techUK
FOR WHAT COMES NEXT

Budget and Comprehensive Spending Review 2021

techUK's representation to Her Majesty's Treasury for the UK Government's October 2021 Budget and Comprehensive Spending Review

September 2021

Contents

Removing the barriers to tech led growth

The COVID-19 pandemic has been one of the greatest tests the UK's economy and society has ever faced. It was not only a health crisis but an economic and social crisis which impacted everyone in the country, fundamentally changing their lives for over a year.

The adaptability and creativity of the British people has been central to how our society and economy weathered the lockdowns and has put the country in a better place to begin to rebuild after the crisis. At the core of the British people's COVID-19 response was the way individuals, businesses, and Government utilised technology to create new ways of working, connecting and shopping.

Technologies such as Zoom, Cisco's Webex, Microsoft Teams, and Google Meet saw huge uptake and helped families and businesses remain connected. Engineers and developers helped keep our internet infrastructure running, built new solutions to manage supply chains, and created new digital public services to mitigate the social and health impacts of COVID-19. Simultaneously, the cyber security industry worked to underpin and secure the enormous shift to remote working and the increase in online activity for business and society alike.

Almost two years on from the first lockdown this accelerated adoption of technology, is no longer a knee jerk response to the pandemic, with tech and digital led growth models being placed as central to the growth strategies of companies across the economy.

This is a shift based on experience and success. Larger businesses and those operating in sectors which were more able to conduct their work via digital channels performed better, with those businesses less likely to have ceased trading or to have put staff on furlough.[1] The most technologically savvy companies, did not just survive, but thrive, able to grow around eight times faster than their peers.[2]

The aim to achieve tech led growth is here to stay, Deloitte's last CFO survey shows that over the next three years businesses will be focusing on investment on digital technology and assets to deliver the gains in productivity and business performance that they want to achieve after the pandemic.[3]

However, despite this fast growth there remain a number of barriers to business taking advantage of tech led growth and reaping the benefits. techUK members have flagged **regulation, skills, infrastructure** and support for **innovation** as roadblocks to companies being able to turbocharge their growth opportunities with tech led strategies.

Delivering and accelerating tech led growth is key to the UK's economic recovery and future prosperity. The GVA contribution of workers in roles that heavily use digital technology is twice that of non-digital workers[4], while before the crisis the digital sector was growing six times faster than the wider economy rapidly expanding the benefits of digitisation.

In our submission to the 2021 Budget, we and our members set out the steps that need to be taken to remove the barriers to tech-led growth helping UK businesses position their business models to success in the post-pandemic global economy.
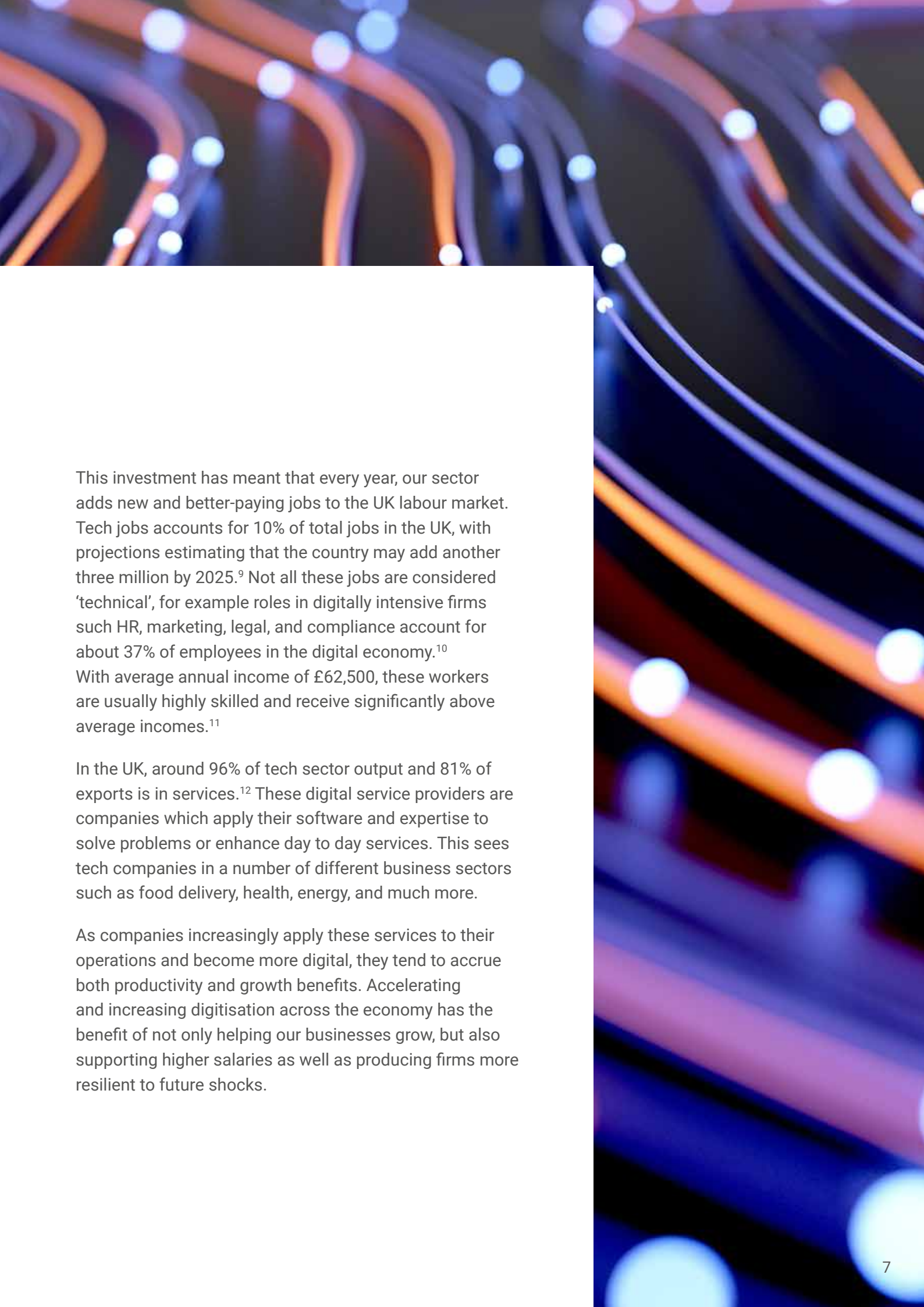
The basis for tech-led growth: the added value of digital to the wider economy

The tech sector is a diverse and expanding sector of the UK economy, with companies ranging from start-ups with as few as two or three employees to huge product manufacturers and service providers with complex supply chains. They are all, however, unified by the fact that the technology that they sell, whether hardware or software, is the unique selling point of their business.

The value that this this sector adds to the wider economy is increasing every year. The tech sector contributed £150.6bn to the UK GVA in 2019, accounting for 7.6% of UK GVA.[5] The rate of this contribution has steadily increased over time, averaging 7% per year since 2016, and growing six times faster than the wider national economy in 2019, outpacing both the US and China to lead global growth.[6] And with estimates showing that the GVA contribution per digital workers is twice that of non-digital workers.[7]

Tech companies are also core to the UK's high growth companies, even in the face of the pandemic. Start-ups and scale-ups raised £13.5bn during the first half of 2021, almost three times what was invested in the first six months of 2020. This investment helped creating 20 new tech 'unicorns' in the process. Which means that the UK is almost creating a $1bn "unicorn" a week. As a result, now the UK is the house of 105 tech unicorns (more than France and Germany combined),153 'futurecorns' (companies with strong growth potential to became unicorns) and 12 'decacorns' (businesses worth more than $10 billion).[8]

This investment has meant that every year, our sector adds new and better-paying jobs to the UK labour market. Tech jobs accounts for 10% of total jobs in the UK, with projections estimating that the country may add another three million by 2025.[9] Not all these jobs are considered 'technical', for example roles in digitally intensive firms such HR, marketing, legal, and compliance account for about 37% of employees in the digital economy.[10] With average annual income of £62,500, these workers are usually highly skilled and receive significantly above average incomes.[11]

In the UK, around 96% of tech sector output and 81% of exports is in services.[12] These digital service providers are companies which apply their software and expertise to solve problems or enhance day to day services. This sees tech companies in a number of different business sectors such as food delivery, health, energy, and much more.

