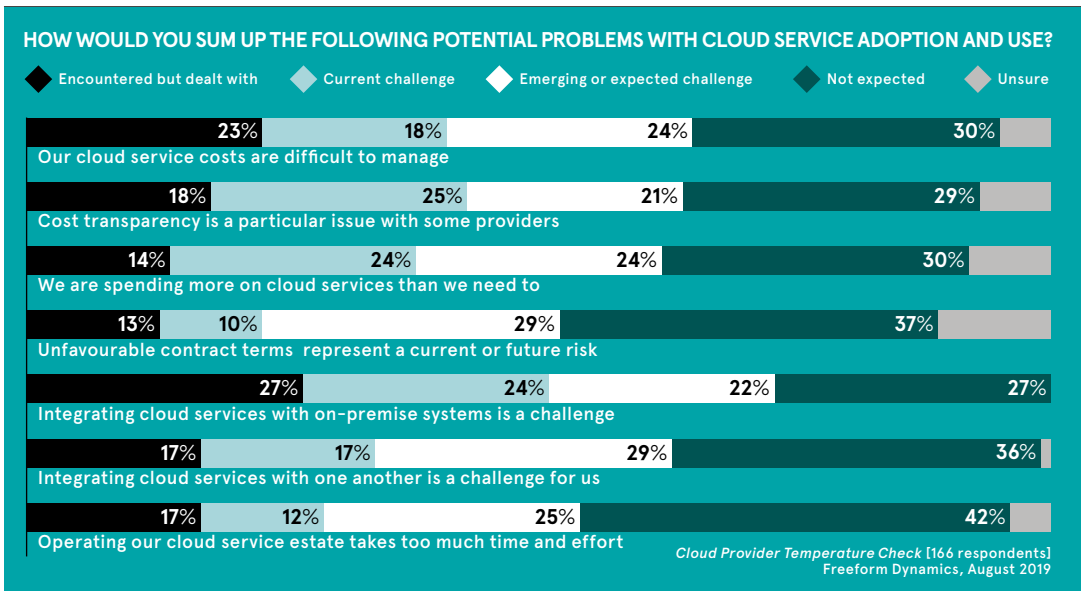

to the organisation. Aligning an organisation's cloud strategy to a business imperative makes much more sense."

Microsoft Azure's business lead Michael Wignall acknowledges the progression along the market's "maturity curve" and explains: "Organisations big and small tend to start with cloud migration. They take existing applications and projects that are traditionally run on-premises and move them to the cloud because of cost efficiency, scalability, security, reliability and flexibility.

"They quickly look to gain further competitive advantage, though, by innovating on the cloud and generally that means modernising existing applications or building new applications."

In the financial services industry, much of the decision-making revolves around risk, so it is no wonder organisations are increasingly lured by performance over brand. "As more services move over to the cloud the decision should be based on minimising risk, providing longer-term flexibility and value," says Mr Williams of YellowDog.

His organisation's research finds that "the cloud provider itself is the least important aspect for decision-makers when selecting their cloud providers" with an insight and data-led approach preferred, and return on investment also a crucial factor.

According to the *2019 European Insight Intelligent Technology Index*, published early this year, UK businesses are on average frittering away £8.8 million annually on unused cloud services, equivalent to £24,000 a day.

"An enterprise's priority is to ensure they receive the maximum return on their cloud investment," says Ozioma Uzoegwu, lead cloud architect at Insight, a software solutions company. "This means understanding where their workloads need to be placed, whether in public, private or hybrid cloud, and choosing providers to match."

Top cloud providers are realising they need to set themselves apart from rivals through better serving customers. However, as Mr Williams says: "This focus on performance means the barrier to entry is high; new entrants need to be extremely well funded."

Ms Roscow at Accenture concurs. "The good news for the big players is that this shift in the dynamics may work in their favour. Moving further up the value chain by offering services on top of their infrastructure is a natural next step. Several key providers are already creating data analytics tools and plug-in industry solutions, which will attract organisations looking for long-term value," she says.

"It will always boil back down to the business problem. The provider that can best answer this, and in doing so ensure their customer's success, will win the next leg of the cloud race."

Jostling for position, Adrian Poole, head of financial services at GCP in the UK and Ireland, claims "the pace of innovation we bring to clients is second to none". He says that, while return on investment isn't where it should be in the cloud market and needs to change, his teams are always focused on trying to solve customers' problems.

"It's not a case of saying to a client, 'We want to move your workloads to the cloud'. They need to understand why we would do that, how it solves their biggest problem, what the benefits are," says Mr Poole. "We're moving into an age of assistance. As cloud providers, we have to anticipate what our clients' needs are. Using artificial intelligence we can put forward appropriate propositions."

Microsoft's Mr Wignall is similarly bullish. "At Azure we talk about being inventive with purpose. We ground ourselves in Microsoft's mission statement, which is to empower people and organisations around the planet to achieve more. Our success is our customers' success," he says.

With the International Data Corporation predicting 90 per cent of large organisations will adopt hybrid and multi-cloud strategies by 2020, the battle lines have been drawn. ●

Outsourcing cloud management is the smart thing to do

Difficult cloud and data decisions can distract companies from their real business, so call in the experts

By 2025, each human being is predicted to produce around 34 terabytes of data during their lifetime, ten times the amount produced in total up to 2016. Given the rapidity in which this landscape is evolving, it's both understandable and necessary that businesses look for expert assistance when it comes to cloud optimisation.

Thankfully, a previously common inertia concerning cloud has been well and truly replaced as a consequence of the data revolution. However, placing change in the correct hands – either your own or an external provider's – brings about its own challenge.

"There are so many facets to consider and most can be mitigated by putting cloud and data decisions into the hands of experts so you can instead focus on your own core competencies," says Hiren Parekh, senior director of cloud services at OVH.

A top-ten cloud provider worldwide and Europe's number one, OVH leverages its smart – simple, multi-local, accessible, reversible, transparent – solution to assist clients in their increasingly complex data journeys.

> **There are so many facets to consider and most can be mitigated by putting cloud and data decisions into the hands of experts**

"These facets, first and foremost, include the agility to deploy and manage data," says Mr Parekh. "Cloud is now a central point of strategy for all companies, even those that were traditionally more hesitant as concerns around cybersecurity and the ability to manage so much data push through."

He also cites aspects of operational expenditure and financial control as a sometimes problematic consideration for companies trying to negotiate the new landscape.

"Managing costs and outlays for something that's developing as quickly as cloud utilisation isn't easy when it's not your core specialism," says Mr Parekh, referencing an August 2019 study OVH commissioned on cloud service adoption with Freeform Dynamics. "As cloud provision is an integral part of our supply chain, our cloud infrastructure becomes more manageable via monthly billing and an operating-expense model.

"It sounds logistical, but it's an apt consideration given the complexity of integration and how companies can struggle to manage this. It's where our focus on reversibility comes in, where open cloud with open standards can facilitate not just a lift-and-shift approach to data transfer, but also a turnkey, all-in-one house to store this data."

GROWING IMPACT OF DATA

OVH recently worked with a data analytics client to help them handle such large volumes of data, including the integration challenges that derive from mergers and acquisitions.

Leveraging OVH's differentiating industrial model, the datacentre consolidation exercise ensured a requisite level of agility to deploy and manage data through one centralised platform.

"Our integration capabilities helped them downsize and optimise what was a previously fragmented infrastructure, bringing together all their data in one safe place," says Mr Parekh.

"Our industrial model is a differentiator in this respect as we can own and manage the supply chain from end to end.

"No matter how capable companies think they are at managing this data in-house, they can never have the same scope as outsourced specialists."

This scope incorporates owned and operated servers, datacentres, water cooling technology, a dark fibre network and international, or multi-local, reach in the case of OVH. In fact, such is the company's acknowledgement of the growing significance of cloud optimisation that the business is transitioning to the OVHcloud brand.

"It's a direct reaction to the shift we're seeing," says Mr Parekh. "OVHcloud will have dedicated universes for specific market segments to fulfil customer needs in the right way. OVHcloud Enterprise for enterprise and business customers, OVHcloud Marketplace as an internal ecosystem for the OVH network and our OVHcloud Partner Program will educate clients while allowing them to focus on their own core competencies."

For OVHcloud, it's a tangible recognition of the growing impact that data is having in both public and private spaces. For prospective clients though, it's as clear a sign as ever that this revolution more often than not requires expert assistance.

"Success for us is facilitating other companies' successes," Mr Parekh concludes. "And in the era of data, success will largely be determined by how companies deploy and manage cloud."

For more information please visit www.ovh.co.uk

OVHcloud

MULTI-CLOUD

Making the most of a multi-cloud approach

As the name suggests, multi-cloud sees organisations using multiple and often-connected cloud services to increase scalability, reduce costs or become more agile in their application infrastructure. This approach has huge potential, as specific business needs can be met with targeted cloud solutions, although it does come with certain risks and complexity. Here's how multi-cloud can enable enterprise IT functions of the future

Christine Horton


Ink Drop/Shutterstock

1

Flexibility

Analysis from IT trade association CompTIA shows that 83 per cent of companies have already moved either infrastructure or applications to a second cloud provider. Further, Gartner predicts that multi-cloud will be the common strategy for 70 per cent of enterprises by the end of 2019.

