STAKEHOLDER INPUT REPORT

Tech for Good, Tech for Growth

PICTFOR

Foreword

The Parliamentary Internet, Communications and Technology Forum (PICTFOR) is one of the largest and most active All-Party Parliamentary Groups (APPG). We bring together engaged Parliamentarians with key industry stakeholders to discuss issues on tech, communications and internet policy, as well as many more issues facing the sector. Facilitating frequent, high-level discussions between policymakers and thought leaders across the sector, PICTFOR creates unique opportunities to exchange ideas and enhance Britain's competitiveness as a digital economy, whilst championing those members of the tech sector who have a social purpose.

Never before has the combination of these two values been more important for the UK, both economically and socially. Continued economic uncertainty combined with persistent social division and renewed public interest in the implications of technology on our lives, has meant that organisations – of all sorts and in all sectors – must increase transparency, flex their commitments to societal good, and signpost their wider economic contributions. It is against this backdrop, and with lessons still being learnt from the UK's societal response to the Pandemic, that PICTFOR continues to make the case that when regulated effectively and delivered equally, the tech, communications and internet sectors can and should play a central role in our nation's physical, mental, societal, and economic health.

PICTFOR, our Vice-Chairs and our members would like to thank our outgoing Co-Chair, Darren Jones MP for his support for the Group since 2017. Darren's advocacy for the tech sector and impactful tech policy has helped to maintain a long tradition of collaboration between Parliament and the tech sector.

PICTFOR's response to this backdrop

Every 12 months, for the tech sector, sees many significant milestones which policy makers, industry leaders, and interested commentators alike might call 'turning points.' This makes the labelling of any 12 month period as 'landmark', or 'significant' rather impotent, but nonetheless, the past 12 months have been significant for the tech sector.

Technology has, at times unwillingly, played a central role at the heart of some of the most defining discussion points of the last year; the ongoing conflict in Ukraine and the use of tech as a weapon in the communications war there remains pertinent, and rapid advancements in the consumer functionality of generative AI have raised fresh discussions about the evolution of artificial intelligence and the potential impact of technology on our social values, our media practices and even our democratic processes. The steady development of, and interest in, the Metaverse has forced a shift in the everyday citizens' perception of the internet, of what it is used for and what engaging with it feels like.

As a result, in the last 12 months especially, the way in which the public perceive and engage with our sector has shifted. This has not been an overnight phenomenon, far from it, but increased media discourse on the activity of the tech sector means increased public interest.

It has also meant increased parliamentary understanding, intrigue and scrutiny. In the last 12 months alone, Parliament has held sessions looking at the delicate relationship between privacy and data, at the emerging use of quantum technologies, at the governance of artificial intelligence, the role that tech should play in shaping the UK's ongoing pandemic recovery efforts and the Lord's inquiry into digital exclusion and the cost of living crisis. The Online Safety Bill has almost concluded its passage through Parliament, representing a unique opportunity for UK regulators to work with industry to create safer spaces online, harnessing the wonders of technological advancement, encouraging enterprise, seizing the opportunities these present, but reducing harm along the way.

PICTFOR too have played a role in shaping this debate. At the start of the year we adopted two key themes, a frame through which each of our discussions would view the role of the tech sector;

1. The Cost of Living and Economic Growth – How can the tech sector work with Parliament to help address the cost-of-living crisis and drive economic growth

2. Digital Inclusion and Skills – How can the sector use 2023 to tackle the digital divide, end digital poverty for good, and address the demand for a highly skilled digital workforce?

We have convened discussions on the emerging technologies which present the greatest opportunities for growth, have looked at the demand for a skilled and diverse workforce, have discussed what developments of and investment in the UK's digital infrastructure could do to accelerate tech adoption and to boost digital inclusion.

As the Chair and Treasurer of PICTFOR, we believe that technology can and should play a central role in shaping the UK's response to the biggest challenges we face. When utilised to its full and benevolent potential, the technology harnessed by PICTFOR's members can transform communities, generate untold economic opportunities and problem solve at a pace never seen before.

Tech for Good and Tech for Growth; it is when these dual purposes combine, as they so often do in our sector, that the real benefits of technology can be felt.

This report provides a snapshot into the activity of our members who ardently support this duality. It contains insights on the intrinsic link between technology and global trade, on the use of immersive and educational tech to boost skills and community cohesion, on the use of digital tools to assess and grow productivity, and much more.

We have been proud to facilitate such a comprehensive response to an unprecedented challenge. In these dynamic and challenging times, it is more important than ever that we champion solutions and innovation and do everything we can to support economic growth and social purpose missions.

The ideas included within this report have the scope to support businesses, to bolster the economy and to shape social endeavours for generations to come and we are grateful to all those who have contributed.

Lord Tom McNally, PICTFOR Treasurer

Dame Caroline Dinenage MP, PICTFOR Chair

Ongoing Activity

PICTFOR will continue to act as a forum for the internet, communications and technology sectors through virtual events and engagement – our next event will be the launching of this report in the House of Commons.

Throughout the autumn we will be hosting events with members of the Digital Regulation Cooperation Forum including the Information Commissioner and Chief Executive of Ofcom, an event on the importance of keeping women safe online and the implications AI has on this, as well as our Annual Dinner, our most prestigious event of the year in the House of Lords, celebrating the ongoing relationship between Parliament and the tech sector.

Arqit – Tech and trade

A UK headquartered leader in quantum-safe encryption, Arqit is dedicated to creating stronger, simpler encryption for all networked devices to keep the data of responsible governments, enterprises and citizens safe.

Arqit supplies a unique quantum-safe encryption Platform-as-a-Service which makes the communications links or data at rest of any networked device or cloud machine secure against current and future forms of attack – even from a quantum computer. Arqit was recently awarded the Innovation in Cyber award at the UK National Cyber Awards and Cyber Security Software Company of the Year Award at the UK Cyber Security Awards.

Tech and trade

The COVID-19 pandemic catalysed the digital transformation of global trade, necessitating businesses and financial institutions to find alternative methods to transact amidst office closures and remote work. The transition to digital document exchanges demonstrated the potential for streamlining processes, reducing costs, and maintaining the continuity of commerce.

Our newest product **TradeSecure™** uses advanced cryptography and distributed ledger technology to enable businesses to finance their supply chains using highly secure referenceable digital negotiable instruments which are safer, easier and faster to manage than paper-based alternatives. Arqit is a security partner of the **Centre for Digital Trade and Innovation (C4DTI)**, supporting the centre to deliver digitally secure, globally interoperable trade solutions, and to educate businesses on the benefits of secure digital trade solutions and the commercial case for adopting them.

In June 2023, we announced our leading role in the successful completion of a pilot project orchestrated by the International Chamber of Commerce UK (ICC) and C4DTI that delivered the **world's first quantum-secure cross-border electronic trade document transaction**. This successful pilot between the UK and Singapore, supported by the Singapore Government agency the Infocomm Media Development Authority, delivered a verifiable, secure and scalable solution that will make international trade cheaper, simpler, faster and more sustainable.

Arqit's TradeSecure™ generated digital negotiable instruments protected by a quantum-secure 'seal', facilitating their secure transfer across digital platforms, thereby removing friction from trade. Leading law firm Watson Farley & Williams LLP has advised that the electronic promissory note and bill of lading used in the project **satisfy the requirements of the Electronic Trade Documents Bill as regards possession and transfer of possession**.

Tech and trade – future engagement

Arqit welcomed the introduction of the Electronic Trade Documents Bill, and it was very encouraging to see the fast pace of the legislation through both Houses and the cross-party support it received. This important legislation will transform trade and sets the stage for a potential surge in economic growth (£25 billion by the end of 2024) as per the ICC, through the digitisation of trade documents.

It is vital however, that now the legislation has been passed that the UK Government does not rest on its laurels. As nations look to realise the significant benefits from trade digitalisation, we need to use this moment to turbocharge its adoption across the world. We need to educate British business on the benefits of secure digital solutions, fostering efficiency, reducing costs, and enhancing customer satisfaction.

BT Group

BT launches Immersive Spaces: the UK's first 5G-enabled, interactive simulation experience

Case study – Immersive spaces

BT Immersive Spaces simulates real-life environments for business and public sector organisations – including education, healthcare, retail, transport, and tourism. We will focus more specifically on how two schools in Scotland and South Wales are using the technology to create fully immersive and interactive classrooms.