As companies increasingly apply these services to their operations and become more digital, they tend to accrue both productivity and growth benefits. Accelerating and increasing digitisation across the economy has the benefit of not only helping our businesses grow, but also supporting higher salaries as well as producing firms more resilient to future shocks.

Executive summary: The steps to achieving tech led growth

The Treasury has a unique role through the 2021 Spending Review and Budget to lay the basis to support businesses to pursue growth and transformation strategies based on the greater use of digital services and advanced technologies. Supporting tech led growth will enable a step change in productivity and our way of doing business. Providing the support for this will not be done in one fiscal statement, but the first multi-year spending review since 2015 and the first budget since the end of the UK's lockdowns provides a unique opportunity to seize the initiative.

techUK and our members therefore provide the following suggestions for,

1. putting in place a regulatory framework that drives tech led growth,

2. delivering the right digital skills for businesses and people,

3. building a world-class digital infrastructure suitable for the challenges of the future and

4. ensuring the competitiveness of the UK innovation ecosystem.

Across each of these areas we set out actions that can be taken in the budget and the spending review and where each of these options can contribute to the growth pillars and opportunities in the Government's plan for growth.

1. Putting in place a regulatory framework that drives tech led growth (pages 13-21)

What do we need?	How can we achieve it?
A Working Group on Competition and Investment	In the Budget HM Treasury should create a Working Group on Competition and Investment to monitor the overall impact of recent competition and investment screening policy changes. Made up of industry representatives and businesses the group could support engagement so that the Government can receive the best information possible for future policy decisions as well as real time information as new policies and regimes are implemented.
Creation of an Autonomous Systems Taskforce	In the Budget the Government should announce an Autonomous systems working group with the aim of streamlining the certifications process for autonomous systems across sectors and regulators. This taskforce should aim to unlock private investment by supporting new testbeds for autonomous systems technology.
Deliver a future of work council	The Budget should provide an opportunity for the Government to announce a future of work council, bringing together businesses, business groups and trade bodies as well as local and combined authorities on the shifts in working patterns and how we can support workers newfound flexibility to increase productivity, creativity and drive the economic recovery across the UK.
Continue the expansion of Sandboxes and Scaleboxes	In the Budget the Government should announce its intention to continue to grow the use of sandboxing to other sectors with a focus on using sandboxes and testbed schemes such as the Living Lab approach to drive innovation across multiple sectors. The Spending Review should allocate money to help Departments and regulators deliver this.
Provide support to research for online fraud mitigation	techUK would like to see the Budget provide funding for further research into the end-to-end journey of different fraud typologies, including how fraud and fraudulent activity intersects different sectors at different stages. This will help support responses from the OFSG to disrupt this activity and in turn will help achieve our common goal of making the UK the least attractive place for fraudsters to operate.
Invest in the Government's Digital ID and Attributes Trust Framework	In the spending review the Government should ensure that DCMS receives sufficient funding to continue the work of Digital ID and Attributes Trust Framework to ensure that Government can establish an effective regulatory landscape that can unlock significant private investment in a UK market for digital ID's.
Undertaking an audit of digital maturity in the adult social care landscape	To support the digital transformation of the social care sector the Budget should include a commitment to undertake an audit of the sector in order to make clear who is responsible for the digital transformation of the social care system. This will be vital to producing a strategy to digitise the sector with the aim supporting the Government's ambition to transform social care.

2. Delivering the right digital skills for businesses and people (pages 22-29)

What do we need?	How can we achieve it?
Expand the coverage of Help to Grow: Digital	The Spending Review should provide additional funding BEIS for the Help to Grow Digital Scheme to ensure that it can expand in future waves and provide a wider range of support for businesses across the UK eager to get on with their digital transformation.
Do not penalise business as they transition to digital through via online sales tax	The Government should move away from an Online Sales Tax at the budget and instead move ahead with a wholesale review of business rates as well as seeking to deliver a new tax regime for multinational companies via the OECD, G7 and G20 routes.
Help SMEs to invest in digital reskilling through a Digital Skills Tax Credit	Taking inspiration from the The Help to Grow scheme the Budget and Spending Review include the introduction of a skills tax credit to incentivise SMEs to invest in training their workforce. This could be modelled on other tax credits for SMEs such as the existing relief for R&D investment.
Continue the reform of the Apprenticeship Levy	The budget should include reforms to increase the percentage of unspent funds from levy-payers that can be transferred to smaller companies in their ecosystem and supply chain, for businesses across the UK eager to get on with their digital transformation.
Develop a Digital Skills Platform 2.0	The Spending Review should include an allocation for the Department for Education to develop a Digital Skills Toolkit 2.0 between citizens interested in entering the digital workforce, the training material and available roles, building on and expanding the success of the Skills Toolkit.
Continue support for the Local Digital Collaboration Unit and Local Digital Fund	In the spending review HM Treasury should ensure funds are available to Department for Levelling-up, Housing and Communities so they can at least match the initial £7.5m funding offered through the fund for the full spending review period 2022-23 to 2024-25.

3. Building a world-class digital infrastructure suitable for the challenges of the future (pages 30-38)

What do we need?	How can we achieve it?
Building a secure and resilient 5G network	The Budget should announce a further £250 million investment to develop the Telecoms Diversification Programme, bringing the total investment in building a secure and resilient 5G network to £500 million.
Complete the rollout of gigabit capable broadband across the UK	The Budget should announce the Government intends to bring forward the remaining £3.8 billion of funding allocated for Project Gigabit, to subsidise the roll-out of gigabit-broadband to the 'hardest to reach' premises in the country.
Maintain the commitment to the Shared Rural Network	The UK's Mobile Network Operators have committed funding to increase 4G coverage to "partial not spots", Government should maintain its committed funding of £500 million to eliminate "total not-spots": hard-to-reach areas where there is currently no coverage from any operator.
Increase business rates relief for telecoms infrastructure	The Budget should include an announcement to increase business rates relief for telecommunications infrastructure, including fibre broadband and small cells, for 15 years.
Produce a route map to greater UK supercomputing capacity	The spending review should include funding for BEIS to deliver an increase in the UK's supercomputing capacity in line with European and other comparative nations where significant investments are being made.
Grow the UK's digital twins capabilities	Budget and spending review should include a commitment to form a 'UK Digital Twin Programme', with funding of £100-125 million over 10 years. To give the UK a world-leading position in the emerging multi-billion-pound digital twin market.
Provide certainty for future of the Climate Change Agreement	Extend the scope of the CCA to address the 2TWh of power estimated that is currently being wasted (equivalent to £140M in energy costs alone and excluding other operational costs) by inefficient on-premises server rooms and distributed IT.

4. Ensuring the competitiveness of the UK innovation ecosystem (pages 39-45)

What do we need?	How can we achieve it?
Expand the coverage offered by R&D tax credits	The Budget should include an announcement from the Treasury to extend the scope of the R&D tax credit to cover key intangible assets, with a specific ask to include data, data analytics and cloud computing as well as acting on long standing and cross industry calls to bring capital expenditure costs within scope, such expenditure on plants and machinery for facilities engaging in R&D.
Continue investment in Quantum including Industrial Strategy Challenge Funds	The Spending Review set out a long-term commitment to investment in the development of the UK's Quantum ecosystem with a focus on Quantum commercialisation. This should include continuing to fund the UK's National Quantum Technologies Programme.
Encourage the adoption of Intelligent Automation in Central Government	The Spending Review should earmark a proportion of digital transformation funding allocated in the spending review to support the uptake Intelligent Automation in Central Government to help central government departments to drive efficiencies and achieve cashable savings through an end-to-end transformation of service delivery.
Continue to secure the UK's global leadership in ethical innovation	The spending review should allocate resources to DCMS to continue to fund the CDEI at 2021/22 levels in real terms until the end of the spending review period in 2024/25. This will support the CDEI to carry out longer-term projects and continue to support a UK comparative advantage in ethical innovation.
Support the delivery of the ten-year plan to make the UK a global AI superpower	Following the publication of the AI Strategy techUK encourages the Treasury to provide space in the spending review through the financial settlements for BEIS and DCMS sufficient resources to implement the long-term investments and funding needed to support the implementation of the AI Strategy's ten-year plan to make the UK a global AI superpower.

1. Putting in place a regulatory framework that drives tech led growth

Developing strong principles that support innovative regulation, is not just good for UK tech, but also increase consumer welfare by allowing British consumers access to and the confidence to use the latest digital services.

