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RACONTEUR

PUBLISHING MANAGER
Lucy O'Boyle

PRODUCTION EDITOR
Benjamin Chiou

MANAGING EDITOR
Peter Archer

HEAD OF PRODUCTION
Natalia Rosek

DIGITAL CONTENT MANAGER
Jessica McGreal

DESIGN
**Samuele Motta
Grant Chapman
Kellie Jerrard**

CONTRIBUTORS

MARTIN BARROW
Former health editor, news editor, foreign news editor and business news editor at *The Times*, he specialises in the NHS and social care.

DAVID BICKNELL
Editor of *Government Computing*, he specialises in public services information management and information technology.

LIZ LIGHTFOOT
A freelance education writer and award-winning specialist, she reports on schools, and further and higher education in the national media.

JIM McCLELLAND
Sustainable futurist, his specialisms include built environment, corporate social responsibility and ecosystem services.

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

EMMA WOOLLACOTT
Specialist technology writer, she covers legal and regulatory issues, contributing to *Forbes* and the *New Statesman*.

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Digital government must stay on track

Government commitment to digital services must not be distracted by events, notably Brexit, if the public sector is to reap the benefits of technology

OVERVIEW
DAVID BICKNELL

The Government Digital Service (GDS) is a bit like Marmite. You either love the different thinking, the agenda for change and the people with digital skills that it has brought to government. Or you'll be put off by its perceived role in shaking up Whitehall's structure of departmental government.

The landscape for so-called digital transformation, both in central government and the wider public sector in 2017, will inevitably be set by GDS strategy to be unveiled by new director general Kevin Cunningham before Christmas.

We have been here before. The run-up to last year's Spending Review was dominated by what budget GDS would receive and many were surprised by its £450 million allocation. Now, a year on, vendors large and small want to help GDS spend its windfall, with smaller companies keen to maintain their influence through procurement frameworks such as G-Cloud, and larger vendors equally keen to stress their own heavy-lifting credentials to transform Whitehall's legacy IT.

As well as GDS's £450 million, last year's Spending Review invested £1.8 billion in digital technology and transformation projects across the public sector; £1.3 billion of that was earmarked to help HM Revenue & Customs (HMRC) move towards a fully digital tax system by 2020. HMRC has made progress towards resolving its outsourced Aspire IT contract, but saw its IT chief Mark Dearnley leave in September.

Looking ahead to 2017, the next instalment of the GDS story is keenly anticipated, with the departure of recent digital executives eagerly examined for any impact on GDS's ambition "to transform the relationship between citizen and state by making the best use of digital ways of working".

One departee's blog complained: "I'm seeing a lack of appetite in departments for real, meaningful transformation. I'm seeing a lack of effective leadership right from the very top of the Civil Service. There is a lack of vision, lack of ambition and lack of any sort of a plan anywhere."

In fairness, the Civil Service has had a few things on its plate, including the 2015 general election, purdah periods, a Spending Review, the European Union referendum, administration change and what Brexit means. So perhaps it's hardly surprising if digital government has slipped in priority, both for civil servants and the prime minister.

Even the way digital transformation is being tackled has been questioned. A Brunel University study argues that ICT has a part to play in the future of policy design and administration, but through the lens of policy instruments, not technology. It warns the assumption that government is a service industry, with a private sector model in mind is dangerously misleading. It adds: "Citizens are not customers."

Camden Council's deputy leader Theo Blackwell has similar concerns. He worries digital transformation won't succeed if public policy treats change in terms of the dynamics of a central versus local debate, rather than using digital technology and techniques to improve public service delivery where it happens.

Alan Mo, research director at the Kable public sector analysis group, says while many local authorities have made a general commitment to the deployment and use

of digital services, the scope and approach adopted varies significantly. "While for some, the digital strategy will initially focus on shifting high-volume transactions to more cost-effective channels, for others creating end-to-end digital services typically requires a major redesign of processes and systems," he says.

Influencing the landscape for public sector technology are the thorny subjects of data-sharing and data protection. Analysing the data remains essential for digital transformation, but there are concerns whether sufficient data analysis, indeed wider digital skills, exist in the public sector.

Meanwhile data-sharing, in Whitehall and the NHS, remains controversial. Data-sharing measures in the Digital Economy Bill currently going through Parliament have been heavily amended

and the Bill is under fire for insufficiently addressing the impact of the impending EU General Data Protection Regulation which will take effect from May 2018. Despite Brexit, the government must still consider how this applies to the UK.

Data is vital infrastructure for a 21st-century economy. It is vital for democratic engagement, economic growth and innovation. The UK has been a leader in the data and digital arenas, but some believe it risks losing this position due to the frustratingly siloed nature of the government's strategy. It needs to build on its open data successes before other countries overtake it.

Underpinning the public sector landscape is the cyber security headache. The latest five-year National Cyber Security Strategy, with £1.9 billion set aside to support workforce training, automated defences and new methods for deterring cyber attacks, will certainly help. But it is probably just a question of time before the public sector's soft cyber underbelly suffers another incident.

Some believe 2017 will see the emergence of a new cloud paradigm for the public sector. The London Grid for Learning suggests delivering common digital capabilities can break down silos, enable service integration, and deliver joined-up services and data. It argues up to £1 billion could be saved if London bought into the idea of a super cloud delivering common digital capabilities for the public sector.

“The UK has been a leader in the data and digital arenas, but it risks losing this position”

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NHS

MARTIN BARROW

The NHS, one of the world's largest employers, defines itself by the humanity of its dedicated and tireless staff. But the reality is that the future of the health service will probably be decided by smartphones and digital technology.

At a time of unprecedented financial challenges, together with a relentless rise in demand from an increasingly vulnerable population, apparent shortcomings of the NHS's technological framework may have been brutally exposed.

While every other aspect of our lives has been transformed by technology, from retailing and travel to communication and banking, the consumer experience of health and social care remains much as it was before the advent of the mobile phone and the internet. For example, in the UK 86 per cent of adults use the internet, but only 2 per cent use it to contact their GP.

The technology industry has enjoyed huge success in creating consumer health products, but these are not comprehensively linked to the formal health and social care sector. The NHS itself is believed to be the world's largest consumer of fax paper, using an obsolete technology that has largely disappeared from most other walks of life. For care professionals, from social workers to doctors and nurses, the arrival of the digital age may often have been experienced not as a force for good, but rather as an intrusive additional burden in an already pressured existence.

Against this inauspicious background, digital technology is at the centre of the NHS Five Year Forward View, the ambitious road map set out by Simon Stevens, the NHS chief executive, to create a sustainable and affordable health service by 2020. For it is now beyond dispute that better use of data and technology has the power to improve health, transform the quality and reduce the cost of health and care services.

The new strategy seeks to draw a line under previous IT initiatives, which have ended in ignominious and expensive failure. In the past, the NHS has oscillated between opposite approaches to information technology



Owen Humphreys/Getty Images



The NHS is working to create an expanding set of accredited health apps that patients will be able to use to organise and manage their own health and care

NHS is to get a course of high-tech treatment

Technology may sometimes be perceived as a bitter pill, but it is the medicine that could yet save an ailing NHS

adoption, from highly centralised national procurements and implementations to the opposite extreme of highly localised, unstructured projects. The result has been systems that do not talk to each other and a failure to harness the shared benefits that come from interoperable systems.

The record of performance benefits from past investments is equally mixed. Despite the signif-

icant investment in hospital systems over the last decade, it has been estimated that across the acute sector only around 33 per cent of the potential benefits have yet been realised, particularly with regard to harnessing patient data to improve the delivery of care.

The latest approach seeks to strike a new course. Nationally, the NHS will focus on the key systems that

enable different parts of the health service to work together. Other systems will be for the local NHS to decide upon and procure, provided they meet nationally specified interoperability and data standards.

A National Information Board has been established which brings together organisations from across the NHS, public health, clinical science, social care, local government and public representatives, addressing past concerns that systems were centrally imposed, instead of being developed collaboratively.

The NHS also has its first chief clinical information officer in Professor Keith McNeil, who was formerly chief executive at Addenbrooke's Hospital. Professor McNeil acknowledges the challenge of delivering on the commitments of the Five Year Forward View, but believes the NHS is better placed than is widely understood.

"There is a varied landscape across the NHS," he says. "There are NHS trusts that have shown foresight and courage in embracing technology, and there are others which are struggling with legacy systems at the end of their useful life."

By way of examples, more than 96 per cent of GPs have installed digital clinical record systems and

ABOVE
NHS chief executive Simon Stevens (centre) has drawn up an ambitious five-year plan around digital technology

NHS Choices gets 40 million visits a month. The Spine, the NHS system for the extraction, collection, storage and transmission of data, handles more than 200 million interactions a month. The challenge is to ensure that what works well is shared across the NHS while continuing to improve the interface between systems, to ensure patient information flows seamlessly to different care providers from, say, dentist to GP to social care provider.

Some of the barriers to improving the implementation of digital technologies are comparatively mundane and easily overcome, including a lack of universal wi-fi access, a failure to provide computers or tablets to ward or community-based staff, and outmoded security procedures that, by frustrating health and care professionals, encourage inappropriate workarounds.

"There is much that we can achieve through some fairly basic investment, such as up-to-date powerful wi-fi, which would improve the effective use of apps," says Professor McNeil. The NHS is working to create an expanding set of accredited health apps that patients will be able to use to organise and manage their own health and care, while forging partnerships with the voluntary sector and industry to support digital inclusion.

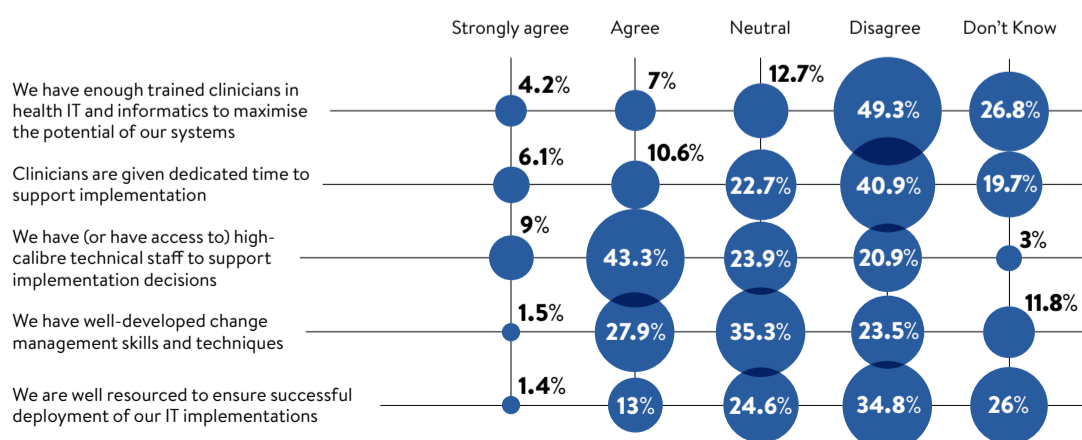
The government has announced investment of £4.2 billion in technology for a paperless NHS by 2020, but making the economic case for investment in IT is a challenge at a time when frontline care is struggling. Professor McNeil says: "In IT, money is always a constraint. But the funding is mostly available. There is enough money to kick-start an IT revolution. What we have to do is to demonstrate a return on investment, both in terms of improved patient care and productivity gains."

