

Risks and opportunities to OSH associated with AI

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Health and Safety Executive

The Health and Safety Executive (HSE) is Britain's national regulator for workplace health and safety.

HSE is unique as a regulator. It has three equal and complementary functions:

- Policy – HSE is the UK Government policy lead for occupational health and safety
- Operations – inspection and enforcement
- Science and evidence – 300+ scientists and engineers in a dedicated Science Division
- Health and Safety at Work act (1974) – proportionate goal base regime, supporting innovation



HSE and AI - Regulating AI

HSEs Regulatory role:

- Use of AI where it impacts on health and safety, in workplaces within our regulatory remit
- Use of AI in the design, manufacture and supply of workplace equipment as a market surveillance authority
- Where AI impacts on protecting people and places, including chemicals and pesticides regulation
- HSE’s goal setting legislation applies to workplace technologies, including AI
- Risk assessment must be conducted for AI applications affecting health and safety
- Appropriate controls, including cybersecurity measures, must be implemented to reduce risks as far as reasonably practicable



[HSE's regulatory approach to Artificial Intelligence \(AI\)](#)

HSE and AI - Using AI to improve health and safety

Discovering Safety - innovative, data driven health and safety

Aim - improving health and safety performance using insights from data and the use of AI and new technologies.

- Large collaborative project delivering health and safety benefits through a data driven global community
- Lloyd's Register Foundation funded research programme commenced in 2018
- Led by HSE and delivered with, Safetytech Accelerator, AtkinsRealis, Wood, Okana, Asite, the University of Manchester and others

<https://www.discoveringsafety.com>



DISCOVERING SAFETY



 **AtkinsRealis**

wood.

Okana

 **ASITE™**


HSE



 **Safetytech
Accelerator**

Discovering Safety

1. HSE data projects
 - Data warehouse
 - Data anonymisation
 - Insight extraction tools
2. Construction Risk Library
3. Leading Indicators
4. Loss of Containment
5. Innovation projects



01/02/25

Construction Risk Library project

The Construction Risk Library is designed to assist with the identification and treatment of construction health and safety risks. It has been...



01/04/21

Leading Indicators

We're working with the University of Manchester and the construction industry to provide the evidence base for using 'leading indicators' in preventing...



01/04/21

Loss of containment insights project

We are working with the processing industry to help develop tools that will help us find the factors that lead to Loss...



Creating the first Industrial Safetytech Regulatory Sandbox for the UK construction sector

The Industrial Safetytech Regulatory Sandbox, funded by the Regulators' Pioneer Fund, provided a successful framework for HSE to explore the potential for new technology to help improve health and safety performance and compliance. HSE worked with the Safetytech Accelerator (STA) as a delivery partner and several companies from the UK construction sector to identify a [...]



01/04/21

Innovations - Predicting risk project

We've been working with partners in construction and artificial intelligence to look at whether using analytic tools could help us to predict...

