

Inventing the Future: techUK Manifesto 2017

How Global Britain can Shape
Our Digital Future

May 2017

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2. Economic Renewal Through a Modern Industrial Strategy

Invest 3% GDP in UK's R&D

Harness tech to solve the "productivity puzzle"

The best place to startup and scale a tech business

An open and dynamic regulatory framework

World class data and digital infrastructure

Lead the smart infrastructure and IoT revolution

1. Making Brexit a Success for Tech

Secure a tech-first deal

International free flow of data

Access to global tech talent

Confidence, stability and certainty for business

Tech at the heart of Global Britain's trade

5. A Safe and Secure Digital World

A leader in cyber security

The safest place to go online

3. Building the Smarter State

Tech at the heart of Government

Unlock Government digital transformation

Digital innovation in health and social care

Digital expertise in the Civil Service

Innovation in the defence supply base

4. Nurturing Skills for the Jobs of the Future

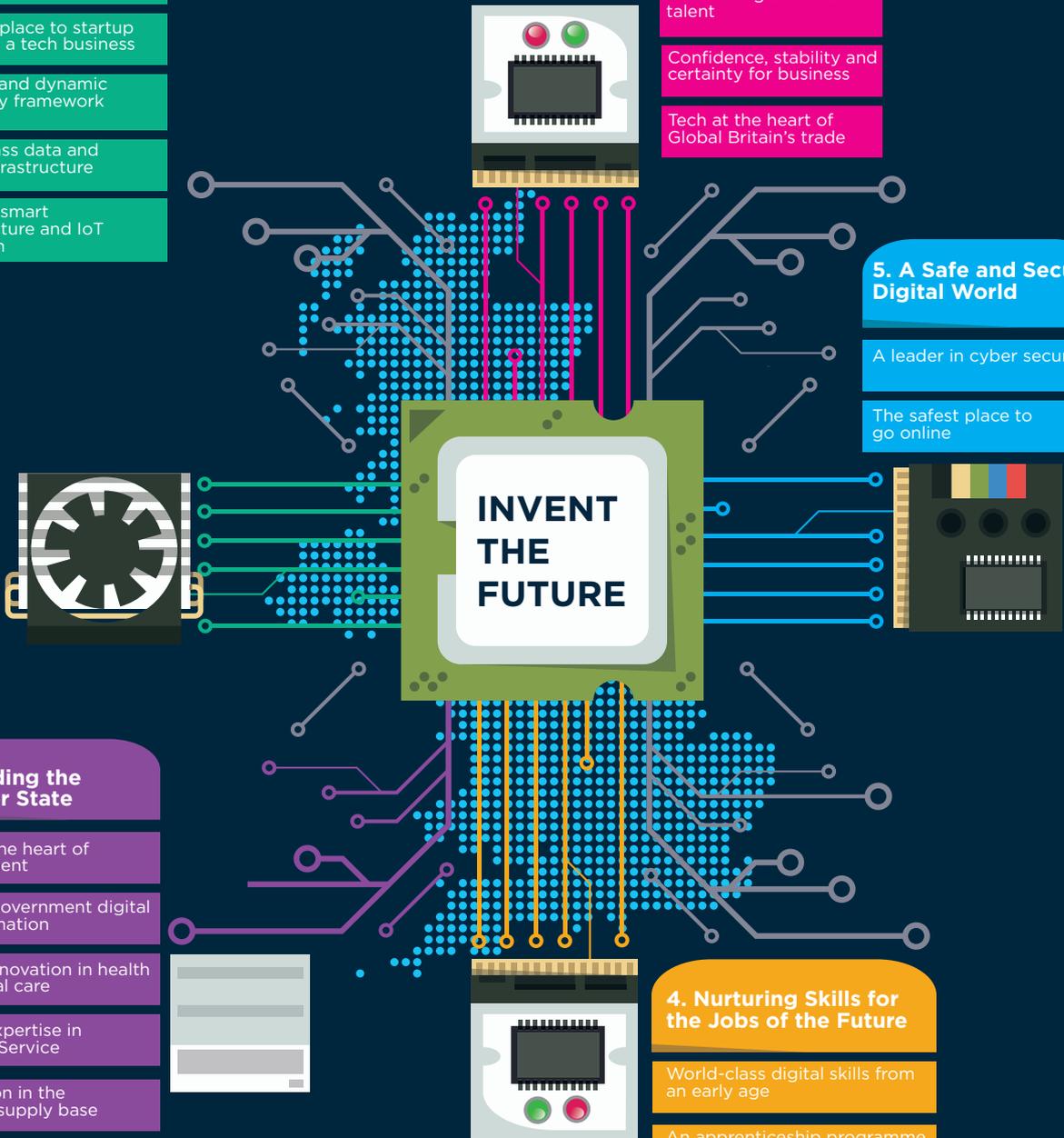
World-class digital skills from an early age

An apprenticeship programme fit for the future

Inspire girls and women to work in tech

Groundbreaking policy on the future of work and lifelong learning

Open to the pioneers and innovators of tomorrow



Foreword | Jacqueline de Rojas techUK President



The nation that gave birth to the first industrial revolution should not fear the next. Invention is in our DNA. Our collective opportunity is to harness the power of digital transformation to deliver an economy that works for everyone.

Technology is changing the world. Ultimately it will have a much bigger impact on all our lives than the decision to leave the European Union. While we have to get Brexit right, we must not lose focus on the big global forces for change or lose faith in our ability to shape a future that can work for everyone.

But what do we want that future to look like?

- We want a **modern, dynamic and productive economy creating good jobs for people across the United Kingdom.**
- We want a **country where people feel positive about what the future holds for them and their families.**
- We want a **society that comes together to overcome the challenges we face now and that is ready for the future.**

techUK's manifesto sets out that future – a bold and positive vision for 2020 and beyond.

Executive Summary

The EU referendum is a watershed in British history. The UK is now committed to forging a new future outside the European Union and the next Government will be tasked with inventing this new future. Brexit is a huge challenge but there is another, equally important economic and social imperative that cannot wait – how to create a modern and open digital economy that works for everyone in the 2020s.

techUK's manifesto provides a comprehensive set of policy recommendations that techUK believes will help the next Government achieve this ambition. These are grouped under five headings:

- 1. Making Brexit a Success for Tech**
- 2. Achieving Economic Renewal Through a Modern Industrial Strategy**
- 3. Building the Smarter State**
- 4. Nurturing the Skills for the Jobs of the Future**
- 5. Creating a Safe and Secure Digital World**

These recommendations will help the next Government deliver on four fundamental objectives that are vital to the wellbeing of people across the country: **boosting the UK's productivity; harnessing digital transformation to build a smarter state; creating new jobs and a new skilled, adaptable workforce; and protecting and empowering people in a digital age.**

1. Making Brexit a Success for Tech

The UK tech sector has been the outstanding success of the UK economy over the last decade and will be vital to the UK's success in a post-Brexit world. The next Government must secure a deal that puts the UK on the best possible footing to thrive outside the EU. This will require a tech-first trade deal; maintaining the cross-border data flows; making the UK a hub for global tech talent; providing confidence, stability and certainty throughout the negotiations; and placing tech at the heart of Global Britain's new trade relationships.

2. Economic Renewal Through a Modern Industrial Strategy

Economic renewal can be delivered through a modern industrial strategy, which provides a long-term and evolutionary framework to build the capacity and capability for a truly innovation-led economy. In order to achieve this, the next Government will need to boost investment in the UK's R&D; harness the power of tech to solve the UK's "productivity puzzle"; make the UK the best place to startup and scale a high growth business; create an open and dynamic regulatory framework; and create the conditions for investment in world class digital and data infrastructure. These will be the successful elements of an economic renewal that creates an economy that works for everyone.

3. Building the Smarter State

The last decade has seen an increased understanding within Government of the importance of driving digital transformation. Digital transformation will be vital to protecting our public services amid rising public sector debt and demands on usage. The Smarter State will place tech at the heart of Government; unlock the next wave of digital transformation in government; develop expertise within the Civil Service; address the barriers to digital innovation in health and social care; and innovate by instinct in the defence supply base.

4. Nurturing the Skills for the Jobs of the Future

The UK tech sector faces a triple hit on digital skills. Alongside the existing digital skills gap in the UK, significant uncertainty on the access to EU talent, and new restrictions to hiring non-EEA workers risk hindering growth. The dynamism of the sector means tech creates new jobs at nearly three times the rate of the rest of the economy, and demand far outstrips supply. To ensure the UK has the digital skills it needs to thrive, the next Government should equip the future generation with world class digital skills from an early age; create an apprenticeship programme for the future; inspire and support girls and women to work in tech; develop a clear and ambitious policy on the future of work and lifelong learning; and open up to the pioneers and innovators of tomorrow.

5. Creating a Safe and Secure Digital World

As the world becomes more digital, ensuring safety and security for people, businesses and infrastructure is of critical importance. The May 2017 ransomware attack showed the substantial global cyber threat and the vulnerability of businesses and public services. The UK needs to build on its strong cyber security credentials by investing further in public sector cyber security; protecting end-to-end encryption; and enabling SME investment in cyber security.

The UK also needs to be the safest place for people to go online. Young people must be empowered to navigate the online world safely through a new “digital resilience” curriculum and a full, evidence-based review into current best practice should be conducted to underpin a comprehensive online safety strategy.

Working together to deliver a positive vision for Global Britain

techUK urges the next Government to consider these ideas closely as it embarks on this defining moment in modern British history. While these recommendations are focused on the things that government can do, the next administration will not be able to 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. The sector recognises that it must be an active partner in helping to invent and shape a new future for the UK. No other sector has quite the same potential for delivering economic and social transformation but as a sector, UK tech must acknowledge the policy challenges this entails. The sector commits to support Government in bold and forward-looking policy choices that can create a prosperous future for all those in the UK.

Summary of Recommendations

What? Objective	How? Recommendation
Brexit	<p>1. Secure a tech-first trade deal</p> <ul style="list-style-type: none"> 1.1. Ensuring that any future trade deal properly encompasses trade in services. 1.2. Signing the WTO's Information Technology Agreement and maintain EU-level tariffs on digital goods. 1.3. Producing a Customs Vision 2020 plan that sets out how HMRC will use the power of technology to deliver a frictionless Smart Customs system. 1.4. Creating a challenge fund to deliver a Smart Customs system to prevent restrictions or delays at the border.
	<p>2. Maintain the international free flow of data</p> <ul style="list-style-type: none"> 2.1. Securing a watertight legal framework for the free flow of personal data across borders once the UK exits the EU. 2.2. Ensuring that there is no 'cliff edge' for data transfers via a clear transitional agreement. 2.3. Committing to the full implementation of the General Data Protection Regulations ahead of May 2018. 2.4. Providing the Information Commissioner with an additional 200 staff to facilitate the smooth transition to the new GDPR landscape.
	<p>3. Securing access to the tech talent the UK needs to thrive</p> <ul style="list-style-type: none"> 3.1. Confirm that EEA nationals residing in the UK prior to 23 June 2016 have the unequivocal right to remain. 3.2. Ensuring that any new system allows for visa-free short term business travel between the UK and the EU. 3.3. Establish a cross-Whitehall and industry Smart Migration Working Group to lay the foundations for a data-driven Smart Migration system.
	<p>4. Provide confidence, stability and certainty throughout the negotiations and beyond</p> <ul style="list-style-type: none"> 4.1. Fully converting the EU acquis into UK law before we leave the EU. 4.2. Producing a set of principles to avoid damaging divergence with EU laws. 4.3. Producing a full economic analysis of the impact of a 'no deal' scenario on tech.
	<p>5. Place tech at the heart of Global Britain's new trade relationships</p> <ul style="list-style-type: none"> 5.1. Identifying the next five targets for embassy-based tech hubs building on the initial five announced in the Digital Strategy. 5.2. Creating a UK Global Tech Ambassador with the status of Senior Diplomat. 5.3. Increasing participation in key international fora such as G7 on digital issues. 5.4. Producing a tech export plan for 2030.