Earlier this year, NHS England awarded £100 million to the most digitally advanced trusts to become centres of global digital excellence. The trusts will lead the adoption of digital technologies into acute care provision and support workforce development, including the development of a next generation of chief clinical information officers.

Professor McNeil concludes: "The good news is that the National Information Board lays out a good platform that gets us to where we want to be. It is exciting and achievable."

HEALTHCARE CHIEFS' ATTITUDES TOWARDS INFORMATION TECHNOLOGY

SURVEY OF CHIEF CLINICAL INFORMATION OFFICERS IN ENGLAND



Source: National Advisory Group 2016

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COMMERCIAL FEATURE

SOFTWARE IS MOBILISING THE NHS

*Innovative mobile communications technology and software are saving lives at hospitals up and down the country, says **Paul Volkaerts**, founder and chief executive of Nervecentre*



Innovation in healthcare saves lives. Every day, across the NHS, clinical staff are delivering higher standards of care through the use of technology that was unimaginable a few short years ago.

There is a public perception that the NHS is locked in a time warp, beholden to a way of doing things that has not changed in a generation. But the reality is that the NHS has made huge progress in the evolution towards a modern, digital health service.

My company, Nervecentre Software, is one of a number of innovative technology companies working with hospital trusts to create new systems that are transforming the way our doctors and nurses work.

Our mobile solution not only provides a way to capture information electronically at the bedside, but assists in the co-ordination of care, ensuring the right doctor is with the right patient at the right time, with the most up-to-date information to hand. Simple as it sounds, this can make all the difference to a patient who is acutely ill.

Bringing innovative technology to front-line clinicians has of course been enabled by the explosion of mobile devices and thanks to software suppliers such as Nervecentre, the NHS has become the world leader in the adoption of mobile technology in hospitals.

To the layman, the efficiency benefit of improving communications within the hospital is obvious, but the

impact this can have on saving lives and preventing avoidable harm is compelling. It is estimated that more than 80 per cent of avoidable harm in a hospital has poor communication as a factor. It has been very rewarding over the last five years to help hospitals adopt 21st-century technology that can have such a significant impact on the level of care, by helping clinicians to communicate and co-ordinate better.

In a study at the Queen Alexandra Hospital in Portsmouth, this change halved the number of cases of significant, avoidable harm during the night-time through the use of mobile software to manage nurses' and clinicians' workload.

Nervecentre technology has been in use across a variety of major hospitals, from specialist hospitals such as Great Ormond Street Hospital for Children, to large acute hospitals including University Hospitals of Leicester, and up and down the country from Cornwall to Durham. Across these diverse hospitals there is clear evidence now that it is saving lives, while helping hospital trusts make good progress towards long-term sustainability.

Its use was pioneered from 2010 at Nottingham University Hospitals NHS Trust (NUH), one of the biggest acute trusts. Today more than 6,000 doctors, nurses and healthcare assistants at NUH use handheld devices in clinical care on a daily basis

in over 80 wards. These include most of the in-patient wards at NUH's two hospital sites, Queen's Medical Centre and City Hospital. Our system has become by far the most-used clinical system in these hospitals with tens of thousands of interactions with the software by clinicians every day.

If you are a patient in any one of those hospitals, the nurse will enter your key vital signs, such as temperature, blood pressure and respiratory rate, into a mobile device while they are stood beside you. If your condition has deteriorated, the Nervecentre software will automatically alert the most appropriate doctor on their mobile device without the nurse stepping away from the patient. Compare this to writing on paper and paging a doctor, which still happens in more than 90 per cent of the world's hospitals.

An evaluation conducted by Nottingham University on behalf of NUH showed that patients who required transfer to intensive care, spent on average 10 per cent less time in intensive care because they arrived there earlier in their deterioration. This equates to approximately £1 million a year in intensive care bed days. As in all industries, process streamlining that increases quality will also reduce costs.

The evaluation by NUH also demonstrated significant gains in efficiency through the introduction of mobile devices. Implementing Nervecentre electronic observations and our mobile Clinical Noting

RIGHT
Paul Volkaerts
Founder and
chief executive
Nervecentre

software cut the time doctors and nurses spend in back offices and at a PC. Findings include that more than 100 hours of nursing time a day may be saved due to efficiencies brought about by the electronic observations process. This releases time to care.

NHS leadership in this area is in part due to targeted government funding. In response to reports from Professor Sir Bruce Keogh, medical director for NHS England, mobile technology and apps such as Nervecentre's were seen as a way to replace paper charts by the bedside. They release time for nurses and help management teams ensure that every patient receives the appropriate level of observation.

During 2014 and 2015, we deployed our software to almost one hospital a month, elevating the NHS and Nervecentre to the position of leaders in this new segment.

This year I was honoured to be appointed a fellow of the NHS Innovation Accelerator, an NHS programme sponsored by Sir Bruce in partnership with the 15 Academic Health Science Networks across England, to speed up the adoption of proven technologies such as ours across the NHS. The fellowship is evidence that the NHS take innovation seriously and recognition that technology innovation is the only route to a sustainable health service.

Last month there was further recognition for Nervecentre when the company was named the fifth fastest-growing technology business in the UK in the prestigious *Deloitte 2016 UK Technology Fast 50*, honouring the thriving small and medium-sized enterprises that are the backbone of British industry in the 21st century.

We are only on the first step of what can be achieved by providing clinicians with information and co-ordination at their fingertips as there is so much more we can do to help improve



safety and efficiency in our hospitals. One such improvement is in the recognition and treatment of sepsis.

Sepsis is a life-threatening condition triggered by an infection or injury. Treatment of sepsis is well understood, but recognition of the condition is complex. In the UK more than 44,000 people each year die from sepsis, it consumes more than a third of our most expensive beds in intensive care and costs the NHS around £2.5 billion.

Our software looks for the signs of sepsis that have been documented by the National Institute for Health and Care Excellence (NICE). We automate the NICE algorithms that combine information from vital signs and blood test results, and can drive immediate notifications to doctors.

Nervecentre embodies the innovative spirit that will enable the NHS to continue to improve patient care. And technologies are emerging that will prevent diseases, speed up diagnoses, improve safety and efficiency, and increase patient participation. Companies such as Nervecentre will continue to make sure these technologies are put at the disposal of NHS patients as early as possible.

For more information please visit nervecentresoftware.com



“ Thanks to software suppliers such as Nervecentre, the NHS has become the world leader in the adoption of mobile technology in hospitals

Tech transformation running out of steam

Transforming the public sector into a digital powerhouse began with a full head of steam, but may now have lost volition

DIGITAL TRANSFORMATION

DAVID BICKNELL

The Institute for Government's *Making a Success of Digital Government* report poses questions whether, after five years of getting more services online, the initiative is hitting a wall. In 2011, the Government Digital Service (GDS), a digital upstart within the Cabinet Office, threatened to shake up Whitehall's established order, ruffling departmental and old vendor feathers.

It disapproved of large IT outsourcing contracts and made departments the subject of strict spending controls which led to some culture clashes and resistance to change. But new people with digital skills began arriving in government, and were sent out across Whitehall to introduce new online services and help departments build their own digital capability.

Recently, however, the pace of digital government appears to have slowed. Taking digital government to the next level will require sustained attention, but there is little evidence that faced with the demands of Brexit, prime minister Theresa May cares much about it.

In November 2015, GDS was given £450 million in the post-election Spending Review. But since then, its leader Stephen Foreshow-Cain has moved on to be replaced by Kevin Cunnington.

Mr Cunnington plans to unveil the new GDS strategy this month and has already offered some clues on where GDS is headed, saying it will be less adversarial with departments, expand Whitehall's "digital academies", and create a national footprint by getting out of London.

According to Mr Cunnington: "GDS is here to help departments transform the relationship between the citizen and the state.

And to do this we will support, enable and assure departments as they deliver their digital transformations. We're here to listen to them, to help them do the right work, and be confident that it's being done in the most efficient and effective way."

A Cabinet Office spokesman adds that the new government strategy will "set out our post-Brexit priorities" and "reflect the next phase of digital transformation, a necessarily more ambitious agenda".

Despite looking ahead to its strategy launch, GDS supporters still worry it is in danger of losing its influence. Jan Joubert, chief executive of Rainmaker Solutions, which has worked with Whitehall departments and the High Speed 2 railway project, believes GDS should stick to what it does best.

"GDS must continue to have confidence in, as well as champion, agile and iterative ways of working. It must have the courage to stick to its original principles and facilitate the continued implementation of change," he says.

Other vendors also have concerns. Tim Hearn, VMware's director of UK government and public services, argues there is a risk that transformation will stall if the issue of legacy IT is not addressed and upgraded. James Norman, UK public sector chief information officer at Dell-EMC, believes digital transformation is as much about transforming culture as transforming IT and hopes the new GDS strategy will be "a trigger for a new governance role supporting departments".

Elwyn Jones, CGI's head of central government and justice, insists digital transformation isn't slowing, but has simply moved from projects offering easy, low-hanging fruit to more ambitious and structured transformation programmes that are either commencing or are being planned.

Steve Shakespeare, an executive director at Civica, says for digital transformation to become a reality, public sector organisations must completely readapt the way they think, with drive from the very top and support for a culture of innovation.



Bloomberg / Getty Images

Dr Mark Thompson, Methods Group strategy director, highlights the difference between Blockbuster Video, which ignored the business implications of the internet, and Netflix, which placed it at the centre of its operating model. And IBM points to the value of so-called cognitive technologies in allowing public sector organisations to understand the value of their data, recently adding new UK cloud data centres and leasing space in Ark Data Centres, the government's joint-venture partner for delivering public sector data-centre services.

