

Securing our digital future

The techUK manifesto for growth and jobs 2015-2020

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Foreword



Victor Chavez
President of techUK

For centuries, British industry has worked to develop, produce and export great British technology. For us, technology is a way of life - it always has been and always will be.

The UK is already the world's most developed market for ecommerce and is regularly described as the world's leading internet economy. Digital technologies are today transforming all aspects of our business and personal lives as well as the delivery of government services.

Our collective opportunity is to now move on to be one of the first developed economies to use digital technology to stem the long-term rise of debt; raise productivity; generate new high value jobs; and build a safe and inclusive digital society. This is an objective that I truly believe is within our grasp.

This manifesto sets out techUK's view of the actions that the next government should consider to respond to this opportunity and how it can put digital leadership at the heart of a strategy for economic growth and social change.

There are many reasons to be proud of the UK's position as one of the great digital economies and to be optimistic about its future, but we must also be realistic about the commitment and determination required going forward.

In 2015 the new government will need to



Reduce long-term debt



Increase productivity



Create new jobs



Include and empower all

The implementation of an effective digital strategy will

SECURE OUR DIGITAL FUTURE

and establish the UK as a world leading digital economy.

Strategy & leadership

Continued commitment to the highest level of leadership across government and industry.

- Cabinet-Level leadership
- The appointment of dedicated Digital Ministers in every department
- Build on the Information Economy Council as the channel for industry commitment
- Champion the UK's reputation as a innovator in tech
- Appoint FCO Digital Trade Czar
- A Chief Privacy Officer.

Excellence in development & use of tech

Greater investment in the UK's capacity for innovation; invest in key growth markets and deepen the exploitation of tech across the private sector.

- Greater investment in science and innovation
- More investment in skills and talent
- Increased investment in infrastructure
- Pioneer the Internet of Things
- Ensure the UK is the best place to start-up and scale up
- Support growth of tech clusters
- Lead in building European Digital Single Market
- Strengthen exports support
- Modernise energy
- Modernise financial services.

Public sector transformation

Greater scale and pace to the process of public sector transformation.

- Bring greater scale and pace to the digitalisation of public services
- Build on successful work of Cabinet Office and GDS
- Leverage data analytics
- Single Criminal Justice and Emergency Services technology strategy
- Address barriers to digital innovation in health and social care
- Up-skill Local Government
- Maintain C4ISR as a sovereign defence capability.

Safe & inclusive digital world

Need to ensure everyone is included and that the online world is safe and secure for all.

- Double the participation of SMEs in the online economy
- Embed the principle of 'digital-trust-by-default'
- Protect free speech
- Strengthen democratic oversight of data retention and surveillance
- Enhance cyber security and the prevention of cyber crime
- Empower children to act safely online
- Fully fund a comprehensive Digital Inclusion Strategy.

Executive summary

This techUK manifesto urges politicians and policy makers from all parties to recognise the critical importance of the global digital revolution for the future of our citizens and our economy.

Over the next five years, the UK has the opportunity not just to be a digital leader – but to use digital technologies to address the fundamental long-term social and economic challenges that will determine our future, and that of our children and grandchildren. Over the next five years we can create the conditions for success for the next thirty.

UK voters believe that innovation improves quality of life, creates jobs, makes things more efficient and saves money.

According to recent research by ComRes, UK voters believe that innovation improves quality of life, creates jobs, makes things more efficient and saves money. They believe that failure to innovate will put UK businesses and jobs at risk from international competition and mean that their children will not be prepared for the future. They believe that innovation has a vital role to play in improving health and social care, the provision of better public services, such as education and the availability of secure and affordable energy. However they also worry about the rapid pace of change and its implications for their lives and their families. Ultimately they recognise that their future and the future of their children and grandchildren depends upon how well the UK economy and society adapts to the new digital world and they believe that it is the role of government to plan for the future.

By focusing on technology led innovation, and building on existing strengths and progress already achieved, the next government can put in place the measures necessary to secure our digital future. This includes: creating the conditions to deliver high quality public services; restoring our productivity; strengthening our ability to create new jobs; and ensuring a more inclusive and secure society. This manifesto sets out how government, with the active engagement and support of the industry, can achieve these objectives.

This is a manifesto for growth and jobs and it proposes that the next government should focus on four headline objectives: providing strategy and leadership to deliver success; securing the UK's position as a global leader in the production and use of tech; harnessing the transformational power of tech across the public sector; and ensuring our digital world is safe and inclusive for all.

UK voters believe that failure to innovate will put UK businesses and jobs at risk from international competition and mean that their children will not be prepared for the future.

On government coordination and strategy, techUK calls for the next government to ensure Cabinet-level leadership for a single integrated strategy for digital, drawing together public sector reform,

the digital economy and digital inclusion. All departments should have a Ministerial post that has digital within its portfolio and these Ministers should come together within the recently established Ministerial Digital Taskforce to ensure strong coordinated action across government. The next government should build on the Information Economy Council as the channel for ensuring strong industry support and the mobilisation of private sector resources behind the strategy.

UK voters believe that innovation has a vital role to play in improving health and social care, the provision of better public services, such as education and the availability of secure and affordable energy.

To secure the UK's position as a global leader in the production and use of tech, techUK calls for a powerful package of action from the next government, including a commitment to ringfence the science budget and an increase in innovation funding. Science and research budgets should be set for the long-term with a 10 year time horizon. We ask policy-makers to urgently address the skills crisis facing the UK, and call for a smart migration policy that makes the UK a world leader in attracting tech talent, as well as £20m in additional funding needed to ensure our schools are equipped to teach the new computing curriculum. Funding for the Small Business Research Initiative (SBRI) should be increased to leverage the innovative potential of SMEs. The focus on improving the effectiveness of export support should be maintained to ensure that the tech sector meets its full

export potential. This must be underpinned by action to fill the remaining coverage gaps in mobile and fixed broadband infrastructure and a commitment to develop a long-term strategy to ensure the UK's infrastructure requirements are met through to 2030 including a revised Universal Service Commitment. Open and easily-accessible European markets are fundamental to the growth of the UK tech sector and the next government must commit to driving the development of the European Digital Single Market, shaping it in the image of the world's leading internet economy - the UK. Proposals that fail to create a platform for the development of growth and jobs - such as the proposed General Data Protection Regulation - should be resisted and modified to ensure they support innovation whilst effectively empowering consumers.

Groundbreaking progress has been made in the approach to digital government over the last four years which the next government must build upon, bringing greater scale and pace to the process of public service transformation. The digitalisation of all major government transactions should be completed by 2020 and real progress now must be made

UK voters worry about the rapid pace of change and the implications on their lives and their families.

on transforming end-to-end service delivery based on the 'government-as-a-platform' model and embracing the innovative potential of the full supplier ecosystem. This must be underpinned by a comprehensive approach to strengthening digital talent in government,

through senior direct hires from industry and expanding the Digital and Technology fast stream. Key learning made in central government should be replicated across Local Government, with a focus on improving skills and the provision of practical support and expertise from a central hub. techUK also calls for the establishment of an Advanced Data Analytics Unit, an independent data ethics committee, and the appointment of a Government Chief Privacy Officer in order to strengthen public trust in the government's use of data. In addition, techUK calls for a series of specific steps across departmental briefs, including addressing barriers to technology-led innovation in health and social care, defence, justice and emergency services.

A strong digital economy and transformed digital public services won't be achieved unless the digital world is perceived as safe and inclusive for all. Accordingly, techUK outlines a series of measures that will achieve the objective, including doubling the participation of SMEs in the online economy, a fully-funded comprehensive digital inclusion programme and a strengthening of the cyber-preparedness of UK firms. techUK calls for stronger parliamentary scrutiny and oversight of data retention and surveillance activities to ensure that companies operate within clear and strict legal boundaries.

The UK technology industry is ready to work with the next government, as both an innovative supplier supporting and enabling public sector transformation and a partner in addressing a broad and challenging policy agenda. Working together we can secure our digital future.

UK voters recognise that their future and the future of their children and grandchildren depends upon how well the UK economy and society adapts to the new digital world and they believe that is the role of government to plan for the future.

Government should work closely with industry to make the UK a world-leading trusted domain for data protection based on practical measures to increase public awareness, understanding and confidence. Meanwhile the next government should guard against setting dangerous precedents that could undermine the role of the web as a force for important democratic principles of openness and free speech.

We urge the main UK political parties to consider these ideas closely as they produce their own political manifestos for the electorate in the run up to May 2015.

The goals of reducing long-term debt, driving productivity growth and creating new high value jobs in future growth sectors are inter-related and inter-dependent. Digital technology connects everything - which means that an integrated approach to digital innovation encompassing central and local government and both suppliers and users of technology across the private sector will be fundamental to success.

Introduction

Our future is digital

The changes that have taken place over the last 25 years, since the invention of the World Wide Web, are just a foretaste of the innovations to come. As Sir Tim Berners-Lee said, “The future is still so much bigger than the past”¹.

This techUK manifesto urges politicians and policy makers from all parties to recognise the full significance of the global digital revolution. Economic growth depends upon the UK being at the forefront of the development and use of digital technologies. The strength of our society depends upon us harnessing technology for good and mitigating potential for harm. This manifesto asks three fundamental questions:

- How can we hope to compete in the world unless it is by producing and using the technologies, goods and services that are driving growth and innovation in the modern global economy?
- How can we reduce the cost and improve the quality of our public services unless it is through the effective and efficient use of digital technology?
- How can either of these objectives be achieved unless we ensure consumer trust and confidence by making the digital world secure and inclusive for all citizens?

Our response to these questions is optimistic. The UK has remarkable strengths that mean that it can innovate and succeed in an open global digital economy. However, this will not happen by accident.

This manifesto sets out what the next government must do, building on successes already achieved, and working in collaboration with the technology industry, to secure our digital future. It focuses on four headline objectives:

- Ensure strategy and leadership to deliver success
- Secure the UK’s position as a global leader in the production and use of tech
- Harness the transformational power of tech across the public sector
- Ensure our digital world is safe and inclusive for all.

Achieving these objectives will support long-term debt reduction, help to revive productivity growth, enable the creation of new high value jobs and strengthen inclusion.

Section 1

The UK in 2015 and the view ahead

According to recent research by ComRes², UK voters believe that innovation improves quality of life, creates jobs, makes things more efficient and saves money.

They believe that failure to innovate will put UK businesses and jobs at risk from international competition and means that their children will not be prepared for the future.

They believe that innovation has a vital role to play in improving health and social care, the provision of better public services such as education, and the availability of secure and affordable energy.

However, they also worry about the rapid pace of change and its implications for their lives and their families.

Ultimately they recognise that their future and the future of their children and grandchildren depends upon how well the UK economy and society adapts to the new digital world and they believe that is the role of government to plan for the future.

The economic and social imperative

The economic imperative

Having experienced the longest recession in recent history, the UK economy is recovering and is expected to be the fastest-growing developed economy in 2014³. However the fiscal impact of the financial crisis will continue to be felt throughout the next Parliament with all of the major parties⁴ committed to implementing “tough deficit reduction plans”⁵ after the next election. However the challenge for the next government is not only to firmly embed that growth, and reduce the deficit in the short-term, but it is also to address the long-term structural economic challenges that threaten to erode living standards and our ability to provide high quality public services for future generations.

The next government needs to address three challenges to get the UK on track by 2020 to long-term sustainable growth and to start to tackle the UK’s long-term structural challenges:

- i) address the long-term debt challenge through a permanent reduction in the cost of running government and delivering public services;
- ii) increase productivity across the economy; and
- iii) support high-growth sectors and firms with the potential to create new high-value jobs.

Address the long-term debt challenge through a permanent reduction in the cost of running government and delivering public services

According to the most recent Fiscal Sustainability Report from the Office of

Budget Responsibility (OBR)⁶, public sector debt will hit 84% of economic output within 50 years⁷. This unsustainable upward trajectory is exacerbated by an ageing population and the increased pressure that this will put on pensions, health, social care and other public services. This is a challenge that is shared to varying extents by every developed economy.

The main reason for the projected increase in debt is ‘key items of age-related spending’. Health spending is now projected to rise from 6.4% of GDP in 2018/19 to 8.5% in 2063/64, while state pension costs increase from 5.5% of GDP to 7.9% as the population ages. Long-term social care costs will rise from 1.2% GDP in 2018/19 to 2.3% GDP in 2063/64.

The only way to reduce debt and protect front-end service delivery, is to harness the transformational power of digital technology to re-engineer our public services to enable them to be delivered more efficiently.

According to the OBR’s forecasts this range of higher costs is unlikely to be matched by increases in revenues. The OBR therefore believes that future governments will need to implement additional fiscal tightening beyond the current consolidation planned for the next five years in order to address the fiscal costs of an ageing population and the associated upward pressure on health and social care spending.

