WILLPOWER

Workforce **I**ntegration **L**everaging **L**earning and **P**redictive **O**ptimization **W**ith **E**nhanced **R**obotics

WILLPOWER
In a “nutshell”

WHAT

- **Human-centric production transformation**
  - Empowers workers with control over robotic systems and production
  - Augments physical and cognitive abilities using robotics and digital tools
  - Democratizes decision-making
- **Integrated technological ecosystem**
  - Using digital audit systems to replace manual tracking
  - Heterogeneous robotic fleets to coordinate across various systems and generations of robots
  - Natural human-machine interfaces
- **Tailored for SMEs**
  - Designed for SMEs with limited automation capabilities
  - Modular, flexible and adaptable solutions for niche production needs and varying environments
  - Reducing worker fatigue and error by automating monotonous and repetitive tasks
  - Allowing workers to focus more on creative tasks

WHY

- **Addressing challenges** of SMEs that
  - Rely on manual, paper-based systems
  - High risk and low flexibility for adopting automation
  - Have high-cost and non-adaptable solutions with high physical and cognitive load on workers
- **Human-centric industry 5.0 vision**
  - Worker well-being, safety and empowerment
  - Inclusive & democratic decision making in production environment
  - Align with EU goals for sustainable, digital, human-centric manufacturing
- **Bridging technology** gaps
  - Leverage existing tech (robotics, AI, NLP, AR) in novel ways
  - Fill gaps in standardization, interoperability and real-time communication
  - Support skills development and future-proofing workforce

HOW

- Creating a **digital audit system**
  - Replace manual audits with real-time, sensor-based tracking
  - Enabling traceability and anomaly detection
  - Integrate digital twins
- Managing **heterogeneous robotic fleet**
  - Modular, flexible and adaptable fleet management
  - User-centric optimization
- Developing **human-machine interface**
  - NLP, AR, gestures, voice
  - Worker issued commands and feedback
  - Adapting to worker conditions and challenges (multitasking, hands busy)
- **Real-time multi-level** communication
  - Worker - robot - management
  - Safe task execution, status updates
  - Edge computing, AR overlays
- **Human-centric design** and **training**
  - Worker needs analysis
  - Augmentation framework, inclusion guidelines
  - Training modules, skill gap assessment
- **Real-world piloting and demonstration**
- **Business and exploitation strategy development with EIT Manufacturing**

Relevance for robotics fleet management partners

Today

- Shared focus on robotics and fleet control
- Complementary research on human-machine interface innovation through direct access to operations
- Contribution to standardization development and updating research roadmaps on national and EU level

Post-project

- Developing interoperability standards
- New verticals - as the **solutions are scalable across industries** (healthcare, logistics, other manufacturing domains)
- **User-centric optimized fleets**
- Upgrading future directions roadmap

Long-term

- Industry leader in human-machine fleet operations
- Strategic differentiation and ecosystem drivers
- Policy influence and part of standardization committees and groups
- Sentient robotic fleets