AI regulation: a pro-innovation approach – policy proposals

Department for Science, Innovation and Technology and Office for Artificial Intelligence

Introduction

On behalf of The Institution of Occupational Safety and Health (IOSH), the Chartered body for occupational safety and health professionals, with around 47,000 members in more than 130 countries. As a Chartered body, we have charitable and international NGO status. As an international non-profit organisation, IOSH influences important decisions that affect the safety, health and wellbeing of people at work worldwide. We collaborate with governments, advise policymakers, commission research, set standards, engage with organisations and we run high-profile campaigns to promote awareness of occupational safety and health (OSH) issues and worker wellbeing.

IOSH is also an active organisation in the policy and regulatory engagement scene. We are a contributing member of The All-Party Parliamentary Group on the Future of Work who brings together Parliamentarians, industry and civil society that analyses the top priorities in terms of directing AI and related technologies to promote good work and that seeks to better understand the use of AI and Surveillance in the workplace.

We have been following with interest debates on the potential impact of AI on employment within the UK, and more specifically on the role that the UK regulator can play. As a professional and membership body IOSH is also interested on the specific impacts of AI on employment and skills[1]; the developments by the Business, Energy and Industrial Strategy Committee who at that time examined how artificial intelligence and technology can change workplace and the UK workforce; or the Commons Science, Innovation and Technology Select Committee inquiry into the Governance of Artificial Intelligence.

IOSH's Response to the consultation

We welcome the opportunity to comment on the timely white paper *'A pro-innovation approach to AI Regulation'* which will divert the matter away from the ongoing policy discussion on prioritising innovation vs regulating artificial intelligence – especially important in light of increasing public uptake of generative and general-purpose AI - to a more constructive framework that assures a responsible adoption and implementation of technologies that have the potential to transform work and working lives. The International Technology Strategy[2] published last month sets out the UK's ambition to be recognised as a leader on science and technology, not surprisingly, AI is listed one of the priority technologies.

We have also seen with increasing interest the UK Parliament debates at the House of Commons on Artificial Intelligence and the Labour Market[3] that have alerted on how rapid technological advances originated by the design, adoption or implementation of artificial intelligence technology can compromise a threat to the working environments and erode well-established workers' rights, which should also consider vulnerable workers such as migrant workers or low-skilled workers.

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[1] PricewaterhouseCoopers. The Potential Impact of Artificial Intelligence on UK Employment and the Demand for Skills. August 2021. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1023590/impact-of-ai-on-jobs.pdf

[2] UK Gov. Policy paper. The UK's International Technology Strategy. March 2023. https://www.gov.uk/government/publications/uk-international-technology-strategy/the-uks-international-technology-strategy

[3] House of Commons. Potential impact of artificial intelligence on the labour market.

While IOSH welcomes the positive prospects that this white paper details, we also believe that the document seems incomplete as it does not offer proposals for effective regulations. Despite this we see timid approaches to legislative developments in the context of the Data Protection and Digital Information Bill and the Artificial Intelligence (Regulation and Workers' Rights) Bill.

Health and Safety Executive (HSE) new central functions that focus on coherence across the regulatory landscape, cross-sectoral risk, and monitoring and evaluation

IOSH believes that the HSE should be one of the key bodies entitled to not only produce guidance and raise awareness but to also provide regulatory oversight on implementing and enforcing AI in a responsible and safe manner based on the white paper proposed principles, therefore supporting the figure of a central Government. As enforcement agencies such as the HSE were created for more traditional forms of work and working environments, the described empowerment of occupational safety and health (OSH) inspectorates in the white paper will need be equipped with competency in this topic and with capacity/adequately resourced considering the yet-to-be determined outpace of existing regulation. In practice, expanding the role of the HSE in the oversight of AI systems in the workplace, should mean increasing staffing levels as the regulator's role and responsibilities have the potential to change – changing with the changes to the way we work - which is quite critical considering that the number of inspectors has fallen by 41% over 20 years.

