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WORKERS' PARTICIPATION, REPRESENTATION AND PREVENTION IN THE DIGITAL ERA: EVIDENCE FROM NATIONAL CASE STUDIES

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INTRODUCTION

Digitalization has notably transformed the **world of work** in recent decades, reshaping organizational structures and promoting **gig economy models** based on short-term and low-protection contracts.



- Almost **28 million** people in the **EU** are engaged in work through **digital platforms**, a figure expected to rise to **43 million** by the end of 2025
- According to the 2024 Italy Fairwork Report, about **2.2 million Italians** earned income through digital platforms, with around **600,000** through platform-based work, a **diverse workforce** with varying levels of income dependence: **57.6%** are **self-employed** and **31%** work without a written contractual agreement
- Algorithmic management systems improve efficiency but can harm **psychosocial well-being**, autonomy, and mental health
- The **OSH Pulse 2022** survey shows that **52.3%** of **EU workers** report that the use of digital technologies determines the **speed** or **pace** of their work, about **43%** report an increase in working **alone** and **37%** indicate greater **surveillance**

DIGITALIZATION AND AI IN EMPLOYMENT



High-Risk Classification: AI systems used for task assignment, performance evaluation, hiring, promotion, and termination are considered **high-risk** under **EU regulations**.

OPPORTUNITIES: If properly governed, AI can **improve working conditions** and foster **trustworthy innovation** in the EU labor market

OSH RISKS: Algorithmic management introduces **new risks** to **OSH**, including surveillance, stress, and reduced autonomy



Italy's National Prevention Plan (PNP) 2020–2025 emphasizes the importance of fostering a culture of OSH in response to digital transformation, addressing emerging risks and leveraging technological innovation to promote safer and healthier workplaces.

The **PNP** calls for strengthening a **culture of OSH**, especially in the face of **digital transformation**

THE PROJECT - PrePaRa

Challenges and opportunities for OSH in the changes due to the **digital economy**. Impacts on worker participation

- **Contexts** requiring **research updates**, on established and/or **emerging risks** and on **OSH prevention** and protection



Outsourced
Project

PrePaRa

Prevention, participation, and worker representation systems in the era of digital transformation

Digitalization of
Production Processes

Models of work
organization enabled by
Digital Platforms

Trade Unions



PROJECT LEADER



**POLITECNICO
MILANO 1863**

PARTNERS

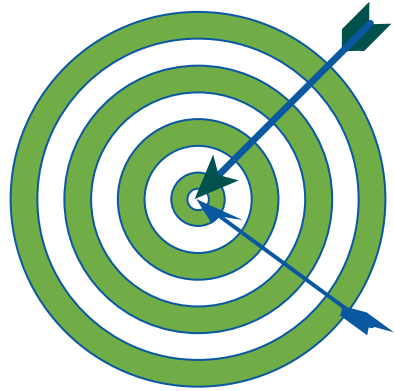


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THE PROJECT - PrePaRa



To **enhance** OSH and representation by studying the impact of **digital transformation** on **work organization** and worker **participation**

Exploratory qualitative methodology

FIELD STUDIES



Mixed-method approach

- Literature and legal doctrine **Review**
- **Interviews** with key informants and Experts
- **Emblematic** company **Case Studies**
- A participatory **Workshop**



