

Artificial Intelligence at work: challenges and opportunities for Occupational Safety and Health

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EU-OSHA

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“We work to make European workplaces safer, healthier and more productive — for the benefit of businesses, employees and governments.”

- Research projects
- Surveys
- Campaigns
- Napo
- OSH Wiki
- Tools/guides
- OiRA online interactive risk assessment
- ESENER

A driver of change

- Technologies
 - AI
 - Robots and cobots
 - Big-data
 - Autonomous vehicles and drones
 - Wearables / IoT
- Digitalization influences
 - What jobs there are
 - Sectors and industries people work in
 - What tasks humans will do
 - New forms of employment
 - How people perceive work
- New occupations and industries

EU-OSHA's research on digitalization and AI

- Impact on work and impact on OSH
- EU-OSHA's foresight on digitalization and OSH
- Priority areas:
 - Advanced robotics & AI-based systems for the automation of tasks and OSH
 - New forms of worker management through AI-based systems and OSH

- OSH and digital platform work
 - Digital systems for the monitoring and improvement of OSH
 - Telework and remote work and OSH
- Literature reviews, qualitative research, quantitative research, policy overviews
 - case studies, workshops, etc.
- Cooperation with: Eurofound, JRC, OECD, ILO, involved stakeholders etc.
- Healthy Workplaces Campaign on Digitalisation starting in 2023!

Impact on jobs (tasks) – AI Automation

- The impacted jobs have been found to be *skill-biased* more specialized but overall less complex skill
- *Increased productivity* of high-skilled workers while *lowering demand* for middle-skilled workers
- *Middle-skill jobs* are more easily automated: Repetitive, finite procedures carried out by AI systems (e.g. cognitively and physically routine tasks in traditional manufacturing, transportation, etc.)
- Repetitive and *routine and low-skilled* as the most likely candidates to be automated (experts)
- Full vs semi-automation

Examples of AI:

- Medical diagnosis via decision support systems
- Logistics
- Predicts incidents and possible emergence of new risks.

OSH effects – Physical

- Physical workload
- Collisions
- Supporting tasks
- Prevention / identify high-risk situations based on data/images

Opportunities

- Can alleviate human from physical heavy tasks
- Minimise exposure
- Reliability: Increases wellbeing, performance and safety

Challenges

- Collision and mechanical failure can lead to physical harm
- Attribution effects lead to decision biases (errors in system use)

OSH effects – Psychosocial

- Job transformation / creative vs boring or physically demanding tasks
- Performance / effectiveness
- Function allocation
- Task design
- Interaction design / collaboration / competitiveness
- Operation and supervision
- Deskilling / Reskilling / Upskilling

Opportunities

- Increase feeling of control
- Increase user satisfaction
- Optimise cognitive load
- Optimise strain and mental health
- Increase motivation, wellbeing and mental health

Challenges

- Leaving the human with unpleasant remaining tasks
- Mental fatigue
- Mental overload

Psychosocial effects

- Job loss: Some jobs will be automated (strong link between job insecurity and poor mental health outcomes)
- Job Transformation: The necessity of 'upskilling' or 'reskilling'
- Loss of Privacy: Transparency in data collection and data treatment
- Loss of Autonomy: AI advances new managerial powers for instruction and surveillance
- Depersonalization: Patients/customers as bodies, not subjects / tech not human
- Human Machine Interaction
- Trust: Overreliance, scepticism (anthropomorphism)
- Mental / cognitive workload and fatigue

OSH effects – Organisational

- Introduction process and change management
- Process / Task design / Allocation
- Worker participation
- Clear and direct communication with workers
- Need for training
- Cybersecurity

Opportunities

- Can increase efficiency/effectiveness
- Can reduce human bias
- Adequate levels of trust promote appropriate system use, i.e. benefit task completion

Challenges

- It may lack transparency if the decisions of the algorithm are inexplicable
- Susceptible to problems of implicit bias that can lead to unjust discrimination
- Ethical

Legislation and prevention

- Framework directive: 89/391/EEC (of 12 June 1989)
 - Principles of prevention: prioritizing collective protective measures, provide info,, adapting the work to the individual, adapting to technical progress, etc.
 - Fundamental processes:
 - Hazard identification

- Hazards elimination whenever possible and if not, their risk is to be evaluated, controlled and specifically detailed in resulting risk assessments
 - Implementation of safety management systems
- Directives with regard to specific hazards at work such as:
 - exposure to dangerous substances (Directive 67/548/EEC),
 - workplace directive (EU 89/654/EEC, 1989),
 - display screen equipment Directive 90/270/EEC,
 - machinery Directive 2006/42/EC
 - platform work Directive: (proposal 2021/0414 (COD) on 9 December 2021)
 - Strategic framework 2021-2027: “Anticipating and managing change in the context of green, digital and demographic transitions”
 - EU guidelines: Non-binding documents which aim to facilitate the implementation of EU Directives.
 - EU standards: adopted by EU standardisation organisations - CEN, CELENEC, ETSI
 - Relevant EU directives, regulations and acts (e.g. AI Act 2021, GDPR, etc.).
 - National legislation and policies

It's about the use of AI ...

- Access to real-time data (monitoring technologies, sensors, AI, etc.) → rapid OSH decision-making and quick implementation of prevention measures / risk assessment
 - Opportunities provided by big-data → extraction of meaningful information and patterns hidden within the data.
 - The use of AI, robots, and other new technologies as tools for prevention
 - Associated risks considered since the early stages
- ➔ Digitalization and AI could have the power to change OSH management practices
- ✓ Human in command

Contact

More on digitalisation and OSH at: <https://osha.europa.eu/en/themes/digitalisation-work>

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