Complementary to the enforcement and oversight role, the HSE mandates a range of regulatory tools to provide free, practical, clear and accessible guidance. Technical resources for employers and those overseeing the use of AI systems in workplaces will therefore be needed. A similar educational support will be required to implement the *principles (and future legislation)* to facilitate employers and those with some degree of responsibility to appropriately assess the hazards associated to these processes and implement the necessary health and safety arrangements and controls to protect workers and/or members of the public who may be impacted through that work activity.

In what ways do AI technologies have the potential to make the UK a healthier and safer place to work

IOSH advocates for prevention first approaches to health and safety, and applying the hierarchy of control. In relation to AI, we propose the following has the potential to make the UK a healthier and safer place to work:

Identifying and mitigating workplace hazards: AI has the ability to analyse vast amounts of data from sensors and other sources to identify potential workplace hazards both physical and, in some cases, psychosocial hazards. Digital tools such as sensors, smart phones and smart clothing are all being used for digital monitoring, from PPE (Personal Protective Equipment) compliance to well-being and suicide prevention in shift workers[4].

[4] Karakhan, A., Xu, Y., Nnaji, C., & Alsaffar, O. (2019). Technology alternatives for workplace safety risk mitigation in construction: Exploratory study. In Advances in Informatics and Computing in Civil and Construction Engineering: Proceedings of the 35th CIB W78 2018 Conference: IT in Design, Construction, and Management (pp. 823-829). Springer International Publishing.

Improving health monitoring: AI can analyse health data from wearable devices and other sources to identify patterns and trends that can help workers and employers monitor and manage their health and prevent chronic diseases[5].

Enhancing workplace ergonomics: AI powered exoskeletons and other wearable devices that use AI can help workers maintain good posture and reduce physical strain, improving their health and reducing the risk of injuries[6].

Automating dangerous tasks: AI can automate tasks that are dangerous for humans, such as handling hazardous chemicals or working in extreme environments, reducing the risk of accidents and injuries[7] and removing humans from the unsafe work and/or unsafe conditions.

Predictive maintenance: AI can analyse data from sensors and other sources to predict equipment failures and prevent unplanned downtime, reducing the risk of accidents and injuries caused by malfunctioning equipment[8].

Generative AI: Generative AI can be a useful tool to improve worker OSH by analysing large amounts of data from various sources to identify potential hazards and predict accidents before they happen. Generative AI may also assist with:

- Risk Assessment - Generative AI can analyse data from different sources such as worker safety records, weather data and other environmental factors to assess the risk level of specific tasks or work areas. This can help employers prioritise safety measures and allocate resources where they are most needed.

- Ethics Checking - Where most of the information currently provided is more generally related to corporate ethics, this could in turn lead to a "step-up" improvement in global corporate ethics standards and much greater ethical accountability by businesses and their boards by AI-assisted scrutinizing employees, shareholders, regulators and commentators"[9].

Interoperable Partnerships: Co-production between humans and AI, collaborative use of AI will integrate with other software's and interoperable technology – many AI systems will be used in this partnership mode[10].

However, for these above benefits to be realised, action must be taken to identify and remedy risks that can occur within these processes. For example, generative-AI outputs rely on appropriate data gathering selection and algorithms to ensure confidence in the outputs. Refer to the section below for further consideration.

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[5] Dai, S., Dai, Y., Zhao, Z., Xu, J., Huang, J., & Wang, S. et al. (2022) Intrinsically stretchable neuromorphic devices for on-body processing of health data with artificial intelligence. 5 [10]. https://doi.org/10.1016/j.matt.2022.07.016

[6] Patel, V., Chesmore, A., Legner, C. M., & Pandey, S. (2022). Trends in workplace wearable technologies and connected-worker solutions for next-generation occupational safety, health, and productivity. Advanced Intelligent Systems, 4(1), https://doi.org/10.1002/aisy.202100099

[7] Onifade, M., Said, K. O., & Shivute, A. P. (2023). Safer mining operation through technological progress. Process Safety and Environmental Protection. https://doi.org/10.1016/j.psep.2023.05.052