One of the most compelling reasons for this move to multi-cloud is the ability to deploy the right workload in the right place. This provides much more choice than adapting, and possibly constraining, your workload or application to fit the tools you have available in a single-deployment model.

It also presents "try-before-you-buy" options that enable small-scale proofs of concept before jumping headlong into a long-term commitment for something that may yet prove to be unsuitable, says Dave Adamson, chief technology officer at cloud managed services provider EACS.

"From a chief information officer's perspective, selling these benefits internally can be a useful way for an organisation to get used to working in a multi-cloud world and learn the skills required to benefit most effectively from a multi-cloud strategy," he says. "This flexibility allows enterprises to select a provider on a per-application basis, as needed, though they must be mindful not to allow the sprawl of cloud providers to become unmanageable."


Markus Spiske/Unsplash

3

Avoiding vendor lock-in

There are several compelling arguments for wanting to avoid being tied to one technology vendor, not least in industries such as financial services where companies are required to prove they are not dependent on a single vendor by their governing bodies.

"The idea is that not 'keeping all of your eggs in one basket' will result in less risk," explains Chris Astley, director of cloud transformation at KPMG UK. "We see examples of this from the regulatory bodies for risk-averse industries such as banking and healthcare, which are fundamental to society and the UK economy.

"To avoid a scenario where all ATMs stop working or critical health services cannot be delivered, regulatory bodies will take precautionary measures and insist on the diversification of cloud infrastructure for organisations."

Elsewhere, other organisations are bound by geographic sovereignty requirements, which dictate that certain clouds might not be an available option in all locations. "In these scenarios, businesses must depend on a mature multi-cloud capability that is built on the understanding they may need to manage multiple clouds, driven by various local compliance requirements," says Richard Munro, director of global cloud strategy at multi-cloud infrastructure vendor VMware.


Josh Appel/Unsplash

2

Cost efficiency

Not everyone is rushing head first into the cloud; 2019 research shows 98 per cent of businesses currently still run on-premise servers, with 72 per cent planning to purchase new server hardware within the next three years. So any investment in multi-cloud must be tied in with the investment in your own on-premise servers, storage and networking equipment.

"Adopting a strategy of deploying predictable, relatively static workloads on-premise while bursting to the cloud when demand dictates is likely to be the most cost-effective option, and investing in standardised deployment models and tooling opens this up to organisations of all sizes," says Mr Adamson.

In addition, as cloud matures some basic aspects of technology are seeing prices fall. The commoditisation of infrastructure-as-a-service, or IaaS, means initial costs for some use-cases, such as storage or back-up and disaster recovery, can now be quite attractive.

Meanwhile, Mark Cree, chief executive of cloud storage solutions startup InfiniteIO, notes: "Data migration and tiering techniques have long existed, storing infrequently accessed files on private or public cloud storage, which is relatively less expensive compared to primary storage. Enterprise IT teams should support existing workloads moving to the cloud by making all the associated files available to people and applications regardless of location."

Developing your own IP and data analytics

Cloud platforms for developers have been a great leap forward for companies that are developing their own applications. An increasing number of businesses are realising that in the right markets or verticals their value lies in their ability to own their intellectual property (IP).

Robin Ody, analyst at Canalys, says global systems integrators have already made significant headway in this area. "Companies like Accenture, Capgemini, Deloitte and others have seen opportunities to mix cloud consulting, their own IP and applications, and managed cloud services, such as data science and analytics.

"For healthcare or manufacturing customers, cloud platforms offer greater flexibility and control to develop what they need, instead of buying more generic products, if they can find the skills and developers to help them do this, but that's a whole other story."

4

Johannes Plenio/Unsplash

Best of breed

In the cloud, one size does not fit all. Ultimately, multi-cloud enables businesses to pick the best tool for the job: the cloud provider that best solves the problem they are facing. Moreover, it minimises the likelihood that an organisation will be forced to stick to a cloud platform that isn't working optimally for them.

"The interoperability of multi-cloud not only allows businesses to move more rapidly and bring to market new services quicker, but also provides customers with the flexibility to choose the exact cloud service that best drives their business needs at any given moment in time," says Mr Munro at VMware.

"Adopting a multi-cloud architecture allows organisations to tap resources and services provided or hosted by any cloud provider they need to get the job done. This allows the cloud to act as the enabler, not the driver, of innovation. That role lies with the applications powering our modern world." ●

5

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Cloud's cost-performance balance

Be sure to get value for money when migrating to the cloud

"I thought this was going to save us money, not cost us more." It's a troubling and recurring cry from businesses looking to get a grip on their cloud migration strategies. Veering away from expensive in-house datacentres in favour of external cloud platform providers should be a secure and cost-effective tactic, but choosing which provider and level of service to opt for is proving an equally daunting proposition.

The aim of moving to the cloud is to leverage a data platform at a lower operational cost to reduce capital expenditure. But, as John Pocknell, database solutions evangelist at Quest Software has noticed, without the right guidance, many companies are struggling to find the balance between performance and outlay.

"The problem lies in the fact that cloud adoption affects all sizes of enterprise and cloud service providers subsequently offer a tiering system in accordance with the package you choose to pay for. However, companies we've spoken to often don't really know what service they need or what tier they're at in relation to the size of their operations and data volume," he says.

"Many therefore tend to overprovision. So, when they get their monthly bills, they are often higher than they anticipated, or even than they used to spend on their datacentres, because they weren't able to gauge what tier they should go in at."

With more than 30 years in the business, Quest Software is made up of five business units providing solutions to support digital transformation. Its database business specifically supports customers through cloud migrations, as well as other IT initiatives such as DevOps and open-source database adoption. Companies want to put their workloads in the cloud, but need to balance performance with cost.

> "Companies want to put their workloads in the cloud, but need to balance performance with cost

$206.2bn

estimated value of the public cloud service market in 2019

83%

of enterprise workloads will be in the cloud by 2020

94%

of enterprises already use a cloud service

66%

of enterprises already have a central cloud team or a cloud center of excellence

50%

of enterprises spend more than $1.2 million on cloud services annually

Hostingtribunal 2019

"You can only do this by testing and monitoring what you do before and after a migration. It's a luxury you don't always get by diving right in with a cloud provider, but we can facilitate this through tools such as Benchmark Factory Spotlight and Foglight for Databases," says Mr Pocknell.

Maximising data benefits and value

Testing isn't just necessary for cloud migrations, but for any database initiative. Preferring commercial database providers or opting for open source is one such decision, as is changing the database licensing mix to reduce maintenance costs.

"Every company's requirements are different and usually the only way to find out what works for you is to not just take the vendor's word for it, but instead to test, retest, and find the optimum level and tier of cloud management for you," Mr Pocknell explains.

"One client we worked with recently was migrating to the cloud and had prepared for 96 hours of downtime to facilitate this manually. These 96 hours equated to around $1.9 million in losses.

"Using our SharePlex database replication tool, we facilitated their migration in a more streamlined way, cut out all potential downtime and ultimately ensured they found the correct level of cloud provision for their needs."

Providers that provide transparency, value for money and performance will rise to the top of the market, and Quest is already setting itself apart in ticking all three boxes.

"There's a fourth box too and that's diversity," says Mr Pocknell. "The growth of multi-cloud environments and the use of more than one provider is a classic example of this need for businesses to try and find an optimum provider to find their own optimum cloud package.

"A company's ultimate vision is to benefit from the data they have and, as an organisation that works with most cloud providers, we can help businesses achieve this vision.

"We can provide consistent testing, monitoring and data movement to make sure, regardless of where the data is, you're maximising benefits and value from it."

