Innovation in Manufacturing with R3-Mydas

Thanasis Poulakidas (Netcompany)
Project coordinator

Manufacturing Days 2026, Brussels

17-18 November 2026

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

R3-Mydas info card

- Project title: **Remanufacturing, repurposing and recycling energy goods through advanced Mechatronic and Digital technologies**
- Project type: Horizon IA, in topic HORIZON-CL4-2023-TWIN-TRANSITION-01-04

7mil €
budget



Partners

Netcompany, aimen TECHNOLOGY CENTRE, AVL, csem, deepblue, eit Manufacturing, EWF, FLENDER, HAROKOPIO UNIVERSITY OF ATHENS, ikerlan, itml innovation applied, LUT University, SPIN ROBOTICS future of assembly, TMCOMAS GROWING TECHNOLOGY, ziknes

Funded by the European Union

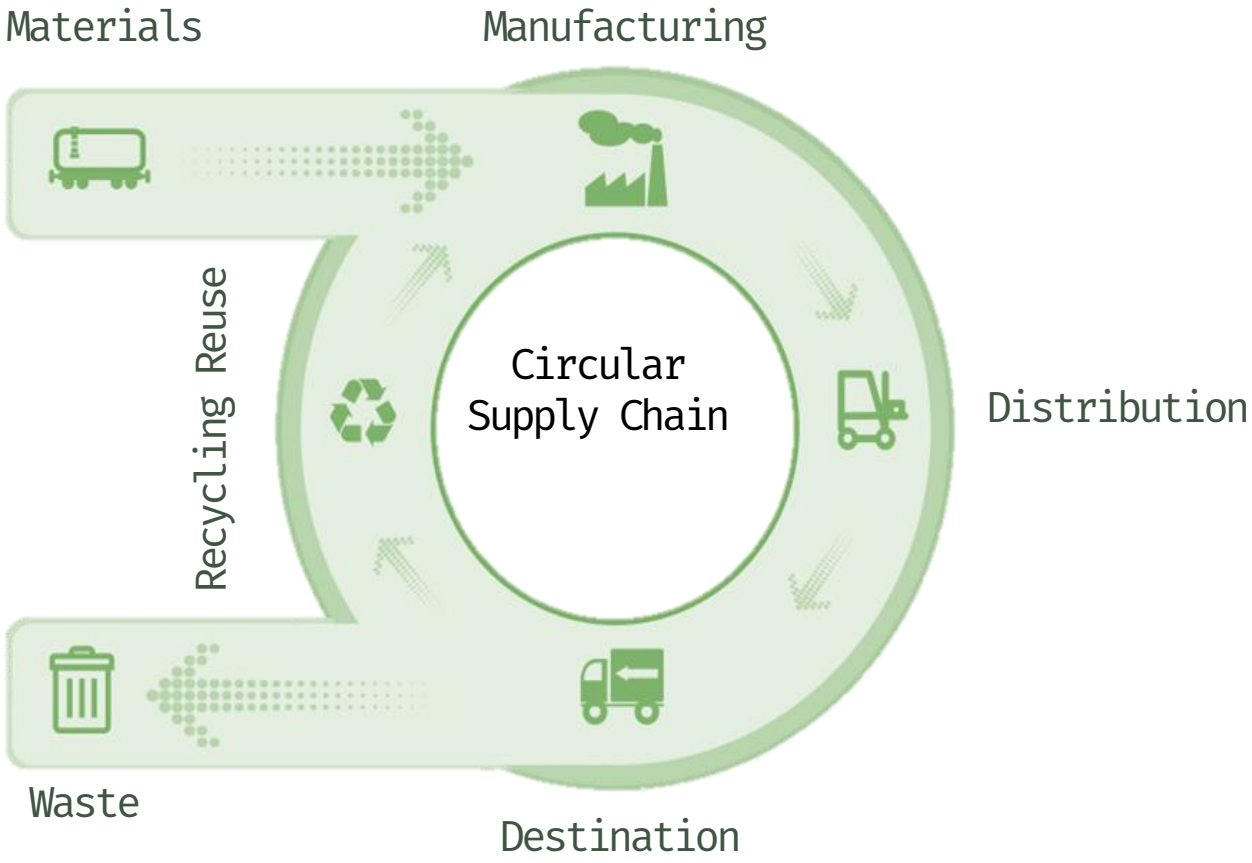
Remanufacturing

Advantages

- ✓ Contributes to circular value chains
- ✓ Promotes circular economy
- ✓ Waste Reduction
- ✓ Energy Savings
- ✓ Price Control

What to improve in Remanufacturing?