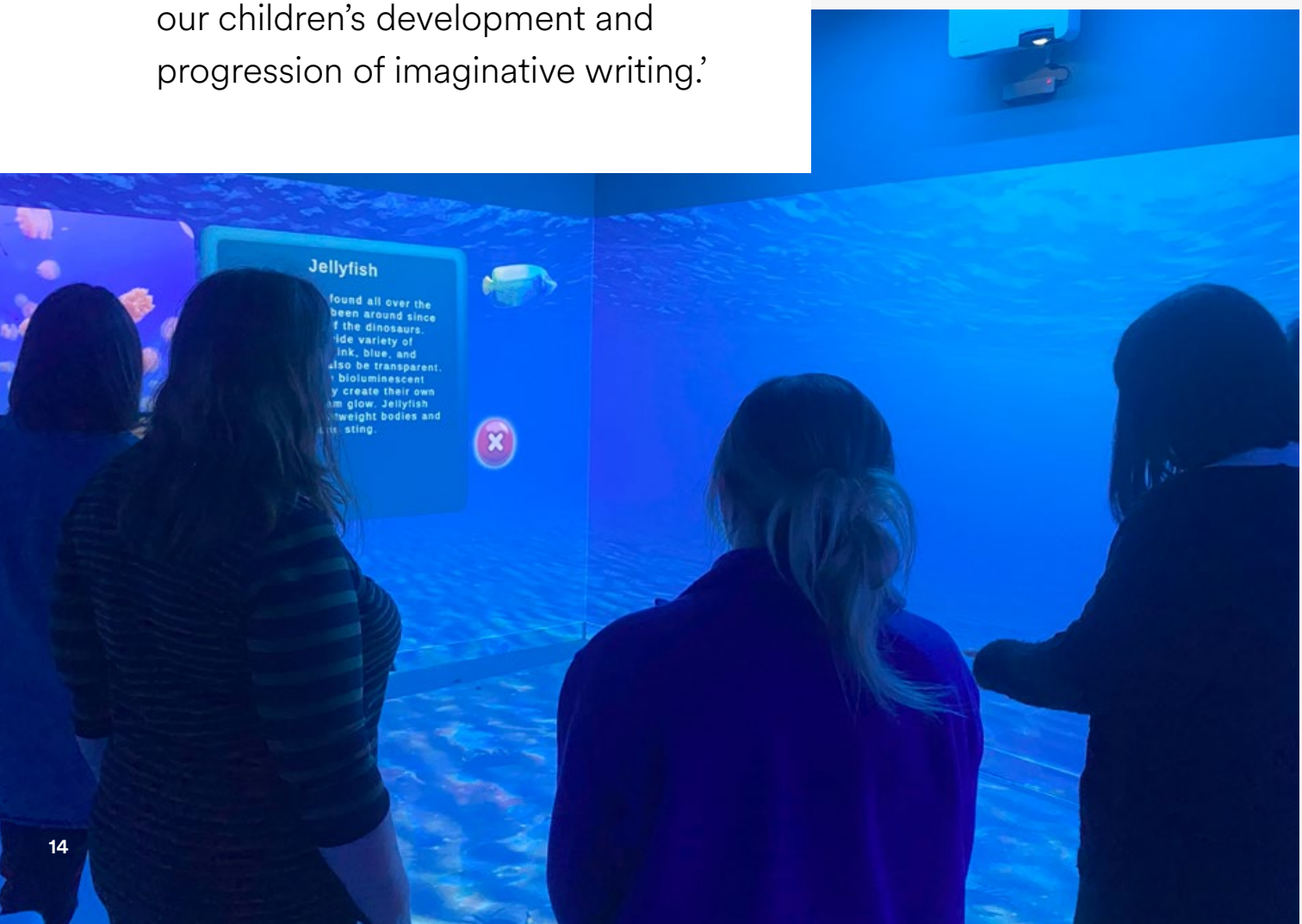
In May, BT launched immersive spaces for its business and public sector customers. Partnering with immersive Interactive Ltd, it will create the UK market's first 5G-enabled interactive simulation experience within an internal or external room, or mobile unit.

The project aims to combine interactive, 360 video content by connecting to the EE mobile network and using cameras and HD projectors to bring it to life. This is complete with lights, sounds, smells, and compatibility with augmented, virtual and extended reality, which will transport users from imagined scenarios into real life simulated environments.

This partnership has helped create spaces, with content libraries of over 3,000 computer-generated scenarios, real life environments, games and training experiences, perfect for schools. Therefore, it is fitting that the initial customers for BT Immersive Spaces include Borders College in Galashiels, Scotland and Cadoxton Primary School in South Wales. Both of which are using the technology, to immerse students by helping make their classrooms more interactive.

According to **Hannah Cogbill, Senior Leadership at Cadoxton Primary School**:

‘The children absolutely love it. Their favourite one so far is life under the sea. We are looking forward to using it to support our children’s development and progression of imaginative writing.’



David Lowe, Assistant Principal of Curriculum and Sustainability at Borders College, said:

‘Thanks to this new innovative 5G enabled equipment from BT, there will no longer be a divide between the opportunities offered to rural and inner city students.’

Students can now learn from a vast range of developments, that can help them navigate career opportunities.

A few of the initiatives developed through this private partnership are listed below:

+ Construction students at **Borders College**, who previously didn’t have access to large-scale inner-city developments for on-site learning, can now experience a construction environment first-hand using this technology.
+ Students taking courses from engineering to medical and health and social care at **Borders College** will benefit, as they will manage real-life scenarios such as electrical safe isolation, ambulance training and dementia training, which will help increase their understanding.
+ Compatibility with VR, AR and XR technologies – can be used for anything from simulated training for paramedics such as roadside accident scene or hospital unit, to the recreation of important historical moments.
+ The immersive space at **Cadoxton Primary School** will be used to support pupils with pre-experiences that they might be nervous about i.e. catching a train or going on an aeroplane.

To learn more about this partnership and find out more information please visit **here**.

CACI: Data & Technology for 40 Years

CACI is a data and technology business with over four decades of experience in harnessing the power of data. We deal with geographical, behavioural, and individual data, supporting many organisations in the private, public, and third sectors. Adapting to the ever-changing landscape of data has been crucial, encompassing volume, velocity, variety, and veracity. Technology has played a significant role in this journey, as exemplified by the following instances.

Public Sector

For the public sector, particularly during the pandemic, there was a heightened need to deliver essential services while achieving cost efficiencies. Prior to this, many public organisations relied predominantly on administrative or open data for decision-making, which limited understanding of the broader community.

CACI recognised this data gap and launched the 'Local Government Data Initiative.' Through this initiative, public sector organisations gained access to CACI's datasets, including consumer segmentation tools, income, and health data. This data proved instrumental in identifying vulnerable groups, like those 'shielding' during the pandemic, and supported prioritising and delivering services more effectively.

Post-pandemic, Local authorities, emergency services, and NHS organisations embraced blended data approaches, integrating administrative, open, and up-to-date commercial data. This shift enabled data-driven decision-making and empowered policymakers at all levels.

Case Study 1: Harborough District Council's Data-Driven Strategy

Harborough District Council faced the challenge of being data-rich but insight-poor, struggling to consolidate disparate data for evidence-based decision-making and funding bids. They also faced misperceptions about their community's needs, hindering their access to funding.

To address these challenges, CACI provided Harborough District Council with access to InSite Everywhere, a cloud-based GIS platform. This platform seamlessly combines administrative, open, and commercial data sources, enabling quick access to insights at district and ward levels. Moreover, we also provided a PowerBI dashboard presenting insights in a user-friendly format that aligned with the Council's four priorities, facilitating objective decision-making by Council members.

Private Sector

The private sector has many of the same challenges as the public sector, but often data access is not one of them. Many have access to their audience's usage generated data which comes with its own challenges. Two core ones being firstly how to deal with that growing volume of data, but secondly how to do so in a way that allows consumers to make their own decisions in behaviour change through enhanced knowledge.

Case Study 2: EDF Energy Empowering Consumers

EDF Energy wanted to support consumers in understanding their energy usage, particularly through their Smart Meters. However, merely deploying technology was not enough; it was essential to engage consumers with the data that was produced and influence their behaviour to make a real impact.

The challenge arose from the growing volume of data from proliferating Smart Meters, requiring effective processing and relevant information extraction. CACI used Cloud technology to play a pivotal role in processing vast data volumes quickly and efficiently. This, coupled with CACI defined data summaries and an EnergyHub portal, empowered consumers to access personalised energy data and receive money-saving tips to enable them to take specific actions.

The outcome was significant, doubling user engagement with the smart meter output.

In conclusion, CACI has been at the forefront of data and technology advancements, supporting diverse sectors in adapting to changing data landscapes. The examples provided showcase the practical applications of our services, delivering valuable insights and impacting consumer behaviour positively. Our dedication to innovation continues, fostering growth and efficiency in an increasingly data-driven world.

NB - CACI's commitment to serving vulnerable communities extended beyond the public sector. Their podcasts, drawing insights from various data sources, provides valuable information to support the understanding and addressing of challenges faced by communities across the UK.
https://pages.caci.co.uk/col_podcast_2022.html

DIGITAL MOBILE SPECTRUM LIMITED

Digital Mobile Spectrum Limited (DMSL) is the only joint venture owned by the four UK mobile networks - BTEE, Three, VMO2, and Vodafone. Our vision is a disruption free digital life for people across the UK. We do this by delivering programmes that keep people connected to networks. Our work includes restoring TV for viewers who experience interference as a result of new mobile services and providing programme governance, management and coordination for the publicly funded elements of the Shared Rural Network (SRN).

The SRN is a £1 billion programme to improve 4G coverage in rural and remote areas across England, Northern Ireland, Scotland and Wales. Mobile operators and government are working together to improve availability of mobile broadband for people living, working or visiting rural areas of the UK.

Connectivity is more important than ever before. One lasting impact of the pandemic is the changes to how we live, work and learn. But connectivity isn't just about sharing videos and watching goals. It means much more for communities and business across the UK:

+ For individuals, lack of connectivity is linked to social isolation, financial exclusion and poorer health outcomes, with the NHS spending half its budget on people who can't access the internet, according to The Good Things Foundation.

+ For businesses, connectivity enables flexible working, from accessing documents and emails, to taking payments on the go, to improved marketing and engagement with customers and prospect through social platforms. A study by Three and YouGov found that poor connectivity is costing British SMEs £18.77bn a year, by limiting employees' ability to get online and work effectively.