The economic and social impact over the next Parliament

	Who? Departments	Boost the UK's productivity	Harness digital transformation to build a smarter state	Support new high-value jobs and changing workforce	Protect and empower people in the digital age
	DExEU, DIT, HMRC, CO	✓		✓	
	DExEU, DCMS, BEIS, FCO, CO, DIT	✓		✓	✓
	HO, DCMS, DExEU, BEIS	✓		✓	
	DExEU, CO, DCMS, BEIS, HMT	✓		✓	✓
	DIT, DCMS, FCO	✓		✓	

<p>What</p> <p>Objective</p>	<p>How</p> <p>Recommendation</p>
	<p>6. Boost investment in the UK's R&D to rival the best in the world</p> <ul style="list-style-type: none"> 6.1. Retain access to international research partnerships, such as Horizon 2020. 6.2. Commit to spending 3% of GDP on R&D by 2025. 6.3. Give UK Research & Innovation (UKRI) powers to set science and innovation budgets over 10 year cycles. 6.4. Create an R&D Facilities tax credit for expenditure incurred on constructing or refurbishing buildings for R&D activities. <hr/> <p>7. Harness the power of tech to solve the UK's "productivity puzzle"</p> <ul style="list-style-type: none"> 7.1. Placing digital transformation at the heart of economic policy. 7.2. Introducing an SME tax credit for investment in productivity enhancing digital products and services paid for from the £23bn Productivity Fund. <hr/> <p>8. Make the UK the best place to startup and scale a high growth business</p> <ul style="list-style-type: none"> 8.1. Establish a Patient Capital Council. 8.2. Strengthen the role of the British Business Bank to mitigate the impact of leaving the EIF and EIB. 8.3. Ensure the UK remains a global hub for international tech talent. 8.4. Make national data sets available so local public and private sector organisations can target scaleup companies. <hr/> <p>9. Create an open and dynamic regulatory framework for global competitiveness in the digital economy</p> <ul style="list-style-type: none"> 9.1. Embed the European Better Regulation Guidelines into UK legislative practices. 9.2. Ensure legislation supports the development of high-growth and disruptive business models. 9.3. Support the creation of an independent Data Ethics Council. <hr/> <p>10. Invest in world class digital and data infrastructure to unlock the next wave of digital growth</p> <ul style="list-style-type: none"> 10.1. Drive investment in digital infrastructure and innovative digital services, ensuring the public sector is in the vanguard of their adoption. 10.2. Ensure Whitehall, Councils and regulators work together to speed up implementation of next generation communications technologies. 10.3. Identify and address obstacles to broadband take-up, so that by 2020 more than 90% of premises will subscribe to a broadband service. 10.4. Create connectivity corridors on all major transport routes including along the length of UK motorways and on-board Wi-Fi on all rail routes. 10.5. Extend the same compensation measures to data centres as are enjoyed by other energy intensive industries.

The economic and social impact over the next Parliament

	Who Departments	Boost the UK's productivity	Harness digital transformation to build a smarter state	Support new high-value jobs and changing workforce	Protect and empower people in the digital age
	BEIS, DExEU, DfE	✓		✓	✓
	BEIS, HMT	✓		✓	
	BEIS, DCMS, HMT, CO	✓		✓	✓
	BEIS, DCMS, CO	✓		✓	✓
	BEIS, DCMS, DCLG, DfT	✓		✓	✓

What Objective	How Recommendation
Economic Renewal	<p>11. Ensure the UK is at the forefront of the smart infrastructure revolution</p> <ul style="list-style-type: none"> 11.1. Placing digital at the forefront of the Infrastructure Pillar of the Industrial Strategy. 11.2. Running all Government infrastructure procurements on a whole-life cost basis and enabling benefits to be accounted on balance sheets. 11.3. Publish a roadmap for a 2030 smart low-carbon energy system. 11.4. Prioritise the Digital Rail project maximising the use of mature technology to realise faster benefits across our rail network.
	<p>12. Make the UK the most competitive market in which to research, develop and adopt Internet of Things solutions</p> <ul style="list-style-type: none"> 12.1. Working with industry to create a culture of confidence on the use of IoT solutions. 12.2. Actively sponsor and support 'proof of concepts', test beds, demonstrators, in conjunction with industry. 12.3. Working with industry to develop solution frameworks for sector-specific services that help customers to understand and buy IoT services.
	<p>13. Put tech at the heart of Government</p> <ul style="list-style-type: none"> 13.1. Ensuring that the Culture Secretary is given a place on all senior Cabinet Committees dealing with the economy, Brexit, security & public services. 13.2. Giving one Minister in every Government Department clear responsibility for tech. 13.3. Retain the place of the Ministerial Digital Taskforce as a Cabinet Sub-Committee.
Building the Smarter State	<p>14. Unlock the next wave of Digital Transformation of Government</p> <ul style="list-style-type: none"> 14.1. Aiming for the bulk of transactions with the Government to be digitised by 2020. 14.2. Refreshing the Verify rollout, with a clearly defined strategy for its implementation across government. 14.3. Introduce a "Digital Devolution Dividend", a £350 million fund to match any Metro Mayor investment in a CDO and city-region digital strategy. 14.4. Make technology a compulsory part of future devolution deals. 14.5. Expand the use of the Digital Marketplace by doubling the number of non-Whitehall parts of the public sector using the system.
	<p>15. Address the barriers to digital innovation in health and social care</p> <ul style="list-style-type: none"> 15.1. Allocate £1 billion a year for digital transformation in the NHS to provide new technology and more efficient service delivery. 15.2. Creating an NHS Open Data plan to enable innovation and investment in UK MedTech.

The economic and social impact over the next Parliament

	Who Departments	Boost the UK's productivity	Harness digital transformation to build a smarter state	Support new high-value jobs and changing workforce	Protect and empower people in the digital age
	BEIS, DCMS, HMT, DfT	✓	✓	✓	✓
	BEIS, DCMS	✓		✓	
	No10	✓	✓		
	CO, DCLG	✓	✓		
	DH	✓	✓		✓

What

Objective

How

Recommendation

Building the Smarter State

16. Develop digital expertise within the Civil Service

- 16.1. Minimum three year placements for civil servants in technical roles.
- 16.2. Expanding the Digital Academy programme to ensure that digital skills are embedded throughout Government.
- 16.3. Including digital skills as part of all Fast Stream training.

17. Innovate by instinct in the defence supply base

- 17.1. Develop long-term strategic relationships with suppliers of all sizes, including in non-traditional sectors, such as digital.
- 17.2. Establish a Digital Adviser as part of the Defence Innovation Initiative.

18. Equip the future generation with world class digital skills from an early age

- 18.1. Ring-fencing the £250 million revenue raised by the immigration skills charge to fund major domestic digital skills programmes.
- 18.2. Providing £10 million in funding to reduce digital exclusion.

19. Create an apprenticeship programme for the future

- 19.1. Placing digital skills training at the heart of every apprenticeship.
- 19.2. Increasing the percentage of transferable funds in the Apprenticeship Levy from 10% to 80%.
- 19.3. Introducing greater flexibility in the use of the Apprenticeship Levy for other industry-led training initiatives.

20. Inspire girls and women to work in tech

- 20.1. Improving careers advice and guidance for girls interested in STEM subjects by investing in £20 million to scale existing initiatives.
- 20.2. Introducing an employer's national insurance holiday for organisations re-training returners.

21. Develop clear policy on the future of work and lifelong learning

- 21.1. Launching an independent Commission into the entire education system, from primary school to lifelong learning initiatives, to ensure the people have the skills to flourish in a 21st century economy.
- 21.2. Protecting the adult education budget in real terms to enable continued lifelong learning at a local level.

22. Opening up to the pioneers and innovators of tomorrow

- 22.1. Undertake a review led by the independent Migration Advisory Committee to better understand how to make best use of the Tier 1 "Tech Nation" route.
- 22.2. Increase the monthly cap on the Tier 2 skilled worker route and reconsider the existing salary caps on Tier 2 General and ICT workers.

Skills and Jobs of the Future

The economic and social impact over the next Parliament

	Who Departments	Boost the UK's productivity	Harness digital transformation to build a smarter state	Support new high-value jobs and changing workforce	Protect and empower people in the digital age
	CO	✓	✓	✓	
	MoD	✓	✓	✓	
	DfE, DCMS, BEIS	✓		✓	✓
	DfE, DCMS, BEIS	✓		✓	✓
	DfE, HMT, BEIS	✓		✓	✓
	BEIS, DfE	✓		✓	✓
	HO, DCMS, BEIS	✓		✓	✓

What Objective	How Recommendation
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23. Make the UK a world leader in cyber security

- 23.1. Provide a 10% increase in the National Cyber Security Strategy budget
- 23.2. Commit to protecting end-to-end encryption while supporting a robust rule-of-law approach to law enforcement.
- 23.3. Work with industry to update the Cyber Essentials Scheme
- 23.4. Require Government procurement to come from Cyber Essentials approved organisations.
- 23.5. Provide a cyber security tax credit for startup and scaleup businesses.

24. Make the UK the safest place to go online

- 24.1. Commission an independent and detailed review into current best practice in industry and education to underpin a long-term and evidence-based online safety strategy.
- 24.2. Give the Children’s Commissioner a seat on the board of UKCCIS to represent the voice of children directly on the Council.
- 24.3. Develop a new PSHE curriculum in “Developing Digital Resilience” to roll out to schools nationally.

The economic and social impact over the next Parliament

Who	Boost the UK's productivity	Harness digital transformation to build a smarter state	Support new high-value jobs and changing workforce	Protect and empower people in the digital age
DCMS, HO, BEIS, CO	✓	✓		✓
DfE, DCMS				✓

Legend

BEIS Department for Business, Energy and Industrial Strategy

CO Cabinet Office

DCLG Department for Communities & Local Government

DCMS Department for Culture, Media & Sport

DExEU Department for Exiting the European Union

DfE Department for Education

DH Department of Health

DIT Department for International Trade

DfT Department for Transport

FCO Foreign Commonwealth Office

HMRC HM Revenue and Customs

HMT Her Majesty's Treasury

HO Home Office

MoD Ministry of Defence

MoJ Ministry of Justice

No.10 Prime Minister's Office

Introduction

2020 Vision - Inventing the Future

The EU referendum is a watershed in British history. The UK is now committed to forging a new future outside the European Union and the next Government will be tasked with inventing this new future.

Brexit is a huge challenge but there is another, equally important economic and social imperative that cannot wait – how to create a modern and open digital economy that works for everyone in the 2020s. The pace of globalisation will only increase over the next five years, so while we navigate Brexit, we have to focus on what kind of economy and society we want for the 2020s, and beyond. While this will bring many complex challenges, it also brings opportunities. At the forefront is the chance to invent a truly innovation-led economy that works for everyone and where everyone has the opportunity to work. Those who invent the future, shape the future.

