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Independent report

AI Opportunities Action Plan

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AI Opportunities Action Plan. Ramping up AI adoption across the UK to boost economic growth, provide jobs for the future and improve people's everyday lives.

Foreword by the Secretary of State for Science, Innovation and Technology

Today, Britain is the third largest AI market in the world. We are home to an extraordinary array of global talent and pioneering AI firms like Google DeepMind, ARM, and Wayve. But despite our record of scientific discovery - from Alan Turing on algorithms and general-purpose computing to Tim Berners-Lee's World Wide Web - the UK risks falling behind the advances in Artificial Intelligence made in the USA and China.

In this next phase of AI development, we want Britain to step up; to shape the AI revolution rather than wait to see how it shapes us. Because we believe Britain has a particular responsibility to provide global leadership in fairly and effectively seizing the opportunities of AI, as we have done on AI safety. That is why one of my first acts as Secretary of State was to commission Matt Clifford to devise an AI Opportunities Action Plan for the British government.

This plan shows how we can shape the application of AI within a modern social market economy. We will do so by working closely with the world's leading AI companies, Britain's world leading academics and entrepreneurs, and those talented individuals keen to start-up and scale-up their businesses here. Our ambition is to shape the AI revolution on principles of shared economic prosperity, improved public services and increased personal opportunities so that:

- AI drives the economic growth on which the prosperity of our people and the performance of our public services depend;

- AI directly benefits working people by improving health care and education and how citizens interact with their government; and

- the increasing of prevalence of AI in people's working lives opens up new opportunities rather than just threatens traditional patterns of work.

Across government, we have already taken decisive action to support the AI sector and take down the barriers to growth. Our transformative planning reforms will make it easier to build the data centres that are the engines of the AI age. Skills England will help ensure that British people are prepared for jobs in the AI-powered industries of tomorrow. The Digital Centre of Government I have created in my Department will drive forward the technological transformation of the state, ensuring that public services offer citizens the same seamless experience they can find in the private sector.

The recommendations in this plan are unapologetic in their ambition; Government must be the same. Delivering our AI vision for Britain requires lots of hard work, some tough choices, and a commitment to real partnership between public and private sectors. There's no time to waste. Today, we have set out how we will rise to the challenge.

The Rt Hon Peter Kyle MP
Secretary of State for Science, Innovation and Technology

The opportunity

AI capabilities are developing at an extraordinary pace. If this continues, artificial intelligence (AI) could be the government's single biggest lever to deliver its five missions (https://www.gov.uk/missions), especially the goal of kickstarting broad-based economic growth. It is hard to imagine how we will meet the ambition for highest sustained growth in the G7 - and the countless quality-of-life benefits that flow from that - without embracing the opportunities of AI.

Any national AI plan needs to be founded on a realistic assessment of the country's strengths and weaknesses. Fortunately, the UK has solid - and in places genuinely world-leading - foundations on which to build:

- Strong fundamental AI research, and high-quality research and engineering talent coming out of our universities, which are some of the best in the world for AI.

- A vibrant startup and scaleup scene, with an increasingly skilled and experienced entrepreneurial workforce and growing quantities of sophisticated capital available for ambitious companies.

- Leading frontier AI companies in London, including Google DeepMind's headquarters, significant OpenAI, Anthropic, Microsoft and Meta AI offices, as well as emerging local winners - such as Wayve, the autonomous vehicle company.

- Global leadership on AI safety and governance via the AI Safety Institute, and a proportionate, flexible regulatory approach.

These are all crucial prerequisites to making the most of AI opportunities; without them, the ambition in this plan would not be credible. However, we cannot be complacent: to remain a world leader we need to lead in both building and using AI. Our goal should be a thriving domestic AI ecosystem, with serious players at multiple layers of the "AI stack" and widespread use of AI products and services across the economy.

The UK's starting point makes this aspiration plausible, but achieving it will require bold and visionary action. The government must:

- **Invest in the foundations of AI:** We need world-class computing and data infrastructure, access to talent and regulation (Section 1).

- **Push hard on cross-economy AI adoption:** The public sector should rapidly pilot and scale AI products and services and encourage the private sector to do the same. This will drive better experiences and outcomes for citizens and boost productivity (Section 2).

- **Position the UK to be an AI maker, not an AI taker:** As the technology becomes more powerful, we should be the best state partner to those building frontier AI. The UK should aim to have true national champions at critical layers of the AI stack so that the UK benefits economically from AI advancement and has influence on future AI's values, safety and governance (Section 3).

This Action Plan is made up of three sections - one for each of these goals. There are detailed recommendations in each. In making them, I have tried to draw consistently on a small number of core principles:

- Be on the side of innovators: In every element of the Action Plan, the government should ask itself: does this benefit people and organisations trying to do new and ambitious things in the UK? If not, we will fail to meet our potential.

