# CLOUD FOR BUSINESS

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Almost half the UK's smaller businesses are set to spend more on cloud technology

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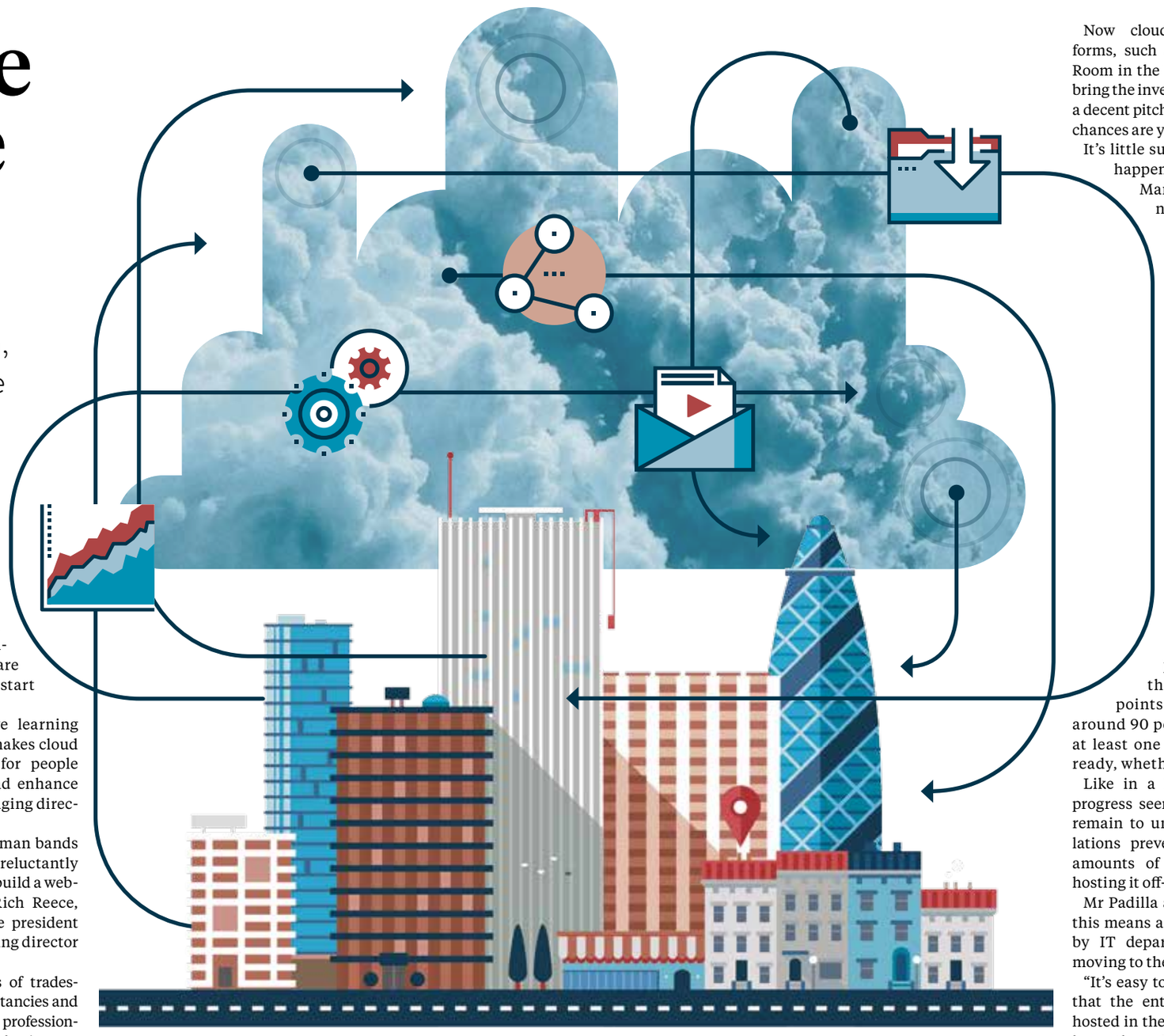
Cloud computing has made many ideas from our favourite books and films an everyday reality

## The UK's future is taking shape in the cloud

Cloud computing, with its benefits of affordable scale, speed and collaboration, is spreading across the business landscape



**OVERVIEW**
DAN MATTHEWS

The cloud is the infrastructure in cyberspace from which a new digital landscape is being shaped. Advances in exciting, emergent innovations, such as the internet of things and machine-learning, are being driven forward by this ubiquitous internet technology which promotes speed and collaboration.

In a cosmic blink of an eye it has transformed the world of work and the structure of business, literally causing organisations to reshape everything they do from how and who they recruit, to the energy and resources they commit to simple operations.

"The cloud's scalability, flexibility and ubiquity helps companies cope with the internal and external pressures that come with growing into new markets or launching new products and services," explains Len Padilla, vice president of product strategy at NTT Communications.

"Procuring ICT as a service through the cloud eradicates the barriers associated with on-premises systems, accelerating the pace of change and making it possible for IT to deliver new capabilities as fast as the rest of the business demands them."

Large companies are learning to love the cloud. It's greener than old legacy systems, which is great for public relations; it's pay as you go, which means there's little or no waste; there's a lot less capital investment to make upfront; and it's flexible, at a stroke turning you into one of those agile businesses you hear so much about.

For small businesses it's arguably even more useful. Many startup costs are reduced to a singularity, communications are elegant, data is accurate, immediate and everywhere, while the cost of scaling your business is also cut drastically.

The cloud helps businesses of any size create products faster and with far greater reach than before. It aids small and medium-sized enterprises, such as Sim Venture, which is about to launch a cloud version of its Windows-based simulation software that helps people learn how to start and run a business.

"Reduced costs, collaborative learning opportunities and ease of use makes cloud technology a natural choice for people seeking to acquire, develop and enhance skills," says Sim Venture's managing director Peter Harrington.

The cloud even helps out one-man bands that only a few years ago were reluctantly coming to terms with having to build a website, says Rich Reece, Europe vice president and managing director of Intuit.

> We have reached a tipping point where adoption continues to rise, paving the way for new, disruptive technologies

"The likes of tradesmen, consultancies and small-scale professional service businesses all extract significant value in being able to run their business on the go, and collaborate with customers, suppliers and clients in real time," he says.

Mr Reece says finance is an area particularly ripe for change. The cloud eliminates paperwork and businesses can make fast, informed decisions based on the real-time data at their fingertips 24/7.

"The previous alternatives were complicated and unwieldly spreadsheets or even physical records, both of which radically drained resources and kept owners from seeing a complete picture of their business," he says.

The cloud is even having a say over how businesses are securing finance. Just ten years ago firms seeking venture capital, or even a loan, had to allocate time for a grand tour of financial institutions. Even then there were no guarantees of finding one prepared to stump up the cash.

Now cloud-based crowdfunding platforms, such as Crowdcube and Syndicate Room in the UK and Kickstarter in the US, bring the investors to you. So if you can write a decent pitch and run a viable business, the chances are you'll get the money you need.

It's little surprise, then, that adoption is happening at light speed. Maurice Martin, director of cloud business at Microsoft, says his clients need little encouragement to make the switch. "Most of the conversations I have with customers these days are about how organisations transition data to the cloud, not why," he says.

"Microsoft, among others, has been educating organisations what the benefits of moving to the cloud are. We have reached a tipping point where adoption continues to rise, paving the way for new, disruptive technologies."

Matthew Wyatt at global technology business CGI estimates that within three years between 70 and 80 per cent of businesses will have the majority of their operations in the cloud. Intuit's Mr Preece points to research suggesting around 90 per cent of UK businesses run at least one application in the cloud already, whether they are aware of it or not.

Like in a British summer, the cloud's progress seems unstoppable. But barriers remain to universal adoption. Data regulations prevent industries holding large amounts of sensitive information from hosting it off-site.

Mr Padilla at NTT Communications says this means around 10 per cent of apps run by IT departments are prevented from moving to the cloud.

"It's easy to fall into the trap of thinking that the entire IT architecture must be hosted in the cloud, but not everything belongs there. Decision-makers we have surveyed on the whole did not believe cloud to be the best option for systems of record, directory and identity management applications," he says.

"This sentiment was especially true in industries such as financial and legal services where security, governance and compliance issues dictate strict data protection and data security, which often means that data remain on-premises or in corporate data centres."

It's come a long way in a short time, but the cloud is still an infant industry relative to its potential. This year it will change at warp speed, diversifying with new complexities that serve our needs in better and more relevant ways.

Perhaps it's a good time to pause, take stock and assess where the capricious winds of the technology sector are blowing the cloud.

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### TOP 5 BENEFITS ACHIEVED FROM CLOUD SERVICES DEPLOYMENT

Survey of public and private UK companies

**TANGIBLE**

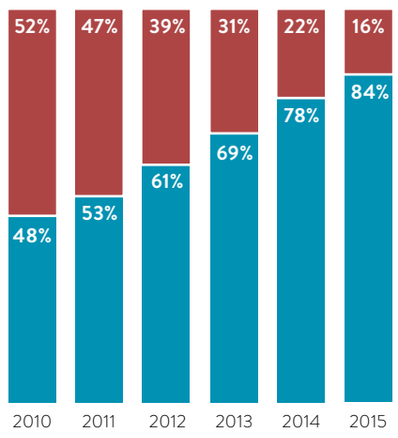
01 More flexible access to technology
02 Faster access to technology
03 Cost-savings over on-premise solutions
04 Reduction in capital expenditure
05 On-demand/predictable cost

**INTANGIBLE**

01 Improved customer service
02 Improved collaboration between departments
03 Improved customer engagement
04 Doing more development through an agile methodology
05 Improved communication between departments

### GROWTH OF UK CLOUD ADOPTION

Does your company have any hosted or cloud-based services in use?

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**RACONTEUR**

PUBLISHING MANAGER **Nada Ali**
PRODUCTION EDITOR **Benjamin Chiou**
MANAGING EDITOR **Peter Archer**
HEAD OF PRODUCTION **Natalia Rosek**
DIGITAL AND SOCIAL MANAGER **Sarah Allidina**
DESIGN **Samuele Motta, Grant Chapman, Kellie Jerrard**

**CONTRIBUTORS**

**CAROLINE BULLOCK** Former business editor, currently focused on technology writing, she contributes to *The Independent, Data Centre Management* and *Talk Business*.

**HAZEL DAVIS** Freelance business writer, she contributes to *The Times, Financial Times, The Daily Telegraph* and *The Guardian*.

**DAN MATTHEWS** Journalist and author of *The New Rules of Business*, he writes for newspapers, magazines and websites on a range of issues.

**CHARLES ORTON-JONES** Award-winning journalist, he was editor-at-large of *LondonlovesBusiness.com* and editor of *EuroBusiness*.

**GREGOR PETRI** Research vice president at Gartner, he covers cloud computing, brokerage and service provider strategies.

**MARK SAMUELS** Former editor of *CIO Connect* and features editor of *Computing*, he specialises in IT leadership issues.

**DAVEY WINDER** Award-winning journalist and author, he specialises in information security, contributing to *Infosecurity* magazine.



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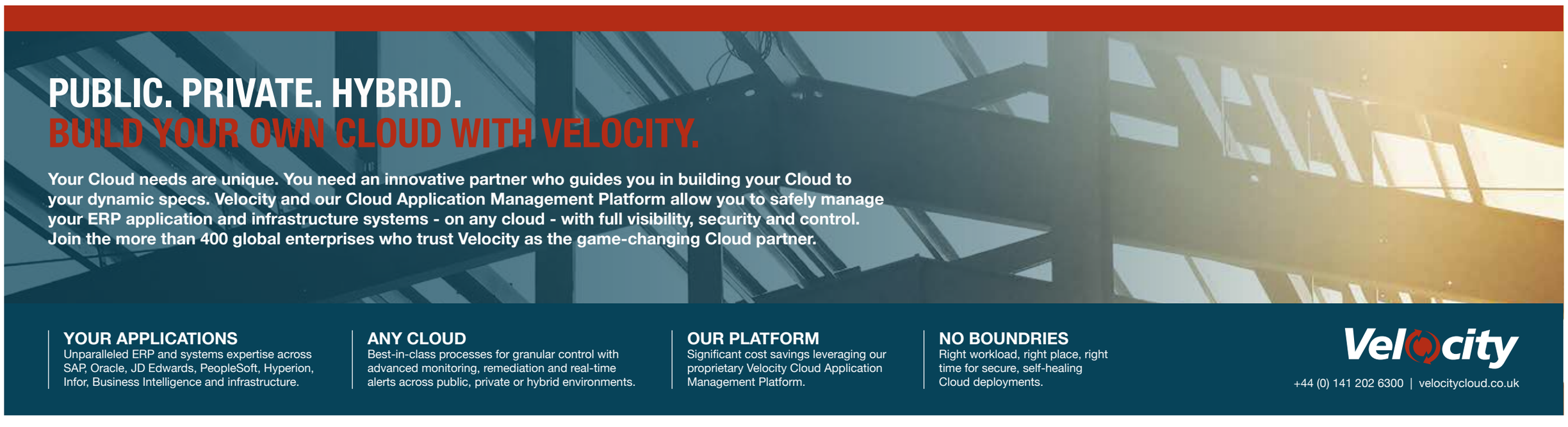


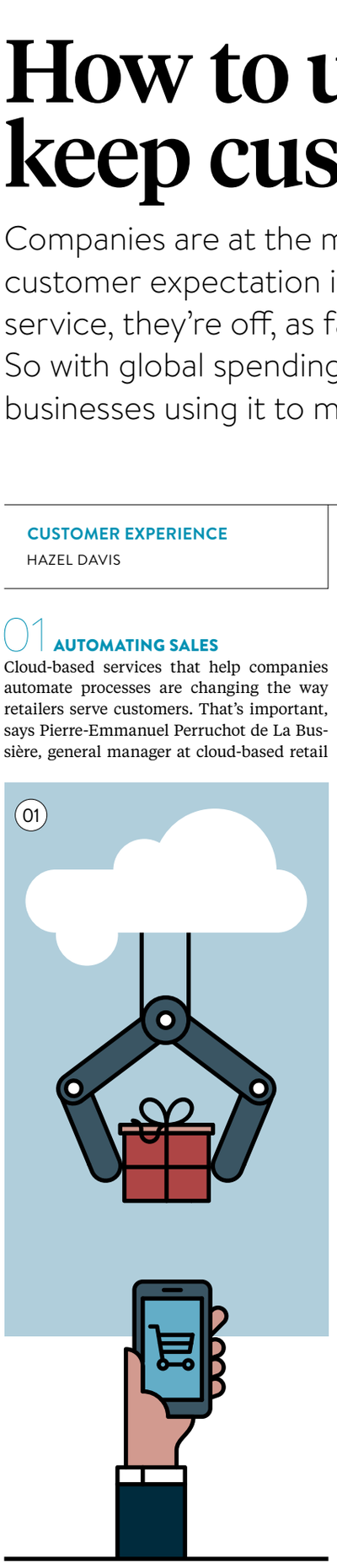
# How to use the cloud to keep customers happy

Companies are at the mercy of their customers these days and customer expectation is sky-high. If customers are not getting good service, they're off, as fast as they can redeem their loyalty points. So with global spending on cloud infrastructure on the up, how are businesses using it to maximise customer experience?