The only realistic way to do this and ensure our ongoing ability to provide pensions and healthcare will be by driving cost out of the public sector and the provision of public services. To quote Robert Chote from the OBR, *“If you want to eliminate the deficit, at the same time as spending more on debt interest and welfare [and]*

not raising much more in revenue – then the only thing that is left are the day-to-day running costs of the public services.”⁸

According to the OBR, to return the debt to GDP ratio to its pre-crisis level of 40% GDP would require a £6bn reduction in public spending every decade to 2063/4. The only way that this can be achieved, while protecting front-end service delivery, is by harnessing the transformational power of digital technology to re-engineer our public services to enable them to be delivered far more efficiently.

Drive output through increased productivity across the economy – by encouraging technology-led innovation

Productivity growth is an indicator of the overall efficiency of the economy and is a fundamental driver of GDP growth. It matters because it is the main determinant of living standards. To quote the Nobel Prize winning economist Paul Krugman, *“a country’s ability to improve its standard of living over time depends almost entirely on its ability to raise output per worker”⁹*.

Failure to maintain productivity growth results in a decline in living standards, requiring people to either work longer hours or accept lower incomes. After several years of growth there was a sharp decline in UK productivity in the wake of the 2008 financial crisis. Output per hour remains 4% lower than it was in 2008 and 16% below where it should have been if pre-recession productivity growth rates had been maintained¹⁰.

The negative effects of declining productivity growth are profound and improving

productivity must be a key objective for the next government. As techUK (then Intellect) argued in its 2012 report *The Bootstrap Recovery*¹¹, there are many factors that drive productivity growth but the effective use of technology combined with investment in intangible assets (such as skills, intellectual property and new management processes) across the economy is one of the most important drivers of productivity growth.

The potential for technology driven productivity growth is highlighted by the technology sector itself which has demonstrated the highest level of productivity of any sector in the UK economy pre and post the 2008 financial crisis¹². The reason for this is that tech firms of all sizes have been early adopters of new ‘general purpose technologies’ (GPTs) emanating from the sector and have been effective at using those technologies to disrupt traditional ways of doing things and developing new, more efficient business models. By contrast, in many other areas of the economy we have seen reduced business investment in new technology and a lack of investment in intangible capital, leading to low or negative productivity growth. This trend must be urgently reversed¹³.

The challenge now is to encourage and support other sectors of the economy to achieve similar productivity gains. This can be done by supporting ICT capital deepening in non-tech producing sectors (the UK has a low

The UK’s declining productivity can no longer be ignored and a long-term strategy to address it is now required. Harnessing technology to drive disruptive innovation across the whole of the economy has a key role to play in that strategy¹⁵.

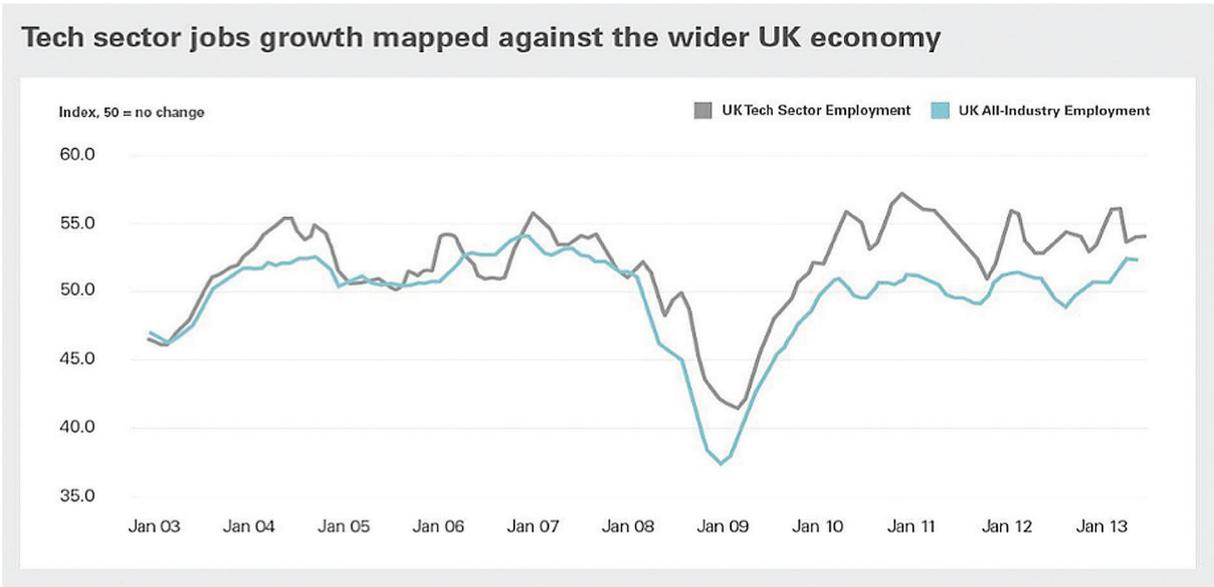
share of ICT capital, especially compared to a decade ago¹⁴) and by encouraging firms in these sectors to use technology to innovate and grow.

Productivity growth cannot be restored overnight. However, it is crucial to understand that productivity improvements compound over time so that even small incremental benefits can have a big impact on GDP in the longer term. This fact has been overlooked by politicians and policy makers for too long as they have sought policy initiatives with short-term impact. However the UK's declining productivity can no longer be ignored and a long-term strategy to address it is now required. Harnessing technology to drive disruptive innovation across the whole of the economy has a key role to play in that strategy¹⁵.

Support high growth sectors and firms with the potential to create new jobs across the UK

Alongside reducing the cost of public services and driving productivity gains across the private sector, government needs to support the creation of new high value jobs. Government should do this by focusing on supporting high growth sectors and firms with the most potential to create new jobs and encouraging job creation in parts of the country where new jobs are most needed.

The tech sector has outperformed the rest of the private sector over the last ten years and recovered far more quickly in the aftermath of the 2008 financial crisis.



Source KPMG/Markit

The tech sector has outperformed the rest of the UK private sector in terms of employment over the last ten years and recovered far more quickly than the economy as a whole in the aftermath of the 2008 financial crisis. At the start of 2014 44% of UK tech firms expected to hire more staff over the course of the year, whilst just 7% expected a fall¹⁶. However, most of this tech job creation will be concentrated in the South East of England¹⁷ and not in areas likely to be hit by headcount reductions in the public sector.

The tech sector has also been a powerful enabler of entrepreneurship, making it far easier to set up a business in any sector of the economy¹⁸. It has also been a source of direct entrepreneurship by supporting a massive increase in the number of digital start-ups through the role disruption plays in opening up opportunities for new ideas and innovations¹⁹. Finally, and most importantly, the tech sector has been a source of successful high growth scale up companies²⁰, which we know are the biggest source of new high value jobs in the economy²¹. All this says that government should be actively seeking measures to help the tech sector grow and innovate; that it should create an environment that better supports the ability of growth companies to reach scale; and that it should give particular attention to helping technology clusters outside the South East of England to reach critical mass.

The social imperative

Keeping the digital world secure and accessible for everyone

The digital revolution of the last 20 years has opened up a world of opportunity for consumers and citizens. Whether through access to knowledge and learning or products

and services, it has been an empowering and liberating force for millions of people, opening up countless opportunities to do new things. This is backed up by public perception studies that reflect positive attitudes to innovation²² and suggest that most people believe that the internet has made the world a better place²³. Yet, many of us will find aspects of the fast changing digital world unsettling at times and, for a minority, 'digital' has been a cause of increasing unease and exclusion²⁴.

Many of us will find aspects of the fast changing digital world unsettling at times and, for a minority, 'digital' has been a cause of increasing unease and exclusion²⁴.

A comprehensive digital policy must take this into account and ensure that the opportunities of the digital world are open to everyone and that all citizens feel secure and empowered.

In summary

The UK needs a digital strategy that can help it address its long-term strategic challenges: ensuring our ongoing ability to deliver high quality public services; restoring our productivity; strengthening our ability to create new jobs; and ensuring that the digital revolution makes people feel more included, empowered and secure. The implementation of an effective digital strategy over the next five years could put the UK firmly on track, by 2020, to deliver these objectives for the long-term welfare and success of the UK economy and its citizens.

Opportunities, challenges and growth markets

Opportunities

This country has an impressive set of strengths and is already recognised as a hub for global tech innovation. The UK is the world's leader in ecommerce with an online ecommerce market accounting for 8.3% of GDP in 2010 (compared to the G20 average of 4.1%²⁵). The UK's position as a world leader in higher education, with six of the world's top 20 universities²⁶, allows it to generate fundamental science and innovative new technology spin-outs²⁷.

The UK has huge strengths unequalled by most developed countries, which provide a remarkably strong platform for success in the global digital economy.

The UK has the most efficient and effective research base in the world, punching well above its weight²⁸. There is a burgeoning community of high growth tech SMEs across the UK generating new jobs. The UK has a predictable regulatory environment based on the rule of law and without favour to national monopolies. Companies based in the UK have access to EU markets and can benefit from a common language with the US, a favourable timezone for transacting around the globe, good global transport links, and long established cultural links with countries where the next billion internet users will come from. The UK has a strong and growing financial and investor community increasingly focused on tech opportunities (particularly at early stage financing)²⁹ and a world-class reputation for legal proficiency that can be a source of national competitive advantage. In London, the UK has one of the world's most influential global cities³⁰, with a world-wide reputation

for excellence in multiple professional and commercial sectors and is a magnet for talent and creativity.

Combined, these are huge strengths unequalled by most developed countries, and provide a remarkably strong platform for success in the global digital economy. Political ambitions to make the UK a global tech hub should not be dismissed as hype – they are entirely achievable.

Challenges

Whilst the UK has real strengths it also faces considerable challenges that threaten its potential for growth and success. Whilst the quality and reach of our digital communications infrastructure improved over the last five years, there remain gaps in coverage that need to be addressed and the take-up of services needs to be strengthened. Access to skills and talent remains a challenge for UK tech firms of all sizes. There is also a need to strengthen public confidence in the use of data; 18% of individuals reporting 'loss of privacy' as a drawback of innovation³¹. Increasing exports in digital technologies and services is critical for addressing the UK's balance of payments, and, although positive steps were taken in the 2014 budget to back UK exports³², further support will be required to ensure the sector achieves its full export potential³³. Cyber security is an unrelenting challenge and it is essential that UK remains one of the most secure digital economies in the world.

Compared to the US, there are not enough high growth companies achieving scale here in the UK. Furthermore, the UK investor community is not perceived to understand

and support tech as well as the US investor community does³⁴. Meanwhile disruptive innovation presents a challenge for government as regulation will need to adapt to the new digital paradigm³⁵. Europe remains the biggest market for UK firms, and there is an urgent need to complete the digital single market as a platform for growth.

Digital exclusion remains stubbornly high. Currently 9.5m adults lack basic online skills³⁶. Similarly, there remains a challenge of regional inclusion, ensuring that the growth of the tech sector and new clusters happens across the UK, not just in London and the South East. Finally, the major challenge of the next government will be overcoming tendencies toward short-termism, and building the capability to support strategic growth over the longer-term.

New technologies poised for growth in the next five years

The pace of innovation in digital technology continues to accelerate and in the course of the next five years we expect to see very significant growth in a number of new technologies. These will be the technologies and trends that will become an everyday reality during the term of the next government, and represent global growth opportunities for UK firms:

- Internet of Things (expected to reach \$7.3tn by 2017)³⁷
- Wearable technology (expected to reach \$70bn by 2024)³⁸
- Big data and data analytics (expected to reach \$32.4bn by 2017)³⁹

- 5G and associated new wireless technologies (expecting a 40-fold increase by 2018)⁴⁰
- Robotics (expected to reach \$29bn by 2018)⁴¹
- Autonomous vehicles (expected to be a £28 billion market by 2020)⁴²
- Advanced manufacturing, building automation (expected to reach \$49.5 billion by 2018)⁴³

These growth estimates are all drawn from different sources and are rarely wholly accurate predictions, but they do indicate the scale of the opportunity as new digital technologies are rapidly adopted around the world. All of these technology trends are disruptive by nature, are global, will grow in value by many billions between now and 2020, and will define the era of the next government. Over the next five years, innovation in technology will continue to have impacts across the global economy.

These technology trends are disruptive by nature, are global, will grow in value by many billions between now and 2020, and will define the era of the next government.