- Invest in becoming a great customer: government purchasing power can be a huge lever for improving public services, shaping new markets in AI, and boosting the domestic ecosystem. But doing this well is not easy - it will require real leadership and radical change, especially in procurement.

- Crowd in capital and talent: The UK is a medium-sized country with a tight fiscal situation. We need the best talent around the world to want to start and scale companies here. If we do that, the best investors globally will want to deploy capital here - both into our startups and our AI infrastructure.

- Build on UK strengths and catalytic emerging areas: The UK has strong companies in the AI application and integration layers that are well positioned to grow. We also have emerging areas of research and

engineering strength - particularly in AI for science and robotics - that could have a transformational impact across the economy, advance AI and unlock further innovation.

No one can say with certainty what AI will look like a decade from now. My judgement is that experts, on balance, expect rapid progress to continue. The risks from underinvesting and underpreparing, though, seem much greater than the risks from the opposite. Even if AI progress slows, we will see large benefits from deploying today's frontier capabilities and investing in our infrastructure and talent base.

If, however, capabilities continue to advance, having a stake in - and being the natural home of - advanced AI could be the difference between shaping the future of science, technology and work and seeing these decisions made entirely outside our borders. This is a crucial asymmetric bet - and one the UK can and must make .

1. Lay the foundations to enable AI

1.1 Building sufficient, secure and sustainable AI Infrastructure

The foundation of the last decade of AI progress has been an extraordinary and sustained investment in computational power (often called "compute"). AI requires data centres that house the large and complex computers that are used to train AI models and to run 'inference' (where AI is used to complete tasks and answer queries).

Of course, the UK does not need to own or operate all the compute it will need. Indeed, only a small fraction of our needs will be through such compute (though this fraction is important). A decade from now the economy will almost certainly be more computationally intensive: new high-skill jobs and compute-adjacent industries will have been created and access to compute will be a key pillar of economic security. Countries that enable the build out of AI infrastructure will reap benefits through increased economic growth, the reinvigoration of former industrial sites and ownership of critical strategic assets.

The availability of powerful computing resources sends an important signal to academic, technical and entrepreneurial talent and is a critical ingredient of innovation. We should expect enormous improvements in computation over the next decade, both in research and deployment. Having this

"learning by doing" happen in the UK is crucial if we want the industries of the future to be built here.

The government must therefore secure access to a sufficient supply of compute. There is no precise mechanism to allocate the proportions, but it should consist of:

- Sovereign AI compute, owned and/or allocated by the public sector, will enable the UK to quickly and independently allocate compute to national priorities. For example, we need the ability to: drive mission-focused AI research; empower academics and startups to train AI models; and ensure access to AI compute for critical services in times of market disruption. Sovereign AI compute will almost certainly be the smallest component of the UK's overall compute portfolio. NB: this review has not considered the requirements of non-AI high-performance computing, for which there is already a well-established case, including the need to deliver an exascale capability. Government should seek to resolve this as soon as possible, noting that these systems will play a crucial role in supporting AI science and research.

- Domestic compute, that is based within the UK but privately owned and operated and that will position the UK as a leading AI economy and ensure the UK's economic security. Due to the criticality of compute for AI, domestic compute will create spillover benefits in the form of jobs, investment and new, AI based, service businesses. In this part of the portfolio, crowding in private and international capital is critical.

- International compute, accessed via reciprocal agreements and partnerships with like-minded partners, to give the UK access to complementary capabilities and facilitate joint AI research in areas of shared interest. We should proactively develop these partnerships, while also taking an active role in the EuroHPC Joint Undertaking.

To achieve this, government should:

1. **Set out, within 6 months, a long-term plan for the UK's AI infrastructure needs, backed by a 10-year investment commitment.** Building a world class AI compute ecosystem requires a clear objective and long-term capability and expertise. Government should consider what the most appropriate delivery body is for large scale research infrastructure that is delivered in partnership with universities and industry. We have pockets of deep academic expertise in this space, such as at Edinburgh, Bristol and Cambridge universities, and we should draw on this. A credible plan will consider emerging compute technologies, include investment in software, skills, and wider high-performance computing capabilities to complement our AI compute and enable AI for science.

2. **Expand the capacity of the AI Research Resource (AIRR) by at least 20x by 2030 - starting within 6 months.** The AIRR should evolve into a set of mission-oriented clusters that bring together compute, data, and talent to

pursue frontier AI research and other national priorities. Expansion by at least 20x by 2030 would ensure the AIRR enables the training of multiple AI models a year and provides an up to date research capability.[footnote 1] Given trends in hardware performance, this would not mean a 20x increase in investment if the government procures smartly.[footnote 2] Such expansion is needed to keep up with the expected increases in computing power that we should assume will be needed for AI workloads. This is unlikely to slow down; we need to "run to stand still". As part of this, government should ensure that the public compute ecosystem hosts a range of hardware providers to avoid vendor lock-in and ensure value for money.