For more information on how Quest can support your database cloud migration, please visit www.quest.com/solutions/cloud-migration/

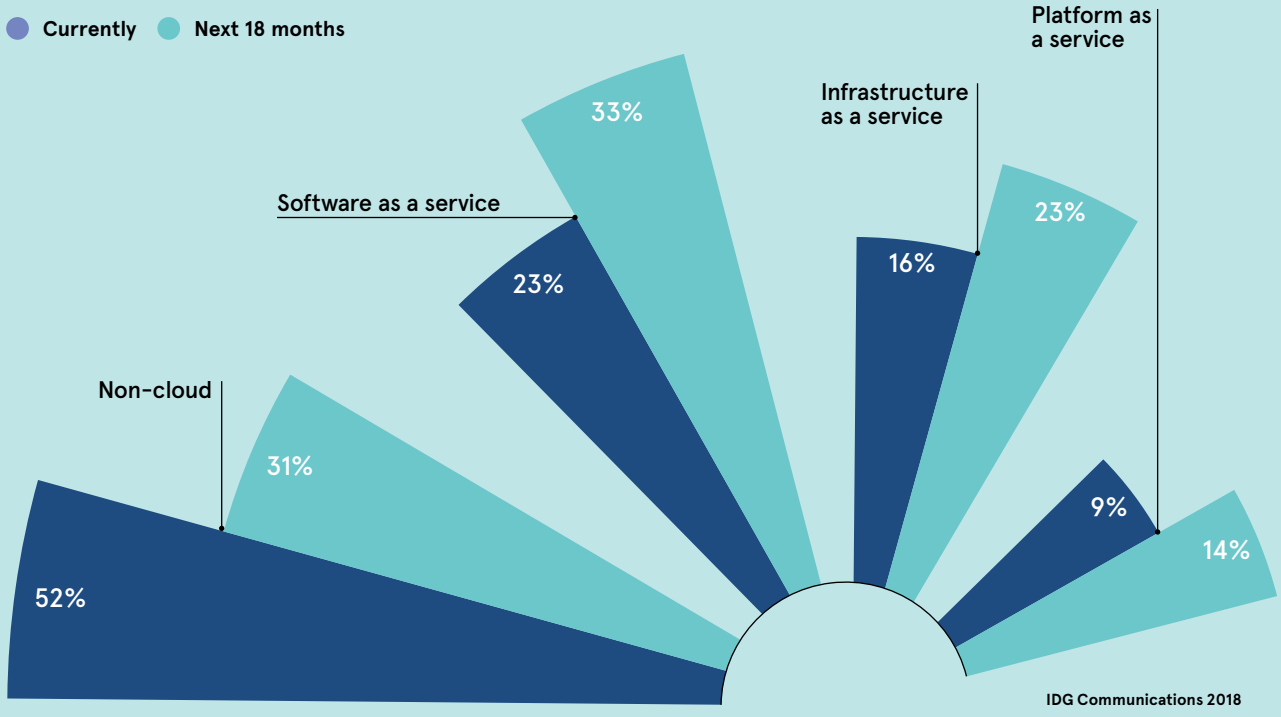
Quest

THE STATE OF CLOUD

Cloud computing adoption has come a long way, with the majority of small and large businesses moving away from on-premise infrastructure in favour of a multi-cloud or hybrid strategy. This infographic explores the world of enterprise cloud and how companies are approaching deployment

IT ENVIRONMENTS ARE CHANGING

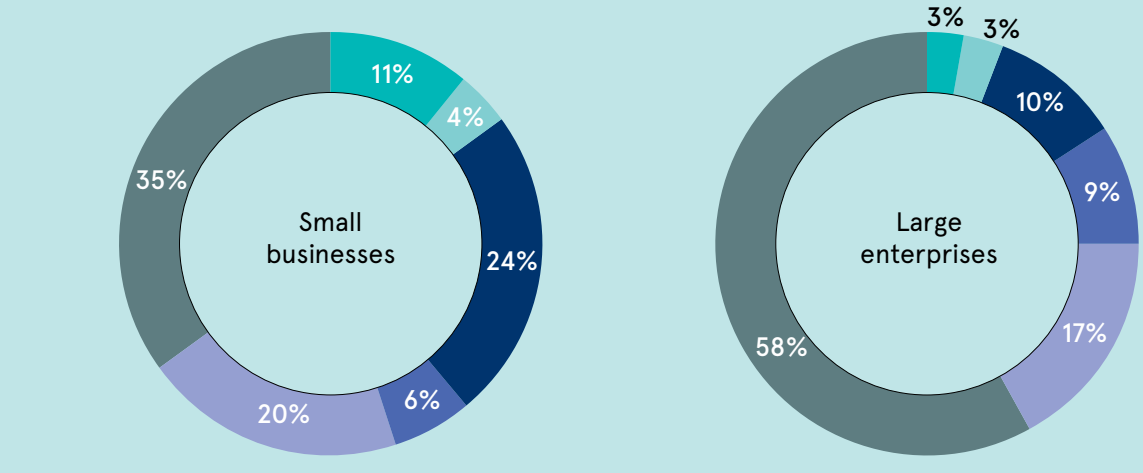
Where companies base their IT environments



IDG Communications 2018

LARGE BUSINESSES FAVOUR MULTI-CLOUD

Cloud strategies of large enterprises and small businesses



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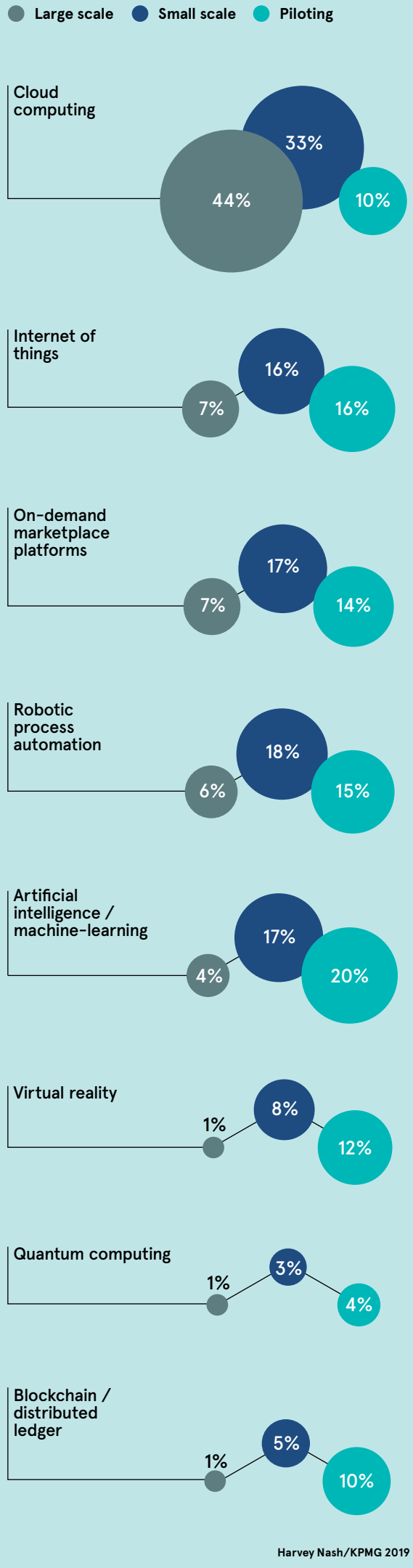
CLOUD ADOPTION IS WIDESPREAD

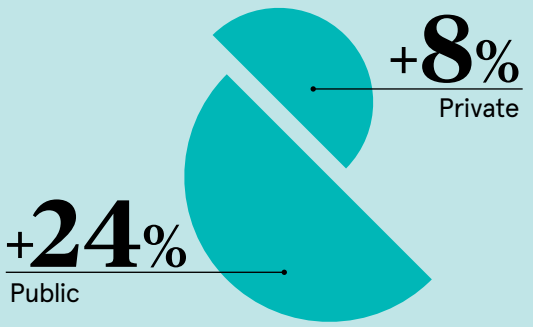
Chief information officers from every industry were questioned about the extent of tech adoption in their organisation



Harvey Nash/KPMG 2019

PUBLIC CLOUD BUDGETS ARE GROWING

How companies think their budgets for public and private clouds will change in 2019



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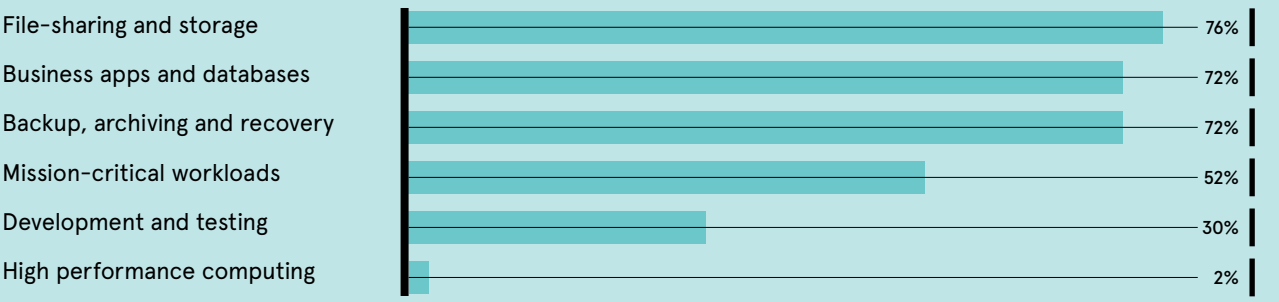
WHAT PUBLIC CLOUD IS USED FOR

