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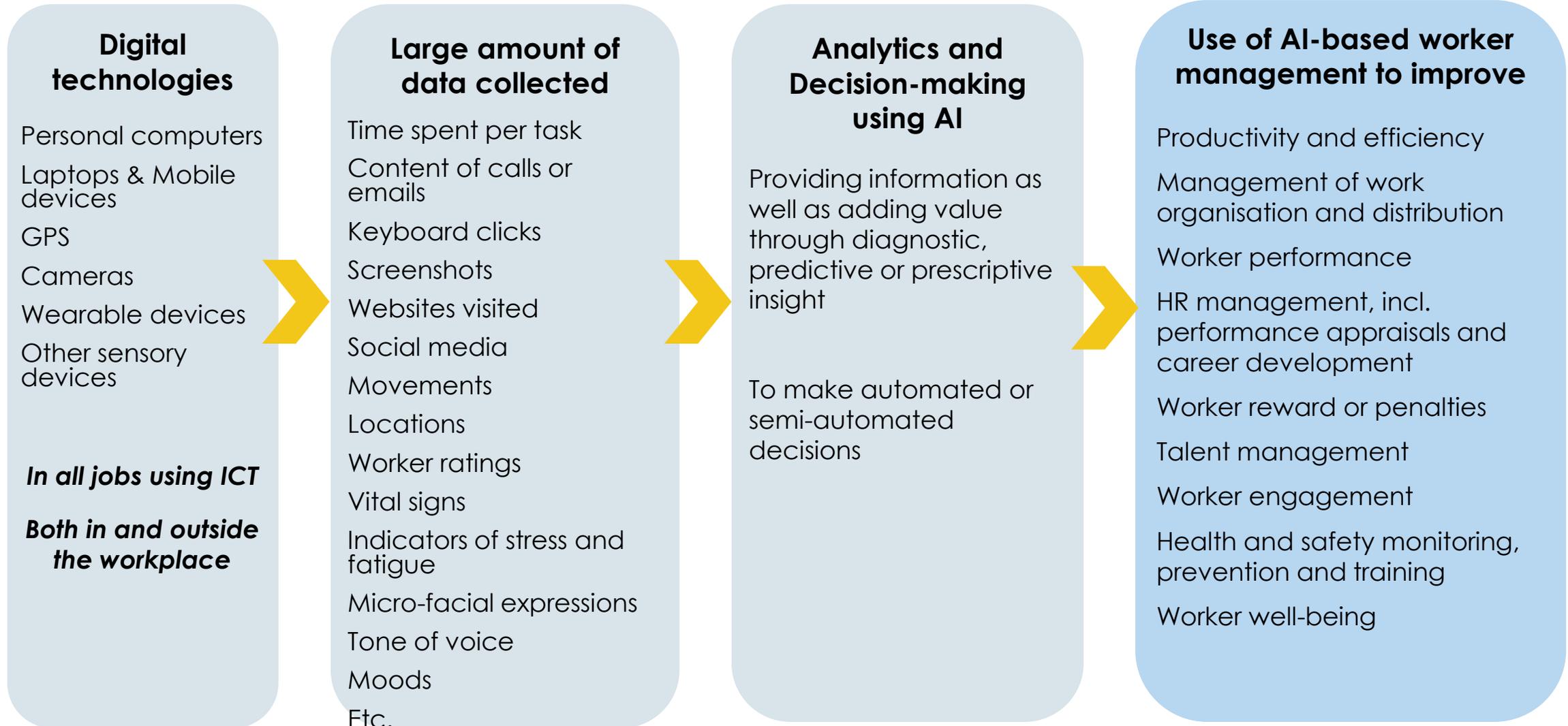
New forms of worker management using AI and their impact on OSH

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1st December 2021



Worker management is as old as work itself... BUT...



Operational definition of AI-based worker management (AIWM)

- Worker management systems that **gather data**, often **in real-time**, from the **workspace, workers, and the work** they do, which is then fed into an AI-based system that makes **automated or semi-automated decisions**, or provides information for decision-makers (e.g. HR managers, employers, sometimes workers) on worker management related questions.

