Blockchain sparks change in banking industry

The distributed ledger technology behind bitcoin presents both a threat and an opportunity - and the banks are taking note of the digital disruption on their doorstep.
Google offers free cloud apps to make Office 365 users switch
Google says enterprises that want to switch to Google Apps can use it for free while they wait for their contract with their existing productivity suite provider to expire. The search giant confirmed in a blog post that it will cover the cost of using Google Apps for Microsoft Office 365, IBM Lotus or Zoho users that want to switch over, but cannot afford to until their current enterprise agreement runs out.

China hacked US firms despite cyber pact, says CrowdStrike
Hackers linked to the Chinese government have attempted to hack into several US firms since the two countries officially agreed not to spy on each other for commercial gain, according to researchers. Hackers based in China have been routinely accused of attacking US businesses and government agencies, while China has accused US hackers of the same.

ServiceNow powers Royal Mail’s multi-sourced IT function
Royal Mail has deployed ServiceNow to manage its multi-sourced IT function using the service integration and management and information technology infrastructure library version 3.0 frameworks. The cloud-based service desk tool is being used to manage 27,000 desktops, several thousand Windows phones and 100,000 Windows-based personal digital assistants.

Quarter of Europeans are active mobile banking users
A quarter of consumers in Europe are active users of mobile banking, but 32% still don’t believe it is safe and secure, according to research from Forrester. Some 25% of European consumers are actively using mobile banking apps, compared with 9% in 2011. The firm predicts that mobile banking will “displace online banking for everyday tasks”.

James Arbuthnot takes Post Office IT fight to House of Lords
Recently retired Conservative MP James Arbuthnot will continue to fight for subpostmasters that allege injustice at the hands of a Post Office IT system, as he takes his seat in the House of Lords. Arbuthnot has been the voice of a group of 140 MPs campaigning for subpostmasters that have been fined – and even sent to prison – for offences they claim they have not committed.
Lufthansa picks Inmarsat GX for 10-year in-flight broadband deal

German airline Lufthansa has signed a 10-year contract with satellite broadband provider Inmarsat to offer its Global Xpress (GX) high-speed in-flight broadband service on 150 of its aircraft. The contract formalises a memorandum of understanding between the two firms signed in September.

BT Openreach division expands services deal with Infosys

BT Openreach has expanded its contract with Infosys to add an extra 1,000 call centre agents to a platform that provides support staff with the information they need in one place. Openreach will now have 5,000 front and back-office call centre agents in what it calls “the Seamless Desktop project”.

Dow Jones denies it was the target of insider trading hack

US publishing and financial information company Dow Jones has denied that the target of a recently announced breach was information that could be used for insider trading.

Nationwide Building Society outsources IT infrastructure

Nationwide Building Society has outsourced its IT infrastructure to Capgemini for the next five years as part of its digital transformation. The contract covers service integration, service desk and user services.

Tech City UK visa scheme helps startups get the right skills

The government is changing the rules for non-EU IT experts to get visas to work in the UK, to help meet the skills demand from UK IT companies.

IBM reports continued sales decline in third-quarter results

IBM reported a drop in sales and profits in its latest financial quarter as it continues to transform its products and services portfolio in the face of fierce competition.
VAT rules cut cloud costs by 20% for NHS and government departments

HMRC ruling on reclaiming tax for cloud services could drive up their use in the public sector, says Caroline Donnelly

HM Revenue & Customs (HMRC) will allow NHS and government departments to reclaim VAT on off-premise IT purchases. Bowing to pressure from cloud-championing campaigners, HMRC unveiled a revamped version of its Contracted Out Services (COS) guidance, which sets out the range of outsourced services government departments and NHS bodies are entitled to reclaim VAT on.

HMRC has added commodity cloud services to the list - meaning such services will cost 20% less for NHS bodies and government departments to procure, from 12 October 2015.

Former G-Cloud lead Mark Craddock welcomed the decision, having publicly criticised HMRC for excluding cloud services in the past. Craddock has been campaigning to have cloud services added to the COS list for four years.

Speaking to Computer Weekly, Craddock said the ruling should make it easier for public sector organisations to make a business case for cloud services. “I did some cost models for on-premise and cloud, and the cost savings are close - but VAT was always the killer,” he said.
“If that 20% VAT wasn’t there, you would say cloud was way cheaper than on-premise, as it made the margins a lot closer and made things difficult when making a business case for cloud.

“On a £1m project, that 20% equates to £200,000, so that’s quite a significant saving.”

**EQUAL FOOTING FOR CLOUD PROVIDERS**

HMRC’s U-turn should level the playing field for cloud providers vying with the big system integrators for government deals, said Craddock. Previous guidance favoured the latter’s way of working. For example, NHS bodies and government departments could reclaim VAT on bespoke computer software and services designed to meet their own specifications.

These could be delivered either as a managed service or a serviced computer infrastructure, using the customer’s or the supplier’s own hardware, for VAT to be reclaimed.

Previous guidance excluded the supply and support of “off-the-shelf” software, which effectively banned public sector organisations from reclaiming the VAT on commodity cloud services.

“You can reclaim the VAT on anything you buy through G-Cloud, because it’s gone out to tender, the services are designed to the specifications of the government because they meet specifications around security and data protection,” Craddock said.

“It’s really good news, as it means cloud services will finally be treated fairly and on an equal footing.”

Daniel Jones, senior analyst at market watcher Kable, backed Craddock’s view, but cautioned IT suppliers against getting too carried away. “It’s good to finally see a level playing field,” he said.

Chi Onwurah, shadow digital economy minister: “I’m glad the government has seen sense and decided to match its warm words on cloud services with action”
“However, suppliers shouldn’t be too exuberant, since cost isn’t the primary constraint on cloud update in the public sector. Security is commonly cited as the biggest concern, closely followed by the challenge of migrating from legacy systems.”

**Campaign for fair cloud VAT**

Craddock is not the only campaigner to have questioned HMRC’s rationale. Labour MP and shadow digital economy minister Chi Onwurah raised the issue in Parliament in February.