+ Connectivity supports innovation, whether that's improved vehicle management, the ability to track stock, or embracing the latest agricultural technology, and boosts tourism, allowing people to book and share their travels on the move.

Lack of connectivity in remote areas can have significant safety implications, if people are unable to call for help after an accident when out alone. By the end of 2025, 95% of UK landmass will have 4G coverage from at least one operator as a result of the SRN, ensuring lone workers, hikers and cyclists can contact help when they need it most.

But availability of new technologies isn't the only challenge. People need the skills and access to technology to benefit from connectivity. It's also vital they are made aware of legacy technologies that are being switched off in the coming years. All parties will need to work together to ensure no one and nowhere is left behind by these upcoming changes.

To support growth, everyone across the UK needs to have access to the connectivity that meets their individual needs - be it fixed, mobile, satellite or a combination of the three. We've seen with 4G public investment and a collaborative approach have been needed to make this a reality for the most remote areas of the UK, and we should expect a similar approach may be needed in the future for other technologies

So what is tech for good, and how do Gamma approach this idea? Well, to begin with, Gamma has a commitment to supporting services that make a critical difference in people's lives. A huge example of this is that, by enhancing communication infrastructure, we enable (directly and through our partners) blue light services to function more efficiently and respond more swiftly. In another similar vein, our technological capabilities also facilitate charitable organisations and helpline services such as the Samaritans to carry out their life changing work by ensuring reliable and robust communication lines that can handle high volumes of calls, especially during critical moments – moments where a phone call can have a real, tangible, and lasting impact on the life of human beings.

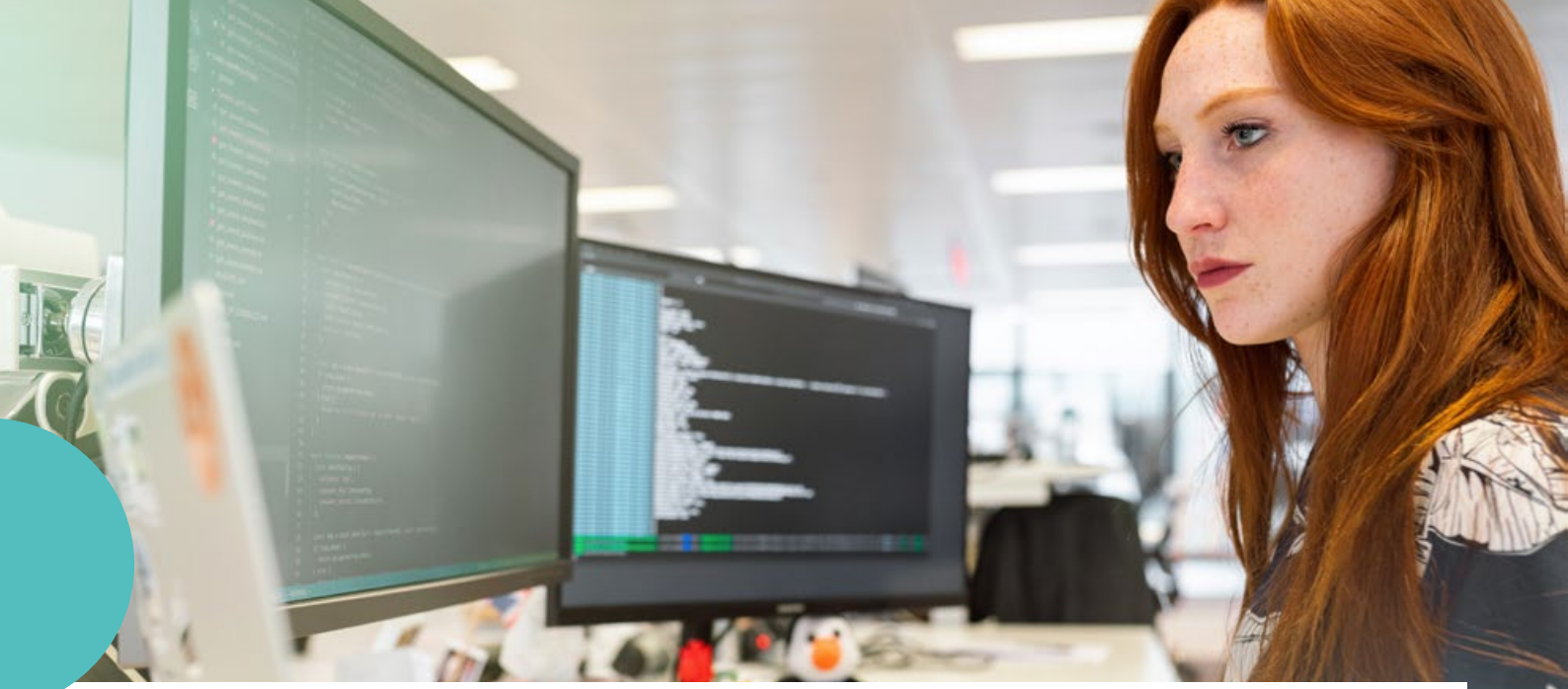
So how do we ensure that we're on the right path with this aim? We underpin it with an ethos.

This ethos of 'communications with a conscience' is the very foundation of our commitment to impactful, ethical and sustainable technology. By upholding transparency, providing high-quality life saving/ life changing service, and promoting balance and inclusivity, we serve our stakeholders and the wider community responsibly. This ethos resonates particularly with our aforementioned support for charities, where technology is not just a tool, but an instrument of good – a conduit for empathy and understanding.

And what about tech for growth? We are absolutely committed to facilitating personal and business growth. But what does this mean? What is tech for growth? A shining example of tech promoting personal growth is in the field of education. Through partnerships with platforms like Microsoft Teams, thousands of schools have been supported during a time when remote learning has become the norm. Students and teachers, separated by distance, can still experience the warmth of a classroom, and the familiar hum of learning continues, unhindered by the events of the wider world. Not only that, but this technology allows children to access information of all kinds, whenever they need it, whatever their background, abilities or individual needs.

Yet growth isn't just a personal exercise. Gamma, as a business, also recognises that growth means scalability for those we serve directly, or indirectly through our partners. In this brave new world where businesses (and individuals) are living an increasingly digital life, being able to scale up operations seamlessly is vital. Gamma is keenly aware of the importance of and deeply committed to empowering businesses to grow without worrying about the limitations of their tech infrastructure.

So what's the essence of Gamma's vision of technology? This vision encompasses two intertwined strands. As a 'tech for good' advocate, we see technology as a tool to support humanity, to strengthen connections and to make a real difference in people's lives. And as a 'tech for growth' enabler, we empower individuals and businesses to grow, learn, and scale up their operations. This dual mission, built on the foundation of our ethos of communication with a conscience, is what defines us and sets it apart in a complex and rapidly changing digital landscape.



Google

Google's mission is to organise the world's information and make it universally accessible and useful. This mission is more relevant than it's ever been, and AI is providing one of the most profound new opportunities to unlock the power of information.

Tech as a driver of growth/ tech and productivity

Google products, platforms and tools, including Search, Maps, Workspace, Cloud, Play and Android, will help provide an estimated £118bn in economic activity in the UK in 2023, supporting over 1 million businesses across the length and breadth of the country.

This year Google is adding more generative AI tools and other forms of AI to many of its core products. Public First estimates these tools could save the average worker in the UK over 100 hours a year, which would be the biggest improvement to work productivity since the arrival of Google Search itself[1]. 47% of larger businesses are already using AI to increase productivity of their business or workforce and another 35% were planning to do so in future[2].

In addition to AI, Google Cloud is also supporting businesses to increase efficiencies. HSBC is using Google Cloud to automate the quality review of sales calls. This has significantly reduced the time required and improved customer experience. We have also been working with Ocado to develop robotics to minimise the repetitive and arduous tasks for humans, like picking heavy six packs of bottled water into customer orders, so they can be released for more important work.

[1] https://economicimpactuk.withgoogle.com/
[2] Ibid.

Tech and skills/ education

Our Google Digital Garage has trained more than 1 million people in the skills needed to thrive in a modern economy since 2015, visiting hundreds of locations across the UK. We have also provided scholarships for our Google Career Certificates, with partners including DWP, Camden Council, The Prince's Trust and the FSB. This summer we launched a new AI-focused Google Digital Garage training series, to offer people and businesses practical skills and knowledge to use the benefits of AI for their career or business. The first of these series are **Grow Your Productivity with AI** and **Understanding Machine Learning**, and can be done online or in person.

Access and digital inclusion

Google has developed a range of tools such as its Android Accessibility Suite which means there are a number of features built into the operating system which include screen readers, magnification tools and alternative input methods making it easier for people with vision, hearing and motor impairments. Google polling found that 51% of Britons who reported a disability and have an Android phone say they have used an accessibility feature in their personal life and 43% in their work life. An android app, '**Project Relate**' built on Google research helps people with non-standard speech communicate more easily with others. Early testers of Project Relate describe how the app has helped them be better understood and build more meaningful connections.

In 2022, Google opened a new **Accessibility Discovery Centre**, a space for the local community, research and product development.

The Institution of Engineering and Technology

About the Institution of Engineering and Technology (IET)

The IET is a trusted adviser of independent, impartial evidence-based engineering and technology expertise. We are a registered charity and one of the world's leading professional societies for the engineering and technology community with over 155,000 members worldwide in 148 countries. We work collaboratively with government, industry and academia to engineer solutions to society's greatest societal challenges, including tackling climate change and building a better digital world.