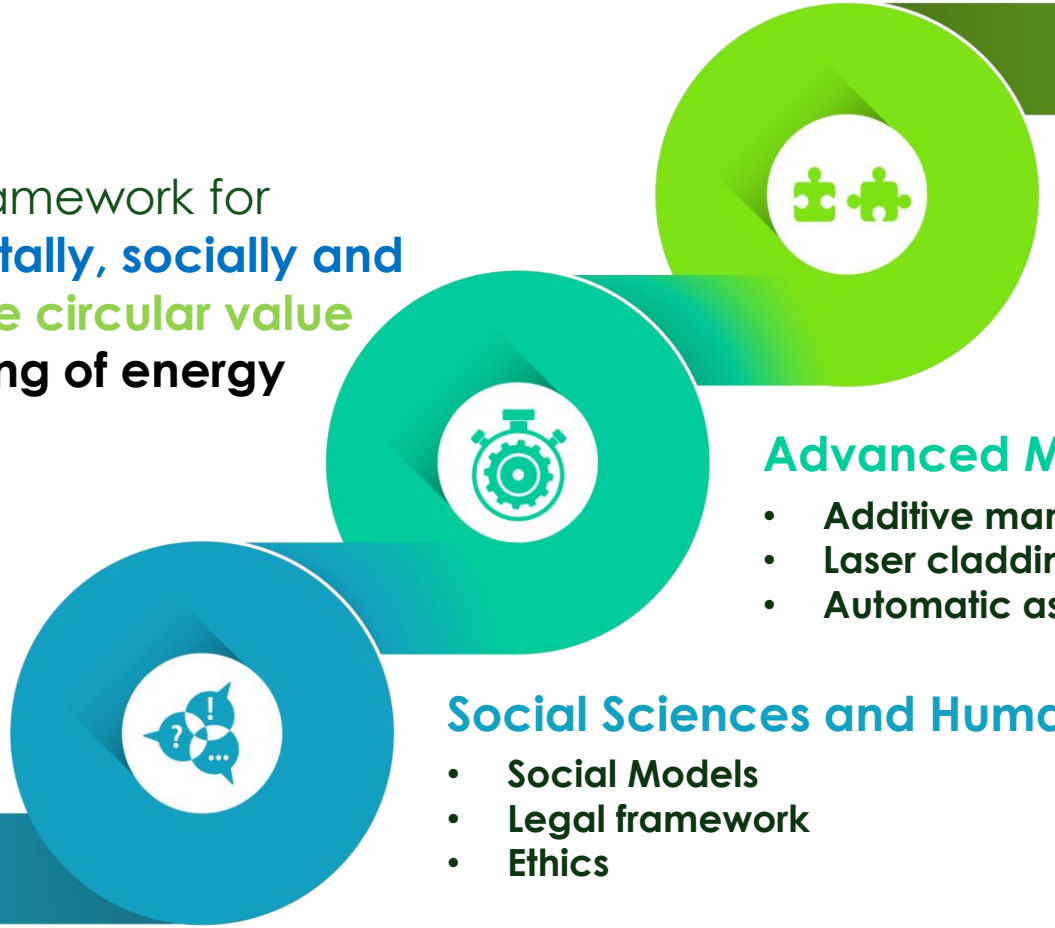
- ? Product Traceability
- ? Reliability
- ? Process Monitoring
- ? Trustworthy industrial practices
- ? Quality Management



Funded by
the European Union

R3-MYDAS primary objective

Develop a multi-actor framework for **functionally, environmentally, socially and economically** sustainable circular value chains for **remanufacturing of energy goods at the factory**



