PROTECTING PEOPLE AND PLACES HSE

Smarter Regulatory Sandbox – Collaboratively Exploring Opportunities to Improve Health and Safety using AI and Technology

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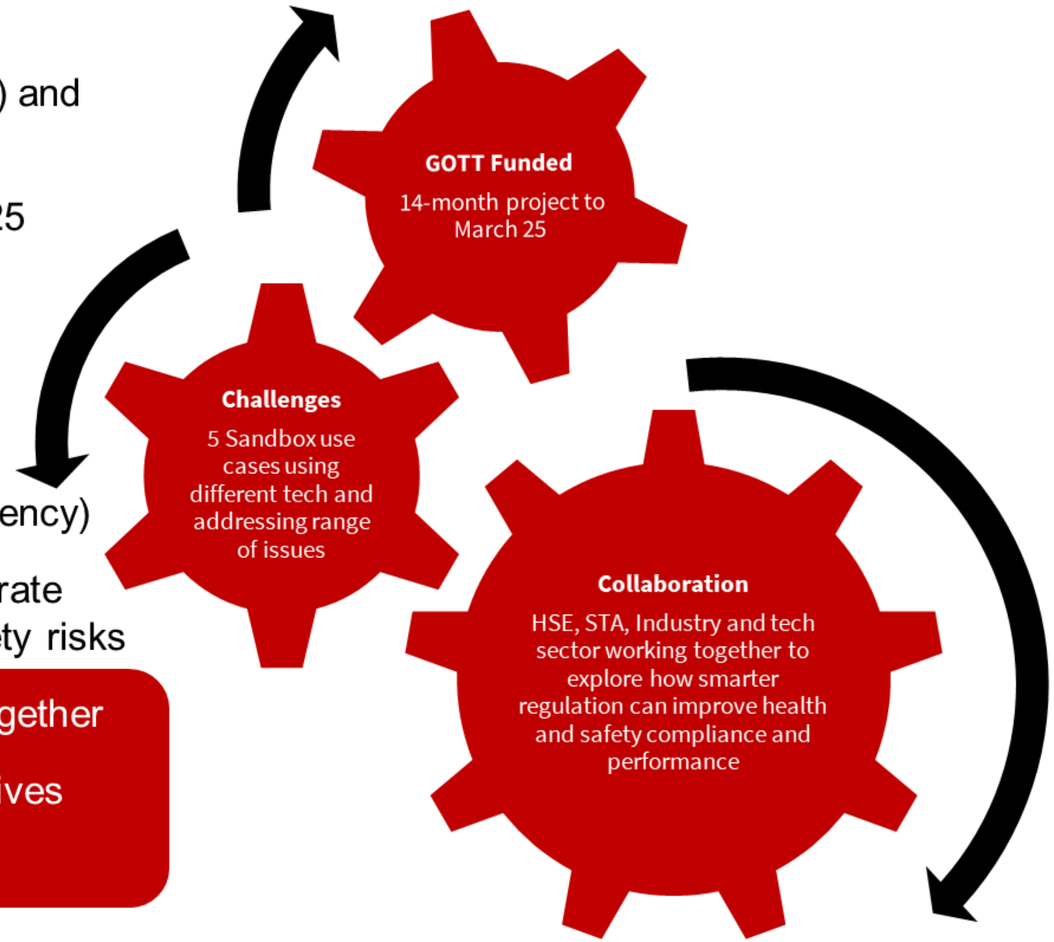
Introduction

Smarter Regulation Sandbox - exploring how smarter, machine-readable regulation and data can improve health and safety regulatory compliance and reduce the burden on industry

- Funded by the Government Office for Technology Transfer (GOTT) and working with the Smarter Regulation Directorate (SRD)
- Project Timeframe – 14-month duration, completed end March 2025
- A collaboration between HSE and Safetytech Accelerator working with the construction sector, tech sector and wider industry and stakeholders
- Support from other regulators (Office for Products Safety and Standards and Food Standards Agency)
- **Sandbox** - building a trusted space to explore, discuss and accelerate new ways of improving compliance and managing health and safety risks



Collaborative environment to explore and understand challenges together

Project teams composed of industry, tech and regulatory representatives

Goals specific to each use case

Aims and Objectives

To explore how smarter, machine-readable regulation and data can improve compliance and reduce the regulatory burden on industry

Aims

- Demonstrating how emerging technologies can impact organisations engagement with regulation and guidance accelerating compliance
- Improving efficiency and productivity, and reducing burdens on industry
- Supporting innovators to bring digital products to market.

