INVOLVING WORKERS TO BOOST THEIR SAFETY AND HEALTH IMPACT

SMART DIGITAL SYSTEMS FOR IMPROVING WORKERS' SAFETY AND HEALTH

Smart digital systems for improving workers' safety and health[1] are systems using digital technologies to collect and analyse data in order to identify and assess risks, prevent and/or minimise harm, and promote occupational safety and health (OSH).[2]

Often, these systems are based on data collection devices, such as sensors, cameras, microphones, etc., which transmits data via Bluetooth, radio-frequency identification or the Internet of things to a cloud platform. In the case of the latter, artificial intelligence (AI) and machine learning (ML) algorithms process data and translate it to information that employers can use to prevent or react to risks. Of course, there are other options too: from smart monitoring systems using augmented reality, virtual reality or mixed reality to train workers in high-risk sectors, to drones conducting remote inspections in the real estate, construction, oil and gas[3] or rail sector, these systems are increasingly entering the workplace.

Research conducted by the European Agency for Safety and Health at Work's (EU-OSHA) suggests that companies and organisations can improve the safety and health of their workers using these systems.[4] However, certain conditions should be met. These include embedding the smart digital systems in their existing OSH framework instead of using them to replace it, and understanding that together with benefits, the smart digital systems can come with limitations.

Further, EU-OSHA research has highlighted that an important condition for the effective implementation of smart digital systems is ensuring that workers are fully involved when their employer introduces new monitoring technology.[5] It is vital that employers address workers' concerns around the potential use of the smart digital systems 'from the outset'. The concerns typically revolve around the potential transfer of responsibility for safety and health from employers to individuals, as well as the possibility of the use of the data collected for performance measurement, and the resulting potential negative implications for workers.

The role of workers

EU-OSHA's research shows that obtaining workers' knowledge and shopfloor experience as well as securing their buy-in are important measures to benefit the most from smart digital tools[2]. Employers not working closely with their workers during deployment are likely to experience poor implementation, leading to problem issues or even to non-compliance. This can result in negative effects on health and safety and provide subsequent sunk costs.[6]

The most common workforce questions that employers have to answer to effectively implement a smart monitoring systems are the following:

---

[1] The term is used interchangeably with 'new OSH monitoring systems' and 'smart monitoring systems'.

[2] EU-OSHA – European Agency for Safety and Health at Work, *Smart digital monitoring systems for occupational safety and health: uses and challenges*, 2023. Available at: https://osha.europa.eu/en/publications/smart-digital-monitoring-systems-occupational-safety-and-health-uses-and-challenges

[3] EU-OSHA, Drones inspecting worksites of gas infrastructure operator (ID16) Available at: https://healthy-workplaces.osha.europa.eu/en/publications/drones-inspecting-worksites-gas-infrastructure-operator-id16

[4] Ibid.

[5] Ibid.

[6] EU-OSHA – European Agency for Safety and Health at Work, *Smart digital monitoring systems for occupational safety and health: workplace resources for design, implementation and use*, 2023. Available at: https://osha.europa.eu/en/publications/smart-digital-monitoring-systems-occupational-safety-and-health-workplace-resources-design-implementation-and-use

Safety and health at work is everyone's concern. It's good for you. It's good for business.

1

European Agency for Safety and Health at Work

Involving workers to boost their safety and health impact –
Smart digital systems for improving workers' safety and health

- What is the purpose of using the system?
- What kind of data does the system collect and how will the company/employer use them?
- Are there (perceived) positive or negative implications for the workers?

How to involve workers

This policy brief sets out six different ways in which employers can involve workers in selecting, testing and implementing a smart monitoring system, in order to ensure that the system is fully adopted and implemented in the company.[7]

Prior consultation

Engaging in prior worker consultation is the most effective way of addressing workers' concerns when introducing a smart digital system. Even in cases where there is no legal requirement for consultation, our research has found that this can effectively address concerns from all involved parties, particularly those related to data usage.

A Swedish mining company, in agreement with workers' representatives, has been using a smart monitoring system that records all the data on a hard drive that is owned and exclusively accessed by the trade union. In exceptional situations such as accidents, geolocation data are made accessible to rescue teams to trace and improve the rescue time of individual workers.

Allow workers to test the smart digital system during trial periods

Most manufacturers/developers of smart digital systems offer trial periods during which workers can learn more about, test and give feedback on these systems. This can provide a first-hand opportunity for organisations to listen to what works from their workers' perspective and decide whether it is worth moving forward with a given solution. As some smart monitoring systems are configurable, trial periods can also be useful for proposing adjustments.