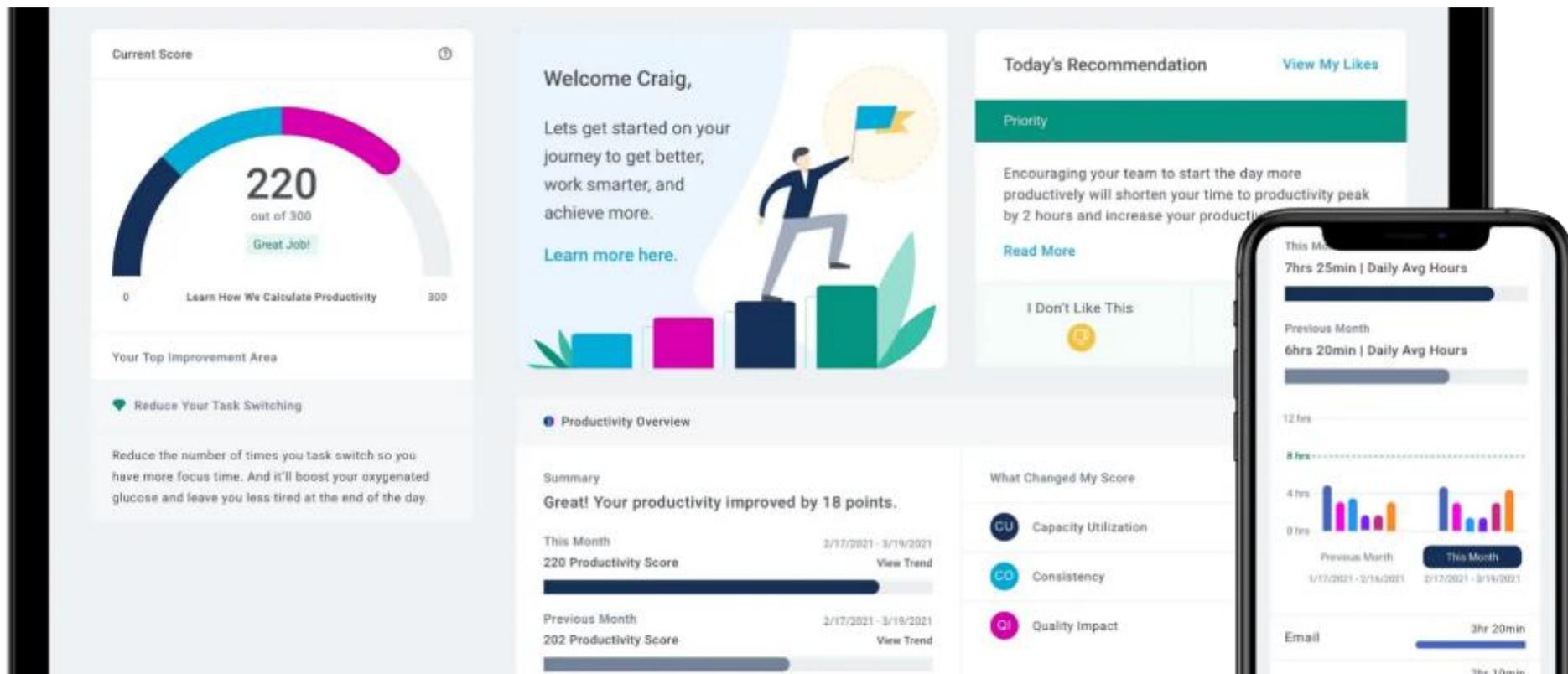
Definition based on European Commission, 2021; European Parliament Research Services, 2020; High-Level Expert Group on Artificial Intelligence, 2019; Moore, 2019

- **5 principles** (Möhlmann and Zalmanson, 2017; Bérastégui 2021):
 - Continuous **monitoring of workers' behaviour** (*digital surveillance*)
 - **Constant performance evaluation**
 - **(Semi-)Automatic decisions** with no or reduced human intervention
 - **Interaction** with the system with **no opportunities for feedback or negotiation**
 - **Low transparency** (*'black box of decision making' ?*)