New technologies, such as 3D printing and new manufacturing techniques, such as rapid prototyping, mean labour costs will not play such a central role in decisions about where high value advanced manufacturing facilities should be located. There is real potential for re-shoring of some manufacturing activities, which might not be labour intensive, but will directly create high value jobs and support additional job creation in ancillary business, logistics and supply chain activities.

Section 2

A roadmap to success by 2020

Given the economic and social imperative to secure the UK's digital future, there are four headline objectives that the next government should adopt.

1. Ensure strategy and leadership to deliver success
2. Secure the UK's position as a global leader in the production and use of tech
3. Harness the transformational power of tech across the public sector
4. Ensure our digital world is safe and inclusive for all.

In achieving these four objectives, techUK outline 24 recommendations which we urge the main UK political parties to consider closely as they produce their own political manifestos for the electorate in the run up to May 2015.

Objective 1

Strategy and leadership to deliver success

Over the next five years the UK has an opportunity not just to be one of the world's leading digital economies but to use digital technologies to address the long-term social and economic challenges that will determine our future.

However, this will not happen by accident. Significant resources will need to be mobilised across the public and private sector, which will require a strong strategic vision, effective coordination across government, and strong engagement from industry.

RECOMMENDATION 1

Develop a single strategy and provide strong leadership to mobilise and coordinate delivery across the public and private sector

1.1 Ensure continued Cabinet-level leadership for digital to develop and execute a single strategy for public sector reform, the digital economy, and digital inclusion

The recent establishment of a Ministerial Digital Taskforce by the coalition government, bringing together ministers from across a number of government departments, is a significant and positive step in helping government bring together important threads of digital policy that are dispersed across Whitehall.

Building on this approach, the next government should ensure there is cabinet-level leadership to develop and execute a single digital strategy that rolls up the digital economy, digitalisation of government and digital inclusion. Other systemically important policy domains have a clear departmental lead and a strong voice at the Cabinet table – it is time the full significance of digital is recognised in the same way.

All Government departments should have a Ministerial post that clearly has digital within its portfolio. These ministers would be responsible for driving consistent implementation of the three core strands of the single digital strategy within that department. These Ministers should come together within a strengthened Ministerial Digital Taskforce. Leadership for digital

should be enhanced by the appointment of a Chief Privacy Officer in Government (see recommendation 13) and a Digital Trade Czar based in the Foreign Office (see recommendation 9).

1.2 Strengthen vehicles for private sector engagement and continue to build capacity across the public and private sector to deliver a long-term industrial strategy

The challenge of overcoming short-termism can only be addressed when industry and government work in partnership to invest in research, new capabilities, products, training, recruitment and skills.

Government cannot deliver on the vision of a digital economy alone. To ensure full and effective private sector support and align private sector resources behind the single digital strategy, the next Government should therefore build on the Information Economy Council.

All Government departments should have a Ministerial post that clearly has digital within its portfolio.

1.3 Champion the UK's reputation for tech and support the whole industry ecosystem across the UK

The current government has done an admirable job in helping to raise international awareness of the UK's excellence in tech. By supporting initiatives like Tech City UK, the government has helped to shine a light on the mix of commercial, technical and creative skills and talent in the UK that has helped to draw investment to the UK and encourage entrepreneurship. Attention was initially focused on tech start-ups in east London but this has now been widened to focus on the role of well-established clusters like Cambridge and new emerging clusters such as Newcastle. However, the reality of the UK tech sector is that it is more diverse and, as highlighted by a 2013 report by NIESR and Growth Intelligence,⁴⁴ is far more geographically extensive than is often recognised.

The next government must continue to champion the UK's growing reputation as a leading innovator in tech; understand the very different needs of companies depending on their size, market and location; and support the full ecosystem of companies small and large, new and established, domestic and international across the whole of the UK.

Objective 2

Securing the UK's position as a global leader in the production and use of tech

A comprehensive industrial strategy approach is required to ensure that the UK remains at the forefront of innovation in the development and use of digital technology.

That strategy should include long term investment in science and innovation skills; a commitment to leadership in the next generation of digital communications infrastructures and the Internet of Things (IoT); clear policies to make the UK the best place to start and scale-up a tech business and support for emerging tech clusters; commitment to the development of a European digital single market; continued export support, and pioneering modernisation strategies for energy and financial services.

RECOMMENDATION 2

Ensure a stable long-term funding base for science and innovation

Science and innovation provides the bedrock of the digital revolution. From the discovery of electricity to the discovery of the graphene, the UK has been at the forefront of the scientific research that is driving the digital revolution. The UK's world-leading universities are essential anchor institutions for the digital economy in terms of the fundamental research that they undertake; the commercialisation of that research into new products and businesses; and their ability to attract world leading talent and inward investment to the UK. Their contribution, particularly in relation to the commercialisation of research still needs to be strengthened.

2.1 Increase innovation spend in real terms and ringfence the science budget

The science and innovation budget is as an engine for growth. It should be increased in real terms with funding for fundamental science ringfenced and funding for innovation increased.

The UK performs strongly on fundamental science⁴⁵ and this position must be maintained as global excellence in science is the cornerstone of a successful strategy for digital leadership. However, the UK performs less well compared with other countries on certain measurements of innovation and strengthening the innovation base must be a key objective for the UK. The significant measures put in place by successive governments must continue to be built upon. The recently instituted Catapult Centres are starting to make an early impact,

providing new avenues for business access to knowledge and supporting innovation, and they should be scaled up over time. However, to ensure that they continue to reflect the evolving needs of industry, the Catapult Centres should have clear and regularly reviewed KPIs.

The geographic spread of universities across the UK must be leveraged to support regional economic growth beyond the south east of England. Universities act as powerful regional anchors for technology clusters and have a vital role to play in their growth and must work closely with industry to ensure their relevance and global competitiveness. Whilst there is a clear need to strengthen innovation in the UK, this should not be done at the expense of pure scientific research which remains the fundamental building block of innovation.

The tech sector values the knowledge and expertise of the UK's publicly-funded universities and colleges, and welcomes the 5% rise in total knowledge exchange investment from £3.4bn in 2011-12 to £3.6 billion in 2012-13. This is a trend that should be continued.

2.2 Set science and innovation budgets over ten year cycles

Economic benefits from science and innovation accrue and deepen over time and therefore budgets for science and innovation should be set for the long-term; decades rather than years⁴⁶.

2.3 Double the funding for the Small Business Research Initiative to £400m per year by 2020

Outside of higher education institutions and Catapults, there are initiatives which greatly support the development of R&D in the corporate setting. One of the advantages of the Small Business Research and Innovation Fund (SBRI), is that it can be a major driver for innovation in the public sector, and should be further scaled up over the course of the next parliament. The 2013 budget announced that the SBRI would be expanded five-fold, rising from £40m in 2012-13 to over £100m in 2013-14 and over £200m in 2014-15. A key component of the SBRI is that it can link business with Government departments in seeking new ways to address particular challenges. Assuming competitive take-up and robust assessment, this figure should be staggered to reach £400m per annum by 2020, with a strong focus on working with growth companies. Additionally, the next government should maintain the R&D tax credit to encourage industry-led research and development.

2.4 Reverse the decline in UK students undertaking STEM Masters courses

The UK should improve the supply of high quality graduates and postgraduates. There has been recent concern about the diminishing number of UK students entering Masters degree programmes⁴⁷, with places on these programmes increasingly being taken by overseas students. It does not help the UK economy if we are simply training people who then return to work in other countries with which we are in competition⁴⁸. The next government should look to address the causes of this, particularly for STEM subjects.

Budgets for science and innovation should be set for the long-term; decades rather than years⁴⁶.

RECOMMENDATION 3

Address immediate skills shortages and build the tech talent pipeline for tomorrow

The UK has significant strengths in strategically important skill sets such as cyber security, data analytics and solutions design. Yet overall access to digital skills and talent is a constant challenge for UK firms. European Commission research suggests that the skills gap is larger in the UK than anywhere else in the EU⁴⁹. e-skills UK's research shows that 120,000 new recruits a year are needed for IT specialist jobs in the UK⁵⁰, while Baroness Martha Lane-Fox states that 1 million new tech jobs will be created by 2020⁵¹.

3.1 Inspire and educate tomorrow's digital workforce

Concerted effort is required at every level of the education system and also within industry. Improving the quality and volume of STEM teaching in schools is a high priority. Good progress has been made with an increase in the number of students taking STEM subjects to A-level this year. The new computing curriculum is a much needed addition, although there are significant concerns that schools are currently under-resourced to teach the curriculum effectively. We urge the next government to give urgent attention to the computer science teaching gap in classrooms across the UK, as schools struggle to implement the delivery of new lesson formats with just an average of £175 per school. There is widespread industry concern at the lack of resource given to implementing the new curriculum in schools across the UK, and techUK endorses the independent UK Digital Skills Taskforce recommendation for an additional £20m to aid implementation.

Whilst the computing curriculum is a positive step, studies show that to get more women into computer science degrees and roles, women need to be engaged at a much younger age⁵². That is why techUK is pleased to support Code Club, which aims to get more 9-11 year-olds involved in coding⁵³. Similarly, the work of e-skills UK to provide employer-backed computer clubs for 10-14 year old girls, and the work of many tech companies who invest in inspiring young people about technology, should be encouraged as a valuable contribution to the nation. The next government should champion more initiatives that embed coding and other technical skills from an early age, to ensure a strong start to the tech talent pipeline by 2020.

In addition, the gender imbalance remains a pervasive issue throughout the education system and within the IT workforce. Only 16% of the UK's IT specialists are female, with a similar proportion on IT-related degrees, meaning the sector is largely missing out on half the talent pool. Concerted action is required at every stage in the education and career development process, with industry taking the lead on making sure that the sector is open and attractive to all. techUK continues to shine a light on good practice through its Women in Tech programme.

New routes should be opened up to bring young people into the industry, and apprenticeships in particular have been underutilised. The new £27.5m Tech Partnership launched by industry and

Government will address this, delivering greater coherence to existing apprenticeship schemes and making this route far more attractive to talented young people.

3.2 Make the UK a global hub for talent by implementing a smart migration policy

To be a world-leading tech hub, the UK must be a global hub for talent. There is a global competition for the best tech skills and the attractiveness of the UK to global talent has been a key factor in the UK's success to date. One in seven start-ups in the UK was founded by a migrant⁵⁴. The UK must be able to attract the wealth creators and skills necessary to fill existing skills gaps and help create the jobs of the future. This requires a smart migration policy that makes the UK attractive to wealth creators and skilled workers.

Recent changes to immigration policy are making it much harder for the tech sector to access the global skills base and making the UK much less attractive to global talent and entrepreneurship. To be a global hub for tech we must have a smart immigration policy that is open to and welcomes entrepreneurs and future wealth creators; developers and engineers with key skills; students and researchers who can keep our universities at the forefront of academic excellence; and teachers who can inspire and educate the next generation.

The key elements of a smart migration policy to support growth would:

- Reinstigate the two year Post Study Work visa
- Remove caps on graduate entrepreneur visas
- Remove the higher salary threshold from Tier 2 skilled migrant visas (upper cap (£40k))
- Extend the Tier 1 Exceptional Talent Visa beyond start ups and increase scale and reach across the UK

To be a world-leading tech hub, the UK must be a global hub for talent.

RECOMMENDATION 4

Ensure a ubiquitous world class communications infrastructure for today and tomorrow

The UK has a highly competitive and world class fixed, mobile and broadcast communications infrastructure that has primarily been financed and deployed by private sector investment. The UK has the most competitive market in Europe for both fixed and mobile services⁵⁵ which has delivered low prices and rapid consumer adoption⁵⁶ and has enabled the UK to build the world's leading internet economy. The UK is also a world leader in the development of digital content⁵⁷.

Ensuring world-class infrastructure requires significant ongoing investment, which depends in turn upon a carefully balanced policy and regulatory strategy to ensure the right level of competition and motivation to invest. In geographic areas with low population densities the commercial case for investment will always be weaker and public funding will continue to have an important role to play. However, this should be a last resort with a preference always given to private sector investment. Government can do a great deal to maximise the incentives for the private sector to invest and thus minimise the need for public sector funding.