In a question addressed to chancellor George Osborne, Onwurah asked if any assessment had been made about the impact of HMRC’s refusal to refund the VAT on off-premise services on the cloud services market. In response, Onwurah was told no such assessment had been made.

Onwurah cautiously welcomed HMRC’s revised stance on the issue, before raising concerns about the damage it may have done in the meantime.

“I’m glad the government has finally seen sense and decided to match its warm words on cloud services with action. Their responses to my questions were not very encouraging,” she told Computer Weekly.

“I am concerned at the damage done to the sector in the meantime, and the lack of understanding it betrays. The absence of a clear industrial strategy for the digital economy is becoming more and more apparent.”

Computer Weekly contacted HMRC for comment about its inclusion of commodity cloud IT in public-sector VAT reclaimation, but had received no response at the time of publication.
Why blockchain heralds a rethink of the entire banking industry

Blockchain, the distributed ledger technology behind bitcoin, is both a threat and an opportunity for financial services – and the banks are taking it very seriously, writes Bryan Glick

When more than 8,000 financial services professionals from around the globe gather together, you can get a pretty good feel for what’s causing a buzz in the banking world. This year’s Sibos event – one of the biggest in the industry’s calendar – had one word more than any other reverberating throughout Singapore’s Marina Bay conference centre: Blockchain.

“Everybody wants to talk about blockchain,” said Bipin Sahni, head of innovation and research and development (R&D) at US bank Wells Fargo. “At last year’s Sibos the conversation was about risk and compliance – this year it’s all innovation and blockchain.”

Blockchain is best known as the distributed database technology behind the virtual currency bitcoin, but banks are starting to investigate its broader capability as a real-time, encrypted distributed ledger for transactions involving a variety of financial assets. Royal Bank of Scotland (RBS) is one of the institutions looking to take a lead on blockchain. The bank told Computer Weekly at Sibos that it intends to pilot a service based on the technology in 2016, with a view to releasing a product later in the year. If the plan is successful, RBS would be one of the first major banks to commercialise the use of blockchain.

Interest has grown quickly, and comes partly as a result of blockchain shedding its association with the volatile bitcoin currency. “Forget about bitcoin and cryptocurrencies,” said Lawrence Wintermeyer, CEO of Innovate Finance, the UK financial technology association. “The number one trending topic for the past three months has been blockchain.”

Digital disruption on the doorstep

So, why the sudden and rapidly growing interest? Banks are realising that digital disruption is on their doorstep. In the early years of the 2000s, all their tech innovation was focused on exotic and ever-more complex financial instruments to squeeze extra margin out of the banking value chain. That led to the 2008 crash as the complexity created went beyond even the big institutions’ ability to prevent disaster.
Since the crash, the focus has been on technology for risk and compliance. But now the sector is feeling a degree of economic confidence again, new technologies such as blockchain are emerging that present both a threat and an opportunity.

Adam Ludwin, CEO of Chain.com, a blockchain software provider, said the technology promises to fundamentally change the way financial institutions operate.

“This is the voice over IP moment for financial services,” he said. “You can go on Skype today, dial your grandmother, have a conversation, hang up, and you’re doing nothing different than 20 years ago when you picked up the phone and there was an analogue dial tone and it was routed over switched networks.

“Similarly, blockchain doesn’t do something fundamentally different for the user, but the voice over IP stack has been transformative and disruptive. We need to separate the user experience from the guts of the infrastructure and the consequent reduction in operating costs.”

Guaranteeing the provenance of transactions

Blockchain is a peer-to-peer technology that uses its distributed ledger and advanced encryption to guarantee the provenance of every transaction. For banks, that provenance is currently provided by a cumbersome and bureaucratic set of back-office systems.

If you transfer a pound electronically to a friend – or spend a pound with a merchant – your bank takes a pound out of your account. Meanwhile, your friend’s bank credits her with a pound. At the end of the day, those two banks need to reconcile those
two transactions and match them up. That involves global transaction networks and complex processes, and it’s why it can take days for certain payments to reach your bank account. Blockchain potentially eliminates all that back-end processing, and provides a secure, provable transaction in near real time.

For banks, that means a blockchain-based startup could offer services much cheaper and faster. But it also means that blockchain offers an opportunity for banks to take huge amounts of cost out of their back-end processing infrastructure.

“If I take a photo on my iPhone and send it to you, you don’t get the photo I took, you get a copy of it. That’s how databases work – they send copies. But if I send you a dollar, it’s super important that I don’t have the dollar afterwards,” said Ludwin.

“We can’t actually achieve that with databases today because they’re not designed like that – but blockchain is designed like that. It’s designed to send the one true thing, the digitally native asset itself, to you. We need fewer intermediaries, less reconciliation, and that is truly transformative.”

**AN ARCHITECTURE FOR BLOCKCHAIN IN FINANCIAL MARKETS**

Banks are starting to understand the potential of blockchain and to invest in learning more. RBS is one of nine founders of the R3 consortium, set up in September 2015 for members to work together on a framework and architecture for using blockchain in financial markets. Other members of the group include Barclays, Goldman Sachs, UBS and JP Morgan.

“A year ago people were scared,” said UBS CIO Oliver Bussman. “Everybody agreed that the one topic we wanted to work together on is blockchain. The banks are getting ready to understand the impact and the use cases, and also to understand that collaboration and open standards, like the R3 consortium, is necessary. Regulators are actively involved in the discussion too. It’s only possible if we have critical mass in the industry and agree upon standards.”

Simon Taylor, vice-president of blockchain R&D at Barclays, said 10 people would still give 10 different definitions of blockchain, but it is high on everyone’s agenda.

“The question has gone from why blockchain, to how. We’re not questioning why to do this any more, that argument has been won. The argument is how – which workflow, which form, with which standards?” he said.

“The jigsaw puzzle is still missing a lot of pieces, and having the right forums to put those together as a group is really important because this is market infrastructure we’re talking about.”

The difficulty for banks is that while they can see the potential and the threat, it’s hard to justify investment in conventional ways.

“We have looked at one or two use cases for this technology, but it’s not easy because use cases normally come along with a business case, and that is proving quite challenging. Use cases are one thing, and credible businesses cases are the next thing,” said Stephan Müller, group CIO at Commerzbank.