CUSTOMER EXPERIENCE
HAZEL DAVIS

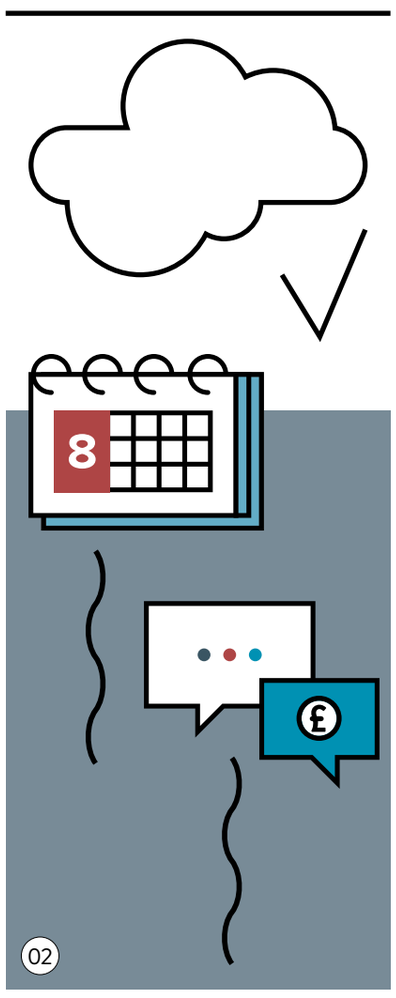
## 01 AUTOMATING SALES

Cloud-based services that help companies automate processes are changing the way retailers serve customers. That's important, says Pierre-Emmanuel Perruchot de La Bussière, general manager at cloud-based retail management platform Vend, because customers are demanding it. "Customers expect a seamless shopping experience. They want their favourite brands to know what they like, how they shop, provide them with a fast service and deliver the same experience whether they are buying online or instore," he says. Historically, there have been a few barriers to a seamless sales experience, such as a customer seeing an item online and then going in-store to buy it, but realising it's no longer in stock. "The cloud removes these barriers," says Mr de La Bussière. "For example, the cloud can be used to sync inventory automatically across a company's physical and online stores, and store assistants can look up stock for customers on iPads from anywhere in the store, driving sales. Companies are now automating their processes based on important business information. For example, pricing strategies can be changed depending on whether a product is performing well or badly and items can be automatically reordered when stock is low. Or you can trigger a personalised e-mail to a customer to entice them to purchase, based on their buying habits. Customers will shop elsewhere if they're not getting that sales experience they're after. Automation is now do or die."



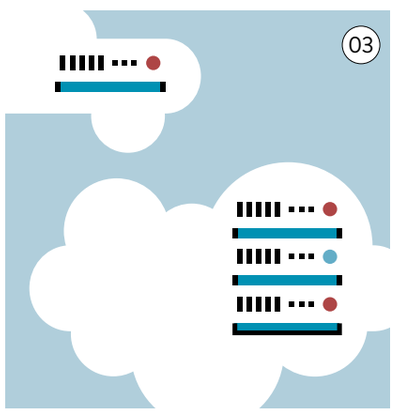

## 02 BEING AGILE

Working in the cloud means customer expectations can be met in an agile way. Chris Martin, chief executive of Waracle, which makes mobile apps for some of the largest companies in the world, says: "Often we don't meet our clients face to face. Mobile apps are very visual, and this means projects are very fluid and things often change along the way. We use agile project management to allow for this where a customer buys a development team for a length of time and uses the team until the time runs out." In order to allow effective collaboration, Waracle uses a cloud-based agile project management tool called Trello, so the customer can insert user stories and functionality into a backlog. "We cost it in terms of likely time to complete and they prioritise it," says Mr Martin. "This allows us to develop what they need in priority order and protects us from scope creep. We find collaborating like this leads to much better apps, better results for the customer and better resourcing planning for us – a win-win."



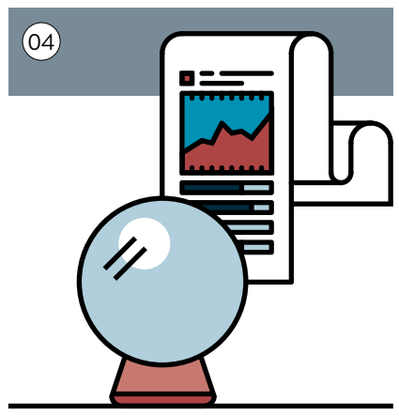

## 03 'ELASTIC' SERVERS

"Over the next several years, you can expect cloud computing to deliver the same advantages to any enterprise application, regardless of the channel, as more and more enterprise computing moves to the cloud," says Satya Ramaswamy, vice president and global head of TCS digital enterprise at Tata Consultancy Services, which has delivered digital projects in the UK for Boots, BT, Diageo, Nationwide, National Grid, NEST [pensions], Marks & Spencer, Thames Water and Virgin Atlantic. "Cloud computing allows deployment of servers in an elastic manner as demand increases. Take the example of a retailer who sees increasing demand as Christmas nears: the retailer may know that demand will keep increasing, but may not know by how much. Cloud allows the server deployments to match closely the demand and ensure the retailer does not miss any customer request, or deliver a delayed or inferior service to any customer. Similarly when the demand later goes down, cloud allows the allocation of servers to go down, thereby saving money which can be spent elsewhere." Cloud computing also provides reliability so that there is back-up for most systems used. Mr Ramaswamy adds: "This means that the failure of a few systems doesn't result in customer services going down in entirety. Cloud is also more secure in most cases, providing peace of mind for customers when they access the service of companies. All these add up to make the customer experience much better when using the cloud."




## 04 PREDICTIVE ANALYTICS

Sailthru helps brands, such as Dr. Martens, to engage with customers on a more personal level via its cloud technologies, including personalisation, analytics and predictions. Neil Capel, Sailthru's founder and chairman, says: "Modern marketers understand that human connections matter now more than ever before. By connecting with customers as individuals, a marketer can deliver a better and more relevant experience that also optimises every revenue opportunity." Predictive analytics capabilities are increasingly being used to power profitable customer-acquisition strategies based on retention data. "In fact, Sailthru's data revealed that 68.5 billion personalised e-mails were sent in 2015, a 94 per cent growth over 2014," says Mr Capel. Data collected from customer engagement allows brands to understand what their consumers and readers are interested in, and predictions help brands understand their specific intent. This, says Mr Capel, allows marketers to offer a superior customer experience by ensuring that their digital touchpoints – e-mail, web and mobile – are individualised based on each customer's specific interests. It also ensures they are proactively engaging with individual consumers based on both the position in the customer journey and intent by automatically optimising content, cadence and channel.

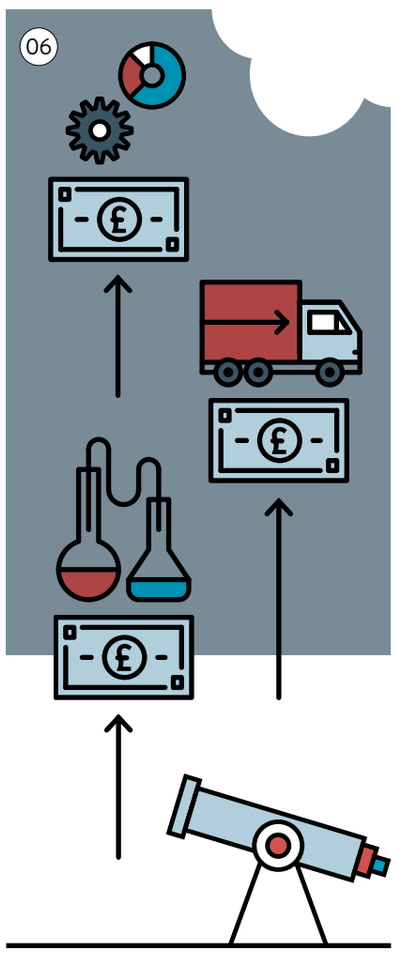


## 05 LOYALTY PROGRAMMES

The cloud enables users of loyalty programmes to access platforms at all times. Corporate software company Okta and airline Etihad are working together to extend Etihad's identity and access management to the cloud. Phil Turner, Okta's vice president, Europe, the Middle East and Africa, says: "The integration of Okta's solutions to Etihad's central system has given the company the flexibility to accommodate its expanding global customer base while accelerating its business by further securing the IT environment." Using Okta's cloud-based identity management solution, 3.2 million members of the airline's award-winning loyalty programme, Etihad Guest, are able to log in to a single platform anywhere, anytime and from any device. Unlike other loyalty schemes, customers are able to navigate through a variety of features to book flights, redeem miles, and view statements and exclusive offers through the cloud.

## 06 ENTERPRISE RESOURCE PLANNING

Outing enterprise resource planning (ERP) into the cloud means a business can extend communication and functionality to external partners. "So a business such as Crocs changes when it goes from only being able to talk to customers and its production plant to being able to talk to customers, retailers, logistics companies, shipping businesses, warehouses, suppliers, manufacturing and everyone else involved," says Bryan Nella, director of GT Nexus, an Infor company. "This is the idea of being able to see into your entire supply chain, both that which supplies a company and the 'onward' value chain to the customer. For this supply chain to be end to end, from customer to fulfilment and all the associated processes, it has to be cloud – you cannot do it any other way." Cloud enables sight lines and those sight lines enable new models of business.




COMMERCIAL FEATURE

# KEEPING YOUR HEAD IN THE CLOUDS

***Neil Davidson**, vice president of enterprise at Deltek, explains how cloud technology can support business transformation in the professional services sector*

Deltek Know more. Do more.™

Transformation is essential in today's business environment, but in no industry is it as pronounced as within the professional services sector where knowledge and skill are the core commodities, competition is fierce, technology evolves at an almost unfathomable pace, and profit levels are always top of mind.

This means that firms spend a lot of time revaluating business strategy to ensure they are heading in the right direction. The problem is that when a company is required to be as flexible, agile and cutting edge as services firms are, it becomes very difficult to build concrete blueprints for success. This is where cloud technology can play a crucial part.

Forming the heart of many strategies, use of cloud infrastructure encourages businesses to take full advantage of the positive business environment of today. It shouldn't be whether companies should move to the cloud, but rather when and how a cloud solution will best support business transformation and growth.

The good news is that no industry is moving to the cloud faster than that of professional services. In 2014, IDC figures identified almost 24 per cent[i] of firms as cloud adopters and this will only have increased in the last year as 74 per cent[ii] indicated a desire to transfer even more infrastructure to the cloud. Additionally, Gartner has stated that at least 30 per cent of service-centric companies will move the majority of their enterprise resource planning (ERP) applications to the cloud by 2018[iii].

Fortunately, those in charge of making these business decisions are spoiled for choice as the number of cloud products available is overwhelming. In many ways, this is what makes asking the right questions even more important. In fact, according to Gartner: "You should never assume that adopting cloud applications will magically provide value; it's essential to link business objectives to your ERP strategy to ensure value is realised, whether adopting on-premise or cloud applications."[iv]

It must be acknowledged that the cloud is a liberating force. It allows companies to transform the way they work. Limiting up-front investment and freeing up working capital for other investments means that for firms looking for agility and the ability to transform, the cloud is the driving force. No longer do they need to rely on generic and inflexible solutions to run operations when specialist project-centric systems built for the rigours of their industry and hosted in the cloud are available.

> It shouldn't be whether companies should move to the cloud, but rather when and how a cloud solution will best support business transformation and growth

The reality is that professional service firms need agility to deal with the rollercoasters of project life cycles and new business. They need guarantees of reliability in order to deliver projects on time to the expected standard and ensure working capital availability in order to respond to market movements. Planning for tomorrow in a world of unknowns is a serious predicament so flexibility and scalability should be at the forefront of any analysis when looking at cloud technology.

After professional service firms have established a base line for what needs to be considered comes execution. This is where firms review the current state of the business, the direction the company is moving in, its financial state and the margin, cash flow, and growth objectives for the coming years. All this combines to paint the picture of what a firm needs to remain competitive and determines which technology solution forms the lifeblood of the transformation strategy.

However, it's also very easy for firms to bite off more than they can chew when it comes to determining what solutions to implement. Making sure firms are not taking on too much also needs to be a key aspect of the consideration phase.

For Fieldstone Architecture and Engineering, the catalyst for change was when it found itself falling behind on its planning capability. "We were previously only working with whatever standalone systems we had available in Microsoft Office," says Fieldstone chief executive Ryan Rasmussen. "It was a struggle to piece together everything we could to keep the company together."