Invention is in our DNA. As the pioneers of the First Industrial Revolution, Britain became the first industrial economy and the world's innovation powerhouse. As we enter the Fourth Industrial Revolution, the UK has the opportunity to build a 21st century economy that can and must deliver on four fundamental objectives:

- **boosting the UK's productivity;**
- **harnessing digital transformation to build a smarter state;**
- **creating new jobs and a new skilled, adaptable workforce; and**
- **protecting and empowering people in a digital age.**

This manifesto provides a comprehensive set of policy recommendations that techUK believes will help the next Government achieve this ambition. These are grouped under five headings:

- 1. Making Brexit a Success for Tech**
- 2. Achieving Economic Renewal Through a Modern Industrial Strategy**
- 3. Building the Smarter State**
- 4. Nurturing the Skills for the Jobs of the Future**
- 5. Creating a Safe and Secure Digital World**

This is a positive vision for Britain's future. But while optimism is essential, it is not sufficient. The political task that lies ahead for the Government in getting a huge number of policy decisions right, in a very short period of time, cannot be overstated. At the vanguard is the challenge to deliver a Brexit deal that works for the UK and that works for tech. But domestic policymaking must continue to help create the economic foundations for a new vision. This economic renewal must be delivered concurrently with the Brexit negotiations. techUK urges the next Government to consider these ideas closely as it embarks on this defining moment in modern British history.

The Brexit Deal

Making Brexit a Success for Tech

The UK digital sectors account for 16% of domestic output, 10% of employment and 24% of exports.² The most digitised sectors are the fastest growing parts of the UK economy and digital technologies have become a fundamental part of people's lives.

Political parties are right to recognise tech as an essential building block for the future. From payment processing to designing the components that go into products from smartphones to aircraft, tech underpins almost every part of our economy. Getting a good deal for tech in the Brexit negotiations is a vital part of getting a good deal for the UK as a whole.

It is extremely difficult to predict exactly what will happen when the UK finally leaves the EU. There is no precedent and there is much that we don't know. However a disorderly Brexit would significantly increase the risk of demand- and/or supply-side shocks that would negatively impact consumers, businesses and the UK economy as a whole. It is vital therefore that the UK achieves a smooth exit from the EU that lays the groundwork for the next Government's ambitions for a new Global Britain.

techUK has set out four key priorities for the Brexit negotiations.³ These goals must be achieved in order to provide the UK tech sector with the stability it needs to continue to drive UK growth and job creation. The four priorities are:

- 1. Secure a trade deal that prevents barriers to UK/EU Trade, including a Free Trade Deal that works for services and a Customs Agreement that facilitates the smooth movement of digital goods.**
- 2. Ensure UK tech companies can access worldwide tech talent easily and efficiently, and that they continue to benefit from investment in innovation, education and R&D.**

3. Ensure there is a robust legal mechanism to allow the free flow of data across UK/EU borders.

4. Provide regulatory certainty to UK tech businesses as we leave the EU and facilitate ongoing cross border cooperation between regulators to ensure a pro-market regulatory system from both the UK and the EU.

The first section of the manifesto takes these four aims as its starting point. Given tech's role as an enabler for all sectors in the economy⁴, the next Government will have to take care to get the right deal. A trade deal that fails to cover services or that increases friction in our customs arrangements will choke the growth engine of the UK economy. Equally tech must retain access to the global talent that played a significant role in making the UK Europe's leading tech hub. The free flow of data underpins a modern, data-driven economy and techUK urges the next Government to make securing a watertight agreement on cross-border data flows

a key priority. Finally, confidence, clarity and certainty are the lifeblood of business and investment – the new Government must provide maximum certainty for businesses if the UK is to remain a leading destination for tech investment.

The Brexit negotiations will be complex and involve difficult choices on both sides. To provide the confidence needed for the UK tech sector to thrive, the next Government must be clear that making the UK the best place to start, scale and locate a tech business is a strategic objective for Global Britain.

The Economic and Social Imperative

Building a 21st Century Economy that Works for Everyone

Over the months and years to come there will be much analysis of the motivations of voters in the EU referendum. However it is already clear that the attitudes of many people up and down the UK were, at least in part, shaped by a sense of unease about globalisation and (albeit to a lesser extent) digitisation. For the inhabitants of the UK's post-industrial towns and cities, the benefits of either can be hard to grasp.

Resisting Protectionism Through an Open Economy

Insecurity, joblessness and stalled living standards are powerful drivers of protectionism. Over recent years a compelling narrative has emerged that these are all inevitable consequences of globalisation and increasing levels of automation. Protectionism has emerged as a clear theme in political debates across Europe and the US.

However an economic policy that seeks to shield the UK from globalisation and innovation would be the equivalent of standing on the shore with King Canute in an attempt to cling on to a past that no longer exists. This does not mean that the new Government can ignore the unease about globalisation. On the contrary it must deliberately strive to ensure that the new economy is for the many and not the few.⁵

Research by the Resolution Foundation makes a clear case that income stagnation is not an inevitable consequence of globalisation.⁶ Moreover, sensationalist headlines about the impact of technology fail to take account of our ability to shape change in our economy and society. Domestic policy plays a vital role in determining the ability of societies to adapt to technological innovations. The new Government must seize the opportunity to invent the UK's future, benefitting from the many technological advances on the horizon, and shaping the UK's economy so it works for everyone. This will need to be accompanied by a wider set of policies that enable the UK to win the race between education and technology and re-establish the link between productivity, high growth and raising living standards.

techUK believes this economic renewal can be delivered through a modern industrial strategy. This should be a long-term and evolutionary framework to build capacity and capability and create a truly innovation-led economy. When considering the role of digital in the industrial strategy, policy makers should focus firstly on the significant income and productivity gains that will result from accelerating the process of digitisation across the economy. These gains will come through productivity benefits and the emergence of new, more competitive business models, businesses, products and services. Policy recommendations on how to achieve this are set out in the second section.

As the economy becomes increasingly digitised, an economy that works for everyone will nurture the skills people need for the jobs of the future and create a safe and secure digital world. From creating meaningful lifelong learning to increase resilience to labour market changes, to developing our cyber capabilities, the next Government will need to think about tech issues if it is to succeed in developing an inclusive and sustainable economy. Sections four and five tackle each of these topics individually, providing a range of policy recommendations that will help meet these challenges.

Building the “Smarter State” - the only state we can afford

The UK’s changing demographic is placing increased burdens on public services. The latest Fiscal Sustainability Report from the Office of Budget Responsibility (OBR) suggests that, all things equal, public sector net debt will rise to 234% of GDP in 50 years.⁷ 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.

According to the OBR, to return the debt to GDP ratio to its pre-crisis level of 40% GDP would require a £30bn reduction in public spending every decade to 2066/67. The only way to protect front-end service delivery is by harnessing the transformational power of digital technology to re-invent our public services, radically improving efficiency and outcomes. The Smarter State will also help invent and shape the new frictionless systems that will be required by Brexit, such as new customs and immigration systems. Section three looks at how to shape the Smarter State to meet these unprecedented challenges.

Our “Condition of Britain” Question

In 1839, the Scottish philosopher Thomas Carlyle, concerned at rising inequality among the working class during the Second Industrial Revolution, coined the phrase the “Condition of England Question”. This period saw significant structural changes to the economy which gave rise to numerous policy challenges. Indeed, it was the Second Industrial Revolution that gave rise to our education system as we know it today. This manifesto offers a glimpse at how to answer our “Condition of Britain Question” and create a vibrant, open and inclusive economy that works for everyone.

SECTION 1

Making Brexit a Success for Tech

The tech sector has been the outstanding success of the UK economy over the last decade and will be vital to Britain's success in a post-Brexit world. The next Government must secure a deal that puts the UK on the best possible footing to thrive outside the EU. Tech is the growth engine of the UK's economy so a good deal for tech means a good deal for everyone across the UK.

Recommendation 1

Secure a tech-first trade deal

A tech friendly trade deal must work for both services and goods. While 80% of the UK's digital sectors are services-based, goods are a vital part of the UK's tech ecosystem. Only by negotiating a deal that supports both goods and services will the next Government have a trade deal that works both for tech and the economy as a whole.

Past trade deals have failed to adequately capture the importance of reducing non-tariff barriers to facilitating trade in services. Most recently, the EU's free trade deal with Canada, the Comprehensive and Economic Trade Agreement (CETA), provides a model for the most comprehensive EU free trade deal to date. This, however, only allows for minimal liberalisation of services, with hundreds of limitations. Any similar limitations would likely mark undesirable restrictions on Britain's trade with the EU, based on the status quo. As such, **the new Government must ensure any free trade deal provides deep and flexible provision**

for the trade in services in a sector where new products are being developed at lightning speed.

While services make up the majority of the UK tech industry, tech exports remain driven by the sale of goods. Half of UK digital goods exports go to the EU, and some digital sectors, such as packaged computer software, rely heavily on EU trade, exporting 68% of products to the EU.⁸ **Securing trade arrangements that enable barrier free access to tech goods is an important part of securing the UK's tech economy.**

Tariffs on digital goods are generally low or zero banded under the EU's schedule at the World Trade Organisation (WTO). **The new Government should commit to maintaining these same tariffs. The next Government should also demonstrate international leadership on tariffs on digital goods by formally signing the WTO's Information Technology Agreement.⁹**

By signing the agreement, which reduces tariffs on hundreds of ICT products, the UK would ensure it is a key part of discussions about future tariffs on current and future ICT goods.

Non-tariff barriers, including lengthy waits for checks at the border must also be tackled. **The next Government should instruct HMRC to produce a revised ‘Customs Vision 2020’ document setting out how it will maintain frictionless customs processes with the EU.**¹⁰

The plan should specifically maintain the existing export licensing system, reducing complexity for exporters businesses, in particular small which will be less able to quickly adapt new procedures. An April 2017 report by techUK, *Leaving the Customs Union: Challenges and Opportunities for a Digital Global Britain*, sets out a number of key recommendations on how to maintain such a system.¹¹

The next Government should also use technology to reduce customs barriers for the future. **To help spur the innovation required to achieve this, HMRC should create a challenge fund for developers.** The scope of this challenge fund should be based on the outcomes of a revised Customs 2020 document.

1. **The next Government should secure a trade deal that works for tech by:**
 - 1.1 Ensuring that **any future trade deal properly encompasses trade in services.**
 - 1.2 **Signing the WTO’s Information Technology Agreement** and maintain EU-level tariffs on digital goods.
 - 1.3 **Producing a Customs Vision 2020** plan that sets out how HMRC will use the power of technology to deliver a frictionless Smart Customs system.
 - 1.4 **Creating a challenge fund to deliver a Smart Customs system** to prevent restrictions or delays at the border for goods and services.

Recommendation 2

Maintain the international free flow of data

The UK has a digitised, data-driven economy that relies on the free flow of data. The ability to transfer data is important for every sector in the economy with cross-border data flows making up 3.8% of our GDP.¹² Around half of all trade in services is 'digitally-enabled', meaning it requires the transfer of data, with much of this flowing across borders.¹³ Leaving the EU risks restricting this ability, potentially affecting thousands of UK businesses of all sizes. **Securing the international flow of personal data must therefore be a top priority for the Brexit negotiations.**

Upon leaving the EU, the UK will lose the automatic right to transfer personal data to and from other EU countries unless it secures a new agreement with the European Commission. Given data flows are of critical importance to the UK economy and the very wide definition of personal data under the new EU data protection rules, **the next Government must make securing a water-tight legal framework to continue the free flow of data across borders a top priority for the negotiations.** techUK believes that the most effective way of securing data flows is via an "Adequacy Decision" from the European Commission.