“People are used to working in a hub-and-spoke system, where the hub is the central authority that has done all the security and the standardisation work. But with distributed ledgers, how do you gain the same trust as you have in a hub-and-spoke system? Moving money about is all about trust.”
WHAT DOES DAY ZERO LOOK LIKE?

The concept of blockchain is so fundamentally different from the way banks currently work that many are struggling to understand where to start.

“As institutions, we have accelerated our learning process from disbelief to cutting our teeth and using the technology to understand two fundamental questions,” said Leda Glyptis, head of the Europe, Middle East and Africa innovation centre at Bank of New York Mellon.

“What does day zero look like? All the conversations we've had are about this abstract future where everything is on a distributed ledger capability. But day one is very hard. A lot of old-world stuff will need to interface with new-world stuff, and that's a hard conundrum to get your head around,” she said.

“Then there is the other piece – the one we are struggling with. If you think about how we make money as institutions, it is based on ways of doing things that are in some way completely changed by these capabilities. They will change the cost element of our business and create operational efficiencies, but they will also contract the value chain.

“That doesn't just mean your operational division will get smaller, it means the products you package will be unbundled. We are unbundling what we have for centuries considered our business. It's less about the technology and more about how do we start on the journey in a way that will not disrupt our customers and regulators. But we can conceptualise a world that will allow us to deliver value completely differently because of these new technologies.”

UBS’s Bussman was quick to stress that it is still very early days for blockchain.

“It's important to mention that we are in the experimentation phase. We are looking at use cases. The key learning for me is that we need to agree on a market infrastructure and a piece of software that can replicate your financial products. It's about how you model those products on the ledger and the workflow around that,” he said.

“The effort to get there is mind-blowing, but the market entry cost will be much lower in future. We have to think about how we simplify those processes. If we have agreement on that market infrastructure it will drive trust, scalability and security. At that moment, people will see a tipping point.”

RETHINKING THE BANKING INDUSTRY

Barclays’ Taylor said that an “industry grade” distributed ledger could be 10 years away. But the potential for blockchain to cause huge disruption in financial services means the big banks are taking it extremely seriously.

“What's interesting is that this technology has forced us to rethink our entire value chain in a way we have never done before,” said Glyptis.

“Whether the new solutions to the new paradigm that will emerge will be on blockchain is not known yet, but we are thinking about what it is we are for as banks and financial institutions in a way we had never done before, as a result of the capabilities put on the table by this technology. It is a very interesting set of technologies that has started a rethink of the entire industry.”
EasyJet seeks digital advantage to rise above the air carrier competition

The airline’s CIO and head of digital tell Clare McDonald price isn’t the only way to get an edge in the flight business

Low-cost airline easyJet runs a number of operations from its aircraft hangar at Luton Airport, an orange beacon near the departures terminal. The hangar provides an enormous space for engineering teams to check and improve the company’s fleet of aircraft, and also houses some of the business’s operations, including the IT and digital departments.

Digital and technology-driven initiatives are important to easyJet. In an interview with Computer Weekly, the airline’s head of digital, James Millet, and CIO Chris Brocklesby explain the initiatives they are putting in place to give the business a competitive advantage, and how teams at the company work collaboratively to deliver customer experience.

“Digital strategy and leadership present a differentiator in the marketplace,” says Millet. “Ease of use for customers – in being able to search for and book flights quickly and clearly at the right price – does differentiate us, and will continue to differentiate us.”

EasyJet has gone to great effort to ensure its customers are not only drawn in by the price of its flights, but return because of the experience it provides when they travel with the airline.

The first port of call for this is mobile technology. The business is constantly updating its mobile application to help customers at each stage of their journey.

“We’re trying to make it as easy as possible for customers to interact with us through digital,” says Millet.

Currently around 12% of boarding passes issued by easyJet are mobile passes, although this can be as high as 50% for some flights. Up to five people can save their booking documents on one mobile device, making it easier for families and small groups to check in and travel together.

The airline is trying to increase the use of mobile among its annual 67 million customers, adding features to cater to their needs. One function easyJet recently added is the capability to scan passports with a smartphone to ease the check-in process. It enables a traveller to use the camera on their mobile phone to take a picture of their passport to auto-populate the fields on the check-in form with the correct information.

Other features include real-time updates to inform customers when the gate is open and how to navigate airports.
“With 67 million people a year flowing through our airports, what we do on the day of travel to make that journey as easy as possible through mobile is a huge opportunity,” says Millet.

“We’re in a fantastic position as a brand because we’ve got all the commercial opportunities, so we’re a £4.5bn e-commerce operation. We can do a lot on mobile to generate revenue and commercial opportunities.”

**Digital innovation to make travel easier**

When the digital team launched the capability to collect boarding passes through the easyJet mobile application 18 months ago, it noticed around 60% of people were checking in online, with only 40% of people choosing to check in at the airport.

Millet’s team adapted the mobile app to better cater for people using digital means to check in, making the process easier and aiming to further reduce the number of airport check-ins.

“We’ve taken a process that could involve being in a queue in an airport - that would take a significant amount of time - on to mobile,” says Millet. “The interim step was that customers had to print a boarding pass at home but, as fewer and fewer people have a printer, this has made the process really quick and easy.”

EasyJet looks at the entire process, from booking to flying, and hones each pain point for customers. In the future, the company hopes to make it possible for customers to declare missed flights and re-arrange bookings through mobile devices.

Using emerging technologies wherever possible is one way easyJet seeks advantage in a competitive industry. Near-field communications (NFC) is one such area the firm has invested in.
EasyJet made its Apple Watch application available on the day Apple launched its NFC-enabled device. Customers with an Apple Watch can use the application to show their boarding passes, receive notifications about flights and collect weather information. “It doesn’t resonate with everyone, but it really works for some of our customers,” says Millet.

The organisation dabbled with streaming service Periscope when it launched, sending videos to customers when problems arose to explain how the situation was being dealt with. “That just felt like a very on-brand thing to do,” says Millet.

