# Horizon Europe COGNIMAN

## COGNitive Industries for smart MANufacturing

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develops and pilots a concept of “**Digital Cognitive Industry for Smart Manufacturing**” to facilitate flexible, resilient, reconfigurable, safe, sustainable and efficient manufacturing processes.

Goal: flexible and efficient manufacturing towards zero waste and high-quality products

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# In a nutshell

11€ Million

16 partners

7 countries

4 pilots

2023 - 2026

HE – HORIZON-CL4-2021-TWIN-TRANSITION-01-01 AI-enhanced robotics systems for smart manufacturing

Coordinator – NORCE Norwegian Research Centre AS

# Pilots

| Description | Partner organisation | Location |
|---|---|---|
| Waste-free glass fibre production | 3B | Norway |
| Cost-effective additive manufacturing of medical implants | CROOM MEDICAL | Ireland |
| Precision machining – deburring of large metal parts | GOIMEK | Spain |
| Flexible manufacturing – digital library for batches | ABS | Italy |

# Waste-free glass fibre production

**Challenge**

- Fibre breaks during production stopping the entire process
- Part of the glass fibre is thrown away as it is unusable
- Difficult to predict breaks

**COGNIMAN solutions**

- Advanced sensors to identify breaks before they happen
- Operators can act instantly
- Minimise waste and manufacturing downtime

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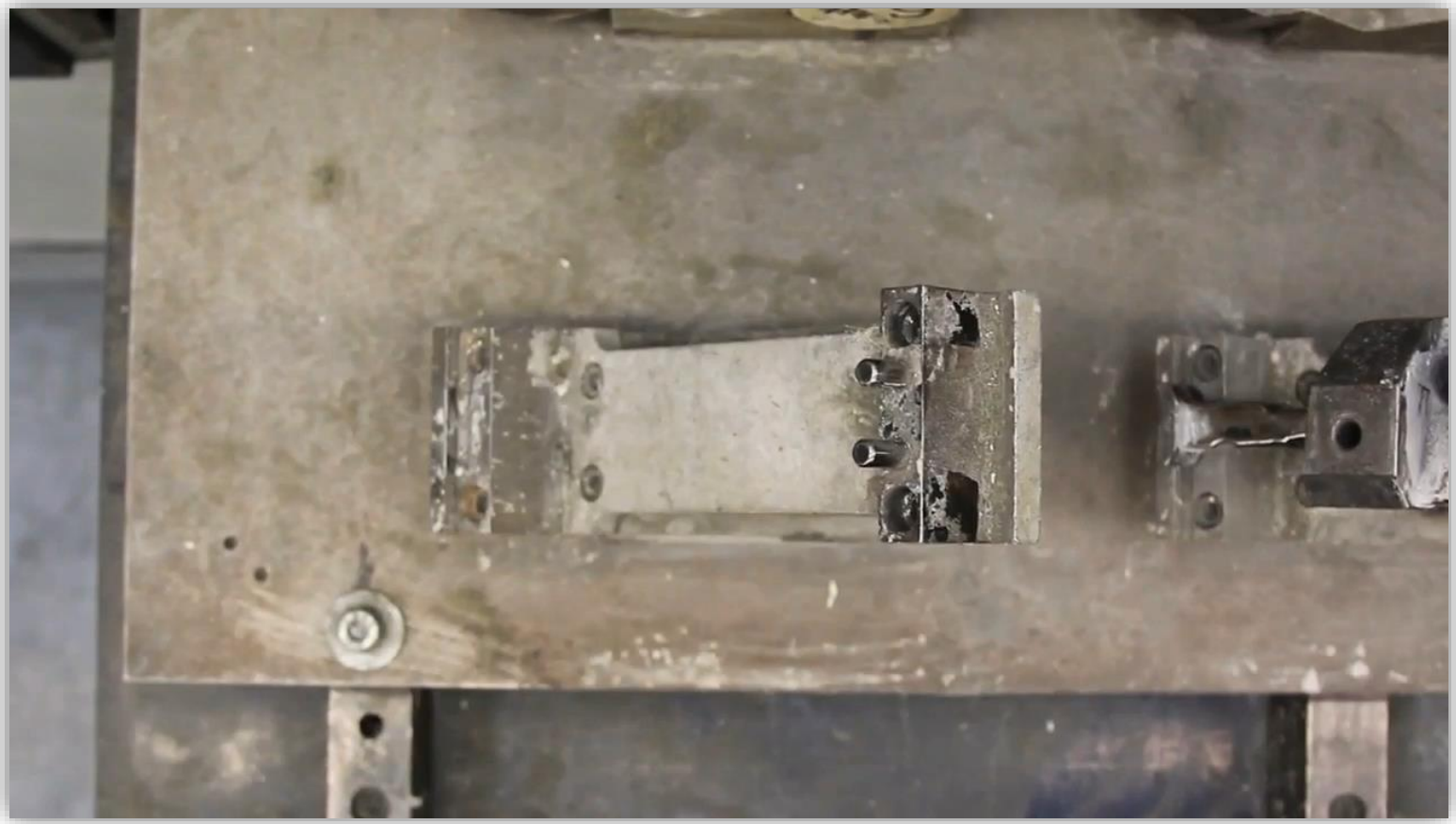
# Cost-effective additive manufacturing of medical implants