**Data flows make up
3.8% of UK GDP**

Whatever the means, this process is likely to take longer than the two year Article 50 period. Given the reliance on constant data transfers, it is vital that there is no gap in the ability to transfer data as a result of leaving the EU.

In order to avoid such a cliff edge, **the Government must ensure transitional measures are in place to cover data transfers between the point we leave the EU and the formalisation of any new mechanism.**

Implementation of the General Data Protection Regulation (GDPR) will be an important step towards securing a data flows agreement. This comes into force before we leave the EU in May 2018. **As such, the next Government should implement the GDPR in full.** Transition to GDPR will also place an extra burden on the regulator, the Information Commissioner's Office (ICO). **techUK supports calls for an additional 200 ICO staff to achieve this.**

2. The next Government can maintain the free flow of data by:

- 2.1 **Securing a water tight legal framework for the free flow of personal data** across border once the UK exits from the EU.
- 2.2 **Ensuring that there is no 'cliff edge' for data transfers via a clear transitional agreement.**
- 2.3 **Committing to the full implementation of the General Data Protection Regulation** ahead of May 2018.
- 2.4 **Providing the Information Commissioner with an additional 200 staff** to facilitate the smooth transition to the new GDPR landscape.

Recommendation 3

Securing access to the tech talent the UK needs to thrive

Global tech talent has been vital to the success of the UK tech sector in the last decade. 18% of the three million digital sectors workers are foreign-born, with one-third from EU countries. Foreign-born workers also accounted for 45% of net employment growth between 2009 and 2015, with EU-born workers contributing the most, in relative terms, to the sector's success.¹⁴ A March 2017 report by techUK, *Global Tech Talent Powering Global Britain: Navigating Post-Brexit Migration Options*, examined this issue in detail, setting out a number of recommendations on how to ensure the UK retains access to the global tech talent it needs to thrive.¹⁵

The loss of existing EU workers already employed within the UK tech industry would be a significant blow to the sector. Given the rapid growth in demand for digital skills across the economy, the UK lacks the domestic skills pipeline to fill many of these roles. **The next Government must confirm that EEA nationals residing in the UK prior to 23 June 2016 have**

the unequivocal right to remain.

In order to ensure that the UK continues to benefit from EU recruitment, and that those with new ideas and innovations can start a business in the UK, **the next Government should ensure that the Brexit negotiations secure a comprehensive agreement on migration that does not impose additional costs on businesses or individuals**, such as those associated with Tier 2 visas.

For many global tech businesses investing in the UK, their UK hub acts to service their entire European operation. That means that highly skilled technical specialists based in the UK must be able to travel to other EU bases of operation quickly if problems arise. Failure to secure an ongoing ability for businesses to operate in this way would pose a significant risk to inward investment in the UK. Any future Government must ensure a future agreement secures these channels of movement.

The vote to leave the European Union (EU) begins a major shift in UK migration policy. The UK can create a dynamic new immigration system which addresses public concerns while supporting high-growth businesses. The UK's vibrant and diverse tech sector can be at the core of such a system – providing the technology needed to create an agile, new system and forging a data-driven approach. To this end, **the new Government should establish a Smart Migration Working Group bringing together the new data centre established by the Office for National Statistics, Home Office, MAC, Government Digital Service, BEIS, DCMS and a diverse range tech companies.**

The working group would provide technical and policy expertise to help the Government deliver this new system, applying the principles of the Smarter State as advocated by then Prime Minister, David Cameron, in 2015. It would also allow the next Government to demonstrate to the

public that it is developing a new and innovative approach to managing the UK's immigration – increasing control by being responsive to the skills gaps that the UK needs to fill at any given time.

3. The next Government should secure continued access to global tech talent by:

- 3.1 **Confirming that EEA nationals residing in the UK prior to 23 June 2016 have the unequivocal right to remain.**
- 3.2 Ensuring that **any new system allows for visa free short term business travel between the UK and the EU.**
- 3.3 **Establish a cross-Whitehall and industry Smart Migration Working Group** to lay the foundations for a data-driven Smart Migration system that allows the UK to deliver the skills it needs in real-time.

Recommendation 4

Provide confidence, stability and certainty throughout the negotiations and beyond

The tech sector is committed to making a success of Brexit. Doing so will require Government to foster business confidence through a clear sense of direction post-Brexit. This means ensuring business knows what decisions are likely to be made and how, as well as putting in place measures to maintain confidence in the UK's evolving regulatory landscape.

In order to provide maximum business certainty in the UK's post-Brexit regulatory framework, **the next Government should seek to fully convert the EU acquis into UK law.** This should be accomplished ahead of the conclusion of the Brexit negotiations and will help place the UK in a stronger negotiating position. techUK has welcomed the publication of a White Paper on the Great Repeal Bill. While the White Paper recognises that “it is not possible to predict at this stage how every law is to be corrected, as in some areas of policy the solution may depend on the outcome of negotiations”¹⁶, **techUK**

believes the next Government must provide greater clarity on how it intends to meet this challenge.

For businesses with cross-border customer and supply chains, regulatory divergence post-Brexit is a key concern. There will be areas where the UK will pursue different rules to the EU, however, the next Government must take pains to avoid diverging from EU rules in areas where close cooperation is needed. Divergence increases the likelihood of trade barriers and could be damaging to the UK's economy. **techUK urges the next Government to create a set of guiding principles to determine whether following or diverting from EU rules is best for the UK.**

This will be for regulatory decisions taken after the UK has left the EU, however, it will require considerable consultation with business.

It will also be important that the next Government and the public have a common understanding of the potential consequences of a ‘no deal’ scenario for tech and its knock on impacts on the UK economy. **The new Government should produce a full economic impact analysis of failing to secure a deal which maintains data flows, access to international talent and minimises barriers to the trade in both goods and services.**

“ **Divergence increases the likelihood of trade barriers and could be damaging to the UK’s economy** ”

4. The next Government should provide business with certainty by:

- 4.1 **Fully converting the EU acquis into UK law** before we leave the EU.
- 4.2 Producing a **set of principles to avoid damaging divergence with EU laws.**
- 4.3 Producing a **full economic analysis of the impact of a ‘no deal’ scenario on tech.**

Recommendation 5

Place tech at the heart of Global Britain's new trade relationships

Whatever the outcome of the Brexit negotiations, the digital sector will remain a growing part of the UK's exports. The next Government must continue this trend and ensure that the UK remains an international leader in the global digital economy.

The UK's digital sectors make up 24% of the UK's £512 billion total exports (2015). UK export growth is also increasing faster than for the rest of the economy, at 5.1%.¹⁷ The contribution of tech to UK exports is therefore a vital part of tackling the UK's Balance of Trade Deficit.

The next Government should build on the Digital Strategy's ambition to boost our impact in emerging digital economies around the world. **It can do so by identifying the next wave of five tech hubs to develop new innovation partnerships in these markets.**

The UK should also adopt global best practice in championing our tech sector to the rest of the world. The Danish Government recently appointed the world's first Tech Ambassador as part of its commitment to making tech and digitisation a priority across the country's foreign service.¹⁸ **The next Government should follow suit, creating a tech ambassador with full diplomatic rights and a brief to promote UK tech around the world.** The ambassador should sit within the Foreign and Commonwealth Office and maintain close links with the Department for International Trade and DCMS. Similarly, the UK must now look to leverage other pluralateral partnerships, such as the G7 and G20, to shape the policies that will best use innovation to unleash economic growth. **Building on techUK's recent recommendations with our G20 counterparts, the next Government should increase participation and influence in key international fora on digital issues.**¹⁹

Given the growing importance of tech to UK exports, and the global growth in tech markets around the world, **the next Government should produce a long term plan for growing tech exports between now and 2030.**

This plan should consider key growth markets, barriers to trade and make recommendations on changes to domestic policy in order to help facilitate strong sustained tech export growth.

“
The UK should adopt global best practice in championing our tech sector to the rest of the world
”

5. The next Government should achieve a digital Global Britain by:

- 5.1 **Identifying the next five targets for embassy-based tech hubs** building on the initial five announced in the Digital Strategy.
- 5.2 **Creating a UK Global Tech Ambassador** with the status of Senior Diplomat.
- 5.3 **Increasing participation and influence in key international fora on digital issues.**
- 5.4 Producing a **tech export plan for 2030.**

SECTION 2

Economic Renewal Through a Modern Industrial Strategy

Tech shapes the future - it powers industrial revolutions, creates new markets, drives up productivity and improves living standards. The next Government must ensure the Industrial Strategy and the Digital Strategy build on the incredible success of the UK's digital economy. Digital is enabling growth across the UK, creating high-value jobs twice as fast as any other sector and doing so in all four corners Britain.²⁰

Get the foundations right and the UK can remain a world-leading digital economy, home to the pioneers and innovators of tomorrow.

Recommendation 6

Boost investment in the UK's R&D to rival the best in the world

The foundation of any innovation-led economy is its research and development (R&D) capabilities, in particular universities. **With four of the world's top 15 universities, the UK punches above its weight when it comes to R&D and the new Government must build on this advantage – it is the foundation of Global Britain.**

Our universities are essential anchor institutions for the digital economy in terms of the fundamental research that they undertake; the commercialisation of that research; and their ability to attract world leading talent and inward investment to the UK. They are also highly embedded in European research networks, such as Horizon 2020 and European Structural and Investment Funds (ESIF). As the Education Select Committee has shown, 18.3% of the total funds the UK received from the EU between 2007 and 2013 were to support science, research and innovation. Furthermore, the UK received €8.8 billion for research,

development and innovation while contributing €5.4 billion.²¹ As such, **any Brexit deal must retain access to international research partnerships, if the UK is to remain a world-leading base for R&D.**

Beyond universities, the UK continues to under-invest in R&D, currently spending under 1.67% of GDP on R&D, compared with an EU average of 2.03%²². The Europe 2020 initiative set a spending target of 3% of European GDP, and **techUK believes the next Government should adopt a target to spend 3% of GDP on R&D by 2025.** This will send an important signal to foreign investors and academics that the UK will remain a leading hub for innovation and scientific collaboration post-Brexit.

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 years.²³ As such, techUK urges the new Government to give **UK Research**

& Innovation (UKRI) powers to set science and innovation budgets over 10 year cycles. This will help ensure the long-term approach to R&D funding essential for delivering the most impactful results.

R&D does not solely happen in universities – much valuable R&D is carried out in supply chains. As the 2016 Deloitte Global Manufacturing Competitiveness Index (GMCI) noted, many businesses believe future competitiveness will be unlocked through the adoption of advanced technologies, especially the Internet of Things (IoT) and other smart technologies.²⁴ The UK, however, lags in incentivising this type of R&D in the UK. While corporation tax reliefs are available for R&D itself, techUK believes the next Government should go one stage further and **offer tax reliefs for companies investing in R&D facilities in the UK.** Ireland offers relief on costs relating to the construction or refurbishment of a building for the purpose of R&D activities, with proportional relief

available where at least 35% of the building is used for R&D facilities.²⁵ A similar policy in the UK would help further incentivise companies to fund their own R&D in the UK.