Instead of shifting its existing set-up to the cloud, Mr Rasmussen realised this was the perfect time to search for a new solution, which was a cloud ERP system engineered to integrate project, resource and financial management. It offered all the benefits associated with cloud including a shift from capital expenditure to operational expenditure, no installation or maintenance costs, and maximum efficiency and improved performance.

Ultimately, it is essential that a cloud system focuses on providing business value, not just being part of business operations. So when choosing a business or ERP system that sits at the heart of a transformation project, it is important to select one which is capable of combining both project management and accounting functions because they are very much interlinked within the professional services industry.

The logic is obvious. Costs need to be tracked during the lifetime of a project. If a project is veering off course, managers need to be able to see this. Those tricky incidentals, such as recruiting freelancers to cover scheduling clashes, can be easily monitored if the ERP does both.

Additionally, a sophisticated cloud ERP system will automate many time-consuming business operations. For example, there are at least 15 ways of recognising revenues, from retainers, time and materials, fixed fee, billing in days, billing in hours, and so on. A strong ERP system will include these options as standard.

Naturally, none of this is easy to do with standard tools. Mixing and matching Gantt charts with generic workflow tools and finance packages is possible, but ill advised. Fieldstone's Mr Rasmussen recalls: "When we were relying on Excel and QuickBooks, we were really limited from a visibility standpoint." He says that moving to a specialist cloud-based ERP system allowed his team to collaborate more easily, and for management to make truly informed decisions on manpower and strategy.

Other areas to benefit include compliance and regulation which are easier to manage with specialist ERP tools. For example, a £20-million piece of work to design a bridge will involve a compulsory risk analysis and your system must enable this vital step. Yet, for a £20,000 short project the analysis may not need to be so in depth. An intelligent ERP system will ensure appropriate governance based on risk and project value.

It then becomes essential to elect a partner rather than simply a software vendor, one who can assist in aligning business strategy and organisational performance to cloud adoption and usage plans. It is not enough to be a simple software provider; the key elements of speed, control, agility and innovation, as well as all facets of the business, need to be supported by cloud infrastructure.

> It is essential that a cloud system focuses on providing business value, not just being part of business operations

Moving to a cloud ERP system offers all of the above benefits, plus the standard pluspoints. There is no hosting or upkeep cost, all updates are introduced seamlessly and access is revolutionised. Which is what Swedish software developer Keylane (formerly Mantacore) discovered when it moved from a mish-mash of generic software packages to a Deltek cloud ERP system.

"We wanted a pre-configured, cloud solution that supported multi-company and multi-currency," says chief operating officer Henrik Svärdlång. "We're using the software right off the shelf, because the best-practice business processes that are in the solution are exactly what we need as a consulting firm."

Mr Svärdlång chose Deltek in part because of its reputation in the project-centric ERP field. Deltek has 30 years' experience developing industry-leading ERP software used by the likes of Grant Thornton, Atkins and COWI.

Once the realm of smaller companies looking for scalability, the economies of scale, risk mitigation, financial gains and efficiency means the cloud is a focus for firms of all sizes, and at the heart of transformation plans. It enables professional service firms to solve business-critical challenges with modern technology solutions that, with the right partner, are custom built to respond to any requirements. Add in all the other benefits and its clear why professional service firms are so keen to make the move to the cloud.

**www.deltek.co.uk**

[i] IDC, *CloudView Survey*, December 2014, n=19,080
[ii] IDC/Deltek, *Managing Your Consulting Firm for Growth, 2014*
[iii, iv] Gartner, *Predicts 2014: The Rise of the Postmodern ERP and Enterprise Applications World, 2014*

# Get set for a spending boost in the cloud

Almost half of smaller businesses in the UK are forecast by GE Capital to increase their spending on cloud technology this year

**INVESTMENT**
CAROLINE BULLOCK

Cloud may be a mainstream part of business rhetoric, but worries over data privacy and security have continued to temper curiosity and awareness, keeping investment and progress modest, particularly across the very sector which stands to benefit the most from its game-changing effects.

Indeed, free from the shackles of the legacy IT systems that constrain their larger counterparts, small and medium-sized enterprises (SMEs) are best placed to capitalise on the cost-saving, enhanced security and scalability the technology affords. But, for momentum to build, it seems a more ambitious vision is required that sees beyond simply cheaper infrastructure or the basics of e-mail services and databases, and thinks bigger and bolder.

Currently just under 14 per cent of the SME IT budget is spent on third-party managed IT services, largely cloud providers, according to Claranet.

"Mid-sized and large enterprises tend to be further down the road of cloud adoption than smaller companies with more complex estates driving greater levels of IT outsourcing," says Neil Thomas, product director at managed services provider Claranet.

"But as data becomes more critical to business success, we will start to see progressive IT teams across all company sizes turn to cloud and managed service providers to support adoption and management, and for this to consume a far greater portion of IT budgets over the coming years."

It's an approach already adopted by savvy operators, who are teaming up with software enterprise leaders to leverage the kind of state-of-the-art technology only possible through significant and sustained investment that traditionally would be prohibitive for their budgets.

Furthermore, by tapping into the knowledge pool of larger enterprise, they are more likely to avoid the pitfalls which continue to hinder smooth cloud adoption for many SMEs, from drawn-out migration processes – an average of 19 months, according to the *Cloud Industry Forum Survey* – to a need for additional investment in software and hardware after deployment.

One industry heavyweight providing the robust infrastructure along with the hand-holding expertise and counsel that comes from a 30-year heritage is TIBCO Software. Renowned for driving the digitalisation of Wall Street in the 1980s, when it comes to providing connections between applications and data, the Silicon Valley-based outfit has remained a trailblazer in the enterprise software market. TIBCO pioneers technology which extracts actionable and differentiating intelligence from a company's data in real time in forensic detail.

Prompted by the demand for its core services to be available in the cloud, when European chief technology officer Maurizio Canton talks of the business' "cloud journey", it's clearly a mission rather than just semantics.

"There's no doubt that we are moving towards an era in which cloud will be the primary environment for our services," he says. "We're seeing particularly strong traction in both telco and retail sectors, where the technology is driving a more personalised customer experience.

"Importantly, though, the industry needs to overcome perceptions that the cloud is complex and something just for larger businesses by providing tailored offerings and not watered-down versions of solutions intended for the larger enterprise, which smaller operators don't fully understand or use in its entirety."

At the heart of the proposition is the pioneering Fast Data platform, which collates and presents data analysis in real time, the benefits of which are already being realised across a diverse range sectors from digital banking to oil and gas.

Retailers such as clothing and outdoor equipment staple North Face use it to drill down into sales and marketing information to identify their customers' purchasing habits and preferences. While motoring organisation, the AA, is bringing greater equity to how car premiums are assessed by using analytics to produce an accurate picture of a driver's performance with sensors that track speed, braking and mileage, and collate the data into one definitive bundle. Thanks to a cloud makeover, this technology is to become even more accessible and available within an accelerated framework.

With all indications pointing to continued but cautious adoption – pockets of cloud in tandem with on-premises solutions – Mr Canton is a strong advocate of providers offering a more integrated and flexible offering that can evolve with business needs.

"Startups have the ideas and the passion, but not always the money" he says. "The cloud has been a great leveller, but we can go further by ensuring the offering is available across a range of options – public, private, hybrid or on-premise. True innovation is often about failing quickly, recovering and trying something else, and not confining the customer to a particular path, an approach that will be vital to their investment."

In the meantime, customers are benefiting from TIBCO's sustained investment, bolstered by the recent acquisition of API (application programming interface) manager leader Mashery and expansion of its SaaS-based (software as a service) integration capabilities. The result has evolved the cloud proposition further to enable the development of even more compelling, multi-purpose applications, which can elevate the customer offering, in some cases, to industry-leading heights.

A case in point is the partnership with smart home technology provider digitalSTROM, a young brand which relies on the TIBCO Fast Data platform to connect the home and its various appliances to the cloud so they can communicate with each other.

A patented terminal block, akin to a LEGO brick, houses an integrated chip which enables all electrical devices, from smoke detectors to doorbells, to connect into one flexible, smart network using the home's existing electrical wires. Running in the background, the Fast Data platform captures insight and co-ordinates all processes connected with the service, reliably and quickly, a fusion of innovation that has generated a 100 per cent growth and underpinned chief executive Martin Vesper's vision to become the smart home solution across Europe.

"Our goal was to provide an infrastructure where cloud-based services, such as weather and security, can be used easily and reliably to make people's homes smart and reactive to events, but without a large cost," he says. "To do this we needed cloud-computing services and very high performance because latency is a big issue in the home and an open, yet very secure and reliable platform."

And the old adage around cloud creating a level playing field more than bears out in the wake of digitalSTROM's recent triumph at the Internet of Things Awards where it defeated industry titans Orange and Nest in the smart home category.

> The industry needs to overcome perceptions that the cloud is complex and something just for larger businesses by providing tailored offerings

Of course, smart home solutions are not the only machine-to-machine (M2M) technology thriving in a more consumer-driven and 4G-enabled environment, which is spiking demand for increasingly sophisticated applications to manage and monitor assets from pet-tracking to fuel consumption to optimise efficiencies.

It's a process that relies on the seamless communication of data across the company's network infrastructure, with information captured from the device and transmitted across a mobile network to be put into action. And as more complex, feature-rich devices bump up the bandwidth, watertight cloud connectivity becomes prerequisite.

Yet managing extreme data volumes and velocity without compromising connectivity demands a level of infrastructure often well beyond the budgets of the smaller players. Tapping into the scope and resources of a M2M network managed service provider, therefore, can be an attractive proposition for those wanting to leverage the reliability, resilience and real-time usage monitoring benefits that come with a seven-figure network investment.

In occupying the space between device creator and network operator, Wireless Logic is one such M2M provider making this infrastructure a more accessible reality for a broader demographic, privately managing internet of things (IoT) and M2M infrastructure across the European networks for a range of vertical markets.

Acquired by TV's *Dragons' Den* entrepreneur Peter Jones and sold back to the co-founders in 2011 for £38 million, the Beaconsfield-based outfit understands the nuances of network choice and tailors solutions accordingly to avoid the bugbears of congestion and latency.

At the heart of the proposition is the cloud-based network Net Pro, the fruition of a £3-million investment which delivers large-scale private networking for minimal cost as an affordable software platform. By acting as an overlay network for global mobile operators from Vodafone to O2, all of which are connected through one central management application, customers have the access and choice that ensures visibility, control and coverage across the network.

"It's the kind of high-end solution that would not be so readily available as an off-the-shelf solution on a smaller scale from a mobile network operator and negates investment in complex IT architecture, connectivity or in-house specialist engineers," says co-founder Philip Cole. "Just one username and password is needed to access a portal of global IoT connectivity in 80 countries."

The cloud is already a great leveller, but for smaller players adopting a collaborative approach can take things up a gear and ensure even more bang for your buck.

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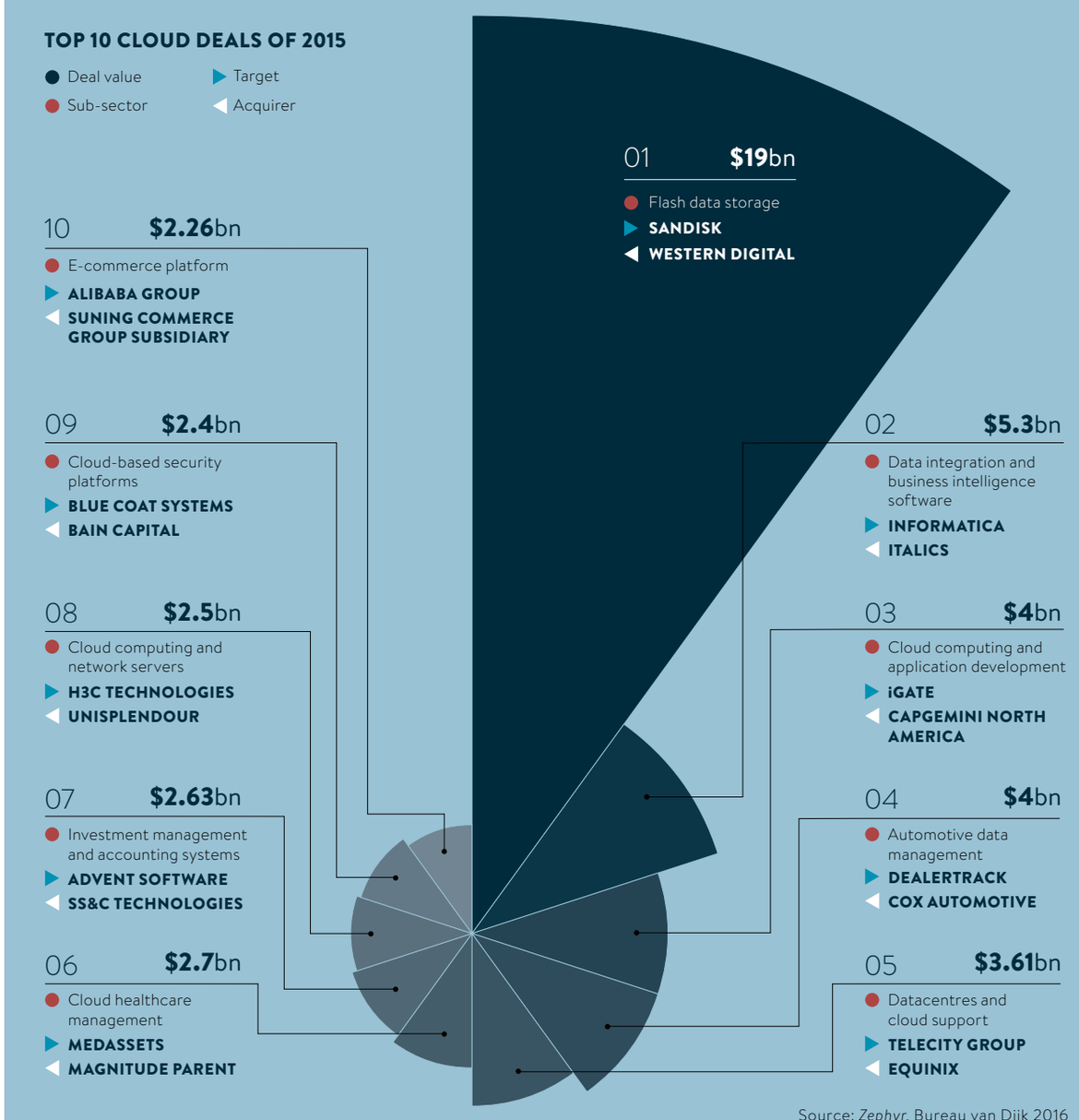
## VALUE OF THE CLOUD