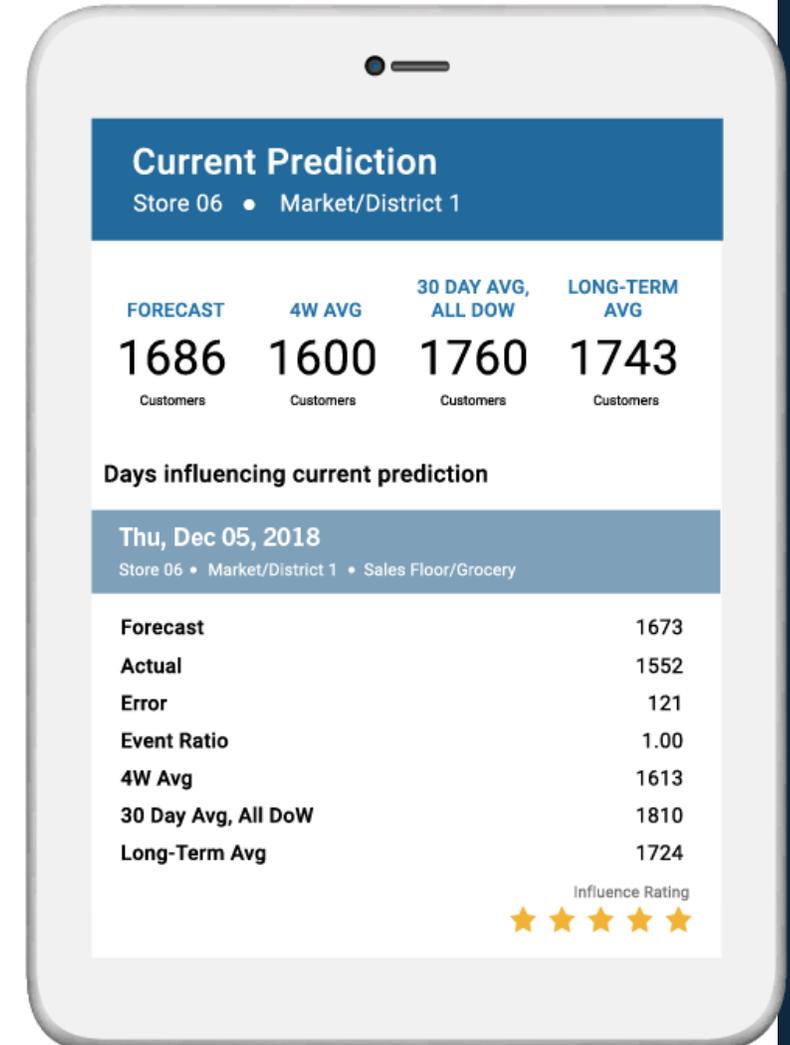
Examples of AIWM: performance / productivity management

Such AIWM tools improve worker performance and productivity by evaluating it and providing recommendations on how it can be improved. For example, a tool called *enable* measures how quickly employees complete various tasks and suggests ways to speed them up (Heaven, 2020).