6. To ensure the remains leader in R&D for the digital economy, the next Government should:

- 6.1 **Retain access to international research partnerships,** such as Horizon 2020.
- 6.2 **Commit to spending 3% of GDP on R&D by 2025.**
- 6.3 Give UK Research & Innovation (UKRI) powers to **set science and innovation budgets over 10 year cycles.**
- 6.4 **Create an R&D Facilities tax credit** for expenditure incurred on constructing or refurbishing buildings for R&D activities.

Recommendation 7

Harness the power of tech to solve the UK's "productivity puzzle"

Since the 2008 financial crisis, UK productivity has stalled. Britain now ranks fifth in the G7 productivity table, 18 percentage points lower than the G7 average.²⁶ **Our low productivity means it takes a worker in Germany four days to produce what a worker in the UK does in five.** Poor productivity matters because improving productivity is the single most effective way of increasing living standards.

The UK's tech sector is uniquely placed to help Britain solve the "productivity puzzle". Highly digitised sectors (ICT, media, finance and professional services) experience faster productivity growth compared to less digitised sectors.²⁷ In the US productivity growth in these sectors has been four times that of the rest of the economy²⁸ and the productivity gap between digital frontier firms and all other firms has widened. UK SMEs, however, have a low level of uptake of certain productivity boosting technologies compared to their European peers.²⁹

Building on the Industrial Strategy Green Paper, the new Government should make an explicit commitment to **place digital transformation at the heart of its economic policy, supporting its role as an enabler for productivity gains across the economy.**

Increased digitisation of businesses across all sectors can help transform the UK into a highly competitive and productive 21st century economy. Adoption of basic technologies is now fairly ubiquitous but SMEs lag behind larger businesses in adopting more advanced technologies. In a survey for the former Department for Business, Innovation and Skills, UK SMEs rated their exploitation of digital technology at 5.86 out of 10, suggesting a strong recognition that digital technologies can be used more effectively.³⁰

Given the productivity uplift from adopting digital technologies, the new Government should **create a tax credit for SME investment in productivity enhancing digital**

technologies. This should be funded from the £23 billion Productivity Fund announced in the November 2016 Autumn Statement. Advances in cloud computing have reduced the cost of much software, increasing the potential value for money from such a tax credit.

7. The next Government can harness the power of tech to solve the UK's "productivity puzzle" by:

- 7.1 **Placing digital transformation at the heart of its economic policy,** understanding it as an enabler for productivity gains across the economy.
- 7.2 **Introducing an SME tax credit for investment in productivity enhancing digital products and services** paid for from the £23bn Productivity Fund.

Recommendation 8

Make the UK the best place to startup and scale a high-growth business

High-growth businesses are nearly twice as prevalent in the tech sector³¹ and **a boost of just one per cent to the UK's scale-up population will create an estimated 238,000 jobs and add £38 billion to GVA.**³² The next Government must commit to the UK Digital Strategy's aim to make the UK the best place to start and grow a digital business.

To achieve this ambition, the UK needs to ensure startups and scaleups have access to the finance and skills they need to flourish. Difficulty in accessing funding and talent are regularly cited as the main restrictions to scaleup growth in the UK. techUK welcomes the previous Government's Patient Capital Review, which aims to strengthen the long-termist culture in investment to help companies scale. To further this aim, the next Government should **establish a Patient Capital Council to deliver evidence-based policy recommendations on developing a culture of long-term finance for growing firms.**

UK VCs have been key investors of European Investment Fund funding in UK high-growth and innovative businesses. Research by the fund estimated that fundraising volumes backed by EIF in 2014 amount to 45% of the overall volumes collected by European VC investors.³³ London also ranks first for EIF-backed VC hubs, which underpin the UK's startup financing. To ensure the UK remains the best place for startup and scaleup financing, the new Government should strengthen the role of the British Business Bank (BBB). Investors have already noted a shift in EIF policy since Article 50 was triggered, with fund managers being told it will be much harder to secure EIF funding.³⁴ If the UK withdraws from the EIB or EIF as a result of Brexit, **the next Government should seek to at least double funding for the BBB in order to enable it to take on the EIB's role for tech ventures that struggle to secure funding through traditional lending routes.**

The UK faces a significant digital skills gap, which has been largely filled by international talent. Alongside access to finance, the next Government will need to **ensure the UK remains a global hub for international tech talent.** This is discussed at length in the previous section on Brexit.

Scaleups should also receive targeted support from public and private organisations. As recommended in the 2014 Scale Up Report, developed in close partnership with techUK, **national data sets should be made available so that local public and private sector organisations can identify, target and evaluate their support to scaleup companies.** Evidence-based policy making will help increase the impact of policy interventions.

8. The next Government can make the UK the best place to startup and scale a tech business by:

- 8.1 **Establishing a Patient Capital Council** to deliver evidence-based policy recommendations on developing a culture of long-term finance for growing firms.
- 8.2 **Strengthen the role of the British Business Bank (BBB)** to mitigate the impact of leaving the European Investment Fund and European Investment Bank.
- 8.3 Ensure **the UK remains a global hub for international tech talent.**
- 8.4 **Make national data sets available** so local public and private sector organisations can **identify, target and evaluate their support to scaleup companies.**

Recommendation 9

Create an open and dynamic regulatory framework for global competitiveness in the digital economy

The UK's innovation-friendly regulatory framework has greatly contributed to its position as Europe's leading digital economy. As Britain leaves the EU, it will gain greater power to shape its own laws. This offers opportunities to further enhance the UK's competitiveness by creating an open and dynamic regulatory landscape that encourages and enables innovation rather than picking winners or defending incumbents.

While there is an opportunity to enhance the UK's competitiveness, the new Government must also recognise the importance of regulatory certainty for tech businesses. Like many other sectors, our digital economy is intricately bound up in important EU regulation that is enabling, rather than constricting. The ultimate aim should be for good regulation, rather than blind deregulation, particularly given the threat of unintentional divergence from the single market, which could have a significant impact on tech businesses (as discussed in

the Brexit section above). As such, **the next Government should embed the European Better Regulation Guidelines³⁵ into UK legislative practices**, which the UK played a key role in drafting. This will help the UK develop regulation that achieves its objectives at minimum cost to business and government, while providing the certainty businesses in the digital economy need to thrive.

As digital technologies transform the UK's economy, the future Government must ensure the UK's regulatory framework is fit to make the UK home for innovative new businesses. For example, the internet sector is underpinned by important limitations to liability, which has led to significant foreign direct investment in the UK. **Any future legislation must take care to maintain the UK's attractiveness to foreign tech investment as well allowing new and disruptive business models to emerge.**

The UK should also seek to become the world's leading data protection jurisdiction. Data is the lifeblood of the digital economy and will become increasingly important as technologies, such as artificial intelligence and advanced analytics unlock new opportunities. As technology typically develops faster than regulation, the next Government will need to ensure the UK's regulatory framework is flexible enough to stimulate innovation, while retaining citizen confidence in the safe and fair use of their data. To this end, **techUK supports the creation of an independent Data Ethics Council to examine and report on ethical issues in data science and practices.** Drawing on the Nuffield Council on Bioethics, the new Council should engage with researchers, policymakers and the media to inform debates about these questions and provide expertise on emerging issues. This will help establish the UK as a world-leader in data ethics, shaping the norms that govern appropriate practices in data science.

In the short term, the aim must be for the UK to disentangle itself as delicately as possible from the body of European law while maintaining certainty and stability required for businesses in the UK. Ultimately, the aim should be for the UK to have one of the most progressive regulatory environments that sets an example to the rest of Europe, and the world.

9. To create the most open and dynamic regulatory environment to support innovation, the next Government should:

- 9.1 **Embed the European Better Regulation Guidelines into UK legislative practices.**
- 9.2 **Ensure legislation supports the development of high-growth and disruptive business models.**
- 9.3 **Support the creation of an independent Data Ethics Council** to shape the future norms governing data science.

Recommendation 10

Invest in world class digital and data infrastructure to unlock the next wave of digital growth

World class digital connectivity is critical for a truly Global Britain. It is a key driver for productivity improvement, facilitates innovation and delivers a range of social benefits. In the last five years we have seen a transformation in the connectivity available to the UK.³⁶ This has been brought about by billions of pounds of investment by both the private and public sector, and has been delivered while maintaining either flat or falling costs to the consumer.³⁷ Ensuring a policy and regulatory environment that promotes such investment is crucial and **Government should ensure the UK has a world-class digital ecosystem by providing clear leadership to drive private investment in digital infrastructure and innovative digital services.**

As the UK looks towards a post-Brexit environment, one of our key differentiators must be world-leading connectivity. In comparison to the EU5 the UK is already highly ranked for delivery, take-up and usage of broadband services³⁸ and the UK

is ranked 5th out of 50 countries for broadband accessibility and coverage as well as its investment in the Internet of Things (IoT) and mobile infrastructure projects.³⁹ But the UK will need to raise ambitions even further, to offer an environment which retains key skills and attracts inward investment. Where there are gaps in connectivity, these must be addressed urgently to avoid the emergence of a new digital divide, and the Government must reach out to the millions who are still offline and include them in our connected future. **Government should identify and address obstacles to broadband take-up, so that by 2020 more than 90% of premises will subscribe to a broadband service.**

As the infrastructure required to deliver connectivity is converging, there will not be a 'one size fits all' solution - UK Government will need to recognise and be open to different approaches and delivery of world class digital connectivity. By 2020, every premise should have access to

fast, reliable broadband; all motorways along their entire length should be covered by mobile broadband from all mobile networks; and on-board Wi-Fi should be available on all services operated on all major rail routes.

We are currently witnessing incredible advances in artificial intelligence, miniaturisation, computing power and storage that have the potential to dramatically change how we live and work. The most exciting advances lie ahead of us; in the next two years we will create more computer power than we have in all previous history combined. For the UK to remain a world-class global economy we will need to lead in both the development and adoption of these technologies. **Government should ensure Whitehall, Councils and regulators work together to speed up implementation of next generation communications technologies by tackling obstacles including planning permission, sharing existing infrastructure, and access by commercial operators to**

public land.

The UK is also the leading data centres market in Europe.⁴⁰ Data centres provide our core digital infrastructure, underpinning all economic sectors, and are the agents of growth for the knowledge economy. Data centres enable and power service economies in the way that heavy industry used to power manufacturing economies. The UK data centre sector is a global success story that disproves the traditional view that nation building industries must produce physical goods rather than services.

Rising energy costs are severely challenging the competitiveness of commercial data centre operators in the UK and are presenting obstacles to inward investment and sector expansion. Non commodity charges currently account for around 50% of the price of electricity and the proportion of these charges is set to rise by around 30% between 2017 and 2019 as the impacts of the Capacity

Market (CM), Contracts for Difference (CFD) start to be felt. Despite their central importance to the UK's digital economy, the Government has not extended the same compensations measures as to other energy intensive sectors. To make sure the UK retains this leading role, **the new Government should extend the same compensation measures to data centres as are enjoyed by other energy intensive industries.**

10. To achieve world class connectivity, the next Government should:

- 10.1 **Drive investment in digital infrastructure and innovative digital services**, ensuring the public sector is in the vanguard of their adoption.
- 10.2 **Ensure Whitehall, Councils and regulators work together to speed up implementation of next generation communications technologies**, tackling obstacles including planning permission, sharing infrastructure, and commercial operators access to public land.
- 10.3 **Identify and address obstacles to broadband take-up**, so that by 2020 more than 90% of premises will subscribe to a broadband service.

