



**ARTIFICIAL
INTELLIGENCE**

MEETS SAFETY AND
HEALTH AT WORK



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

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EU-OSHA - www.osha.europa.eu

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

Research projects



Surveys

Campaigns



Healthy Workplaces



EENER



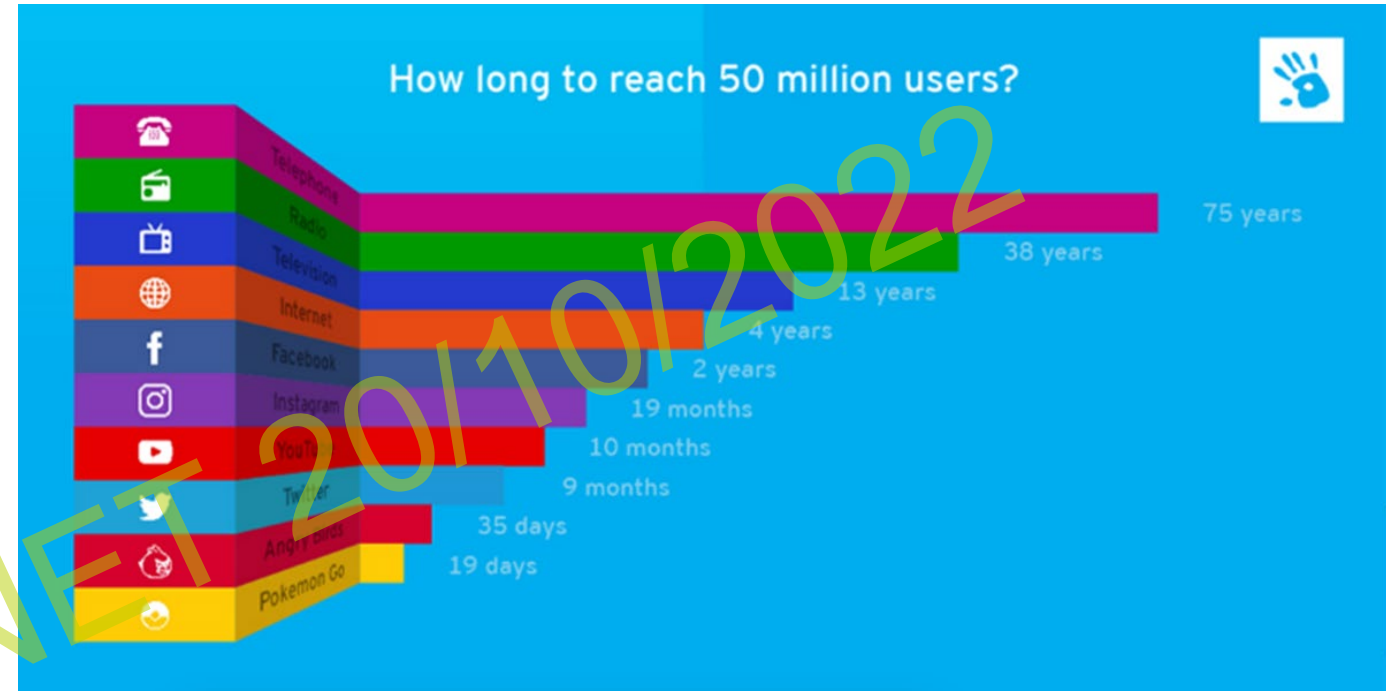
Tools / guides





A driver of change

- Technologies
 - AI
 - Robots and cobots
 - Big-data
 - Autonomous vehicles and drones
 - Wearables / IoT
- Digitalisation 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



Collage of news articles:

- Article 1: "We will soon be able to read minds and share our thoughts" (Next Year Preview, 14 December 2016)
- Article 2: "Smart buildings predict when critical systems are about to fail" (Daily News, 29 January 2017)
- Article 3: "Smartwatches know you're getting a cold days before you feel ill" (Daily News, 12 January 2017)



EU-OSHA's research on digitalisation and AI

- Impact on work and impact on OSH
- EU-OSHA's foresight on digitalisation 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 specialised 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
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Challenges:

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

- Leaving the human with unpleasant remaining tasks
- Mental fatigue
- Mental overload
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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, skepticism (anthropomorphism)
- Mental / cognitive workload and fatigue



OSH effects - Organisational

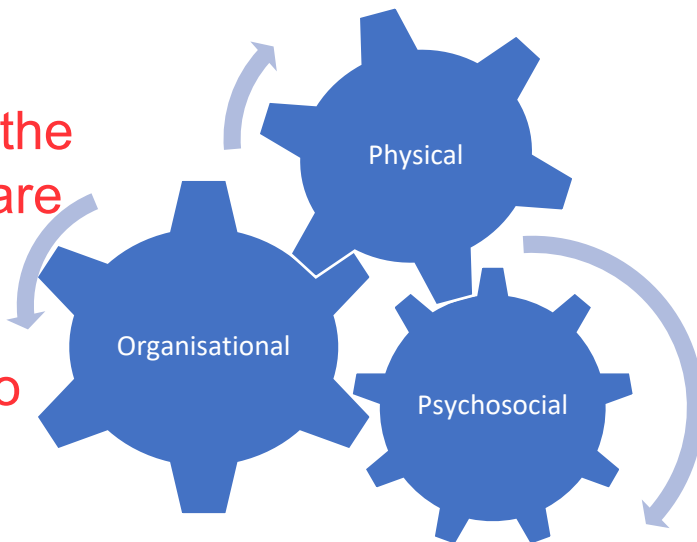
- **Introduction process and change management**
- **Process / Task design / Allocation**
- **Worker participation**
- **Clear and direct communication with workers**
- **Need for training**
- **Cybersecurity**

Opportunities:

- Can increase efficiency/effectiveness
- Can reduce human bias
- Adequate levels of trust promote appropriate system use, i.e. benefit task completion
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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
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Legislation and prevention 1/2

- 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 regards to specific hazards at work such as:
 - exposure to dangerous substances (Directive 67/548EEC),
 - 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)
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Legislation and prevention 2/2

- 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

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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 / RA.**
 - **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





Thank you for your attention!



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

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