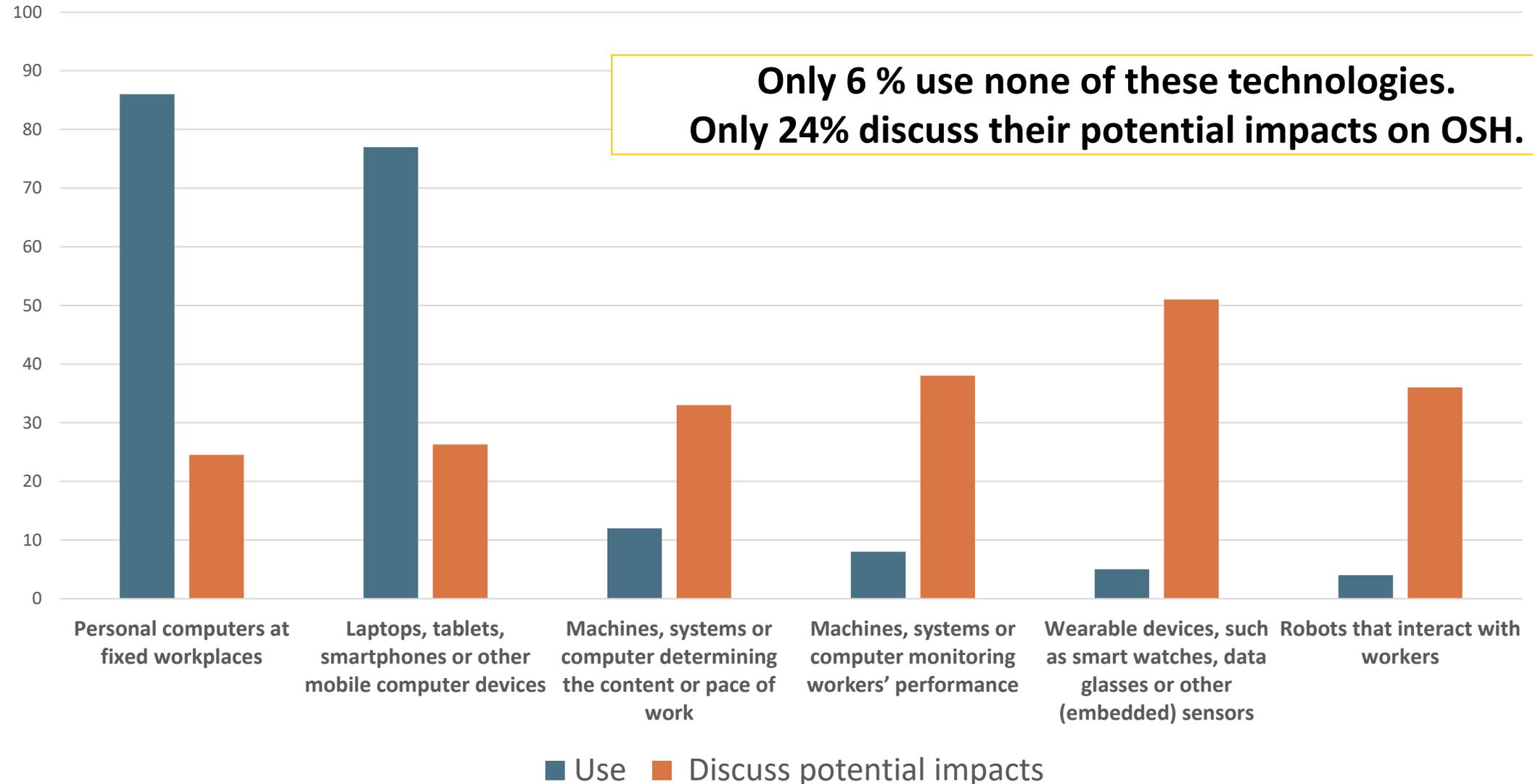


Examples of AIWM: AI-based scheduling and task allocation

- Scheduling systems that can automatically schedule tasks to specific workers (i.e. match skills with tasks), as well as ensure optimal labour coverage for every shift.
- For example, *Kronos AIMEE* – an AI-powered scheduling tool – boasts that it can forecast customer demand based on the weather forecast and provide recommendations on how many workers should be in the shift and who, based on skills and experience, should be scheduled for a particular task (Kronos, 2018).



technologies & Discussing their impact on OSH (ESENER-3, 2019)



Up-take of new forms worker management

- There is lack of data specifically measuring the use of AIWM systems
- The uptake of AIWM systems is relatively low across the EU27 (2020), but it is **growing**.
- 71 % of international companies consider **people analytics a high priority** (Deloitte, 2017)
- Demand for worker monitoring software **increased by 87%** in April 2020 **compared to pre-pandemic** (Top10VPN, 2020)

Organizational analytics – ‘helping organizations understand how their teams interact in order to increase performance’ (Humanzyze)



Mixed workers' perception about AIWM

- 80% of surveyed workers would **not be comfortable with AI** acting as a **supervisor or manager** (PEGA, 2020).
- **25% workers** feel monitoring has **more benefits than downsides**, **38% disagree**, 35% are uncertain (TUC report)
- Many workers do not trust AI because they are not sure how their employers/managers are using it
- Many workers **not aware of their rights** or feel **unable to challenge** employers' use of surveillance

Digitalisation and impacts on OSH discussed (ESENER-3, 2019)

Impacts on worker health and safety discussed	% establishments (EU27_2020)
Need for continuous training to keep skills updated	77%
Prolonged sitting	65%
More flexibility for employees in terms of place of work and working time	63%
Increased work intensity or time pressure	58%
Repetitive movements	58%
Information overload	52%
Blurring boundaries between work and private life	47%
Fear of job loss	21%

Particularly discussed by those using “workers’ performance monitoring technologies”.