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- 10.4 **Create connectivity corridors on all major transport routes** including mobile broadband along the length of UK motorways and on-board Wi-Fi on all major rail routes.
- 10.5 Extend the **same compensation measures to data centres as are enjoyed by other energy intensive industries.**

Recommendation 11

Ensure the UK is at the forefront of the smart infrastructure revolution

The economic potential and social wealth of the UK is heavily reliant on infrastructure, with physical assets such as buildings, transport, and energy underpinning the basic functions of everyday life. UK capital stock is the lowest of all G7 countries and disjointed investment has meant the performance of UK infrastructure performs poorly compare with G7 countries.⁴¹ **The next Government must put digital at the forefront of the Infrastructure pillar of the Industrial Strategy.**

To maximise the capacity and resilience of existing infrastructure, ensuring assets continue to provide value now and in the future, **The next Government should ensure that infrastructure procurements are run on a whole-life cost basis.** This will help drive a change in behaviours across different industries and groups. This is necessary because sectors are facing a challenge of rising demand and an inability, either due to cost or physical constrictions, of building new infrastructure. This is a particular

issue for the UK's rail network but smart rail infrastructure can have a transformational effect on capacity and cost.

Digital signalling can support increases in the capacity of existing rail infrastructure,⁴² with more trains running per hour, while also creating the conditions for a more adaptive rail network that can minimise disruptions through smarter connections and timetabling. **Government should prioritise the Digital Rail project maximising the use of mature technology to realise faster benefits across our rail network.** The impact of a fully digital railway will be felt beyond the South East, bringing faster and different connections between regions such as the Northern Powerhouse cluster of cities.⁴³

Smart infrastructure can also transform the UK's energy system. A reliable and globally competitive energy system is absolutely crucial to the UK's long-term economic security. The UK needs to transition to a low-carbon energy future that is affordable for both consumers and businesses. Digital technology has a fundamental role to play in this transition, delivering value through at both the infrastructure and customer level. Utilising these technologies could deliver £23bn to the UK economy, including £5bn in exports.⁴⁴ Despite recent advances, more needs to be done to create a policy and regulatory framework that not only incentivises but prioritises innovation. To provide direction and long term certainty to industry, **the next Government should publish a roadmap for the delivery of a smart low-carbon energy system by 2030, setting out key milestones for industry to deliver against.**

11. The new Government can ensure the UK is at the forefront of the smart infrastructure revolution by:

- 11.1 **Placing digital at the forefront of the Infrastructure Pillar of the Industrial Strategy.**
- 11.2 **Running all Government infrastructure procurements on a whole-life cost basis** and enabling **social and environmental benefits to be accounted on balance sheets.**
- 11.3 **Publishing a roadmap for the delivery of a smart low-carbon energy system by 2030**, setting out key milestones for industry to deliver against.
- 11.4 **Prioritising the Digital Rail project** maximising the use of mature technology to realise faster benefits across our rail network.

Recommendation 12

Make the UK the most competitive market in which to research, develop and adopt Internet of Things solutions

The Internet of Things (IoT) can deliver significant benefits to our society and economy, enabling better health services, cleaner and safer societies, more efficient industries and stimulating new businesses. The UK benefits from a leadership position in IoT research⁴⁵ and there is a potential global market of over \$250bn by 2020.⁴⁶

Despite this the UK IoT market is stagnating. This means that we are neither getting the benefits of IoT, nor invigorating our domestic supply chain. To strengthen IoT adoption the next Government must renew its level of ambition and commitment to IoT, in particular by **working with industry to create a culture of confidence on the use of IoT solutions, tackling security, privacy and interoperability challenges in the market.**

In doing this, the next Government should seek to build on existing IoT trials⁴⁷ and use the National Productivity Investment Fund to deliver larger, at scale demonstrators of IoT. This would include **actively sponsoring and supporting “proof of concepts” and test beds in conjunction with industry to show the benefits of IoT adoption.** These should be promoted through existing organisations and structures, such as LEPs, and focus on replicable business models.

Tackling trust in IoT will help drive demand. However, **the new Government needs to work with industry to develop solution frameworks for sector-specific services that help customers to more easily understand and buy IoT services.**

12. The new Government can make the UK the most competitive market in which to research, develop and adopt Internet of Things solutions by:

- 12.1 Working with industry to **create a culture of confidence on the use of IoT solutions, tackling security, privacy, transparency and interoperability challenges in the market.**
- 12.2 **Actively sponsoring and supporting ‘proof of concepts’, test beds and demonstrators,** in conjunction with industry to show the benefits of digital technology adoption.
- 12.3 Working with industry to **develop solution frameworks for sector specific services** that help customers understand and buy IoT services.

SECTION 3

Building the Smarter State

The last decade has seen an increased understanding within Government of the importance of digital in driving transformation. Digital transformation will be vital to protecting our public services amid rising public sector debt and demands on usage. The smarter state also places tech at the heart of Government by increasing digital expertise in the Civil Service and ensuring Ministerial responsibility for transformation in each department.

Achieving this goal will require a radical rethink of how Government operates. It will also require the next Government to build a public sector that is “digital-by-default” and able to adapt to new technologies.

Recommendation 13

Put tech at the heart of Government

In a digitised world, tech increasingly underpins almost every part of our economy, our public services and our lives. **As such, it must have a voice at the top of Government.** This is particularly important throughout the Brexit negotiations which will have a significant impact on the UK's future as a world leading digital economy.

While the Secretary of State for Culture, Media and Sport currently participates in a number of key Cabinet Committees, including the Economy and Industrial Strategy Committee,⁴⁸ the Secretary of State does not currently sit on other Committees of key importance to the sector – namely, the Exiting the European Union and Trade Committees. **Given tech's vital role in the economy, the tech sector should be represented on key senior Cabinet Committees dealing with the economy, Brexit, security and public services.** The Secretary of State should be also given a role on the National Security Council alongside the Secretary of State

for Business, Energy and Industrial Strategy to reflect the growing importance of cybersecurity in keeping us safe.

As there is no area of Government where tech is not a vital consideration, **techUK believes that one Minister in every Department should be given responsibility for tech.** These Ministers would be responsible for driving consistent implementation of the Digital Strategy as well as aligning with the Government Transformation Strategy. In key Government Departments, including the Cabinet Office, Treasury, BEIS and DExEU, this Minister should hold the role of at least Minister of State.

“**techUK believes that one Minister in every Department should be given responsibility for tech**”

In order to coordinate this cross Departmental approach, the **Ministerial Digital Taskforce should be retained as a Cabinet Sub-Committee and its membership increased to include all Ministers with a responsibility for digital and tech issues.** Given the cross-cutting nature of tech, techUK believes the Minister with direct overall responsibility for digital should be given the right to attend Cabinet.

13. The next Government can ensure tech is represented at the highest levels by:

- 13.1 Ensuring that **the Secretary of State for Culture, Media and Sport is given a place on all senior Cabinet Committees dealing with the economy, Brexit, security and public services.**
- 13.2 Giving **one Minister in every Government Department clear responsibility for tech.**
- 13.3 **Retaining the place of the Ministerial Digital Taskforce as a Cabinet Sub-Committee.**

Recommendation 14

Unlock the next wave of Digital Transformation of Government

Achieving major change in the public sector is difficult - implementing new technologies in large complicated organisations with many legacy systems is challenging. However, these challenges are not unique - large, complex private sector organisations have been successful in using digital technology to develop new ways of operating. There is no fundamental reason why the public sector, working with the same broad ecosystem of technology suppliers, cannot do the same.

The new Government should be ambitious in its digital transformation aims. techUK believes the next Government **should create a formal target of ensuring that the majority of transactions carried out by Government are digitised by 2020.** In addition, the 150 highest volume digital transactions, including benefit transactions, should be entirely digital-by-default by that time. This would mean 95% of both public and businesses transactions with Government taking advantage of

digital processes.

Digital identification is a key piece of the digital transformation jigsaw and must be a priority. The flagship Government Digital Service (GDS) service, Verify, provides a single identification point for a dozen public services across a number of departments. However, a recent NAO report warns Verify “has been undermined by its performance and GDS has lost focus on the longer term strategic case for the programme”.⁴⁹

A single, trusted log in platform across all Government services is critical for delivering a Government which is “digital by default”. In its absence, users of Government services (including businesses) must rely on either fragmented identification processes across the range of services they are using or engage by post, phone or in person. This is also true for local government services, where Verify Local has failed to make a significant impact. **The next Government must refresh Verify, with a clearly defined strategy for its roll-out across government. This should also include how it will interact with Government Gateway,** which currently hosts 138 public sector services.

“**The next Government must refresh Verify with a clearly defined strategy for its roll-out across government**”

The use of digital technology must also form part of future progress on devolution. The creation of Metro-Mayors and other newly devolved forms of Government has given significant budgetary power to local areas. techUK has created a Digital Devolution: Guide for Mayors which encourages the new Mayors to embrace digital transformation by setting out what it can do for their administrations.⁵⁰ **The next Government should support local government to understand digital best practice and make digital a core part of future devolution deals.**

techUK was a leading advocate for a Chief Digital Officer (CDO) ahead of the 2016 London Mayoral election. In May 2017, Mayor of London, Sadiq Khan, fulfilled his manifesto pledge for a CDO, “tasked with ensuring that London’s globally renowned reputation for technological innovation is used to transform the way that public services are delivered in London, making them more accessible, efficient, and better suited to the needs of Londoners”.⁵¹

techUK urges the next Government to introduce a “Digital Devolution Dividend”, a £350 million fund to match any Metro Mayor investment in a CDO and rigorous city-region digital strategy, which aligns with the objectives in the Government Digital Strategy.

“**The next Government should introduce a £350 million *Digital Devolution Dividend***”

In addition to forming part of the procurement process, the next Government should ensure that technology is used to facilitate procurement itself. **The future Government should ensure it uses its buying power to encourage the development of technology in order to reduce long term pressure on the public purse.**

The Digital Marketplace, and GCloud in particular, has benefited both Government and Industry. Research by IIAPS suggests that services bought through GCloud can save the taxpayer as much as 50% when compared to legacy contracts, while 80% of SMEs told techUK that GCloud had helped them to access the market, and 86% thought that it should be used more widely in Government.

14. The next Government can unlock the next wave of digital transformation by:

- 14.1 Aiming for the **bulk of transactions with the Government to be digitised by 2020.**
- 14.2 **Refreshing the Verify rollout, with a clearly defined strategy for its implementation across government.**
- 14.3 Introducing a **“Digital Devolution Dividend”, a £350 million fund to match any Metro Mayor investment in a CDO and rigorous city-region digital strategy, which aligns with the objectives in the Government Digital Strategy.**
- 14.4 **Making technology a compulsory part of future devolution deals.**
- 14.5 **Expanding the use of the Digital Marketplace** by doubling the number of non-Whitehall parts of the public sector using the system in procurement processes.