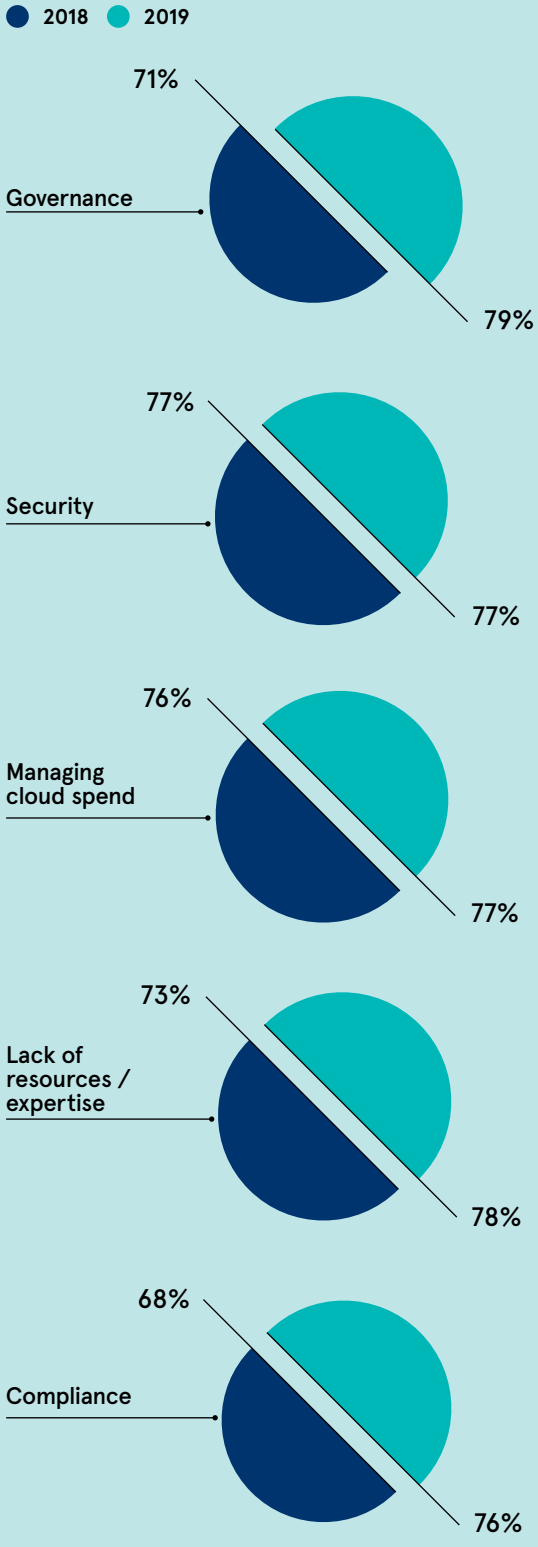
Types of workloads hosted in public cloud



Filecloud 2019

GOVERNANCE IS THE BIGGEST CONCERN

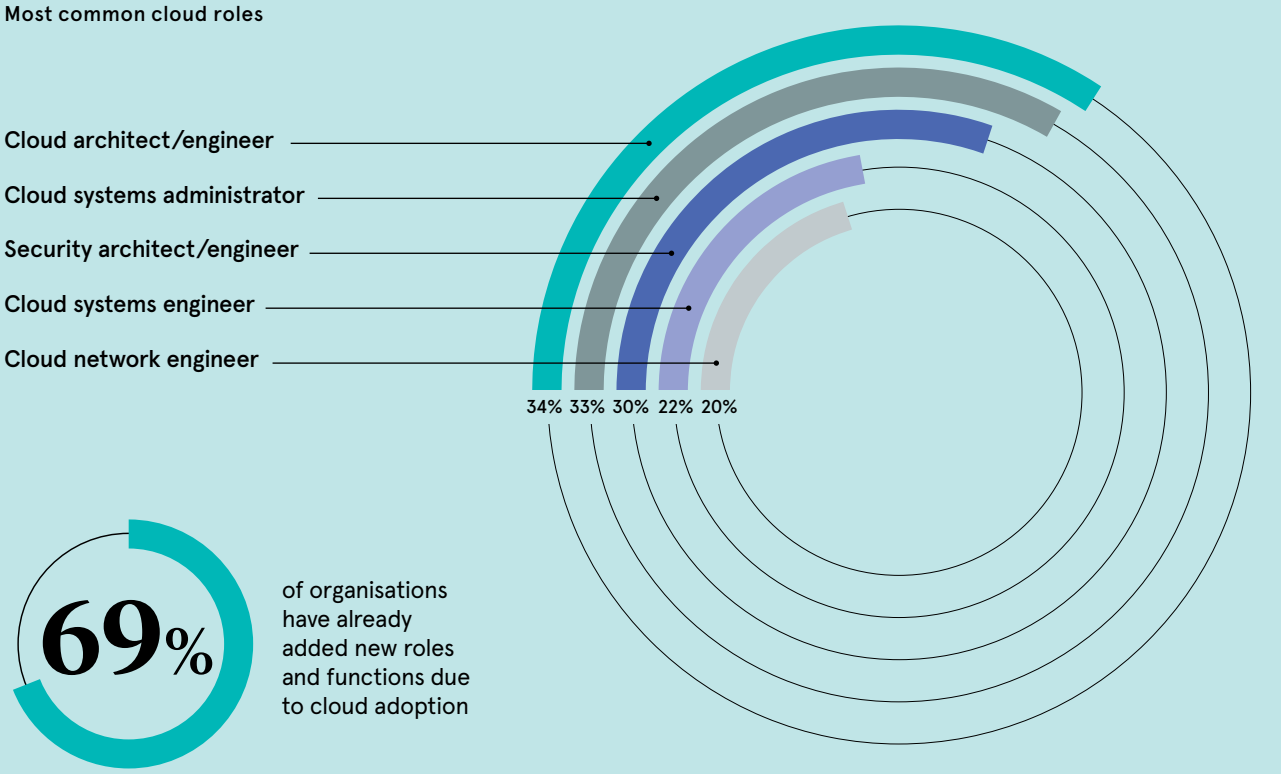
Top five cloud challenges IT professionals have when it comes to cloud adoption



RightScale 2019

CLOUD IS CREATING NEW ROLES AND FUNCTIONS

Most common cloud roles

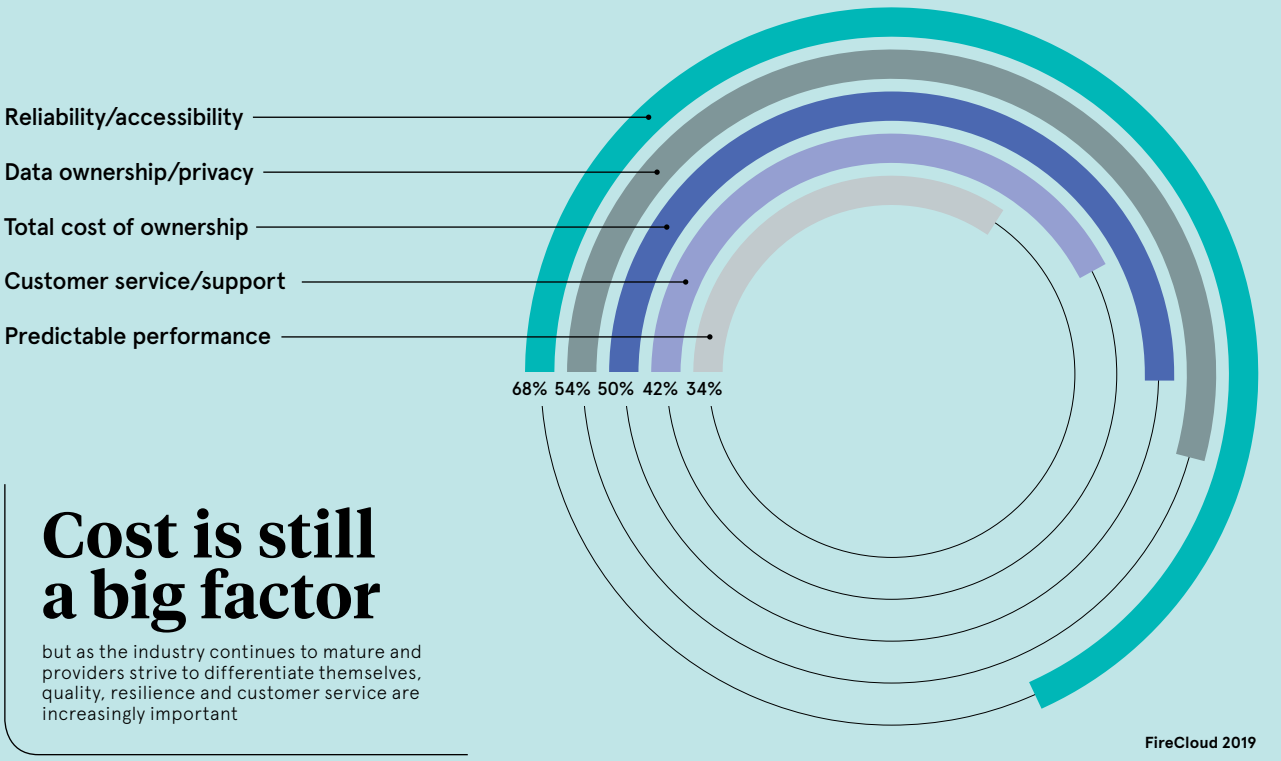


of organisations have already added new roles and functions due to cloud adoption