Regulation and the role of regulators has always been key for the tech sector, however, the growing focus on competition in digital markets through the creation of the Digital Markets Unit, the selection of Ofcom as the regulator in the Online Safety Bill and the creation of the cross regulator Digital Regulation Cooperation Forum (DRCF) has seen the role of regulators increase, becoming more central to the UK's digital economy than ever before.

This is particularly important for the UK as our digital economy is dominated by digital services. Of the UK's digitally intensive industries, 96% of output and 81% of exports is in services. For these digital service providers, the regulatory framework surrounding the research, development, marketisation and compliance requirements for digital service products is central to determining whether the UK is seen as a competitive economy within which to invest and grow the business.

The Government has set out a strong marker for the kind digital regulation it wants to drive in the UK through the Plan for Digital Regulation. Ensuring these principles to *actively promote innovation, achieve forward looking and coherent outcomes and exploit opportunities and address challenges in the international arena*[13] are met as new regulations are develop will be vital to ensuring the UK maintains a world leading regulatory system.

techUK and our members make some suggestions for HM treasury in the budget to drive this change.

1. Putting in place a regulatory framework that drives tech led growth

What do we need?	How can we achieve it?
A Working Group on Competition and Investment	In the Budget HM Treasury should create a Working Group on Competition and Investment to monitor the overall impact of recent competition and investment screening policy changes. Made up of industry representatives and businesses the group could support engagement so that the Government can receive the best information possible for future policy decisions as well as real time information as new policies and regimes are implemented.
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Deliver a future of work council	The Budget should provide an opportunity for the Government to announce a future of work council, bringing together businesses, business groups and trade bodies as well as local and combined authorities on the shifts in working patterns and how we can support workers newfound flexibility to increase productivity, creativity and drive the economic recovery across the UK.
Continue the expansion of Sandboxes and Scaleboxes	In the Budget the Government should announce its intention to continue to grow the use of sandboxing to other sectors with a focus on using sandboxes and testbed schemes such as the Living Lab approach to drive innovation across multiple sectors. The Spending Review should allocate money to help Departments and regulators deliver this.
Provide support to research for online fraud mitigation	techUK would like to see the Budget provide funding for further research into the end-to-end journey of different fraud typologies, including how fraud and fraudulent activity intersects different sectors at different stages. This will help support responses from the OFSG to disrupt this activity and in turn will help achieve our common goal of making the UK the least attractive place for fraudsters to operate.
Invest in the Government's Digital ID and Attributes Trust Framework	In the spending review the Government should ensure that DCMS receives sufficient funding to continue the work of Digital ID and Attributes Trust Framework to ensure that Government can establish an effective regulatory landscape that can unlock significant private investment in a UK market for digital ID's.
Undertaking an audit of digital maturity in the adult social care landscape	To support the digital transformation of the social care sector the Budget should include a commitment to undertake an audit of the sector in order to make clear who is responsible for the digital transformation of the social care system. This will be vital to producing a strategy to digitise the sector with the aim supporting the Government's ambition to transform social care.

Create a Working Group on Competition and Investment: Ensuring the UK remains an attractive destination for investment will be vital to the economic recovery from the COVID-19 pandemic. This comes alongside major changes in the way the UK treats investors with changes to the CMA's merger assessment guidelines published in March 2021, a new National Security and Investment regime due to go live from early 2022 and significant changes being proposed to the UK's competition policy mean this is a very active space with both techUK members and investors looking closely at the UK's next steps.

The UK Mergers and Acquisitions (M&A) landscape has been negatively affected over the last years. In 2020, the UK ranked fifth in the M&A Attractiveness Index, behind only the US, Singapore, Germany, and the Netherlands as the most attractive countries to invest. Although the 2020 ranking is an improvement over 2019, the UK's current position is four places lower than it was in 2015 and, according to Refinitiv data, the number of M&A agreements has declined by 29% and the value of overall deals has decreased by 40.8% between 2016 and 2020.

Ensuring the UK remains an attractive destination for investment will be vital in the upcoming years, as the UK must send strong signals that it is open for business. Big risk is that as the economic recovery gets underway the UK there is hesitancy around investing in the UK. This is particularly risky to tech as Deloitte's CFO survey shows firms are focused on investment in tech and digital and M&A activity as key to accelerating growth over the next three years.[14]

We understand and share the idea that any anti-competitive behaviour in digital markets should be addressed. We also recognise that mergers and acquisitions (M&A) can be a significant component of market concentration in particular situations, requiring the development of appropriate regulatory frameworks to tackle down these specific situations. However, members have raised concerns that the recent direction of Government policy in this area may not have the desired effect on market competition, while leading to an even further reduction of M&A for the UK economy.

techUK has worked closely with the Government to input into policy changes on competition and investment as well as provide opportunities for Government to engage with the sector as new policy is implemented.

However, this should go further, and HM Treasury should create a Working Group on Competition and Investment to examine the overall impact of the recent Government policy to provide feedback. Made u of industry representatives and businesses the group could support engagement so that the Government can receive the best information possible for future policy decisions as well as real time information as new policies and regimes are implemented.

Creation of an Autonomous Systems Taskforce: Autonomous systems will be critical to the UK's competitiveness in the near future, as this technology has the potential to revolutionise manufacturing, medicine, the military, and transportation.

However, the sector has identified to be particularly difficult in the UK to engage in the experimentation, creation and commercialisation of new and innovative autonomous products, as the regulatory landscape is perceived to be complicated and uncoordinated by the industry. This is in addition to the numerous ethical, moral, and legal considerations that should be considered in the development of these technologies.

We believe that these concerns can be better addressed by a taskforce driven by the BEIS that brings together academia, government, and industry to develop best practises and a new modern regulatory framework, capable of competing internationally, that attracts investment and allows us to not miss out on the opportunity to be global leaders in Autonomous systems.

The UK is missing an opportunity here with a significant amount of expertise and the global industry based in the UK, more streamlined regulatory and certification processes could unlock significant amounts of private investment.

The Government should therefore create an Autonomous systems working group with the aim of streamlining the certifications process for autonomous systems across sectors and regulators. This taskforce should aim to unlock private investment by supporting new testbeds for autonomous systems technology.

Deliver a future of work council: The adoption of remote working technologies helped to keep the country moving throughout lockdown. The use of Zoom, Cisco's Webex, Microsoft Teams and Google Meet among others increased significantly and have now become second nature tools across all business sectors.

This mass upskilling and the flexibility it brings means the adoption of hybrid working practices are likely to become more common. Indeed, how we use office space is now at the forefront of minds across the UK. Shifting working patterns also has the opportunity to increase footfall and consumer spending in smaller towns and cities, assisting the levelling up agenda as well as empowering the labour force to choose the working arrangements that work best for them by reducing the trade-offs and frictions between employment models - enabling a more dynamic economy.

However, understanding what infrastructure is needed will be vital, Government should therefore review research by Vodafone and others into the role regional digital hubs and better connectivity can play in creating secure well connected working environments to support hybrid working[15] as well as new business models for the high street.[16]

techUK's Digital Local Capital Index, launched this year, also provides valuable insights on the needs at the local level to maximise the benefits of the digital economy, providing recommendations to build 21st century skills to support the development of local digital hubs.[17]

To examine all these factors and shape a coherent strategy the Government should convene a future of work council, bringing together businesses, business groups and trade bodies as well as local and combined authorities on the shifts in working patterns and how we can support workers newfound flexibility to increase productivity, creativity and drive the economic recovery across the UK.

Continue the expansion of Sandboxes and Scaleboxes: regulation is central to innovation in the tech sector, good regulatory practices have already shown their ability to help foster entirely new markets with the FCA's Sandbox and new proposed Scalebox providing a strong model for how regulators can enable innovation.

This has practical benefits with techUK members telling us that sandboxing and a regulator which supports innovation can contribute to reduced development costs. Good practice can also make it easier to raise investment for products which are supported by sandboxes or where the regulator is seen as engaged and has a good understanding of the market.

While this general principle is accepted across many sectors the Government needs to be alive to some sector specific challenges. For example, in the utilities sector the right environment for innovation at scale is based deploying products in relatively fixed market conditions. The Energy Systems Catapult's experimental "Living Lab" approach has yielded good insights through testing and development with real consumers in real homes. For example, it allows innovators to identify true interoperability in a commercial environment and that can be more useful than a sandbox in this sector.