Recommendation 15

Address the barriers to digital innovation in health and social care

Over the next five years, the demand on the NHS and social care will reach unprecedented levels. This challenge cannot be met without a revolution in productivity and delivery. The potential to improve outcomes and reduce costs through better use of technology is enormous and **the next Government must address the existing barriers that are hindering digital innovation in our health and social care services.**

True digital transformation will require giving the largest public bodies the necessary funding to allow capital expenditure on new technologies. This is particularly important for the NHS where long term pressures on the service will require active use of technology. Typical spending by acute trusts amounts to between 0-3% of overall expenditure.⁵² Evidence suggests that investing in new technologies, such as early warning systems can both dramatically improve health outcomes and also reduce time spent in hospital, benefiting both patients and NHS

budgets.

To provide the financial capacity needed to undertake true technological transformation within the NHS, **the next Government should allocate £1 billion a year for digital transformation in the NHS to provide new technology and more efficient service delivery to support patients and improve outcomes.**

This would mean an increase in the sustainability and transformation budget from 2% to 3% of NHS England spend, bringing it closer to average private sector IT spend.

Current restrictions mean that NHS data is severely underutilised. **The new Government should undertake a full review of current NHS Data Practises and develop an Open Data plan that allows businesses, at little cost to utilise NHS data for the purposes of technological interventions.** Such a plan could include requirements that these interventions are provided at a reduced cost to the NHS as the data supplier before they are exported around the world to other health providers.

“**The next Government should allocate £1 billion a year for digital transformation in the NHS**”

15. The next Government can address the barriers to digital innovation in health and social care by:

- 15.1 Allocating **£1 billion a year for digital transformation in the NHS to provide new technology and more efficient service delivery.**
- 15.2 Creating an **NHS Open Data plan to enable innovation and investment in UK MedTech.**

Recommendation 16

Develop digital expertise within the Civil Service

One of the UK's greatest assets is its Civil Service. **Ensuring that it adapts to an increasingly digitised world will be important in maintaining this vital resource.** To become the home for the next generation of high-growth tech businesses, the UK will need an open and dynamic regulatory framework but this requires up-to-date technical expertise at the heart of government. Failing this, the UK risks being unable take full advantage of new innovations and the chance to ride the next wave of digital growth.

Tech policy issues are often complex and require a high level of technical knowledge. Given recent civil service reforms, not least the creation of three new Departments (BEIS, DExEU and DIT), it is vital the new Government allows the civil service adequate time to develop expertise in specific areas. **The next Government should consider placing three year minimum periods for those in technical areas to ensure those dealing with complex topics are able to develop deep knowledge in these**

areas.

Creating a truly Smarter State requires a step change in civil service digital skills. The recently established Government Digital Service's Academy programme will be important in providing a solid foundation for civil servants in a range of digital skills. **The next Government should commit to ongoing resourcing of the Academy as part of the Government Digital Service.** It should also expand its scope to provide world class training across both Whitehall and Local Government.

In addition, the Government should seek to ensure that both senior civil servants and new entrants are given the tools needed to create a digital Government. Senior civil servants should be given bespoke training on the benefits that technology can bring to the delivery of their Department's business plan. Meanwhile, **new entrants to the Fast Stream should also be provided with digital skills training during their initial departmental rotations.**

16. The next Government can enhance expertise in the Civil Service by:

- 16.1 **Minimum three year placements for civil servants in technical roles.**
- 16.2 Expanding the Digital Academy programme to **ensure that digital skills are embedded throughout Government.**
- 16.3 **Including digital skills as part of all Fast Stream training.**

Recommendation 17

Innovate by instinct in the defence supply base

Renewed emphasis on engaging new suppliers has been a welcome shift in the MoD. In order to harness the ingenuity and creativity of the UK's digital sector, the new Government must seek to engage non-traditional SMEs and start-ups with defence challenges in ways that appeal to their more rapid and agile ways of working.

It is vital for Government and MoD to appreciate the real challenges posed by supplying into UK Defence. Long programme timescales with limited opportunities for consistent revenue generation, twinned with rigid commercial processes that demand much from a new supplier, can act as a disincentive for digital technology companies.

In broad terms, the creation of a UK Defence 'ecosystem', fostering a diverse community of suppliers should be a primary focus defence policy. To create and sustain a globally competitive industry, the next Government must move away from a completely transactional relationship

with industry towards long-term strategic relationships with suppliers of all sizes. This will help create an environment that encourages SMEs and new entrants to challenge received wisdoms and deliver innovative solutions. To this end, **the next Government should develop long-term strategic relationships with suppliers of all sizes, including in non-traditional sectors, such as digital.**

In order to fully use this new relationship with industry, both with traditional suppliers and new entrants, MoD must make a full commitment to innovation. Programmes such as the Defence Innovation Initiative must operate in a way that truly engages with our industry. It is of vital importance that a new Government ensures the associated innovation activities are adequately funded in the short term, commercially viable in the long term, and are linked end-to-end to a committed defence customer. To this end, **the new Government should establish a Digital Adviser as part of**

the Defence Innovation Initiative to champion the transformational role of digital.

“ The new Government must engage digital and tech SMEs to deliver innovation in the supply chain ”

17. The new Government can do this by:

- 17.1 **Developing long-term strategic relationships with suppliers of all sizes**, including in non-traditional sectors, such as digital.
- 17.2 **Establishing a Digital Adviser as part of the Defence Innovation Initiative** to champion the transformational role of digital.

SECTION 4

Nurturing Skills for the Jobs of the Future

The UK tech sector faces a triple hit on digital skills. Alongside the existing digital skills gap in the UK, significant uncertainty on the access to EU talent, and new restrictions to hiring non-EEA workers introduced in April 2017 risk hindering growth. The dynamism of the sector means tech creates new jobs at nearly three times the rate of the rest of the economy, and demand far outstrips supply.

To capitalise on the next wave of digital growth, the new Government must ensure developing the skills needs for the jobs of the future is at the heart of its agenda.

Recommendation 18

Equip future generations with world class digital skills from an early age

There have been a number of positive developments in recent years – many of which have been driven by industry and Government working together effectively. The introduction of the computing curriculum, T-Levels, and a new National College for Digital Skills are notable successes. The UK, however, still faces a sizeable domestic digital skills gap, which must be closed if Britain is to be one of the world’s leading digital economies.

The £1000 Immigration Skills Charge, added to all Tier 2 visas and long-term Intra-Company Transfers since April 2017, is set to raise approximately £250 million in 2017-18 financial year alone, based on calculations by the Migration Advisory Committee.⁵⁴

The Government should ring-fence this initial £250 million raised to fund investment in domestic digital skills programmes. This would meet a central commitment in the Digital Strategy to boost the UK’s digital skills and help scale existing initiatives. Thereafter, the annual funds raised by the charge should continue to be used

to develop UK digital skills initiatives.

“**The UK has a sizeable digital skills gap which must be closed if Britain is to be a world-leading digital economy**”

The computing curriculum in England marked a new departure in teaching the skills needed for a digital age. However, a 2015 survey found that almost a third of teachers do not feel confident in their ability to teach coding effectively, while nearly half (42%) do not believe that they have received adequate training and support.⁵⁵ Teachers must be confident in the subject matter to ensure young people are excited and empowered by technology. As such, **the new Government should commit £50 million in additional Continued Professional Development (CPD) funding for computing teachers.**

Schools should also use additional funding to understand how to implement the STEAM agenda, connecting arts and STEM subjects.

Projects such as Samsung's 'digital classroom', teaching maths and science through music at the Royal Albert Hall, help inspire children to apply technology in other subjects. Developing broader creativity and problem solving skill sets will be

increasingly important as technology reshapes the jobs of the future.⁵⁶

The new National College of Digital Skills (known as 'Ada') is a transformative new model for 16-18 learning, aligned with needs of industry. This specialist further education institute is tailored to fit the UK's need for higher-level digital skills, and is also in part a social mission to upskill socially disadvantaged young people. This model is a commendable means to address the digital skills gap, and **the next Government should roll this model out nationally.**

Everyone will need basic digital skills to participate in normal daily life, whether it is to communicate, find information or purchase goods and services. Yet there is a digital divide where up to 11.5 million adults lack basic digital skills⁵⁷ and 5.3 million people in the UK have never used the internet.⁵⁸ Digital exclusion will be a major inhibitor to digitising public services and hamper social mobility.

The new Government should commit £10 million in funding to help significantly reduce digital exclusion over the term of the next Parliament.

18. The next Government can equip the future generation with world class digital skills from an early age by:

18.1 Ring-fencing the £250 million revenue raised by the immigration skills charge to help fund major domestic digital skills programmes such as:

18.1.1 Equipping teachers with the skills to effectively deliver the computing curriculum by allocating £50 million in funding for CPD training.

18.1.2 Reversing cuts in the arts curriculum funding to deliver the STEAM agenda – connecting STEM and the arts.

18.1.3 Expanding the National College for Digital Skills model nationally.

18.2 Providing £10 million in funding to help significantly reduce digital exclusion over the term of the next Parliament.

Recommendation 19

Create an apprenticeship programme fit for the future

The Government has identified apprenticeships as a key means of addressing the skills gap, and the tech sector is committed to ensuring it works. There is no doubt vocational training could offer a route to fixing the UK's talent pipeline, however, the next Government must do more to understand the needs of the sector and work with industry to ensure the apprenticeship programme (and the Apprenticeship Levy) have a positive, long-lasting impact on increasing digital skills provision in the UK.

Digital skills must be at the heart of every apprenticeship standard.

As the UK grows its domestic talent pipeline, we must look ahead to the jobs of the future and ensure the workforce is equipped with the skills it needs. As such, digital skills must form part of the core of each apprenticeship, regardless of what level or qualification.

The Apprenticeship Levy risks undermining current training initiatives as well as investment in future ones. **Tech companies welcomed the confirmation that from 2018, organisations would be able to transfer 10% of their Levy funds to another organisation within the digital apprenticeship system. However, the next Government should increase this percentage to 80%.** This will allow organisations to invest in schools, charity organisations, and SMEs in their local areas to train people in digital skills and build local ecosystems.

Additionally, there is a real opportunity to make the Apprenticeship Levy more flexible so it can be adapted to future ways of working. It is imperative that a culture of lifelong learning is forged to ensure that companies are investing in genuinely valuable skills for the future.

Employers should be incentivised to use the Levy to reskill employees in areas where apprenticeships are unavailable, such as training for new roles as they are created.

19. The next Government can create an apprenticeship programme fit for the future by:

- 19.1 Placing **digital skills training at the heart of every apprenticeship.**
- 19.2 **Increasing the percentage of transferable funds in the Apprenticeship Levy** from 10% to 80%.
- 19.3 **Introducing greater flexibility in the use of the Apprenticeship Levy** for other industry-led training initiatives.

Recommendation 20

Inspire girls and women to work in tech

Women occupy just 17% of tech jobs, and fewer than one in ten of these women are in leadership positions in the sector.⁵⁹ A lack of female applicants makes it difficult for tech businesses to achieve a more even gender balance, and means businesses miss out on a large proportion of the talent pool.

As the tech sector has recognised that it suffers the consequences of a lack of gender balance, it has become evident more must be done in partnership to ensure the female tech talent pipeline is cultivated.