IDG Communications 2018

COST IS NOT THE BIGGEST DIFFERENTIATOR

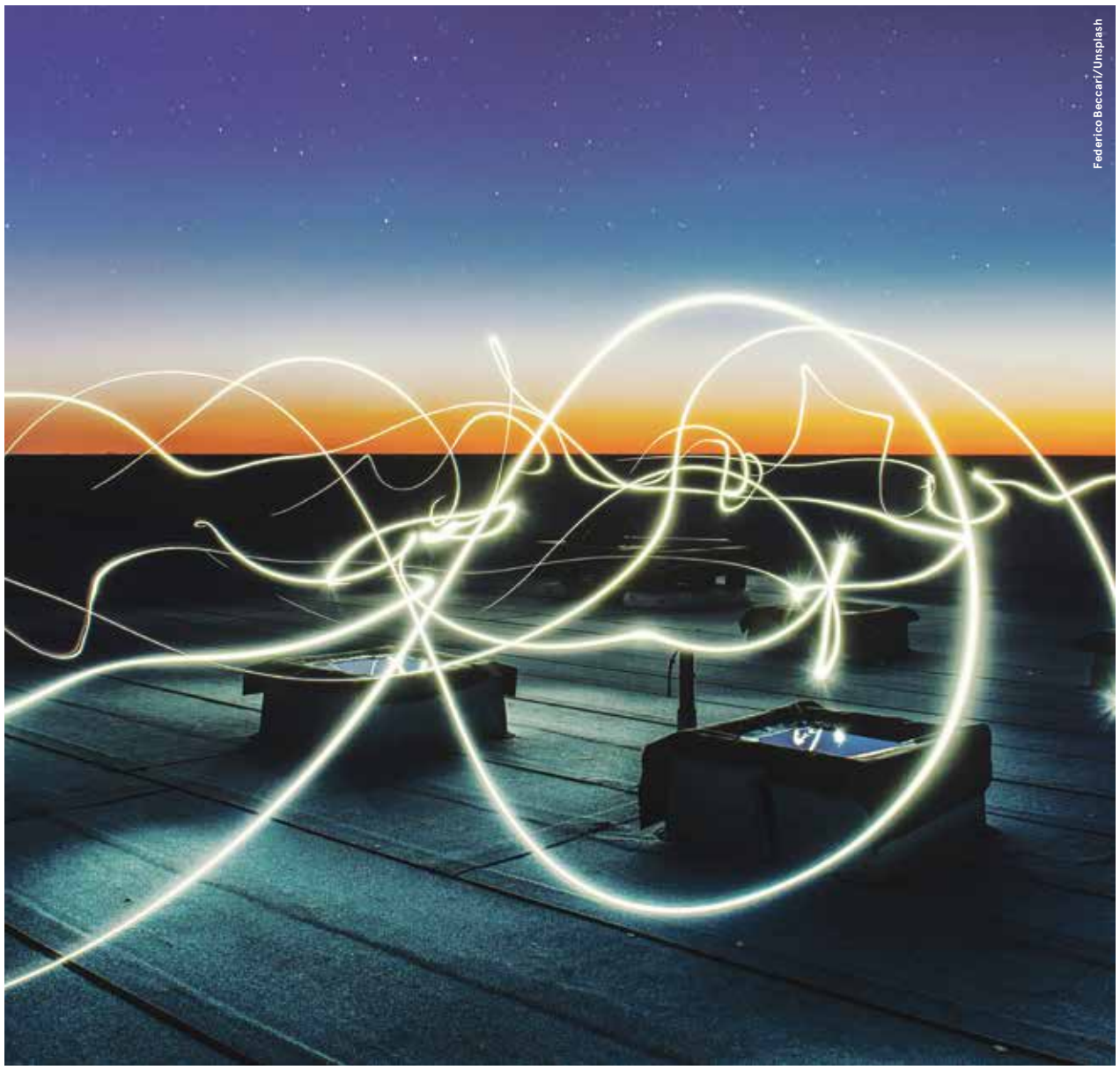
Leading factors when evaluating cloud service providers



Cost is still a big factor

but as the industry continues to mature and providers strive to differentiate themselves, quality, resilience and customer service are increasingly important

FireCloud 2019



Federico Beccari/Unsplash

ANALYTICS

Data quality: your company's biggest obstacle

Data analytics is becoming increasingly scalable, sophisticated and accessible aided by cloud infrastructure, but challenges remain in data quality and building the right culture

Ben Rossi

The data analytics market has evolved rapidly, applying algorithms to larger datasets on a more frequent basis by a wider group of people and practitioners. Many of the sophisticated algorithms deployed are now more than 50 years old, but the recent ubiquity of almost limitless data storage and compute power, and improved development tools, has enabled greater scale.

Data analytics systems have advanced to apply more complex analysis in a much more responsive manner. Analytics remains all about creating insight and providing answers to important questions, which businesses can exploit to achieve improved outcomes. Contemporary systems now apply machine-learning to more diverse datasets, where the analysis is driven to a larger extent by the computer rather than the operator. The real-time arrival of new data enables insights to be discovered as soon as they occur.

Historically, the demand and needs of corporate data have been less onerous. But as companies now look to leverage their data, rather than just record it, a rapidly growing major issue is the veracity of that data. The quality of the analysis conducted is only ever as good as the quality of the data fed into a system. Increasing the quality and management of data has not yet been a requirement, but this leads to the creation and use of data that isn't up to scratch for the type of analytics companies need to develop.

Analytics tools and technologies are to a large extent commoditised, but the single biggest challenge for organisations to exploit them is the creation and availability of adequate datasets. Establishing these foundations is typically a particular problem in organisations that have not historically fostered a data-centric culture.

"Sometimes relevant data doesn't exist and when it does its location is often poorly understood, riddled with quality issues and spread across multiple systems of record," says Paul Fermor, UK solutions director at Software AG. "The majority of organisations that have realised the potential value of their data are engaged in substantive projects to improve its quality, real-time availability and integration across systems."

Senior leaders want data analytics capabilities for their organisation, but can often become frustrated with slow progress due to the underlying limitations of their existing core data infrastructure. This is particularly common in companies that have grown through acquisitions, leading to fragmented technology, teams and cultures.

The rise of cloud has helped resolve data infrastructure scalability concerns, providing data analytics software as a service. Cloud has ensured the latest tooling is readily available without the need to maintain and patch, while traditional database administrators can build machine-learning models without the knowledge required just a few years ago.

"Cottage industries and data fiefdoms will gradually disintegrate; the future of data analytics is in the cloud," says James Tromans, technical director at Google Cloud. "Those with the correct clearance can quickly start applying advanced data analytics to a valuable business problem in a way that simply wasn't possible previously."

The injection of new technical capability into organisations means their ability to transform with cloud infrastructure is becoming much easier. Increased availability of the infrastructure that algorithms reside in means major cloud providers are racing to add on related technology such as live streaming or security. As well as the analytics, they want to cover the control and regulatory compliance of the data.

An example of a company already combining machine-learning and data analytics in the cloud is Ocado Technology. Partnering TensorFlow with BigQuery, Ocado developed a mechanism for predicting and recognising incidents of fraud among millions of other normal events using data collected from past orders, as well as cases of fraud. Creating a reliable model, Ocado improved its precision of detecting fraud by a factor of 15.

Sometimes relevant data doesn't exist and when it does its location is often poorly understood, riddled with quality issues

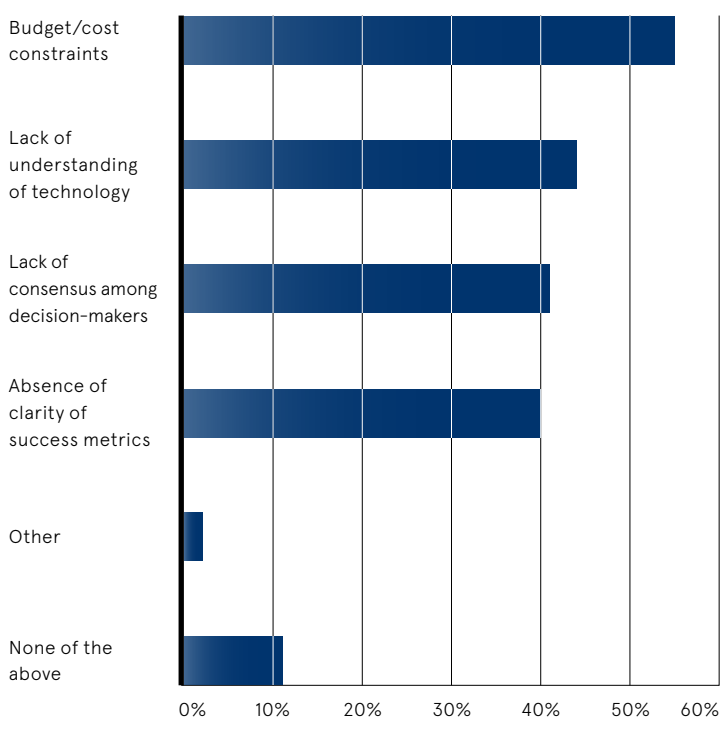
"Business and industries are being disrupted by cheaper, more agile competition. How they respond is based on how they are able to manage and exploit their data," says Nick Whitfeld, head of data and analytics at KPMG UK. "The culture around data needs to change. Organisations need to fully understand that if the quality of data at the point of creation is poor, this will undermine investment or focus in the future of data analytics."