An interesting case example of this comes from the same Swedish mining company noted above. They strategically placed smart digital system equipment in communal areas like canteens and coffee spaces. This approach allowed workers to test the equipment, offer feedback and serve as ambassadors for its adoption.

While many manufacturers/developers offer off-the-shelf smart digital systems, others also offer bespoke solutions that might require workplace adaptations. For example, a large chemicals company adapted one of its facilities by repainting a wall, as its bright colour was hindering the detection capability of a smart monitoring system using infrared cameras.
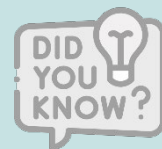
Work with ambassadors

Assigning an ambassador role to workers who are open to new ideas can be an effective strategy to boost the adoption of smart monitoring systems. To motivate workers to take on such a role, non-

---

[7] Unless otherwise specified, the information in this section comes from the research conducted in the context of EU-OSHA (2023). Smart digital monitoring systems for occupational safety and health: uses and challenges: https://osha.europa.eu/en/publications/smart-digital-monitoring-systems-occupational-safety-and-health-uses-and-challenges

European Agency for Safety and Health at Work

Involving workers to boost their safety and health impact –
Smart digital systems for improving workers' safety and health
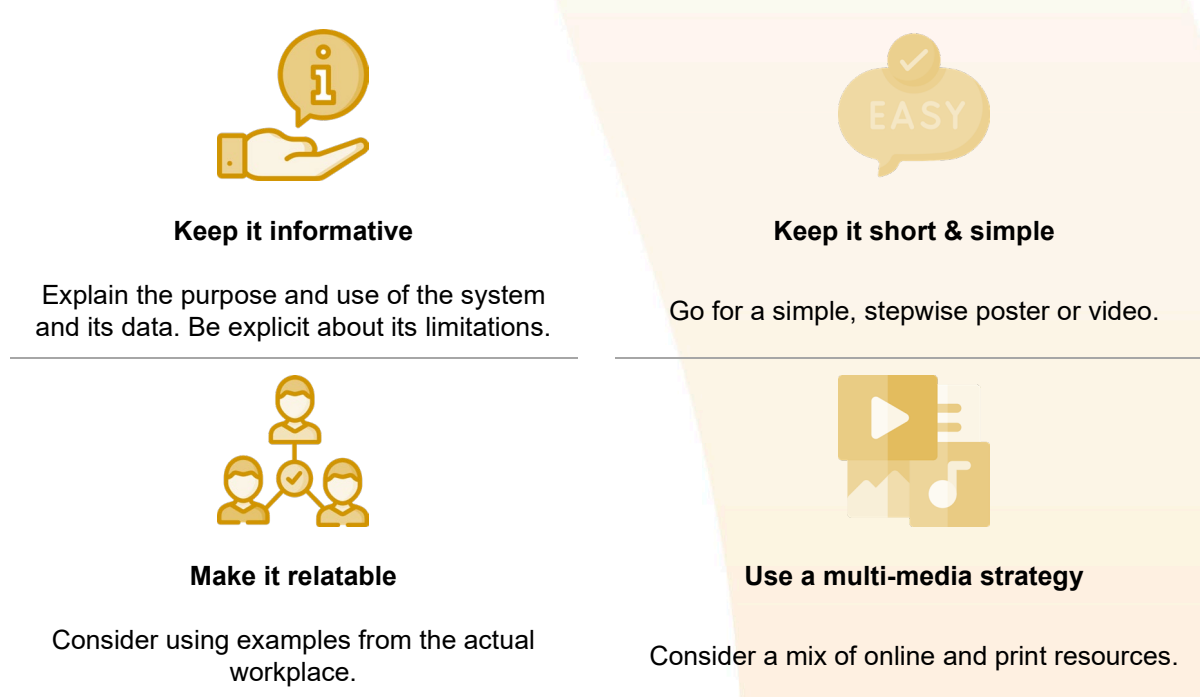
financial incentives like having direct discussions with the organisation's management or being among the first to use the systems can be offered. This worker could act as a champion, promoting effective implementation and use, maximising the benefits for OSH and ensuring that the system is used as intended.

Find different opportunities to engage

Finding different occasions to involve workers in issues on safety and health, including those relating to the implementation of smart digital systems, can be another good way of increasing their uptake and effective deployment.