The Treasury in its work with the FCA and the financial services industry has driven the use of sandboxes and now scaleboxes. The Government should apply these principles to other sectors with a focus on using sandboxes and testbed schemes such as the Living Lab approach to drive innovation across multiple sectors.

Provide support to research for online fraud mitigation: techUK acknowledges the ongoing threat to consumers from online fraud and our members have a shared ambition to enhance collaboration between sectors to build on existing solutions while increasing consumer awareness and resilience. In April 2021, the Online Fraud Steering Group (OFSG) was set up, co-chaired by techUK, UK Finance and the National Economic Crime Centre, to form collective solutions to the respond to patterns of fraudulent activity.

As part of our broader discovery of the challenges around online fraud we have been speaking with various government departments, officials, and Parliamentarians about the threat of online fraud. It appears that online fraud is on the fringes of a range of government departments who understandably all have a specialist area of interest ranging from DWP considering pension fraud, DCMS focusing on online advertising and HMT looking at investment fraud. However, due to the nature of fraud being led by patterns of behaviour, we are forming the view that a fragmented response to this issue will not effectively solve the problem in the long term.

techUK would like to see the Budget provide funding for further research into the end-to-end journey of different fraud typologies, including how fraud and fraudulent activity intersects different sectors at different stages. This will help support responses from the OFSG to disrupt this activity and in turn will help achieve our common goal of making the UK the least attractive place for fraudsters to operate.

Invest in the Government's Digital ID and Attributes Trust Framework: techUK and its members agree with the Government on the importance of widespread use of digital identity products to increase the use and accessibility of public services; to boost economic growth, with estimates indicating that these products contribute £800 million per year to the wider economy; and to improve security, helping to reduce the record levels of abuse of personal data and impersonation to commit fraud in the UK, with over 220,000 cases reported in 2019.[18]

However, to achieve this, techUK members would like to see continued investment in the Government's Digital ID and Attributes Trust Framework to help create a trusted, commercially viable model for governing the future use of digital identities in the UK, making it quicker and easier for people to verify themselves.

In the spending review the Government should ensure that DCMS receives sufficient funding to continue the work of Digital ID and Attributes Trust Framework to ensure that Government can establish an effective regulatory landscape that can unlock significant private investment in a UK market for digital ID's.

Undertaking an audit of digital maturity in the adult social care landscape: Digital transformation can significantly improve the quality and safety of social care, from improving clinical outcomes and patient/service user experience, through financial savings that benefits all taxpayers.[19] However, progress in advancing the digital maturity of the sector and moving towards integration with primary and secondary healthcare continues to be delayed. An audit of the sector in order to make clear who is responsible for the digital transformation of the social care system and thus facilitate much-needed change would be a vital step in focusing the energies of the UK health tech market on this generational challenge.

The audit should consider funding the following proposals to enhance digital transformation in adult social care:

> Education and upskilling programmes for social care staff in order to increase digital confidence and facilitate the uptake of innovative technologies. This would support the Government's Pillars of Growth and in particular, fostering opportunities to improve the skills of people in all regions, as outlined in the Build Back Better plan.

> Foundational technology for care homes, including adequate internet connectivity and IT infrastructure, in order to facilitate the use of digital health technologies.

> Digital technologies which can further the prevention agenda, helping to increase the independence of adults in social care, as well as reducing the need for more costly care.

> A community of social care providers which enables them to experiment outside of policy to increase innovation within social care.

To support the digital transformation of the social care sector the Budget should include a commitment to undertake an audit of the sector in order to make clear who is responsible for the digital transformation of the social care system. This will be vital to producing a strategy to digitise the sector with the aim supporting the Government's ambition to transform social care.

2. Delivering the right skills for businesses and people

There are no digital jobs to drive tech led growth without people and businesses with the right digital skills. To lay the bedrock for an accelerated recovery, we must seek to turbocharge the UK's productivity and make commonplace the use of digital solutions such as trading platforms, RegTech, and cloud services to help businesses to find the tools they need to cope with new challenges, but also to revolutionise the day to day of the way the UK does business. Doing so will support tech led growth across all sectors, creating new and well-paying jobs. This means incentivising digital adoption across SMEs, providing a support to help those out of work retrain and find new jobs and supporting local tech ecosystems.

2. Delivering the right digital skills for businesses and people

What do we need?	How can we achieve it?
Expand the coverage of Help to Grow: Digital	The Spending Review should provide additional funding BEIS for the Help to Grow Digital Scheme to ensure that it can expand in future waves and provide a wider range of support for businesses across the UK eager to get on with their digital transformation.
Do not penalise business as they transition to digital through via online sales tax	The Government should move away from an Online Sales Tax at the budget and instead move ahead with a wholesale review of business rates as well as seeking to deliver a new tax regime for multinational companies via the OECD, G7 and G20 routes.
Help SMEs to invest in digital reskilling through a Digital Skills Tax Credit	Taking inspiration from the The Help to Grow scheme the Budget and Spending Review include the introduction of a skills tax credit to incentivise SMEs to invest in training their workforce. This could be modelled on other tax credits for SMEs such as the existing relief for R&D investment.
Continue the reform of the Apprenticeship Levy	The budget should include reforms to increase the percentage of unspent funds from levy-payers that can be transferred to smaller companies in their ecosystem and supply chain, for businesses across the UK eager to get on with their digital transformation.
Develop a Digital Skills Platform 2.0	The Spending Review should include an allocation for the Department for Education to develop a Digital Skills Toolkit 2.0 between citizens interested in entering the digital workforce, the training material and available roles, building on and expanding the success of the Skills Toolkit.
Continue support for the Local Digital Collaboration Unit and Local Digital Fund	In the spending review HM Treasury should ensure funds are available to Department for Levelling-up, Housing and Communities so they can at least match the initial £7.5m funding offered through the fund for the full spending review period 2022-23 to 2024-25.

Expand the coverage of Help to Grow: Digital: the Government's Help to Grow: Digital scheme provides a discount of up to 50% up to £5,000 for SMEs who want to upgrade their software. However, when it launches the programme will be limited to just three types of software, Accounting, Customer Relationship Management (CRM) and e-commerce.

To make this programme the real driver of digital adoption that it aspires to be the Government should expand the scheme to cover new types of software as the programme develops. Expansions could include cybersecurity and Human Resources software as well as Enterprise Resource Planning (ERP) software which can help businesses drive digital across their whole operation.

The BEIS is committed to making this scheme a success and research from techUK's members has shows that if SMEs can adopt the technology they need 61% expect to be able to increase their workforce, creating new better paying jobs and increasing the UK's digital skills base.[20]

The Treasury in the Spending Review should therefore provide additional funding BEIS for the Help to Grow Digital Scheme to ensure that it can expand in future waves and provide a wider range of support for businesses across the UK eager to get on with their digital transformation.

Do not penalise business as they transition to digital via an online sales tax: in response to the shift to online sales and tech-enabled retail experiences, there have been calls for the Government to adopt an online sales tax. Analysis performed by Oxford Economics found that a 2% online sales tax could raise around £1.6 billion in government revenue.

However, the gain in government revenue will not compensate for the loss in both consumer welfare and supplier margins, with the net inefficiencies created by an online sales tax estimated to be around £206 million—around 13% of the revenue raised by a potential 2% online sales tax.[21]

In essence, while an online sales tax would raise revenue for government, it would increase costs for many small businesses who are least able to bear them, as they rapidly shift to selling online as a response to the changes in the business environment during COVID-19 pandemic. An online sales tax could disincentivise many small businesses from adopting technology that could help them grow in the future, undermining tech led growth.

In addition, most of the tax burden will fall on consumers at a time when jobs and the wider economy are just beginning to recover from the huge recession caused by the COVID-19 pandemic and inflation is a rising concern for families.

An online sales tax is also counterintuitive to the Government's existing policy direction where it is actively trying to encourage businesses to adopt e-commerce platforms via the Help to Grow Digital Scheme.

Rather than an online sales tax, the Government should move ahead with a wholesale review of business rates—which is needed now more than ever to help revitalise high streets across the UK. techUK supports the Government's aim to agree a new tax regime for multinational companies via the OECD, G7 and G20 routes. This route would deliver a multinational tax agreement that will mean large international firms pay a greater proportion of their tax in the markets where they operate, rather than where they are headquartered. This is preferable to an online sales tax which would likely penalise digitising businesses and consumers.