If there is one area of the public sector that literally cannot afford to see stalling digital transformation, it is local government, which is trying to transform itself through digital processes to offset swingeing budget cuts.

In these cases, a visionary local leader is key. At Leeds City Council, chief digital officer Dylan Roberts has driven a 100 per cent digital

vision with, in the context of health and social care, a strong focus on local citizens becoming more digitally literate and able to do things for themselves through consumer-based tools.

At Wigan Council, chief executive Alison McKenzie-Folan's focus is creating a truly digital borough by



If there is one area of the public sector that literally cannot afford to see stalling digital transformation, it is local government

2020. The strategy includes increasing digital connectivity to boost digital business, growing digital skills and tackling digital exclusion so residents can have increased life opportunities.

Wigan created The Deal, an informal agreement between the council and everyone

who lives or works locally, to work together to create a better borough. The plan has saved around £100 million from Wigan's budget and includes encouragement for citizens to interact with the council through online services.

The council also has a digital strategy steering group, a public-private partnership working with business partners to ensure



BELOW
Former GDS head Stephen Foreshow-Cain resigned in August after just nine months

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GOING PAPERLESS



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Within the public sector, healthcare and local government are seeing widespread process changes that are delivering significant savings and improving collaboration.

Wigan Council, which has followed a totally paperless route, with a strong focus on paperless meetings, made a saving of approximately £51,000 a year which paid for the purchase of iPads in the first year alone.

In 2015 the council's democratic services team introduced a deal with its members, under which they would agree to work in a "paper-light, self-reliant manner", and in return would receive and be trained to use an iPad. Relevant agenda papers for meetings can be downloaded and managed on the devices.

Relevant apps have been installed on the iPads to assist members, with a welfare reform toolkit enabling them to signpost residents affected by welfare reform and bedroom tax, and so offer immediate support in the community outside officers' usual working hours.

Citizens and supplier e-Portals have also driven a channel shift to e-invoicing and e-receipting, and are starting to demonstrate full-cycle correspondence to citizens electronically.

The big gains through paperless have begun with better workforce mobilisation which has in turn enabled better paperless administration.

At University College London Hospitals NHS Foundation Trust, Nick Roberts, the trust's deputy director of digital services, believes the future opportunities for health and social care to go paperless are huge.

"My priorities include digitisation of all our paper-based patient records – the legacy – and implementation of a comprehensive electronic health record, shareable across health partners. This will be the widespread game-changer for process change and collaboration in the health sector," he says.

Wigan is a digital destination, and a digital taskforce in place to provide support and direction in embedding digital across the borough.

Such digital initiatives, both in local government and the wider public sector, aren't without their headaches. They include lack of finances, integration of software applications, staff resistance, increased demand across all channels, lack of digital skills, lack of senior management support and lack of citizen motivation or adoption.

Arguably there are three stages of readiness for digital transformation – early, developing and maturing – and they all have their challenges.

Early issues include providing the leadership, vision and ambition, developing the business case, being brave, and taking the necessary leap of faith, embracing digital at a time of austerity.

The development stage challenges include building confidence, maintaining pace and building relationships with the community to engage them in the journey, while key maturing focuses for government agencies are information governance and using data in a more sophisticated way to provide an integrated experience across services.

In the wider digital government picture, collaboration and governance are two key issues for Kit Collingwood-Richardson, deputy director of universal credit at the Department for Work and Pensions.

"We are going to have to start bleeding between organisational boundaries and say, 'We're not this department or that department, but here is the service that we offer as a collaboration between departments'," she says.

"I care passionately about governance. We sort of do it through the wrong end of a telescope. Government is very good at drawing pretty pictures and operating at three to five years hence. But we are not as good at understanding what we're doing in the next three months."

John Jackson, chief executive of the London Grid for Learning, argues that if the public sector is to unlock the next wave of efficiencies and innovation, it has to be fundamentally disruptive.

He believes not enough attention is being given to embedding digital into the DNA of public sector institutions so it is "marbled" into leadership, cultures and ways of working.

"How many organisations, for example, include digital skills as a must-have for their top leadership team?" he asks. "How many policies really embed the potential of digital? How many organisations have a cadre of digital evangelists in every service they run? So while we've improved our approach to design, we've not addressed embedding digital into the DNA of the public sector."

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COMMERCIAL FEATURE



ADAPTABLE TECHNOLOGY FOR THE UK'S FUTURE

We are only scratching the surface when it comes to digital transformation



Department chiefs are under increasing pressure to deliver significant cost savings, while also improving services and taking advantage of digital technology.

This is a tough ask when many are still hamstrung by large, long-term contracts with traditional IT firms that struggle to match the pace of innovation available elsewhere.

The acceleration of digital disruption is forcing the sector to turn away from the large consultancies and systems integrators. Smaller, more agile organisations are bringing a fresh approach on how to align technology with the needs of the department and its users.

Arguably, working more flexibly has never been more important as Whitehall faces continued uncertainty in dealing with the fallout of Brexit.

The challenge is apathy. Many department chiefs are wary of adopting new ways of working and are still falling into the trap of opting for large, complex projects with a more traditional approach to defining, sourcing and delivering technology.

But it doesn't need to be like this, according to Jan Joubert, chief executive of digital transformation specialist Rainmaker.

"We look to deliver the digital transformation agenda in a way that still achieves cost-reduction targets and minimises risk to improving services," explains Mr Joubert.

There is a growing acceptance that the fat in old, large supplier contracts offers an opportunity for a new approach which can free up savings and remove some of the major, common barriers to funding transformation.

"I've always believed the IT industry overcomplicates things", says Mr Joubert, who co-founded Rainmaker in 2010 and has built it into a leader in business and digital transformation.

"Transformation requires the accelerated delivery of flexible solutions that focus on the needs of the business, its people and its customers. These solutions need to be well designed and adapt to constantly changing requirements, driven by advances in technology and new ways of working."

There has been a lot of progress within government, driven mainly by the Government Digital Service (GDS), but it has been slow, difficult and, some would argue, nowhere near radical enough. "Now is not the time to lose faith in the direction GDS has set," says Mr Joubert.

Having leaders that truly understand why technology improvements are needed and how they align with business performance is critical to success. According to Mr Joubert, they also need to encourage a culture that rewards experimentation and encourages staff to invest time in finding better ways of working.

This is not easy, concedes Mr Joubert, who explains: "Getting this right requires time, experience, courage and a mindset that there's a different way of doing this. To take our approach does require resolve and rigour, but it's worthwhile."

One of Rainmaker's clients is High Speed 2 (HS2), the government-backed rail company which will open a new route between London and Birmingham over the next decade.

Rainmaker has played a major role in setting the vision for HS2's digital strategy and is now supporting its implementation.



Jan Joubert, chief executive of digital transformation specialist, Rainmaker

Crucial to its thinking about technology has been a focus on the company's vision that HS2 is not just a railway, but a catalyst for growth across Britain.

There has been a concerted effort to keep the technology team as small as possible so it can adapt to change, focused not on creating a solution that will last until 2026, but one that may need to change frequently as the needs of the business evolve.

It needs technology that can adapt as over time the focus of the business switches from planning, to digging holes, laying track, and eventually running trains and selling customers tickets.

The result is an organisation that has embraced technology. As Mr Joubert puts it: "It's about transferring skills and changing culture so the approach can be embedded in the DNA of the organisation."

For more information please visit rainmaker.solutions

Waging war on organised hackers...

Mobilising cyber-security measures is a central part of protecting the state and its citizens, presenting a daunting task for UK authorities

CYBER SECURITY

DAVEY WINDER

Chancellor Philip Hammond is developing a strategy for spending the £1.9 billion left by his predecessor George Osborne to get a grip on the growing problem of cyber security.

While some will ponder whether even such mind-boggling figures are ever going to be enough to do anything but skim the surface of the cyber security problems facing the UK, others are more concerned with semantics.

"This is largely a question of where you draw the line concerning what is cyber security and what isn't," says Robin Wilton, technical outreach director for privacy and identity at the Internet Society. "The citizen's interests are better served by a clearer and more restrictive definition of cyber security."

To get the linguistic ball rolling, Mr Wilton defines cyber security as having two goals. One is protecting those parts of the critical national infrastructure that make the internet

possible and the other is protecting the parts critically dependent on the internet to operate. In this latter category, Mr Wilton means the parts which could be disabled by an internet-borne act.

"If malware targeted at supervisory control and data acquisition or SCADA-compliant systems were able to shut down the water and waste systems of a large part of the UK," he argues, "I would view that as a cyber-security issue." The point of drawing such boundaries is that without them the number of calls on Mr Hammond's budget that could be made under the heading of cyber security are endless.

It's vital to remember that even security spending is not a budget of the bottomless-pit variety. "Government needs to continue to invest," says BT Security chief executive Mark Hughes, "but there is no magic number that will make the problem go away." But £1.9 billion is most definitely a drop-in-the-ocean number.

"Exclude large organisations," says Professor Steven Furnell, head of the Centre for Security, Communications and Network Research at Plymouth University, "and just share that funding among the 5.4 million small and medium-sized enterprises that make up 99 per cent of UK businesses and each would get a whopping £70 per year for the next five years." Obviously, the government investment must rely upon being strategic perfection then, which could be problematic.

Earlier this year, the National Audit Office (NAO) published a pejorative report slating how the government approached digital security. Of the 1,600 staff within 73 government teams tasked with responsibility for data security, the NAO said they were "operating without cohesion and governance". According to Sir Amyas Morse, head of the NAO: "The Cabinet Office, departments and the wider public sector need a new approach."

While conceding that the NAO is right in some regards in its report, Unisys chief security architect Salvatore Sinno argues: "The government

has taken big steps to improve the way in which they look at governance and overall approach to digital security."

There's no doubting the sheer scale makes it a monumental challenge for the government, with myriad interlinking departments impacting millions of people. There's also no doubting the scale of the challenge in relation to privacy.

"For true cohesion and governance of data to be achieved," Mr Sinno says, "there needs to be some level of permission for the government to share this information internally between departments."

Striking the right balance between privacy and consent issues when updating the current policy framework around data security is important, as is applying the right amount of carrot and stick across the public sector threatscape.