PrePaRa – Case Studies

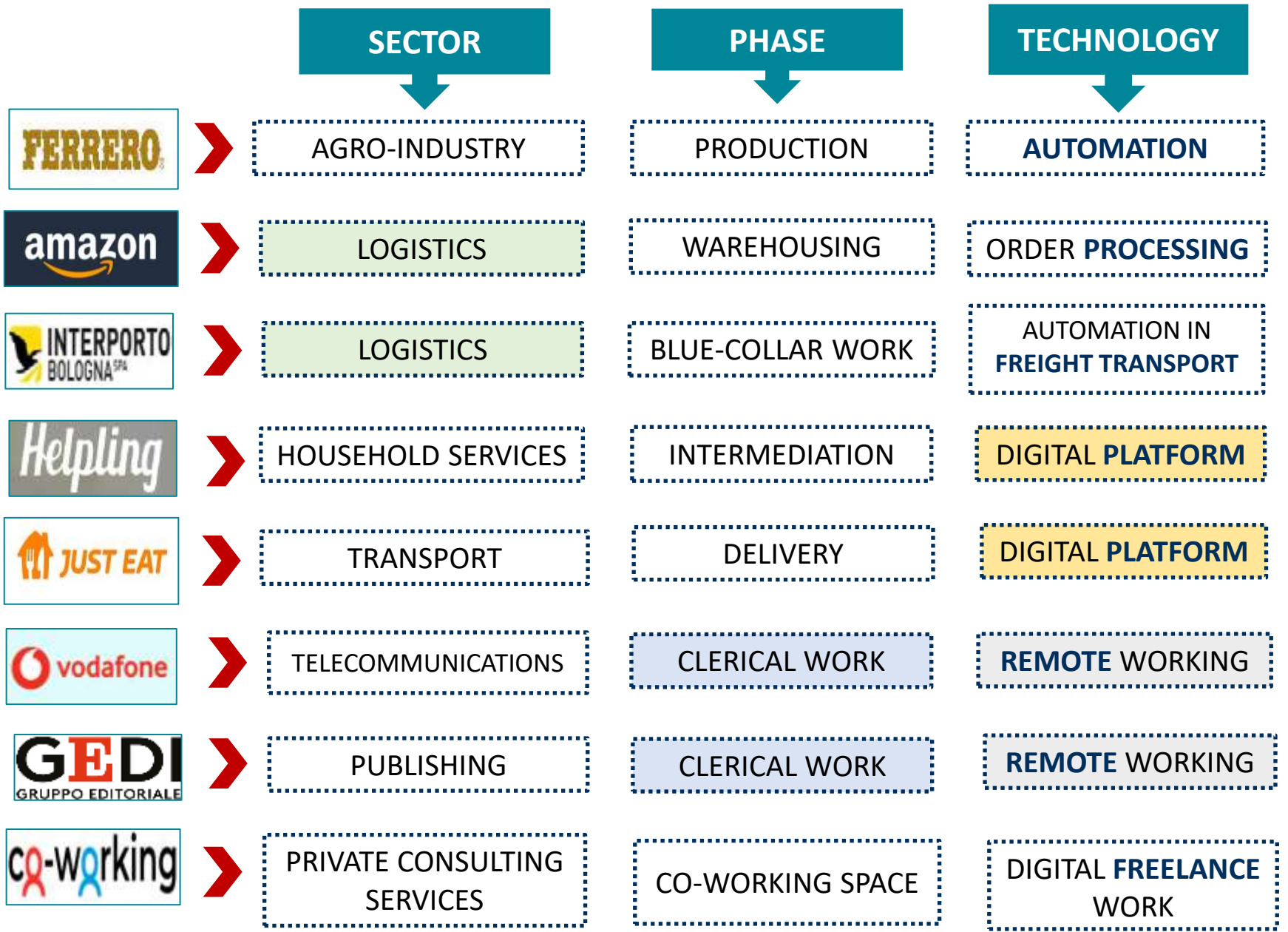


1. **Long-standing** innovation with established prevention systems
2. **Recent innovation** with less mature prevention systems

Sectors: Logistics, Services, ICT ...

Professions: High/Low Skilled, Blue & White Collar

Technologies: Industry 4.0 → Platform Economy



CASE STUDIES – INTERVIEW SELECTION STRATEGY

DATA COLLECTION STRATEGY



- **Documentary sources**
Agreements, certifications, literature reviews, RAD...



SEMISTRUCTURED INTERVIEWS

- **In-depth semi-structured interviews** (Online/Focus group)

REPRESENTATIVENESS



- **Diversification** of roles and perspectives
- **Inclusion** of prevention professionals at company and regional level

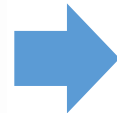
FIGURES INTERVIEWED



Approximately **10 keynote speakers** for each case study, (stakeholders in prevention field)

- Employer, Process/HR/ Managers, H&S Manager
- Occupational Physician
- Union Safety Reps (HSR, RSU/RSA)
- Workers
- External Experts / Stakeholders (Local Health Authority, INAIL)