Help SMEs to invest in digital reskilling through a Digital Skills Tax Credit: Employer investment in training of existing employees has faced a substantial decline, particularly amongst the SME community.[22] Businesses should be supported and incentivised to invest in the upskilling and retraining of their employees. techUK's Digital Jobs Taskforce has recommended a Skills Tax Credit, similar to the R&D tax credit system, and the creation of a resource within Local Digital Skills Partnerships to help SMEs network and pool resources to achieve economies of scale with regards to investment in training.

SMEs make up 99% of all UK businesses, employing three-fifths of the UK's working population and making around half the turnover in the UK private sector.[23] With many businesses now running leaner operations because of the pandemic, there is a real concern that investment in skills and training, which is already low, falls even further down the list of priorities.

The Government's recently announced Help to Grow scheme recognises the importance of both skills development and digital as a driver of growth and productivity. These two programmes, which together make up Help to Grow, will help businesses invest. The issue, however, is that they remain time-limited and only available to a small proportion of SMEs.

Enabling more SMEs to invest in skills: Studies show that SMEs face a number of obstacles to investing in their workforce, including a lack of information about what training is available, access to economies of scale (smaller employers typically pay three times more per member of staff than larger firms for formal training) and accessing training that is flexible and specific to their needs.[24]

The evidence shows that for each taxpayer pound spent on the R&D tax credit system there is a return of between £1.53 and £2.35 in terms of R&D generated.[25] Given the well-established relationship between human capital and growth and case studies from the US and other countries that offer tax incentives for training, there is a strong case for offering SMEs relief on an investment that enhances productivity and redresses what has been described as an "imbalance between investment in physical and human capital."[26]

Taking inspiration from the The Help to Grow scheme the Government should introduce a skills tax credit to incentivise SMEs to invest in training their workforce. This could be modelled on other tax credits for SMEs such as the existing relief for R&D investment.

Continue the reform of the Apprenticeship levy:
A YouGov poll in April 2020 found that more than 61% of employers say their apprentices have lost out on learning or work experience as a result of the COVID-19 pandemic.[27] Many current apprentices are having their training paused as companies furlough their staff. It is unlikely that companies will be returning to pre-crisis levels of training.

Training providers are facing a large cash constraint as many employers have stopped recruiting new apprentices and the lockdown is preventing existing apprentices from being able to complete their training programmes. A survey from Association of Employment and Learning Providers (AELP) found that 60% of employers have stopped all new apprenticeship starts since the pandemic began and 75% of them have stopped at least 80% of starts normally expected at this time of year.[28]

The Apprenticeship Levy is an important part of the changes to raise apprenticeship quality and supports techUK members to make a long-term and sustainable investment in skills and training. However, the number of apprenticeship starts since the introduction of the levy in 2017 has fallen year-on-year, with 23,400 fewer people participating in an apprenticeship in 2019-20 than in 2018-19, according to official figures.[29] Now is the time to institute a full review of the apprenticeship levy to ensure that it is working for tech businesses small and large. Engineering and Manufacturing Technologies and ICT apprenticeships continue to remain in the top six sector areas of apprenticeship starts in England, with 81,000 starts in 2018.[30] Reform of the levy is vital to ensure employers and learners continue to reap the rewards of apprenticeships.

Employers are collaborating through techUK's digital skills subsidiary TechSkills to encourage the uptake of degree apprenticeships, helping providers develop programmes that meet industry needs. Accredited as Tech Industry Gold, these programmes grew to nearly 60% of the total digital degree apprenticeships market in 2019/20, outstripping growth of non-accredited programmes year on year by 31% (accredited) to 18% (non-accredited). techUK encourages government to recognise the value of collaborative industry support for programme development and delivery as well as the design of the standards themselves.

Revitalising the apprenticeship levy will be a cornerstone in how we effectively upskill and retrain our workforce for post pandemic economy in a situation of high unemployment. Between 2017 and 2020, the unemployment rate amongst those with apprenticeships averaged 2.5%, while that of the wider economy averaged 4.2% and graduates average stood at 2.8%.[31] Given the success of apprenticeships, there is a need to pivot more people currently in the workforce to digital and provide entry points for young people who have been hit hardest by the pandemic. techUK believes small changes to the Apprenticeship Levy could have significant positive outcomes and widen the market recognition of apprenticeships.

Employers should be further encouraged to invest in skills to maximise the number of apprenticeships and the effectiveness of the levy.[32] This should include increasing the percentage of unspent funds from levy-payers that can be transferred to smaller companies in their ecosystem and supply chain.

Develop a Digital Skills Platform 2.0: The UK Government has already stepped into this space with the creation of the Department for Education's Skills Toolkit - launched at the height of the COVID-19 lockdown in April 2020. This resource helped signpost individuals to quality resources available online in core areas. The Government was implicitly nudging individuals to specific core skills that it had identified as valuable. As a trusted resource, this message was heard and translated into action.

The appetite for this type of intervention was evidenced by the volume of uptake, with tens of thousands of interactions in the first month alone. This is despite the fact that the Skills Toolkit is a fairly rudimentary resource – for example, it does not allow for self-assessment of an individual's current skill level or an explanation of what digital jobs might become more accessible after the completion of these courses.

Nevertheless, the Skills Toolkit has been a huge success, with Taskforce members seeing a surge in participation. For example, Cisco's Programming Essentials in Python Networking Academy had 17,811 registrations and 13,870 people following through to participate in the course.

The Government has the credibility, profile, and network to catalyse the creation of a trusted solution positioned at the centre of the digital skills ecosystem. It is able to take a strategic view, invest over an extended period, and create and maintain a gold standard for assessing human capabilities based upon the consolidation of existing frameworks, trusted by all parties in the digital marketplace.

The UK Government is therefore uniquely positioned to create a Digital Skills Toolkit 2.0 between citizens interested in entering the digital workforce, the training material and available roles. The need is for a solution that not only supports retraining of the technically savvy but is also able to map out a tailored learning journey for those wishing to enter the market but who may need significantly more support and guidance.

Continue support for the Local Digital Collaboration Unit and Local Digital Fund: The Department for Levelling-up, Housing and Communities' (DLUHC) Local Digital Collaboration Unit is driving the local digital movement, fostering collaboration across local public services through their work in patterns, outputs and template re-use. As well as training senior leaders across the country to improve their digital capability.

The Unit delivered the Local Digital Declaration, which has seen over half of all councils sign-up to. The Declaration has been pivotal is spearheading digital transformation locally across the country.

The Local Digital Collaboration Unit currently manage the Local Digital fund which has evolved to continuous funding of existing projects. The Local Digital Fund is the key funding arm that allows the Local Digital Declaration to deliver on its principals. 100 councils in England have partnered on at least one of these funded projects. The fund has also been used to deliver digital training to over 1000 council employees.

The benefits of the fund are clear with each case requiring a strong business case to secure part of the £7.5m of funding allocated to the fund for 2018/19 and 2019/20. An additional £800,000 of extra funding was released to support Digital, Data and Technology (DDaT) to combat the challenges faced by local government as a direct result of COVID-19.

COVID-19 has highlighted the importance of local decision making and the need for local capabilities. Recognising and building on this in the future will be vital to ensuring local authorities can deliver digital solutions that will not only create efficiency savings, but also improve local public service outcomes and create places where citizens want to live, thrive and support local digital ecosystems to grow.

In the spending review HM Treasury should ensure funds are available to the -recently renamed- Department for Levelling-up, Housing and Communities so they can at least match the initial £7.5m funding offered through the fund for the full spending review period 2022-23 to 2024-25. The DLUHC should however build on the benefits of the fund by increasing early market engagement. This could be support by seeking to announce additional funding for 2020/21 and 2021/22 as soon as possible.

3. Building a world-class digital infrastructure suitable for the challenges of the future

The UK economy is supported by its infrastructure. In the short term, infrastructure investments boost economic growth and help create job opportunities, becoming an essential pillar in the post-Covid-19 economic recovery.

Perhaps even more significant are the long-term benefits of infrastructure investment: high-quality infrastructure can increase UK productivity and competitiveness, allowing the UK to create the right environment for the challenges of the future.