4.1 Fill remaining gaps in coverage to meet existing targets

In the short-term, urgent action is required to fill remaining gaps in superfast broadband and mobile coverage to meet existing coverage targets, including 4G. To do this government must:

- Lower communications network infrastructure / property costs and improve access through Electronic Communications Code reform. Under the current regime, the electricity industry pays £150 on average per pylon per year, while communications operators pay thousands of pounds per site. Reform of the Code is urgently needed to bring rental costs, charges and time delays to access equipment for repair and upgrade on a par with those faced by the utility industry
- Enable better access to public sector land and street furniture. Helping to improve coverage and capacity across the UK; public bodies should have a presumption in favour of enabling access to their buildings, land and street furniture for use for network infrastructure
- Reform planning laws. Move to a system that makes it easier to implement new sites and infrastructure, including enabling taller masts in rural and semi-urban areas. Also given that 85% of the cost of building transmission line infrastructure is in civil engineering work, Government should enable innovative infrastructure deployment techniques. Furthermore, a consistent application of the Permit Scheme, supportive of industry, by local authorities is now more essential than ever
- Create a plan to plug the full mobile 'not-spots' in areas where people work and travel

- Provide incentives for industry to address the partial ‘not-spots’
- Work with industry to achieve high levels of connectivity across the rail network, including wifi on trains.

4.2 Work with industry to develop a long-term digital communications infrastructure strategy

techUK strongly supports the strategic review of long-term communications infrastructure requirements that is being led by DCMS⁵⁸. We cannot be complacent that the UK’s communications infrastructure will remain fit for purpose. Infrastructure solutions cannot be delivered overnight. They require large scale investments, and regulatory and policy changes take time to develop and implement. Long-term decision making is therefore critically important.

Our digital infrastructure is not just used to deliver traditional telecommunications, broadcast and emergency services but an ever increasing range of applications from digital entertainment to healthcare, transport, industrial processes and automation (e.g. Machine to Machine / Internet of Things). Many of these applications rely on the availability of sufficient and suitable spectrum. Decisions on spectrum are made increasingly in international arenas, and Government and Ofcom must continue to work in conjunction with industry to be proactive in these fora to ensure that these international decisions support UK requirements.

Furthermore, with increasing convergence, many of the developments in digital communications sectors are inter-related. Whilst the Government needs to avoid ‘picking winners’ and remaining technology neutral, it also has an important role on strategic decisions such as on spectrum reallocations, switchovers and the development of new technologies, such as through its

investment in the 5G Innovation Centre⁵⁹ and White Space pilots.

A commitment to long-term consistent policy development that enables the market to make long-term investment decisions is essential. Long-term measures must include:

- The development of a long-term communications infrastructure strategy for 2025 following through on the recently launched DCMS consultation process. This should include plans for improving incentives for infrastructure investment, a clear roadmap for strategic decisions on spectrum allocations and technology evolutions (e.g. DVBT2), and an international engagement plan on spectrum (to ensure international decisions support UK ambitions)
- A review of the universal service commitment for broadband to ensure it remains fit for purpose and that all UK households and businesses can access a suitable minimum level of connectivity
- Work with industry through the Spectrum Policy Forum to develop a world-leading approach to Spectrum Policy to support innovation and new services including 5G⁶⁰.

4.3 Ensure continued investment in broadcast platforms

Continued innovation is required in our broadcast infrastructure including free-to-air TV and digital radio:

- Ensure continued innovation in free-to-air TV – ensure sufficient spectrum can enable innovation based on more spectrally-efficient technologies
- Certainty for radio – a ‘positive-in-principle’ decision with a clear and careful timetable for radio switchover to give industry the incentive to invest in the digital future.

RECOMMENDATION 5

Initiate a major programme to push the boundaries on the development and use of the Internet of Things (IoT)

The advent of the Internet of Things (IoT) will bring about a period of profound transformation for industry, government and citizens. Some have even gone so far as to liken its potential impact as comparable to the first wave of the digital revolution.

The UK has an exciting opportunity to be a world leader in IoT development. The commercial opportunities presented by IoT are clear for all to see⁶¹. Government appetite is there – exemplified by the interest taken in the area by, for example, the Government Office for Science and the £47 million allocated to related areas such as smart cities by Innovate UK (formerly the Technology Strategy Board). The industry expertise is there too: the UK is home to many of the world leaders in IoT technology. And, finally, the UK has the required knowledge base – our universities and research councils are world leading, and capable of pioneering the next big developments in this major growth area.

To consolidate and develop our position into one of world leadership, government should have a more coordinated approach to IoT development, coupled with the right kind of incentives to stimulate the market and keep pace with the ambitious investments seen in China and the USA.

techUK encourages the next government to create a major new UK IoT programme that clearly articulates the nation's ambition to be a world leader in IoT. This should be coupled with investment in large scale IoT deployments across the country that leverage the skills of the UK's private sector and research communities.

The UK has an exciting opportunity to be a world leader in IoT development.

RECOMMENDATION 6

Make the UK the best location to start and scale up a high growth tech business

The digital revolution is disruptive by nature. It is about finding new better ways to do things and creating new forms of value. Digital tools have made it easier to set-up and run a business than ever before and we have seen a record number of new start-ups launched over the last three years⁶². This more entrepreneurial culture is also spilling over into existing businesses as companies seek to harness the disruptive ideas and innovation coming from new entrants; by hiring people with start-up experience; supporting start-up incubators; partnering with SMEs; or buying disruptive new companies. All of this fortifies the tech ecosystem in the UK. The current government should be applauded for its policies to back start-up culture in the UK, and these should be built upon.

Government and large businesses can play an important role in supporting the growth of SMEs, by making it easier to contract or partner with them (see objective 3 on harnessing the transformational power of tech across the public sector). In doing so they benefit from the innovation, pace and agility that SMEs can often deliver. However, both government and large companies need to understand that SMEs are not homogenous and have varying needs that must be understood and accommodated.

In reality, many small businesses welcome the opportunity to work in collaboration with bigger businesses that can help them with business development, managing the risk of big contracts and the cashflow implications of delivering large milestone-based contracts. Collaboration between large and small is an increasingly common phenomenon across the tech ecosystem.

Although we know most new start-ups fail, many will succeed and the roll call of successful UK tech start-ups continues to grow. However, not enough of those companies have yet made it to scale here in the UK and too many have sold or relocated at a point where they need to grow. Given the importance of high growth firms to the economy the failure to take such firms to scale is a huge missed opportunity that must be addressed. A report led by Sherry Coutu CBE (and supported by techUK) will be published in the autumn. It will provide a clear set of policy recommendations to support high growth SMEs to reach scale. This report should be implemented in full by government, industry and wider ecosystem players alike.

RECOMMENDATION 7

Support the development of tech clusters across the UK

Clusters are a major contributor to growth. As shown by a recent report from McKinsey and Centre for Cities, 31 economically significant clusters contain 8% of the UK's businesses, but generate 20% of UK GVA⁶³. The UK has a number of well-established clusters in London and the South East of England, and in recent years we have seen the emergence of exciting new clusters, often rooted in long-standing local strengths, more widely across the UK, including in Bristol, Cardiff, the North East, Sheffield, Leeds and Manchester. Whilst it would be erroneous to overstate the role of government in creating and supporting tech clusters, there is much that Government can do to support and promote their growth.

The Department of Business and the Cities Unit in the Cabinet Office should actively work with LEPs, universities, techUK and the National Cluster Alliance to support these clusters.

This support should be based on a careful understanding of local needs and should seek to strengthen the underlying infrastructure that supports and nurtures local firms, talent, and skills. The vital role that universities play in the development of tech clusters must be understood and built upon at the local level.

The tech sector and the wider digital economy generate a huge amount of data that can help the sector make more informed decisions and investments. We urge the next government to replicate the US cluster mapping exercise⁶⁴ for the UK.

31 economically significant clusters contain 8% of the UK's businesses, but generate 20% of UK GVA⁶³.

RECOMMENDATION 8

Drive the development of a European digital single market and international trade agreements that support innovation and growth

The EU is the UK's biggest export market, accounting for over 50% of international trade⁶⁵. Three of the UK's five biggest trading partners in e-commerce are EU member states⁶⁶. Whilst the recession in Europe has depressed exports to the EU in recent years, the value of the EU as an export market will pick up in the long-term as European markets return to growth. The completion of the EU digital single market will create a large scale domestic market for digital products and services and will help innovative SMEs to reach scale. As a net producer of digital services the UK will be one of the prime beneficiaries of a digital single market.

The EU digital single market should be shaped by Europe's most successful digital economy – the UK. Accordingly, we need a policy approach that supports a strong single market that is open, globally oriented and focused on enabling and supporting innovation. In order to do this, the UK should be leading, not following, negotiations on the completion of the European Digital Single Market. It is

therefore absolutely crucial that we build cross-government / cross-party / cross-industry support and engagement to drive this through – UK political parties must ensure that their MEPs are standing up for UK national interest in relation to the digital single market.

The UK government should work with European partners to ensure trade agreements such as the Transatlantic Trade and Investment Partnership (TTIP) are in place that enable businesses to reach overseas markets as easily as possible.⁶⁷

The EU digital single market should be shaped by Europe's most successful digital economy – the UK.

RECOMMENDATION 9

Double UK tech exports by 2020

Positive steps were taken in the 2014 Budget to back UK exports⁶⁸ and the current government's target to have £1 trillion worth of exports in goods and services by 2020 is welcome. The UK should maintain levels of trade support and continue to work with industry bodies to get more SMEs in high growth tech markets exporting to the world's high growth economies. The UK has a tremendous opportunity to gain from the constant growth of the tech sector and the UK is rightly recognised as a global centre of excellence in digital tech. techUK is playing its part to help over 1000 new tech companies to export by the end of 2015, in conjunction with UKTI.

UK Export figures for technology and digital products and services show that in 2012 exports amounted to at least £31bn⁶⁹. The next government should continue to aim for the £1 trillion goal by 2020 and should aim to at least double the amount of tech exports to £62bn by 2020. To that end, the next Government should appoint a Digital Trade Czar based in the Foreign and Commonwealth Office.

The UK has a tremendous opportunity to gain from the constant growth of the tech sector and the UK is rightly recognised as a global centre of excellence in digital tech.

RECOMMENDATION 10

Harness digital technology to modernise the energy sector

Having a reliable and globally competitive energy system is absolutely crucial to the UK's long-term economic security. 87% of the public believe that innovation in our energy system is crucial for long-term wellbeing⁷⁰. The UK needs a transition to a low carbon energy future that is affordable for consumers and businesses.

Digital technology has a fundamental role to play in the transformation of our energy system. It will be one of the first sectors to be transformed by the Internet of Things (IoT). However success depends upon a supportive policy and regulatory environment. Some important building blocks are already in place, such as the rollout of smart meters, the commitment to electricity market reform and the ongoing commitment to modernising the country's electricity grids (aka 'smart grids').

Smart grids (powered by IoT) are a fundamental part of modernising our energy system: by using innovative new technology products and services, they will help deal with rising peaks in demand, the incorporation of energy storage technologies and the rollout of Electric Vehicle (EV)

charging infrastructure. They will also provide significant economic benefits, delivering savings of an estimated £19bn by 2050 when compared to conventional 'business as usual' reinforcements to our energy networks⁷¹.

Another critical tool in aiding the low carbon transition will be the widespread adoption of demand-side response ('DSR') in the UK; which will, again, draw heavily on IoT technologies. DSR enables consumers - both domestic and industrial - to adjust their demand for electricity in line with pricing or other signals from the grid, thus helping empower consumers to achieve cost savings as well as carbon and economic savings for the UK as whole. However, many in industry believe that the current market arrangements still require significant further work if nationwide development of DSR is to become a realistic ambition⁷². Failure to address this could result in the vast majority of consumers and the country having to wait many more years before they are able to take advantage of the opportunities DSR promises.

The next government should therefore make getting the market arrangements right for DSR one of its key energy policy objectives. To do this, the next government should provide renewed emphasis on the importance of DSR, whilst also supporting existing initiatives that are looking at how to overcome the obstacles to its development, such as the DECC/Ofgem Smart Grid Forum.



RECOMMENDATION 11

Support a digital modernisation strategy for financial services

Following the financial crisis and the great recession, it is easy to lose sight of the fact that the UK remains one of the world's leading financial centres and that the financial services sector remains a significant contributor to GDP. Technology underpins all of the financial services; enabling new business models but also providing an open frontier for improving financial services right across the board.

This year, techUK called for a Digital Modernisation Strategy⁷³, outlining the need for the financial services sector to address the limits that outdated technology platforms impose on modernisation and innovation. This recognises the importance of disruptive new FinTech firms, as well as the ability of the tech sector to improve the performance of existing large financial institutions. The end goal is to have a more resilient, competitive and transparent financial services sector,

which better serves the needs of consumers and businesses across the UK. In order to ensure the leading position and continued competitiveness of the UK Financial Services Industry, the government should work with financial institutions, regulators and the tech industry to launch a Digital Modernisation Strategy for the financial services sector, which addresses the full panoply of existing financial institutions and new, emergent FinTech firms.

The financial services sector must address the limits that outdated technology platforms impose on modernisation and innovation.

