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

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EUROSHNET

ARTIFICIAL INTELLIGENCE
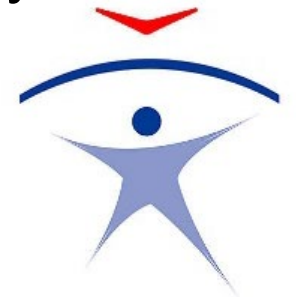MEETS SAFETY AND HEALTH AT WORK

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

European Agency for Safety and Health at Work

Healthy Workplaces

Surveys

NAPO

OiRA
Online Interactive Risk Assessment

ESENER

Campaigns

Tools / guides

OSH WIKI
Networking knowledge
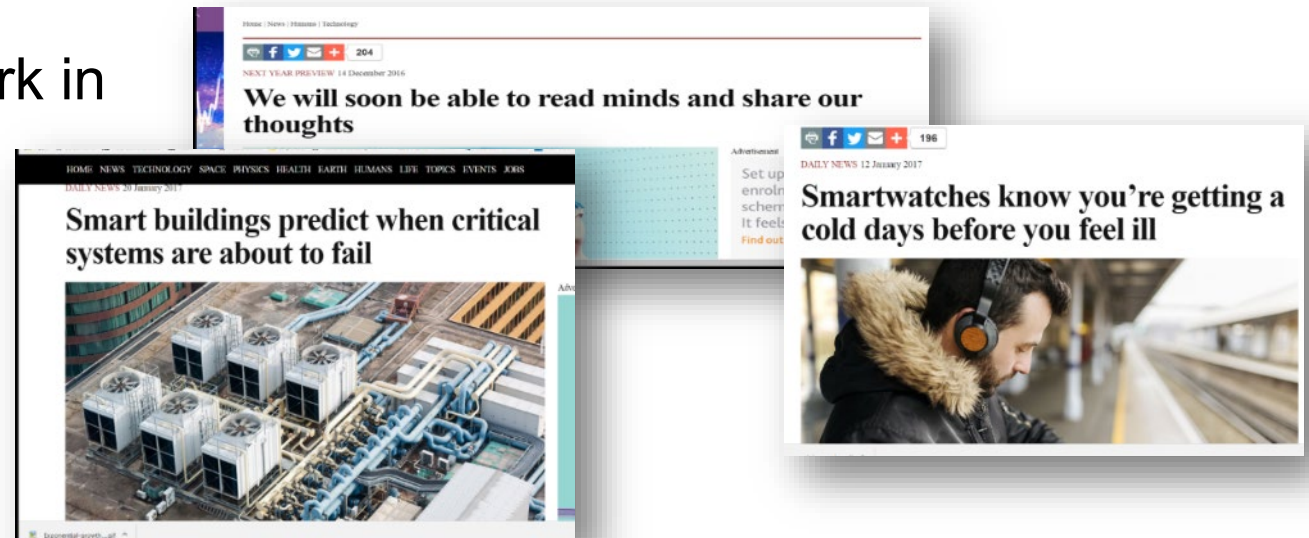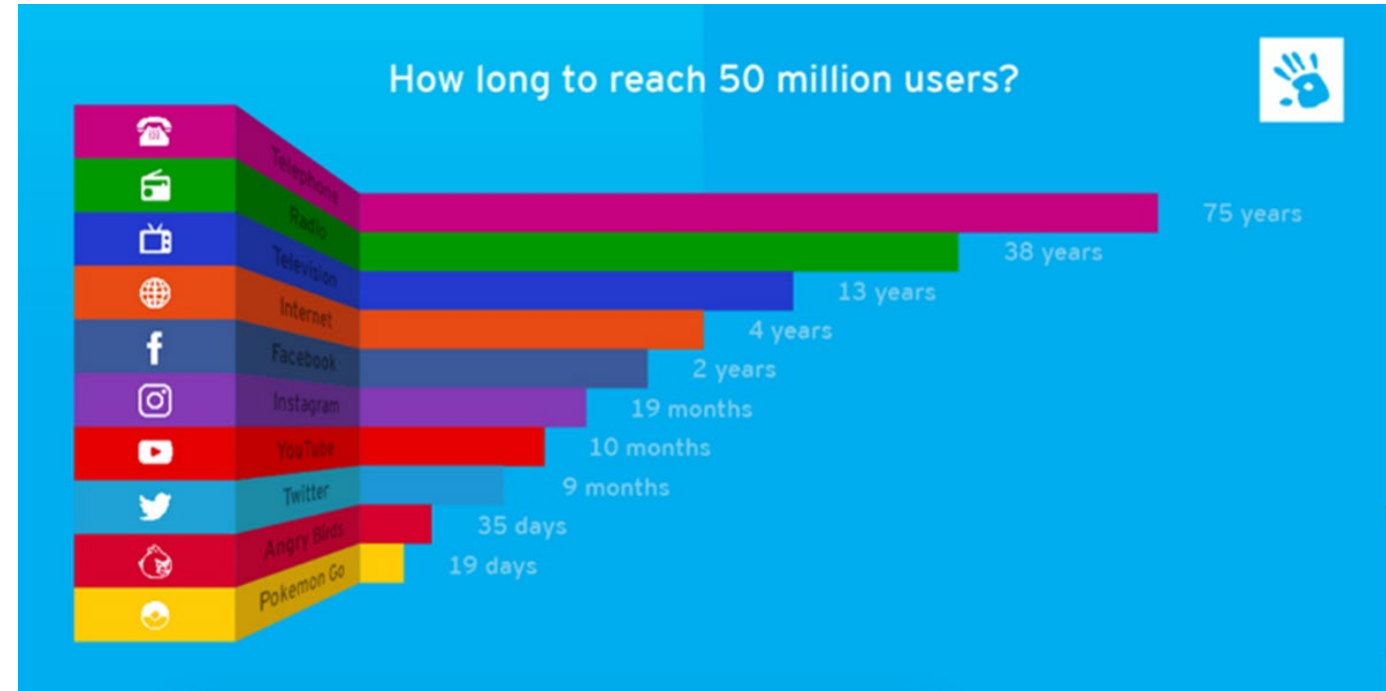
A driver of change

- 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

How long to reach 50 million users?

Telephone — 75 years
Radio — 38 years
Television — 13 years
Internet — 4 years
Facebook — 2 years
Instagram — 19 months
YouTube — 10 months
Twitter — 9 months
Angry Birds — 35 days
Pokemon Go — 19 days

We will soon be able to read minds and share our thoughts

Smart buildings predict when critical systems are about to fail

Smartwatches know you're getting a cold days before you feel ill

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
- …………………….

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

Physical

Organisational

Psychosocial

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
- ....

Physical

Organisational

Psychosocial

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
- ……………………..

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
- ………………………...

Physical

Organisational

Psychosocial

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)
  - …..

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, GDRP, 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 / 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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