3. **Strategically allocate sovereign compute by appointing mission-focused "AIRR programme directors" with significant autonomy.** These could be modelled after the Defense Advanced Research Projects Agency (DARPA) or the Advanced Research and Invention Agency (ARIA) to quickly and independently provide large amounts of compute to high-potential projects of national importance, operating in a way that is strategic and mission driven. Allocation is an essential part of any compute strategy: spreading large amounts of compute thinly will have little impact. We will have to make choices about when to subsidise compute and when to provide it at cost, recognising that this could form part of an attractive offer to entrepreneurs and researchers deciding where to base themselves.

4. **Establish 'AI Growth Zones' (AIGZs) to facilitate the accelerated build out of AI data centres.** As AI infrastructure providers seek access to land and power, governments who move quickly and mirror the pace of growth and innovation in the AI data centre market will be best placed to secure investment. AIGZs could introduce a streamlined planning approvals process and accelerate the provisioning of clean power. This is a major opportunity to crowd in private capital to boost our domestic compute portfolio and to build strategic partnerships with AI developers to work on shared AI and AI-enabled priorities. Government can also use AIGZs to drive local rejuvenation, channelling investment into areas with existing energy capacity such as post-industrial towns and coastal Scotland. Government should quickly nominate at least one AIGZ and work with local regions to secure buy-in for further AIGZs that contribute to local needs. Existing government sites could be prioritised as pilots, including Culham Science Centre, the UK Atomic Energy Authority's headquarters, which has access to significant power and land. Alongside this, government should consider other measures to accelerate buildout of data centres, such as offering central guidance, creating a bespoke planning use-class and considering the case for AI data centres to be eligible for relevant relief schemes that incentivise private sector investment.

5. **Mitigate the sustainability and security risks of AI infrastructure, while positioning the UK to take advantage of opportunities to provide solutions.** This should focus both on secure private-sector compute as well as collaboration with the UK Intelligence Community. Government should also explore ways to support novel approaches to compute hardware and,

where appropriate, create partitions in national supercomputers to support new and innovative hardware. In doing so, government should look to support and partner with UK companies who can demonstrate performance, sustainability or security advancements.

6. **Agree international compute partnerships with like-minded countries to increase the types of compute capability available to researchers and catalyse research collaborations.** This should focus on building arrangements with key allies, as well as expanding collaboration with existing partners like the EuroHPC Joint Undertaking.

1.2 Unlocking data assets in the public and private sector

To fuel both frontier AI progress and high-quality AI applications, developers need access to high-quality data - the lifeblood of modern AI. Data that isn't in the training sets of current models and encodes new insights about the world is particularly valuable. Public data sets, including scientific data sets, may be extremely important in this context.

We should seek to responsibly unlock both public and private data sets to enable innovation by UK startups and researchers and to attract international talent and capital. As part of this, government needs to develop a more sophisticated understanding of the value of the data it holds, how this value can be responsibly realised, and how to ensure the preservation of public trust across all its work to unlock its data assets.

The creation of the National Data Library (NDL) presents an enormous opportunity. As it develops the NDL, the government should:

7. **Rapidly identify at least 5 high-impact public datasets it will seek to make available to AI researchers and innovators.** Prioritisation should consider the potential economic and social value of the data, as well as public trust, national security, privacy, ethics, and data protection considerations. We should explore use of synthetic data generation techniques to construct privacy-preserving versions of highly sensitive data sets. Government data sets are a public asset, and careful consideration should be given to their valuation.

8. **Strategically shape what data is collected, rather than just making data available that already exists.** Government should look to collect data in strategically significant areas, building on existing UK strengths. For example, the NDL could build on the achievements of the UK Biobank to enhance research in areas such as disease recognition and the prediction

of health outcomes. The NDL should run open calls to receive proposals from researchers and industry to propose new data sets.

9. **Develop and publish guidelines and best practices for releasing open government datasets which can be used for AI, including on the development of effective data structures and data dissemination methods.**

10. **Couple compute allocation with access to proprietary data sets** as part of an attractive offer to researchers and start-ups choosing to establish themselves in the UK and to unlock innovation.

11. **Build public sector data collection infrastructure and finance the creation of new high-value datasets that meet public sector, academia and startup needs.** Government should identify how public data will be collected and its quality enhanced, including the use of AI-driven data cleansing tools to curate data sets stored across government, making them suitable for AI developers and researchers.

12. **Actively incentivise and reward researchers and industry to curate and unlock private datasets.** In particular, the NDL should engage with UKRI to identify how the creation of valuable high-quality data sets that support the research community could be better acknowledged via the Research Excellence Framework. Government should also explore how to shape the market in data set curation, including contributions from the private sector.

13. **Establish a copyright-cleared British media asset training data set,** which can be licensed internationally at scale. This could be done through partnering with bodies that hold valuable cultural data like the National Archives, Natural History Museum, British Library and the BBC to develop a commercial proposition for sharing their data to advance AI.