However, the UK has historically underinvested in infrastructure, having a lower capital stock than comparable countries, and ranked 11th in the world for infrastructure quality, below both France and Germany.[35]

The Government's commitment in the Spending Review 2020 to invest £100 billion in capital investment in 2021-22, a £30 billion increase over 2019-20, and in line with the goal of delivering £600 billion in gross public sector investment over the following five years is therefore welcome.

Public infrastructure investment is only one side to this story; it is also critical to provide the right environment for the private sector to invest in infrastructure, which experienced a significant impact during the pandemic.

The sector welcomes announced initiatives such as the creation of the UK National Infrastructure Bank and the white paper on Economic Regulation to provide the necessary regulatory frameworks to promote private investment in infrastructure.

There are still outstanding tasks to be accomplished in the coming months, such as determining how to effectively deploy the government's committed resources. In order to prepare the UK infrastructure for future challenges.

3. Building a world-class digital infrastructure suitable for the challenges of the future

What do we need?	How can we achieve it?
Building a secure and resilient 5G network	The Budget should announce a further £250 million investment to develop the Telecoms Diversification Programme, bringing the total investment in building a secure and resilient 5G network to £500 million.
Complete the rollout of gigabit capable broadband across the UK	The Budget should announce the Government intends to bring forward the remaining £3.8 billion of funding allocated for Project Gigabit, to subsidise the roll-out of gigabit-broadband to the 'hardest to reach' premises in the country.
Maintain the commitment to the Shared Rural Network	The UK's Mobile Network Operators have committed funding to increase 4G coverage to "partial not spots", Government should maintain its committed funding of £500 million to eliminate "total not-spots": hard-to-reach areas where there is currently no coverage from any operator.
Increase business rates relief for telecoms infrastructure	The Budget should include an announcement to increase business rates relief for telecommunications infrastructure, including fibre broadband and small cells, for 15 years.
Produce a route map to greater UK supercomputing capacity	The spending review should include funding for BEIS to deliver an increase in the UK's supercomputing capacity in line with European and other comparative nations where significant investments are being made.
Grow the UK's digital twins capabilities	Budget and spending review should include a commitment to form a 'UK Digital Twin Programme', with funding of £100-125 million over 10 years. To give the UK a world-leading position in the emerging multi-billion-pound digital twin market.
Provide certainty for future of the Climate Change Agreement	Extend the scope of the CCA to address the 2TWh of power estimated that is currently being wasted (equivalent to £140M in energy costs alone and excluding other operational costs) by inefficient on-premises server rooms and distributed IT.

Building a secure and resilient 5G network: to ensure the UK can keep pace in the deployment of 5G government will need to increase its commitment to building a secure and resilient 5G network by increasing the funding to meet the objectives of the 5G Supply Chain Diversification Strategy, published in November 2020.

The £250 million of funding, described as 'initial' when it was announced in the 2020 National Infrastructure Strategy was welcomed, but we believe lacks ambition compared to budget allocated for similar projects in other countries. In June 2020, Germany announced ____ for "5G and, later on, 6G" and supporting "innovative companies as they develop and test new, software-controlled network technologies".

Direct competitors are investing heavily in the development of 5G technology, and the cost of inaction for the UK will be high: the Future Communications Challenge Group in a report for DCMS set out that not doing the necessary interventions to establish UK leadership in 5G could result in an opportunity cost of £173bn of GDP over 10 years between 2020 and 2030.[36]

Greater ambition is required in expanding R&D and industry support to ensure the UK's telecoms networks are secure, resilient and future proof. Government should invest a further £250 million in developing the Telecoms Diversification Programme, bringing the total investment in building a secure and resilient 5G network to £500 million.

Complete the rollout of gigabit capable broadband across the UK: Industry is confident that it can deliver the government's original target of 100% gigabit coverage for the UK by 2025, if the full Project Gigabit funding of £5 billion is available for the hardest to reach areas. Provided the barriers to deployment continue to be addressed, the target is deliverable. There is no need to artificially constrain the supply of gigabit broadband by continuing with a reduced spending profile for the Programme.

The nationwide deployment of full fibre broadband is estimated to provide a £59bn boost to UK productivity by 2025, save 700k tonnes of carbon from reduced commuting as more people can work from home and bring one million people back into the workforce through remote working (with a corresponding £25 billion boost to productivity from these new workers). Full fibre could also impact workers' residential decisions, with modelling suggesting 270,000 people could be supported to move from urban to more rural areas.

Further, if the 2025 target is to be met, the £5bn F20 "outside in" programme needs to be delivered via simple and effective mechanisms that encourage competitive and credible bids from operators of all sizes. Crucially, it needs to be designed and scaled for rapid deployment with a clear and realistic timetable, maximising industry's ability to deliver in the last 20% of the UK.

The task is now to get this done and bring forward the remaining £3.8 billion of funding allocated for Project Gigabit, to subsidise the roll-out of gigabit-broadband to the 'hardest to reach' premises in the country that will not be reached by private investment (20% of the UK). This is around five million premises in mostly rural areas.

Maintain the commitment to the Shared Rural Network: currently, only 67% of the UK has good quality coverage from all four operators, and that will improve to 84% by the end of the Shared Rural Network programme. This will mean far fewer people in rural areas will find themselves locked-in to the only mobile network with good coverage of their area. The programme will transform 4G coverage without duplicating infrastructure, minimising the impact on our countryside.

[Collectively the Shared Rural Network](#) will provide additional coverage to 280,000 premises and 16,000 kilometres of roads by 2026, as well as improve geographic coverage to 79% of Areas of Natural Beauty, up from 51%, and 74% of National Parks from 41%, benefitting millions of visitors every year. The benefits of reliable 4G mobile connectivity are far reaching with many personal and commercial benefits, as well as positive impacts on healthcare, education, tourism, remote working, and accessing online services.

The UK's Mobile Network Operators have committed funding to increase 4G coverage to "partial not spots", Government should maintain its committed funding of £500 million to eliminate "total not-spots": hard-to-reach areas where there is currently no coverage from any operator. This will provide new digital infrastructure in total does not spot areas not commercially viable for the operators.

Increase business rates relief for telecoms infrastructure: return on investment on telecoms infrastructure deployment takes many years, and investors need a clearer long-term commitment from government on tax relief. The Telecommunications infrastructure (Relief from Non-Domestic Rates) Act 2018 will expire in March 2022 and should be extended to encourage further investment in our gigabit networks. For the mobile sector, the relief should also be extended to [small cell](#) deployment.

Business rates relief for small cells will play an increasingly important role in rural and semi-rural areas where connectivity from large macro-sites is difficult to achieve. In addition, relief should be extended to sites in very rural areas. Encouraging the deployment of small cells by granting business rates relief to this infrastructure will support network rollout.

We therefore propose the Government increases business rates relief for telecommunications infrastructure, including fibre broadband and small cells, for 15 years.

Produce a route map to greater UK supercomputing capacity: outside the EU, UK businesses will be more reliant on domestic capacity or else be required to bid for time with non-domestic machines. To ensure UK based companies and scientists can access the most advanced computing capabilities, the UK needs to lift its ambition on supercomputing and plan for future capacity now.

When the UK's new national supercomputer – Archer 2 – is installed, it will already be 20x less powerful than Japan's newest system. There is a risk that without a forward plan for computing capacity for scientific and industrial purposes the UK will be at a disadvantage to comparable markets.

techUK members and wider industry rely on computing power in product design and development and in university partnerships across a wide range of projects. When a business weights up where to locate R&D facilities access to computing power is a key factor. Without a clear route map for future capacity the UK may miss out on long term investments.

The Government should therefore look to Increase UK supercomputing capacity in line with European and other comparative nations where significant investments are being made. In fact, as of June 2021, the UK has no supercomputers in the global TOP25 list, while the European continent had eight.[37] Therefore, investments should include new supercomputing infrastructure alongside reviewing bids for new Supercomputing centres.

Grow the UK's digital twins capabilities: a digital twin is the generation or collection of data representing a physical object. Digital twins allow for testing and innovation in a simulated environment with huge productivity boosting potential for design and innovation.

The modus-operandi of digital twins, to offer the analytical capability to help realise whole systems thinking, is a reoccurring theme from a range of stakeholders, such as the Prime Minister's Council for Science and Technology.[38] In December 2020, the Royal Society argued that data, in conjunction with technologies such as digital twins, should be at the heart of the net zero transition.[39]

The work of the Centre for Digital Built Britain (CDBB) has helped to seed a common framework to consider digital twins and with further investment we can unlock inclusive, R&D led growth, strengthen environmental resilience, embed expertise, and enhance and optimise public administration at a local, national, and even international, level.

