

## **The AI revolution and public services transformation**

As the world around us experiences a rapid transformation driven by technological enhancements, the discourse around artificial intelligence (AI) has taken centre stage. Governments across the world have been increasing their expenditure on AI in recent years. In April 2018, the UK government committed to invest around £1 billion to boost the UK's global position as a leader in AI technologies (DCMS, 2021). More recently, in the Autumn Statement, Chancellor Jeremy Hunt pledged an additional £500 million in the next two years to make the UK an "AI powerhouse" (HMT, 2023). These investments emphasise the government's recognition of the power of AI to improve healthcare, education, transportation, regulation and environmental protection – thereby improving productivity, growth and innovation both in the private and public sectors.

While some express apprehension about potential negative consequences of AI, such as job losses, algorithmic bias and privacy issues, others envision a future where this technology positively revolutionises several aspects of our lives. This includes promoting transparency, sustainability and data-driven decisions in delivering public services. By using AI to process extensive amounts of data, identify patterns and make predictions, the government can design better policies, improve the efficiency and effectiveness of its services, and change its interaction with citizens, residents and businesses. In this essay, we have tried to succinctly capture the main points regarding the promise of AI in public services while also acknowledging important counter-perspectives. The central idea is that, despite valid risks, the potential benefits are too substantial for governments not to pursue and promote the adoption of AI for public benefit.

An immediate application of AI in the public sector involves task automation, particularly automating simple, more administrative and processing tasks. This automation can increase public sector efficiency and productivity by freeing up civil servants to concentrate on more relevant and strategic tasks. For example, Viechnicki and Eggers (2017) report that civil servants in the United States spend approximately 10% of their time on documenting and recording information. Automating these tasks could increase productivity and result in substantial cost savings for governments. Another AI application is digitalising public services towards an end-to-end digital service model. Governments can improve their service user experience by incorporating chatbots and speech recognition on their websites and call centres. Chatbots could also be used to issue licenses, while big data analysis could identify vulnerable people in need of welfare services and automate public funds distribution, such as subsidies for schools. Additionally, facial recognition could strengthen border control and identify fraud in digital applications (Ubaldi et al., 2019), speeding up processes, and increasing coverage and customisation of public services.

Another critical area where AI may have an impact is in promoting transparency and responsibility. AI systems can scrutinise government spending, evaluate programme performance, and identify corruption practices and inefficiencies. This improved transparency and monitoring of government activities can enhance public trust in government institutions as well as guarantee an efficient and responsible use of resources. Regarding policymaking, AI can play a crucial role for the government. Its capacity to analyse large datasets allows policymakers to make data-informed recommendations, thereby improving resource allocation and policy implementation. In addition, AI can analyse policy outcomes, providing additional insights and identifying areas where policies may be insufficient. Moreover, AI's predictive capabilities can help identify potential issues, allowing the government to implement preventive measures to mitigate or avoid problems before they arise (Ubaldi et al., 2019).

Shifting focus from policy decisions, applying AI to optimise transportation networks also carries several advantages for public services. The government can effectively use AI to optimise traffic flows, alleviate congestion, enhance public transportation schedules, prevent accidents and improve road safety. Using computer vision machine learning, AI processes large amounts of data from several sensors and cameras installed on the road to identify traffic patterns. For example, Siemens Mobility developed a system that monitors traffic through cameras and changes traffic light patterns based on real-time road conditions, thereby reducing road congestion (Siemens, 2023). Similarly, some systems use GPS-linked speed-limit data and video cameras to help drivers keep to speed limits. When the speed is above the limit, either the driver is alerted, or the speed is automatically reduced on the vehicle, decreasing the risk of road speed accidents. This Intelligent Speed Assistance system has been mandatory in new vehicles in the EU since 2022, but for it to work properly, local governments need to digitise their speed limit maps and keep them up to date (ETSC, 2018).

The cost of repairing roads in Britain has reached a record high, exceeding £14 billion according to the Annual Local Authority Road Maintenance (ALARM) survey. Compensation claims accounted for a total payout of £11.6 million, with pothole-related claims constituting 72% of this figure, on average (AIA, 2023). For years, the task of monitoring road conditions has relied on citizens who reported damages to their local authorities. However, now, computer vision in AI can meticulously identify potholes and assess surrounding infrastructure by looking at the conditions and changes in the asphalt and concrete. These algorithms collect image data to detect cracks in the road and create a classification system, which is updated in real-time. This system shows the authorities the road damage so they can take action to improve road maintenance. These AI processes help the government save time and money by improving allocation efficiency, while also increasing road safety.

Likewise, AI also has significant potential to transform healthcare services by enabling real-time monitoring of patients' health, analysing medical data, facilitating early disease detection and recommending personalised treatments. Governments could leverage AI diagnostics tools to provide more effective and personalised healthcare interventions to their citizens. The National Health Service (NHS) in the UK has already adopted some of these available AI tools. For example, the NHS collected data to create the National COVID-19 Chest Imaging Database (NCCID), which comprises chest X-rays, magnetic resonance imaging (MRI) and computed tomography (CT) scans from UK patients. This database aims to better understand COVID-19 and enhance machine learning technologies to improve the care provided to hospitalised patients (Cushnan et al., 2021). Furthermore, the NHS has developed an AI tool capable of detecting heart diseases in 20 seconds while the patient is still in the MRI scanner. This contrasts starkly with the average 13 minutes it takes a doctor to perform the same analysis, with Davies et al. (2022) highlighting the machine's superior precision compared to three clinicians. The integration of this AI technology has the potential to enhance efficiency and efficacy within the healthcare system. By reducing backlogs, it provides doctors and patients with increased confidence in results, particularly helping in the decision-making process regarding potential treatments.