Engineering, Technology and Economic Growth

The UK possesses a strong science base, but it is not a technological superpower. One reason for this is that whilst UK-based businesses develop successful prototypes, they struggle to take them to the next step and scale. Engineers hold the key to making this transition possible, by –

+ Innovating to provide better solutions to specific technological challenges.
+ Reducing the economic and environmental cost of technology.
+ Improving buyer confidence with better performance evidence and information.

However, the IET's own research reveals that the UK faces a chronic technical skills shortage in its engineering sectors, which may be hindering innovation and holding back economic growth. For example, 47% of engineering employers report a skills gap in their technical workforce, and 49% of engineering employers with a digital skills gap report that it reduces their productivity.

Below, we outline a series of recommendations to government on how to tune the UK's skills and innovation policy landscape to accelerate economic growth in the engineering sectors.

Skills

As the pace of technological change increases, there has never been a more compelling case for lifelong learning. This is underscored by the rise of artificial intelligence (AI) technologies – while 36% of engineering employers see AI as 'important to growth' by 2027, only half of these firms report having the skills to take advantage.

As 80%+ of 2030's engineers are already working, the immediate focus should be on upskilling and reskilling the existing workforce. The Lifelong Learning Bill is a step in the right direction, but it is not practical for many workers to take out student loans for continual upskilling.

Therefore, we recommend that the government embeds flexibility into existing funding mechanisms, such as the apprenticeship levy. Allowing employers to direct unspent levy entitlements – which total £2bn since 2017 – could fund the annual training costs of an additional 200,000 employees.

Innovation

We believe investment in innovation should be prioritised for those technologies that will unlock a healthier, more prosperous society. For example, healthcare engineers are creating devices which can machine-process patient data to diagnose disease at an earlier stage. These technologies will give us longer, healthier lives, and could potentially shave billions per annum from the NHS budget. **Therefore, we recommend that the next government set-up a National Institute for AI and ageing research**, to boost innovation and help propel the UK to the forefront of this emerging sector.

Another area of great promise is digital twins – virtual representations of physical systems, such as buildings, which can respond in real-time to optimise system performance. Digital twins stand to accelerate productivity in the construction sector, which has stagnated since the 1960s. **The government should commit to increasing R&D spending to 3% of GDP by 2027**, and as part of this introduce targeted funding for innovation in these engineering sectors.

Overview

The Internet Watch Foundation (IWF) is a UK-based charity that works in partnership with the tech industry, law enforcement and government to remove images and videos of child sexual abuse wherever they are hosted in the world.

We provide a secure and anonymous place for the public to report suspected incidents of this content and use the latest technology to proactively search the internet for these images and videos. The technical tools and services we provide help to keep technology companies' platforms and services free from child sexual abuse. These services include, but are not limited to:

+ Image hashing
+ Keyword and URL lists
+ Takedown notices
+ Domain alerts

The IWF has over 170 Members from the internet industry who deploy our services to combat the spread of CSAM on their platforms.

Every day our analysts view and assess thousands of CSAM images and videos. Through this difficult work, we remove the worst type of illegal content, protecting children and safeguarding users.

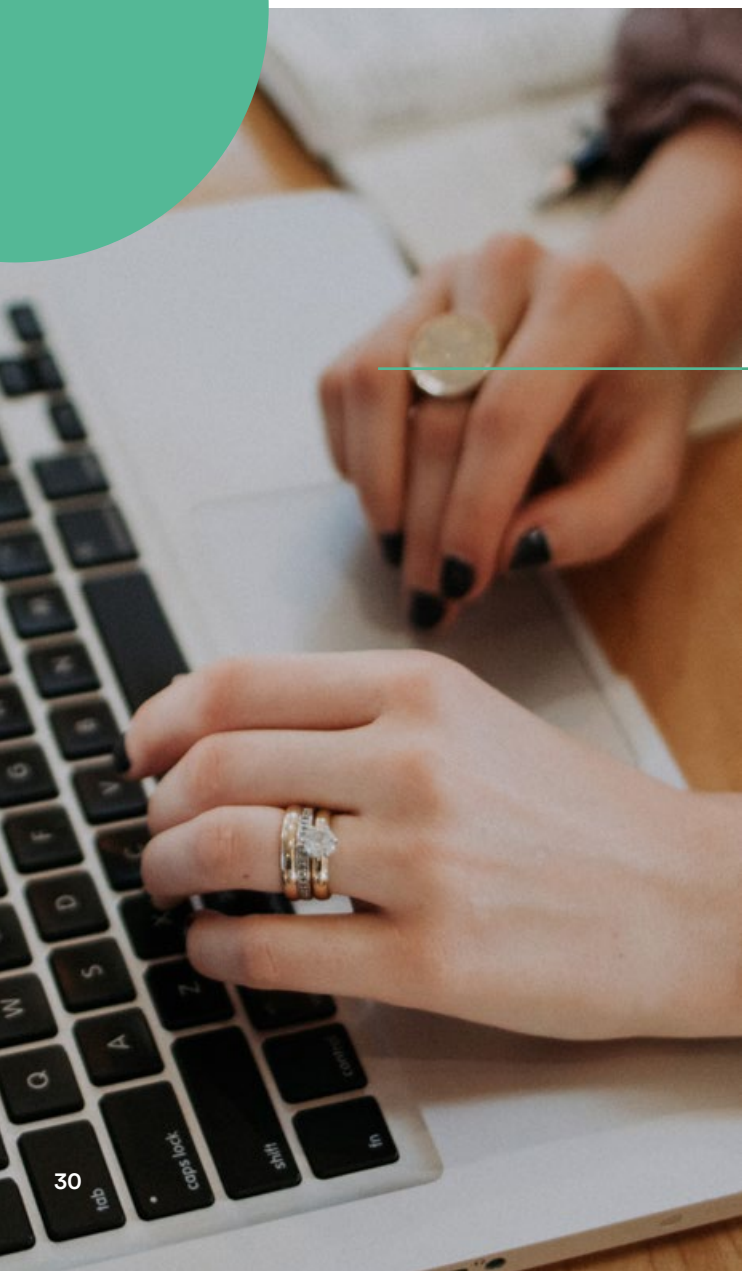
Policy activity

The IWF works with governments, industry and law enforcement globally to share best practice about how we prevent the proliferation of child sexual abuse material online. Accordingly, we are involved in a variety of workstreams to ensure that legislation builds upon current best practice, respects current international collaboration, and further improves the response to this crime.

Regarding UK policy, the IWF is closely following the Online Safety Bill as it continues its passage through Parliament. Our activity has focused on achieving clarity regarding Ofcom's relationship with third parties and advocating against a carve out for services that are End-to-End Encrypted. The IWF has previously engaged with government on encrypted channels as part of its **Safety Tech Challenge Fund** project, which aimed to explore new ways to stop the spread of child abuse material in encrypted online communications. The IWF was involved in one of five projects which were awarded UK government funding.

In Europe, the IWF has engaged with the European Commission's proposal for a regulation laying down rules to prevent and combat child sexual abuse. In partnership with the **European Child Sexual Abuse Legislation Advocacy Group** (ECLAG), the IWF has liaised with MEPs regarding the amendments to the proposal with a particular focus on issues such as End-to-End Encryption, the inclusion of voluntary measures, and Detection Orders.

MINDEROO
CENTRE FOR
TECHNOLOGY
& DEMOCRACY



The Minderoo Centre for Technology and Democracy is an independent team of academic researchers at the University of Cambridge, who are radically rethinking the power relationships between digital technologies, society and our planet.

From AI and the future of work, to digital accessibility and inclusion, our team are developing solutions that result in positive change to the digital world for constituents across the country.

Our team are available to speak with parliamentarians and their teams.
Three priorities that might be of interest:

The future of work and the need for AI guardrails

Our team of experts are available to answer any questions MPs and their teams have about recent AI developments and the impact this may have on the workforce.

ChatGPT means more people are now asking how artificial intelligence (AI) changes our lives and our world. One thing we all want to know is how AI will change work.

The government's recent white paper on AI says it 'has the potential to make Britain a smarter, healthier and happier place to live and work'. There are many ways these changes might improve how we work. Right now, AI can help employers manage people working from home, making flexible working arrangements easier. A Latin American bank uses AI to combat harassment, improving the working environment jobs better for more workers. Thanks to AI-based weather modelling, farmers in Africa are getting better information to improve their crop yields. But it is also likely that AI could make on-the-job surveillance worse, AI 'deepfakes' may mean even more harassment, and the lack of access to AI tools could lead to a world of information haves and have-nots.

Which future do we want? Our team recently co-authored a **report** on AI and the working lives of women. Our report showed how AI systems present both challenges and opportunities in the workplace. That means that governments, industry, researchers, civil society, and workers have a lot to do to ensure AI will improve our jobs.

Principles for the UK's digital future - a new approach to our digital world

We believe that now is a crucial moment to develop core policy principles and regulatory guardrails for the UK's digital future. We would be delighted to speak with MPs and their teams about this work.

This programme brings together expert voices from academia, policy and civil society to examine five key themes identified in our research as being imperative to good digital futures in the UK. These are:


Participation


Accountability


Transparency


Trust


Sustainability

Our aim is to bring research to governments, policymakers, regulators, and civil society to jointly build our digital future.

From this engagement, we will release a new manifesto for our digital future in Autumn 2023.