COMPARATIVE ANALYSIS



DIMENSIONS	CHARACTERISTICS
Structural dimensions	Type of business , production processes , and technologies involved
Work organization	Changes in tasks , professional profiles , and organizational structures
Quality of work	Psychophysical conditions, emerging risks and opportunities for OSH and their impact on work quality
Industrial relations	Analysis of industrial relations systems and ability to address digital and technological innovation
Prevention systems	Procedures and roles of prevention system stakeholders, with a focus on HSRs and workers : <ul style="list-style-type: none"> ▪ OHS procedures ▪ Role of the HSR ▪ Worker participation in prevention systems ▪ Relationships among prevention stakeholders

CASE STUDIES – Results

Work organization

WORK ORGANIZATION

- **Reorganization** of work structures
 - Gradual (established contexts)
 - New models (innovative contexts)
- Increased formal procedures
- High **flexibility**
- **Streamlined** processes
- **Optimization** (and/or **intensification**) of use of time, resources, tools, and staff



Patterns of Work Organization

- FERRERO** → Lean **manufacturing**
- AMAZON** → On-demand, **highly automated** warehousing
- JET & HELPLING** → **Platform-based** service models
- VODAFONE** → Agile work, **flexible** use of space/time







CASE STUDIES – Results

Quality of Work

QUALITY OF WORK






RISKS



- Intensification of **work pace** →  
- Individual accountability and individual performance **monitoring/evaluation**
- Direct relationship between **workload, productivity,** and pay →  
- Increase in **workload** → 
- Work **fragmentation** (tasks broken into smaller phases; loss of overview and meaning) → 

OPPORTUNITIES



- **Safer** machinery/tools, **reducing** the risk of accidents and physical strain →  
- Improve **production of information**, greater ability to share and manage it
- Encouraging **worker participation** → 
- Relationship between innovation and the **reduction of irregular work**: Digital platforms have reduced activities often performed without contracts or protections →  



Emerging risks remain **under-addressed** in innovative settings, with **low awareness** of hazards linked to new technologies

CASE STUDIES – Results



Amazon's Warehouse Management System is a **warehouse management system** based on **cloud technologies** and allows the **optimization** of warehousing processes

- Growing emphasis on **workplace safety** and **efficiency**, especially in **accident prevention**
- **Robotic** technologies contribute to improving safety, particularly from an **ergonomic perspective**
- Interviews highlight **health problems** related to work **rhythms** and issues caused by **task repetitiveness**

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- Since 2021 riders are **employees** and follow OSH National legislation (transports contract)
- **Poorely informed** on **long-term risks** (e.g. musculoskeletal disorders, pollution, weather)
- **Lack of algorithm's transparency, decrease of social relations**, and continuous monitoring can cause work-related stress
- The algorithm is defined at central level, without taking into account the **features** of the **territory** and the **worker's profile**
- **Union proposals**: adapt platform to territory, weather, rider profile, vehicle type

CASE STUDIES – Results

IR & Prevention Systems





INDUSTRIAL RELATIONS (IR)

- **HSR role** closely linked to Unions. Prevention and IR are **interconnected** →  
- **Strong** industrial relations promote **dialogue**, worker **participation**, effective bargaining, and management of prevention innovations → 
- Need to strengthen **inter-company relations** (site & group), trilateral **social dialogue** (institutions–unions–companies) at both **national** and **local** levels → 

PREVENTION SYSTEMS

Strengths in mature systems



- Long-term innovation processes
- Well-established IR and prevention systems
- Formalized H&S procedures
- Active **HSR involvement** →  
- Greater **worker participation** in health protection

Challenges across contexts



- Digital innovation can **fragment** stakeholder relationships
- Innovation often **centralizes** and standardizes procedures
- **Difficulties** in building relationships across value chain & local actors (*Cases characterized by both Long-standing/Recent innovation*)

CONCLUSIONS

- Comparative **case studies** highlight diverse trends in the relationship between digitalization, prevention systems, and the role of Health and Safety Representatives
- Impacts of digital transformation are not uniform: risks and protections depend on **multiple factors**
- Some protective measures exist (e.g. riders), but significant **gaps** in OHS regulation **remain**
- Findings show **wide variability** - from greater **autonomy** to **stronger algorithmic control** and work **intensification**
- Digitalization can enhance efficiency and safety, but also introduces new risks and challenges for prevention systems - reinforcing the **central role of HSRs**
- **Call to action:** strengthen **representation**, innovate **prevention tools**, and promote **inclusive training** and legal reforms

Thank you for your attention!