2015 WAS A BIG YEAR FOR CLOUD INVESTMENT...

### TOP 10 CLOUD DEALS OF 2015

● Deal value ● Sub-sector ▶ Target ◀ Acquirer




Source: *Zephyr*, Bureau van Dijk 2016

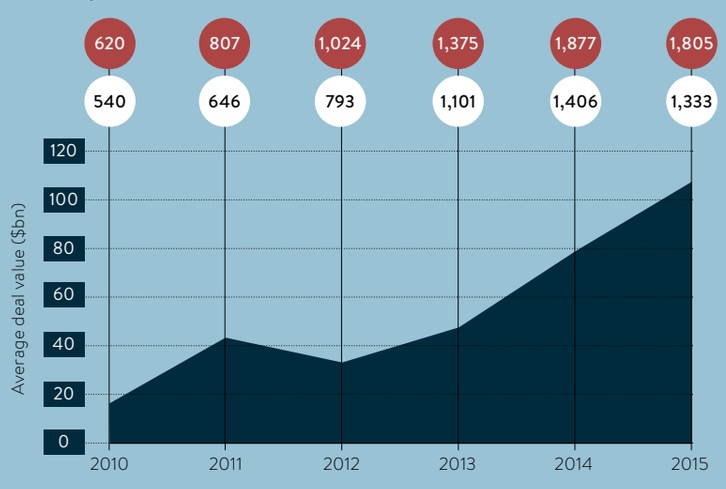
### TOP 10 CLOUD VENTURE CAPITAL FUNDRAISERS 2015

| | | |
|---|---|---|
| 01 | $250m | **GITHUB** Source code repository |
| 02 | $175m | **SIMPLIVITY** Cloud datacentre hardware |
| 03 | $160m | **SLACK** Workplace cloud communication solutions |
| 04 | $130m | **TWILIO** Cloud communications APIs for developers |
| 05 | $125m | **TINTRI** Cloud storage solutions for virtual applications |
| 06 | $110m | **FINANCIALFORCE** Enterprise resource planning software |
| 07 | $100m | **TWILIO** Communications APIs for developers |
| 08 | $95m | **DOCKER** Open-source platform for developers |
| 09 | $83m | **DIGITALOCEAN** Cloud infrastructure solutions for developers |
| 10 | $80m | **COUPA SOFTWARE** Cloud spend management software |

Source: PivotIIQ 2016

### YEARLY CLOUD DEALS 2010–2015

● Average deal value ($bn) ● No of deals ● No of deals with known values




Source: *Zephyr*, Bureau van Dijk 2016

### CLOUD SPEND SHOWS RAPID GROWTH IN GLOBAL IT INFRASTRUCTURE BUDGETS

**$54.6bn** expected to be spent globally on cloud IT infrastructure by 2019, up from $33.4 billion in 2015

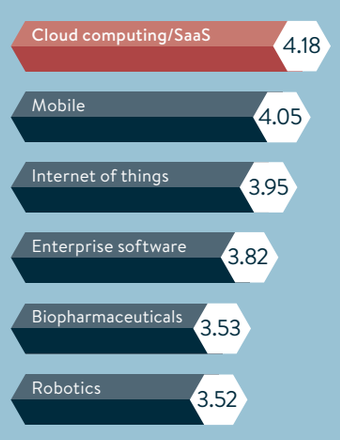
**+32.2%** year-on-year change for **public cloud** IT infrastructure spend from 2014 to 2015

**0%** year-on-year change for **non-cloud** IT infrastructure spend from 2014 to 2015

Source: IDC 2015

### CONFIDENCE IN VENTURE CAPITAL INVESTING BY SECTOR

Ranking from zero to five, with five being most confident




Source: Deloitte 2015

### TOP 10 LARGEST PUBLIC CLOUD COMPUTING COMPANIES

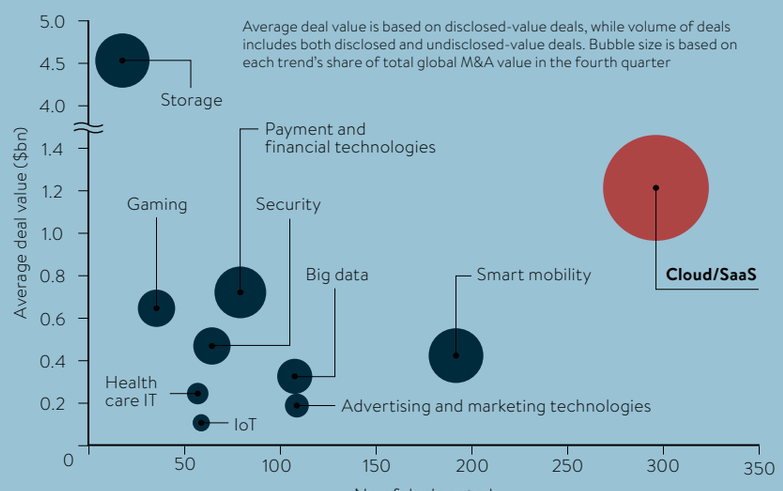
MARKET CAPITALISATION ($BN)

| | | 2008 | | 2016 |
|---|---|---|---|---|
| 01 | Salesforce | 7.4 | Salesforce | 46.4 |
| 02 | Netsuite | 2.3 | LinkedIn | 25.7 |
| 03 | Concur | 1.6 | Workday | 12.8 |
| 04 | DealerTrack | 1.3 | ServiceNow | 12.4 |
| 05 | Blackbaud | 1.2 | AthenaHealth | 5.5 |
| 06 | AthenaHealth | 1.2 | NetSuite | 5.2 |
| 07 | Ariba | 0.8 | Atlassian Corporation | 5.0 |
| 08 | Ultimate Software Group | 0.8 | Ultimate Software Group | 4.9 |
| 09 | Taleo | 0.7 | Veeva | 3.2 |
| 10 | Constant Contact | 0.6 | Medidata Solutions | 2.4 |

Source: BVP/public data, 2016 figures as of January 28

### DEAL-DRIVING TRENDS IN GLOBAL TECH M&A

DEALS FROM THE FOURTH QUARTER OF 2015




Source: EY 2016

## CASE STUDY: YAKULT IS HEALTHY IN THE CLOUD

Cloud-based data analytics has enabled leading probiotic drinks business Yakult to keep a steer on competitors and enjoy a 20 per cent rise in sales in the Netherlands, all on the back of a modest £2,000 annual investment.

TIBCO's business intelligence tool Spotfire turned detective for the fermented milk drink giant to shed light on why the emergence of more competitors in the market had led to a hike in Yakult's Dutch sales.

"You would have expected a loss of market share, but in fact it seemed like there was a synergy between the competitors," says Yakult market analyst Egbert Jan Vierkant. "After several years of steady sales, we experienced an extraordinary increase and we wanted to know why, but analysis using spreadsheets and fragmented multiple data sources was just time consuming, ineffective and not revealing any answers."

In need of a solution that could integrate all strands of data from the sales and marketing mix, attention turned to Spotfire's ability to draw core intelligence into one place and drill down deep into the detail to provide a full overview of their market.

From region and gender-specific purchasing behaviour to weather data and Google searches, a whole raft of diverse insight has been brought to life through visually compelling graphics to provide a clear snapshot of the sales drivers that would otherwise be buried in spreadsheets.

Knowledge gleaned has informed the marketing budget, fuelled further growth and can be shared with retailers stocking the product so they can tailor orders and shelf display to their customer demographic.

By finding the solution in the cloud, Yakult has been able to exploit faster and more flexible access, easy expansion and sharing of the analysis that has delivered tangible value to the bottom line with minimal investment and seamless installation.

OPINION COLUMN

# Cloud and the digital imperative

The way in which forward-thinking organisations transact is going through some fundamental changes while businesses have come to embrace digital technologies as a means of disrupting industries and securing competitive advantage

ALEX HILTON

Chief executive
Cloud Industry Forum

We have witnessed time and again how young startups are leveraging digital technologies to disrupt industries and transform the way consumers do things. The speed and innovation facilitated by digital technologies have, over the last few years, seen market leaders toppled and the balance of power shift from the old guard to digitally native organisations.

But what is clear is that this sort of innovation is happening across the entire spectrum of organisations, from the Ubers and Airbnbs of this world to more established organisations.

It should come as no surprise, then, that digital transformation is creeping up businesses' agendas as they seek to get ahead of the game, steer and make better use of technology, attract talent and drive innovation. And although digital transformation strategies are somewhat in their infancy, seven in ten UK organisations expect to have implemented one by the end of 2017.

Cloud is very much part of the digital transformation story and it is clear those companies with designs on digitally transforming themselves would struggle to do so without the delivery model.

Unbound, at least from a technology point of view, from fixed infrastructure and proprietary IT, businesses using cloud are free to take more risks. Flexible, on-demand, consumption-based cloud services and applications are removing the barriers to change, allowing businesses to react to changing market conditions, and to move on new opportunities faster than their competitors, without having to invest heavily in IT infrastructure and skills. Cloud removes, or at least lessens, the risks.

> Cloud is part of the digital transformation story and those companies with designs on digitally transforming themselves would struggle to do so without the delivery model

The benefits of cloud and adopting a cloud-first approach are considerable and, indeed, well documented. Organisations using cloud routinely report that it has helped them to save time, gain competitive advantage, and achieve a whole host of other tangible and intangible benefits, from improved customer engagement and employee satisfaction to a significantly more resilient IT estate.

But the journey to cloud and, by extension, to unlocking the potential of digital transformation, is far from complete. While four in five British organisations use cloud services to some extent, their data is still more likely to be kept in-house than in the cloud.

Concerns about security and data privacy keep certain applications firmly on the ground, while legacy technology and infrastructure necessarily slow the pace of adoption as businesses look to get the most out of their existing investments. Elsewhere, a lack of skills and executive leadership, particularly in smaller businesses, prevent more applications and infrastructure from being migrated.

Encouragingly, there are strong indications this will change in the not-too-distant future. Three quarters of cloud users expect to increase their usage over the next year and more than six in ten organisations can foresee a time when they will migrate everything to the cloud, representing a significant shift from this time last year.

Cloud will continue to grow and mature over the course of this year, and those businesses that don't use it or are yet fully to explore and exploit the delivery model would be advised to do so – and quickly.

# Seeing clearly between the clouds

The cloud is soaring in popularity, yet a significant number of firms are sticking with an on-premises set-up to work alongside it, preferring a hybrid model which is now the dominant approach

HYBRID CLOUD

CHARLES ORTON-JONES

Many companies are avoiding the cloud even for web-hosting and communications. Research by Claranet and Vanson Bourne shows between 40 and 70 per cent of corporate applications are typically hosted internally using an on-premises infrastructure.

So what's going on? Why are corporations persisting with on-premises hosting in tandem with the cloud? Is there something wrong with the cloud?

*Raconteur* asked a broad cross section of experts for their take on the hybrid cloud. This included independent experts, representatives from the top cloud suppliers and corporate chief information officers, who make the call on how to approach cloud migration. Their answers tell us a lot about how to get the best from the cloud.

First up, there is general agreement that the cloud is superior to an on-premises approach in pretty much every way. Cost, versatility, ease of access, maintenance, scalability – the cloud is better at all of these things.

"If you are starting off as a new organisation you would be a 'born on the cloud' organisation," says Doug Clark, cloud leader at IBM. Everything from finance and human resources (HR) to security and web-hosting ought to be cloud based.

But, as Mr Clark is quick to point out, every company comes with history. And that is where the choice between cloud and on-premises gets complicated. When you factor in practical issues of cloud migration, the merits of the hybrid approach become clear.

A recent survey by RedHat and IDG reveals the biggest concerns with moving totally to the cloud. The number-one concern is security and compliance issues, cited by 49 per cent of companies. Banks, for example, are often banned from using certain public cloud services.

Concerns over migration were cited in the survey as the second biggest reason to avoid the cloud with more than one in three companies saying they felt their applications were too mission critical to risk moving and they felt conventional architectures were more stable.

Expense is a factor with 33 per cent saying new software licensing is too expensive.

Amazon Web Services has over 10 times the computing capacity in use than the next 14 largest cloud companies combined, according to Gartner

Consider a product like Adobe's Creative Cloud suite; companies holding Adobe CS5 licences will find it hard to justify ditching these for a near-identical cloud version of the product which entails a monthly fee.

These issues mean that in practice it is tricky to move entirely to the cloud. Just ask Robin Johns, a senior executive who had to make big decisions for a huge infrastructure project. He is head of information services at the Thames Tideway Tunnel, nicknamed London's "super sewer". It is a colossal job, the largest infrastructure project ever undertaken by the UK water industry. The sewer is 25 kilometres long and costs £4.2 billion.

Mr Johns built the IT system from scratch and after deliberation went for a hybrid cloud set-up. This comprises a private cloud of 130 virtual servers hosted by Advanced 365, who also agreed to manage Tideway's overall IT infrastructure. Communications, including Office 365, SharePoint and Skype for Business, are run on the public cloud. And there is an in-house component, with the Bentley-design software run from an on-premises IT system. Media files are also hosted on-premises.