Innovative Digital Technologies

- Machine Learning
- Marketplace
- Digital Product Passport
- Graph models for defects

Advanced Mechatronics

- Additive manufacturing
- Laser cladding
- Automatic assembly/disassembly

Social Sciences and Humanities

- Social Models
- Legal framework
- Ethics

Funded by
the European Union

Demo Cases



Wind Turbine Gearboxes

FLENDER



Oil & Gas Components

COMAS
GROWING TECHNOLOGY



E-vehicle batteries

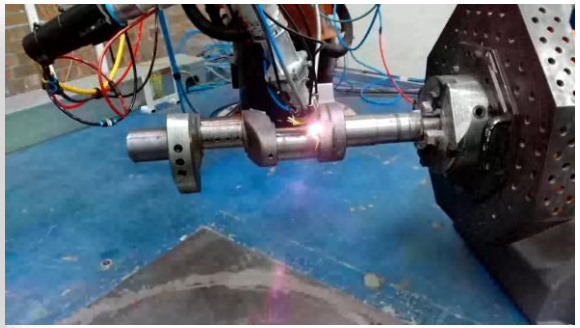
AVL

Funded by
the European Union

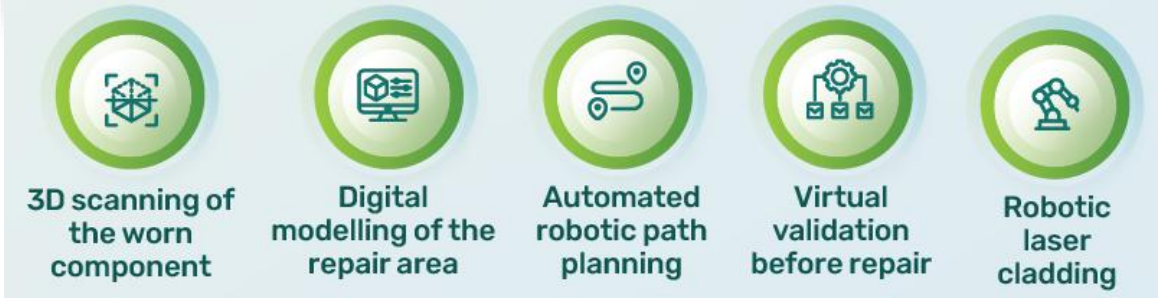
Demo case: Oil&Gas components

- Target: Make crankshaft repair more precise, repeatable and sustainable





- Solution: A scanner-driven repair workflow that connects inspection, digital modelling and robotic laser cladding into a more automated remanufacturing process



- Impact:





Funded by the European Union

Demo case: E-vehicle batteries

- Target: Safer, more efficient and circular battery value chains

- Solution: Combine battery diagnostics, AI-based decision support and robotic disassembly to make end-of-life battery management safer, more reliable and easier to scale





State-of-Health diagnostics | One-shot hybrid assessment | AI-driven decision support | Robotic battery disassembly | Computer vision and precision screwdriving | Human-robot collaboration

- Impact:





Funded by the European Union

Demo case: Wind turbines gearboxes

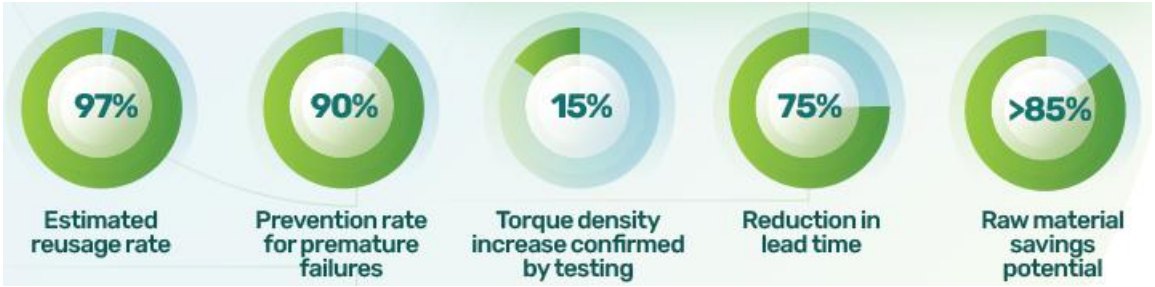




- ➢ Target: More reliable, circular and cost-effective wind turbine gearbox components
- ❑ Solution: Develop new repair, reuse and remanufacturing approaches for wind turbine gearbox components, combining material innovation, testing and simulation to improve reliability and circularity