[8] Soori, M., Arezoo, B., & Dastres, R. (2023). Internet of things for smart factories in industry 4.0, a review. Internet of Things and Cyber-Physical Systems. https://doi.org/10.1016/j.iotcps.2023.04.006

[9] Macey-Dare., R (2023). ChatGPT and Generative AI Systems as Corporate Ethics Advisors. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4413226

[10] Maddikunta, P. K. R., Pham, Q. V., Prabadevi, B., Deepa, N., Dev, K., Gadekallu, T. R., ... & Liyanage, M. (2022). Industry 5.0: A survey on enabling technologies and potential applications. Journal of Industrial Information Integration, 26, https://doi.org/10.1016/j.jii.2021.100257

What legal responsibilities need to be considered from an OSH standpoint across the AI value chain (covering the whole AI development cycle, from data collection and preparation, to model training and testing, to deployment)

Data collection and preparation:

a) privacy laws: ensure compliance with applicable data protection and privacy laws when collecting and handling personal data.

b) informed consent: obtain informed consent from individuals whose data is being collected, ensuring they understand the purpose and potential risks involved. There needs to be accountability in the entire AI project delivery lifecycle[11].

Model Training and Testing:

a) Data quality and bias: Address issues related to data quality, bias, and fairness to prevent discriminatory outcomes or biased decision-making.

b) algorithmic transparency: strive for transparency and explainability in AI models, especially in critical applications that may impact individuals' rights or safety[12].

Deployment or use:

a) workplace safety: assess and mitigate risks associated with AI deployment in work environments, ensuring compliance with workplace health and safety regulations.

b) User safety: prioritise user safety when designing AI systems, particularly in domains such as autonomous vehicles, or medical diagnostics.

c) Product liability: consider potential liability for harm caused by AI systems and implement appropriate risk management strategies.

d) intellectual property: protect intellectual property rights related to AI technologies, including patents, copyrights, and trade secrets[13].

Regulatory Compliance:

a) sector-specific regulations. Be aware of industry specific regulations that may apply to AI systems, such as healthcare regulations or financial compliance requirements.

b) ethical guidelines: adhere to ethical guidelines and frameworks for AI development, such as those provided by organisations like the IEEE or the Europeans Commission's Ethics Guidelines for Trustworthy AI.

c) consumer protection: comply with consumer protection laws, ensuring transparency, accuracy, and fairness in AI-based products and services. The difficulty here is that specific

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[11] Leslie, D. (2019). Understanding Artificial Intelligence Ethics and Safety: A guide for the responsible design and implementation of AI systems in the public sector. The Alan Turing Institute. https://www.turing.ac.uk/sites/default/files/2019-06/understanding_artificial_intelligence_ethics_and_safety.pdf

[12] Ferrara, E. (2023). Should ChatGPT be biased? Challenges and risks of bias in large language models. arXiv preprint arXiv: https://doi.org/10.48550/arXiv.2304.03738

[13] EU-OSHA. (2022). Artificial Intelligence for Worker Management: An Overview. https://osha.europa.eu/en/publications/artificial-intelligence-worker-management-overview

legal responsibilities will vary depending on the jurisdiction and the nature of the AI application. Consultations with legal experts and staying up to date with the evolving regulatory landscape is crucial to ensure compliance throughout the AI value chain.

The EU must comply with GDPR (General Data Protection Regulation) and data privacy laws (e.g., for proposed legislation see Digital Services Act, EU AI Act, EU Commission).

- Once approved the EU AI Act will be the world's first rule on Artificial Intelligence and will include bans on biometric surveillance, emotion recognition, predictive policing AI systems.
- WHO (World Health Organization) recommends that when using AI in the context of health, that policymakers ensure patient safety and protection while technology firms work to commercialise large language model (LLMs) tools[14].
- The Alan Turing Institute recommends 5 Fastrack principles as normative guideposts of ethical AI: Fairness, Accountability, Sustainability, Safety, Transparency[15].