Objective 3

Harness the transformational power of tech across the public sector

Groundbreaking progress has been made in the approach to digital government over the last four years, which the next government must build upon, bringing greater scale and pace to the process of public service transformation.

The promise of digital government has been much discussed over the past 25 years, yet the efficiency gains achieved in public service delivery have been modest compared to the changes that have taken place in the private sector over the same period. As a result we are not yet on track to reduce the cost of public service delivery to the point that would bring the trajectory of national debt down to sustainable levels. This has to change and there is no fundamental reason why the public sector cannot be as successful as the world's most innovative companies in using digital technology. As a society we cannot afford to give up on making this happen.

Since 2010 there has been a fundamental change in the approach to technology use in government, drawing on experience from the private sector and based on smaller scale agile innovation. This has disrupted traditional approaches and set government and suppliers on a new course. Broadly, this is the right course and the next government has an excellent opportunity to build on the successful work of the Cabinet Office and the Government Digital

Service (GDS) and bring scale and pace to the process of public service transformation. Suppliers of all sizes have an important role to play, working with government, to help drive innovation and better outcomes for citizens.

The next five years should be remembered as the period when the UK started to truly rebuild its public services for the 21st century, delivering the quality of service that its citizens expect at a cost which current and future generations of tax payers can afford.

Achieving major change in the public sector is difficult and implementing new technologies in large complicated organisations with a huge number of large legacy systems is challenging. However, these challenges are not unique and large, complex private sector organisations have been successful in using digital technology, provided by a broad range of technology suppliers, to inculcate new ways of operating and new platform-based business models. There is no fundamental reason why the public sector, working with the same broad ecosystem of technology suppliers, cannot do the same.

Many of the building blocks to deliver on the promise of digital Government are now finally in place: there is a wealth of private sector experience that can be drawn upon in using digital technology to create new ways of operating and new platform-based business models. Many of the technology components required to enable change have now been commoditised and are available as commercial-off-the-shelf solutions. The UK has a wealth of suppliers, from SMES to large multinationals, with the capability to bring innovative ideas to support service transformation and has a technical and management skills base that the public sector can recruit from to strengthen its own in-house knowledge and capabilities. The UK is ranked 9th globally in terms of network readiness⁷⁴, and has a good and improving high-speed fixed and mobile communications infrastructure in place, making services accessible to people and businesses across the country. Digital devices have become more accessible and far simpler and more intuitive to use; and finally, and perhaps most importantly, UK citizens themselves are amongst the world's most eager early adopters of new technology and digital services⁷⁵.

The tools are at hand and many of the elements are in place. Wholesale public service transformation will not happen overnight or even over the next five-year parliamentary term. By 2020 the next government, building on the changes already put in place, can put the UK firmly on course for a new era of more efficient, effective and affordable public services.

Delivering on the objective of digital government requires new approaches, new skills, new capabilities and new ways of working. Success depends upon a coherent approach within Government, new collaborative and effective relationships with a full range of suppliers and, most importantly, an open dialogue with the public. These challenges are well understood and significant progress has been made over the last four years and the following recommendations build on that approach.

RECOMMENDATION 12

Work with technology suppliers to bring a greater scale and pace to the digital transformation of government

12.1 Be clear about the scale and scope of the change required and the purpose of that change

Public service transformation is a disruptive process that faces inevitable opposition. Therefore, it is essential that the objectives must be communicated clearly by politicians to suppliers, staff and the public. Transformation is not simply an exercise in cutting costs, it is about delivering services that meet the changing needs and increasing expectations of citizens, at a time when private sector service providers are transforming the way they engage and interact with their customers.

12.2 Complete the digitalisation of major government transactions

The digitalisation of the bulk of government transactions should be completed by 2020 with the 150 highest-volume Government transactions all converted to the digital-by-default standards by that time. This will equate to 95% of all citizen and business interactions with government.⁷⁶



12.3 Focus upon organisational culture and skills to support process change

Digitalisation of government will be achieved through well-developed and implemented change management strategies, not a series of interconnected IT projects. These strategies must have clear sustained ownership at the highest level and be supported by stronger technical and management skills within the public sector. Good progress has been made recently with 100 digital technical experts being brought into government departments over the last 12 months. Coupled with material incentives for individual excellence, a much stronger skills base across government will enable civil servants to act as empowered and effective customers, improving their capability to draw upon the innovative potential of a diverse supplier base.

A long-term commitment to improving management and technical skills is essential. The civil service competency framework should be revised to take greater account of the importance of core digital competencies and the new Digital and Technology (DaT) fast stream for entry civil servants⁷⁷ should be increased in scale with immediate effect to ensure that all departments have junior and mid-level skill sets required to drive service transformation over the next five years.

12.4 Promote end-to-end service transformation using the Government as a Platform (GaaP) model across the whole of the public sector

The most successful digital companies are those that have used technology to transform their entire architecture and mode of operation rather than just using it as a 'bolt-on' to automate existing established processes. Therefore, there is a need to move beyond transactions to look at complete end-to-end service transformation and the move to new efficient platform-based architectures that are adaptable for the future. There is no reason why the same principles that have been developed for central government by GDS should not be applied consistently across other services such as health and emergency services.

12.5 Embrace the innovative potential of the full supplier ecosystem

Make contracting with the public sector easier for all suppliers, regardless of size, so that Government can draw upon the widest supplier base possible. This will enable government to take advantage of the capabilities of companies large and small, and tax payers don't have to bear the additional costs of overly complex procurement processes.

SMEs are not homogenous and government should therefore develop a more structured and better articulated strategy for categorising, engaging and procuring without prejudice from the full spectrum of the UK supplier ecosystem.

Government should engage with the supplier base at the earliest pre-procurement stage of projects to help them understand service transformation objectives and encourage them to compete to come forward with innovative and disruptive solutions.

Greater transparency on the costs of delivering public services would enable suppliers to identify new opportunities for cost savings and come forward with innovative new ideas. Although an early ambition of the coalition government, this still hasn't been fully achieved and requires further standardisation in the way that costs and KPI are reported so that comparable costs and performance data can be shared with industry.

12.6 Use off-the-shelf solutions within an open architecture where appropriate

The use of commoditised and utility solutions if used appropriately and consistently across Government, can help to standardise similar, though currently disparate, functions and progressively enable the sharing of data. Where it is necessary to use bespoke and proprietary solutions, Government should consider how to use them in ways to promote further growth. This is particularly important for SMEs that may wish to re-use IP that they have developed for government contracts.

RECOMMENDATION 13

Leverage data analytics across government based on an ethical approach to data sharing that ensures privacy

13.1 Strengthen cross-Whitehall data analytics capabilities

Across the private sector, advanced data analytics are being used to more fully understand customer requirements, inform business decisions and improve operations. The effective use of data analytics across Government will significantly improve processes and support better-evidenced policy making⁷⁸. This will support better outcomes – from reducing crime to helping to identify needs for social care. To enable much deeper exploitation of data analytics, a specialist unit should be set up to make advanced data analytics capabilities widely accessible across Government.

13.2 Establish an independent data ethics committee and appoint a Chief Privacy Officer

The ability for data to be shared across services is fundamental to the functioning of digital Government and 21st century public services. For this to be done in an open and transparent manner, citizens need to understand how and why their data will be used and which controls will be in place. To ensure consistent compliance to appropriate ethical standards Government should establish an independent data ethics committee to create a code for responsible analytics and guide the novel use of data consistently across the public sector. Mirroring best practice in data driven businesses, Government should also appoint a Chief Privacy Officer responsible for ensuring appropriate privacy requirements are built in by design as public services are progressively digitalised.

RECOMMENDATION 14

Create a single criminal justice and emergency services technology strategy

The policing and criminal justice sectors have been subject to significant political reform in the past four years. This has not been supported a coherent approach to technology. A single criminal justice and emergency services strategy is required to set out the assets and data that are required. Looking at the end-to-end needs as a whole - as opposed to the constituent parts - will save money,

prevent duplication and provide clarity to suppliers. For Government this will enable greater availability of data, which will yield operational and organisational innovation and efficiencies. As described above, the strategy should include a commitment to buying commercial off-the-shelf products as default in order to reduce costs and promote standardisation.

RECOMMENDATION 15

Address barriers to digital innovation in health and social care

Given the long-term impact on the national finances of an aging population and associated long-term chronic conditions, increasing productivity in the delivery of health and social care should be regarded as the holy grail of public policy making. 93% of the public believe that innovation has an important role to play in improving the quality of health and social care⁷⁹.

The potential to improve outcomes and reduce costs through better use of technology in health and social care is enormous. Throughout the patient journey there are opportunities to streamline processes, and improve data flows that can help speed up diagnoses, enable earlier interventions, and make more efficient use of scarce resources. However the ability of the health and social care system to understand, adopt and absorb the benefits of new technologies is often hampered by organisational structures, budgets and processes that are not designed to encourage innovative new ways of doing things.

The coalition Government's ambitious goal to make the NHS paperless by 2018 was an important attempt to change this status quo through a bold objective that would be a stimulus to new thinking and better engagement between healthcare professionals, patients, the public and suppliers. Good progress is being made on thinking about how this objective can be achieved but more action is required in terms of successful implementation⁸⁰. Nevertheless, further similar bold challenges should be made to open up the health service to more digital innovation. As a route to helping decision makers better

understand how new emerging technologies and solutions can help drive efficiencies across the health service, a central platform should be established to enable suppliers to showcase the range of industry options and enhance customer knowledge of the new solutions that could be brought to market.

There also needs to be a comprehensive review and reform of the way information systems are procured in the health and social care sector. Procurement innovations introduced by Government such as LEAN and G-Cloud have many advantages, but suppliers continue to cite examples of NHS Trusts and Local Authorities ignoring both services or, in some cases, not knowing what they are. Part of the problem is that the decision makers responsible for procurement decisions within Trusts often lack the skills and knowledge to enable them to act as an informed customer. Senior clinical engagement, for example, should be mandatory when procuring information systems to ensure the end-user is involved in the decision-making and to encourage a more holistic view of the impact throughout the patient journey. Moreover there needs to be more commercial agility from the demand side - the risk/reward balance is often set too low with buyers tending to be highly risk averse. This not only inhibits the potential for innovation but it also mitigates against services using SMEs and start-ups. Greater use of soft-market testing in the pre-procurement process, proportionate qualification and evaluation processes during procurement and better bidder recourse for failed or cancelled bids should be encouraged, in order to address this problem.

RECOMMENDATION 16

Up-skill local government to capitalise on digital by default

Approximately a quarter of total managed government expenditure is spent by local government⁸¹ and the localism agenda has put Local Authorities in the driving seat. However as with the NHS, local authorities often lack the skills and resources to utilise the digital agenda to transform service delivery. To mirror some of the progress being made in central government, a body with a similar remit to the Government Digital Service should be established to act at the regional level to help local authorities identify the common building blocks of software, hardware and processes that can be standardised and commoditised across local Government. Development of common approaches to support transformational change and cogent engagement in a cost effective way with suppliers also needs to be emphasised.

Local government is on the cusp of a digital revolution. ‘Smart Cities’ are starting to highlight ways to join up services and utilise data collection to make services work in a smarter way. For this to be successful nationally, regional political structures and processes need to be reviewed in order to ensure that they do not impede the large scale collaboration required to leverage the optimisation benefits that the Internet of Things offers in terms of the development of ‘smart cities’. Cities in which citizen behaviour and preferences are understood are well-positioned to provide optimal public services. The Department for Businesses, Innovation and Skills has conducted work⁸² to understand the challenges in building smart cities. Action is now required to realise the potential these approaches offer to the UK.

To mirror progress being made in central government, a body similar to the Government Digital Service should be established to act at the regional level.

RECOMMENDATION 17

Maintain C4ISR as a sovereign defence capability

The UK's position as a global technology leader is beneficial not only for the national economy, it is also an essential feature of the UK's armed forces. Self-reliance and self-sufficiency within a military context (otherwise known as sovereign capability) of ICT systems and services is a vital component of modern national defence. The ability to quickly and securely communicate, disseminate orders and information, relay images, and transfer data, are all components of what is called C4ISR (command, control, communications, computers, intelligence, surveillance, and reconnaissance).

Effective C4ISR is the cornerstone of networked armed forces, and can best be understood as the equivalent of a central nervous system, enabling the military to control and direct our operational capability. C4ISR provides the essential foundation of the Future Force 2020 initiative upon which the MoD is building and shaping the UK's armed forces. Sovereign capability in C4ISR allows the UK to completely and securely control its own data and better manage sources of information and intelligence, without having to rely on others for vital operational information or communications links. Without sovereign capability of C4ISR, the UK military would be much more vulnerable and the UK's ability to protect its national interests could potentially be compromised.