Base: all establishments in the EU27_2020 reporting (1) the use a digital technologies and (2) discussing their impact on the health and safety of their workers, ESENER-3 (2019).

Algorithmic management: 'high-tech' version of old management principles ?

By Prof. Yves Roquelaure, University of Angers (France)

Manager's perspective : 'prescribed' task (*what is requested to do*)

→ **technical and organizational logic**

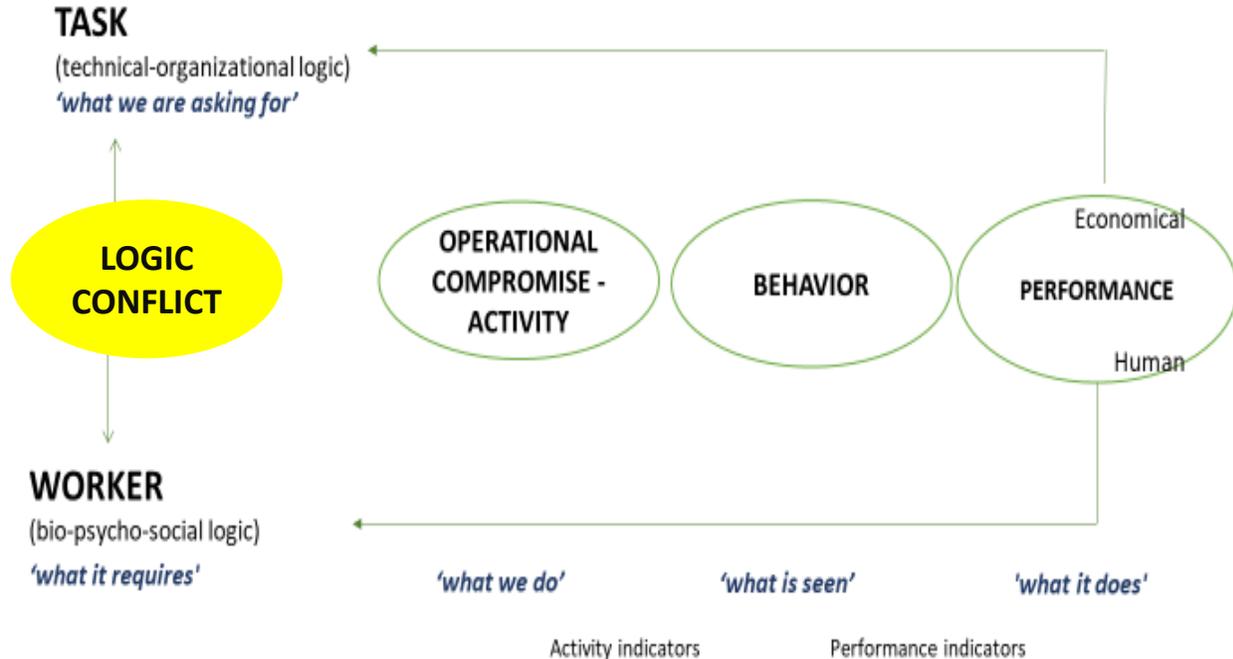
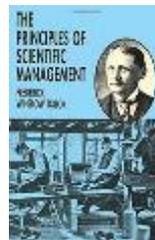
- Optimizing the efficient allocation of resources in the production (goods, services)
- Highly adaptative production methods
- **Strict procedural control of the prescribed task**
- Reduce costs and increase productivity

Worker's perspective : 'Activity' (*what this requires*)

- Highly variable 'real work' organization
- Constant need to adapt its operating methods
- Permanent adaptation of gestures, information gathering, information exchange, etc.
- **Very low possibility of decision making and self-regulation**
- **Very little operational leeway to cope with the task**