The education sector can also benefit from the AI revolution and improve learning outcomes. Since COVID-19, when schools and universities were forced to close and faced disruption in the delivery of education, institutions in England and across the world introduced or increased the use of technology to deliver remote lessons and deal with the new challenges created by the pandemic (DfE, 2022). While AI cannot substitute teachers, it can provide new teaching tools and support the management of educational institutions. In October 2023, the UK Prime Minister announced a £2 million investment in Oak National Academy, which was founded to provide high-quality curriculum resources online to teachers, to develop new teaching tools using AI. The government suggests that these new tools will help teachers plan lessons, prepare quizzes and exercises and reduce their workloads. The initiative is a first step towards offering a personalised AI lesson-planning assistant to every teacher (DfE, 2023).

Additionally, AI could enhance the way pupils learn by creating a customised curriculum for each student and providing individual feedback to educators, parents and students. Similarly, AI could reduce the gap in accessing education by creating subtitles or translating in real time what teachers are saying, making classes worldwide available to all students regardless of the language they speak, including those who may have visual or hearing impairments. It can also benefit students who cannot attend school due to medical conditions or geographical limitations and those who require learning at a different level than the traditional grade levels (Vincent-Lancrin and van der Vlies, 2020). Finally, AI can help prepare students for new skill sets in increasingly automated economies. Understanding the

relationship between skills and the labour market is crucial for the future of the economy. AI can identify the demand and supply of skills and help the government to provide the necessary skills that will create economic opportunities in the future (OECD, 2019a).

Furthermore, moving from AI adoption in healthcare and education settings, AI can also provide significant support to the government in designing regulations and delivering regulatory enforcement tasks (OECD, 2019b). Regulators can use AI to analyse extensive amounts of data and identify areas in which they should focus their efforts and who to investigate. Similarly, regulators can use AI to predict the outcome of potential litigation. These potential usages of AI allow regulators to allocate resources more efficiently towards activities that will yield better results for their regulatory activities (Berryhill et al., 2019). Another area that which the government can explore the use of AI is security both physical and cybersecurity. For instance, facial recognition has been used by several cities around the world to identify and locate criminals as well as to counter terrorism. With AI development surveillance can detect potential threats in real time (Ubaldi et al., 2019). Likewise, on the cybersecurity side, AI tools can help the government monitor network problems and irregularities and ultimately prevent cyber-attacks. The UK National Cyber Security Centre has published guidelines on assessing intelligent tools for cybersecurity to assist users, including the public sector when using or developing AI tools (NCSC, 2019). Moreover, on the secret intelligence and military operations front, the UK is actively working on the concept of “human-machine-teaming” within AI environments, particularly in the cyber context. This initiative is designed to facilitate the integration of humans, artificial intelligence and robotics into warfighting environments to analyse the combined capabilities of individuals and technologies and outmatch adversaries in military operations (Ministry of Defence, 2018).

Finally, complementing uses in several areas, AI can also assist the government in environmental protection efforts. For instance, sensors using AI can monitor the environment, detecting pollution levels, water quality, wildlife and any other ecological disparities in real time. It can also optimise resource allocation to avoid waste by analysing consumption behaviour and supply chains, promoting energy efficiency and conservation. Furthermore, AI models can predict and analyse environmental data to model and forecast climate trends and changes enabling policymakers to anticipate environmental systems and, therefore, formulate sustainable policies (WEF, 2018).

In conclusion, AI has the potential to profoundly transform the public sector, providing more efficient, targeted and innovative services that benefit citizens and society. As discussed above, applications in areas spanning healthcare, education, transportation, regulation, security and environment can improve productivity, lower costs, and promote sustainability as well as equality. However, despite all the potential benefits of AI, the adoption of these emerging and transforming

technologies faces some challenges across public sector organisations. First, government workers may not have the necessary skills to deal with the vast amount of data and to build AI models that can benefit the public. Also, different public sector departments may have different IT systems and standards making it difficult to create integrated solutions. Moreover, AI models can be notably biased based on different inputs and characteristics, raising ethical issues and questions about the fairness and integrity of the government. There are also concerns about data privacy protection when collecting large amounts of individual data, in particular, if the government outsources the development of AI systems to third-party companies. Finally, a major constraint is resistance to change and insufficient political commitment due to risk aversion and regulatory obstacles (Ubaldi et al., 2019).

Regardless of the reservations surrounding AI, the public sector should not refrain from embracing its potential. For AI implementation to truly serve the public good rather than exacerbate existing inequities, governments need to guarantee that they are transparent, accountable and ethical about the use of digital technologies in their services. With conscientious frameworks for testing and audits for fairness, publicly funded research and thoughtful communication campaigns, as well as retraining programs, the risks can be mitigated. The success of AI implementation in public services depends on the government establishing trust and fostering understanding among the public regarding how AI is employed. At this critical juncture, the question for policymakers globally is not whether but how exactly to best leverage AI for public services.

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