1.3 Training, attracting and retaining the next generation of AI scientists and founders

If we want the UK to have both world-class AI research and a world-leading AI application ecosystem, we need to be the natural home for elite talent. In the next 5 years, the UK must be prepared to train tens of thousands of additional AI professionals across the technology stack to meet expected demand and proactively increase its share of the world's top 1,000 AI researchers.

In the long-term, government needs to create a deeper pool of AI skills and talent that will build, diffuse and use AI products across the economy.[footnote

[3] Setting a short-term target to train tens of thousands of AI professionals by 2030 will help bridge the estimated gap between supply and demand. [footnote 4] This would put the UK in step with countries like France, whose National AI Commission calculates that the number of French AI graduates would need to triple over the next decade to match estimated demand. [footnote 5]

As a priority first step, government should:

14. **Accurately assess the size of the skills gap.** Current estimates are imprecise and outdated; the last government-funded AI labour market survey was in 2020 and the Unit for Future Skills' jobs and skills dashboard, while a step in the right direction, still uses supply data from 2019.[footnote 6] The success of the following recommendations depends on accurately understanding the skills gap, and so government must make efforts to come to a concrete and up-to-date number.

Once the size of the skills gap is confirmed, to reach this target over the next 5 years government should:

15. **Support Higher Education Institutions to increase the numbers of AI graduates and teach industry-relevant skills.** In 2022, 46,000 students graduated from an AI-relevant higher education programme in the UK. While this is the highest in Europe, with Germany (32,000) second, the UK is behind Finland and others on a per capita basis and there remains unmet demand for skilled workers.[footnote 7] Supporting universities to develop new courses co-designed with industry - such as the successful co-operative education model of Canada's University of Waterloo, CDTM at the Technical University of Munich or France's CIFRE PhD model - and increasing their teaching and recruitment capacity would help train the tens of thousands of AI professionals needed by 2030.

16. **Increase the diversity of the talent pool.** Only 22% of people working in AI and data science are women.[footnote 8] Achieving parity would mean thousands of additional workers. The AI conversion courses have helped to diversify the AI pipeline, but only at the top end. Government should build on this investment and promote diversity throughout the education pipeline. Interventions must be tailored - there is no one-size-fits-all approach. Hackathons and competitions in schools have proven effective at getting overlooked groups into cyber and so should be considered for AI.[footnote 9]

17. **Expand education pathways into AI.** Higher education is the most common pathway into AI careers and will likely remain so at least until 2030. [footnote 10] To meet the demands of the labour market and the changing skills needs of the future, however, government should encourage and promote alternative domestic routes into the AI profession - including through further education and apprenticeships, as well as employer and self-led upskilling.

18. **Launch a flagship undergraduate and masters AI scholarship programme on the scale of Rhodes, Marshall, or Fulbright for students to study in the UK.** Open to a diverse initial cohort of 100 scholars from the UK and abroad, the programme would combine financial support, cohort building, industry co-investment, and placements in government or private sector AI organisations. Potential scholars must show exceptional promise, but recognising the broad range of talents needed for success in AI, this could be in a variety of fields, such as strong performance in a leading STEM competition (e.g. the International Mathematical or Informatics Olympiads).

19. **Ensure its lifelong skills programme is ready for AI.** AI will continue to change the labour market, though exactly how and when is unclear. What is certain is while some jobs will be replaced by AI, many will be augmented - and an unknown number will be created. Government should ensure there are sufficient opportunities for workers to reskill, both into AI and AI-enabled jobs and more widely. The UK should also learn and adopt best practice from other countries who are preparing their skills systems for the long-term impacts of AI. Singapore, for example, developed a national AI skills online platform with multiple training offers. South Korea is integrating AI, data and digital literacy throughout its education pipelines through an AI curriculum and a variety of training and education programmes. Skills England and the independent Curriculum and Assessment Review present an opportunity to consider the merit of such approaches in our system.

Alongside these longer-term investments, the government's priority should be to rapidly increase the number of top AI research talents who work in the UK. These leading AI scientists and engineers are few in number and highly prized globally. The countries that attract them will play an outsized role in the future of AI. It is not surprising that the US, which is the number 1 destination for top talent, has also been at the forefront of recent AI breakthroughs.

International competition for top talent is fierce. The UK must go further than existing measures and take a more proactive approach at every stage of the talent pipeline. Though ambitious, these efforts could yield large benefits for the UK if one individual founds the next DeepMind or OpenAI.

Within the next year, government should:

20. **Establish an internal headhunting capability on a par with top AI firms to bring a small number of elite individuals to the UK.** Government should build on the success of the AI Safety Institute in attracting top talent. This may include recruiting more people into AISI, UK Sovereign AI or other public AI labs, as well as UK-based companies. Officials will need flexibility to develop specific offers and provide wraparound support to talent targets - recognising that to truly 'headhunt' talent the programme will need to be backed by appropriate funding.