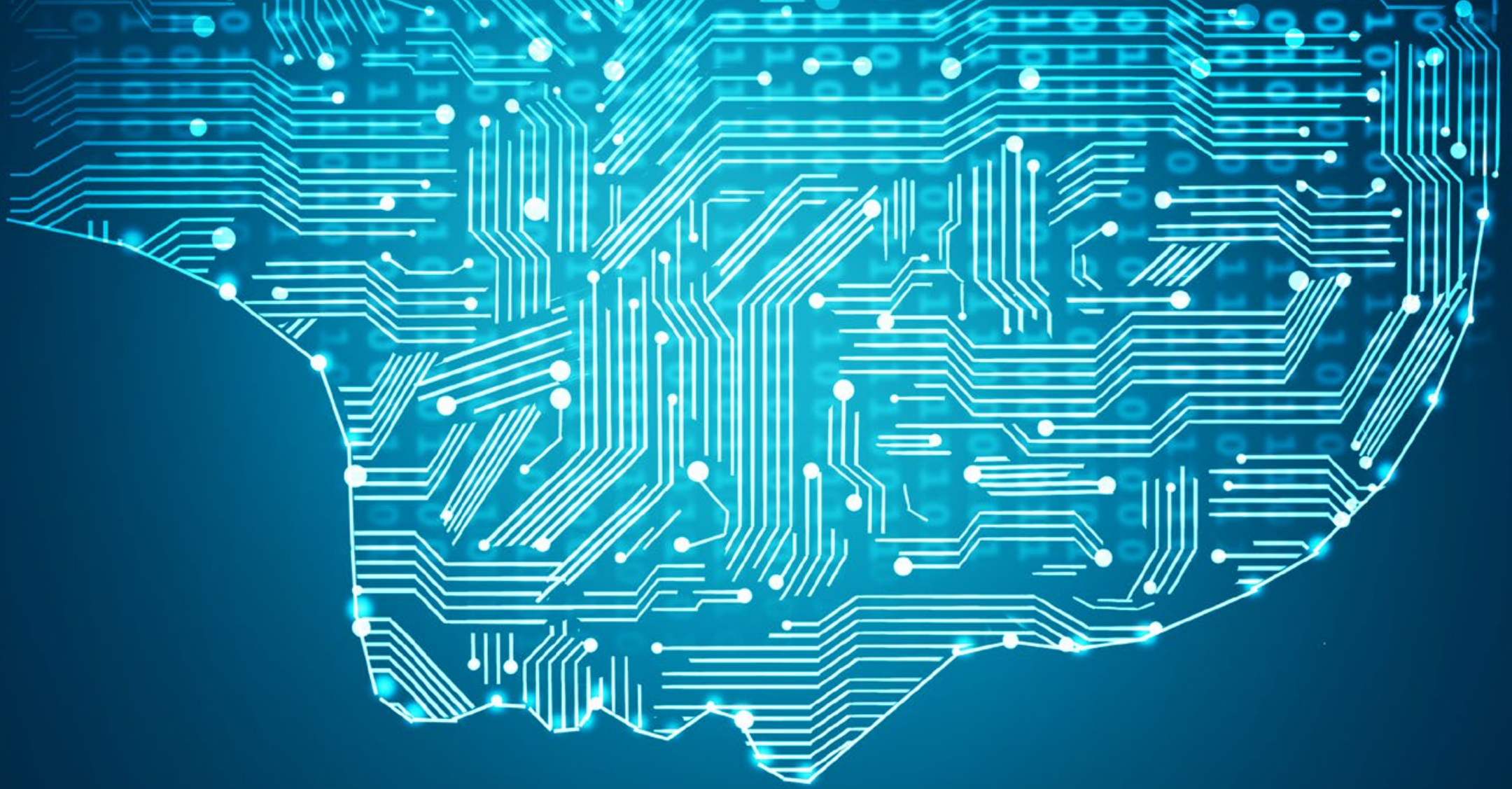
A new approach to access and digital inclusion

This research project expands the category of work to include the broader remit of accessing work and employment by both disabled and non-disabled workers.

The work draws on a series of case studies including autonomous delivery devices, on-demand driving and autonomous vehicles.

For more information on any of the above, please contact Jeremy Hughes on **jph79@cam.ac.uk** and **minderoo@crassh.cam.ac.uk**

Learn more about the Minderoo Centre for Technology and Democracy at **www.mctd.ac.uk**



National Innovation Centre Data
Powered by Newcastle University

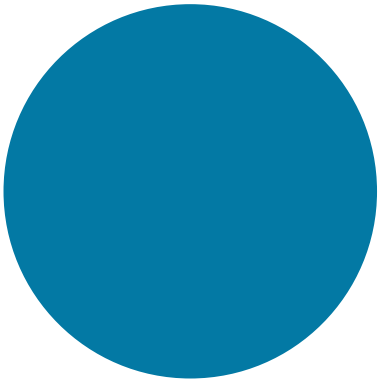
UK National Innovation Centre for Data

Harnessing the power of data is critical to not only prosperity and security, but in creating a future in which businesses of all sizes and all citizens can share.

The National Innovation Centre for Data (NICD) was established in 2017 by UK Government and Newcastle University, to help businesses and organisations of all sizes unlock insights and value from their own data.

Since then, we have run successful projects with over 80 businesses, public organisations, and charities. Our events have allowed us to engage with over 10,000 attendees.

Success for NICD is the effective transfer of data science skills into the regional and national economy. We are proud that the credibility we have earned with industry and public partners is built on mutual trust and a shared commitment to unlocking potential.



Unlocking insight and delivering value

Supporting organisations to harness the power of their own data and develop the skills to sustainably create and act on further insights is at the core of the National Innovation Centre's mission.

Our ethos has meant we have had the privilege of working with partners as diverse as large corporates (e.g. Sage) as well as SMEs across the north east, and a foodbank issuing 24,000 parcels per year; while building expertise in helping a range of organisations in very different contexts to unlock insights and deliver value from their data.

The productivity benefits of predictive maintenance, identifying opportunities for new markets, or better understanding customer need, are essential ingredients in data science skills serving both 'for good' and 'for growth' in an economy and society on the cusp of new technological frontiers.

We have seen first-hand the transformative potential of effective data science.

Deploying these tools to enable SMEs to scale; ensuring some of the most vulnerable people in the UK could be supported more effectively during the COVID-crisis, and in helping businesses of all sizes to implement environmental stewardship measures on their path to Net Zero, has shown us all what is possible with wider tech adoption across the UK.

Come and work with us

At the National Innovation Centre, we are very keen to share what we have learned and to collaborate with others. In 2023, we were announced as a Hub of the Science and Technology Facilities Council's Hartree Centre, to drive further digital adoption for businesses across the UK.

Now, more than ever, it is crucial to work across geographies, sectors, and tiers of government to ensure the global position of the UK as a place for the innovative, safe, and effective deployment of advanced technologies.

We must work with these new tech trends, while promoting the value of data skills and analytics in providing assurance, dealing head-on with bias, maintaining privacy, and driving sustainability.

These challenges may seem huge, but at NICD we have seen how putting data skills into the hands of our industry leaders, public organisations, charities, and SMEs can drive new value, and business models which embrace innovation.

2023 has seen AI become usable to the public through Generative AI but will also be remembered as the year of "AI Openness." But what that means is confused.

Large Language Models at the heart of Gen AI, cost hundreds of millions of dollars, and require massive human resources, energy and compute. Few companies have the means to create them and 90% of AI compute is believed to be in the US and Asia. Accessing LLMs - from the hands of a few - is necessary to enable innovation, facilitate new market entrants and competition and to democratise technology. Learning from the lessons of our recent tech past means opening up LLMs.

The Falcon LLM was released "open source,'" its software distributed under the Apache 2.0 license - an Open Source Initiative ("OSI") approved licence. To be "open source software" the human readable source code is shared, ie open and the software is distributed on an OSI approved licence.

Llama LLM was released earlier this year by Meta on a research licence which was not open source. It was "leaked" making it available to a wider audience unlicensed. Users innovated at an alarming pace and reportedly this caused LLM-owning Big Tech companies to realise that they would not be able to differentiate their LLM products enough to see a viable revenue model. They could not keep up with the pace of community innovation.

In July Llama 2 was released as "open innovation", formally granting a licence to allow community use – the Llama Community Licence. This is not open source software. It is neither Open Source Initiative ("OSI") approved nor would it be. It does not meet the Open Source Definition ("OSD") due to its commercial restrictions and its Acceptable Use Policy ("AUP").

All OSI approved licences meet the OSD. Definitions 5 and 6 of the OSD mean anyone can use open source software for any purpose. This free-flow is critical to the open source software ecosystem. Nobody requires any additional rights to use that code. Any attempt to restrict this free-flow with requirements such as a patent licence or a commercial payment would disrupt and potentially destroy an ecosystem which 96% of todays software – including proprietary – has dependencies on. Adding clauses to an OSI approved licence removes its status as approved.