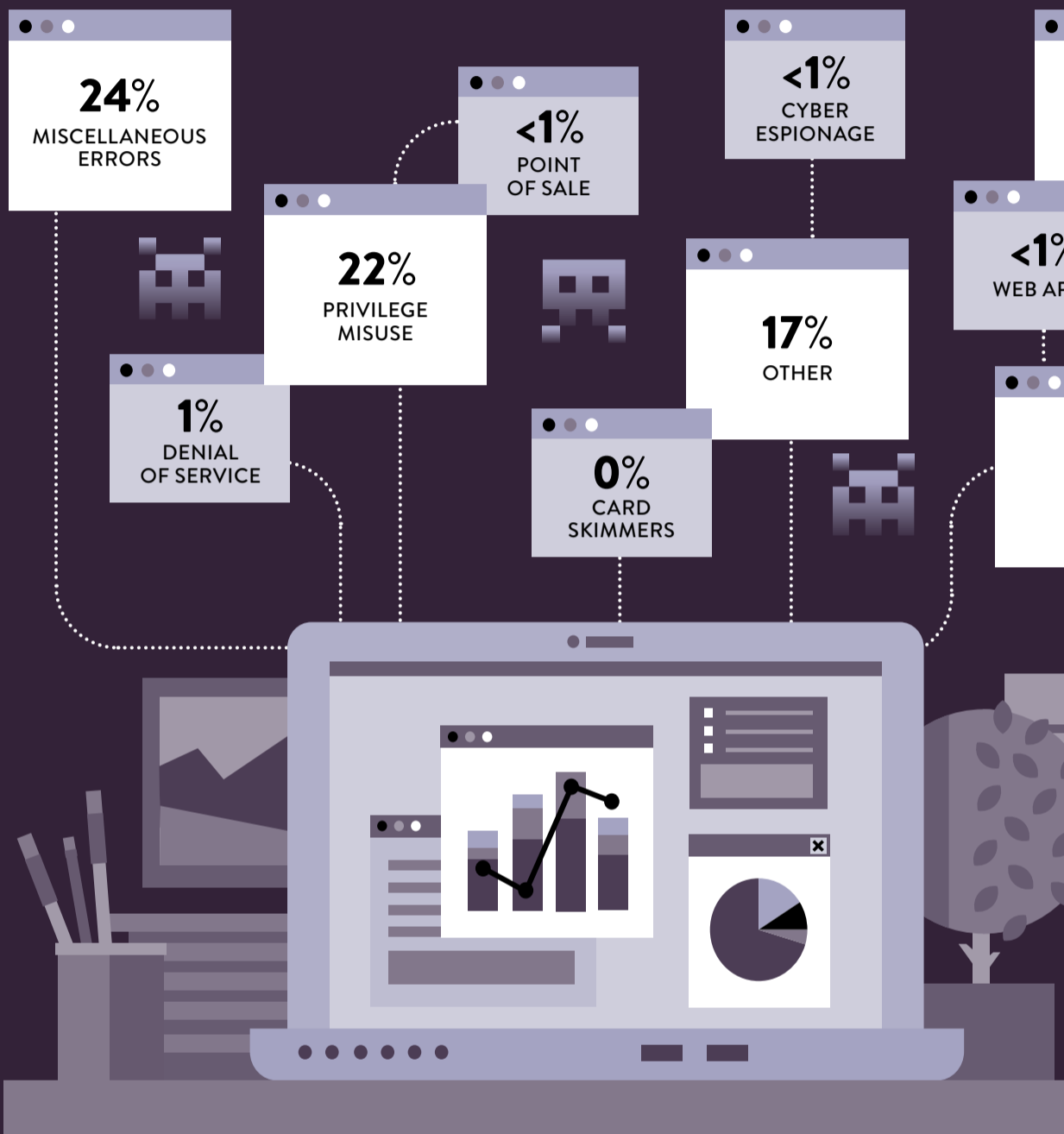
"Funding can help government provide carrots through driving new processes and encouraging the use

£1.9 billion is most definitely a drop-in-the-ocean number

PROTECTING PUBLIC DATA

PATTERNS OF PUBLIC SECTOR CYBER SECURITY

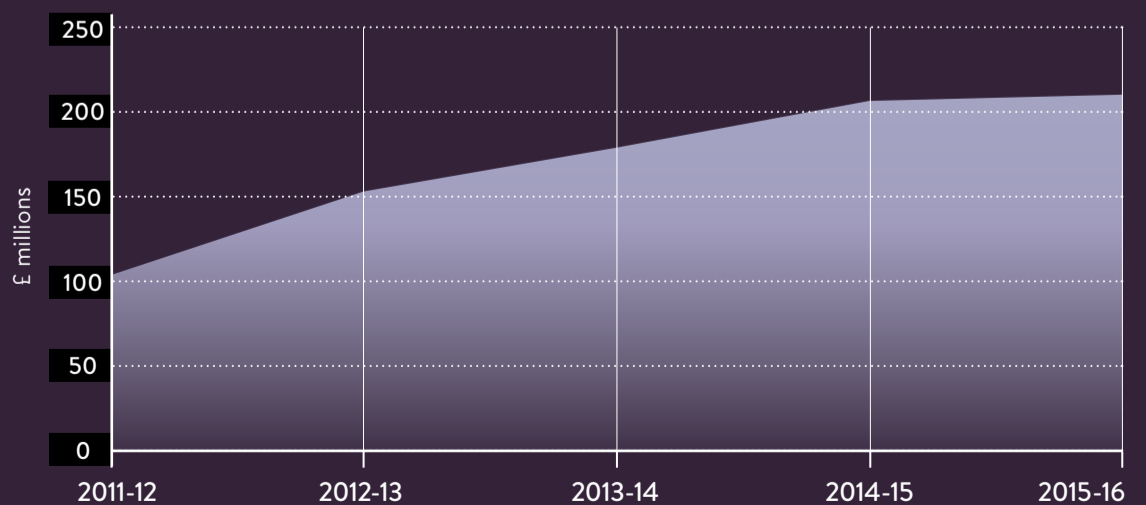
Study of 47,237 cyber-security incidents in global public sectors in 2015



Percentages do not equal 100 per cent due to rounding

ANNUAL SPENDING ON UK GOVERNMENT CYBER SECURITY

Following the Spending Reviews of 2010 and 2013, the National Security Programme was allocated £860 million to spend



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SPENDING BREAKDOWN OF UK GOVERNMENT CYBER-SECURITY BUDGET

How funding for cyber security was spent between 2011 and 2016, by thematic area of work



£441.8m

National sovereign capability to detect and defeat high-end threats

£117m

Law enforcement and combating cyber crime

£80.6m

Support to full spectrum effects capability

£61.1m

Private sector engagement and awareness

£40.4m

Mainstreaming cyber throughout defence

£39.6m

Improving the resilience of the public sector network

£32.8m

Education and skills

£24.4m

Incident management/response and trend analysis

£8.1m

International engagement and capacity building

£7.8m

Programme management, co-ordination and policy

Source: Verizon 2016

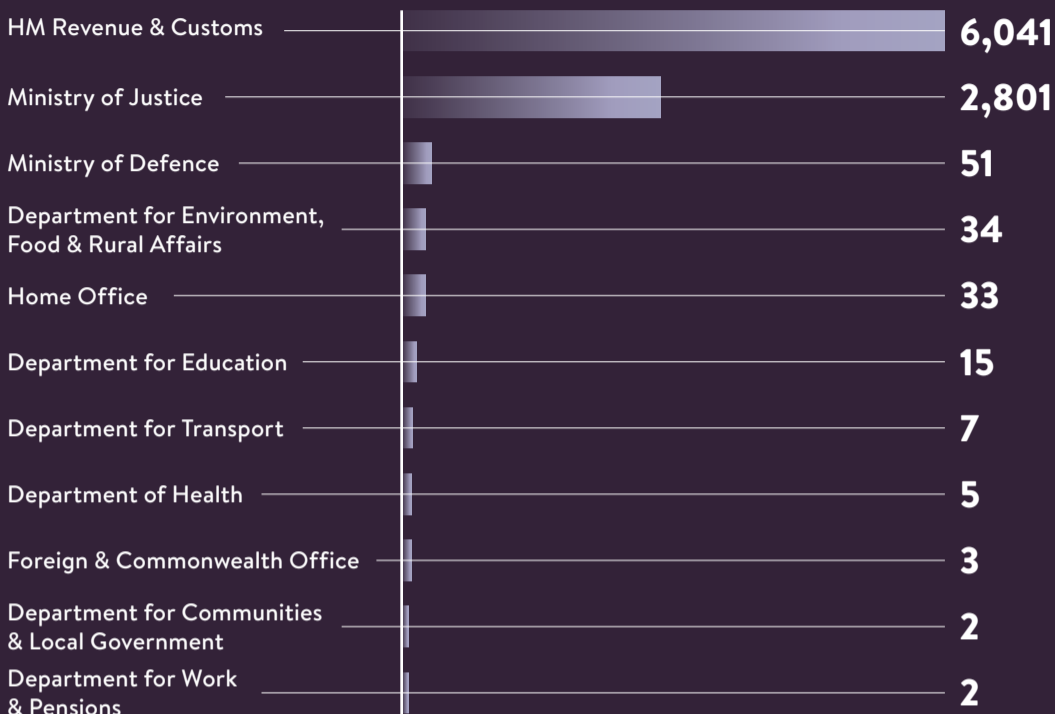
Investment over five years

Source: Cabinet Office 2016

Source: Cabinet Office 2016

DATA BREACHES BY UK GOVERNMENT DEPARTMENT

Number of data incidents in 2014-2015 recorded by the UK government's largest departments



Source: National Audit Office 2016

of red team simulations to assess the ability of an organisation to find an active attacker," says Kasey Cross, director of product management at LightCyber, "while sticks come in the form of the General Data Protection Regulation (GDPR)."

John Shaw, vice-president of product management at Sophos, agrees that the government decision to double down on a commitment to implement the European Commission's GDPR with fines of up to 4 per cent of revenue, is as good a stick as you get.

"If the record fine for the TalkTalk breach had been the £93 million implied by GDPR instead of the £400,000 under the current framework, a lot more boardrooms would be discussing improving their cyber security," says Mr Shaw.

Not everyone agrees, of course, and Philip Lieberman, president of Lieberman Software, insists that the alignment of the UK with the European Union on data privacy and cyber security has been at the core of miserable security within both.

"The first step in improving security is the complete discarding of the existing privacy regulations foisted on the UK by the EU, and the creation of sensible and practical rules that balance the needs of government and business with reasonable accommodation to the needs of consumers," says Mr Lieberman.