The airline plans to use data to offer a truly personalised experience to the customer in the future. “You have to be very careful, as it has to be relevant and it has to be useful. If you can tick those boxes, that’s great,” he says.

“We’re really tailoring how we communicate with customers, and there will be a lot more of that across all digital channels.”

GUIDING TRAVELLERS THROUGH THE AIRPORT

Gatwick Airport is easyJet’s biggest base. The team has worked collaboratively with the airport to introduce geofencing technologies to interact with the easyJet application and guide travellers through the airport at different stages of their journey.

Airport information is aggregated and delivered to customers through the company’s app, giving information such as gate or baggage claim information.

“As soon as you land at the airport, you get a message telling you which baggage belt your bags will be at and you get a map,” explains CIO Brocklesby.

The system is up and running in Geneva airport, with Edinburgh lined up to go live next. EasyJet wants to “integrate and collaborate with the airports” to make each customer’s mobile phone a “travel companion”.

But roll-out will depend on individual airports and their technology, as some are ahead of others. “We’ve had a really good reception from a number of airports, and it’s win-win – it works for them and it works for us,” says Brocklesby.

“DIFFERENTIATING THROUGH DIGITAL IS CHALLENGING, BUT IT’S ABOUT DOING MORE AT A QUICKER PACE”

CHRIS BROCKLESBY, EASYJET CIO

“We have 140 airports across Europe, and different airports will be at different stages of maturity in the way they can provide that data to us. We’ll work with them to migrate everyone across to it in time, which is really exciting.”

COMMUNICATION INSIDE THE BUSINESS

EasyJet has an open-plan office for wider understanding and greater communication across all departments. “My team can never use the excuse that they don’t know how the business works,” says Brocklesby.
The digital and IT teams recently adopted an agile way of working, which is helping the airline attract a lot of IT graduates and talented IT people, because “younger digital natives go wherever the most exciting work is”, he says.

“It’s not just been about delivering transformation for our customers, there has been some level of internal transformation in the way we work together and in terms of recruiting the right kind of people who can work in that type of environment.

“Our people need to deal with a level of ambiguity and they need to be comfortable with that.”

As well as developing customer-facing technologies, easyJet is looking at adapting IT to make processes easier for employees as well, starting with the crew.

“We’re talking about a wireless initiative for colleagues, particularly flight crew and pilots,” says Brocklesby. “We’ve started at the front of the plane, with initiatives to provide pilots with digital capabilities and remove a lot of paperwork from the flight deck. Then we’re going into the cabin, providing crew with mobility.”

The airline is looking at reducing the paperwork that needs to be completed for each flight. Instead of staff having to take this back to the crew room to scan or type up after each flight, the airline is looking into capturing this information digitally. The IT and digital teams want to cut inefficient processes to make the operation as lean as possible – and save even more costs.

“At the moment, the cabin manager has to go back to the crew room to finish all the paperwork, whereas in the future we’d like them to finish their job through a digital device and go home, rather than having to go back to a crew room to complete their shift,” says Brocklesby.

“There’s a whole initiative around digital crew that we’ll move on to next.”

**Prioritising projects**

With so many projects and areas to build and improve on, it can be difficult to decide what to work on next.

“You have to be fairly ruthless in your prioritisation. And you have to be open to re-evaluating that prioritisation, because you won’t necessarily have got it right, and you have to make sure you continue to challenge the order of things,” says Brocklesby.

“In an organisation that wants to get on and has loads of ideas, that’s one of the things we constantly do. “Differentiating through digital is challenging, but it’s about digital delivery and doing more and more and more at a quicker pace than our competitors.”

EDSTOCK/ISTOCK
The value of industrial cloud

Global technology director at General Electric Bill Ruh says machines are getting smarter. He tells Cliff Saran how the company has expanded its vision of an industrial internet to an industrial cloud.

In 2013, Computer Weekly spoke to Bill Ruh about the software-enabled services industrial giant General Electric (GE) was building to provide predictive analytics, based on continuous device monitoring on the so-called industrial internet.

At the time, Ruh talked about how jet engines and wind turbines could be monitored in real time to improve efficiency and reduce failure rates. Two years on, he says GE’s business is now very much powered by software services.

Customers want outcomes, says Ruh, and these outcomes will be realised through an industrial cloud platform: “We have focused on building applications to generate these outcomes.”

Ruh believes an industrial-based business should not ignore the threats and opportunities of devices connected to the internet. “Our biggest worry is if someone figures out how to manage a jet engine in a better way, which is a bit like when iTunes disrupted the music industry,” he says. “All industrial companies need to create services using analytics data and sensors.”

GE’s priority lies in building the software. Ruh says software has added substantially to the organisation’s bottom line, but this does not mean GE will become an IT company.
“People don’t think we’ll build the next smartphone. We’re not going to be Microsoft or SAP. But any industrial business that does not become a software business will not be relevant,” he says.

**INDUSTRIAL INTERNET**

“The industrial internet is about using data from connected machines to make them more efficient,” says Ruh. “We are pulling data off our wind turbines and jet engines. On our jet engines, 5,000 data points are generated continuously in flight. We are putting cameras on our outdoor light fittings to enable a light fitting to provide more than just light, by having intelligence, which enables it to be used for applications such as traffic analysis.”

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"**WE ARE BUILDING AN INTELLIGENT PIPELINE SYSTEM WHICH IS NOW BEING INSTALLED AT COLUMBIA OIL AND GAS**"

**BILL RUH, GENERAL ELECTRIC**

GE has created an industrial application platform called Predix, on which it is now building applications. “We have created 40 applications,” says Ruh. “One of these, PowerUp in our wind turbine business, uses sensors about weather and turbine data to develop best practice to enable operators to generate up to 5% more electricity without physically changing it.”
Another example is an application to monitor oil pipelines. “We are building an intelligent pipeline system which is now being installed at Columbia Oil and Gas,” says Ruh. “We are combining sensor data and data from assets that Columbia Oil and Gas has in other locations, to create risk models. This allows us to assess the risk of any problem occurring, by predicting where they will see problems on the pipeline.”