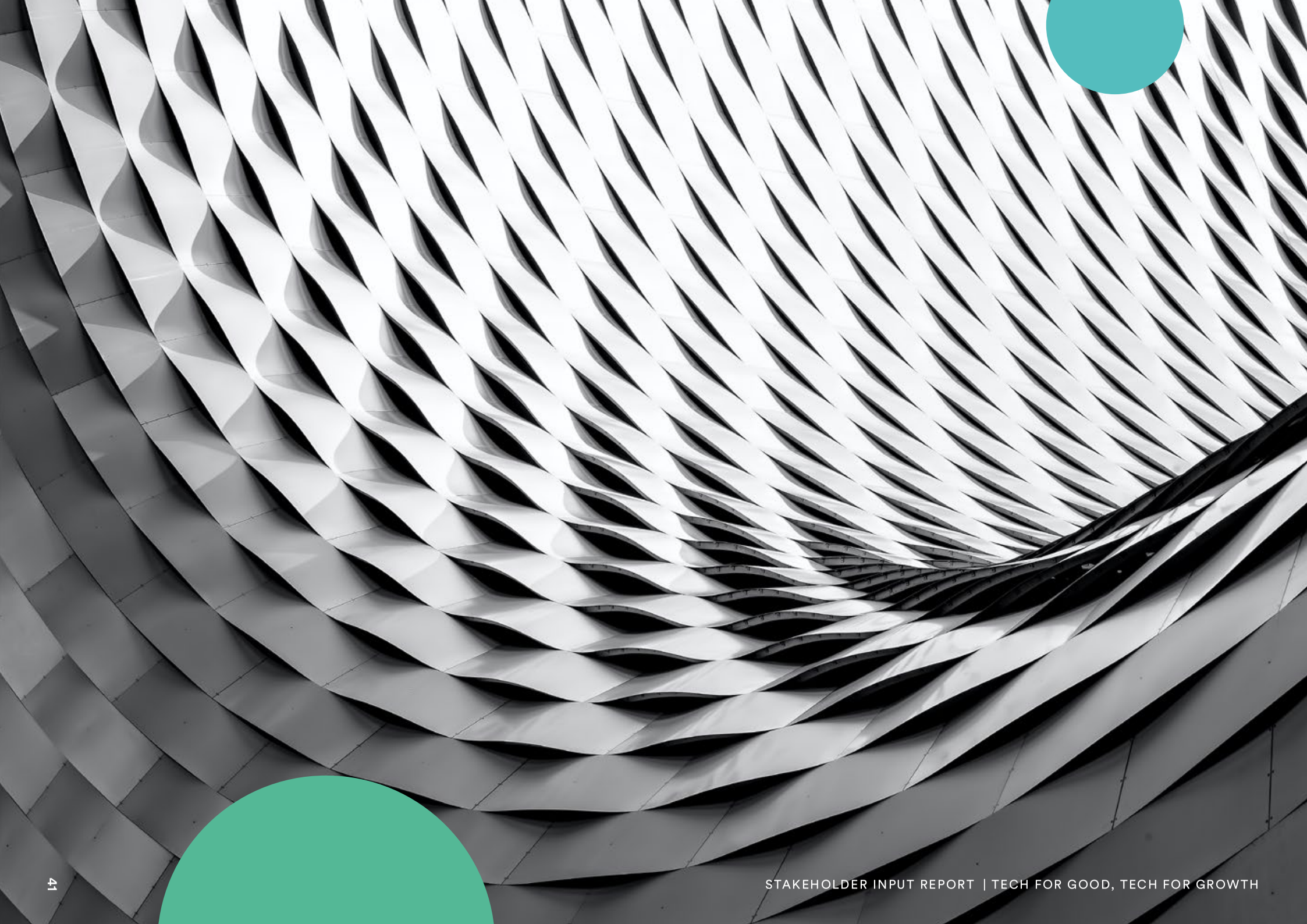
The opposite of open source is not closed source, but proprietary software. That takes a little understanding. If software is shared with the source available or open but not distributed on an OSI approved licence it's "public or shared source" - a form of proprietary software. A formal definition of this" in-between open code" is likely at some stage, but for now it must be regarded as proprietary and not called open source.

Certain actors have been perceived as taking advantage of the open source ecosystem without living by this standard of code being available for use by anyone for any purpose. Commercial open source effectively enables your competitors with your innovation. Licences that are not OSI approved but which have wrongly been open source are known as "Fauxpen Source" or "Open Washing." Whilst the Llama 2 website carefully states that Llama 2 is open innovation not open source software Mark Zukerberg and other senior executives describing it as open source when it is not has led to controversy. This was very unfortunate but Meta's shift to open innovation is a move in the right direction.

Through openness we will create transparency which not only allows better innovation and competition but also trust and control.

Licences are trumped by law. Any legal restriction overrides the licence, e.g. export control laws. As we see regulation take shape around AI it is likely that, to manage perceived risks, all usage will require compliance with prescribed codes of conduct like the Llama 2 AUP. This will likely mean that distribution will not be true open source software.

The licensing required to open up LLMs is not simply software but also data licensing, instructions or guides and research. A recognition that its very nature means AI requires a different kind of openness has led the OSI to undertake a consultation on what “Open Source AI” means and the outputs of this as well as the ongoing G7 Hiroshima Process are likely early 2024 These will help clarify the current confusion.



Productivity and Tech in the UK

Overall **UK productivity** has basically flatlined since 2008. Public sector productivity has been broadly flat for even longer between **1998 – 2020**, according to ONS.

GDP increases came from population growth and long hours – unsustainable as the population ages.

Higher productivity means better treatment of staff and more reliable careers. It's a measure of added value – sustainable growth. It underpins political goals regardless of political affiliation.

While long term capital and infrastructure projects are as important as ever, let us look at the potential impact of digital services. There are two key differences – they can be delivered rapidly, and they are opex not capex.

It surprises many that the UK has poor adoption in digital technology services for business. Some estimates put as low as 20% of companies as digitally intensive in business processes, which correlates with high productivity.

The UK looks good when it comes to digital, but that's mainly consumer and B2C adoption – it is in **the top three** in the world for consumer use, but **31st overall**.

The prize to change this is immense – according to ONS, use of business technology and services (ERP, CRM and SCM) are associated with a **productivity premium of around 25%**. Digitally intensive sectors are responsible for **86% of the UK's value added growth**.

The UK Government did launch and then fairly halted the overly bureaucratic and poorly targeted **Help to Grow: Digital scheme**. In short, there's nothing from Government that faces up to the scale of both the challenge and prize.

In difficult times it's fair to ask – why now? There are two obvious answers. Firstly, today's basic digital tools form the foundation for other productivity enhancing tools. You cannot miss the impact of AI, but that depends on a digital foundation, and the same goes for all the other so-called fourth industrial revolution technologies. Productivity means better efficiency – better use of resources that underpins environmental ambition. In short, without movement the gap between the highly productive companies and the so called long-tail will get worse and harder to address, thus damaging the UK's growth and environmental ambitions.

Of course, digital tech and services are only the 'entry ticket' to high productivity. They must be matched with the other well-known UK shortcoming – digital skills and, again, the solutions offered seem to fall short of the scale of the challenge.

This is not a call for massive subsidy or government assistance for tech suppliers – almost by definition this is about helping companies help themselves. It is a call to help put this on the agenda of politicians and businesses and, just as importantly, business advisors and support schemes of all types.

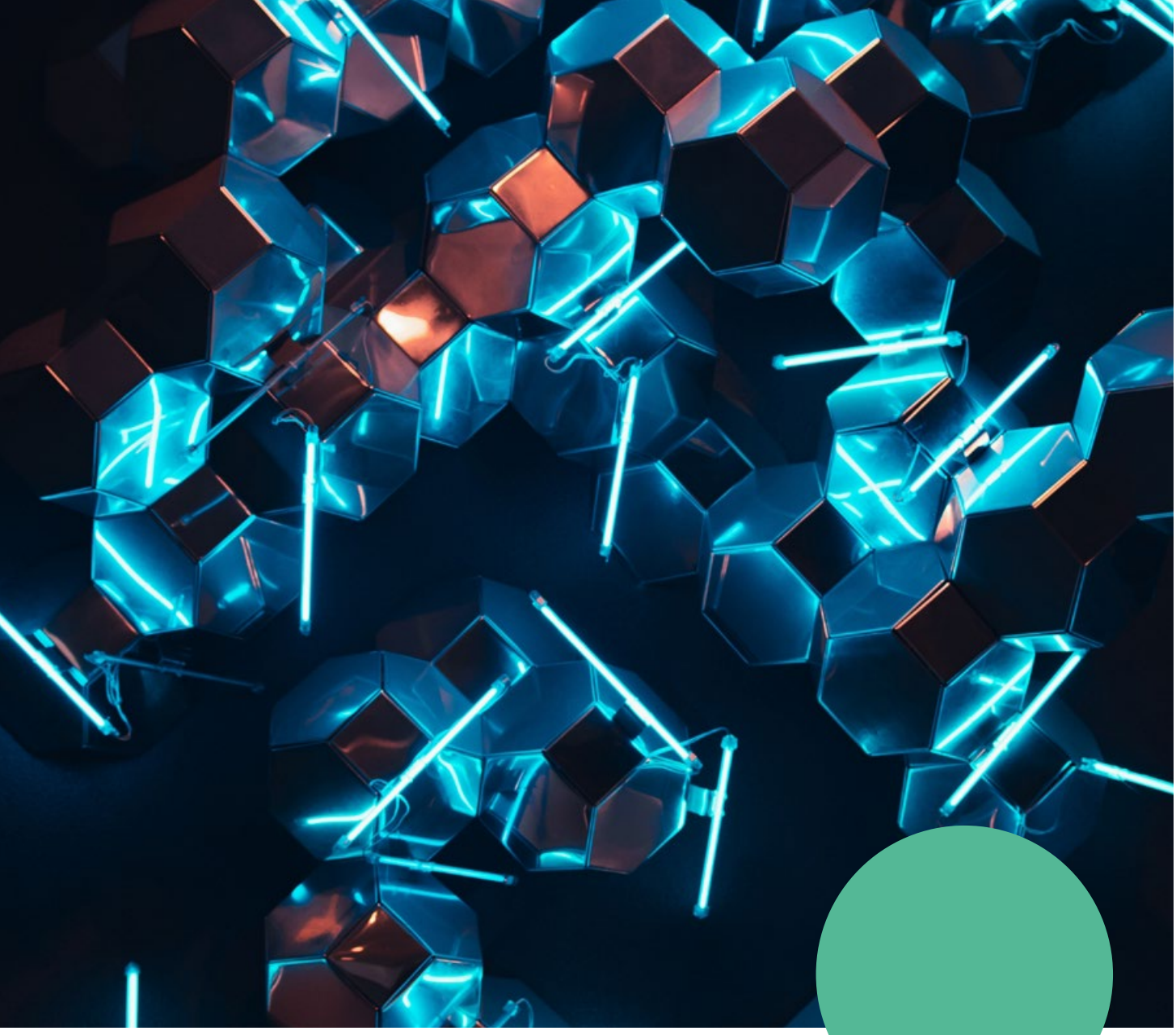
There are clear roles for government – modernise the tax system to recognise that innovation and productivity is about opex as well as capex, support skills the same way it supports R&D for broadly the same reasons of spillover, and nudge tech adoption onto business agendas using things like company reporting, score cards, benchmarks and the tax system.