- ✓ Impact:





Funded by the European Union

R3-Mydas Marketplace

A marketplace for both

✓Remanufactured products

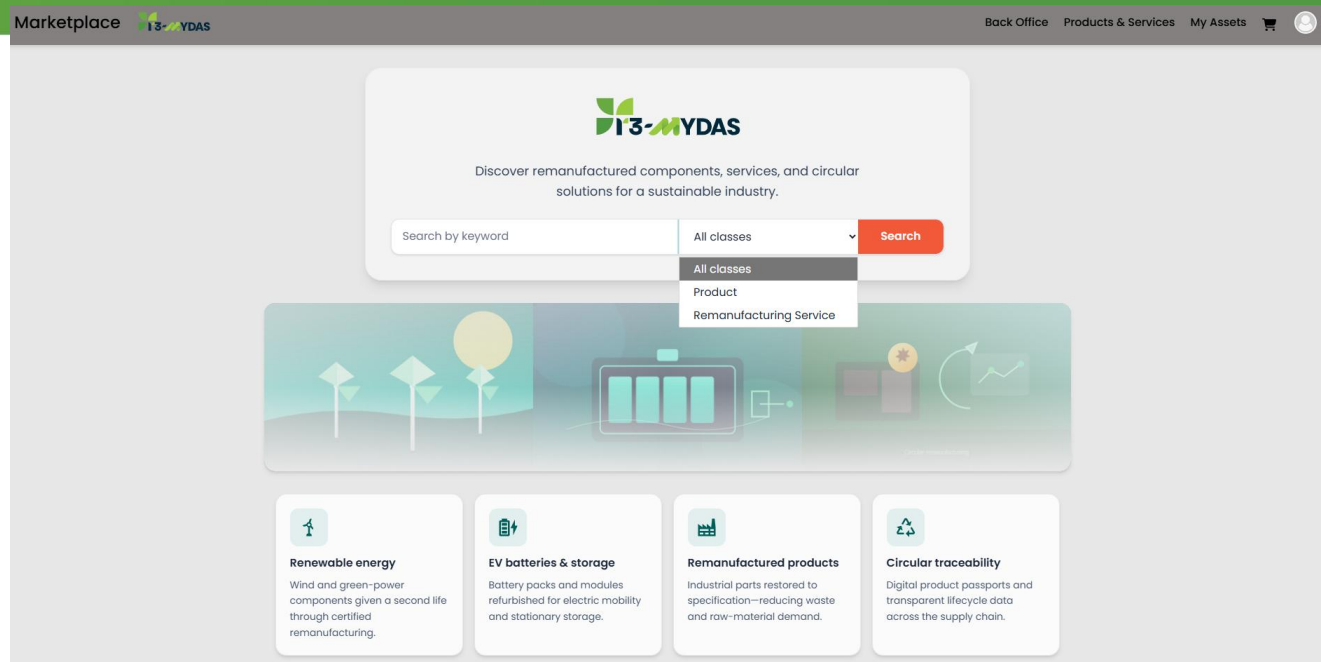
✓Remanufacturing services

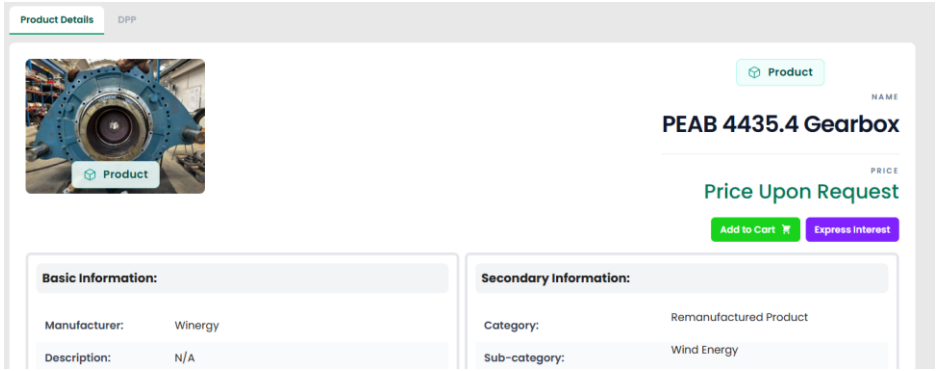
combining

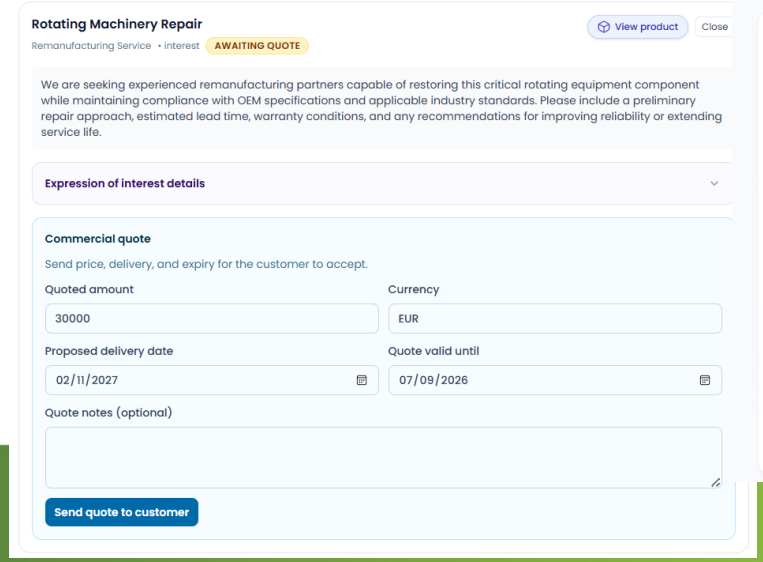
❑Dataspace-powered data sharing

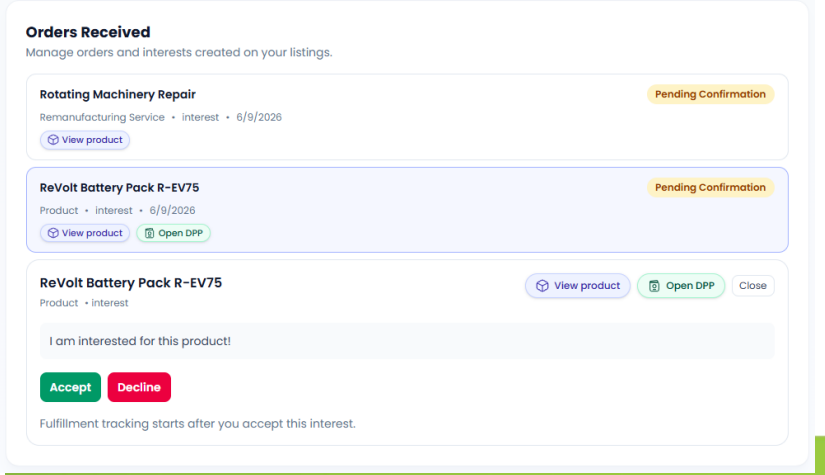
❑Blockchain-powered data validation

❑Digital Product Passport support









Funded by the European Union

Trusted Marketplace for Remanufactured Products & Services

Dataspace-enabled • Blockchain-secured • DPP-powered

BUYERS

Dashboards



- Browse offerings
- Express interest
- Manage requests
- Track progress
- Access data (via dataspace)

Data Consumers
Consume data offers from sellers through dataspace (peer-to-peer)