Ruh believes such technology will enable oil companies to build, repair and manage the current two million miles of oil pipelines safely and more efficiently. “This is the idea of the smart pipeline,” he says.

**Growing the Software Business**

In 2011, GE reported revenues of $2.1bn from its software, mainly licences in healthcare, intelligent platforms and the GE power grid line of business. Ruh says: “We weren’t really thinking about the big picture on creating greater value.”

He says that, to achieve this, the company needed to develop an entirely new common platform and transform the businesses, “to re-imagine the service portfolio”. This became the Predix platform, which Ruh created a team to build.

In 2013, this team numbered 100; it has now grown to 1,000. Ruh says the team’s focus lies in improving the analytics, cyber security and user experience of the platform.

Globally, GE has more than 10,000 software developers and architects. Part of Ruh’s ambition is to connect these people to his software innovation centre and retrain them on the Predix platform and agile software development.
He says one of the challenges he faced was to make the business comfortable with the concept of Predix as a software platform. “But, in the end, we needed the platform to drive greater efficiency in our software development,” he says.

“We see some really specific patterns emerging of commonality in the industrial space, so we are inventing in these common application elements and putting them into the platform, so that you end up with 80% of the work already done.”

**THE COST OF STORAGE AND BUILDING AN APPLICATION QUICKLY, AND THE COST OF CONNECTING A CUSTOMER, HAD TO COME DOWN**

**BILL RUH, GENERAL ELECTRIC**

Ruh took a strategic decision to build Predix on the cloud. The costs of IT infrastructure quickly add up – according to one of his recent tweets, 30,000 miles of oil pipeline generates 17TB of data.

“We realised that, when we’re talking about connecting machines, the cost to serve is high if you do it using traditional mechanisms. The cost of storage and building an application quickly, and the cost of connecting a customer, had to come down.”

The only way GE could achieve this was through a cloud-based business model, mirroring the way the consumer technology giants use the cloud as a platform for their online services.

**THE CHALLENGES OF BECOMING A SOFTWARE FIRM**

The success of organisations such as Google and Microsoft has been fuelled, in part, by opening their platforms to third-party developers. Similarly, open data allows developers to build innovative applications, such as for smart cities. But it has taken the IT industry a long time to see the benefits of opening data and application programming interfaces (APIs).

This is one of the challenges Ruh faces as GE becomes more software-focused. “Many of our businesses say: ‘Don’t you dare sell to our competitor,’” he says. “But our software has to work with other products.”

Standards may have helped the software industry move away from locking in customers, but Ruh is not keen on standards. “There are more standards than you can shake a stick at,” he says. “We don’t care unless it gets us quickly to a solution.”

Instead, he says: “We created a consortium of test beds. We want to test interoperability, so anyone can bring in their stuff and test it.” The Industrial Internet Consortium now has 150 members.

Another challenge is charging for GE’s software capabilities. “If you support 50 million devices where there are a few gas turbines and many valves, you still have to serve the same API,” he says. Clearly, charging on a per-device basis does not take into account the differences between a simple valve and a fully operating gas turbine. “So you need to charge on a use basis,” he says. “The main dynamic is the cost of a gigabyte of storage, plus the cost to serve the API.”

Ultimately, he says, the value of the API needs to be based on the value of the outcomes it can achieve.
Don't wait around for digital disruption

Digital disruption in every sector of the economy and public life is inevitable and unstoppable – the only question is the pace at which it happens.

This is a debate affecting boardrooms across the country. The conversation for laggards has changed from “it will never happen to us” to “it will happen to us more slowly, we have plenty of time”. Neither statement is correct.

Look at two very different sectors as examples. Computer Weekly recently attended the Sibos financial services conference, where digital disruption was high on the agenda. Banking has been relatively unaffected by technology-led transformation, compared with the retail, entertainment and media industries. The sector is protected by high regulatory barriers. But industry leaders have reached a tipping point of awareness – they know that change is coming; they realise digital is both a threat and an opportunity. There will be some great innovations in the next five years or so.

By contrast, we also attended the recent Socitm conference for local government IT managers. While there are some outstanding pockets of digital transformation in the sector, many councils are struggling, and most often this is because they haven’t reached that same tipping point that the banks finally have. They still believe they can carry on doing what they do, cutting costs here and there with a bit of IT efficiency or outsourcing.

Here, councils are protected by statute, not by regulation. A local authority won’t go out of business if it doesn’t go digital. But as austerity cuts bite harder, the quality of public services will suffer.

In both banking and local government, digital disruption is inevitable and unstoppable. The only difference is the pace at which it happens. The reason? You. And the woman next to you, and the bloke beside her. As soon as digital technology makes it easier, cheaper or quicker to perform an activity, people start to do it.

The competition watchdog said last week that only a tiny minority of people switch banks, despite the industry making it easier to do so. Just wait until a mobile bank makes it possible at the press of a button – watch people switch. Watch citizen engagement with councils blossom when they can do so easily and intuitively thanks to technology.

Digital disruption is inevitable and unstoppable. Just wait and see – or better still, don’t wait at all.
Life is tough for today’s chief information officers. Just keeping up to speed with what is happening in the world of technology is difficult. Three and even four-letter acronym (TLA and FLA) confusion abounds. Where does SDN fit into SDDC? Should you be looking at VoLTE rather than VoIP over SIP? Is NVMe via M.2 better than PCIe for high-performance datacentre storage?

In reality, these terms aren’t of that much use to CIOs – it is all just so much speeds and feeds. These technical aspects change so rapidly that trying to keep up to date just creates a further problem of firefighting – you get so worried about being on an old platform that all that you can do is implement ill-thought-out technical changes with continuous, negative business impact.

The position of CIO has been changing and we are seeing more people in the role from less technical backgrounds than in the past. The main driver for this is cloud computing – a public cloud platform hides more of the technical back end from the user than an in-house, physical platform.

The canny CIO can then focus on what matters, which is supporting the business. Rather than worrying if the servers are AMD, Intel or Power-based, with a Dell, HP or IBM badge on them, the CIO can look at the overall capabilities and performance of a cloud provider’s platform and services.

The position of CIO is changing and there are more people in the role from less technical backgrounds than in the past, says Clive Longbottom.