One thing that consumers need is trust in those who handle our data and public fears regarding the same might slow government digital transformation efforts down. David Emm, the principal security researcher at Kaspersky Lab, doesn't see any signs of a slowdown

though. Not least, perhaps, as most of the digital transformation effort is coming from the private sector; think biometric development, internet of things.

"I don't see that there's a huge amount of public concern around security either," he says. "There's shock and horror when we hear about a breach, but if there was legitimate fear, we'd see fewer people carrying out online transactions."

“It's clear the public has accepted cyber security is now a vital necessity and that cyber threats will not go away without serious action

So, if not mistrust and fear, what is the barrier to digital transformation such as there is one at all? Easy, says Microsoft UK's national security officer Stuart Aston, it's budget constraint.

He is sure that while public and organisational fear is driving a slow digital transformation rate, it is austerity that has been the predominant hindrance in terms of adoption. To a certain extent, public fear is healthy after all; it means everybody has a vested interest and must ultimately be accountable for cyber security. It means cyber security is an important component of the relationship

between government and citizens.

"It's important to note that the recent announcement that spending on cyber security would be increased did not raise any negative response in the media or from the population," says Greg Sim, chief executive at Glasswall. "How many other budgetary announcements go unaccompanied by the grumbles of taxpayers?"

It's clear the public has accepted cyber security is now a vital necessity and that cyber threats will not go away without serious action. This has been, and will continue to be, an ongoing war which the government and the people are committed to winning together.

"Cyber security is important to the relationship between government and citizens," the Internet Society's Mr Wilton says, "because of the extent to which our daily lives depend on the proper functioning of the digital realm."

If you think about it, cyber security is now a core competence of national governance. The ability to manage the nation's cyber security competently is as critical to our economic and social wellbeing as the ability to execute any major function of the political executive.

"A government that can't deliver effective law enforcement and criminal justice is at the mercy of organised crime," Mr Wilton concludes, "and a government that can't protect the nation's digital assets is at the mercy of bad actors reaching into almost every aspect of modern life."

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COMMERCIAL FEATURE

NEW TECH ERA FOR TOWN HALLS

Civic centres may appear to be behind the technology curve compared with the private sector, but they could soon be pioneers of leading-edge systems that until recently were relegated to the realms of science fiction



While some local authorities are still grappling with digitisation and the introduction of web-based services, others could be early adopters of new technology that will automate many everyday dealings between councils and their customers.

Developments in artificial intelligence (AI) and voice recognition have put us on the brink of a new era, says Ian Robson, business development manager for local and regional government at Pythagoras.

"It is the next obvious epoch of this journey and it is here now. This is exciting because this is the future. The potential is there and the opportunity is there to be seized. It is now possible to speak to a machine without the caller realising there is not a human being on the other end of the line," he says.

This technology is already being introduced in the private sector where businesses are under unrelenting competitive pressure to reduce costs, improve services and increase profit margins.

Similarly, local authorities face unprecedented budget cuts, amounting to billions of pounds, while under pressure to maintain the quality of services they provide.

Although successful companies have long embraced new technology to transform their business, local government has been relatively tardy, partly for financial reasons and also because of the complexity and politics of the decision-making process.

As a result, councils have struggled to match the standards the private sector has set in providing quick and simple ways of buying and using services – such as shopping and banking – online.

Four decades ago, council staff communicated with customers by letter or in person, but since then there has been huge progress, first with the widespread use of telephone services through to the current push for digital transformation and e-government.

But Mr Robson says digitisation has not been fully embraced by many councils and behind the veneer

of new technology some still rely heavily on shuffling around physical paper work.

He is sympathetic towards them because of the conflicting financial and political pressures they face, and points out that an online catalogue retailer or internet bank offer only a fraction of the services a large local authority provides.

"A bank might only do five things, but in contrast the public sector has to provide a myriad of services and a unitary authority could easily have 800 lines of services, from waste collection to care for the elderly," he explains.

One of the challenges for councils is to offer their citizens the same levels of service they have become used to from the private sector, in particular when on the move through their smartphones.

"If you want to book a cinema ticket or a flight, you do it via an app. When people need to contact the council, they want to do the same, not wait until they get home," says Mr Robson.

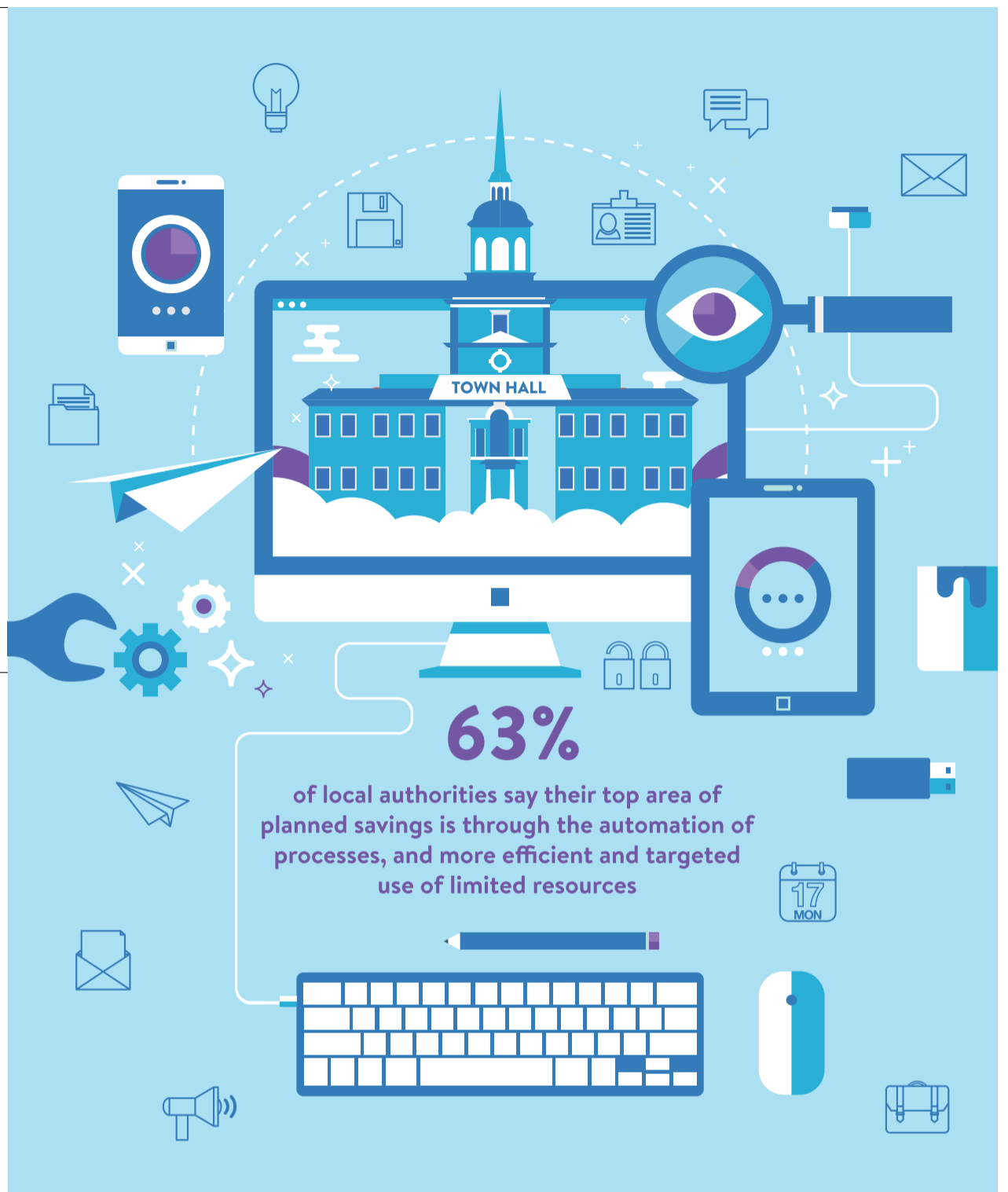
Against the backdrop of heavy spending cuts, the business case for investing in automation is clear, allowing precious financial and manpower resources to be diverted to where they are most needed.

Almost a decade ago, reducing avoidable contact became a key target set by national government to encourage councils to get things right first time and move more processes online, saving costs and reducing human error.

Mr Robson says that principle can now be taken to the next level through what he calls "automated contact resolution", using AI to deal with customers, either through voice recognition for phone calls or the next generation of chatbots that can carry out a conversation online.

He says: "Now the real question is how many calls can be successfully answered by a machine or computer rather than by staff? That's where the savings are going to come from."

So-called bot technology is best suited to the high-volume, low-complexity calls that require relatively little skill to resolve, such as requesting



forms and reporting incidents. Advances in computing also mean this type of system can be hosted via the cloud instead of the large and costly servers required in the past.

Developments in AI and cognitive learning now mean that machines can figure out how to resolve problems by "listening in" to calls between a customer and a member of staff.

Not only will it lead to better service quality, by increasing speed, reducing human error and duplication, resulting savings will allow financial resources and manpower to be diverted to other services.

Julian Stone, chief executive of Pythagoras, says: "It's wrong to think that everything a local authority does can be done in this way. Some things like adult or children's care need a degree of investigation, empathy and experience."

“It is now possible to speak to a machine without the caller realising there is not a human being on the other end of the line

RIGHT
Rob Musekiwa
Digital transformation director
City of Wolverhampton Council

"Why employ people to do something repetitive, fairly simple and easily resolved when they could instead be using the soft skills that computers don't have in order to resolve more complicated issues?"

Rob Musekiwa, digital transformation director at the City of Wolverhampton Council, comments: "Recent statistics reveal that 63 per cent of local authorities say their top area of planned savings is through the automation of processes, and more efficient and targeted use of limited resources. A further 8 per cent of authorities identify additional savings can be made through cutting IT spending. This supports Mr Robson's principle of automated contact resolution being the next step in digital transformation."

Some of this new technology was showcased at the Microsoft Future Decoded event in London in early November and Mr Robson believes it heralds a revolution in the way we interact with computers, essentially making the keyboard obsolete.

He warns those still thinking about digitisation risk lagging behind and need to leapfrog to the next generation of technology. "Once this



was something you saw on sci-fi shows such as *Star Trek*, but it has become reality and local government should seize the opportunity to use it in the here and now," Mr Robson concludes.