The future regulation of AI

The UK is the third largest AI economy in the world after the USA and China[3], and is ahead of France and Germany combined. But in the race to regulate AI and set out standards that may become global regulatory norms the UK is lagging behind China and the EU. Both of these powerhouses have not delayed in developing laws to regulate AI although in each case the approach adopted is not without its problems. In the UK we now have, following the publication of the white paper, "A pro-innovation approach to AI regulation"[4], which puts us ahead of the USA who have yet to seriously consider at a federal level what an AI regulatory framework may look like.

[3] https://www.ai-ecosystem.org/uk

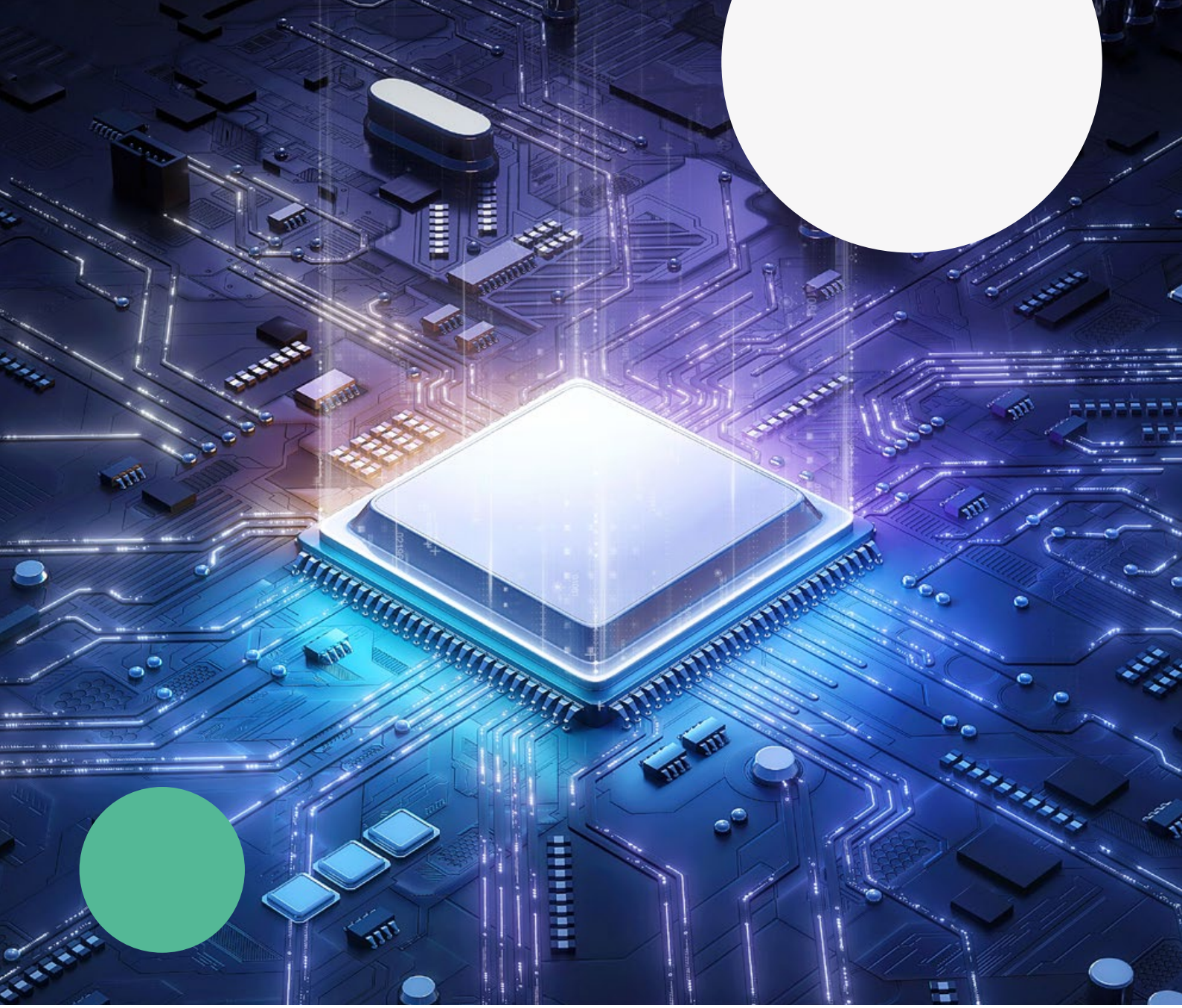
[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1176103/a-pro-innovation-approach-to-ai-regulation-amended-web-ready.pdf



The UK white paper sets out an approach that can take advantage of some of the issues seen with the approach adopted in China and the USA. But only if the approach is properly consulted on and the legitimate fears expressed in the media are acted on. In the UK government published white paper, a pro-innovation approach is based on six core principles that exiting regulators must apply with flexibility to implement in ways that best meet the use of AI in their sectors. No new regulator would be created. The government aims to establish clear, innovation-friendly and flexible approaches to regulating AI to unleash growth and innovation while safeguarding fundamental values and keeping people safe and secure.

The six core principles are:

- Safety, security and robustness
- Fairness and non-discrimination
- Accountability and transparency
- Privacy and data protection
- Ethical values and human rights
- Innovation



This approach has the potential to contrast sharply with the EU which in its AI Act has adopted a risk-based approach. The EU AI Act requires AI applications that are deemed high risk to comply with a pre-conformity check before they may be deployed. All high-risk AI systems will have to meet standards of data quality, accuracy, robustness, and non-discrimination, with accompanying technical documentation, record-keeping, a risk management system, and human oversight. Failure to generate documentation demonstrating such compliance before deployment may result in fines up to 6% of annual global turnover.

The fear is that the approach adopted by the EU may stifle innovation as entities may seek alternative ways of achieving outcomes without having to go through such a compliance exercise. The AI Act also pre-dates Chat GPT and the emergence of large language modulators (LLMs). It may already be the case for example that Chat GPT / other LLMs are already being used in a wide range of sectors in the EU which would make Chat GPT a high risk AI application. The AI Act will be difficult to implement therefore given the high number of high-risk AI applications and the novelty of AI standards. These standards as they emerge will be important in determining the success of the AI Act.

At least the EU is attempting to regulate LLMs. In China LLMs are effectively banned and the new regulations put in place require domestic LLMs to be true to "socialist core values". The story of Xu Liang is instructive. He is an A.I. entrepreneur who released a mobile app called ChatYuan as a challenge to Chat GPT. It was noticed that ChatYuan's answers were very different from the party line. ChatYuan for example described Russia's war in Ukraine as a "war of aggression" in contradiction to the official position of the Chinese Communist Party, who promptly soon shut down the app[5]. This approach is reflected in Article 4(3) of the "Measures for the Management of Generative Artificial Intelligence Services", published by the Cyberspace Administration of China, which requires the content generated by an LLM to be "true and accurate" – whatever that means?[6] As a post script: Mr. Xu making changes to create a "patriotic" LLM which will filter out sensitive keywords and he plans to hire manual reviewers to identify wrong answers. All very AI…