"We wanted to use the cloud as much as possible," says Mr Johns. "We are an infrastructure project with private investment and we don't know who might buy us in the future. Any buyer would want to use their systems, so it didn't make sense to invest a lot."

Yet he still chose to use on-premises hosting for several key components. Why? "Integration is one issue," he says. "The cloud isn't appropriate for every application." The Bentley-design application works well from on-premises hosting and the complexity of moving to the cloud wasn't worth it, he says.

> When you factor in practical issues of cloud migration, the merits of the hybrid approach become clear

Security wasn't an issue. "The security models deployed by private and public cloud providers are much better than ten years ago," says Mr Johns. "If you have done your due diligence, you should be happy with security in the cloud."

One other issue tilted the decision in favour of the hybrid model – upgrades. "When you use software as a service, you are reliant on the supplier for patches and upgrades. Apple iPhone users will know this. You can't control the timing. With on-premises you can do it yourself," he says. The blend of cloud and on-premises hosting meant Mr Johns got exactly what he needed for each application.

Here's another issue in the cloud versus on-premises debate. When chief information officers (CIOs) talk about security and other concerns, they may not mean what they say. "Security is a card often played by CIOs looking to maintain control of the empires they fought so hard to establish," says Lee Newcombe, cloud expert at KPMG. "People are reticent to see their influence diminish. If you run datacentres and move to the cloud, you don't need so many staff. Your empire shrinks, which is upsetting. It is human nature."

It is a theory more plausible than claiming security concerns. Today's cloud is widely seen as secure, if not more secure, than on-premises hosting. As William Fellowes, cloud expert at IT consultancy 451 Research, says: "I would say the public cloud at this point in time is more secure than pretty much any on-premises service provider."

He points out that even the most paranoid industries are using public cloud. "There has been a sea change in attitudes to public cloud in regulated industries. Banking and insurance are well publicised cases of firms moving to Amazon Web Services, Azure and Google," he says. In the Netherlands the regulators permit banks to use the public cloud. That would not be possible if there were any question over security.

A final issue to consider is that control over the location of data is mandated by European Union law. Yet many users of the cloud lose sight of where their data ends up in the cloud.

Research by VMware shows more than a third of UK business data is stored outside the UK and 69 per cent of businesses are concerned they may need to move data to comply with regulation or customer demands. Yet 90 per cent of firms are unprepared to move data to the UK. While cloud providers strive to create data-location compliant services, an on-premises approach can address this.

So this is the story of the hybrid cloud. In an ideal world, business would be rushing to embrace the cloud for all activities. But factor in legacy systems, the cost of moving, data compliance, internal politics, integration, good old fashioned ego issues and it's clear on-premises hosting has a future. For these reasons the hybrid model will be with us for some time yet.

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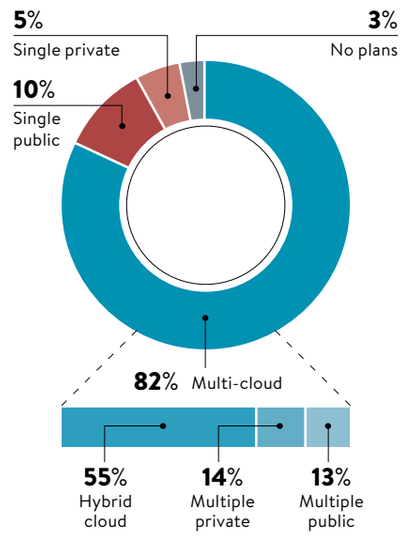
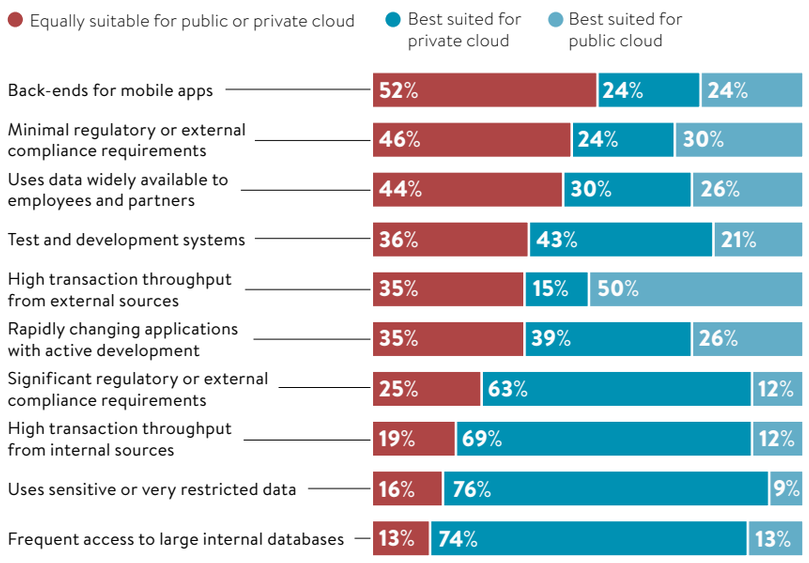
## PLANS FOR ENTERPRISE CLOUD STRATEGY

Survey of businesses with more than 1,000 employees




Source: Rightscale 2015

## BEST ENVIRONMENTS FOR WORKLOADS ON THE CLOUD




Source: *InformationWeek* 2014

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# Cloudy outlook signals disruption ahead...

Cloud computing has reached a tipping point as buying IT on demand has moved to the core of technology provision with businesses using it to transform their operations

BUSINESS MODELS

MARK SAMUELS

Excitingly, the cloud is providing a platform for organisations to develop new products and services. As many as 44 per cent of enterprises already buy IT on demand to launch new business models, according to research from Oxford Economics. That figure is expected to rise to 55 per cent through 2017.

The reason for the increase, says former chief information officer (CIO) turned digital adviser Ian Cox, is the cloud complements the rapid change inherent in modern markets. Digitally engaged customers now have access to more information than ever before, and they can use this information to find better deals and services.

Smart executives are aware of this new era of flexibility. Rather than being hamstrung by the slow-moving nature of traditional IT, entrepreneurial individuals are using the cloud to develop and launch business models far more quickly than was possible previously.

"Executives can use the cloud to scale up these models to meet a surge in demand in a matter of days or even hours," says Mr Cox. "The brand, scale and resources of an established company do not necessarily provide the protection they were once used to when a disruptive new competitor or business model appears on the scene."

Such flexibility creates an advantage for organisations that are able to identify new openings and exploit such gaps quickly. Research from BCS, the chartered institute for IT, reports that fleet-of-foot startups have been able to move into territory that is traditionally owned by larger enterprises. Unencumbered by legacy systems, processes and markets, such startups have used digital technologies to offer new services and products to customers.

Think of how online letting specialist Airbnb has redefined the accommodation rental sector. Then think about Uber, which has created similar levels of disruption in the transportation sector, creating a technology giant that has been valued at as much as $50 billion.

Finally, think of Netflix, which disrupted the relatively young video and DVD rental market through the use of on-demand streaming. Other examples abound. *The Economist* refers to classified ads (Craigslist), long-distance calls (Skype), record stores (iTunes), research libraries (Google), local stores (eBay) and newspapers (Twitter).

Organisations that are sharp enough to enter a market first will undoubtedly have some success, agrees independent consultant and author Ade McCormack. Yet originality is no guarantee of exclusivity and executives should expect other organisations to move into their nascent space quickly. At best, firms that move first have a "cash calf" or a product or service that provides a temporary monopoly in a specific niche.

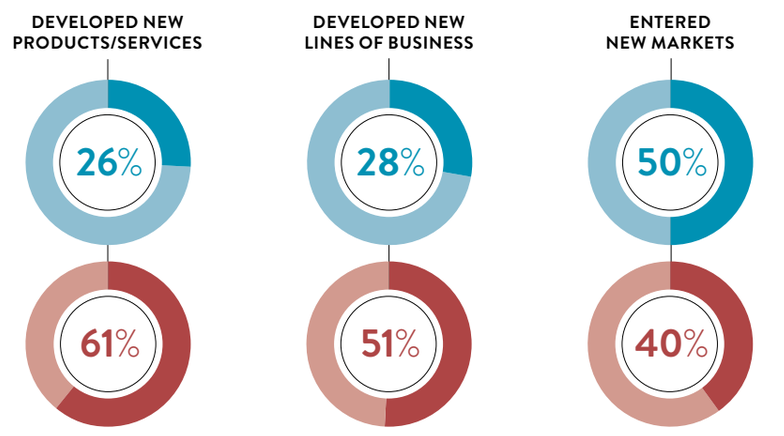
**44%** of global firms said cloud computing has resulted in new business models

**55%** said they expect an impact on business models within the next three years

Source: SAP/Oxford Economics 2015

## CLOUD ADOPTION BENEFITS

Survey of global businesses




Source: SAP/Oxford Economics 2015

CIOs and senior managers in organisations of all sizes must use the cloud to help their colleagues generate new and novel routes to market. Executives should look to make the most of their traditional capabilities, but also to explore radical ideas. "Don't be scared to experiment – if you don't try things, you don't learn," says Mr McCormack.

Chris Hewertson, CIO at hotel group glh, is a good example of an IT leader who has pushed a cloud-led business transformation. The firm began its IT change programme three years ago. Executives wanted systems that were always available, easy to set up and intuitive for users. Mr Hewertson says the cloud became the natural mechanism to support business change and growth.

Today, the firm does not run any in-house servers and 95 per cent of IT services are delivered through the cloud. "It helps that our CEO was passionate about the revenue-generating part of the business," says Mr Hewertson. "He wanted to give the hotels all the systems and services they needed to be successful."

Such examples, says Andrew Marks, former CIO and now the UK and Ireland managing director for energy in Accenture Technology Strategy, prove the cloud has matured in terms of its capability and people's trust in it. Rather than simply offering another means to host services on a third-party hardware platform, the cloud represents a new, more flexible way to access and consume IT services.

Mr Marks encourages IT leaders to focus on one key question: If you started your organisation today, what is the only work you would do? Asking that question to the internal stakeholders, he says, allows modern CIOs to focus on the concerns that will actually help the business to meet its objectives.

It is a focused approach that chimes with Dan Probert, head of IT innovation at charity Camfed. The organisation helps marginalised girls in sub-Saharan Africa to go to school, succeed and lead. More than 3.5 million children in Zimbabwe, Zambia, Ghana, Tanzania and Malawi have benefitted.

Camfed has created detailed records of more than 220,000 pupils and is adding more every day. These records are completed on mobile devices and stored in the cloud. Mr Probert says the charity uses Salesforce as its base platform and iterates as new projects come along.

glh

Amba Hotel Charing Cross, part of the glh hotel brand which delivers 95 per cent of its IT services through the cloud

"The cloud plays a crucial role in regards to access to information," he says. "The development team on the ground can report back to us centrally, so we really have great data on tap. We have data protection to ensure the right people have access to the right kinds of information."

Mr Probert says the charity's use of the cloud is not novel as such but, more importantly, on-demand IT plays a crucial role in supporting the vital work of the organisation. "Technical innovation allows us to drive social innovation," he says.

> Don't be scared to experiment – if you don't try things, you don't learn

Such is the transformative power of the cloud that the use of on-demand IT is extending into previously unchartered territories. Business leaders in highly regulated sectors, such as law and finance, have traditionally been reticent about holding sensitive client data externally.

Smart executives are turning that perception on its head and using technology to offer new services to key customers. Rather than just picking elements of enterprise IT to run on demand, researchers at Forrester say we are entering a new stage of the cloud, where executives are able to run entire business ecosystems in the cloud.

Take Alex Hamilton, co-founder and chief executive of Radiant Law, an innovative and high-tech commercial contracts firm that uses the cloud to communicate and collaborate with staff and clients. When he established the business a few years ago, Mr Hamilton made a conscious decision to use on-demand technology.

"The cloud is critical to the way we run our IT infrastructure, but it also allows us to compete with larger organisations," he says. Radiant Law uses a range of tech startup tools, such as collaboration platform Slack, to help staff communicate and generate new ideas. The firm also uses the cloud to scale up IT resources quickly as new business demands become apparent.

Such agility means the firm can be experimental without expending too much cost or effort. Innovative ideas include using the cloud for a model that allows client businesses to create new contracts quickly. The firm also uses on-demand IT to allow its customers to monitor the workflow and value of contracts.

"We're continually looking for better ways to serve the needs of our clients," says Mr Hamilton. "The cloud provides the base layer that allows us to run our firm effectively, but it allows us permanently to experiment. The future of our business is tightly linked to the cloud."

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## 5 UNUSUAL USES FOR THE CLOUD

### 01 KEEPING ANIMALS FED AND HAPPY

Managing director Adam Taylor says PetShop.co.uk is the first UK-based company in the pet sector to move to an entirely cloud-based infrastructure. With the help of BT Business, the firm's on-demand system allows employees to manage workflow, and for customers to engage with staff and tailor their orders. "The cloud has helped us cope with rapid growth to offer the very best experience," says Mr Taylor.

### 02 REMOVING THE RISK OF DATA PROCESSING

While executives at some heavily governed firms run scared from the cloud, First Utility chief information officer Bill Wilkins has embraced on-demand IT. The approach extends to data processing. Rather than store credit card numbers in house, Mr Wilkins uses a third party to process data through a secure payment gateway. "We've taken a very conscious approach and have tried to avoid handling sensitive data as much as possible," he says.

### 03 USING MOBILE APPS TO DRIVE CHANGE

Finance firms have also started exploring the power of the cloud. William Fellows, co-founder and vice president at 451 Research, says smart executives recognise the power of combining consumer IT with on-demand services. He cites the Royal Bank of Scotland that recognised its busiest branch in 2014 was the 7:01 from Reading to London Paddington. More than 167,000 customers now use the RBS mobile banking app on the commute to work every day.

### 04 COMBINING INFORMATION SOURCES

Business credit specialist Graydon is using cloud-based business intelligence from Birst to bring together information sources across marketing, sales, human resources and finance. Bart Redder, group customer relationship management and intelligence director at Graydon, says the approach gives business leaders a single, daily insight into cross-company performance. He says: "The sources now contribute equally to greater strategic goals and insights, which wouldn't have been possible if the analytics were run in the cloud separately."