The tech industry's role in the pursuit of sovereign capability is an important one. Investing in the capacities and capabilities of British-based technology companies allows the UK to produce the products and services that protect UK soldiers on the front line and offer those same capabilities to our allies; it is good for our national security and good for the economy. What gives the UK the edge in the C4ISR domain is the skilled personnel and world leading industrial capability resident in the country. To secure its position as a global leader, the UK must identify the critical capabilities required for C4ISR and invest in UK companies for the long-term to sustain the industrial base and enhance export potential. Put simply, the UK armed forces cannot operate without C4ISR capability. We must ensure that the UK retains the inherent skills and know-how to design and operate C4ISR systems.

With a new Strategic Defence & Security Review (SDSR) due for publication in 2015, techUK calls for the formal recognition that C4ISR should remain a sovereign capability.

RECOMMENDATION 18

Double the participation of SMEs in the online economy

The potential for technology driven productivity growth is highlighted by the technology sector itself which has demonstrated the highest level of productivity of any sector in the UK economy pre and post the 2008 financial crisis⁸³. The reason for this is that tech firms of all sizes have been early adopters of new technologies and tools emanating from the sector and have been effective at using those technologies to disrupt traditional ways of doing things and developing new, more efficient business models. By contrast, other sections of the economy have seen reduced business investment in new technology and a lack of investment in intangible capital, leading to low or negative productivity growth. This trend must be urgently reversed⁸⁴.

Estimates indicate that increasing the digital capabilities of the UK's SME population can unlock economic returns of £18.8 bn⁸⁵, and evidence suggests that SMEs are not capitalising as best they might on this lever for economic growth⁸⁶. Just 14% of SMEs transact online⁸⁷, and over a third of SMEs do not have a website⁸⁸. Similarly, only 35% of their employees are considered to be digitally savvy and 24% of SMEs say their employees do not have basic IT user skills⁸⁹.

The challenge now is to encourage and support other sectors of the economy to achieve similar productivity gains seen by the tech sector. This can be done by supporting ICT capital deepening in non-tech producing sectors (the UK has a low share of ICT capital, especially compared to a decade ago⁹⁰) and by encouraging firms in these sectors to use technology to innovate and grow. For example, the rollout of superfast broadband and local SME demand stimulation work represents a significant opportunity to see the positive effects of tech adoption flow right across the UK economy. Accordingly, the next Government must aim to double the participation of SMEs in the online economy.

Estimates indicate that increasing the digital capabilities of the UK's SME population can unlock economic returns of £18.8 bn⁸⁵.

RECOMMENDATION 19

Work with business to make the UK a world-leading trusted domain for data protection

Data is the fuel that drives the digital economy and as we move beyond the world of ecommerce to the Internet of Things, the rules governing the use of personal data become ever more important. The EU's data protection and privacy rules, although still effective, were written almost 20 years ago and need updating. However, this needs to be done in a way that both builds consumer trust and empowerment and supports innovation, growth and jobs.

Current EU proposals for a new General Data Protection Regulation (GDPR) fall some way short of both making it easier for consumers to understand and manage the use of their own data or providing the more harmonised and predictable regulatory environment that is needed by small businesses seeking to expand their operations across the single market. If the GDPR is a test of the potential for a digital single market to make it easier for small businesses to grow and create jobs in the EU, then it is failing. The UK government and UK MEPs from all parties should continue to work

to ensure that the GDPR delivers a platform for growth and jobs by enabling innovative data-driven SMEs to scale up across Europe. Central to that objective is an effective and workable one-stop-shop mechanism providing clarity and certainty for businesses and consumers on where data protection decisions are adjudicated.

Meanwhile, at the national level there is much more that can be done to help consumers understand how data is used and to manage data use as in ways considered appropriate by consumers. To embed the principle of 'digital-trust-by-default', the government should support ongoing initiatives being led by the technology industry to develop an effective, clear and transparent ethical framework for companies' use of personal data that protects users, engenders trust, and maximises innovation. Meanwhile funding for the Information Commissioner's Office should be increased to take account of its critical role in a data driven economy.

RECOMMENDATION 20

Protect free speech

At a time when more authoritarian regimes around the world are seeking to use international fora to limit freedom of speech on the internet, the UK must continue to champion the World Wide Web as an open public space where freedom of speech is protected. The recent CJEU ‘right to be forgotten’ ruling is a retrograde step in this

regard and the unintended consequences of this ruling should be highlighted and addressed in the EU data protection reforms. The next government must guard against setting dangerous precedents that could undermine the role of the web as a force for important democratic principles of openness and free speech.

RECOMMENDATION 21

Enhance cyber security and the prevention of cyber crime

The world's leading digital economy must not only be the most connected but it must also be the most secure. The UK has world leading cyber security capabilities, as was demonstrated by the 2012 London Olympic Games which were kept safe from disruption despite facing sophisticated threats. The next government must ensure that the UK maintains its reputation as one of the world's most secure digital economies by continuing to invest at scale in its own capabilities; encouraging and where necessary incentivising businesses to strengthen their cyber resilience; and promoting best practice to consumers. The UK should also optimise the growth potential for the UK economy by helping UK firms to export knowledge and capabilities to overseas markets where appropriate.

The current government has set out a strong cyber security strategy that the next government should build upon. Cyber threats will continue to evolve over time and the UK government will need to continue to invest in improving skills and capabilities across the public sector as well as awareness-raising across the private sector.

Meanwhile the next government will need to continue to invest in combating cyber crime. It must ensure the National Cyber Crime Unit is properly funded to prosecute online crime and work with industry to identify opportunities to design out cybercrime wherever possible.

The UK has world-leading capability to fight cyber crime at the national level through the National Cyber Crime Unit and the City of London Police. It lacks, however, the essential skills in cyber security investigation and digital forensics within its local police forces, which leaves the police unable to successfully deal with the large volumes of low level cyber crimes that affect most citizens. Mainstreaming cyber skills throughout the police force by instigating proper cyber security and digital forensics career paths and rolling out a niche cyber specials programme is essential if the UK is to maintain its ability to fight crime.

This year, the Government successfully launched the Cyber Essentials Campaign⁹¹, aimed at improving cyber security amongst the UK's SME community. Helping UK businesses to secure themselves against cyber crimes is key to maintaining confidence in the online economy and halting the flow of billions of pounds which are stolen from them every year. To encourage the uptake of this scheme government should consider introducing additional incentives to adoption, such as tax breaks for businesses. This would not only secure smaller businesses but, through them, increase security of the supply chain to larger companies which is increasingly becoming their Achilles heel.

The current government has set out a strong cyber security strategy that the next government should build upon.

Alongside financial incentives the government should look at options for establishing a Small Business Cyber Crime Help Centre, based on the Cyber Essentials Scheme. This would need to have an online presence with a website offering advice on best practice, a Q&A forum, a self-service diagnostic tool for companies to assess their current level of cyber security and a list of suppliers which SMEs could locate in their area to provide cyber security products and services including system audits. This would help SMEs to proactively put the Cyber Essentials scheme into practice but would also provide them with an important source of advice and remedy if their systems are breached. techUK has found that many small businesses are often unaware of where their vulnerabilities lie and have no idea about what to do in the event that they are successfully attacked. Such a resource would therefore help to increase the resilience of the UK's SME community.

RECOMMENDATION 22

Strengthen democratic oversight of data retention and surveillance activity to re-build trust

Recent revelations on surveillance issues and the emergency measures that were used to enact the Data Retention and Investigatory Powers Act (DRIPA) have weakened public confidence in the democratic process which underpins the relationship between the technology industry and government on these issues. The technology industry has important legal obligations to work with government to help to keep the UK safe and secure. However there must be full public confidence that these obligations are based on a clear legal framework and that there is full parliamentary scrutiny of the way in which government uses these powers.

The next government needs to make a clear and visible correction to show that the security services and companies required by law to work with them operate within clear and strict legal boundaries in order to ensure public trust and confidence in digital services. We welcome the Independent Anderson Review on Terrorism Legislation⁹² and the RUSI Surveillance Review⁹³ which are important steps to ensuring an informed and detailed debate on achieving the right balance between security and privacy in a 21st century democracy.

RECOMMENDATION 23

Work with parents and educators to empower children to act safely in the online world

The online world offers huge opportunities for children and young people to learn, create, communicate and have fun. However, the online world is not without risk and UK industry has a long track record of working with government and educators to put measures in place to help parents and children navigate the online world safely and with confidence. We believe that any Child Online Safety strategy must have education at its core, and the school curriculum has an important role to play. Legal content should be self-regulated by optional filters which are controlled by parents and guardians.

There are no grounds for complacency when it comes to empowering and protecting children.

There are no grounds for complacency when it comes to empowering and protecting children. However the success of initiatives facilitated by UK Government and a number of NGOs, such as the Internet Watch Foundation, demonstrate how industry can work effectively with government and law enforcement agencies to address some of the most challenging issues, such as removal of illegal child abuse images online and the subsequent identification and successful prosecution of perpetrators.

Given the global nature of many of the online services that children use, the government should focus on supporting and adopting international solutions being developed by industry rather than seeking bespoke national level solutions.

RECOMMENDATION 24

Deliver on ‘digital for everyone’ by fully funding a comprehensive digital inclusion strategy

By 2020 everyone will need basic digital skills to participate in normal daily life as a digital citizen, whether it is to communicate, find information or purchase goods and services. Yet according to current predictions 10% of UK adults will still not have those basic skills in 2020. Digital exclusion will be a major inhibitor to completing the digitalisation of public services, costing the public sector many billions, whilst restricting opportunity for some of the most vulnerable members of society. The promise of digital Government won't be achieved unless the most excluded in society, who are often the most complex and demanding customers of Government services, are able to access digital services. The economic benefits of a properly realised digital inclusion strategy, building upon the work of organisations such as Go ON UK and others, will far exceed any associated costs: a 2014 report by the Tinder Foundation has estimated that a national commitment to ensure basic online skills for everyone by 2020 would cost some £875m⁹⁴.

Successive digital inclusion strategies have failed to address this problem comprehensively and have relied too heavily on overstretched third sector and private sector resource. In a rapidly digitising world this problem can no longer be considered peripheral, or wished away by underfunded strategies. Government will be the biggest beneficiary of an effective digital inclusion strategy, as it will enable it to fully digitalise the delivery of public services. The next government should therefore implement a comprehensive and properly funded digital inclusion strategy and provide ‘assisted digital’ support to those in society who will not be able to access digital public services without support⁹⁵.

The promise of digital Government won't be achieved unless the most excluded in society are able to access digital services.

Conclusion

The UK has an opportunity not just to be a global digital leader, but to put digital leadership at the heart of its strategy for economic growth and social change, and to use digital technologies to address the fundamental long-term social and economic challenges that will determine our future.

This manifesto sets out a series of headline objectives, practical recommendations and specific actions that the next government could take to ensure that by 2020 the UK is securely on course towards long-term debt reduction, increased productivity growth, high value job creation and an inclusive society. We urge the main UK political parties to consider these ideas closely as they produce their own political manifestos for the electorate in the run up to the May 2015 General Election.

Whilst these recommendations are necessarily focused on the things that government can do, government cannot achieve these outcomes alone. Many of these recommendations are about creating a framework in which the private sector can work in collaboration with government to meet joint objectives.

Digital technology connects everything – which means that an integrated approach to digital innovation encompassing both central and local government, and both suppliers and users of technology across the private sector will be fundamental to success.

The UK technology industry is ready to work with the next government, as both an innovative supplier supporting and enabling public sector transformation and as a partner in addressing a broad and challenging policy agenda.

Working together we can secure our digital future.