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The position of CIO is changing and there are more people in the role from less technical backgrounds than in the past, says Clive Longbottom.
The modern CIO has to be far more of a business-led advisor, getting involved as early as possible in the discussions around the business’s tactical and strategic needs. Therefore, the CIO needs to tap sources of information on these subjects. The internet has lots of information, but therein lies the problem – there is too much information available. The internet suffers from a lack of curation. Even though the technical capability to measure the perceived value of information is there through tracking how many times a document has been referred to, re-posted or tweeted, there are few easy ways to carry out a global search and receive curated information back. Fighting through all the dross to find the flecks of gold is too much of a time-waster for most CIOs.

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Sure, the CIO still has to be careful to ensure the services and functions they are advising the business to use meet strict criteria of performance, availability, security, compliance and so on. But this is not predicated on the physical platform so much as the cloud provider’s overall approach and its use of policies and procedures to ensure agreed service levels are met.

This does not absolve the CIO from abdicating all knowledge of what is happening in the technology world. Although the abstraction from hardware to software means the general need to track speeds and feeds is less of an issue, what is happening at the software layer becomes more important.

To ensure the business is fully supported, an understanding of how to achieve high availability at the right cost is needed, along with how to ensure that information is secured as it passes along a process workflow.

Being able to understand how disparate work-flows between the company and its customers and suppliers can be integrated to provide the optimum business value is also needed, as is being able to ensure areas such as the internet of things/everything (IoT/E) are dealt with successfully.

Tapping information sources

Therefore, the CIO needs to tap sources of information on these subjects. The internet has lots of information, but therein lies the problem – there is too much information available.

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Trusting in incumbent suppliers and service providers is also not recommended. They will have their...
own agendas, often trying to force their existing portfolios into the topic du jour, even if it is actually the wrong tool for the job.

Even paid-for information, in the line of industry analyst services, may not be what a CIO is looking for. Unfortunately, many paid-for sources are not in a position to carry out full product evaluations, and the sources are having to produce output that is aimed at the general organisation - not your specific one.

With all of these sources, there is a need for a trust relationship to be built up first. Ask yourself: Do you know the author of an item picked up off the internet? Has your supplier or service provider been honest and trustworthy with you before? Do you have a good working relationship with a named analyst?

SURROUNDING YOURSELF WITH THE RIGHT PEOPLE

So, this seems to leave the CIO with a pretty major problem. However, as the “grunt work” of systems admin is progressively avoided through automation and outsourcing to public cloud, more of the IT budget and resources should be freed up.

The CIO has to look for the right people to surround themselves with people who can have a depth of understanding in for example, the IoT/E while also having sufficient breadth of knowledge to be able to contextually understand how this fits into the business’ needs and what the rest of the IT team is doing.

These new IT team members have to be a new breed of business architects - driven from the top of the business, being able to act as the Babel Fish, translating business needs into technical capabilities. Each one can use multiple sources to increase their depth of knowledge in their particular area, and as a team can report back to the CIO who then has the job of ensuring that any composite system meets the business’s overall needs. So, although previously stating that all sources have to be regarded as suspect, by sharing out the work effectively, those flecks of gold dust can be found more effectively.
Don’t forget the users, either. Many of these may well have found approaches that work for them through shadow IT, paying low-cost subscriptions for cloud-based services they or their team are using.

Users are now more likely to be technically ahead of the technology curve an organisation has had to adopt because of long refresh cycles, due to the ubiquity of advanced technology in their personal lives.

Bring your own device and the increase in home automation means there are many users out there who may have great ideas or be already using great systems to support their work. CIOs should identify such usage and see if it is useful across the company – then make sure the system is enterprise-grade. If so, push it out across the rest of the business; if not, find a similar system that offers the same or better functionality that is enterprise-grade.

All information gathered from these new business architects and users needs to be captured and curated internally, so that all assumptions and sources can be checked as needed to make sure that false or suspect information has not been used.

Here, companies such as Druva, Commvault and Docurated provide tools for analysing and tagging data and information for all workers that can collate information into libraries that do not involve high cost document management systems that only focus on the needs of the few.

**Whereas technical change for the sake of technical change is bad for the business, supporting continuous change in the business through technical flexibility has to be the goal**

CIO more critical than ever

The new CIO is therefore a person wearing many hats. They are the point of confluence between business needs and technical capabilities. They are the aggregate point for sets of mixed ideas coming through from a team of business-led technical experts. They are business advisors ensuring the organisation does not take on tactical technology systems that work against the longer-term strategy. They are the buffer against suppliers who over-promise and under-deliver.

With the pace of change in technology and the need for organisations to have continual change in their processes, the CIO role is more critical than it has ever been. Whereas technical change for the sake of technical change is bad for the business, supporting continuous change in the business through technical flexibility has to be the goal.

Those who want to remain hyper-technical now need to get out and work for a hyper-technical company, such as a cloud service provider. Those who want to remain a valid and valuable member of a user organisation must change their mindset and take on these various hats to ensure the business maintains market competitiveness into the future.

Clive Longbottom is founder of analyst company Quocirca
Over the past few years, the concept of digital disruption has received as much or more attention than any other business topic. Given the massive changes we have seen in the media, advertising, retail, taxi services and other sectors, speculation that similar shifts will spread across the wider economy is only natural.

But are these disruptions imminent? Why have some industries been so much more disrupted than others? How, and to what extent, will each of our major industrial sectors really change? Where will Silicon Valley or its many global imitators find the next generation of mega successes?

Digital disruption is inevitable - but different forces in different industries mean the pace of change varies by sector, writes David Moschella

Each major phase of IT industry progress has been led by a new generation of firms

Disruption past and present

The historical pattern couldn’t be clearer. Each major phase of IT industry progress has been led by a new generation of firms - IBM in mainframes, Digital Equipment Corp in mini-computers, Microsoft and Intel in personal computers, Apple in mobility and Google, Amazon and Facebook in the internet era. As new firms have arisen, many once-great firms have become a shell of themselves or vanished altogether.
The reason Clayton Christensen is the most famous business professor of our time is because he developed the best explanation of why new firms have so often defeated much larger rivals.