Pythagoras is a Microsoft Gold Partner, delivering business-critical IT solutions and services across the Microsoft Cloud, supporting their customers with strategic, digital and technical business needs.

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

Councils are blazing tech trail to cut costs

Technological innovations are saving cash-strapped councils millions of pounds and at the same time improving services for council taxpayers, including some vulnerable residents

TOP FIVE
EMMA WOOLLACOTT

01 GLASGOW CITY COUNCIL

With the help of £24 million in funding from the Technology Strategy Board, now known as Innovate UK, Glasgow City Council has embarked on a project called Future City Glasgow, aimed at making life in the city safer and more sustainable.

Along with projects to crowd-source cycling information and optimise routing for the minibuses that transport children and social work clients, the council has been trialling a new intelligent street lighting system.

The internet-connected LED light bulbs not only have lower energy consumption than standard sodium lights, they can also respond to demand.

If there's nobody around, they remain low; but if they sense a cyclist approaching they automatical-



ly adjust their brightness level from about 40 per cent to full.

The lights can be remotely brightened for street festivals or outdoor concerts and can also record air quality, noise and movement.

"It currently costs around £8.5 million a year to power and repair the city's street lights. With the longer life cycle of LED lamps, we

not only reduce our future maintenance and associated costs, but also our carbon emissions," says council leader Frank McAveety.

"It was found that an energy saving of up to 68 per cent could be achieved through the use of LEDs and the central management system will also achieve additional savings."



02 NORTH TYNESIDE COUNCIL

In 2014, North Tyneside Council embarked on a robotic process automation (RPA) project with the aim of improving service quality and consistency while cutting costs.

Initially handling revenues and benefits services, the robot software enters information submit-

ted online and proceeds with the processing on the basis of a set of rules. The software follows the business process flow chart, flagging up any areas of uncertainty for human intervention.

"This work is all about making our services more responsive to residents' needs, as well as making them more efficient," says mayor Norma Redfearn.

The system has, says the coun-

“
More than half of new benefits claims are now assessed within 24 hours of submission

cil, cut the time spent on data input by 50 per cent, speeded up claim resolution and reduced the time taken to process new claims by 45 per cent. More than half of new benefits claims are now assessed within 24 hours of submission. While in 2014 it took 36 days to fully process a new benefit claim, it currently takes just 25.

The council is now encouraging staff to extend the system by writing their own RPA procedures, automating the annual job of collating social housing stock rents and updating benefit details, for example. Future projects are likely to include automating the process for managing council tax account credits.

03 MILTON KEYNES COUNCIL

As part of its smart cities programme MK:Smart, Milton Keynes Council is aiming to make life easier for motorists and cut the cost of running parking services by installing hundreds of sensors across the city's car parks.

The sensors monitor occupancy, with the data transmitted wirelessly to receivers on lampposts and analysed in the central MK Data Hub.

They provide real-time information on the availability of parking spaces, which drivers can access via an Android or iPhone app and then use to reserve a space.

With the land value of a parking space reckoned at £10,000 to £15,000 and annual maintenance at between £200 and £300, the aim is to reduce the number of spaces required.

The council says it's hoping for a capital saving of at least £105 million, along with reduced fuel use and vehicle emissions.



"As well as giving real-time data on parking availability, the sensors are providing us with valuable information about average parking duration," says Brian Matthews, head of transport at Milton Keynes Council. "We can use that to adjust parking restrictions to meet majority customer needs."

For example, when the sensors revealed that an average stay in the station drop-off zone was 16 minutes, the council adjusted the wait limit up to 20 minutes. In future, the system could also be used to aid parking enforcement.



04 HAMPSHIRE COUNTY COUNCIL

Of Hampshire's 1.3-million population, 235,000 are over 65 and around 16,000 have been assessed as having critical or substantial needs, presenting a major problem in terms of social care.

But through an award-winning partnership with PA Consulting Group, the council has been able to introduce a range of assistive technology aimed at improving services while cutting costs.

Its telecare system includes GPS-equipped personal alarms for use inside and outside the home. Motion sensors can automatically switch on a light when the client gets out of bed, and activity monitors, fall detectors, incontinence and epilepsy sensors, medication reminders and management and bed or chair occupancy sensors are also available.

"With Hampshire's older population growing rapidly in number and many people living with long-term health conditions, technology is becoming an increasingly critical part of the way we support people to remain living as independently as possible, for as long as possible," says council leader Roy Perry.

The system currently covers around 6,500 Hampshire residents and, says PA Consulting, saved the council £1.9 million in its second year of operation, even though the service is offered free.

"We have a service that improves lives and costs us less than nothing," says Richard Ellis, the council's deputy director of adult services.

05 RUGBY BOROUGH COUNCIL

Last year, concerned that bins in parks and play areas were full to overflowing at weekends, Rugby Borough Council decided to take action. While it was keeping on top of the problem with extra collections, this was proving expensive.

To try and deal with the problem, it replaced 56 traditional bins, each of which had been receiving up to three collections a day, with 23 Bigbelly smart stations.

Thanks to a compactor, powered by a solar panel, each bin can hold up to eight times more rubbish than a traditional street bin. Sensors monitor how full each bin is triggering the compactor when required and sending an e-mail and text message to the council when it's nearly full.

The council says this has cut the number of manual waste collections from 51,100 a year to just 1,509. Resources saved have been transferred to other street cleansing services,



such as litter picking on the main trunk roads into Rugby town centre.

"Not too long ago we'd carry out regular waste collection 'milk rounds', regardless of whether the bins needed emptying or not," says Sean Lawson, head of environment and public realm at Rugby Borough Council.

"These days we're notified when collections need to be made and can clearly see when bins don't need emptying just by looking at a smart device or office computer."

Learning to keep pace with digital natives

Technology in education is transforming schools and how students learn, but educationalists warn funding is tight despite government claims that provision is at an all-time high

EDUCATION
LIZ LIGHTFOOT

In high spirits the children from Gearies Primary School set off to take five adults with disabilities on a trip into central London. They had researched the route for wheelchair-accessible stations, but disaster struck at the first hurdle.

The gradient of the ramps and subways on the Central Line were too high for wheelchairs. At Newbury Park there was supposed to be a lift, but it hadn't been installed. At Stratford the lift for disabled people wasn't wide enough to take the wheelchairs.

So the pupils and teachers from the school in Gants Hill, north-east London, had to abandon the visit to a historic garden they had planned for friends at the Woodbine Centre for adults with learning disabilities.

Upset and disappointed, the 10 and 11 year olds decided to programme an app to help disabled people plan their journeys using mainly wheelchair-accessible buses. They tried out the routes and recorded them on tablets and smartphones to build an entry for the Apps for Good competition.

Because one adult could not read, they recorded verbal instructions alongside the photos and then provided pictures in sequence to help another with poor working memory. They made the final three in the contest, despite being some of the youngest entrants.

Just three years ago it is unlikely that primary-age children would have been able to handle algorithms and content to build their own app, but schools have made great strides since September 2014 when a new computing curriculum was introduced.

The government changed the focus from being able to use technology to knowing how it works and coding. It also made computer science GCSE a contributing subject to the over-arching English baccalaureate for 16 year olds.

Walk into schools nowadays and most will have suites of laptops and tablets for use across curriculum subjects. From making comic strips of science experiments to video recording of cookery demonstrations and digital maths challenges, children are harnessing the tools of technology. IT has come out of the locked computer rooms to become an intrinsic part of teaching and learning.

Far from banning mobile phones in the classroom, some schools are using BOYD – bring your own device – to supplement resources, with children working on their own tablets and smartphones. Others



The UK is one of the world leaders in its use of education IT, according to the BESA's Caroline Wright

are harnessing their pupils' devices and home computers for the "flipped classrooms" whereby students access and study videos of the material they need to know before the lessons. It frees up time for students to explore the concepts and apply what they have learnt with the teacher in class, rather than doing it alone as homework.

The UK is doing well in the way it uses information technology to aid teaching and learning, says Caroline Wright, director general of the British Educational Suppliers Association (BESA).

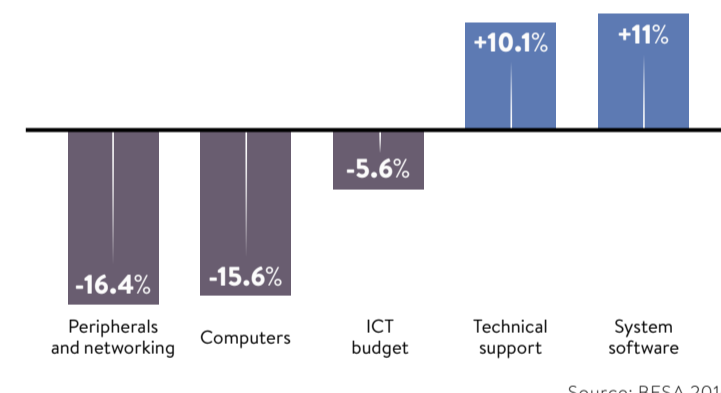
"We are one of the world leaders, particularly in digital content to support the curriculum. To give just one example, the Malaysian government wants to become the technology hub of South-East Asia and has decided the best way to do that is through partnership with the UK," she says.

The UK hosts the annual BETT exhibition of education technology and more than a quarter of its expected 40,000 visitors next January will come from overseas.

Schools have come a long way since the 1990s when the main funding for computers came from vouchers parents collected with their food

ICT BUDGET ALLOCATIONS IN 2016-17

SURVEY OF 1,325 UK STATE SCHOOLS ON HOW THEIR ICT BUDGETS CHANGED FROM 2015-16



Source: BESA 2016

shopping. BESA's annual reports show school spending on computer hardware and software in England has soared from £135 million in 1997 – slightly below the budget for stationery – to £616 million last year.

There are signs that schools are struggling to maintain their ICT budgets, however. The National Association of Head Teachers (NAHT) claims there has been a reduction in overall education spending on schools this year of 7.9 per cent in real terms compared with 2011-12.

"As schools face rising costs, it is no wonder many schools report that budgets are at breaking point," it says. The Department for Education disputes the figure, saying: "The schools budget has been protected and in 2016-17 totals over £40 billion, the highest ever on record."

BESA also finds technology spending under pressure. Its 2016 survey found a quarter of schools had downgraded their planned ICT investments. It predicts that overall ICT budgets across all schools are likely



Information technology has come out of the locked computer rooms to become an intrinsic part of teaching and learning

to go down by 5.8 per cent in 2016-17.