Mr Fermor at Software AG believes the future of data analytics will address harder problems, such as creating more human-like machines. "This might manifest itself in more convincing chatbots and artificial intelligence assistants, or improved medical diagnosis tools. There are also efforts to automate the machine-learning process, which is still driven by humans, and create a less technical, self-service approach to creating and deploying sophisticated models," he says.

Organisations that want to become data enabled must evaluate their skills and operating models in the future of data analytics. Ensuring they are able to process and exploit data quickly will require an ecosystem of talented people, who are geared up to work at an unprecedented level of accuracy.

TOP OBSTACLES WHEN IMPROVING DATA QUALITY

Data modernisation and cloud computing survey of IT leaders in large US companies



Deloitte 2019

Embracing the benefits of private cloud

Delivering unified communications and contact centre solutions on a private cloud is a straightforward and appealing proposition for enterprises looking to up their customer service game

In an age of constant disruption for both established and startup firms, businesses of all sizes and operating across every industry must ensure they have the technological tools to adapt rapidly to changing market conditions.

According to a study from Accenture, 63 per cent of major organisations are currently experiencing high levels of disruption, forcing all firms to rethink the technologies they rely on if they want to remain competitive.

Public cloud offerings have often sold themselves as an answer to these issues. The problem with them, however, is that public cloud solutions can sacrifice data security for scalability. This is as true in the data storage world as it is in the realm of unified communications and contact centres.

And for organisations that hold large amounts of confidential data on their customers, this is a trade-off that simply cannot be accepted. Add to this the fact that public cloud solutions are infamously difficult to customise and it's little wonder large enterprises tend to shun them.

But what if you could gain the scalability and innovation promised by a public cloud solution, while keeping the security and customisation benefits at the same time?

According to Avaya, a global leader in solutions that enhance and simplify communications and collaboration, this is something that large enterprises are clamouring for. And it's available in Avaya's ReadyNow solution, which delivers contact centre and unified communications technology through a private cloud hosted in a UK datacentre.

The company says that its private cloud solutions provide a number of distinct advantages that may better suit the needs of forward-thinking enterprises.

"While firms may be comfortable with public cloud offerings for general activities, the reason why major enterprise customers are increasingly asking for a private cloud over public cloud is because they know one size fits all doesn't work. These businesses require a customisable solution that can be delivered remotely and meet stringent data security policies," explains Ayman Majzoub, senior director of private cloud and managed services at Avaya.

Private cloud solutions can still offer the same level of efficiency and scalability as public cloud solutions, but because computing resources are not split with other businesses, users of private cloud solutions can benefit from improved control and security. This enhanced level of management allows organisations unprecedented levels of flexibility over how they can tailor their cloud environment to ensure their exact business requirements are catered for.

A locally hosted cloud solution is also a valuable service for large organisations, especially those in industries such as insurance or financial services, which handle millions of personal customer records. Each country or region an organisation operates in is likely to have specific regulations that require data to be stored in a much more secure way than a public cloud solution may be able to offer.

Plus, delivering a service which may be suitable in one geography might not work for the specific market requirements in another country.

"Many countries, including Russia and China, have regulations which dictate that the data must reside in the nation it was created in. We recognised this early on, which is why we made the decision to invest heavily and create partnerships to host data from those regions in a way that is consistent with local laws and regulations," says Mr Majzoub.

Consuming contact centre and communications technology via a cloud-based model can also offer a notable upgrade against legacy technology. Many contact centres rely on out-dated technology and software that simply can't stay up to date with digital customer demands. Adding new communications channels, including text and Twitter messaging, may not be an easy task on these old systems, but cloud-based models can prove to be extremely flexible and nimble for these purposes.

From up-to-date compliance to eliminating in-house maintenance and the use of innovative features, embracing the advantages of cloud-based communications hosting can assist firms in their mission of exceeding customer expectations.

With features such as intelligent call-routing and advanced analytics setting forward-thinking firms apart from slow-to-react competitors, major organisations can ensure they remain competitive by unifying communication channels in silos into a fully cloud-based solution. Many of these benefits remain present on public cloud-based platforms, but private cloud wins out on customisation to a large organisation's specific needs and on security.

> **We've invested in data security to ensure businesses receive the same level of security they would on-premise**

"We've invested in data security to ensure businesses receive the same level of security they would on-premise. Our customers tell us that because we have a global presence, we help deliver these technology services where their business grows and expands," adds Mr Majzoub.

Besides the benefits of scalability and flexibility, companies can achieve increased levels of reliability, as cloud platforms benefit from higher uptime rates compared with legacy on-premise systems. And the big benefit comes in shifting IT expenditure to an operating-expense model.

"Since the 2008 downturn, we are seeing lots of mergers and consolidations in the business world, either to reduce cost or achieve efficiencies, which means IT infrastructure needs to be unified," says Mr Majzoub.

Digital transformation is forcing analogue companies to adapt and use services based on new technologies to compete. Businesses realise as time has gone by IT departments have often expanded and there is a renewed focus on using providers to migrate some workflows to gain valuable advantages.

From reducing costs to improving performance, alongside a major crunch on capital expenditure and a move to operational expenditure, firms are increasingly not wanting to pay upfront and are looking for new operational models, so they can invest capital in other areas.

For ReadyNow, its private cloud solution, Avaya has partnered with IBM to launch datacentres in the UK and Germany, enabling enterprise customers to move their on-premise communications technology seamlessly on to a private cloud and benefit from local hosting wherever they require.

Avaya's ReadyNow solution eliminates much of the friction associated with implementing advanced cloud infrastructure and can help improve the process of pilot testing and establishing proof of concept. ReadyNow also takes the burden of maintenance away from organisations, so staff can be deployed on more strategic projects.

Thanks to standard configurations being prebuilt, ReadyNow allows organisations to deploy a cloud-based system rapidly and customise the solution to their needs. In addition, the solution facilitates easy scalability, which is increasingly important for businesses operating in industries facing disruption.

For more information please visit www.avaya.com

AVAYA

Experiences That Matter

EMPLOYEES

Enhancing employee education on the move

Cloud is shaking up traditional employee development, but what impact has this had on the workforce and, ultimately, business performance?

Suchandrika Chakrabarti

While learning and development (L&D) is at the heart of a company's digital transformation, gone are the days of providing employee training during induction or group classroom sessions.

The digital revolution has transformed the technology used to train employees, as well as expectations of access to learning materials. The challenge for firms is to ensure L&D evolves alongside employees' needs, particularly for staff working remotely.

A solution could be in cloud computing, which can support career development in a fast-paced digital age. "Techniques and methods are constantly evolving, so you need to be constantly learning or you will quickly fall behind," says David White, head of project management at Best Response Media.

One of the major advantages of cloud computing can be talent retention. Ian Cook, vice president for people solutions at Visier, references his firm's recent *Gender Equity* report, which used cloud data to uncover a "manager divide", a growing under-representation of women, aged 32 and above, in management positions. "The manager divide is closely tied to the childcare years," says Mr Cook, "when women experience increased demands from their home life and may even exit the workforce as a result."

Addressing this issue involves offering employees flexible, location-independent working and training. "We offer our 50-plus employees very flexible working opportunities and career progression," says Victoria Usher, founder and chief executive at GingerMay, a consultancy that uses cloud-based solutions such as Google Drive, Dropbox and Slack. Ms Usher oversees a senior leadership team made up of 85 per cent working parents and which is 85 per cent female.

Employee performance becomes an ongoing dialogue, ensuring no employee gets left behind as digital evolves evermore rapidly. Cloud computing can make training part of the everyday interaction between manager and employee.

"Constant contact on feedback, training and performance makes employees feel they are more engaged with the business, compared to six-month or yearly reviews," says Mr White. This is essential for teams with remote workers. For example, managers can easily check that everyone seconded on to an important project has been through the same L&D modules.

Making the cloud the baseline technology used in training employees reflects how digital has woven its way into all of our lives, making L&D more user friendly. "We're all used to consuming infinite apps, content and games, and we're looking for this same experience at work," says Mr Cook. "This conversational review cycle can help employees learn and grow more quickly, and keep them motivated."

> **These technologies have single-handedly had the biggest impact on our workforce and performance**

Nevertheless, digitising training can't make employees learn more quickly or feel completely confident in newly acquired, but untested, skills. "Although our flow of feedback has grown faster, the human ability to grow and master skills hasn't," Mr Cook adds.

Without a structured process for managers to listen to feedback, build training plans and conduct performance reviews, implementing the cloud as the main training technology can make employees feel disconnected, as though their work is just disappearing into the ether.