→ **New forms of "Digital Taylorism" ?**

→ **Job quality ?** (Nurski, 2021)



The Activity of the operators is not a simple application of **prescribed instructions**, but a **re-conception of the task and a self-regulatory process** to achieve the **objectives** while managing the **variations** in the technical-organizational system and its own individual variability

Ergonomic perspective: the importance to preserve the margin of maneuvers

By Prof. Yves Roquelaure, University of Angers (France)

Situational margin of maneuvers (MMs) refers to :

- options (space of freedom) available or created by workers
- to elaborate **alternative strategies and ways of working**
- according to their skills, knowledge and values
- in order to **achieve production targets**,
- **reducing** psychological, mental and physical **strains**
- avoiding **negative health effects**

Several levels of MMs

- **Sufficient MMs** : several working strategies are possible, and the operator can alternate and invent new ones (*developmental perspective*)
- **Low MMs** : the range of possible operating methods is very limited, which can lead to overstrain and/or difficulties in achieving the performance requested
- **Absence of MMs**: failure in achieving objectives can occur, even at the cost of overstrain and/or health disorders

MSDs or mental health disorders can be conceived as the consequence of a lack of workers' margin of manoeuvre and a defect in the self-regulatory processes of work activity



OSH RISKS of AI-based management of workers

- Constant monitoring, direction and control
- Loss of job control and autonomy
- Increased performance monitoring/rating
- Increased performance pressure
- Increased work intensity
- Inability to take (mini-)breaks
- Reduced relationships with peers/managers
- Unstable work schedules, permanent availability and blurring work/life
- “Datafication” of workers
- Dehumanising of workers

- Deskilling of the workforce
- “ Black box”, lack of transparency
- Mistrust
- Information imbalance
- Discriminatory bias
- Privacy issues

OSH IMPACTS:
Musculo-Skeletal Disorders, cardiovascular disorders, disorders of the urinary system, stress, fatigue, exhaustion, anxiety, burnout, fear of losing their job, decreased cognitive and intellectual capacities, creative thinking and independence of thought, incidents, accidents



Opportunities for OSH

- Hazard monitoring:
 - toxic substances, noisy environment, collisions etc.
 - workload, bullying, violence, burn-out
- Can alert real-time of a dangerous situation
- Accidents and incidents factor analysis
- Advanced, dynamic workplace risk assessment
- Mental health monitoring, digital counselling
- Foster health promotion
- Worker engagement and satisfaction
- Support to workers with disabilities
- Input to design safety training programs
- Support targeted OSH inspections

Examples:

- Pandemics 2020-2021: monitors worker's proximity
- Warehouses - The workers and fork-lifts can be monitored to detect their positions and movements: a risk of collision can be predicted by algorithms



Abbott Storage Systems: <https://www.abbott-group.com.au/>

EU regulatory framework

At the EU level, regulation of aspects of AIWM is provided by:

- The **EU OSH acquis** that implicitly applies to risks posed by AIWM at work
- **General Data Protection Regulation (GDPR)** that has extensive provisions preventing organisation from abusing private data, including, according to Art. 22: “**preventing decision based solely on, automated processing**, including profiling, which produces legal effects concerning him or her or similarly significantly affects him or her”.
- **EU Charter of Fundamental Rights** and the **General Framework for Equal treatment in employment and occupation**



EU regulatory framework (*continued*)

In addition, in April 2021, the EC proposed a new regulation that explicitly targets AI, including AIWM, titled **Proposal for a Regulation on a European approach for Artificial Intelligence (the Artificial Intelligence Act)**. In very broad terms, the proposal covers:

- Safe deployment of AI-systems, **prohibiting some** of them, while casting others as “**high-risk**” requiring more safeguards for the design, development, and use of these systems.
- The proposed list of “**high-risk**” systems includes AIWM tools, such as AI systems used for recruitment or selection, and AI systems used for **making decisions on promotion and termination** of work-related contractual relationships, for **task allocation** and for **monitoring and evaluating performance and behaviour** of workers.
- Proposes compliance with mandatory requirements for high-risk AI systems, e.g. **establishing and maintaining risk management** systems throughout the life cycle of AI systems, training these systems with **human oversight**.