Dan Lea, deputy headteacher of Gearies Primary School, says there is only £50 left in this year's ICT budget of £18,000 for 710 pupils. "Funding is a problem for us at the moment. We have projects we would like to run, but we don't have the money. We want to join the Childnet Digital Leaders Programme that trains pupils to be digital safety leaders because we think they will listen more to each other, but it costs £500. We've raised £315 from a raffle and are hoping to have a toy sale for the rest," he says.

The effective use of ICT is not just about money. Training, especially for older staff, is crucial if children are to be prepared for the digital future, says Chris Woolf, headteacher of Pinner High School. "We are a new school and one of the things that makes us different is that we are not adapting to a wireless future, we are setting up a wireless future. Sometimes people get hung up on the hardware, but it's more about the communication and collaboration that it allows," he says.

"We have books on a reading cloud, use an online homework app and encourage pupils to work together to edit material online and communicate with students from schools in other countries."

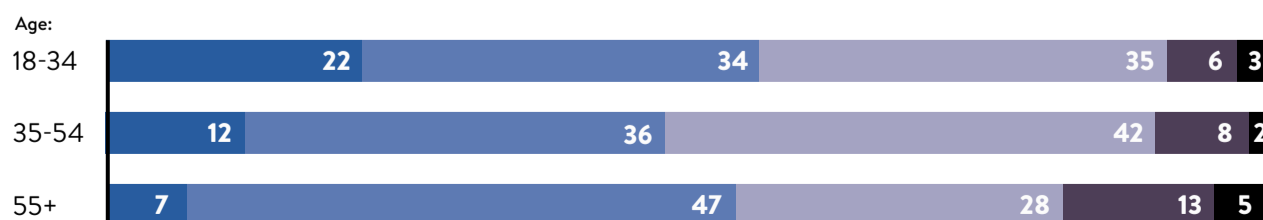
NAHT adviser Siôn Humphreys says the initial surge of interest and enthusiasm for the new computing curriculum has plateaued. "Those teachers who were tech savvy were early adapters. The challenge now is to get all teachers involved. But technology isn't always the best method – to use a golfing analogy, teachers have to use the right club at the right time," he says.

Futurists tell us that it won't be long before our brains can be "chipped" with information, making much of the school curriculum redundant. For now, however, schools are concentrating on keeping pace with technological advances and the new ways their "digital native" pupils are finding to use them.

ATTITUDES TOWARDS TECHNOLOGY IN EDUCATION (%)

UK ADULTS WERE ASKED WHAT IMPACT TECHNOLOGY WILL HAVE ON EDUCATION LEVELS OVER THE NEXT TWO DECADES

● Very positive ● Fairly positive ● Neutral ● Fairly negative ● Very negative



Source: ComRes/Nesta 2016

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OPINION COLUMN



Delivering future public services

Public services are being transformed by digital technology, but much more can be done to fulfil the vast potential and create a connected, digitally enabled UK

JULIAN DAVID

Chief executive
techUK

66 The digital revolution is upon us. Technology is enabling social and economic changes for good across the globe. Some industries have accelerated their digital transformation.



medical appointments automatically, or updated on your planning application progress on your smartphone, or informed your passport will soon expire via a personal device.

The retail sector, for example, has invested in big data analytics and automation to provide a highly personalised experience and improve supply chain efficiencies.

By 2030, public services could and should be as accessible and as customer friendly as we would expect from our customised, efficient retail experiences.

The UK has also made strong progress to date in building its Government Digital Service. And with ongoing digital leadership ambitions, the public sector is ready to drive change and create a world-leading civil service in its adoption of innovative technology.

All citizens should be able to access all services at all times and have control over their own information via one login to a single intuitive profile. Connected services will allow different public services teams to work together remotely. Further to this, autonomous and smarter technology, such as artificial intelligence (AI) and drones, will enable predictive and pre-emptive services in areas such as emergency services and traffic control.

The government is faced with tightened budgets and a growing strain from an ageing population who are increasingly demanding as they consume more digital services. This is an enormous opportunity for the transformation of public services through the smart application of digital technology.

Working closely with industry and opening up the public sector to harness the best of UK technology will make this digitally enabled world a reality.

All citizens should be able to access all services at all times and have control over their own information via one login to a single intuitive profile

Government is already wise to the potential of technology. In a first-of-its-kind project in 2015, the DVLA made a seamless transition to abolish the paper counterpart to the photo-card driving licence and provide all driver information online. This transformed the DVLA, creating significant cost savings and improving services.

Government and industry must work together to ensure that all citizens' data is securely stored and all systems are safe. In fact, AI and big data analytics can provide the protection, rather than the risk, but we must equip teams with the right skills to use the technology appropriately with security at the heart.

Digital transformation does not stand still and the DVLA is continually making iterative improvements to the service, having been reassured by the initial investment in innovation. This constant drive to improve is something that should be replicated across the public sector.

In this new digital era, public services are changing dramatically and the potential improvement in quality of services for UK citizens by 2030 is vast.

Life would be much simpler if you were reminded of routine

techUK's public sector conference PS2030 2017 is a focus for digital transformation, where civil servants and industry leaders come to together to create the vision and set the course for our digital future.



COMMERCIAL FEATURE



CLOUD PARADIGM

How Certus is helping Whitehall adopt Oracle Cloud services

Certus Solutions has its heritage in the public sector. The small and medium-sized company specialises in delivering Oracle Cloud human capital management (HCM) and enterprise resource planning (ERP) applications, and has a series of central government customers, including the Ministry of Justice, National Offender Management Services and Civil Service Human Resources.



Mark Sweeney
Chief executive
Certus Solutions

It is now working on groundbreaking Whitehall implementations of Oracle ERP and HCM Cloud applications at the Office for National Statistics (ONS) and HM Treasury, with the ONS project having successfully just gone live.



Paul Layland
Financial director
ONS

The project sponsor, ONS financial director Paul Layland, is driving a major change programme to bring corporate financial services in the organisation into the digital age by 2017.

A key goal for Mr Layland was to integrate workforce planning into the ONS's systems. But he knew his legacy ERP system was incapable of handling any new demands.

The ONS Oracle Cloud project offered an unmissable opportunity to bring the department's financial and HR systems up to date, and deliver the management information necessary to make smarter, more informed decisions.

engaged Certus through G-Cloud late in 2015 and started working with them in January, with the target of going live in October," he says. "They just gave us confidence. They understood central government and departments, and from day one it was a natural fit. And our confidence has grown. We knew Certus would pull out all the stops for us."

We knew Certus would pull out all the stops for us

"Our system was old, unsupported and not fit for purpose. Oracle Cloud, coupled with new data analytics systems like Tableau and Alteryx, gives us better statistics and better statistics make for a better business," he says.

Since the summer, Mr Layland has been discussing the project with other government departments that now have a significant reference point for the challenges faced in implementing Oracle Cloud technology.

He concedes: "It was risky for us to be the first government department to implement a cloud-based system. But there's huge potential, not least for our relationship with the Treasury. In the first year of the Spending Review, it is so important to have the right data and gain the confidence of your key stakeholders behind you, especially the Treasury."

The project's success has given ONS tightly integrated, clear visibility of both its operations and financial management.

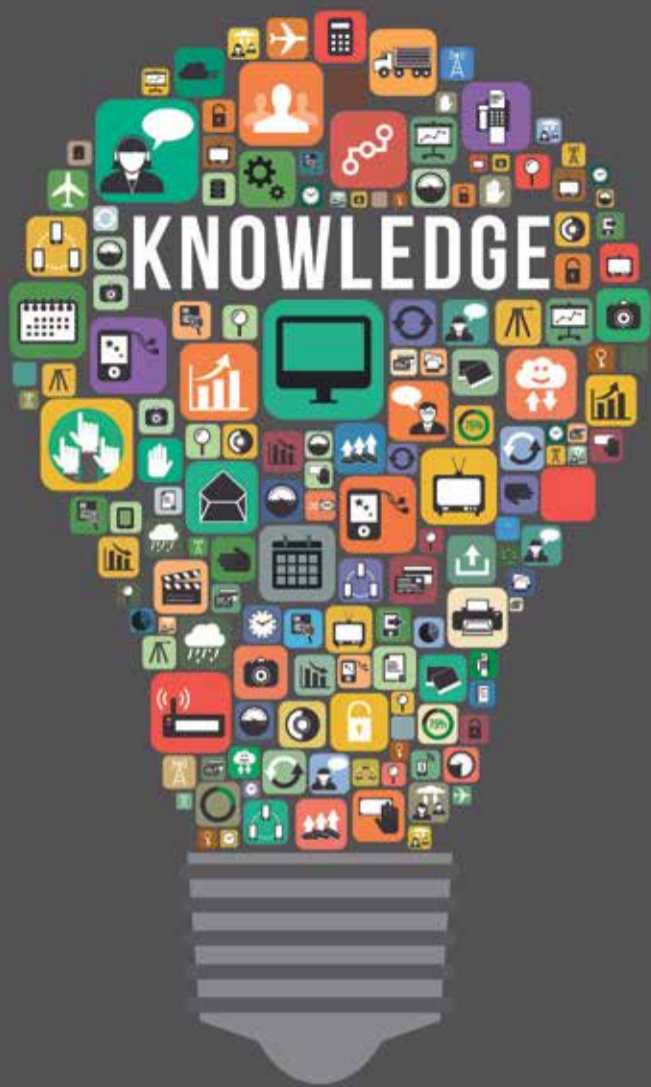
people around more easily and create more development opportunities for our staff. In the second phase, which Certus is supporting us on, we plan to train budget holders, empowering them to prepare and own their budgets and managing their people with access to real-time data."

As well as its ONS engagement, Certus is now working on a cloud-based Oracle ERP and HCM implementation at the Treasury, which is due to go live next April.

With Whitehall's small to medium-sized departments still under financial pressure, Certus founder and chief executive Mark Sweeney believes cloud applications offer a paradigm shift for back-office services, just as shared services did for the Prison Service over a decade earlier on the back of the *Gershon Efficiency Review*.

















"This technology provides Whitehall with an inflection point to consider how this new paradigm can deliver significant cost-savings, not only through the provision of real-time information on its finances and workforce, but also through the removal of costly on-premise legacy systems. The technology is proven – it's now a case of 'when' and no longer 'if' Whitehall departments move to adopt cloud," Mr Sweeney concludes.