21. **Explore how the existing immigration system can be used to attract graduates from universities producing some of the world's top AI talent.** Graduates from some leading AI institutions, such as the Indian Institutes of Technology and (since 2020) Carnegie Mellon University in the US, are not currently included in the High Potential Individual visa eligibility list. Government should take steps to develop new pathways, and strengthen existing ones, to support these graduates. It should also explore how best to address wider barriers like the cost and complexity of visas which create obstacles for startups and deter overseas talent from re-locating to the UK.[footnote 11]

22. **Expand the Turing AI Fellowship offer.** 15 new Turing AI Pioneer Fellowships should be created for specialists in other sectors who wish to develop deep technical skills in AI. At the same time, funding for 25 more Turing AI Acceleration and AI World-Leading fellowships should be committed to maintain the current cohort size over the next 3 years, as existing fellows graduate from the programme.

1.4 Enabling safe and trusted AI development and adoption through regulation, safety and assurance

The UK's current pro-innovation approach to regulation is a source of strength relative to other more regulated jurisdictions and we should be careful to preserve this.

Well-designed and implemented regulation, alongside effective assurance tools, can fuel fast, wide and safe development and adoption of AI. Regulators themselves have an important role in supporting innovation as part of their Growth Duty. Government must protect UK citizens from the most significant risks presented by AI and foster public trust in the technology, particularly considering the interests of marginalised groups. That said, we must do this without blocking the path towards AI's transformative potential.

Ineffective regulation could hold back adoption in crucial sectors like the medical sector, but regulation, safety and assurance have the power to drive innovation and economic growth too, as shown by the success of regulatory sandboxes in supporting fintech startups and the development of the UK's cyber security industry.[footnote 12] Clear rules provide clarity to businesses so they have the confidence to invest and bring new products and services to market.

The government should:

23. **Continue to support and grow the AI Safety Institute (AISI) to maintain and expand its research on model evaluations, foundational safety and societal resilience research.** AISI is the first safety institute to have conducted pre-deployment evaluations of frontier models and its success is a significant and growing source of international influence for the UK. Continued investment is needed to ensure AISI retains its position as a world-leader and remains attractive to top AI safety researchers. It is also essential to act quickly to provide clarity on how frontier models will be regulated. A top priority of any such regulation should be preserving the capability, trust and collaboration that the AISI has built up since its creation.

24. **Reform the UK text and data mining regime so that it is at least as competitive as the EU.** The current uncertainty around intellectual property (IP) is hindering innovation and undermining our broader ambitions for AI, as well as the growth of our creative industries. This has gone on too long and needs to be urgently resolved. The EU has moved forward with an approach that is designed to support AI innovation while also enabling rights holders to have control over the use of content they produce. The UK is falling behind.

It is also essential that we act now to ensure sector regulators are fit for the age of AI. In particular, government should:

25. **Commit to funding regulators to scale up their AI capabilities, some of which need urgent addressing.** Government should also ensure all sponsor departments demonstrate how they are funding this capability within their budgets through the Spending Review process.

26. **Ensure all sponsor departments include a focus on enabling safe AI innovation in their strategic guidance to regulators.** AI will touch every aspect of the economy and so it is essential that all regulators are prioritising understanding its impacts in their domains and considering how best to encourage its safe adoption.

27. **Work with regulators to accelerate AI in priority sectors and implement pro-innovation initiatives like regulatory sandboxes.** These should be targeted in areas with regulatory challenges but high-growth potential, such as products which integrate AI into the physical world like autonomous vehicles, drones and robotics.

28. **Require all regulators to publish annually how they have enabled innovation and growth driven by AI in their sector.** To ensure accountability, this should include transparent metrics such as timelines to publish guidance, make licence decisions and report on resources allocated to AI-focused work. Even with these initiatives, individual regulators may still lack the incentives to promote innovation at the scale of the government's ambition. If evidence demonstrates that is the case, government should consider more radical changes to our regulatory model for AI, for example by empowering a central body with a mandate and higher risk tolerance to

promote innovation across the economy. Such a body could have expertise and statutory powers to issue pilot sandbox licences for AI products that override sector regulations, taking on liability for all related risks. This approach could initially be explored and piloted for specific AI applications at small scale.

Alongside investing in pro-innovation regulation, the government should:

29. **Support the AI assurance ecosystem to increase trust and adoption by:**

- Investing significantly in the development of new assurance tools, including through an expansion to AISI's systemic AI safety fast grants programme, to support emerging safety research and methods.
- Building government-backed high-quality assurance tools that assess whether AI systems perform as claimed and work as intended.