MARKETPLACE

Discover
Public listings of remanufactured products & services

Express Interest
Buyers express interest for products or services

Connect
Facilitated matching between buyers and sellers

Trust & Transparency
Verified data, DPP and milestone proofs build confidence

SELLERS

Dashboards



- List products & services
- Manage inquiries
- Share data offers
- Track transactions
- Manage data access policies

Data Providers
Publish data offers and control access through dataspace (peer-to-peer)

REMANUFACTURING SERVICE WORKFLOW

Service Contract
Agreement between buyer and seller

Milestone 1
Inspection & Assessment

Milestone 2
Disassembly & Refurbishment

Milestone N
Testing & Validation

Ready Remanufactured Product

DPP
Digital Product Passport

Each milestone generates data • Stored in Dataspace • Hash anchored on Blockchain

DATASPACE (SOVITY)

Sovereign data exchange peer-to-peer

- Full Millestone Data
- Full DPP Data
- Access Policies & Permissions

Data Integrity Link

BLOCKCHAIN

Integrity, immutability and traceability

- Hash of Milestone Data
- Hash of DPP Key Properties
- Timestamps & Actor Identities

PUBLIC INFORMATION

Basic & public information about products & services is visible to all users.

Detailed information is available only after authorized data exchange.

PEER-TO-PEER DATASPACE

Direct, secure and sovereign data exchange between data providers and consumers.

Sellers remain in control of their data and access rules.

DIGITAL PRODUCT PASSPORT (DPP)

Created from verified milestone history • Trusted • Verifiable • Portable

KEY BENEFITS

End-to-End Trust
Immutable records and verifiable provenance

Circular Economy Enablement
Promotes reuse, reduces waste and supports sustainability

Multi-Party Collaboration
Aligns incentives and builds mutual trust

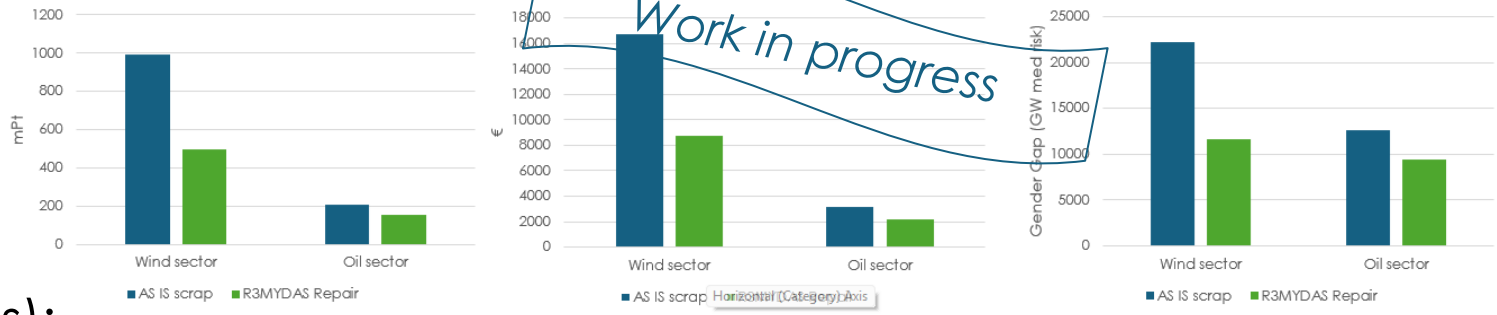
Regulatory Compliance
Supports DPP requirements and audit readiness