We recommend the following series of investment to level up the UK's digital twin capabilities:

> **Form a 'UK Digital Twin Programme', with funding of £100-125 million over 10 years. This kind of programme would drive a more coherent government, industry and academic digital twin community, and give the UK a world-leading position in the emerging multi-billion-pound digital twin market.**

> **Develop a cross-cutting, interdisciplinary coordinating body to drive forward digital twin adoption and diffusion in the UK. A recommendation in our digital twins report from this year, we need to complement the academic CBDD with a policy/applied perspective from within government.**

> **Continue and expand funding (£1 million) for the rollout of the CDBB's Information Management Framework (IMF).**

> **Fund a permanent Digital twins demonstrator programme: which then go to pilots and are scaled up from there. We estimate costs of £1.5- £3 million per demonstrator between 2021 – 2024. High-level of ambition = 4-6 demonstrators for five thematic areas. A minimum level of ambition = 2-3 demonstrators per domain.**

> **Development of an online digital twin procurement portal. Cost £5-10m as part of the Gov's digital services procurement funding.**

Provide certainty for future of the Climate Change Agreement (CCA): Data centres are where our industrial strategy meets our digital strategy, the UK's data centre sector is a key contributor to economic growth, powering the UK's internet economy.
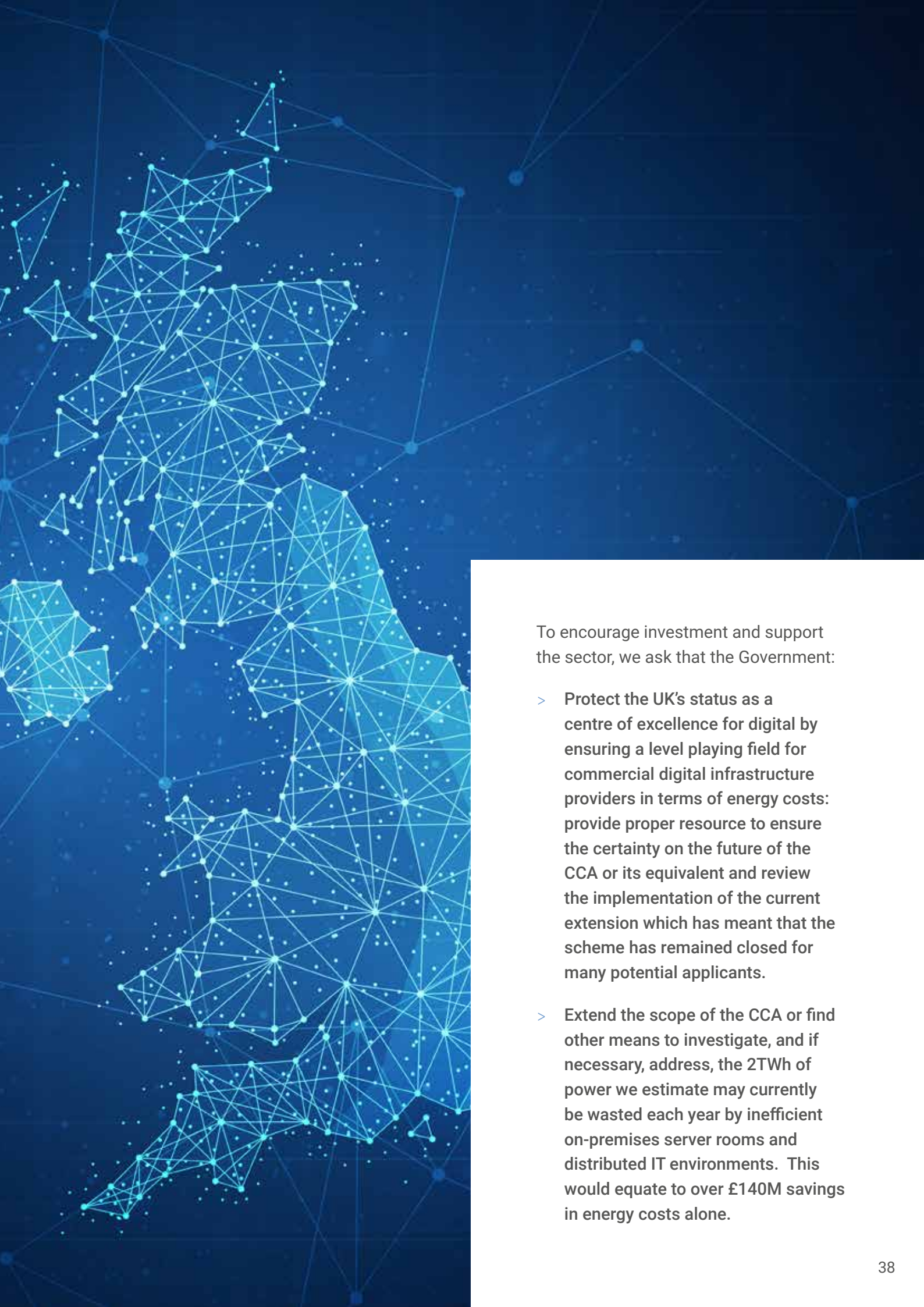
The sector is a real success story, is globally important and provides the technical infrastructure for financial services, aerospace, transport, healthcare, retail and utilities. Each new data centre contributes between £397m and £436m in GVA per year to the UK economy while each existing data centre is estimated to contribute between £291m and £320m per annum.[40]

As the Government seeks to support UK digital industry and build up resilience, data centres will be a key cornerstone of the infrastructure we need. Indeed, during the COVID-19 pandemic UK data centres supported the continuing functioning of many UK businesses and the online services they relied upon.

UK data centre operators benefit from a Climate Change Agreement. The discount goes some way to levelling energy costs (which are disproportionately high in the UK compared to competing markets), shortens ROI on projects, improves investor confidence and demonstrates that the UK government recognises the economic importance of a world class digital infrastructure.

The sector has enjoyed a period of consistent growth since entering the CCA scheme in 2014, and operators attribute much of this to improved competitiveness resulting from their participation. The scheme has also provided invaluable data on sector energy use.

The UK is increasing finding itself in tighter competition with other markets seeking to increase their own data centre sector. techUK has shared data with DCMS on current construction projects, demonstrating a healthy, high value pipeline (a new data centre project is now usually valued well over £100m). We know from conversations with providers that the CCA discount has been the deciding factor between the UK and other locations.

To encourage investment and support the sector, we ask that the Government:

> **Protect the UK's status as a centre of excellence for digital by ensuring a level playing field for commercial digital infrastructure providers in terms of energy costs: provide proper resource to ensure the certainty on the future of the CCA or its equivalent and review the implementation of the current extension which has meant that the scheme has remained closed for many potential applicants.**

> **Extend the scope of the CCA or find other means to investigate, and if necessary, address, the 2TWh of power we estimate may currently be wasted each year by inefficient on-premises server rooms and distributed IT environments. This would equate to over £140M savings in energy costs alone.**

4. Ensuring the competitiveness of the UK innovation ecosystem

The UK is already a world leader when it comes to science, technology and innovation. To hold this position in a highly competitive global economy the UK will need to take action to maintain our lead in a global race to become a science and innovation superpower.

The UK has a 17% productivity gap with the US and 12% with Germany, this is added to a growth that has been essentially static for the past ten years.[41] Innovation is critical for increasing productivity and long-term economic growth, generating more and better-paid jobs, allowing companies to thrive, and improving the UK's competitiveness.[42]

There is a strong argument for the government actively support businesses to innovate: firms that innovate are more likely to compete in the market, developing new goods and services for their consumers and lowering their costs via increased efficiency; innovative businesses are also more likely to capture a larger proportion of existing markets and create new ones; and businesses that innovate grow twice as fast as firms that do not innovate.[43]

techUK welcomed the recently published Innovation Strategy of the Government which has the "overarching goal of making the UK a global hub for innovation, placing innovation at the centre of everything this nation does". This approach sets the tone to unleash UK innovators and private sector investment in innovation. We believe the UK is in a unique position to lead a revitalised global spirit of innovation, but to do so we must build on our current innovation system.