When a disruptive innovation emerges, it is usually immature, and thus incumbents easily dismiss it as a “toy” that can be safely ignored – even ridiculed. However, as the technology improves, the new approach is seen as an increasingly serious threat that must be either resisted or co-opted.

In the final stage, the once-mocked technology becomes the obvious industry norm – but by then, it is usually much too late. Personal computers, mobile phones and social media have all followed this toy/threat/obvious pattern.

However, this three-stage dynamic is not just an IT industry phenomenon. PayPal, Netflix, Skype and Uber were also once dismissed as toys, and in recent years, the number of technologies in the toy phase has risen sharply: 3D printers, digital cash, self-driving cars, smartwatches, internet TV, 3D goggles, robots, smart clothing, massively open online courses, drones, expert systems, do-it-yourself medical tests, the quantified self, artificial intelligence and more.

It is this proliferation of possibilities that fuels today’s sense of accelerating disruption potential.

**INDUSTRY DISRUPTION VARIES WIDELY BY SECTOR**

This diagram (right) provides a sense of how industry disruption has varied so far, from dramatic transformations to almost no change at all.

Interestingly, no industry has experienced total disruption. There are still successful newspapers, recording labels, bookstores, travel agents, taxi operators, retail stores and advertising firms. The Financial Times recently sold for an impressive $1.3bn, and printed books are now holding their own against e-book competition. Super Bowl television advertising slots sell out at astronomical prices. Incumbent firms still have many strengths and advantages.

Nevertheless, our attention is inevitably drawn to the bottom half of the figure. Why have these industries changed so much less than others, and – more importantly – will these differences continue?
Research by Leading Edge Forum examined 10 major industries. Six of these are commercial – automotive, manufacturing, retail, banking, insurance and professional services – and four are quasi-public.

Healthcare, electrical utilities, education and defence are a mix of private companies and public services, and this affects the nature and speed of potential disruption. Overall, the current mixed picture is expected to continue, with much depending on whether one is using a five or 10-year timeframe.

The top-level disruption perspectives in five major industries are briefly summarised below:

**Banking**
The potential for disruption is strong across the entire banking industry value chain, especially in lending, payments, currency, funds transfer and financial advice. Increasingly fierce competition between traditional banking incumbents and emerging financial technology (fintech) players is expected.

**Insurance**
In contrast, insurance shows little sign of imminent change. There are very few exciting new digital insurance firms, and there is still a great deal of inertia in the system. The fact that many forms of insurance are purchased annually, and used even less frequently, seems to be a major gating factor.

**Healthcare**
Medical technology (medtech) is evolving rapidly, and sophisticated at-home, retail and self-administered healthcare services will significantly disaggregate much of today’s medical industry. But the big question is how well public healthcare services will adapt to these important new capabilities.

**Transport**
Uber and various on-demand services are fundamentally disrupting the taxi business. However, their impact on the major carmakers will be modest. Electric and self-driving cars will have much greater disruptive potential, but not until the 2020s. While Silicon Valley currently has the “cartech” edge, partnerships with Detroit, Germany, Japan, Korea and eventually China will prove essential.

**Manufacturing**
Smart products, robots and 3D printing have yet to alter the current advantages of high-volume, offshore manufacturing. Further, the internet of things has so far proven to be more sustaining than disruptive. While some significant changes are expected, the overall level of manufacturing industry disruption for the next five years will be modest.
**Future Disruption**

As previously noted, discussions about industry disruption need to be clear about the timeframe under consideration. While the scenarios described earlier can be seen as relatively modest, it is because they are focused on the changes we expect over the next five years.

**Biotech, nanotech, robotics, machine intelligence, printed electronics, virtual reality and synthetic food are just a few of the potentially hugely disruptive technologies that lie ahead**

But of course, from a 10 to 20-year perspective, entirely new possibilities come into play.

Biotech, nanotech, robotics, machine intelligence, printed electronics, virtual reality and synthetic food are just a few of the potentially hugely disruptive technologies that lie ahead.

Indeed, when historians look back at today’s disruptive innovation situation, they may view it as a relative lull between the huge successes of the initial internet boom (1995-2015) and the pervasive technological transformations of the 2020-2050 period.
After three years of debate, drafts and discord, the work of the European Commission (EC) to overhaul the laws governing how the personal data of European Union (EU) citizens should be treated is nearing completion, with the final version of the General Data Protection Regulation (GDPR) legislation set for publication before the year is out.

While the finer points are still being hammered out, the proposals aim to introduce a single set of rules governing how personal data should be held and processed by all 28 EU member states.

Daniel Hedley, technology, media and telecoms lawyer at legal firm Thomas Eggar LLP, explains: “At the moment, we have a directive and 26 different implementations of it – all of which vary – and 28 different regulators all applying their own policies and interpreting them in their own way; and they only collaborate loosely through something called the Article 29 Working Party.

“What the new regulations will do is establish a fully harmonised, directly effective, EU-wide data protection law.”

GDPR and the cloud provider community
The push to replace the continent’s patchwork of data protection rules has been broadly welcomed by the cloud service provider community, albeit cautiously.
While it stands to make it easier for native and US-based cloud providers and hosting firms to win business across Europe, the regulation will also put them on an equal footing with data controllers when it comes to liability for data breaches and rule violations.

For this reason, Hedley says cloud service providers need to be aware of the obligations the upcoming set of rules will impose on them.

“At the moment we have a sharp distinction between the data controller [the enterprises that own the data] and the data processor [cloud providers], as all the legal obligations are on the data controller – but this is going to change,” he says.

“Anyone who up to now thought, ‘I’m a processor, I don’t need to think about data protection,’ is soon going to discover that’s not true anymore.”

David Barker, technical director of Surrey-based colocation provider 4D, says the joint liability requirements are likely to prove a big source of concern for cloud firms.

“Traditionally, cloud providers – mainly those in the infrastructure-as-a-service (IaaS) category – haven’t really wanted or needed to know what data is held on their servers, and have simply provisioned a one-size-fits-all system you can subscribe to,” he says.