Starting at the beginning of the pipeline, there is a significant issue in girls' GCSE and A-level choices. 65% of the UK's mixed secondary schools have no girls doing Computing at A Level and many have no girls doing any STEM subject in the sixth form.⁶⁰ The UK's digital skills gap will not be addressed if so much talent is lost after GCSEs. Advice and guidance is critical for girls who are interested in studying and pursuing STEM subjects further.⁶¹ techUK's Women

in Technology programme works hard to increase the uptake of girls taking STEM subjects, specifically through partnering with the Women in Science and Engineering Campaign (WISE) to bring the 'People Like Me' pack online.⁶² This is a resource pack specifically designed to encourage and empower girls to continue with STEM subjects and show which STEM careers could be of interest. **The next Government should commit £20 million to support industry-led existing initiatives that encourage girls to pursue STEM subjects.**

“**Women occupy just 17% of tech jobs and fewer than one in ten of these women are in leadership positions**”

Retaining female tech workers is also a challenge. Almost two million women in the UK are currently economically inactive due to caring commitments, and 76% of professional women on career breaks want to return to work.⁶³ techUK identified this as an issue and recently launched a Returners Hub⁶⁴ serving as a one-stop shop for individuals looking to return to the tech sector and for employers to explore training initiatives. Further collaboration and incentivisation must take place for hiring returners to become more commonplace. To encourage this amongst businesses, **an employer's national insurance holiday should be introduced for organisations who are hiring and re-training returners.** This could lead to savings of up to £5,000 per employee per year for employers, creating a greater incentive for employers to hire returners.

20. The next Government can inspire girls and women to work in tech by:

- 20.1 **Improving careers advice and guidance for girls interested in STEM** subjects by investing in £20 million to scale existing initiatives.
- 20.2 **Introducing an employer's national insurance holiday for organisations re-training returners,** similar to the scheme currently in place for employers who hire under-21s.

Recommendation 21

Develop clear policy on the future of work and lifelong learning

Tech and digital are changing the fundamental nature of work in every sector – from the invention of autonomous vehicles to the digitisation of manufacturing across the UK. Gaining a better understanding of these shifts and planning ahead will be critical for the next Government. Unlike previous industrial revolutions, policy makers have greater insight into the changing landscape and potential outcomes. **To ensure this revolution benefits UK workers, people will need meaningful lifelong learning opportunities, providing them with the skills they need for work in the 21st century.**

A radical rethink of education policy is necessary to adequately prepare for the future of work. The current education system emerged out of the radical socio-economic changes brought about by the First Industrial Revolution. The Fourth Industrial Revolution will similarly transform our society as technological advances in AI and robotics reshape the labour market. Currently, the UK education system rewards on ability to acquire knowledge and recall information in standardised methods of examination. As technological innovation increasingly provides options for automation, including those white collar jobs once thought immune, individuals will benefit far more from a skill set based on the application, rather than the acquisition of knowledge. techUK believes **the next Government should launch an independent Commission into the entire education system, from primary school to lifelong learning initiatives, to ensure people have the skills to flourish in a 21st century economy.**

Adult education infrastructure will be critical for establishing an effective lifelong learning system. In 2015-16, adult education budgets saw a 29% cash term reduction.⁶⁵ Protecting this budget is fundamental to ensuring there are sufficient pathways for adults looking to reskill in their local areas. **The next Government must protect the adult education budget if it is to deliver meaningful lifelong learning for adults to reskill throughout their lives.**

21. The next Government can develop clear policy on the future of work and lifelong learning by:

- 21.1 Launching an **independent Commission into the entire education system, from primary school to lifelong learning**, to ensure people have the skills to flourish in a 21st century economy.
- 21.2 **Protecting the adult education budget in real terms** to enable continued lifelong learning at a local level.

Recommendation 22

Opening up to the pioneers and innovators of tomorrow

Since the Coalition Government's immigration reforms, leading tech voices have been highlighting the way these risk starving the tech industry of the skills it needs to maximise growth. techUK believes, alongside key negotiation priorities for EU citizens in the UK, **reforms to the current system for non-EEA international talent are vital to securing the high-skilled workers the UK requires for short- to medium-term economic growth.** This is in tandem with continued Government investment in our domestic digital skills initiatives as outlined above.

Within Tier 1, the Tech Nation visa offers a route for exceptional tech talent to reside in the UK. While techUK is supportive of the Tech Nation route, it is yet to provide the volume of talented individuals to significantly enhance the UK's tech ecosystem. Each party has set out its vision for the UK to be a magnet for international talent and a home to the pioneers and innovators who will shape the world ahead. The tech

sector wholeheartedly agrees with this sentiment, and **the next Government should undertake a review led by the independent Migration Advisory Committee to understand how to make better use of the Tier 1 route.**

“**The UK must be a magnet for international talent and a home to the pioneers and innovators who will shape the world ahead**”

The Tier 2 visa is the main immigration route for skilled workers coming to the UK to take up employment, and the tech sector is a large user of this route. techUK has long argued that the Tier 2 visa system needs reform to deliver the skills the tech sector requires.⁶⁶ As the UK tech sector grows, it employs more UK professionals but also relies on the ability to hire skilled employees via the Tier 2 visa route. Limiting the ability to recruit non-EEA talent will limit the sector's growth. Accordingly, the next Government should consider **increasing the monthly cap on the Tier 2 skilled worker route and reconsidering the existing salary caps on Tier 2 General and ICT workers**, showing that the UK is open to talent from around the world. This would send a positive message to business, particularly multinationals who need to make the case to global headquarters on why the UK is the best place to invest in a tech company when there is a period of uncertainty on ongoing access to EU talent.

22. To ensure the UK remains a hub for global tech talent, the next Government should:

- 22.1 Undertake a review led by the independent Migration Advisory Committee to **understand how to make better use of the Tier 1 “Tech Nation” route.**
- 22.2 **Increase the monthly cap on the Tier 2 skilled worker route** and reconsider the existing salary caps on Tier 2 General and ICT workers.

SECTION 5

Creating a Safe and Secure Digital World

As the world becomes more digital, ensuring safety and security for people, businesses and infrastructure is of critical importance. The UK needs to build on its strong cyber security credentials while also making the UK the safest place for people to go online. Essential cyber security tools, such as encryption, must be protected, and young people must be supported to develop digital resilience to navigate the online world safely.

Recommendation 23

Make the UK a world leader in cyber security

The May 2017 ransomware attack highlighted the ever increasing cyber threat facing organisations around the world. The UK has excellent security capabilities, led by the new National Cyber Security Centre. The next Government, however, 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, while also encouraging and incentivising businesses to strengthen their cyber resilience.

The ransomware attack also underlined the vulnerability of public services to cyber-attacks, with a number of frontline NHS services substantially disrupted. This shows the critical importance of maintaining the highest level of cyber defences. The previous Government provided a welcome increase in cyber investment, committing £1.9 billion in its 2016 National Cyber Security Strategy⁶⁷, up from £650 million in 2011-2015.

techUK calls on the new Government to provide a 10% increase in the total

National Cyber Security Strategy budget to strengthen government and public sector ICT. This would equate to almost £200 million in extra funding.

One of the most fundamental cyber security tools is encryption. Recent comments to allow backdoors to encryption are misguided and would significantly undermine encryption – a backdoor for government is a backdoor for those with malign intentions. While the sector recognises the need to tackle issues surrounding online security and extremist content, targeting encryption is not an effective policy. **The new Government should unambiguously commit to protecting encryption.** The sector will continue to play its part in a robust rule-of-law approach to national security issues.

Encouraging cyber best practice is also crucial. **The next Government should build on the Cyber Essentials Scheme by working with industry to ensure it is updated to deal with increasingly sophisticated threats.**

This will help build a culture of best practice to enable UK businesses enhance their cyber security. **To promote the uptake of the Essentials Scheme, the Government should make Cyber Essentials certification a requirement for any Government procurement.**

While the Essentials Scheme is designed to tackle cyber security basics, companies should also be incentivised to invest in the most up-to-date cyber security products. This is particularly important for the many businesses that store personal or other sensitive data. **techUK urges the next Government to develop a cyber security tax credit for SMEs who invest in more sophisticated cyber security solutions.**

23. To ensure the UK takes full advantage of its strength in cyber security, the next Government should:

- 23.1 Provide **a 10% increase in the total National Cyber Security Strategy budget to strengthen government and public sector ICT.**
- 23.2 **Commit to protecting end-to-end encryption** while supporting a robust rule-of-law approach to law enforcement.
- 23.3 **Work with industry to update the Cyber Essentials Scheme** ensuring it is fit for purpose amid increasingly sophisticated threats.
- 23.4 **Require Government procurement to come from Cyber Essentials approved organisations.**
- 23.5 Provide **a cyber security tax credit for startup and scaleup businesses to promote safe and secure innovation.**

Recommendation 24

Make the UK the safest place to go online

The UK tech sector wants Britain to be the safest place for people to go online in the world. Parents need to be empowered to support their children when it comes to online safety and schools need a truly 21st century approach to help children develop digital resilience. Government, law enforcement, NGOs and industry must continue their world-leading partnership model to tackle online safety.

There have been numerous attempts by Government create a holistic online safety strategy over the last decade, most recently the Internet Safety Strategy. While the sector wholeheartedly supports the aims of these various strategies, the constant revisions and reformulations have prevented a long-lasting and evolutionary approach to online safety issues. techUK believes **the next Government should commission an independent and detailed review into current best practice in industry and education to underpin a long-term and evidence-based strategy**

for online safety. Any new internet safety strategy must be grounded in the evidence and must lay the ground for an evolutionary approach, building on the extensive work the sector has done in this area over the past decade.

Any online safety strategy must also empower children with the tools they require to navigate the online world safely. This is known as “digital resilience”. There is a key role for the Department for Education to play here in ensuring an effective curriculum. To this end, techUK urges **the new Government to work with industry and experts to develop a new PSHE curriculum in “Developing Digital Resilience” to roll out to schools nationally.**

The UK Council for Child Internet Safety (UKCCIS) has been an effective forum for industry, Government and experts to enhance child online safety. techUK is fully supportive of UKCCIS but believes it could benefit from having the voice of children represented directly. **techUK believes the Children’s Commissioner should be given a seat of the board to ensure it is part of a co-ordinated approach to keeping children safe online.**

24. To make the UK the safest place to go online, the next Government should:

- 24.1 Commission an **independent and detailed review into current best practice in industry and education to underpin a long-term and evidence-based online safety strategy.**
- 24.2 **Give the Children’s Commissioner a seat on the board of UKCCIS** to represent the voice of children directly on the Council.
- 24.3 **Develop a new PSHE curriculum in “Developing Digital Resilience”** to roll out to schools nationally.

Conclusion

In the face of the most profound political change in Britain since the Second World War, the next Government has no choice but to invent a new future for the UK. Coming at a time when new technologies are also reshaping our economy and society, this creates an opportunity for the UK to harness the power of digital technologies and create an economy that works for everyone.

techUK's manifesto sets a roadmap for this economic renewal and we urge the next Government to consider these ideas closely as it embarks on this defining moment in modern British history. While these recommendations are focused on the things that government can do, the next administration will not be able to 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.

The sector also recognises that it must be an active partner in helping to invent and shape a new future for the UK. No other sector has quite the same potential for delivering economic and social transformation but UK tech must acknowledge the policy challenges this entails. The sector commits to support Government in bold and forward-looking policy choices that can create a prosperous future for all those in the UK.

As the UK reinvents itself outside of the European Union, the next Government and the sector need to work with, rather than against, the grain of change. Building on the Industrial Strategy Green Paper, both the new Government and industry will need to understand and take full account of the opportunities and challenges posed by globalisation, and digitisation. We will also need to think as carefully about people as we do about business, and enable innovation rather than picking winners or defending incumbents.

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