### 05 BRINGING THE WRITTEN WORD TO LIFE

Independent publisher Faber & Faber, which has published books by twelve Nobel Laureates and six Booker Prize winners, is using cloud platform Box to manage incoming manuscripts from draft to final approval. Jim Lindsay, integration specialist at Faber & Faber, says the system is helping the firm embrace the digital world. "Content is central to what we do and cloud computing makes content easily accessible for all staff, no matter where they are in the world," he says.

COMMERCIAL FEATURE

# IoT: THINK BEYOND THE 'THINGS'

*Paddy Srinivasan, general manager of LogMeIn's Xively IoT division, explains how the internet of things can strengthen brands and improve customer experience – with the right support*

For all the hype, the internet of things (IoT) is also very real and will soon impact nearly every aspect of our lives. However, there tends to be a misconception that the way to win the IoT is to invent the newest, life-changing IoT-enabled gadget.

The truth is that the IoT is really not about the things. It's about transforming business, deepening customer relationships, enriching support levels, and increasing the overall interactions businesses have with both their product and their customer. And when it comes to new offerings, it's far more about the experience they deliver.

The true power of the IoT comes not from simply connecting products, which frankly is where many companies focus, but instead from leveraging the data these connected "things" create.

Traditional product companies, notably discrete manufacturers, have the disadvantage of not really knowing who their customers are and, potentially worse, having almost no real-world understanding of how their products are ultimately used.

Their products are sold through a brick-and-mortar store or a third-party site and once the product leaves the warehouse, they have little visibility into who purchased that product and how it is used.

Having a connected product dramatically changes this model and, even more importantly, the customer experience. A connected product provides companies with the ability to connect directly to their customer and understand how their product is being used, or not. This information is extremely valuable for both the company and the customer.

IoT allows companies to walk hand in hand with their customers and hear their voice through the product. Each step of their journey provides more insight into customer engagement with the brand. From first impressions to everyday use and service issues, the company is with the customer every step of the way. This creates the opportunity for greater user satisfaction and a better brand experience. For example, when something goes awry the company can be the first to know and the first to act, so it can turn a potentially upset customer into a brand ambassador.

The business benefit feels obvious now, but it's not easy to achieve. The trick for companies developing connected products won't be just connecting them to give them a voice, but also to give that voice meaning. Determining how to untangle and distill all the information is a challenge companies have never faced before. How do you manage the millions or billions of data points? How do you sift through the noise to generate actionable insight? How do you meet customer demands and always-on expectations?

That's where Connected Product Management (CPM) comes in. As companies embrace IoT, they are faced with the challenge of establishing and then managing relationships between devices, organisations and users. This is CPM. It helps companies connect products securely, manage those products and the data they produce, and reimagine how they engage with their customers.

The information CPM provides can help companies optimise business process and product development, market more effectively to the customers who are using their product, and develop new revenue streams through additional services. By providing the information, companies will be able to give customers a more personalised experience, quicker resolution of support issues and new, targeted service offerings. The IoT gives products a voice and they have a lot to say.

So many companies head into the unknown world of IoT on their own. The do-it-yourself model has proven to be difficult or unachievable, as most traditional product companies do not have a core competency in connecting and managing IoT-enabled products. Finding the right partners makes this process significantly easier.

As more IoT products hit the market faster, and become more prevalent, customers will embrace the benefits of IoT and the experience that comes with it. As those benefits become more tangible, adoption will increase and that is where we really see the IoT become mainstream.

The IoT is definitely one of the most exciting technological breakthroughs of our time. It has the ability to change the way we work, live and play. My advice to all product companies looking to get in on the IoT is to take a step back and think about the project beyond the connected device. See the big picture. Understand how a connected product will change the business. Be prepared for the challenges. Be excited for the rewards. And remember – it's not all about the things, it's about the experiences.

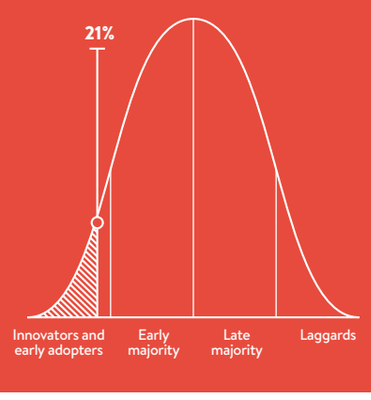
**For more information on Xively, visit www.xively.com/IoT**

## IoT ON THE RISE

**Approaching early majority**

**IoT adoption has reached 21%.** Early-majority adoption is coming in the next 24 months

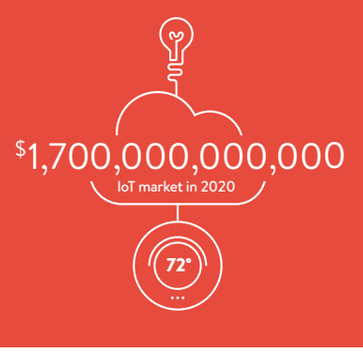
Source: *Lessons Learned from Early Adopters*, Machina Research 2015




**Rise of connected devices**

The worldwide IoT market will grow from $655.8 billion in 2014 to $1.7 trillion in 2020 with a compound annual growth rate (CAGR) of 16.9%

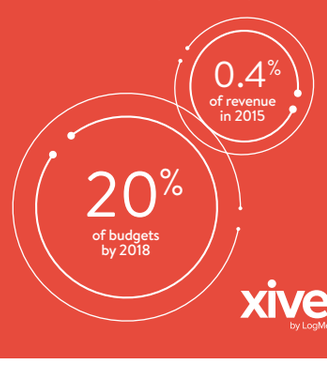
Source: *Worldwide Internet of Things Forecast*, 2015–2020, IDC, June 2015




**Time to act**

In 2015 companies with IoT initiatives invested an average of $86 million—or 0.4% of revenue —on IoT projects. By 2018 IoT budgets are expected to rise by 20%

Source: *Internet of Things: The Complete Reimaginative Force*, Tata Consultancy Services, July 2015




xively by LogMeIn

# Cloud security doesn't have to be a grey area

Cloud Industry Forum research reveals that while 70 per cent of businesses cite concerns about security when moving to the cloud, 99 per cent never experience a breach when there

SECURITY

DAVEY WINDER

When hosting provider Rackspace commissioned Vanson Bourne to interview 500 decision-makers about cloud migration plans, the results suggested that security is a top-three motivator for moving to the cloud. This isn't quite as encouraging as it first appears.

While reducing IT costs resonated with 61 per cent of respondents ahead of disaster recovery for 50 per cent, security was a distant third with only 38 per cent. That leaves 62 per cent yet to get the cloud security assurance message.

So why is convincing management that the cloud brings financial and functional benefits to the table so easy, but that it isn't inherently insecure so hard?

"Security is a topic that is still not fully understood by many organisations as they prepare to migrate to the cloud," says Simon Leech, chief technologist for security at Hewlett Packard Enterprise, "and it's this uncertainty that plays on executives' minds when they are assessing the viability of cloud."

Risk is usually the reason put forward when organisations are both discussing, and delaying, cloud migration; they can outsource the operation of the public cloud, but it's impossible to outsource the risk to the business itself. After all, should a breach occur at the cloud service provider that results in customer data being compromised, it's not the provider's reputation that gets damaged.

The truth is that responsibility for data security sits with the chief information security officer wherever that data may reside. Yet there is no great panic about the risk of datacentre insecurity or on-premise insecurity when perhaps there should be. After all, most data breaches that made the headlines last year involved traditional on-premise IT rather than the cloud. That cloud-based data continues to dominate the insecurity debate can be explained by one word – control.

John Godwin, director of information assurance and compliance at Skyscape Cloud Services, blames a lack of security education for this continuing corporate confusion. "The reality is cloud infrastructure does not inherently make cloud services and software offerings any more or less secure," he says. "But most organisations feel more comfortable if they have absolute control over their data even if, in reality, it's less secure."

This argument would appear to be confirmed by the Vanson Bourne survey which suggested 84 per cent of UK chief information officers (CIOs) worry that the cloud causes them to lose control over IT. It's a statistic that Mr Leech puts down to an increase in what's known as "shadow IT". Such unauthorised hardware, software or services can weaken the overall security posture.

"End-users may find it easier to order a cloud service on a credit card," he explains, "rather than wait for the organisation to go through the process of deploying the service they need."

Rob Lamb, cloud business director for UK and Ireland at EMC, warns: "Bypassing IT policies and controls, or uploading data into unsanctioned cloud instances, not only aligns to the CIO's loss of control concern, but also increases the risk of a customer-originated security failure." It's something the Gartner *Top Strategic Predictions for 2016 and Beyond* report predicts will account for 95 per cent of all cloud security failures up to 2020.

Javvad Malik, a security advocate at AlienVault, is inclined to agree with Gartner that the risk comes primarily through the user "for not understanding and acting upon their responsibility". Mr Malik puts this down to a mentality AlienVault sees a lot often among smaller organisations.

So, what can be done to mitigate the cloud security risk? Raj Samani, chief technical officer for Intel Security in Europe, recommends that when migrating to the cloud a business should first ensure it knows the value of its data.

"Identifying information assets ensures that only data which is suitable to be moved to the cloud makes the transition," Mr Samani advises. "Organisations must also recognise that traditional security models no longer apply." Just as shops barcode each individual product instead of relying on a perimeter security guard to prevent theft, cloud security must focus on protecting the data itself, not the data location.

> Most organisations feel more comfortable if they have absolute control over their data even if, in reality, it's less secure

When it comes to risk mitigation in the cloud, the sharing of responsibility for security is to be ignored at your peril. "Cloud service providers are responsible for physical and network security, while users are responsible for securing the data they are putting into the cloud," says Pravin Kothari, chief executive at CipherCloud.

The problem is that too many organisations assume that signing a cloud contract shifts security responsibility to the provider. "This assumption creates a lot of unnecessary risk because the customer at that point doesn't take the necessary steps of building data-level protection, like encryption, tokenisation and access policies that can secure information in the event of a network breach," says Mr Kothari.

Uncontrolled adoption of public cloud services – the shadow IT problem – is a genuine security risk and one that raises both regulatory compliance and data protection concerns, says Terry Greer-King, director of cyber security at Cisco UK.

"The most effective way to mitigate sources of risk when it comes to cloud computing is to adopt an integrated security policy that ensures visibility and control across the entire network, its access points and known or unknown applications," says Mr Greer-King. Adopting this "security as a process" approach enables organisations to determine effectively the right cloud services for the business.

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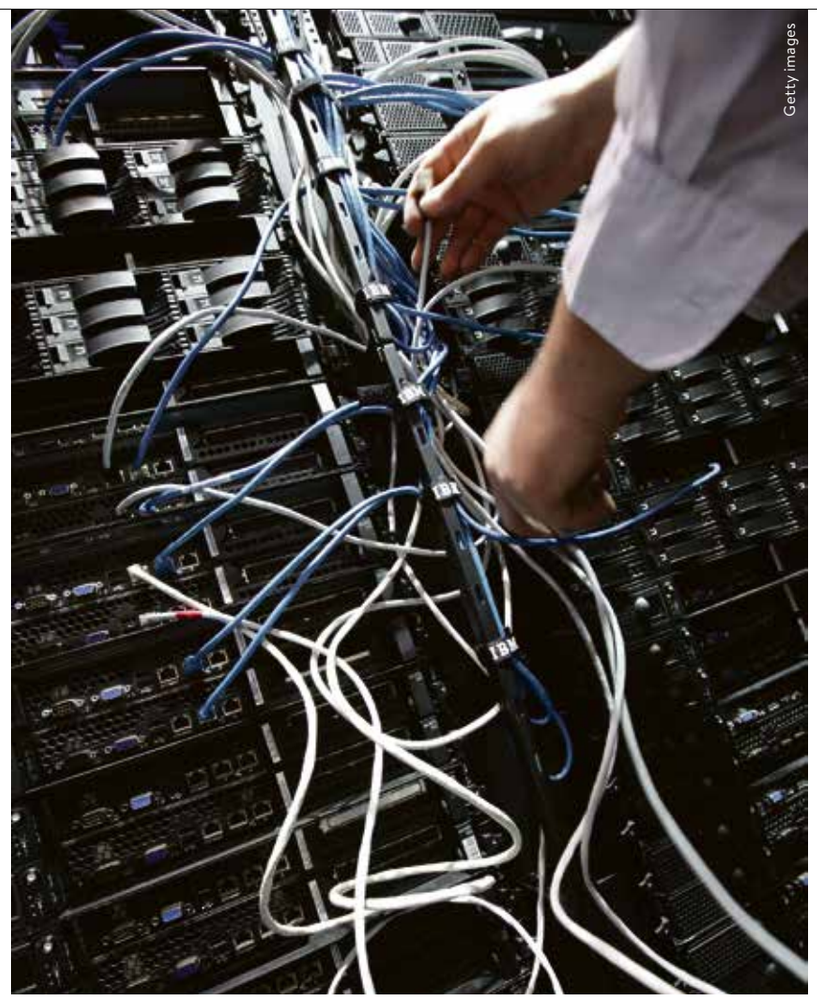
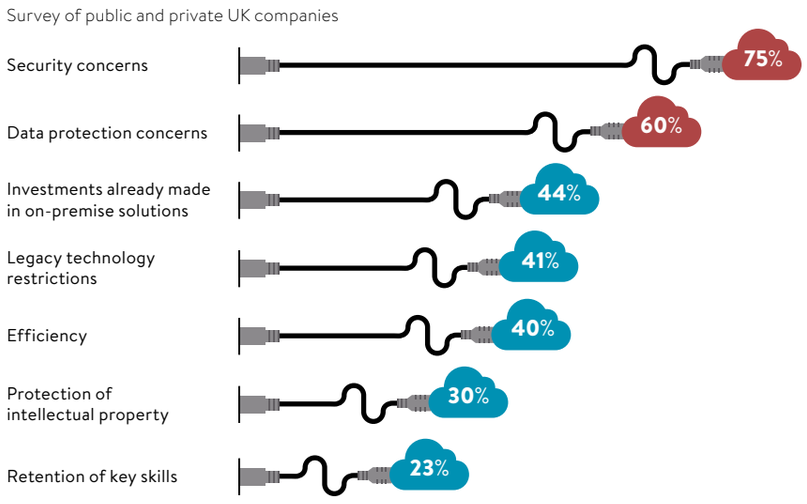

Getty images

**99%**
of UK companies have never experienced a security breach when using a cloud service
Source: Cloud Industry Forum 2015

**73%**
of global companies cited data security as the biggest challenge holding back cloud projects
Source: Cloud Security Alliance 2015

## PRIMARY REASONS FOR NOT MOVING APPLICATIONS TO CLOUD SERVICES

Survey of public and private UK companies




Source: Cloud Industry Forum 2015

## DISPELLING MYTHS ABOUT THE CLOUD

**01 THE CLOUD IS LESS SECURE THAN AN ON-PREMISES SOLUTION**

"Not true. Cloud still has physical anchors in the form of datacentres. Most cloud service providers (CSPs) have better physical security for their datacentres than most companies have for their own facilities," says Pravin Kothari, chief executive at CipherCloud.