Approach to AI sandbox

On the subject of piloting regulatory safe spaces in high-risk areas of AI (also known as sandboxes), AI needs to be regulated to protect workers, consumers and citizens alike against the potential risks in a practical manner that does not hamper innovation or creates risks for workers or working environments or to others who could be impacted. Improving the approach to AI standards development processes while adopting fit for purpose and proportional regulation is a necessary approach but doesn't have to be pursued together with other safeguards[16].
This process, that keeps some similarities with safeguards normally applied in safety in design throughout the lifecycle of a project, asset or at the design phase of a project development, can be pivotal to bring closer the bridge between AI policy and regulation and adoption and deployment of AI systems. If effectively implemented AI sandboxes can not only facilitate a more comprehensive mechanism to involve the regulator but facilitate more robust evidence-based policymaking[17]. With that in mind, OSH professionals can make valuable contributions by providing their knowledge to good OSH risk management advice and the necessary control strategies and safeguards that need to be in place in the design of the sandbox before its implementation.

One thing that the white paper doesn't describe in detail is the mitigation strategies and practices for unforeseen consequences. It is for that reason that lessons learnt from ongoing pilots that look at better understanding the functioning of AI sandboxes (e.g. EU AI Act and the Spanish sandbox pilot) must be shared across key stakeholders.

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[14] World Health Organisation (2023) WHO calls for safe and ethical AI for health. 16 May 2023. https://www.who.int/news/item/16-05-2023-who-calls-for-safe-and-ethical-ai-for-health

[15] Leslie, D. (2019). Understanding Artificial Intelligence Ethics and Safety: A guide for the responsible design and implementation of AI systems in the public sector. The Alan Turing Institute. https://www.turing.ac.uk/sites/default/files/2019-06/understanding_artificial_intelligence_ethics_and_safety.pdf

[16] See the work of the existing work of the Information Commissioner's Office's (ICO) regulatory sandbox that provides a strong foundation on responsible approaches to experimentation. a safeguarded and controlled regulatory environment.

[17] Pop, F. (2021, September). Sandboxes for Responsible Artificial Intelligence. Retrieved February 3, 2023, from https://www.eipa.eu/publications/briefing/sandboxes-for-responsible-artificial-intelligence/

Final remarks. A statutory duty requiring regulators to have due regard to the cross-sectoral principles

We reinforce the principle that a human-centric 'by design and by default' approach to AI that prioritises human ethical responsibility and the empowerment of humans at the design phase and throughout the lifecycle of AI systems needs to be firmly embedded in AI-related developments. This requires a political desire for integrating socially responsible and trustworthy AI usage, and embed a human-centred approach that prioritises worker participation, involvement, consultation and training, and skills development.

We also recommend the involvement of occupational safety and health professionals to input at the design stage and in risk assessments, to ensure health, safety and wellbeing risks and opportunities are identified and action taken.

Principles must be embedded into actual and future plans to introduce legislation that tackles potential shortcomings rather than opting for a more 'laissez faire' approach.

While IOSH remains positive about the appropriate use of AI technologies and systems in workplaces and working practices, there is a need for regulators to adopt fit for purpose synergies through cohesion policies based on non-negotiable values of health and safety, transparency, public engagement, expert supervision, and thorough assessments that enable workers, workplaces, end users and ultimately people to benefit from AI systems in a healthy and safe manner. This is consistent with public perceptions on this subject. A new national survey[18] by the Ada Lovelace Institute and The Alan Turing Institute evidenced that more than 60% of the British public support fit for purpose 'laws and regulations' to guide the use of AI. These safeguards are necessary to guarantee that AI developments don't come at the expense of rights and protections of workers by promoting good work as part of building a responsible AI ecosystem.

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[18] Ada Lovelace Institute. The Alan Turing Institute. How do people feel about AI? A nationally representative survey of public attitudes to artificial intelligence in Britain https://www.turing.ac.uk/sites/default/files/2023-06/how_do_people_feel_about_ai_-_ada_turing.pdf