Objectives:

- To understand what regulatory data and information is needed from HSE to address the identified challenges and in what format and quality
- To understand whether and what further engineering is required to provision this information
- To understand whether the Government Open Regulation Platform and its metadata standard enhanced the ability of the HSE to provision the required data
- To understand what emerging digital technologies are currently available that might be adopted by the construction industry to help them better assure their health and safety regulatory performance

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Sourcing Participants and Defining Challenges

Sandbox Launch

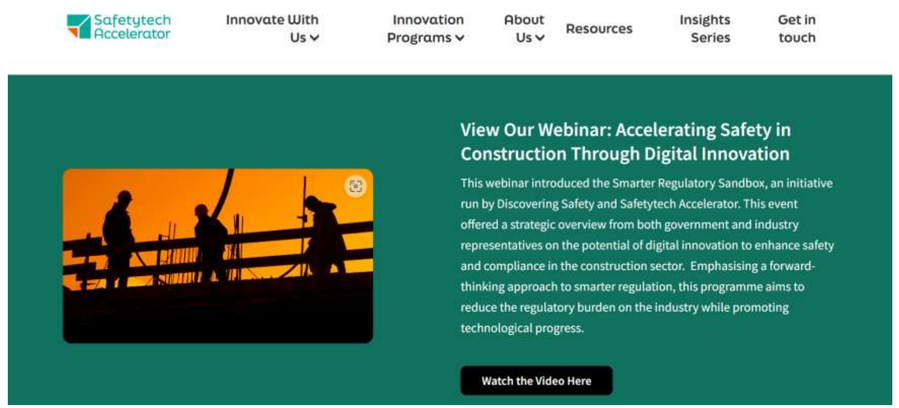
- Marketing and comms activities, social media, blogs, briefing webinars
- Website set up for submissions of expressions of interest
- Targeted reach-out across existing industry contacts and networks

Tech and industry Interest

- 50+ industry partners approached
- Interest from 30+ technology providers

Defining Challenges

- Discussions with Industry
- Review of Tech sector solutions against qualification criteria



Gate 1: Qualification into sandbox

Is there demand?	✓The idea has a demonstrated user group who have provided early feedback that it would be us ✓Good prior contact with stakeholders in user segments who have validated the idea through a feedback form e.g. client ✓Demonstrate high level understanding of market dynamics ✓Do users fit into/ is demand demonstrated in relevant market scope we set
Is it worth it?	✓There is a clear benefits case with an outline model of ROI ✓We have an outline view of how much investment is required ✓They have a plan for how benefits will be tested
Can we do it?	✓Internal sponsorship from HSE lead who agrees the data is available and modifiable ✓ORP sponsorship and buy in for the use case ✓Resources from external team are adequate ✓Stakeholders from outside are bought in e.g. users

Industry Feedback

The following are the top challenge themes of interest resulting from the initial calls with Industry and technology providers:

- **Multiple Regulations:** Consolidating multiple regulatory requirements against internal operating procedures.
- **Operational Advice:** Effective communication of requirements at point of works e.g. excavation
- **Best Practice:** Using a knowledgebase to provide advice and guidance on dealing with risks
- **Implementation:** Use of tools to help steer from HSE guidance to practical implementation
- **Data Mapping:** Mapping H&S data against external requirements e.g. guidance, standards.
- **Mark-up Language**: Metadata standard, ability to mark-up regulations to clause level.
- **Automation:** How can we automate the mark-up language, potential use of LLM.

Five challenges selected to take into the Sandbox – which ran for 3 months.

Sandbox Challenges

Comet- Provide data-driven software and services to improve business performance, eliminate repeat failures and mitigate past, present and future risks.
Challenge- Explored if machine learning models can benchmark health and safety performance against published good practice standards
Partners- Network Rail, HS2, East West Rail

Evercam- Construction project management software company leveraging AI-driven site cameras to enhance project visibility, track safety compliance and improve productivity through real-time oversight.
Challenge- Tested if Large Language Models (LLMs) could detect unsafe working practices captured in CCTV site footage, based on health and safety text and image content
Partners- FtSquared, Heathrow, Ferrovial, Zurich

Sandbox Challenges

Navatech- Data science company who use large language models to integrate AI and automation, to improve access to health and safety information via platforms like Microsoft Teams and WhatsApp to enhance workplace safety .
Challenge- Examined how AI can help structure and index HSE data for third-party utilisation and how AI can assist in dynamically generating regulatory documents such as Risk Assessments and Method Statements.
Partners- City of London, IOSH, Digital Reality, ACWA Power