HSE Data

Each Year HSE collects approx

85,000 concerns reported by workers or the public

70,000 formally reported incidents

20,000 workplace Inspections

9,000 improvement or prohibition notices

5,000 investigations

650 prosecution cases

150 Scientific investigations

150 fatality investigations

Data Insights

Profiling of existing, new and emerging risks

Understanding regulatory compliance challenges

Insights into causes of accidents and prevention measure

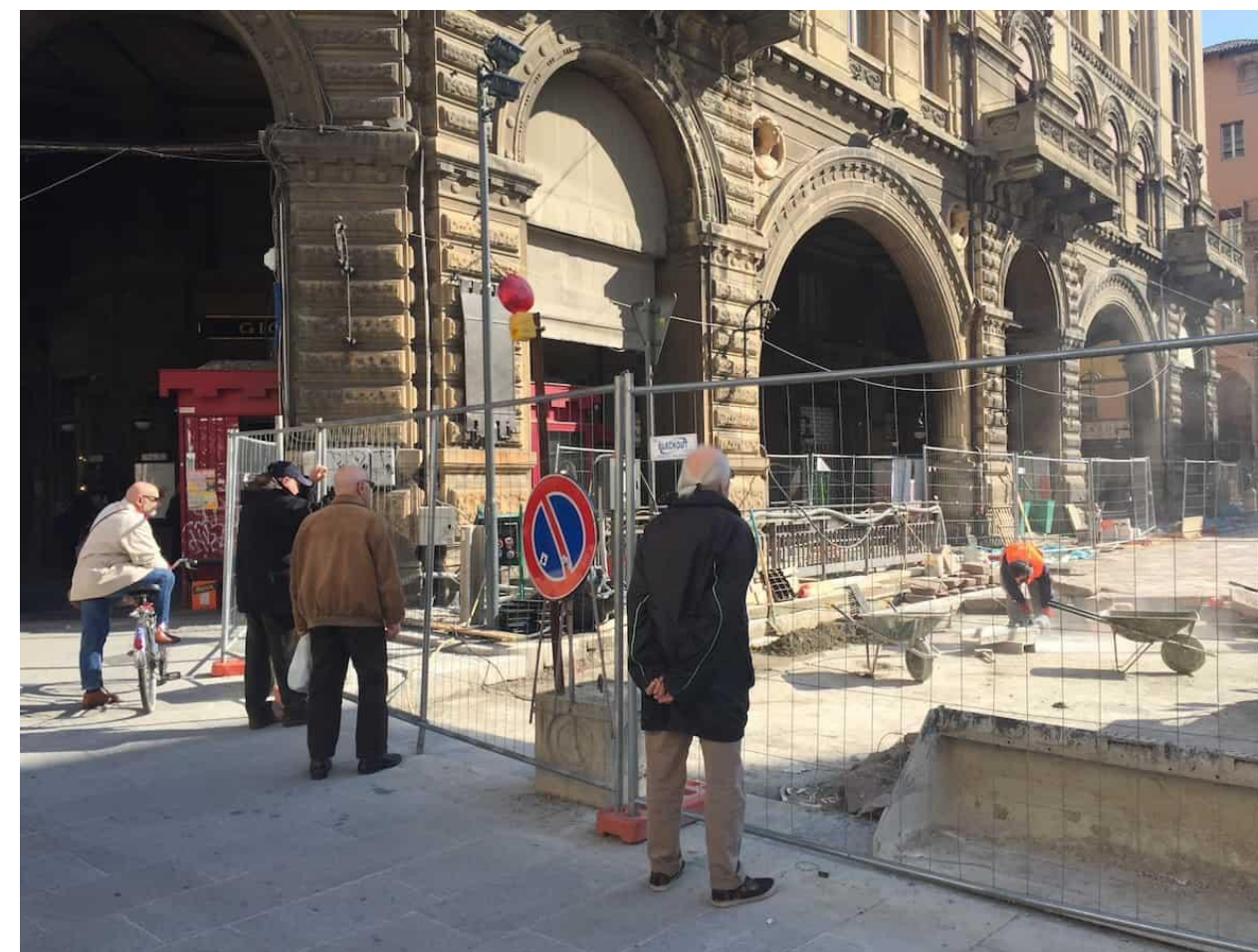
Supporting industry in meeting regulatory responsibilities