**02 THE CSP IS RESPONSIBLE FOR SECURING YOUR DATA**

"When you outsource IT operations to the cloud, you don't outsource your risk. End-responsibility for data lost in a breach always rests with the organisation – and in some cases the individual – that owns the data," says Simon Leech, chief technologist for security at Hewlett Packard Enterprise.

**03 USERS IN THE SAME CLOUD CAN ATTACK EACH OTHER**

"A common concern is that attacks from one customer to another are easier because everyone is using the same service. But it's extremely difficult for one virtual machine to attack another. Most providers go further than the basics in ensuring that all layers of a virtual machine are isolated from each other," says David Barker, technical director and co-founder of 4D.

**04 DATA IN THE CLOUD CAN BE LOCATED ANYWHERE AS LONG AS IT'S ENCRYPTED**

Business credit specialist Graydon is using cloud-based business intelligence from Birst to bring together information sources across marketing, sales, human resources and finance. Bart Redder, group customer relationship management and intelligence director at Graydon, says the approach gives business leaders a single, daily insight into cross-company performance. He says: "The sources now contribute equally to greater strategic goals and insights, which wouldn't have been possible if the analytics were run in the cloud separately."

COMMERCIAL FEATURE

# CONNECT TO THE CLOUD WITH CONFIDENCE

*As companies move applications and data to the cloud, one question is getting more and more attention: what is the best way to connect to cloud services?*

Many companies still rely on the public internet to access the cloud, running mission-critical operations over the same network that consumers use.

This approach has obvious shortcomings. The public internet is subject to wildly fluctuating traffic volumes. During peak times, performance will be affected, hampering access to critical corporate applications. Issues such as latency and packet loss are also hard to control.

And security risks are so difficult to manage that the public cloud is often completely ruled out for sensitive data.

For consumers, there is no alternative to the public internet. Fortunately, businesses have other options.

A private wide area network (WAN) approach, architected using ethernet (VPLS) or MPLS-based IP VPN, provides secure, robust and reliable connectivity to the cloud. By using this approach, companies are able to access the cloud services and applications they require via their corporate WANs.

The private nature of the network means there is no congestion caused by third parties. Data flow is easy to control and optimise. Performance is also elevated far beyond that of the public internet. For companies that rely on the cloud, the adoption of private WAN technology is now seen as an essential part of any cloud strategy.

Security is significantly enhanced by using a private WAN. With the public internet, connection to a cloud-based application is obtained via a log-in page, providing an obvious target of attack for cyber criminals.

In contrast, the private WAN integrates cloud services into the corporate network, so there is no log-in and thus no point of exposure. Furthermore, for an ethernet WAN, Layer 2 switching enables enterprises to retain networking routing control over critical applications, ensuring a higher level of security.

The quality of connection is also improved with private networking. Private WAN providers can generally offer 99.999 per cent network availability, with 2ms or lower jitter and a 0.1 per cent frame/packet loss ratio. Public internet providers usually cannot meet these performance metrics.

Ethernet WANs are efficient from an IT management perspective. IT personnel can treat the cloud services as simply another location on the corporate WAN. Scaling the network as required is simple as well. An enterprise-grade ethernet WAN can move from 1Mbps to 10Gbps, seamlessly and flexibly, unlike traditional networks.

Only a few carriers can offer a truly global ethernet WAN solution. To do so requires extensive investment in the physical infrastructure of the internet.

GTT Communications is a leading internet service provider operating a top-five, global, tier-1 IP network with more than 250 points of presence across five continents, including major business centres. Multinationals can benefit from direct connectivity to datacentres used by leading cloud providers, including IBM Cloud, Microsoft Azure and Amazon Web Services.

Over the past 17 years, GTT has forged agreements with more than 2,000 last-mile providers, enabling them to deliver services in over 100 countries. GTT's network is so secure that it forms one of the largest backbones in the payment card industry, a sector specifically known for its extraordinarily rigid data security protocols. The company also supplies services to government entities, including the US Department of Defense.

The public cloud is acceptable for consumers, but for large multinational organisations that require access to mission-critical applications and services, private networking solutions can be an ideal choice to provide the high-performance and secure connectivity they require.

**For more information on GTT's portfolio of services, visit gtt.net**

# Now a second wave of cloud is rolling in

New adopters of cloud technology want more than greater speed and lower costs – they want measurable business transformation

SECOND WAVE
DAN MATTHEWS

The problem with technology, at least for a lot of non-techies, is that just as you're getting used to it, things change. The feeling is a bit like spotting a nice comfortable chair and then having it kicked away just as you're half way through the process of sitting down.

So it is with the cloud. People are still writing guides about how you define it, such is its youth, but already we're being moved on to version two. This time it's global tech behemoth Cisco that's the driving force behind the new terminology.

In a blog posted late last summer, Cisco senior vice president Nick Earl claimed to have identified a "second wave" of cloud adoption, with four in ten organisations already having transferred to either public or private cloud services.

Up until that point, he says, the primary drivers behind the cloud were speed and cost – the former fast, the latter low. But in the second wave, businesses are moving to the technology for new reasons, namely to achieve "transformative and measurable" business change.

Just over half of businesses questioned in an IDC survey for Cisco expect the cloud to allow them to allocate IT budgets more effectively, while about the same number (53 per cent) claimed the cloud will help them increase company revenue, in other words generate sales or increase their value.

It's a point reinforced by other Cisco staffers, such as Joachim Mason, head of datacentre at Cisco UK and Ireland. He points to the global titans of business that have created multi-billion-dollar valuations thanks to cloud tech.

"Long-standing organisations within established industries are being disrupted by businesses that have adopted cloud technology as their weapon of mass disruption," he says. "Cloud traffic is expected to quadruple and 83 per cent of total datacentre traffic set to come from the cloud by 2019, according to the *Cisco Global Cloud Index*, so it's clear cloud technology is moving well beyond a regional trend to firmly establish itself as global mainstream solution.

"For example, Uber has used cloud capabilities to transform the taxi industry, Airbnb the hotel industry and Netflix has turned the home entertainment market on its head, while also bankrupting a high street brand. Ultimately, no industry is immune – finance, education, healthcare and the technology industry itself are all prime candidates for this type of disruption."

Second-wave adopters of the cloud expect it to help drive change, making them leaner, faster, more innovative and ultimately more disruptive. But Cisco says the value derived by any given business is proportional to the maturity of its cloud strategy.

Adoption is a spectrum, says Mr Earl, ranging from the ad hoc pick-up of solutions as and when problems happen, to centralised, systematic cloud platforms that connect people throughout the business with cutting-edge digital services from internal and external sources.

According to IDC and Cisco, there are five stages moving through the levels of opportunistic experimentation with short-term improvements, then repeatable IT resources, provided by standardised IT systems, and self-service portals accessing cloud services.

The fourth stage is managed cloud defined as implementing a consistent enterprise-wide best practice approach to the cloud, with service delivery across an integrated set of resources.

Top organisations fall into the "optimised" bracket and drive company-wide innovation through transparent access to IT capabilities based on their value to the business.

As you move up the adoption curve, according to the research, key performance metrics to do with sales, employees and IT budgets all tick up significantly. Those in the top-tier category, occupied by of a zen-like pedigree, enjoy an average 4 per cent increase in revenue, for example.

They provide IT services 99 per cent faster, increase their ability to meet service level agreements by 72 per cent and they enjoy a whopping 77 per cent reduction in the cost of IT. However, in a cloud to the silver lining, Cisco says only 1 per cent of the companies it questioned had created these gilt-edged cloud strategies.

Shutterstock

> Cloud technology is moving well beyond a regional trend to firmly establish itself as global mainstream solution

Michael Liebow, global managing director of Accenture Cloud Platform, agrees that full-scale adoption is in the future for most businesses. He expects significantly more adoption in 2016, along with a general maturing of cloud strategies.

"While 2016 will bring some challenges as companies adopt cloud solutions, we are only beginning to scratch the surface," he says. "If given the proper education, the right environment, some diligence and smart investments, companies are poised to reap the big benefits of cloud.

"Adoption of cloud brings, speed, agility and scale, which ultimately improves user experience, supercharges the ability to get to customers faster, helps businesses innovate more rapidly and opens their doors to more significant transformative change in the not-too-distant future.

"Enterprise adoption is expected to accelerate this year. It's the end of the beginning of enterprise cloud and we see significant maturity in the way an enterprise will use the cloud. We see the cloud being firmly established as a central feature of a comprehensive digital strategy across all parts of an organisation, all devices and all applications."

The growth of the cloud is being accelerated by its perfect relationship with other emerging digital technologies, such as the internet of things (IoT), which the cloud helps understand.

"The internet of things is soon to arrive in full force. Some businesses have already started to realise the importance of thinking in terms of networks, ecosystems and data," says Nestor Zwyhun, who leads datacentre operations for GT Nexus worldwide.

"Cloud technology is required to harness the power of the IoT's granular big data and make sense of it. By being centrally located, always available, massively scalable and hardware-independent, the cloud is fantastically positioned to turn IoT data into insight and help businesses operate as networks."

Yet roadblocks remain. Mr Liebow says one of the main challenges to greater take-up of cloud services is company culture, particularly within large organisations with complex and entrenched legacy systems. But he says even small firms should not get complacent.

"Culture is key and cultural change, no matter the organisation's size, takes time to mature. Organisations that resist change and don't aggressively move to cloud, risk putting their people, customers and investors at significant risk of disruption by more nimble competitors," says Mr Liebow.

Another potential sticking point, according to David Gibson, vice president of strategy and market development at Varonis, is security. In the race to adopt evermore sophisticated and all-encompassing technology, some companies will inevitably put vital security work on the back burner.

"We've seen that organisations have had a difficult time making sure the data they store on-premises is adequately secured. Sensitive data is kept in unexpected places and accessible by too many employees, and employers aren't watching how their employees use data, so it's very difficult to spot and recover from a breach," he says.

"If organisations take the same lax approach in the cloud, they are one shared link or weak password away from total disaster. Fortunately, organisations can protect data they store on-premises and in the cloud, and many have adopted processes and technologies to do so. The desire to take advantage of the cloud may prompt organisations to focus on some of the data security efforts they've been neglecting for too long."

Keeping these concerns in mind, companies are being advised to think like second wavers and move to the new plane of thinking. Mr Earl at Cisco recommends considering some important questions such as how will moving workload to the cloud affect cost, security, scalability and data governance?

He says strategies should answer questions concerning when to use public cloud, or dedicated or private resources, which parts of the business should take priority and how to make changes without causing unwelcome upheaval.

Businesses must answer these questions because a cloud-enabled organisation is leaner, more agile, faster and generally more powerful than one lacking all the advantages cloud adoption brings.

### CLOUD MATURITY CURVE

LOWER ADOPTION → HIGHER ADOPTION

**AD HOC** Beginning the process to increase awareness of cloud technology options

**OPPORTUNISTIC** Experimenting with short-term improvements in access to IT resources through cloud

**REPEATABLE** Enabling more agile access to IT resources through standardisation and implementation of best practices

**MANAGED** Implementing a consistent, enterprise-wide best-practices approach to cloud

**OPTIMISED** Delivering innovative IT-enabled products and services from internal and external providers

Source: Cisco 2015

### CLOUD COMPUTING MILESTONES

**2010** Amazon turns off last physical web server and moves retail website to Elastic Compute Cloud (EC2)

**2011** Apple launches iCloud, enabling users to store images and documents remotely, introducing many users to automated back-up

**2012** UK government launches G-Cloud with the aim to shift 50 per cent of new government IT spending to the cloud

**2013** Google announces it will begin encrypting data stored on its cloud platform automatically

**2014** Amazon Web Services releases 516 new features/services, showing the drastic reduction in development/deployment time for new software

**2015** FBI moves criminal information to the cloud using Microsoft's Azure platform, a major endorsement of cloud security

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COMMERCIAL FEATURE

# CLOUD AS AN ENABLER OF STRATEGY...

*The single biggest digital game-changer for business in recent years is cloud technology, transforming entire industry sectors and empowering the smallest of enterprises*

INGRAM MICRO®

The most forward-thinking small and medium-sized businesses (SMBs) are now going beyond simply embracing the cloud. Working with the right IT partners, they are building a cloud strategy to drive growth and productivity, and give them a competitive edge in the market.

Cloud is not a new technology solution; out of its infancy and adopted by a majority of companies, however, the impact it is having on the business world, in particular the SMB sector, has become apparent more recently.