As part of taking forward the recommendations in this Action Plan, government should:

30. **Consider the broader institutional landscape and the full potential of the Alan Turing Institute to drive progress at the cutting edge, support the government's missions and attract international talent.**

2. Change lives by embracing AI

2.1 AI Adoption is core to delivering the government's missions

The adoption of high-performing, trustworthy AI at scale will be critical to the [government fulfilling the five missions](https://www.gov.uk/missions) (https://www.gov.uk/missions). AI should become core to how we think about delivering services, transforming citizens' experiences, and improving productivity. As well as strengthening the foundations - data, skills, talent, IP, and assurance measures set out above - government should also focus on its role as a major user and customer of AI and how it uses its powers to catalyse private sector adoption:

Adoption missions

Though we are still early in the development of the AI application layer - and all AI use should be tailored appropriately to the specific setting or sector in which it will be deployed. For example, AI use in health and care will raise different considerations than in advanced manufacturing. Indeed there are already great examples of AI use-cases driving tangible benefits across the private and public sectors:

- **Using AI assistants** to do repetitive tasks better and faster, freeing up to 20% of an employee's time.[footnote 13] For example, it is helping some teachers cut down the 15+ hours a week they spend on lesson planning and marking in pilots.

- **Drafting structured reports and forms with AI** can cut final document production times by 20-80% in professional services.[footnote 14] Trials are underway exploring how these methods can save time for clinical practitioners in the NHS.

- **Automated threat and anomaly detection** is already being responsibly deployed by police forces across the country and used to clean up social media.

- **Assessment and diagnosis** can be improved through the use of AI. For example, through the £21 million AI Diagnostics fund, Department for Health and Social Care (DHSC) is supporting the deployment of technologies in key, high-demand areas such as chest X-Ray and chest CT scans to enable faster diagnosis and treatment of lung cancer in over half of acute trusts in England. Assessments can be done better, cheaper, and more quickly across multiple sectors. We also anticipate that AI will be a useful tool for assessment in the education sector. For example, the Department for Education's generative AI and rules-based marking tool showed 92% accuracy in a pilot with teachers on year 4 literacy work when drawing from appropriately coded educational data and content. [footnote 15]

2.2 Adopt a "Scan > Pilot > Scale" approach in government

While there are instances of AI being used well across the public sector, often they are at small scale and in silos. Scaling these successes is

essential, but will require us to think differently about procurement, especially if this activity is to support the domestic startup and innovation ecosystem. As the digital centre of government, DSIT should support public sector partners where needed to "move fast and learn things".

Government should generally employ a flexible "Scan > Pilot > Scale" approach.

Scan
Investing in building a deep and continually updated understanding of AI capabilities mapped to their highest impact challenges and opportunities. This will require:

31. **Appointing an AI lead for each mission to help identify where AI could be a solution within the mission setting, considering the user needs from the outset.**

32. **A cross government, technical horizon scanning and market intelligence capability who understands AI capabilities and use-cases as they evolve to work closely with the mission leads and maximise the expertise of both.**

33. **Two-way partnerships with AI vendors and startups to anticipate future AI developments and signal public sector demand.** This would involve government meeting product teams to understand upcoming releases and shape development by sharing their challenges.

Pilot
Rapidly developing prototypes or fast light-touch procurement to spin up pilots in high-impact areas, robust evaluation and publishing results. This will require:

34. **Consistent use of a framework for how to source AI - whether to build in-house, buy, or run innovation challenges - that evolves over time, given data, capability, industry contexts and evaluation of what's worked.** Where appropriate, the government should support open-source solutions that can be adopted by other organisations and design processes with startups and other innovators in mind.

35. **A rapid prototyping capability that can be drawn on for key projects where needed, including technical and delivery resource to build and test proof of concepts, leveraging in-house AI expertise, together with specialists in design and user experience.**

36. **Specific support to hire external AI talent.** Creation of a technical senior civil servant stream, benchmarking of internal AI-related role pay to at least 75% of private-sector rate and a technical AI recruitment screening process.[footnote 16]

37. **A data-rich experimentation environment including a streamlined approach to accessing data sets, access to language models and necessary infrastructure like compute.**

38. **A faster, multi-stage gated and scaling AI procurement process that enables easy and quick access to small-scale funding for pilots and only layers bureaucratic controls as the investment-size gets larger.** Multi-staged "Competitive Flexible Procedures" should be encouraged, and startups compensated for the rounds they make it through.[footnote 17]

Scale
Identifying successful pilots that can be applied in different settings to support citizens (e.g. to reduce waiting lists or minimise time and cost to complete paperwork) and rolling them out beyond organisational boundaries. Scale is essential if AI is to have a meaningful impact on productivity, effectiveness and citizen experience, as well as maximising government spending power. Moreover, doing this well and procuring in a way that benefits innovators is a powerful lever for upending the cliché that the UK is good at invention, but poor at commercialisation. It will require:

39. **A scaling service for successful pilots with senior support and central funding resource.** The government should support a select number of proven pilots to scale - with central finance and tools available to avoid fragmentation across systems and budgets - and achieve up to national level reach.