HSEs Data

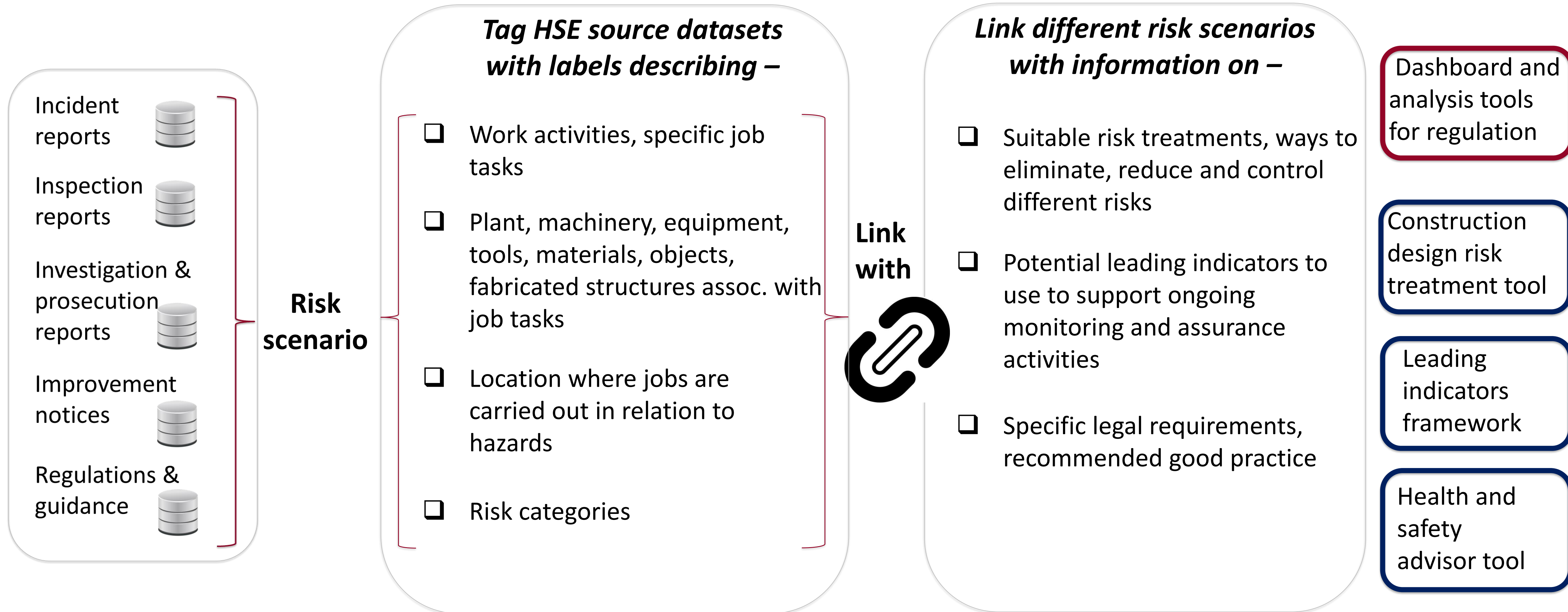
- The Health and Safety Executive (HSE) keeps a huge amount of data in free-text format.
- HSE maintains a diverse collection of data sources, incident reports, inspection letters, investigation reports, concerns (and more!).
- Previously HSE has been unable to leverage this due to the time and effort required to manually review the data.

A close-up photograph of a hand holding a yellow pencil, ready to fill out an 'ACCIDENT REPORT' form. The form has a blue header with the title in large, bold letters. Below the header is a section titled 'Personal Information' with several fields: 'Last Name:', 'Middle Name:', 'City:', 'State:', 'Zip:', and 'Mobile Telephone:'.

Personal Information			
Last Name:	Middle Name:		
City:	State:	Zip:	
Mobile Telephone:			



Data enrichment



UNDERSTANDING HOW AI IS USED IN HSE REGULATED SECTORS

Purpose

- HSE identified ~250 AI use cases across regulated industries (internal research + industry surveys)
- Aim: understand AI impact on occupational health and safety

Key Areas of AI Use

- AI used in maintenance, autonomous systems, safety management and workforce monitoring
- Common uses: predictive maintenance, autonomous vehicles, computer vision, AI risk assessments

Key Findings

- Major safety benefits: better hazard detection, predictive monitoring, reduced exposure to hazards
- Key risks: automation over-reliance, AI errors, cyber threats, deskilling, alert fatigue

Regulatory Considerations for HSE

- Existing health & safety law still applies
- New challenges: assurance, accountability, human oversight
- Need for stronger AI expertise, updated guidance, focus on human–machine interaction