Summary of recommendations

What Objectives	How Recommendations	Who Lead Departments	Why The economic and social impact by 2020			
			Address the long-term debt challenge	Increase productivity	Support new job creation by high-growth sectors and firms	Include and empower all
1 Strategy and leadership to deliver success 2 Secure the UK's position as a global leader in the production and use of tech	1 Develop a single strategy and provide strong leadership to mobilise and coordinate delivery across the public and private sector <ul style="list-style-type: none"> Ensure Cabinet-Level leadership for Digital to develop and execute the single strategy for the digital economy, digital government and digital inclusion Build on the Information Economy Council as the channel for ensuring strong industry support and industrial strategy capability Champion the UK's reputation as a leading innovator in tech and support the full tech ecosystem across the whole of the UK 	No.10, HMT & CO	✓	✓	✓	✓
	2 Ensure a stable long-term funding base for science and innovation <ul style="list-style-type: none"> Increase innovation spend in real terms and ringfence science budgets Set budgets over 10 year cycles to allow benefits to accrue and deepen Double funding for Small Business Research Initiative (SBRI) by 2020 Maintain R&D tax credits to deepen industry-led research Reverse the decline in UK students undertaking STEM Masters courses 	BIS		✓	✓	
	3 Address immediate skills shortages and build the tech talent pipeline for tomorrow <ul style="list-style-type: none"> Inspire and educate tomorrow's digital workforce Make the UK a global hub for talent by implementing a 'smart migration policy' 	HO, DfE & BIS		✓	✓	✓
	4 Ensure a ubiquitous world class communications infrastructure today and tomorrow <ul style="list-style-type: none"> Fill remaining gaps in coverage to meet existing targets Work with industry to develop a long-term Digital Communications Infrastructure Strategy Ensure continued innovation in broadcast platforms 	DCMS & BIS		✓	✓	
	5 Initiate a major programme to push the boundaries on the development and use of the Internet of Things (IoT)	BIS		✓	✓	
	6 Make the UK the best location to start and scale up a high growth tech business <ul style="list-style-type: none"> Continue policies that have succeeded in creating successful environment for start-ups Implement recommendations of The Scale-Up Report led by Sherry Coutu CBE (launching November 2014) 	No.10, HMT & BIS		✓	✓	
	7 Support the development of tech clusters across the UK <ul style="list-style-type: none"> Strengthen local needs and strengthen underlying infrastructure that supports firms, talent and skills Replicate the US cluster mapping exercise in the UK 	BIS & LEPs	✓	✓	✓	

Summary of recommendations continued

What Objectives	How Recommendations	Who Lead Departments	Why The economic and social impact by 2020			
			Address the long-term debt challenge	Increase productivity	Support new job creation by high-growth sectors and firms	Include and empower all
	8 Lead the development of a European digital single market and international trade agreements that support innovation and growth	BIS, FCO & No.10	✓		✓	
	9. Double UK tech exports by 2020 • Appoint a Digital Trade Czar	BIS & UKTI	✓	✓	✓	
	10 Harness digital technology to modernise the energy sector	BIS & DECC		✓		✓
	11 Support a digital modernisation strategy for financial services	BIS & HMT		✓	✓	
3 Harness the transformational power of tech across the public sector	12 Work with technology suppliers to bring a greater scale and pace to the digital transformation of government • Clearly communicate the purpose of transformation • Complete the digitalisation of major government transactions • Promote end-to-end service transformation and platform-based models • Focus on organisational culture, skills and process change • Embrace the innovative potential of the full supplier ecosystem • Use off-the-shelf solutions within an open architecture where appropriate	CO with all departments	✓	✓	✓	
	13 Leverage data analytics across government based on an ethical approach to data sharing that ensures privacy • Establish an Advanced Data Analytics Unit • Establish an independent Data Ethics Committee • Appoint a Chief Privacy Officer for Government	CO with all departments	✓		✓	✓
	14 Create a single criminal justice and emergency services technology strategy	HO	✓	✓		
	15 Address barriers to digital innovation in health and social care • Set out bold challenges to open up health and social care to innovation • Create a central platform to showcase new innovative solutions	DH	✓	✓		
	16 Up-skill Local Government to capitalise on digital by default and deliver on the vision of smart cities • Learn from digitalisation of central government • Create a central hub to provide practical support and expertise • Build local collaborate necessary to deliver on smart cities	CLG & CO	✓			✓
	17 Maintain C4ISR as a sovereign defence capability	MoD	✓		✓	

Summary of recommendations continued

What Objectives	How Recommendations	Who Lead Departments	Why The economic and social impact by 2020			
			Address the long-term debt challenge	Increase productivity	Support new job creation by high-growth sectors and firms	Include and empower all
4 Ensure our digital world is safe and inclusive for all	18 Double participation of SMEs in the online economy	BIS		✓	✓	✓
	19 Work with business to make the UK a world-leading trusted domain for data protection <ul style="list-style-type: none"> Embed the principle of 'digital-trust-by-default' across the public and private sector 	FCO & BIS	✓	✓	✓	✓
	20 Protect free speech <ul style="list-style-type: none"> UK must continue to globally champion the World Wide Web as an open public space where freedom of speech is protected 	MoJ				✓
	21 Enhance cyber security and the prevention of cyber crime	MoJ, BIS & CO	✓		✓	✓
	22 Strengthen democratic oversight of data retention and surveillance activity to re-build trust	MoJ				✓
	23 Work with parents and educators to empower children to act safely in the online world	DfE, HO & DCMS			✓	✓
	24 Deliver on 'digital for everyone' by fully funding a comprehensive digital inclusion strategy	Ministerial Digital Taskforce	✓	✓	✓	✓

Legend

BIS	Department for Business, Innovation & Skills	DH	Department of Health
CLG	Department for Communities & Local Government	HMT	Her Majesty's Treasury
CO	Cabinet Office	HO	Home Office
DCMS	Department for Culture, Media & Sport	LEPs	Local Enterprise Partnerships
DfE	Department for Education	MoD	Ministry of Defence
FCO	Foreign Office	MoJ	Ministry of Justice
		No.10	Prime Minister's Office
		UKTI	UK Trade & Investment

References

- 1 Opening Governance. Sir Tim Berners-Lee. Retrieved from <http://www.opening-governance.org/sir-tim-berners-lee>
- 2 Comres (June 2014). Innovation Population Summary Report. Retrieved from http://www.nesta.org.uk/sites/default/files/innovation_population_summary.pdf
- 3 IMF. (July 2014). World Economic Outlook Update. Retrieved from <http://www.imf.org/external/pubs/ft/weo/2014/update/02/pdf/0714.pdf>
- 4 The Guardian (May 2014). Labour 'cannot afford to undo coalition spending cuts in next government'. Retrieved from <http://www.theguardian.com/politics/2014/may/29/labour-cannot-afford-undo-coalition-spending-cuts>
- 5 Labour Party (December 2013). Labour launches Zero-Based Review of public spending. Retrieved from <http://press.labour.org.uk/post/70480621642/labour-launches-zero-based-review-of-public-spending>
- 6 OBR (July 2014). Fiscal Sustainability Report. Retrieved from <http://cdn.budgetresponsibility.org.uk/41298-OBR-accessible.pdf>
- 7 The OBR estimates that the combination of planned government spending cuts, and economic growth, will reduce public sector spending from its 2013/14 figure of 40.5% of total gross domestic product to 34.3% by 2018/19. However, spending, as a proportion of GDP, is then forecast to rise by 39.1% by 2063/64 if current entitlements on health, pensions and social care are maintained. As a result, public sector debt is projected to rise from around 75.1% of economic output in 2012/13 to 84% by the end of the forecast period.
- 8 The Times (July 2012). Treasury warned of 'financial time-bomb'. Retrieved from <http://www.thetimes.co.uk/tto/business/economics/article3473389.ece>
- 9 Paul Krugman (1997). The Age of Diminished Expectations, p.11. Retrieved from <http://books.google.co.uk/books?id=awA0yp1V8c8C&q=productivity+isn%27t+everything#v=snippet&q=productivity%20isn%27t+everything&f=false>
- 10 Financial Times (June 2014). Money Supply. Retrieved from <http://blogs.ft.com/money-supply/2014/06/16/uk-productivity-puzzle-the-bank-of-englands-answers/>
- 11 techUK (2012) The Bootstrap Recovery - winning the global race for competitiveness. Retrieved from <http://www.techuk.org/insights/reports/item/247-the-bootstrap-recovery-winning-the-global-race-for-competitiveness>
- 12 ONS (September 2010). Multi-factor Productivity - Indicative Estimates, 2010. Retrieved from http://www.ons.gov.uk/ons/dcp171766_278729.pdf
- 13 Bank of England (June 2014). The UK Productivity Puzzle. Retrieved from <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q201.pdf>
- 14 The Conference Board (May 2014). Productivity and Digitalisation in Europe: Paving the Road to Faster Growth. Retrieved from <http://www.conference-board.org/publications/publicationdetail.cfm?publicationid=2786>
- 15 Intellect (February 2012). The Bootstrap Recovery. Retrieved from <http://www.intellectuk.org/publications/intellect-reports/7873>
- 16 KPMG (January 2014). Tech Monitor UK. Retrieved from http://www.kpmg.com/UK/en/IssuesAndInsights/ArticlesPublications/Documents/PDF/Market%20Sector/Technology/kpmg_markit_tech_monitor_jan_14.pdf
- 17 KPMG (2013). TechMonitor UK: Understanding tech clusters and tracking the UK tech sector's outlook for employment and growth. Retrieved from <http://www.kpmg.com/UK/en/IssuesAndInsights/ArticlesPublications/Documents/PDF/Market%20Sector/Technology/tech-monitor-uk.pdf>
- 18 The Guardian (August 2014). Unknown startups can now compete head-to-head with their biggest rivals. Retrieved from http://www.theguardian.com/media-network/media-network-blog/2014/aug/14/startups-micro-enterprises-technology-digital-revolution?CMP=twf_gu
- 19 Between 2009 and 2012 the number of digital companies in London increased 76% growing from 49,969 to 88,215. Government. Tech City celebrates third anniversary as new figures show economic success story. Retrieved from <https://www.gov.uk/government/news/tech-city-celebrates-third-anniversary-as-new-figures-show-economic-success-story>
- 20 Future Fifty (Accessed in August 2014). The Future Fifty Website. Retrieved from <http://www.futurefifty.com/index.html>
- 21 Nesta (March 2013). Exploring the incidence and spatial distribution of high growth firms in the UK and their contribution to job creation. Retrieved from http://www.nesta.org.uk/sites/default/files/exploring_the_incidence_and_spatial_distribution_of_high_growth_firms_in_the_uk_and_their_contribution_to_job_creation.pdf
- 22 Nesta (June 2014). Speaking to the Innovation Population. Retrieved from http://www.nesta.org.uk/sites/default/files/speaking_to_the_innovation_population.pdf
- 23 Pew. (February 2014). The Web at 25 in the US. Retrieved from http://www.pewinternet.org/files/2014/02/PIP_25th-anniversary-of-the-Web_0227141.pdf
- 24 The Economist (2013). Privacy Uncovered: Can Private Life Exist in the Digital Age. Retrieved from http://www.economistinsights.com/sites/default/files/legacy/mgthink/downloads/Privacy%20uncovered_0.pdf
- 25 Boston Consulting Group. (January 2012). The Internet Economy in the G-20. Retrieved from <https://www.bcg.com/documents/file100409.pdf>
- 26 QS. World University Rankings 2013. Retrieved from http://www.topuniversities.com/university-rankings/world-university-rankings/2013#_U_Ma5GdwZzM
- 27 See Spin-Outs UK <http://www.spinoutsuk.co.uk/>; also The Telegraph (2014) 'Top 50 University spin-out companies' retrieved from <http://www.telegraph.co.uk/finance/your-business/6867210/Top-50-University-spin-out-companies.html>
- 28 HEFCE (2014) 'UK universities lead the world in research'. Retrieved from <http://www.hefce.ac.uk/news/newsarchive/2014/news87377.html>
- 29 Silicon Valley Bank (2014) Innovation Economy Outlook 2014. Retrieved from http://www.svb.com/pdfs/ieo/SVB_IEO_UK_Report_2014.pdf
- 30 Forbes (August 2014). The World's Most Influential Cities. Retrieved from <http://www.forbes.com/sites/joelkotkin/2014/08/14/the-most-influential-cities-in-the-world/>
- 31 Comres (June 2014). Innovation Population Summary Report. Retrieved from http://www.nesta.org.uk/sites/default/files/innovation_population_summary.pdf
- 32 'techUK welcomes Budget building blocks' 19 March 2014. Retrieved from <http://www.techuk.org/insights/news/item/1197-techuk-welcomes-budget-building-blocks>
- 33 HSBC Global Connections (2014) Global Trade Forecast Report. Retrieved from <https://globalconnections.hsbc.com/>