“If we’re becoming liable for the data customers put on those servers, there needs to be some clear delineation on where the responsibility for that data lies; how the underlying cloud infrastructure is being protected; and how the customer protects any data they put on those virtual servers.”

**Law could push up cloud prices**

This means cloud firms will have to take a keener interest in what exactly users are planning to store on their infrastructure – which could cause their overheads to rise.

“The costs are going to start to creep up, to take into account the additional administration of dealing with these regulations for each customer deployment – and we might even see more bespoke requirements for production systems for larger businesses,” he says.

While this might mean customers have to pay more for services, the alternative – currently mooted as either a fine of up to €100m or 5% of the company’s annual global turnover, whichever the higher – is even less attractive.

“If you’re looking at a fine of that size, the customer is going to be happy to pay that little bit extra as insurance,” says Barker.

Lillian Pang, director of legal at managed cloud provider Rackspace, says the joint liability requirements also mean cloud providers will be obliged to alert the authorities to data breaches within 72 hours.

**“The scope of the reform is large enough for this to be viewed as a global data protection law”**

Steve Durbin, Information Security Forum
“It will require the cloud provider to have a very good incident-response management programme in place,” she says.

“If there is any type of breach coming in, they will need to be able to identify it, and notify the customer about what that breach looks like, so they can notify their users.

“There are going to be quite a few steps involved – especially from the cloud provider perspective, because they’re not necessarily the ones who will have the direct relationship with the user in every case.”

**OVERSEAS PROVIDERS AND ‘RIGHT TO BE FORGOTTEN’**

Such a wide-ranging reform of the EU’s data protection landscape last took place 20 years ago – at a time when the internet was an emerging technology, and the amount of user data collected, shared and stored was miniscule by today’s standards.

Indeed, the amount of personal data belonging to EU citizens now held and processed outside Europe has markedly increased – another area the GDPR seeks to address.

But Steve Durbin, managing director of the non-profit Information Security Forum organisation, fears many overseas cloud providers may not know the rules apply to them.

“US cloud providers who host personal data of EU residents will, in many cases, be subject to EU law – even if the cloud provider’s clients are not themselves established in the EU,” Durbin says.

“Suffice to say, the scope of the reform is large enough for this to be viewed as a global data protection law, and organisations would be well advised to begin preparations now.”

This expanding geographical remit is keenly felt throughout the GDPR, particularly where its reworking of the rules around the “right to be forgotten” are concerned.

Under the terms of the 1995 Data Protection Directive – the legislation the GDPR will replace – an individual can ask for personal data held about them by an EU-based data controller to be deleted, once it is no longer needed.

The updated version expands this, so that the same principles will now apply to non-European companies that process the data of EU citizens – regardless of where their servers are located.

**BUILD LAW INTO INFRASTRUCTURE**

Aside from this, several parties have flagged the “right to be forgotten” as an essential part of the GDPR for cloud providers to get to grips with.

Philippe Courtot, CEO of network security supplier Qualys, foresees a number of different ways in which EU citizens’ right to be forgotten could trip up ill-prepared cloud providers.

“It depends on the application and what the cloud provider offers, as information can be copied and redistributed into multiple different places – so deleting everything can be difficult,” he says.

**“ONCE WE’VE GOT A FINAL REGULATION, AT LEAST WE WILL KNOW WHAT WE HAVE TO DO”**

Daniel Hedley, Thomas Eggar LLP
“It might be a problem for some cloud providers in how they store data and create multiple copies of information for backup but, if you design your system with this in mind from the start, then it will – of course – be easy to support.”

4D’s Barker says that, to ensure compliance, providers will probably need to collect more metadata around the information they hold about individuals, to make it easy to find where it is stored and delete it.

“Otherwise there is going to be no way a company will be able to say for sure that they’ve deleted every piece of data held on an individual,” he says.

“I think there is going to be an enormous overhead in auditing current datasets and managing the metadata that sits around it.”

Providers will need to develop foolproof systems to confirm the data has been wiped, Barker warns.

**Codifying best practice**

Despite all this, Barker points out that much of what the GDPR requires the cloud and datacentre provider community to do is covered by existing legislation, or formalises existing industry best practice.

“For example, some of it is covered under ISO 27001. So, if you’re certified to that ISO standard, a lot of the preparation will be around reviewing what the provider is already doing,” he says.

“If they don’t have the [ISO 27001](https://www.iso.org/standard/41569.html) standard, it is going to be a big change to how you run your business.”

Hedley agrees, citing another of the GDPR’s stipulations, that companies should take a plain-English approach when writing their privacy policies, so users don’t have to second-guess how their data might be used.

“Writing your privacy policy in a way people can understand is obviously good practice – and well-advised, well-run organisations that are good at data protection already do that,” he says.

“The requirement to have a data protection officer on your staff, if your company is above a certain size, is another example. Most well-run organisations will already be doing that. So, a lot of it is simply codifying good practice.”

For cloud providers yet to secure the ISO 27001, or whose privacy policies currently amount to legalese gobbledygook, there is still time to ensure they operate within the boundaries set by the GDPR, Hedley says.

“From a practical standpoint, once we’ve got a final regulation, at least we will know what we have to do,” Hedley says.

“There will be a transition period. Assuming the regulation is set and adopted by the [end of the year](https://compweek.com/2015/10/31/end-year-2015/), that doesn’t mean it will come into force. I think the plan is to do that in 2017, so there will be some breathing space.”

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**Editors’ note:**

Downtime is the result of skilled writers working hard across the entire Digital Week publishing group. Contributions to Downtime are welcome. Contact us at: [downtime@computerweekly.com](mailto:downtime@computerweekly.com)
Stadium deductive reasoning

IT people always talk about aligning IT with the business. So if you head up technology for Arsenal, Manchester United or any other team, what's the priority from an IT perspective? Options are:

1. Put Wi-Fi in the stadium
2. Figure out how to make the queue for the loos go quicker
3. Faster ordering of beer

Logic dictates pick number two. The problem with number three is that if you make it quicker to order more beer, sure as hell punters will buy more, drink more and get drunk more – then they realise pretty quickly they need the loo.