HSE's Role Regulating AI

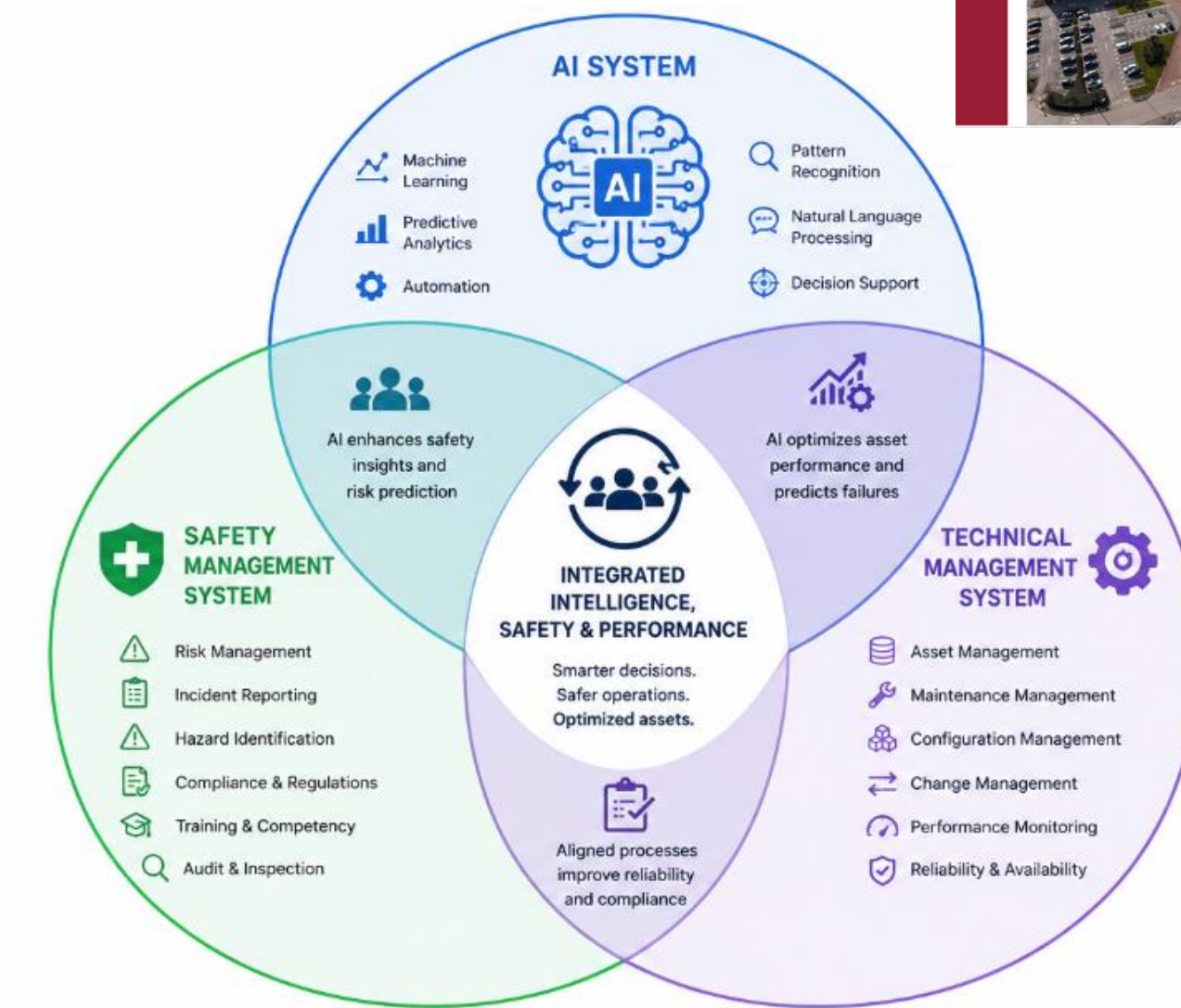
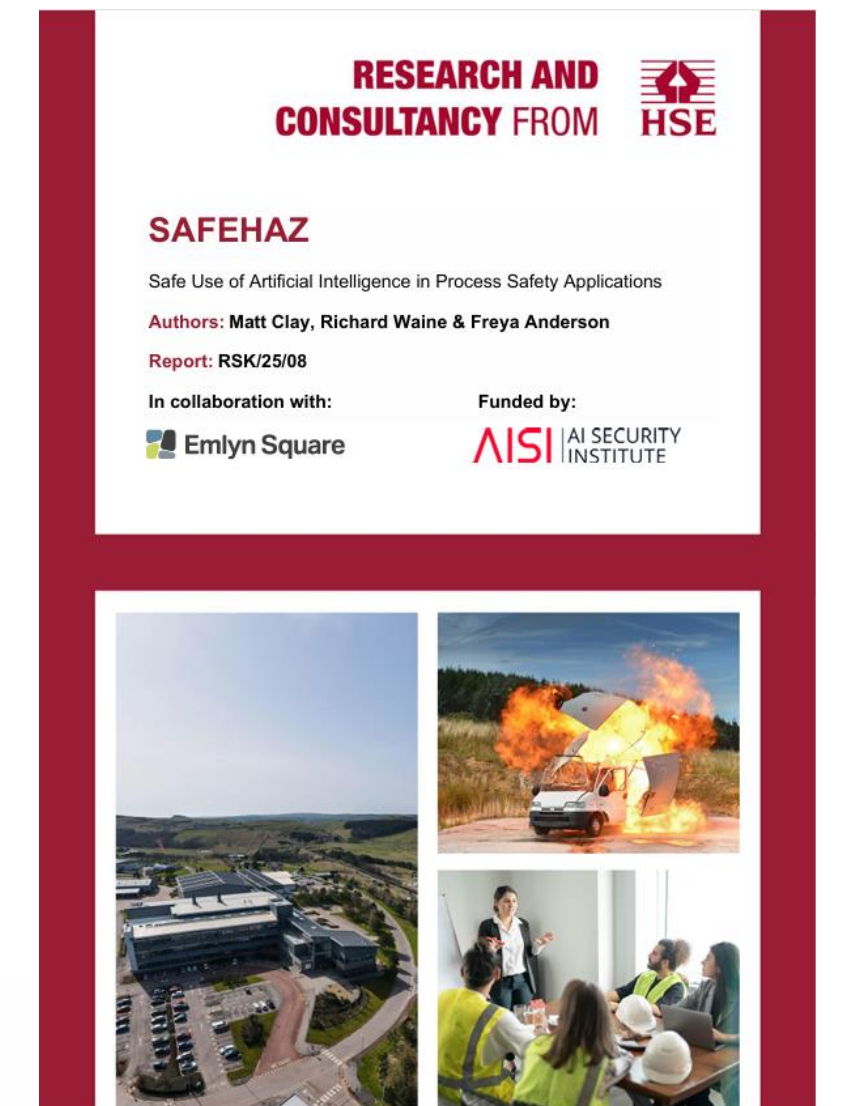
- Building capability to understand AI risks and opportunities
- Likely future role: set assurance expectations, investigate AI incidents, collaborate with industry and regulators