4. Ensuring the competitiveness of the UK innovation ecosystem

What do we need?	How can we achieve it?
Expand the coverage offered by R&D tax credits	The Budget should include an announcement from the Treasury to extend the scope of the R&D tax credit to cover key intangible assets, with a specific ask to include data, data analytics and cloud computing as well as acting on long standing and cross industry calls to bring capital expenditure costs within scope, such expenditure on plants and machinery for facilities engaging in R&D.
Continue investment in Quantum including Industrial Strategy Challenge Funds	The Spending Review set out a long-term commitment to investment in the development of the UK's Quantum ecosystem with a focus on Quantum commercialisation. This should include continuing to fund the UK's National Quantum Technologies Programme.
Encourage the adoption of Intelligent Automation in Central Government	The Spending Review should earmark a proportion of digital transformation funding allocated in the spending review to support the uptake Intelligent Automation in Central Government to help central government departments to drive efficiencies and achieve cashable savings through an end-to-end transformation of service delivery.
Continue to secure the UK's global leadership in ethical innovation	The spending review should allocate resources to DCMS to continue to fund the CDEI at 2021/22 levels in real terms until the end of the spending review period in 2024/25. This will support the CDEI to carry out longer-term projects and continue to support a UK comparative advantage in ethical innovation.
Support the delivery of the ten-year plan to make the UK a global AI superpower	Following the publication of the AI Strategy techUK encourages the Treasury to provide space in the spending review through the financial settlements for BEIS and DCMS sufficient resources to implement the long-term investments and funding needed to support the implementation of the AI Strategy's ten-year plan to make the UK a global AI superpower.

Expand the coverage offered by R&D tax credits: In the March Budget the Chancellor announced a wide scale review into the R&D Tax relief scheme. The review aims to ensure the existing schemes remain fit for purpose and to build on a previous consultation to determine whether data and cloud computing services should be brought into the scope of R&D tax credits relief scheme, which was welcomed news for techUK and our members.

We also welcomed the opportunity to respond to the consultation on R&D Tax Reliefs. In this regard, we think the Government will need to consider a radical rethink of how it incentivises businesses to invest in innovation activities and R&D. As without significant year on year increases, well above the existing trend, the 2027 target will be missed.

There is strong evidence for the effectiveness of R&D tax credits in stimulating R&D. The most directly relevant and recent assessments from a 2015 HMRC econometric analysis[44] and a 2014 analysis by Frontier economics pointing to large positive spill over effects from increased private R&D to the wider economy.[45]

Enabling businesses to invest more in R&D has important societal benefits, but to do so, businesses must see clear returns on investment in innovation. While this does not solely come from tax reliefs the UK's R&D Tax Credit system is an important part of this and is seen by many techUK members as a key part of the value case when locating R&D activity in the UK.

The R&D tax credit has many strengths, however, over the years the credit has begun to fall behind changes in the economy as well as competitor regimes abroad. Therefore, we have identified three key areas for improvement of the R&D tax system:

> **The scope of qualifying expenditures should be expanded to cover key intangible assets, with a specific ask to include data, data analytics and cloud computing.**

> **Government should act on long standing and cross industry calls to bring capital expenditure costs within scope, such expenditure on plants and machinery for facilities connected to R&D activities.[46]**

> **Improve the simplicity of the system when it comes to making claims, aiming to create avenues for evidence to be submitted in advance, provide increased official guidance and create a more generous RDEC scheme for SMEs.**

Continue investment in Quantum including Industrial Strategy Challenge Funds: Quantum computing has been identified as a key emerging and transformative technology that will have an impact on the UK's long term digital and economic future. This technology is projected to provide £4 billion in economic opportunities globally by 2024, with productivity benefits from quantum computing expected to exceed £341 billion in the next decades.[47]

Becoming an early adopter may resulting in new employment, skills, and knowledge across the UK. Furthermore, Quantum will have the potential to enable smart cities, revolutionise healthcare systems and drive innovation in key industries. To prepare for this future techUK believes now is the time to bring the Government and the wider technology sector into the discussion about the UK's quantum future and how we plan for success.

This should include long-term investment in building the UK's capability and capacity in Quantum which will become a key transformational innovation in computing and infrastructure. The UK's early investment in Quantum has helped us become a world leader, however to maintain this position and reap the full benefits from being a quantum leader this commitment must be continued.

The Government should therefore continue its long-term commitment to investment in the development of the UK's Quantum ecosystem and with a focus on Quantum commercialisation. This will send important signals about the UK's intent to innovators and companies around the world that may be looking for a place to conduct R&D in Quantum. Funds should therefore be allocated to BEIS in the Spending Review to support investment in Quantum programmes, including continuing to fund the UK's National Quantum Technologies Programme.

Encourage the adoption of Intelligent Automation in Central Government: Intelligent automation has the capacity to revolutionise business services across a variety of industries through driving optimisation, enhancing digitisation and building resilience.

Since the pandemic, businesses from across different sectors can look to automation to build resilience and drive continuity, and in turn push forward a new, technology-focused future of work that will drastically change the UK's workforce and economy.

Industry has highlighted the need for more funding to be in place in the next Comprehensive Spending Review in order to really scale automation in Government, however, it is recognised that this technology will be competing with other ICT initiatives for a share of the budget.

It is important that Intelligent Automation receives the appropriate expenditure in order to help central government departments to drive efficiencies and achieve cashable savings through an end-to-end transformation of service delivery.

The Government should therefore earmark a proportion of digital transformation funding allocated in the spending review to support the uptake Intelligent Automation in Central Government.

Continue to secure the UK's global leadership in ethical innovation: the ethical use of new technologies, specifically AI is not just a concern of Governments and potential markets but also the developers and producers of these products.

Almost three-quarters (74%) of Chief Marketing Officers (CMOs) say data ethics will be more important to their roles in the next five years as issues around data collection and privacy become more salient.[48] When surveyed by Deloitte 62% of potential users of industry 4.0 products "completely agree" that their organisation is highly concerned with how to ethically use new technologies.[49]

The Centre for Data Ethics and Innovation (CDEI) has played a pivotal role in conducting independent, in-depth and considered research on complex, technical ethical issues that relate to new technology products and services. Therefore, it has played an important role in supporting innovators in the UK to build ethical and responsible products and services to a high global standard and allowing UK based companies to lead discussions on ethics and subsequently the rules that regulate the use of new technologies. The centre also plays a role in attracting leading thinkers to the UK, by providing a forum and acting as a convener for industry, academia and civil society.

The benefits are clear as the UK has significantly grown investment in British AI companies, with investment nearly doubling between 2017 and 2019 from £575 million to £1.3bn.[50] The CDEI is key part of the UK's thriving AI ecosystem and plays a key role which we believe will be vital to continue to support the growth of this strategically important sector.

The CDEI is funded by the Department for Digital, Culture, Media and Sport with £4.5 million allocated in 2021/22. Current funding for the Centre runs out this year. To ensure the centre can continue to play its vital role, we suggest funding remain at 2021/22 levels in real terms until the end of the spending review period in 2024/25. This will support the CDEI to carry out longer-term projects and continue to support a UK comparative advantage in ethical innovation. DCMS should be allocated funding to support this.

Support the delivery of the ten-year plan to make the UK a global AI superpower: AI could deliver a 22% boost to the UK economy by 2030, mostly by AI-driven productivity growth[51], with significant gains across all UK regions.[52] The Government shares our belief in the beneofts of AI with the recent publication of an ambitious AI strategy which techUK and its members welcomed.

The AI strategy fires a starting gun on the next stage of AI research, development an deployment in the UK. However to make this a success the projects and announcements made in the Strategy, such as the piloting of an AI Standards Hub, a new National AI Research and Innovation Programme, a new Office for AI / UKRI programme to stimulate wider adoption of AI, among others, will need to be well supported in the Spending Review.

Following the publication of the AI Strategy techUK encourages the Treasury to provide space in the spending review through the financial settlements for BEIS and DCMS sufficient resources to implement the long-term investments and funding needed to support the implementation of the AI Strategy's ten-year plan to make the UK a global AI superpower.

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FOR WHAT COMES NEXT

About techUK

techUK is a membership organisation that brings together people, companies and organisations to realise the positive outcomes of what digital technology can achieve. We collaborate across business, Government and stakeholders to fulfil the potential of technology to deliver a stronger society and more sustainable future. By providing expertise and insight, we support our members, partners and stakeholders as they prepare the UK for what comes next in a constantly changing world.

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