"This responsibility comes down to the manager," says Mr White. "There is nothing worse than giving feedback that you don't think is going to be listened to." Maintaining trust in the colleagues and managers beyond the training technology remains vital.

Ms Usher has seen the positive impact of utilising the cloud in her business. She says: "Combining multiple cloud-based solutions enables us to be a more attentive employer to our employees. As a result, over two thirds (68 per cent) of staff work part time, flexi-hours or from home." This clearly cuts down on office space and costs, while leaving employees happier.

Mr White also believes moving training to the cloud has been transformational for Best Response Media. "These technologies have single-handedly had the biggest impact on our workforce and performance," he says. "We have been able to increase efficiencies and reduce costs at the same time."

Importantly, the ability to review and analyse the impact of cloud-based training is pivotal to its success, says Mr Cook, who predicts a bright future for the use of cloud computing. "Just because we have lots of content, doesn't mean it's actually working. Training analytics can be used to develop more impactful training programmes," he says.

In addition, collecting and understanding data can help highlight dissonant trends in promotion rates, performance reviews, resignation rates and so on. As a result, employers will benefit from a much better understanding of their own organisational culture, as well as properly trained staff. ●

Joseph gruenthal/Unsplash

Three business leaders discuss the benefits of cloud-based employee development

James McAulay, founder of musician bookings platform Encore

Cloud technologies have made employee development seamless and collaborative, and allow materials to naturally evolve as the business evolves. New recruits are given a set of onboarding materials called the Encore Academy.

1

Spreadsheets are used to provide a framework for the onboarding. Recruits are given lists of reading material, checklists and milestones they can mark as completed during their first few weeks. The master spreadsheet links to dozens of other documents, which is extremely simple when everything is in the cloud. This checklist can be updated by anyone in the company, as new materials and articles are created. Every employee at Encore has a one-to-one check-in with their manager on a fortnightly basis, with notes kept in Google Sheets. This makes it easier for managers to keep track of recurring issues, and gives them somewhere to note down successes they want to recognise and areas for improvement between meetings.

Nigel Davies, founder and chief executive of intranet software provider Claromentis

Our people work flexibly and often from home, so everything happens in our digital workplace, from product development to human resources to culture. That meant e-learning was a natural fit for the way we work, but it's not enough to offer training in the cloud or even to assign a budget for learning. It has to be cultural. We give everyone in our business a yearly budget of £1,500 each to spend on training courses of their choice. But, finding that some people weren't taking full advantage of this benefit, we decided to make it a bigger part of our culture. Now we encourage people to attend training courses in small groups, so they get the social benefits, and to report back the highlights. Our learning management system is now a bigger feature in the digital workplace; people see it as soon as they login in the morning.

2

Sean Marshall, vice president for worldwide sales at ecommerce marketing platform Klaviyo

Our sales leaders use the Chorus.ai platform to capture client calls, which are then used for group training. In monthly meetings with team members, we review a series of calls, pause them where needed and then ask questions like, "How do you think this person handled this objection?" and "What do you think of the way they closed the call?" It's a live forum that we can hold with our team anytime we want to, on the fly. Chorus.ai lets you listen to what actually happened on a call, instead of asking a rep to retell it in a one on one. We hear firsthand how customers are responding to our messaging and what objections they might have. This insight is helping us to drive awesome improvement in our sales team, including quarter-by-quarter increases in our win rate.

3

Boutique beats big in the digital workplace

Enterprises are racing to embrace the digital workplace, but the traditional route of engaging large IT consultancies is not driving the transformation needed to get there

Workplaces have been transformed by technology over the last 25 years. From the large beige boxes sat underneath desks and the clunky monitors and telephones of the 1990s, to the smart devices, wireless network capabilities, and software and services that allow people to work wherever they are, digital innovation has reimagined working practices.

The promoter of digital workplace is the cloud, providing a feature-rich, ever-capable set of products upon which businesses can consume the latest applications and services. But while the benefits are clear, enterprises with hidden and complex legacy IT can run into a myriad of issues when trying to transition.

"The first and critical objective is to establish robust co-existence," says Simon Reid, managing director at OKTiK Technology. "The complexity of workforce demand in large enterprises, their reliance on current configuration data and services often at volume, constrains the ability to rapidly migrate. The key failure of most transformations is business disruption caused by problems related to this, which makes a robust co-existence solution crucial."

Irrespective of co-existence, there are other aspects of a transformation which need focus for a successful outcome. These include addressing infrastructure and application issues, security protocols, and users' appetite for change and adoption.

In the face of these challenges, many enterprises turn to the large IT consultancies and outsourcers hoping their resources and experience can help deliver the transformation. But while these companies appear low risk with a well-defined new world, typically they are not able to undertake the client's most difficult challenges, where assistance is most valuable, in mitigating the unknown and complex legacy challenges.

"Asking these companies to deliver complex change rapidly and without disruption seldom results in the outcome envisaged," says Mr Reid. "The ability to execute and the caveats in the contractual terms formed at early engagement are often inhibitors. The 'unknown' frequently results in unpredicted overspend and the pressures of having spent millions to only migrate a handful of users become too much to bear."

Given the complexities and legacy issues, large organisations are realising they can benefit more from engaging with niche, highly specialised, flexible consultancies that leverage the local knowledge within in-house teams to deliver the objectives.

OKTiK Technology has assembled a team of leading experts who collectively have transformed workplace environments for some of the largest and most complex enterprises globally. The company has developed a suite of applications – bespoke mechanics, environment intelligence gathering and analytics – to deliver a user-centric, automated, "one-click" experience for transition to the cloud.

"We have a process to bridge the gap between legacy and new technology, while we're in the background continuously mitigating those unknown difficult challenges," says Mr Reid. "It's all about acceleration with consideration. The faster we go with minimal risk and impact, the lower the cost to the customer. That's how we differ from the big guys: we're able to adjust to unforeseen environment or technical blockers quickly, not bound by an A-to-B service agreement."

OKTiK Technology was retained by a large European enterprise after a strategic move to combine countries operating models and acquire new companies and brands, following which a large IT consulting firm was chosen to create a single organisation wide digital workplace to service a 25,000 users base.

Eighteen months into the programme, however, it was evident that the complexity of the proposed solution couldn't guarantee a minimum user impact approach to transformation. The implication was then a higher risk, unknown project cost and time to transform. OKTiK was engaged to provide a rapid solution, plan and strategy to address these key issues.

"We immediately set about stabilising the current environment and implementing a robust co-existence strategy," says Mr Reid. "By working with our client we have developed an effective solution and engaged the business through communications and education. Our core focus is user first and how can they be least disrupted. It's destined to fail if you don't have the community onboard with what you're doing."

"Large organisations are realising they can benefit more from engaging with niche, highly specialised, flexible consultancies

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OkTik

OPEN SOURCE

Open season for future innovation

The collaborative nature of open source technology is enabling innovation at an astonishing rate and could hold the key to future breakthroughs

Jon Axworthy


Krisztian Bocsi/Bloomberg via Getty Images

Have you typed in a Google search today? Shared a file on Dropbox? Used an Android phone or just looked at a friend's image post on Facebook? If you've done any of these things then you've already benefited from open source technology, where priority is given to free software that can be seen and worked on by anyone with an interest in making it better.

At its inception in the late-nineties, the concept of open source was viewed by businesses with a mix of distrust and bewilderment. After all, why would a company simply give away tech infrastructure that could give it a competitive edge and open itself up to security issues at the same time?

"It's only recently that it has started to gain ground in the enterprise mainstream," says Stephan Fabel, director of product at open source specialists Canonical. "Previous hesitance was often down to a poor understanding of open source tools, and a fallacy that it is both unsupported and lacks the necessary security and compliance for commercial use."

However, over time there has been an awakening that open source technology provides a space for companies to collaborate in a way that's mutually beneficial.

"What was one just the tool of disruptive companies is now being relied on by more traditional organisations, who are increasingly pushing their developers towards this ecosystem," explains Mr Fabel.

Google's Android is based on the open source Linux operating system and the tech giant is one of the top contributors to the Linux kernel, the largest open source project in the world with a staggering 13 million lines of code.

In 2016, Microsoft announced that SQL Server, its corporate data software, would run on Linux as well as Windows. This is truly a measure of how far the concept of open source had come – in 2001 former Microsoft chief executive Steve Ballmer infamously called Linux a "cancer that attaches itself in an intellectual property sense to everything it touches".

What businesses, big and small, have come to realise in those intervening years is that open source technology promotes progress and the collective approach to innovation is having a significant impact in areas such as cloud computing, artificial intelligence (AI), machine-learning, microservices and blockchain.

One of the most exciting projects to come out of the open source revolution is Kubernetes, a tool helping companies running their software on cloud services. It enables them to get the most out of the processing power they're paying for by identifying machines that are being underutilised. So, if the software detects that a machine is not being optimised, it will load it up with another task so it's working as hard as it can.