40. **Mission-focussed national AI tenders to support rapid adoption across de-centralised systems led by the mission delivery boards.** An example of tendering to enable scale is the NHS's AI Diagnostic Fund allocating £21 million to twelve imaging networks, covering 66 NHS trusts across England, significantly speeding up the roll out of AI diagnostic tools nationwide.[footnote 18] However, these tenders should be designed to encourage new entrants, avoiding reliance on commercial frameworks where possible.

41. **Development or procurement of a scalable AI tech stack that supports the use of specialist narrow and large language models for tens or hundreds of millions of citizen interactions across the UK.**

42. **Mandating infrastructure interoperability, code reusability and open sourcing.** The AI infrastructure choice at-scale should be standardised, tools should be built with reusable modular code components, and code-base open-sourcing where possible.

2.3 Enable public and private sectors to reinforce each other

The public and private sectors should play mutually reinforcing roles in AI adoption. To get the most from working together, government should:

43. **Procure smartly from the AI ecosystem as both its largest customer and as a market shaper.** Innovative AI suppliers from the UK and around the world should be engaged to support demand and encourage investment. Procurement contract terms should set standards (e.g. quality), requirements, and best practice (e.g. performance evaluations). "Contemplation" clauses should be included in contracts to ensure the government remains agile to a rapidly changing AI ecosystem by mandating that contractors regularly assess and adopt newer technologies.

44. **Use digital government infrastructure to create new opportunities for innovators.** For example, an approach akin to Jeff Bezos's API mandate at Amazon could be adopted. This required all teams' data and functionality to be exposed through APIs (Application Programme Interfaces). All standard documentation interactions, like compliance or planning, could be done through APIs, to which companies could connect their own tools. Similarly, mandating e-Invoices from government suppliers could automate billing, speed up payments and reduce fraud.

45. **Publish best-practice guidance, results, case-studies and open-source solutions through a single "AI Knowledge Hub"** accessible to technical and non-technical users across private and public sectors as a single place to access frameworks and insights.

46. **In the next 3 months, the Digital Centre of Government should identify a series of quick wins to support the adoption of the scan, pilot scale approach and enable public and private sector to reinforce each other.**

2.4 Address private-sector-user-adoption barriers

AI adoption could grow the UK economy by an additional £400 billion by 2030 through enhancing innovation and productivity in the workplace. [footnote 19] Safe, effective and swift AI adoption has the potential to enhance the international competitiveness of sectors of UK strength and unlock new growth opportunities across the whole economy, including for SMEs. To capture the benefits of AI adoption across the private sector, the government should:

47. **Leverage the new Industrial Strategy. The development of a new Industrial Strategy presents an opportunity to drive collective action to support AI adoption across the economy.** The Industrial Strategy will need to set out how AI adoption can best be supported in key industries, noting particular use cases that could boost productivity and present a particular competitive advantage while also identifying possible regulatory barriers and specific skills needs that need to be addressed. DSIT and others with AI expertise within government can play a critical role in combining with those who have a deep understanding of their sectors to engage business leaders, identify high-potential use cases, co-design targeted interventions to promote them and overcome barriers to adopting them.

48. **Appoint AI Sector Champions in key industries like the life sciences, financial services and the creative industries to work with industry and government and develop AI adoption plans.**

49. **Drive AI adoption across the whole country.** Widespread adoption of AI can address regional disparities in growth and productivity. To achieve this, government should leverage local trusted intermediaries and trade bodies to support business leaders, and also consider opportunities to accelerate AI adoption by working across supply chains. A particular focus should be put on supporting SMEs and the specific challenges they face.

3. Secure our future with homegrown AI

By the end of the decade, having national champions at the frontier of AI capabilities may be a critical pillar of our national and economic security. Government should use the full powers it has available to ensure this happens.

AI systems are increasingly matching or surpassing humans across a range of tasks. Today's AI systems have many limitations, but industry is investing at a scale that assumes capabilities will continue to grow rapidly. Frontier models in 2024 are trained with 10,000x more computing power than in 2019, and we are likely to see a similar rate of growth by 2029. If progress

continues at the rate of the last 5 years, by 2029 we can expect AI to be a dominant factor in economic performance and national security.

Many of us have become familiar with the remarkable capabilities of large language models across a broad set of domains. Leading AI companies continue to push this frontier, and we are also seeing stunning progress in other modalities, including breakthroughs in video and image generation, robotics, mathematics, and scientific discovery. To take one example, DeepMind's AlphaFold - which predicts protein structures - is estimated to have saved the equivalent of 400 million years of researcher time. We can imagine the impact on science, medicine and the broader economy if we see this sort of success in other domains.

Given the pace of progress, we will also very soon see agentic systems - systems that can be given an objective, then reason, plan and act to achieve it. The chatbots we are all familiar with are just an early glimpse as to what is possible.

The economic consequences of continued progress in these areas could be enormous. Just as with previous technological revolutions, the people and countries who make decisions about how these systems operate and what values they reflect - including their approach to safety - will have huge influence over our lives.