Business Efficiency
Digital workflows, automation and transparency

Human and environmental dimensions

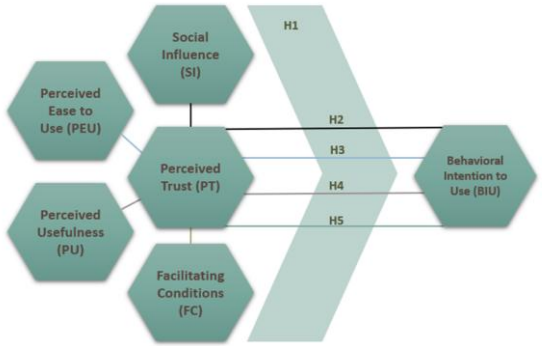
1. Environmental and socio-economic

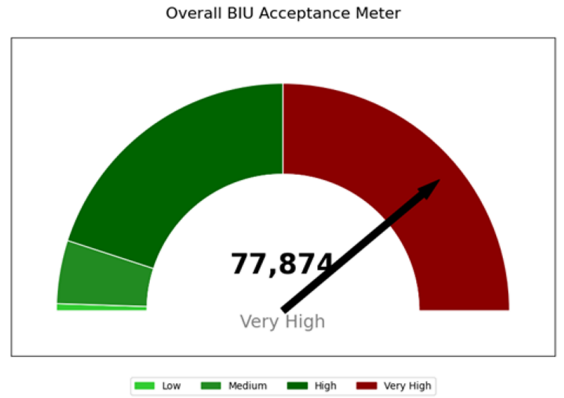
- Methodology
  - Sustainability by design (SbD)
    - Life Cycle Assessment (LCA)
    - Life Cycle Cost (LCC)
    - social LCA
  - SSbD adds safety dimension
- Some takeaways (*work in progress*):
  - Repair scenarios perform better than the AS-IS scrap approach
  - The impact depends heavily on the magnitude/type of the failure



2. End users

- Workshops on Technology acceptance & Gender equality
- 3 industry & 1 end user surveys
- Methodology: QETAM





- Some takeaways:
  - Positive acceptance outlook
  - Support and usability are closely linked and need improvement

Funded by the European Union

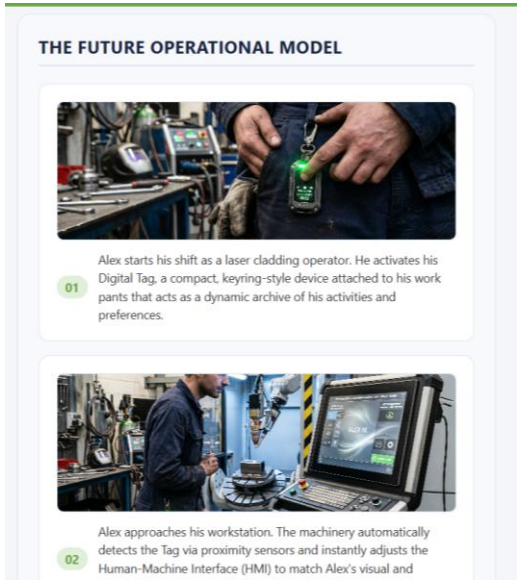
Human and environmental dimensions

3. Workers

- Personas
- Artifacts from the future
- Future scenarios
- *Work in progress*







4. Industrial logistics

- Reverse logistics is a key challenge for industrial remanufacturing
- Coordination is a central issue across first- and last-mile activities, distance, condition uncertainty, and compliance
- Secondary data analysis + industry examples + digital tools
- *Work in progress*

5. Ethics and liability

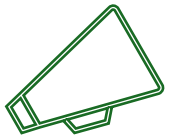
- Ethical assessment
- Analysis of relevant regulation regarding ethics and data protection
- Specification of legal cases
- *Work in progress*

Funded by
the European Union

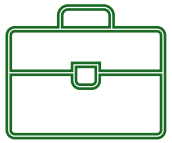
Other important horizontal activities



Standardization and transferability → engaged with 3 Technical Committees (ISO/TC 44, ISO/TC 261, ISO/TC 323)



D&C, clustering → complete dissemination package for main results, 12 newsletters, TTRAC cluster



Business planning → facilitating 19 Key Exploitable Results, Business Plans for each of the 3 demo cases, sustainability analysis for the marketplace



Training → 6 new courses, 1 workshop

Funded by
the European Union

Check our webpage and social media

Webpage

r3-mydas.eu

(full videos available under Documents/Videos)

LinkedIn

/company/r3-mydas/

Funded by the European Union

Any Questions?

Thank you!

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union. Neither the European Union nor the granting authority can be held responsible for them.