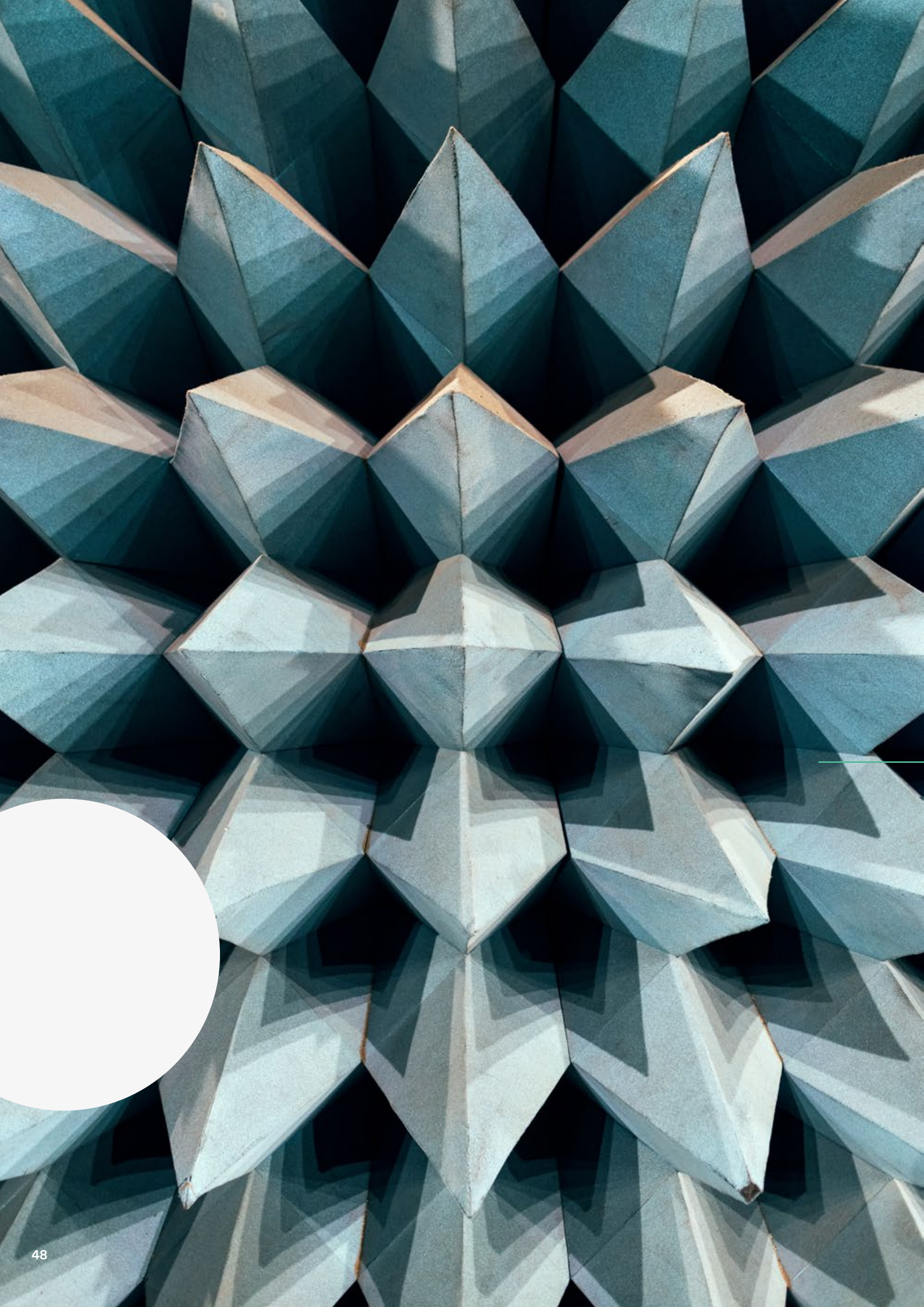
The UK has an opportunity to learn from the EU experience and develop an approach that won't be outdated as soon as it is enacted. But the challenge ahead remains a tough one. There are no easy answers. Or in the words of Chat GPT in response to the question should AI be regulated? -

"Ultimately, the question of AI regulation is a complex one that requires careful consideration of the potential risks and benefits. It involves interdisciplinary collaboration among policymakers, technologists, ethicists, and other stakeholders to develop appropriate frameworks that can foster the responsible and beneficial use of AI while addressing any potential challenges."

Well said Chat GPT!

[5] https://www.taiwannews.com.tw/en/news/4807319

[6] https://digichina.stanford.edu/work/translation-measures-for-the-management-of-generative-artificial-intelligence-services-draft-for-comment-april-2023/



techUK

The UK has established itself as a leading tech economy, with a strong digital sector and globally leading research and start-up ecosystem. The tech sector is one of the UK's modern economic success stories, with its contribution to the economy rising over 25% between 2010 and 2019, and now adding over £150 billion. This makes it one of the country's most valuable economic assets and the leading tech sector in Europe.

However, our success must not breed complacency. There is now a fierce global race over the key technologies that will shape the future: from AI and Quantum to green technologies and semiconductors, competition between governments to attract talent, bring in investment and grow tech clusters is greater than ever. If the next Government does not make the most of the UK's strengths, there is a real risk of it falling behind.

Summary of opportunities

1. **Improve access to day-to-day digital services, cutting costs for both central and local Government as well as improving public services**: update policy to introduce common standards and improve the interoperability of digital public services to cut the costs of administration for local authorities, and help UK companies seize the benefits of the global digital ID market predicted to value $40.44 billion by 2027.

2. **Make the UK one of the most trusted, safe and secure places to be online**: launch a new online safety sandbox to help deliver the aims of the Online Safety Bill, facilitate a new cross sector data and intelligence sharing initiative between the tech, telecoms and financial services industries and publish a 'top 5' priority list of smart data schemes.

3. **Plug the digital skills gap to boost pay, opportunity and our national resilience**: help raise British workers' pay by £5.69 billion by making the Apprenticeship Levy more flexible, delivering an Employment Bill, and building an online Digital Skills Toolkit to help individuals and employers identify accredited courses to boost digital skills.

4. **Make sure everyone has access to the online world**: through a new future network strategy that could help 1 million people back into the labour market and add £159 billion to the economy by 2035 through the widespread uptake of 5G, and by using satellite and drone technology to help rural and hard-to-reach communities get connected.

5. **Deliver the digital transformation that the NHS and social care system needs**: reform how we spend the existing £2.1 billion earmarked for NHS and social care digital transformation, so we can better onboard the technologies that will cut waiting times, save staff hours and support more preventative treatment.

6. **Rethink our approach to how technology can support the criminal justice system**: enabling the criminal justice system to better leverage digital tools could cut the cost to the public of cyber and fraud related crime in the UK, which amounted to £4.1 billion between April 2022 and May 2023.

7. **Regain the UK's reputation as a global leader in Open Data and rank among the five countries on the UN E-Government Index**: enact reforms to open up Government and public data sets to help create a better environment for UK Govtech solutions and improve our approach to public procurement.

8. **Ensure the UK holds on to its fintech crown**: facilitate the uptake of new technologies such as AI and machine learning to deliver fintech services that speed up the delivery of a Central Bank Digital Currency and shore up the fundamentals of our fintech system by delivering reforms on Digital ID and Smart Data.

9. **Grow tech clusters across the UK**: give local and combined authorities more incentives and confidence to invest in digital projects and review the roles of the British Business Bank and National Infrastructure Bank to accelerate digital transformation across local Government and support tech clusters across the UK.

10 **Support a thriving digital and AI ethics ecosystem to enable better governance and regulation**: by establishing emerging tech taskforces under the Centre for Data Ethics and Innovation, promote education and training for digital ethics from the classroom to the boardroom and delivering an approach to artificial intelligence underpinned by a system of AI ethics, governance and regulation.

11 **Digitise the day-to-day economy helping small businesses get ready for the AI revolution**: set up a costed Digital Growth Fund by reallocating money unspent under Help to Grow: Digital which could help 600,000 SMEs adopt new digital technologies such as AI and increase sales by as much as 18% over three years.

12 **Fix the UK's broken scale up economy so British firms have the opportunity to become global champions**: give start-ups certainty over existing support schemes and launch a British 'Scale-up Sprint' to identify, within six months, new investment vehicles and regulatory changes that could create new investment opportunities into critical technologies such as green tech, AI, quantum and semiconductors.

13 **Ensure we have a competitive innovation economy**: set out a five-year plan for gradual reform of the UK's R&D Tax Credit, bring down the cost and time it takes to get a connection to the national grid and reduce the cost of lab space, to make the UK a more competitive investment destination for highly innovative businesses and reach the target of 3.0% of UK GDP being invested in R&D per annum.

14 **Commercialise and deploy the emerging technologies vital to a growing and resilient economy**: ensure the next Government builds on existing plans to support the commercialisation and deployment of emerging technologies, from AI and Quantum to semiconductors and autonomous vehicles, we could send strong signals to the market that the UK wants to be a hub for emerging technologies that will shape the future economy.

15 **Build a smarter approach to foreign and trade policy for the UK in a more complex and less secure world**: focus UK efforts on supporting multilateral systems such as the WTO, take targeted action alongside allies to secure supplies of key technologies such as semiconductors, and update rules on investment screening and how the Government consults on new free trade and digital economy agreements, to enable the UK to build a smarter and more responsive approach to foreign policy and international trade.

16 **Boost the competitiveness of the UK as a green technology hub**: add £13.7bn to the economy by 2030 through reforms to the grid, Environmental Social Governance requirements, and providing a database of green tech investment prospects.

17 **Empower individuals and businesses to better understand and improve their own environmental footprint**: change planning rules so all new homes can support smart tech that can empower people to better manage their energy bills, create standards so home smart tech is interoperable and reduce the cost of switching and speeding up the rollout of EV charging points.

18 **Make tech greener**: deliver a strategy to recycle and re-use the UK's e-waste and critical minerals, reduce our dependence on imports, digitise the grid to reduce the cost of reaching net zero by up to £16.7bn per year, and secure a first-mover advantage in biodiversity reporting.

We would love for you to get involved in our active All-Party Parliamentary Group. We bring together Parliamentarians and key players in the internet, communications and technology sectors to engage with the most pressing issues of today and tomorrow. Hosting numerous high-level discussions, our group exchanges ideas to strengthen the UK's position as a leading digital economy.

We welcome involvement and attendance at our events from a wide range of people and stakeholders.

Contact a member of the PICTFOR team at **admin@pictfor.org.uk** to hear more about our plans.

PICTFOR