As an illustration, using the **World Day for Safety and Health at Work** could be a good opportunity to bring together workers at an event where they can engage in dialogue about health and safety concerns not only among themselves but also with management. This type of event could also incorporate collaborative activities, allowing workers to participate in the co-creation of workplace guidance such as posters or leaflets designed to encourage the adoption of a specific smart monitoring system within the workplace. Figure 1 shows four principles that organisations can employ to create effective workplace resources.[8]

Figure 1: Principles for designing workplace resources

Keep it informative

Explain the purpose and use of the system and its data. Be explicit about its limitations.

Keep it short & simple

Go for a simple, stepwise poster or video.

Make it relatable

Consider using examples from the actual workplace.

Use a multi-media strategy

Consider a mix of online and print resources.

On-the-job training, team briefings, walks & talks

Providing on-the-job training regarding the implementation of a smart monitoring system can help workers to gain ownership and communicate potential issues with its use. Equally, having an OSH

---

[8] EU-OSHA – European Agency for Safety and Health at Work, *Smart digital monitoring systems for occupational safety and health: workplace resources for design, implementation and use*, 2023. Available at: https://osha.europa.eu/en/publications/smart-digital-monitoring-systems-occupational-safety-and-health-workplace-resources-design-implementation-and-use

European Agency for Safety and Health at Work

Involving workers to boost their safety and health impact –
Smart digital systems for improving workers' safety and health

professional on the ground talk to workers during regular team meetings or day-to-day activities can also boost engagement.

Some manufacturers/developers of smart digital tools or monitoring systems offer in situ and remote training. Engaging workers in this can help them to get to know the smart monitoring system and flag potential issues early on in the process of implementation.
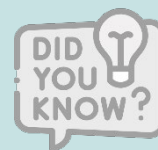
Technology discovery workshops

Another way of helping companies to improve their safety and health could be to engage their OSH professionals and/or a representation of their workers in workshops in which they jointly look for safety solutions that can address workplace needs.

A German manufacturer/developer has been conducting 'technology discovery' workshops in collaboration with its deployers[9] (the users/employers). During these workshops, they work together to explore ways to enhance existing products and develop new ones, with a primary focus on improving workplace safety and health capabilities.

Conclusions

The involvement of workers in testing, selecting and optimising smart monitoring systems appears to be a crucial prerequisite for their effective implementation. Research indicates that a top-down approach to implementation may yield suboptimal results, including issues such as non-compliance.[10] Workers, drawing from their shopfloor experience, can offer valuable insights into the effectiveness and efficiency of the proposed systems, while also identifying potential challenges in their implementation that can be collaboratively addressed with developers. This level of involvement is likely to foster knowledge and trust including a sense of ownership among workers, and thereby increasing acceptance.

In light of this, this policy brief presented six different approaches through which employers can work together with their workers in selecting and deploying smart digital tools or monitoring systems. Emphasis was placed on including approaches suitable for companies of various sizes and sectors. The proposed approaches include implementing trial periods to test new OSH monitoring systems, introducing ambassador programmes, where workers can share their ideas around these systems among their peers, as well as creating technology discovery workshops. Developers, together with deployers, can use such workshops to explore different options for leveraging new technologies, and integrating them, for example, into their existing OSH framework.

Authors: Kyrillos Spyridopoulos, Andrea Broughton (Ecorys).

---

[9] In EU-OSHA's publications, the terms "designer", "implementer" and "system user" are used. These publications were prepared before the AI Act (Regulation (EU) 2024/1689) was adopted. With the AI Act adopted new terms such as "provider" and "deployer" have also been introduced.

[10] EU-OSHA – European Agency for Safety and Health at Work, *Smart digital monitoring systems for occupational safety and health: uses and challenges*, 2023. Available at: https://osha.europa.eu/en/publications/smart-digital-monitoring-systems-occupational-safety-and-health-uses-and-challenges

European Agency for Safety and Health at Work

Involving workers to boost their safety and health impact –
Smart digital systems for improving workers' safety and health

Project management: Annick Starren, Ioannis Anyfantis - European Agency for Safety and Health at Work (EU-OSHA).

This policy brief was commissioned by the European Agency for Safety and Health at Work (EU-OSHA). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect the views of EU-OSHA.

Neither the European Agency for Safety and Health at Work nor any person acting on behalf of the Agency is responsible for the use that might be made of the above information.