Vita- Technology company using AI-powered biometric monitoring to detect worker fatigue in real time, enhancing workforce readiness assessments and supporting safety-critical industries.
Challenge- Tested the Vita app as a readiness-to-work tool to assess workforce fatigue and physical preparedness. Focused on identifying fatigue-related risks and evaluating how real-time data can improve safety, productivity and worker retention.
Partners- Ferrovial Construction, Heathrow, EDF

Sandbox Challenges

Plix- Technology company developing connected sensors and AI-powered solutions that enhance safety, efficiency, and compliance in construction. The smart broker, SiteOS, integrates real-time project data with regulatory requirements to improve risk management and automate compliance monitoring.
Challenge- Explored whether the AI-driven compliance tool SiteOS, could automate real-time safety and regulatory checks in construction.
Partners- Keir

Results and next steps

comet	AI-driven compliance solutions show positive application in the construction sector. Accessing quality source data is challenging, inconsistent and incomplete safety data limits AI effectiveness. Structured audit and assurance data proved more reliable for compliance assessment than incident reports. **Next Steps** - expand industry partnerships to enhance HSEQ data diversity and refine AI models for improved compliance assessment.
EVERCAM	AI-assisted CCTV safety analysis provides valuable insights but requires human oversight for validation. CoPilot performed best with trend-based operational efficiency analysis rather than object-based detection like PPE compliance, highlighting further investment in machine learning models is needed. **Next Steps** - refine CoPilot AI models for object-based safety detection, expand user trials, and explore opportunities in insurance and compliance integration.
Navatech	Integrating HSE data improved AI accuracy from 88% to 94%, and expanded conversational AI solutions into WhatsApp, Teams, and WeChat enabling real-time HSE compliance assistance. Successful commercialisation of AI copilots securing two industry contracts and validating AI-powered RAMS automation, reducing manual documentation efforts. **Next Steps -** refine AI copilots for real-time compliance monitoring and expand integration into project management tools and IoT devices
Vita by Pillar	The workplace fatigue app trial with industry partners validated its effectiveness in real-world settings, providing valuable industry feedback that refined its capabilities. **Next Steps** - enhance Vita by developing chronic fatigue detection tools and scaling health coaching solutions to prevent fatigue-related risks
PLINX KIER	Enhancements to SiteOS, expanded its compliance automation capabilities. Developing common data standards across the construction landscape are key to facilitating the development of auto compliance checking **Next Steps** - expand SiteOS to more construction activities, collaborate with regulators on machine-readable regulations, and standardise compliance taxonomies.

Results and next steps

The Smarter Regulation Sandbox revealed how emerging technologies positively impact how organisations engage with regulation and guidance providing:

- Industry with increased assurance and clarity on compliance
- Regulators with a pro-innovation environment to trial smarter interventions
- Tech companies with opportunities to use smarter regulatory information

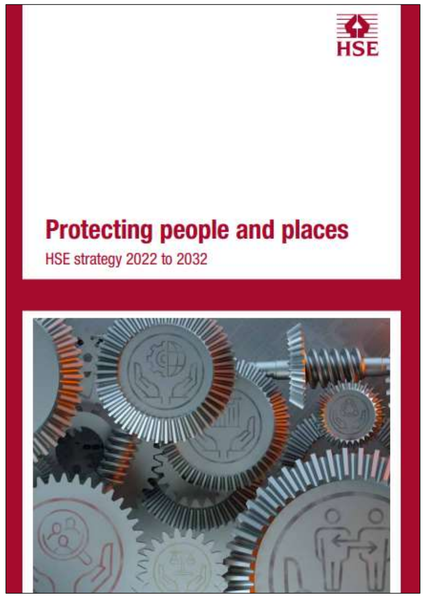
Sandboxes in general provide a new collaborative environment to understand emerging risks and mitigations together with stakeholders

HSE Perspective

- HSE wishes to remain an intelligent, enabling regulator, fit for the 21st century world of work
- HSE strategy for 2022 to 2032, Protecting People and Places, recognises that the world of work is changing, need to keep pace with change, importance of enabling industry to innovate to achieve this

Sandboxes provide-

- Open dialogue with regulatory dutyholders and innovators looking to bring technology solutions to market
- Collaboration with stakeholders to understand the opportunities and challenges of the workplace of the future
- Opportunity to understand and harness new technology to improve H&S performance



Enable industry to innovate safely to prevent major incidents, supporting the move towards net zero

Maintain Great Britain's record as one of the safest countries to work in

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Thank you for listening

Any Questions

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