- united-kingdom/en/tools-data/trade-forecasts/global
- 34 Financial Times (April 2014). No tech please - we're British. Retrieved from <http://www.ft.com/cms/s/0/7b7b366e-c4a6-11e3-b2fb-001444feabdc0.html#axzz3CFTL70Wq>
 - 35 Plum Consulting (September 2013). The European App Economy: Creating Jobs and Driving Growth. Retrieved from http://www.plumconsulting.co.uk/pdfs/Plum_Sep2013_The_European_App_Economy.pdf
 - 36 Whilst levels of internet literacy are lowest in the 65+ bracket, where 52% of people do not have basic online skills, small yet significant proportions of younger age-groups face the same problem, with 12% of 45-54 year-olds and even 7% of 15-24 year-olds lacking them. People in lower socio-economic groups are not only more likely to have worse online skills but the gap between them and those better off is widening; from September 2013 to March 2014 the proportion of individuals in classes C2, D and E rose from 68% to 72%. BBC (September 2013 and March 2014). Media Literacy: Understanding Digital Capabilities follow-up. Retrieved from http://www.bbc.co.uk/learning/overview/assets/digital_capabilities_2014.pdf
 - 37 IDC. (February 2014). Worldwide Internet of Things Spending by Vertical Market 2014-2017 Forecast. Retrieved from <http://www.idc.com/getdoc.jsp?containerId=prUS24671614>
 - 38 Idtechex. (2014). Wearable Technology 2014-2024: Technologies, Markets, Forecasts. Retrieved from <http://www.idtechex.com/research/reports/wearable-technology-2014-2024-technologies-markets-forecasts-000379.asp>
 - 39 IDC. (December 2013). New IDC Worldwide Big Data Technology and Services Forecast Shows Market Expected to Grow to \$32.4 Billion in 2017. Retrieved from <http://www.idc.com/getdoc.jsp?containerId=prUS24542113>
 - 40 Sanderson, R., IHS. (February 2014). Wireless Power Report - 2014. Retrieved from <https://technology.ihs.com/438315/wireless-power-2014>
 - 41 Companies and Markets. (February 2013). Robotics: Technologies and Global Markets. Retrieved from <http://www.companiesandmarkets.com/Market/Information-Technology/Market-Research/Robotics-Technologies-and-Global-Markets/RPT1138974>
 - 42 Strategy& (August 2013). Market potential of passenger cars projected to quadruple by 2020. Retrieved from http://www.strategyand.pwc.com/uk/home/press_contacts/display/connected-car-uk
 - 43 Marketsandmarkets. (February 2013). Building Automation & Controls Market (2013 - 2018): By Product (Lighting, Security & Access, HVAC, Entertainment, Outdoor, Elevator Controls, Building Management Systems (BMS)), Application & Geography (Americas, Europe, APAC, And ROW). Retrieved from <http://www.marketsandmarkets.com/Market-Reports/building-automation-control-systems-market-408.html>
 - 44 NIESR and Growth Intelligence (2013) Measuring the UK's Digital Economy with Big Data. Retrieved from http://niesr.ac.uk/sites/default/files/publications/SI024_GI_NIESR_Google_Report12.pdf
 - 45 Department for Business, Innovation and Skills (January 2014). Insights from international benchmarking of the UK science and innovation system. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/277090/bis-14-544-insights-from-international-benchmarking-of-the-UK-science-and-innovation-system-bis-analysis-paper-03.pdf
 - 46 Department of Business, Innovation and Skills (May 2014) Science and Research budget allocations for financial year 2015/16. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/278326/bis-14-p200-science-and-research-budget-allocations-for-2015-to-2016.pdf
 - 47 The Times (January 2013). Eight per cent drop in UK students entering postgraduate study. Retrieved from <http://www.timeshighereducation.co.uk/422358.article>
 - 48 techUK (July 2014). UK must become hub for global talent, says techUK. Retrieved from <http://www.techuk.org/insights/news/item/1945-uk-must-become-hub-for-global-talent-says-techuk>
 - 49 European Commission (2014) Does digital technology create or kill jobs?
 - 50 Eddie Copeland and Cameron Scott, Policy Exchange. (August 2014). Silicon Cities; Supporting the development of tech clusters outside London and the South East of England. Retrieved from <http://www.policyexchange.org.uk/images/publications/silicon%20cities.pdf>
 - 51 Baroness Martha Lane-Fox (January 2014) Maiden speech in the House of Lords. Retrieved from <http://marthalanefox-blog.wordpress.com/2014/01/16/25th-anniversary-of-the-world-wide-web/>
 - 52 Washington Post (19 June 2014) 'No, really. How do we get girls to code?'. Retrieved from <http://www.washingtonpost.com/blogs/the-switch/wp/2014/06/19/no-really-how-do-we-get-girls-to-code/>
 - 53 <http://www.codeclub.org.uk/>
 - 54 Centre for Entrepreneurs (2014) 'Migrants behind one in seven UK companies' <http://www.centreforentrepreneurs.org/Media/Default/Campaigns/Migrant%20Entrepreneurs/Release%204-13-14%20Migrant%20Entrepreneurs.pdf>
 - 55 Ofcom (March 2014). The European Broadband Scorecard. Retrieved from http://stakeholders.ofcom.org.uk/binaries/research/broadband-research/scorecard/European_Broadband_Scorecard_2014.pdf
 - 56 The European Broadband Scorecard. Retrieved from http://stakeholders.ofcom.org.uk/binaries/research/broadband-research/scorecard/European_Broadband_Scorecard_2014.pdf
 - 57 FT (June 2014). 'Powerhouse' UK leads Europe app development, says research. Retrieved from <http://www.ft.com/cms/s/0/d0562d5a-fc6f-11e3-86dc-001444feab7de.html#axzz3CttiXWps>
 - 58 Government (Accessed August 2014). Digital Communications Infrastructure Strategy consultation. Retrieved from <https://www.gov.uk/government/consultations/digital-communications-infrastructure-strategy-consultation>
 - 59 <http://www.surrey.ac.uk/5gic/>
 - 60 <http://www.techuk.org/about/uk-spectrum-policy-forum>
 - 61 IDTechEx (May 2014). Internet of Things (IoT): Business Opportunities 2015-2025. Retrieved from <http://www.idtechex.com/research/reports/internet-of-things-iot-business-opportunities-2015-2025-000386.asp>
 - 62 FT (October 2013). UK business start-ups set to pass record-breaking 500,000 mark. Retrieved from <http://www.ft.com/cms/s/0/e90c1042-2e6d-11e3-be22-001444feab7de.html#axzz3CttiXWps>. Enterprise Nation (January 2013). 2012: Another record-breaking year for UK start-ups. Retrieved from <https://www.enterprisenation.com/blog/2012-another-record-breaking-year-for-uk-start-ups/>. Real Business (December 2011). 2011: A Record Year for business start-ups. Retrieved from <http://realbusiness.co.uk/article/9036-2011-a-record-year-for-business-startups>

- 63** Centre for Cities & McKinsey & Company (2014) Industrial Revolutions. Retrieved from <http://www.centreforcities.org/research/2014/07/02/industrial-revolutions/>
- 64** Cluster Mapping (accessed August 2014). The Cluster Mapping Website. Retrieved from <http://www.clustermapping.us>
- 65** Office of National Statistics. (August 2014). UK Trade, June 2014. Retrieved from <http://www.ons.gov.uk/ons/rel/uk-trade/uk-trade/june-2014/index.html>
- 66** OC&C (2014). The Global Retail E-Empire; The Internationalisation of E-Commerce
- 67** UK Government (2014) Government response to House of Lords European Union Committee's Fourteenth Report: The Transatlantic Trade and Investment Partnership. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329716/42014-Cm-8907-Transatlantic-trade-and-investment-partnership.pdf
- 68** 'techUK welcomes Budget building blocks' 19 March 2014. Retrieved from <http://www.techuk.org/insights/news/item/1197-techuk-welcomes-budget-building-blocks>
- 69** Calculating the extent of total relevant exports is challenging since enabling technologies spans each and every industrial and consumer sector. This figure is based on Office of National Statistics figures comprising of Telecommunications and Communication equipment, Computer and Information Services, Electronic components and systems, Computers, Software and peripherals, Consumer Electronics, and electrical equipment.
- 70** Comres (June 2014). Innovation Population Summary Report. Retrieved from http://www.nesta.org.uk/sites/default/files/innovation_population_summary.pdf
- 71** Smart Grid GB (2012). Smart Grid: a race worth winning?. Retrieved from <http://www.smartgridgb.org/component/k2/item/3-smartgrid-gb-release-report-on-the-economic-benefits-of-smart-grid.html>
- 72** SmartGrid GB (November 2013). Demand Side Response and the Capacity Market in Focus. Retrieved from <http://www.smartgridgb.org/policy-regulation/item/293-sggb-releases-new-report-on-capacity-market-and-dsr.html>
- 73** techUK (2014) Towards a 'New Financial Services'. Retrieved from <https://www.techuk.org/insights/reports/item/884-towards-a-new-financial-services>
- 74** World Economic Forum (2014). The Global Information Technology Report 2014: Rewards and Risks of Big Data. Retrieved from http://www3.weforum.org/docs/WEF_GlobalInformationTechnology_Report_2014.pdf
- 75** Ofcom (December 2010). UK Consumers Revealed as Early Adopters of New Technologies. Retrieved from <http://media.ofcom.org.uk/news/2010/uk-consumers-revealed-as-early-adopters-of-new-technologies/>
- 76** Policy Exchange (September 2014). Technology Manifesto. Retrieved from <http://www.policyexchange.org.uk/images/publications/technology%20manifesto.pdf>
- 77** Government Digital Service (August 2014). Introducing the Digital and Technology fast stream. Retrieved from <https://governmenttechnology.blog.gov.uk/2014/08/19/introducing-the-digital-and-technology-fast-stream/>
- 78** McKinsey (October 2013). Open data: Unlocking innovation and performance with liquid information. Retrieved from http://www.mckinsey.com/-/media/McKinsey/dotcom/Insights/Business%20Technology/Open%20data%20Unlocking%20innovation%20and%20performance%20with%20liquid%20information/MGI_Open_data_FullReport_Oct2013.ashx.
- 79** Comres (June 2014). Innovation Population Summary Report. Retrieved from http://www.nesta.org.uk/sites/default/files/innovation_population_summary.pdf
- 80** techUK (March 2014). Digitising the NHS by 2018 - One Year On. Retrieved from <https://www.techuk.org/insights/news/item/1179-acceleration-of-progress-is-needed-paperless-nhs-by-2018>
- 81** Department for Communities and Local Government (May 2013). Local Government Financial Statistics England. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/203942/29699_DCLG_WEB_version.pdf
- 82** Department of Business, Innovation and Skills (October 2013). Global Innovators: International Case Studies on Smart Cities Smart Cities. Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249397/bis-13-1216-global-innovators-international-smart-cities.pdf
- 83** ONS (September 2010). Multi-factor Productivity - Indicative Estimates, 2010. Retrieved from http://www.ons.gov.uk/ons/dcp171766_278729.pdf
- 84** Bank of England (June 2014). The UK Productivity Puzzle. Retrieved from <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q201.pdf>
- 85** Booz & Co and Go ON UK (November 2012) The Case for Universal Digitisation. Retrieved from http://www.go-on.co.uk/files/2113/5237/0908/The_Booz_Report_Nov2012.pdf
- 86** Federation of Small Businesses and Intellect (now techUK) (2013) The Digital Imperative retrieved from <http://www.fsb.org.uk/frontpage/assets/fsb-intellect-april13.pdf>. See also Lloyds Banking Group (2013) Britain's Digital Opportunity. Retrieved from <http://businesshelp.lloydstsbbusiness.com/news/helping-your-business-click/>.
- 87** Booz & Co and Go ON UK (November 2012) The Case for Universal Digitisation. Retrieved from http://www.go-on.co.uk/files/2113/5237/0908/The_Booz_Report_Nov2012.pdf
- 88** Lloyds Banking Group (2013) Britain's Digital Opportunity. Retrieved from <http://businesshelp.lloydstsbbusiness.com/assets/pdf/Britains-Digital-Opportunity.pdf>
- 89** Booz & Co and Go ON UK (November 2012) The Case for Universal Digitisation. Retrieved from http://www.go-on.co.uk/files/2113/5237/0908/The_Booz_Report_Nov2012.pdf
- 90** The Conference Board (May 2014). Productivity and Digitalisation in Europe: Paving the Road to Faster Growth. Retrieved from <http://www.conference-board.org/publications/publicationdetail.cfm?publicationid=2786>
- 91** Department of Business, Innovation and Skills, and David Willetts (June 2014). New scheme to help businesses defend against cyber threats goes live. Retrieved from <https://www.gov.uk/government/news/new-scheme-to-help-businesses-defend-against-cyber-threats-goes-live--2>
- 92** <https://terrorismlegislationreviewer.independent.gov.uk/>
- 93** <https://www.rusi.org/news/ref:N5315B2C9B1941/#.VANv2ktOzIU>
- 94** Tinder Foundation (February 2014). Putting a price on a digitally included Britain. Retrieved from <http://www.tinderfoundation.org/our-thinking/news/putting-price-digitaly-included-britain#sthash.Nr42OrcV.dpuf>
- 95** Booz & Co (November 2012). "This Is for Everyone": The Case for Universal Digitisation. Retrieved from http://www.strategyand.pwc.com/media/uploads/Strategyand_ThisIsforEveryone.pdf

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About the authors

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