National regulatory framework

- The majority of EU countries have adopted AI strategies and have ongoing debates regarding general AI-issues, not OSH specifically.
- Member States have OSH strategies, some including digitalisation, AI, robotics, online platform work but rarely AIWM
- But current regulation either doesn't or is unclear how it includes OSH
- The attention to AIWM is increasing, mainly as a consequence of the pandemics



Key pointers for the prevention of OSH risks

- Proper **enforcement of the existing regulation** (such as OSH legislation, GDPR, anti-discrimination)
- Incorporate **ergonomic concepts, user-centered approach and participatory methods** to the design and use of AIWM to preserve workers' **job control, autonomy and margin of manoeuvre** - and to avoid the come back of old Taylorian 'one best way' of designing working methods
- **User-centered Prevention-through-design** approach - OSH to be considered from the beginning to design out potential OSH risks
- AIWM should be **designed for the purpose of improving OSH** – if not, they will not do it
- Proper consideration of AIWM in the **workplace Risk Assessment**
- Workplace risk assessment should be **repeated periodically** given the evolving nature of AI systems
- The workplace Risk Assessment should **not be “delegated” to technology**
- **Humans in command** (workers and managers)
 - Technology and AI to support but not replace human control and decisions

Importance of worker participation in AIWM for prevention

- Worker participation: a cornerstone to OSH prevention
- At all stages, from **design, ex-ante assessment, implementation, workplace risk assessment, and decision-making** (workers should have a say about Ai-based decisions)
- The **lack of transparency** on how AIWM work and are used result in an **imbalance of information and of power**, making workers' participation very difficult in practice
- **“Professional isolation” is a barrier** to collective worker representation and collective bargaining/social dialogue – and also shifts OSH responsibility towards individual workers
 - Algorithmic management leading to competitiveness, a loss of professional relationships with peers and isolation/individualisation, exacerbated by telework/remote work
- AIWM should be designed, implemented and managed in a **transparent, understandable and empowering** way guaranteeing **workers' equal access to information and participation**
- **Co-governance** of AIWM must be guaranteed
- The **EU social partner agreement on digitalisation (2020)** needs to better translate it into practice

Key pointers for the prevention of OSH risks (continued)

- Need to **clarify responsibilities and liabilities** of developers and employers in relation to the design, development and use of AIWM and their potential OSH risks
 - Especially with regard to the level of autonomy of AIWM in decision-making autonomy
- **Data minimisation:** The need to collect worker data should be balanced against the rights of workers to privacy and their safety and health
- **Information and training to ALL** stakeholders, including designers, managers, workers and their representatives, to allow **AI literacy** as a **pre-requisite to social dialogue** and to the **prevention and management of OSH** risks of AIWM
- **Improve the designers and managers' knowledge** related to human functioning (*incl. subjectivity*), ergonomic principles, and the OSH risks associated with AIWM
- Need to **raise awareness** at the policy, development and workplace levels about the impact of digitalisation, in particular on **mental health**

➔ **Healthy Workplaces Campaign 2023-25 “Safe and healthy work in the digital age”**

Thank you for your attention!



Available early 2022: Reports, summaries and policy briefs:

- New forms of worker Management using AI and OSH
- Digital platform work and OSH
- New digital systems for OSH monitoring
- Advanced robotics and AI-based automation of tasks

Already available:

- Policy brief “Impact of AI on OSH” available [here](#) (soon in several languages)
- Brochure “Digitalisation and OSH” available [here](#) (in 19 languages)
- Series of Expert discussion papers on “The future of work”
 - **The digitalisation of work: psychosocial risk factors and MSDs** – Prof. Y. Roquelaure, University of Angers (2021)
 - **Working in a virtual environment and OSH** - Professor Stavroula Leka, UK (2021)
 - **Cybersecurity and OSH**, Dr, Corradini, IT (2022), etc.

And more on Digitalisation and OSH at:

<https://osha.europa.eu/en/emerging-risks/developments-ict-and-digitalisation-work>



HVALA
THANK YOU