UNDERSTANDING HOW AI IS USED IN HSE REGULATED SECTORS



SAFEHAZ Project

<p>Human & Organisational Risks</p> <ul style="list-style-type: none"> • Shadow AI outside governance • De-skilling & automation bias • Reduced engineering judgement • Loss of critical thinking 	<p>AI / Technical Risks</p> <ul style="list-style-type: none"> • “Silent failures” / hallucinations • Poor explainability & auditability • Security & data integrity risks • Agentic feedback loops
<p>Systemic Risks</p> <ul style="list-style-type: none"> • Reduced human oversight • Shared AI as single points of failure • Faster AI evolution than regulation • Industry-wide competence erosion 	<p>Opportunities Identified</p> <ul style="list-style-type: none"> • Targeted AI use could augment conventional human-based safety actions • Large-scale trend analysis • Improved safety monitoring • Better use of unstructured data • Targeted decision support & anomaly detection



AI introduces both new systemic risks and new opportunities for improving process safety.

HSE / Regulatory Perspective

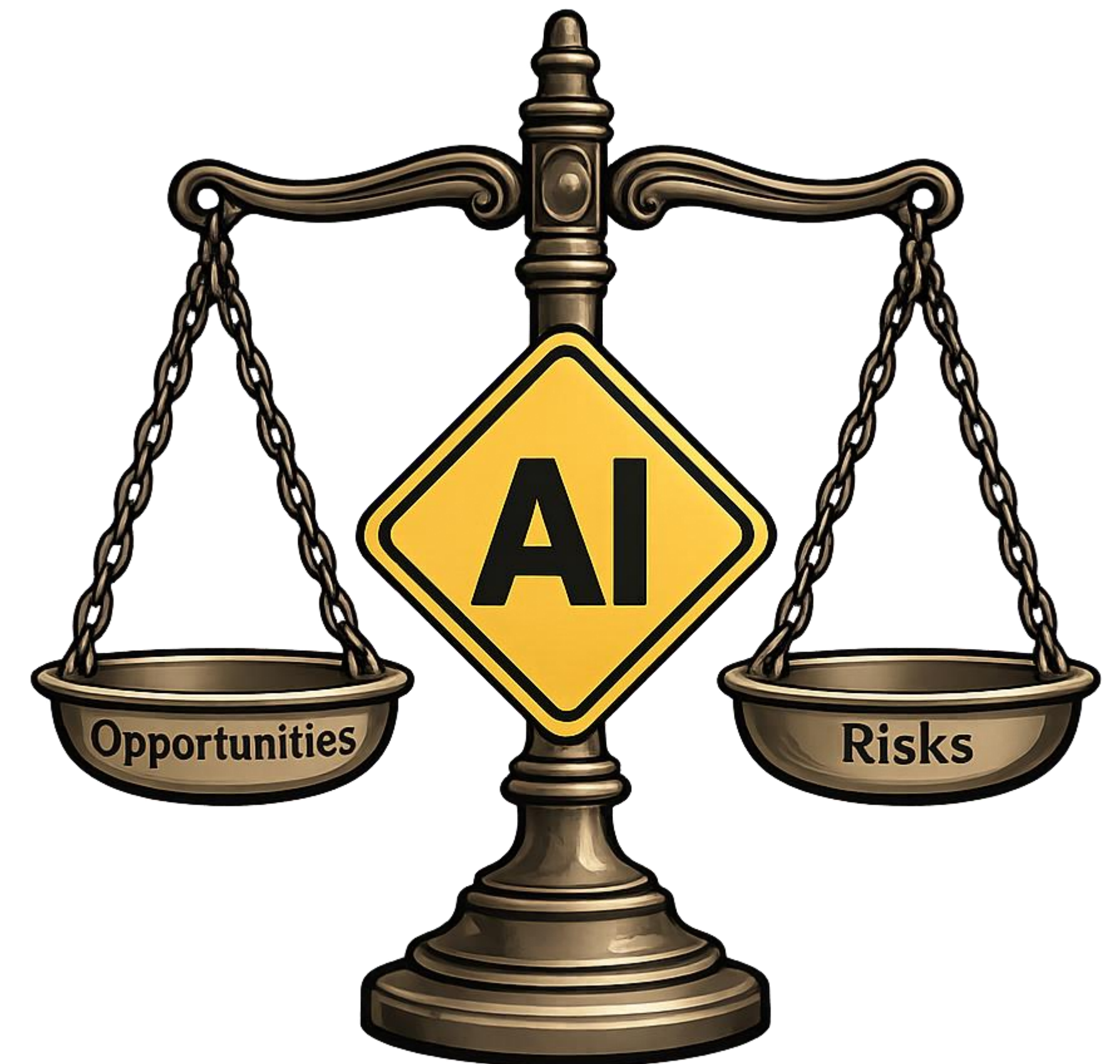
- Regulating workplace health & safety where AI is used
- Assessing safety assurance for AI-enabled systems
- Understanding impacts on safety management systems

Industry Challenges

- Safe integration into existing systems
- Maintaining competence & oversight
- Governance of data, prompts & models

Conclusions

- Existing safety tools can be adapted
- But AI needs socio-technical assessment methods
- Governance & human oversight remain essential
- AI has the potential to improve safety if bounded & controlled



HSE and Industry - Regulatory Sandboxes



Regulators, as key influencers of the environment within which industry are able to innovate



Tech companies developing novel digital solutions



Research space for parties to work together to help bring technology solutions to market



Industry as potential users of digital solutions

Thanks for listening

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<https://www.linkedin.com/company/discovering-safety>

<https://www.discoveringsafety.com>