For more information please visit www.certus-solutions.com



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Bristol sails ahead as a future city

Famed for its marine and aerospace engineering, Bristol is now a front runner in digital technology which is revolutionising the city's public sector

SMART CITIES

JIM McCLELLAND

If there is one city in the UK that you do not want to be up against for an award, it is probably Bristol. The ship-shape star of the South West seems to have been collecting trophies and funding almost for fun over the last five years.

In the first-ever *Huawei UK Smart Cities Index* launched this year, Bristol was identified as a leader, ranked second only to London. Various descriptions as Britain's fastest-growing and most efficient city, Bristol was the European Green Capital for 2015 and declared Britain's best city to live in by *The Sunday Times* in 2014. It was also allocated £11.3 million from the UK Urban Broadband Fund, as one of ten super-connected cities in 2012.

Bristol has a population of nearly half a million and a relatively young demographic, with more under-16s than pensioners. Famous for its maritime history and the engineering of Brunel, it boasts a strong academic pedigree, plus cultural attractions such as the Bristol Old Vic theatre.

In last year's *Prosperity Map*, Bristol was the fifth most affluent city in the UK and third most expensive

place to buy a house, fuelling rising concerns about gentrification.

However, to picture Bristol simply as a property hotspot for the well heeled and better educated would be to misrepresent and misunderstand this complicated and modern metropolis.

Bristol is a city of extremes, with 16 per cent of inhabitants resident in the most deprived areas in England. This complexity and diversity makes the smart city challenge that bit bigger and a spirit of togetherness even more important, says Stephen Hilton, director of Bristol Futures Global.

"When it comes to smart cities, Bristol is certainly ahead of the pack, but the city doesn't want to become a smart island, disconnected from the surrounding region, or a place where citizens and communities are disconnected from each other," he says.

Accordingly, director of Knowle West Media Centre (KWMC) Carolyn Hassan sees the city leading on people-centric thinking. "Bristol is really contributing to a growing movement globally that puts people before technology, or harnesses technology and its transformative power to think about how we provide for all citizens, their individuality and rich, diverse cultures," she says.

SMART TRAFFIC ON TWO WHEELS



Given that the 560,000 bicycles in central Copenhagen actually outnumber citizens, it should perhaps come as no surprise the city is investing in intelligent transport systems focused on beneficial outcomes for cyclists.

New smart controllers at 380 traffic junctions will cut bike

travel times by 10 per cent, with numbers of stops also down 10 per cent to reduce accidents.

Showcased in *Cities100 2016*, published by think-tank Sustainia, this initiative targets boosting already impressive city rates of 45 per cent of daily commutes by bicycle and supports ambitions for 75 per cent of all trips being car-free by 2025.

The real concern though is not wheel count, but people metrics, says Sustainia analyst and *Cities100* editor Monica Keaney. "When we think about smart city projects, we have to remember their ultimate purpose is to improve urban life for residents," she says. "So they need to keep livability as their core aim."

A pioneering arts organisation and charity, KWMC supports individuals and communities to get the most out of digital technologies. It is situated in the Knowle West area of Bristol, one of the most economically deprived. Advocating a sharing and collaborative model, it champions Citizen Sensing for inclusive community-driven digital projects involving sensor technologies. This approach puts people and social needs first, tackling issues affecting health, education and quality of life.

The sustainable purpose-built home of KWMC is itself an award-winning example of straw-bale construction, pioneered by local architects White Design. The same Bristol-based practice is currently collaborating with KWMC on smart solutions to the local housing crisis, says founding director Craig White.

"We are working on the Made in Bristol Home (MiBH). KWMC has brought digital to an area of deprivation and transformed how the community thinks of itself and acts. The MiBH combines the physical, digital and societal to imagine how that community can now become the developer of the homes it needs," he says.

Integration of digital technology as an enabling and empowering force at community level can also be seen supporting city targets on energy and climate change. According to councillor Martin Fodor, of Bristol Green Party, the emerging smart agenda will be essential to ambitions for a carbon neutral city by 2050.

"There are dozens of grassroots groups in the city engaged with a community-led energy agenda. Combined with a thriving social enterprise sector, we have seen a range of creative energy projects, like neighbourhood infrared (IR) surveys mashed into street view images using second-hand iPhones and an IR sleeve, programmed in someone's home."

The platform underpinning all these cross-sector projects is, of course, the digital ecosystem of smart city infrastructure. For Mr Hilton, who a decade ago first established and led the city's digital partnership Connecting Bristol, certain smart technology choices paved the way for where Bristol is today.





Nimbus / Alamy

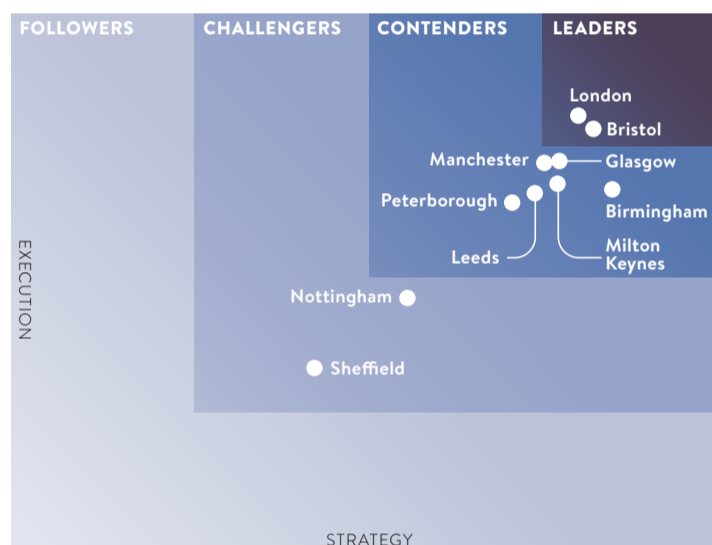
COMMERCIAL FEATURE

SDN: A NOT-SO-SECRET INGREDIENT FOR TRANSFORMING GOVERNMENT SERVICES

Software-defined networking or SDN is the key to opening up ICT change programmes

UK SMART CITY LEADERBOARD

TAKEN FROM THE HUAWEI UK SMART CITIES INDEX



Huawei/Navigant Research 2016

“The city council buying a duct network to rollout dark fibre was very significant. Bandwidth became a utility rather than a commodity and the cost of experimenting with digital massively reduced. The city wouldn’t now be experimenting with the internet of things if the connectivity wasn’t already there,” he points out.

Experimentation is the lifeblood of Bristol is Open, a joint venture between the University of Bristol and Bristol City Council to develop an open and programmable city.

Bristol University professor of high performance networks and chief technology officer of Bristol is Open Dimitra Simeonidou sees their work building on former mayor George Ferguson’s vision of Bristol as a laboratory for change. “Bristol is Open is quite unique. This is not a smart city, it is a city-scale testbed on which we have the opportunity to place and try technologies – hardware and software,” he says.

As evidence of this ability to experiment, the city has already de-

veloped 5G equipment and been trialling services long before chancellor Philip Hammond broke the news in his Autumn Statement.

This openness to experimentation at city-scale is attracting interest from private sector companies, with startups and big corporations alike choosing Bristol as a playground for trialling technologies. The ultimate vision going forward, though, is one of a programmable, equitable city, concludes Professor Simeonidou. “Here at Bristol, we have committed

to this whole notion of programmability,” he says. “This means that the city should actually work in the end for the citizens. What I should like is for the citizens to be able to design services that suit themselves and the community, completely democratising the smart city.”

In this Bristol of tomorrow, we are all winners.

“This is a city-scale testbed on which we have the opportunity to place and try technologies – hardware and software

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An early draft of the *Government Digital Transformation Strategy* shows that, for the Government Digital Service (GDS) at least, it remains a priority to create services that cut across organisational boundaries.¹

When shared services work, the benefits are obvious. According to the Local Government Association, local government shared services have contributed to taxpayers saving more than half a billion pounds. But it’s also not hard to find examples of shared services failing to deliver. The recently published National Audit Office report on the government’s two shared service centres shows they have so far not delivered value for money.

What makes the difference between success and failure? There is broad agreement that leadership, governance and user buy-in are all critical – easy to say, not so easy to achieve, of course. And then there’s the approach to ICT.

EVOLUTION NOT REVOLUTION

“A problem we often see is organisations embarking on massive ICT programmes that try to change everything all at once,” says Simon Parry, chief technology officer for the UK public sector at Ciena, a global network strategy and technology company. “This can take years to deliver any kind of return on investment and by then what they’ve delivered is quite possibly out of date.”

Citing software-defined networking (SDN), he says: “Today there are better ways to deliver ICT change programmes. With the right SDN solution, you can evolve existing infrastructures, relatively quickly and cost effectively, to support new strategies such as shared services. Importantly, you can interconnect separate legacy networks and manage them as a single network, without any significant change to the underlying infrastructures.”

Having to integrate networks with different, closed architectures has been a serious obstacle to the efficient delivery of shared services in the past. By simplifying network interconnectivity, SDN can allow government to simplify the development of shared services, while fully exploiting existing networks.



Further improvements, from network optimisation to automated end-to-end orchestration, can then follow in stages, as part of ongoing “retire, replace, reform” strategies.

HOPES AND HAZARDS

This evolutionary story is a big part of SDN’s appeal for government organisations under pressure to do more with less.

“You can evolve existing infrastructures to support new strategies such as shared services

“We know that organisations as diverse as GDS, Transport for London (TfL) and Jisc, [which provides digital support for UK education and research], are starting to explore the potential of SDN,” says Mr Parry.

This is because SDN has so many potential use-cases in government. It can help a council cut through some of the politics holding back shared-service development by

letting them reformulate a project as a proof of concept, using existing infrastructure to trial some new software – a small step that is much easier to get buy-in for.

With Jisc and TfL, SDN can simplify network agility and improve service velocity by automating manual workflows, and increase security in the very large backbones they manage. Equally important, it can dramatically improve their ability to monetise networks by offering ICT services to other government organisations.

But in these early days for SDN, there are a multitude of different offerings and standards, not to mention hype.

“We advise organisations not to get tied into multi-year contracts,” says Mr Parry, “and to choose an SDN solution that is genuinely agnostic regarding hardware, protocols and architectures, because not all are. It should have published, open interfaces and toolkits, which not all do. This would enable you to choose any contractor for specific integrations, software development or ongoing network development. Or, indeed, do any of this in-house.”

¹Computer Weekly, November 11, 2016

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