In doing so, Kubernetes helps companies harness processing power and run their software more efficiently no matter how many machines they have and no matter how many competing cloud services they're using. This is especially useful for companies without a refined IT service as it makes managing commercial software cloud servers much less of a headache.

These abilities are all underpinned by open source code so it enables a company to build a system tailored to their needs, which will evolve as it becomes more successful and expands its operations.

Originally open sourced by Google in 2014, Kubernetes has remained relevant technology because of the open source community that supports it and it's consistently one of the top projects on GitHub, the open source cloud server used by developers to store and manage code.

Twitter, Huawei, Intel, Cisco and IBM are just some of the businesses that have been involved in its development over the years thanks to the fact that Google donated it to the Cloud Native Computing Foundation, a collective of open source development advocates.

> **Open source allows people to collaborate and promotes a meritocracy of ideas**

"The beauty of open source licensing and governance models are they allow people to collaborate on them and promote a meritocracy of ideas within these projects," says Stephen Watt, distinguished engineer and head of emerging technologies at Red Hat, which contributes to more than 450 open source products.

"This has the by-product of reducing redundant efforts, striving for the same outcomes and providing the opportunity for the best minds to collaborate on the same project. You only need to look at the business impact of Linux, big data platforms and Kubernetes to see how open source is out-innovating alternative and proprietary models of software development."

The most striking recent example of this is TensorFlow, Google's AI framework, which was open sourced in 2015 and has since been downloaded more than 40 million times.

Of course, the decision to open source TensorFlow wasn't purely altruistic as the proprietary software that drives it was held back. However, the software released was enough to allow companies and developers to build applications that rely on machine-learning, and in doing so TensorFlow grew stronger and more robust as the open source community found different uses for it.

Since launch, it has been used by researchers to detect breast cancer and forecast earthquake aftershocks, by developers to build apps to help reduce obesity and diabetes, and by businesses from eBay to Airbnb to enhance the user experience.

Red Hat's Mr Watt believes that it's this kind of collaborative approach that will drive future tech breakthroughs. "I think society has yet to discover a better way to bring the brightest minds together and

'Building the road as we travel across it'

One of the most interesting and controversial projects currently utilising open source technology is OpenAI, a research company with some heavyweight investors. Elon Musk, Reid Hoffman and Sam Altman are just some of the big names backing the San Francisco-based lab in its mission to create artificial general intelligence software in the safest environment possible.

OpenAI has made its research in areas as diverse as computer vision to natural language processing open source and it's in this last area that it has recently raised important questions regarding the fine ethical line open source tech must tread going forward between innovation and misuse.

GPT2, OpenAI's most recent software, is a text generator that was found to be so good – "generating text of unprecedented coherence", according to the company – that it decided not to open source the framework for fear it could be used maliciously in the generation of spam and fake news.

"We need to perform experimentation to find out what they can and can't do," says Jack Clark, OpenAI's head of policy. "We're not saying we know the right thing to do here; we're not laying down the line and saying `this is the way'. We are trying to develop more rigorous thinking. We're trying to build the road as we travel across it."

WHAT ENTERPRISE OPEN SOURCE IS BEING USED FOR

Global survey of IT leaders who were familiar with open source technology

RedHat 2019

encourage them to collaborate in an open manner to produce these types of breakthroughs," he says.

"The notion of the open source collaboration model also extends beyond software and spans complementary disciplines like data, content and hardware. It's the confluence of this collaboration model that holds the key to significant breakthroughs."

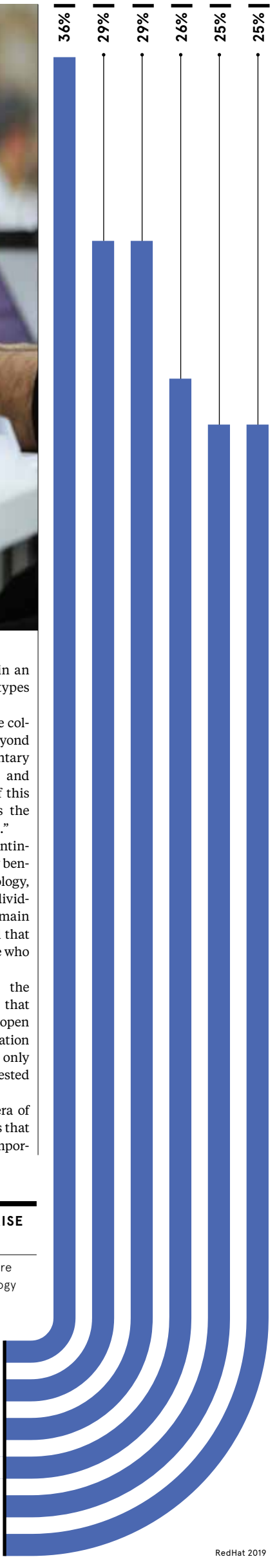
Critically, there must also be continued collaboration between every beneficiary of open source technology, from tech industry giants to individual users, for open source to remain a friction-free innovation model that isn't just the playground of those who are well funded.

From its Linux origins to the advances in machine-learning that are currently being witnessed, open source tech is enabling innovation at an astonishing rate that will only increase as more and more interested parties accept it.

As Mr Watt concludes: "The era of open has arrived and companies that evolve and embrace it will play important roles as co-creators." ●

TOP BENEFITS OF ENTERPRISE OPEN SOURCE SOLUTIONS

Global survey of IT leaders who were familiar with open source technology



RedHat 2019

Embracing multi-cloud to empower digital transformation

Experiencing the true value of digital transformation means empowering developers to use whichever clouds they need to create the best revenue-generating applications. But issues relating to data mobility and application logic hold organisations back

Business has transformed in the last decade as companies have been forced to ride the waves of digital transformation. Initially a consumer-led trend sparked by the release of the iPhone in 2007, the app revolution that followed quickly accelerated demand for services and interactions with companies online and via mobile.

Soon businesses that were technology first in their approach and delivery, such as Uber and Airbnb, had a distinct competitive advantage which they used to disrupt industries. They went from niche to mainstream at rapid speed and fuelled the prevailing mindset that every company is now a tech company, placing digital at the heart of their business.

Being a technology-first company equates to putting applications at the forefront of driving the customer experience. This has created a golden era for developers, who are on the front line of crafting these digital services. Previously, in-house developers typically worked on back-office applications, helping streamline organisations' business processes. Now they play a crucial role in the customer-facing apps that drive revenue.

"They're empowered because they are realising they're front and centre of the business," says Rob Whiteley, vice president of marketing for NGINX at F5 Networks. "AWS and other cloud providers taught us if you make technology easy enough to consume, developers will adopt it. This increases their productivity and enables them to spend more time focused on creating compelling applications, instead of dedicating a lot of their time to maintaining core infrastructure."

Empowering developers means allowing them to choose whatever technology solves their problems. However, companies struggle to maintain this ethos when it comes to cloud. They understand it's risky to have just one cloud provider. Firstly, outages have become more frequent and longer in duration, forcing developers to seek multiple clouds for improved resiliency. Secondly, different clouds have different strengths, spurring developers to seek multiple clouds for the best functionality. But there are key barriers to multi-cloud.

Cloud providers make it easy to move data on to their platform, but once there it's costly and time consuming to get large quantities of it back out, even if there's no inherent lock-in. Meanwhile, if developers take advantage of multiple cloud services, their application logic in each one is so tightly coupled to functions such as authentication, databases and security that they can't just pick it up and move it to another cloud.

"They would need to completely refactor it," says Mr Whiteley. "Each cloud has its set of cloud-native services, but they're programmed, costed and invoked in different ways. Even if you can move your data, you're stuck having to move the application itself, unless everything was designed multi-cloud from the beginning. Most companies were born in a single cloud, grew in it and it wasn't until they had an outage or hit some critical mass that they wanted to diversify. The key is balancing developer choice between cloud native and something that scales across cloud boundaries."

NGINX is an abstraction layer that sits below the application and above the proprietary infrastructure which fits in each cloud. By deploying it as a delivery layer on every cloud, developers can code once against the NGINX standard and then move this across any cloud. Containers have provided abstraction for compute, software-defined storage enables it at the data layer and NGINX is the solution for the application services layer.

> **Investing in this abstracted application services layer allows an application to move effortlessly across cloud boundaries and unlocks the ultimate vision of multi-cloud**

75%

of organisations will be completely digitally transformed in the next decade

90%

of all new apps will feature microservices architecture by 2022

35%

of all production apps will be cloud native by 2022

"Companies realise that the first generation of cloud first was necessary, but not sufficient, with lock-in and risk. Multi-cloud is the next wave," says Mr Whiteley. "Those that get it wrong will become obsolete. They have to think how they're going to tackle cloud challenges knowing that one day they're going to move some or all of their app to another cloud.

"Developers don't want to code services such as authentication and encryption into applications. They need to code against a reliable set of programmable services. Investing in this abstracted application services layer allows an application to move effortlessly across cloud boundaries and unlocks the ultimate vision of multi-cloud."

For more information please visit www.nginx.com

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