If this is to benefit the UK we must be an AI maker, not just an AI taker: **we need companies at the frontier that will be our UK national champions.**

We have all the raw ingredients to make this possible. AI research and product development is a UK strength rooted in world-class engineering talent coming out of our excellent universities and local AI winners such as DeepMind and Wayve. Our position between the US and Europe, and convenient time-zone, make the UK an ideal place for international founders to collaborate.

Section 1 and Section 2 of this Action Plan above are critical to building on this. Section 1 covered the policy and infrastructure needed for the growth of the domestic AI sector. Section 2 covered the policies needed for widespread AI adoption - a necessary condition for a world-leading AI application ecosystem.

We should assume that most advanced economies will soon be doing much of the above. If we aspire to be one of the biggest winners from AI and drive national renewal, we need to go further.

Given the lead the current frontier firms enjoy, we cannot expect the market to solely underwrite a new challenger, especially in the next 2 to 3 years. But government holds critical levers for the next stage of AI development. Generating national champions will require a more activist approach and

something more akin to Japan's MITI or Singapore's Economic Development Board in the 1960s, not the "invisible hand".

The government must maximise its ambition and ensure the UK has national champions at the frontier of economically and strategically important capabilities. This means government needs to:

- Ensure that research and development of frontier AI capabilities takes place in the UK - both in the current foundation model paradigm and in emerging spaces such as AI for science, robotics, and "embodied AI".

- Ensure that the UK maximises both its economic upside from and influence on these capabilities as they advance.

Achieving this will require bold, concerted and coherent action, using all the levers of the state to make the UK the best place in the world to build and scale frontier AI companies. While I don't want to understate how difficult this will be, I am confident that with the right focus and backing, the UK can do this.

To this end, the government should:

50. Create a new unit, UK Sovereign AI, with the power to partner with the private sector to deliver the clear mandate of maximising the UK's stake in frontier AI.

Public-private collaboration will be at the heart of this unit. It will support the private and academic sectors in doing what they do best, with the ability to collaborate internationally, create joint ventures, as well as invest in, incubate and spin out AI companies - refining its strategy and approach as the technology matures.

To achieve this, the unit must develop a clear position on which areas of AI research are strategically important for the future of the technology and make concentrated bets in these areas. This could involve supporting entrepreneurs to create new companies, backing startups to scale or partnering with existing AI companies that are already at the frontier to maximise the UK's upside however the technology develops.

With a clear and powerful mandate the unit will play a critical coordinating role, able to remove barriers and make deals to maximise the UK's chance of growing globally competitive national champions. It will need to be able to draw on the resources of government to act quickly and decisively. If it is to succeed, it will require support from other government organisations. Especially important will be Innovate UK, which should make AI a top priority and support the unit through the funding it provides to promising start-ups.

Early tolerance for scientific and technical risk can be hugely valuable. For example, the unit or its public sector partners might join funding rounds or provide advanced market commitments to credible and ambitious startups in emerging fields of AI. AI for science is an area with the potential to be particularly important because of its economic value and security implications; the UK's existing talent strengths; and the particularly high value of the state's assets in this space.

The use of these non-financial assets, alongside capital and procurement, will be critical to the unit's offer. **UK Sovereign AI should lead the delivery of a government offer to new and existing frontier AI companies that includes:**

- Direct investment into companies, including promising start-ups as well as joint ventures with other commercial partners.

- Delivering appropriate sites for compute in the UK, including through AI Growth Zones, and international partnerships to guarantee compute access from appropriate allies.

- Packaging and providing responsible access to the most valuable UK-owned data sets and relevant research.

- Supporting UK-based AI organisations working on national priority projects to bring in overseas talent and headhunting promising founders or CEOs (and their teams) by convincing them to relocate to the UK.

- Facilitating deep collaboration with the national security community.

In exchange, UK Sovereign AI should ensure economic upside from, and influence on, governance of frontier AI for the UK.

AI may well be the most important technology of our time. Now is the moment to act boldly and with vision so that the UK helps to shape AI's course and our citizens' share in its upside.

Conclusion

The Action Plan I have set out will require the government to both take a long-term view and take action immediately. It will need to commit to securing the physical infrastructure and human capital that will underpin all future AI developments. Government should also have the self-confidence and ambition to set an example for the rest of the economy. This will require a novel approach involving close collaboration with industry to ensure the whole of society can benefit from the opportunities offered by AI.

Business-as-usual is not an option. Instead, government will need to be prepared to absorb some risk in the context of uncertainty.

This will require a whole of government commitment, with senior and visible leadership and a relentless focus on driving progress.

This is no small task. Nevertheless, the benefits are likely to be transformational, not just to support economic growth, but to people's lives across the whole of the UK.

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1. Assumes compute requirements continue to grow at 4x per year.

2. Assuming trends in hardware performance continue, by 2030 each pound spent on GPUs will buy 8x more FLOP and require 4x less power, therefore expanding AIRR by 20x would require much less than a 20x increase in investment.

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