The almost overnight success of startups such as Uber, Netflix and Airbnb, and their transformation into global brands is unprecedented, and largely the result of cloud. At the heart of the sharing economy is the phenomenon of crowdfunding, a viable alternative source of business finance where growth has also been driven by the cloud.

Success stories like these have inspired SMBs to not only implement cloud technology solutions within their own organisations, but to become more strategic about how they use it to gain a competitive advantage.

As a master cloud service provider, working with a portfolio of leading cloud vendors such as Microsoft and a community of value-adding resellers, Ingram Micro is at the leading edge of the cloud revolution taking place in the SMB arena.

"Cloud has turned everything on its head," says Apay Obang-Oyway, director for cloud in Northern Europe at Ingram Micro. "It is no longer about big organisations eating small businesses; now it's small eating the big, because with cloud, small can be so much more innovative and agile. Greater opportunities now lie with SMBs. It's important to realise the potential of cloud; you can be sure your competition already has and is leveraging it to accelerate their growth or is well on the way to doing so."

A recent IDC *Worldwide IT Industry Predictions* report illustrates the scale at which this is happening. It found that by 2018 at least half of IT spending will be cloud based, reaching 60 per cent of all IT infrastructure and 60 to 70 per cent of all software, services and technology spending by 2020.

> Thanks to cloud technology, a single, small high street coffee shop can have a loyalty card scheme, customer wi-fi and a social presence

Indeed, the pace of technological change, particularly around cloud-enabled solutions and software, has meant that forward-thinking SMBs are not simply moving to the cloud, they are raising their game and seeing cloud as a strategic enabler.

"One of the big changes we have seen is cloud becoming part of the boardroom conversation," says Mr Obang-Oyway. "Senior executives now want to know how cloud technology helps and empowers their employees to become more productive.

How does it empower managers and leaders to better manage talent? And how does it drive innovation, acquire new customers and retain existing customers?"

The key lies in leveraging cloud in the right way to ensure it delivers strategic strength to your organisation and that means bringing in the right technology partner.

Ben Gower, chief executive at global Microsoft Office 365 partner Perspicuity, which works with many SMBs, says: "Customers have always wanted to have cloud conversations, as far back as 2009. Now they have a much better understanding of why cloud is so important to them.

"For example, a modern approach to technology is now pivotal to being able to attract and retain the talent that companies need within a very competitive market. New recruits who are used to using the very latest technology on their own devices at home, will not be motivated or engaged by being asked to work with PCs and systems that are several years old."

Another major business benefit of using cloud is that it allows teams to collaborate from almost anywhere in the world with services such as Office 365 and mobile security solutions. Companies with mobile and distributed workforces can collaborate on documents, attend meetings and brainstorm new ideas simultaneously and instantly.

The effect on output and productivity is immense, as transport and travel issues, both time and cost related, are practically eliminated.

"The things that once seemed trivial and minor have become incredibly empowering, even for micro-businesses," says Mr Gower. "Today, thanks to cloud technology, a single, small high street coffee shop can have a loyalty card scheme, customer wi-fi and a social presence – a big ask just a few years ago."

So cloud can clearly have a positive effect on boosting the UK's flagging productivity figures. And according to a study by Deloitte, it is also driving growth. Their research found that SMBs using an above-average number of cloud services grow 26 per cent faster than those that use no cloud tools and are also on average 21 per cent more profitable. These are results that no business can afford to ignore and, slowly but surely, IT decision-making within organisations is shifting upwards and becoming more senior and more cross-functional, and SMBs are becoming much smarter about the power of the cloud.

Mr Gower adds: "By the time the customer is contacting us, they've made up their mind they need to buy, what they want is a plain-speaking specialist to help them migrate their data to the cloud and create a long-term strategy that will deliver a return on their investment."

While there is a compelling business case to embrace a cloud strategy, as Mr Obang-Oyway points out, there are concerns that can become barriers to implementation, particularly around data security and compliance.

"Data management, security and compliance are important considerations in any decision to invest in cloud, but the important thing is not to let them become barriers to your strategic thinking and development," he says.

Businesses can avoid many of these barriers by having the right external cloud partner on board and understanding what they need to bring. They need to know how well an IT partner understands their industry, their business model and their customers, what commercial competence they have, and how progressive they are in their thinking.

"Businesses need to be clear on how that partner will leverage the technology megatrends we are seeing in a way which will benefit them as a modern organisation and empower their customers to do business with them," says Mr Obang-Oyway.

"Our role at Ingram Micro is to spend time helping and enabling our community of reseller partners to deal with the transformation taking place in the market, and be the right strategic IT partner for each end-customer. We are here to help our reseller partners move from being the IT Infrastructure deliverer to being the enabler of strategy through the cloud for the SMB market"

**www.ingrammicrocloud.co.uk**
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**www.perspicuity.co.uk**
**0333 444 4365**

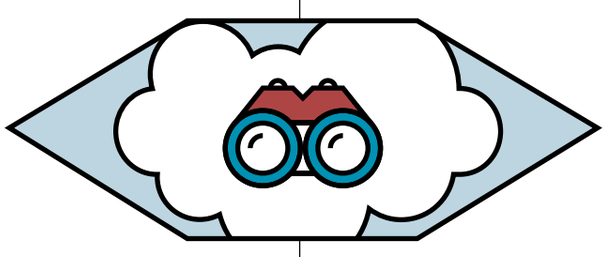
# Top 10 ways the cloud is going back to the future

While businesses around the world come to grips with the impact the cloud will have on their future, it is enlightening to examine how cloud computing has already made many ideas from our favourite books and films an everyday reality

FICTION FACTFILE
GREGOR PETRI

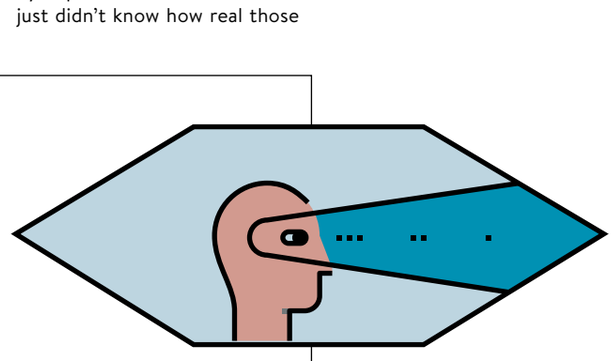
## 01 MONEY CRIMES

Criminals and crime fighters in our favourite stories have always "followed the money". When William Francis Sutton Jr, aka Slick Willie, was asked why he kept robbing banks, he answered, "Because that's where the money is." As the money moves to the cloud in the form of Bitcoins and other cryptocurrencies, crime will follow – if not to steal it, at least to use it. The cloud will also help us protect our money through an allegedly unbreakable federated ledger technology, spread out across the cloud, called the blockchain, a technology many traditional banks are now investing in.



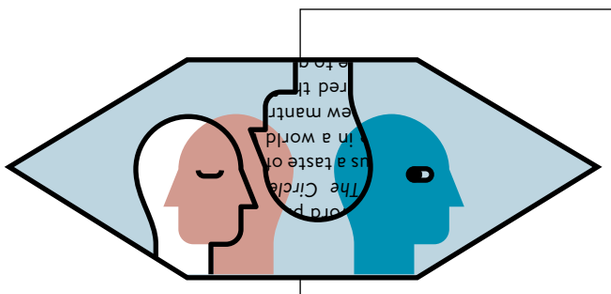
## 02 CLOUD SURVEILLANCE

When we first saw *Enemy of the State*, starring Will Smith in 1998, many dismissed the intense and all-seeing surveillance by a national security agency as dystopian science fiction. We just didn't know how real those practices had become – in the cloud – at least until the 2013 release of thousands of secret documents by whistleblower Edward Snowden.



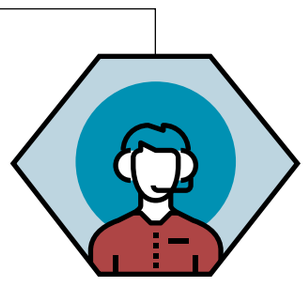
## 03 VIRTUAL REALITY

A cloud-based virtual world like *The Matrix*, with Keanu Reeves in 1999, was clearly science fiction up until this year. That is if you believe the reports coming back from the 2016 Consumer Electronics Show in Las Vegas, where new 3D virtual reality (VR) goggles were all the rage. One review even predicted this year would see the first real-life VR casualty. Likely someone tripping over his living room coffee table while immersed in a virtual trip through a gaming combat zone.



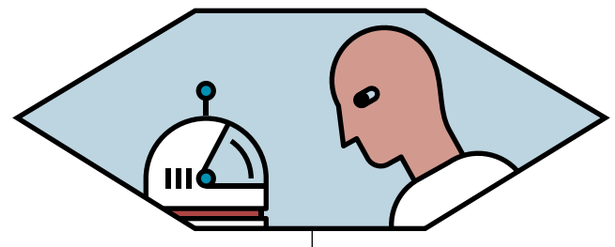
## 04 SOCIAL PRIVACY

Social media gives new meaning to the word privacy. In his 2013 book *The Circle*, Dave Eggers gave us a taste of how it will feel to live in a world where sharing is the new mantra and privacy is considered theft. Maybe we all just have to get used to a cloud-based future where, as former Sun Microsystems chief executive Scott McNealy once put it so eloquently, "You have zero privacy anyway. Get over it."



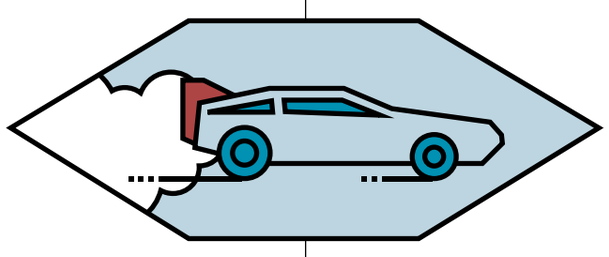
## 05 FUTURE OF WORK

The "future of work" sounds a lot better than "no work, no future", but the realisation that cloud-based automation and smart algorithms will drastically reduce the demand for labour, and thus the opportunities for work, has even reached the Swiss mountains of Davos and this year's World Economic Forum. The 2008 Disney/Pixar *Wall-E* gives an animated, but still disturbing, impression of the inactive and consequently obese lifestyle that could await many, unless society finds a better way to allocate work and income.



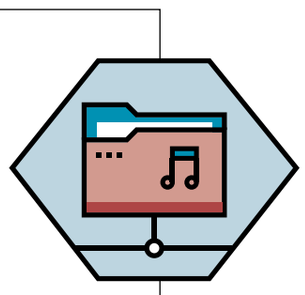
## 06 ROBOTS AT HOME

Lack of work outside the house might imply we will become much more active at home. But as we already saw back in 1962 in *The Jetsons*, produced by Hanna-Barbera, the fact that George Jetson's job consisted merely of pushing one button once a day did not stop him from hiring Rosie, the charming robot that travelled by public transport to the Jetson family home each morning. Our home automation and personal assistants will be more stationary, but largely powered by cloud-based intelligence.



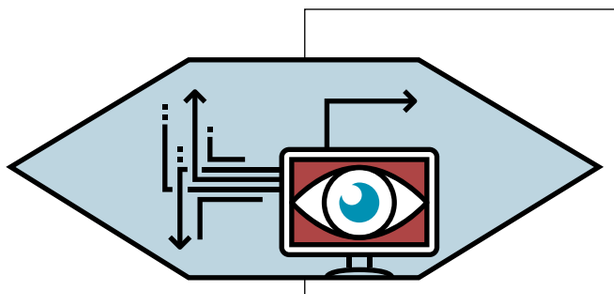
## 07 TIME TRAVEL

Unlike the 1985 blockbuster *Back to the Future*, starring Michael Fox, in which the future actually was last year, the closest we've got to time travel is being able to generate better predictions about the future, like we do through ever-more accurate weather reports. However, in the 2006 thriller *Déjà Vu*, we saw scientists cause the US Northeast blackout of 2003 to create a worm hole big enough to slip Denzel Washington through. So when the next big cloud outage hits, we may want to check what Denzel is doing that day.



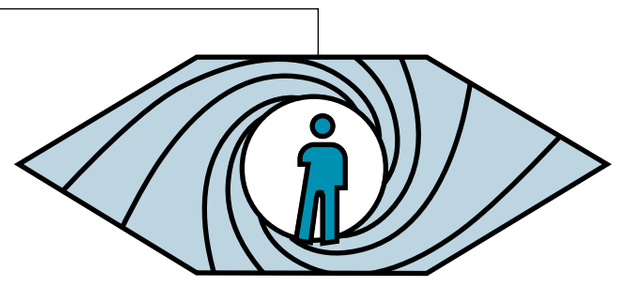
## 08 STREAMING MUSIC

Not many artists are as vocal about cloud-based music streaming's "race to the bottom" as Taylor Swift, but nobody has proven as visionary as the late David Bowie about the phenomenon. Not only was he among the first, in 1996, to release songs online only, he even started his own internet service provider venture. He also predicted, long before anyone else realised it, that touring would be the only viable remaining method for artists to monetise their works and with perfect timing cashed in on his own music rights through a bond-based IPO.



## 09 TV BINGEING

Anyone with teenagers around them will be aware they can watch TV anytime and anywhere. Up until Netflix used the cloud to enable this new reality, the closest we got to binge-watching was sitting through all three DVDs of *The Godfather* in a row. The only kink still needing to be worked out is that the funding model of most of the world's TV programmes, namely commercials, is obliterated by the binge phenomenon.



## 10 THE NAME IS JAMES...

For some reason it is always the villains who are building the type of cloud-like globe or even universe-spanning megalomanic technological ventures, while our hero 007 depends on an endless supply of smart but largely standalone gadgets from his ever-reliable source Q. It's a romantic but unfortunately increasingly unrealistic scenario. Combining evermore data and evermore processing power – in the cloud, where else? – creates advantages that no solo hero, no matter how smart or sexy, will be able to combat.

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