**Challenge**

- Repetitive and labour-intensive post-processing
- Unfavourable working conditions
- Difficult to interpret large datasets

**COGNIMAN solutions**

- Robots for post-processing (ie., support removal, polishing, inspecti on)
- Operator collaboration with the robotic system
- Digital twin for AM process

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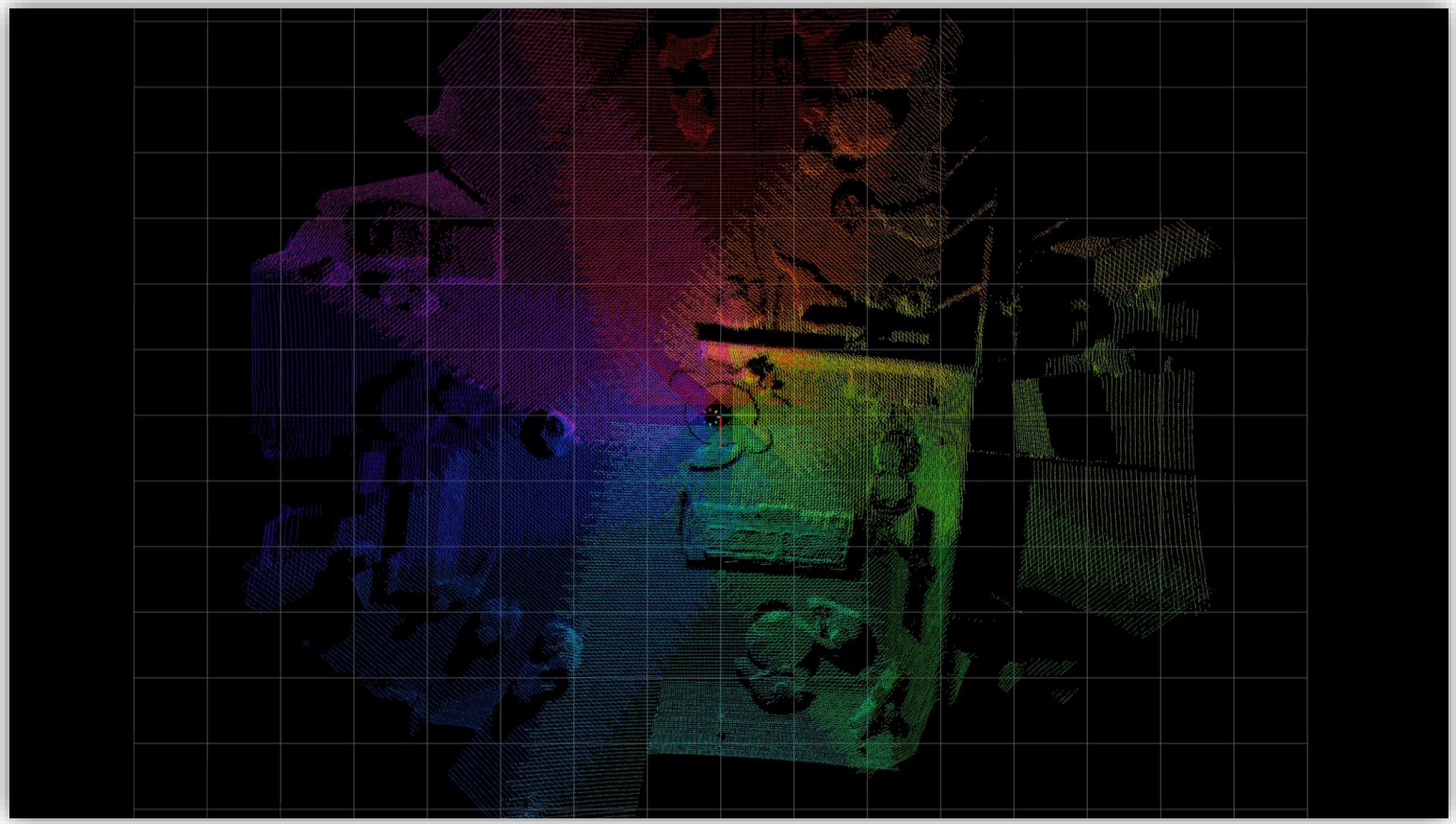
# Precision machining – deburring of large metal parts



**Challenge**

- Repetitive and labour-intensive process
- Unfavourable working conditions

**COGNIMAN solutions**

- Comprehensive understanding of the environment
- Cognitive robots for deburring that can handle large parts
- Connected to a Digital twin for AI training

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# Flexible manufacturing – digital library for batches

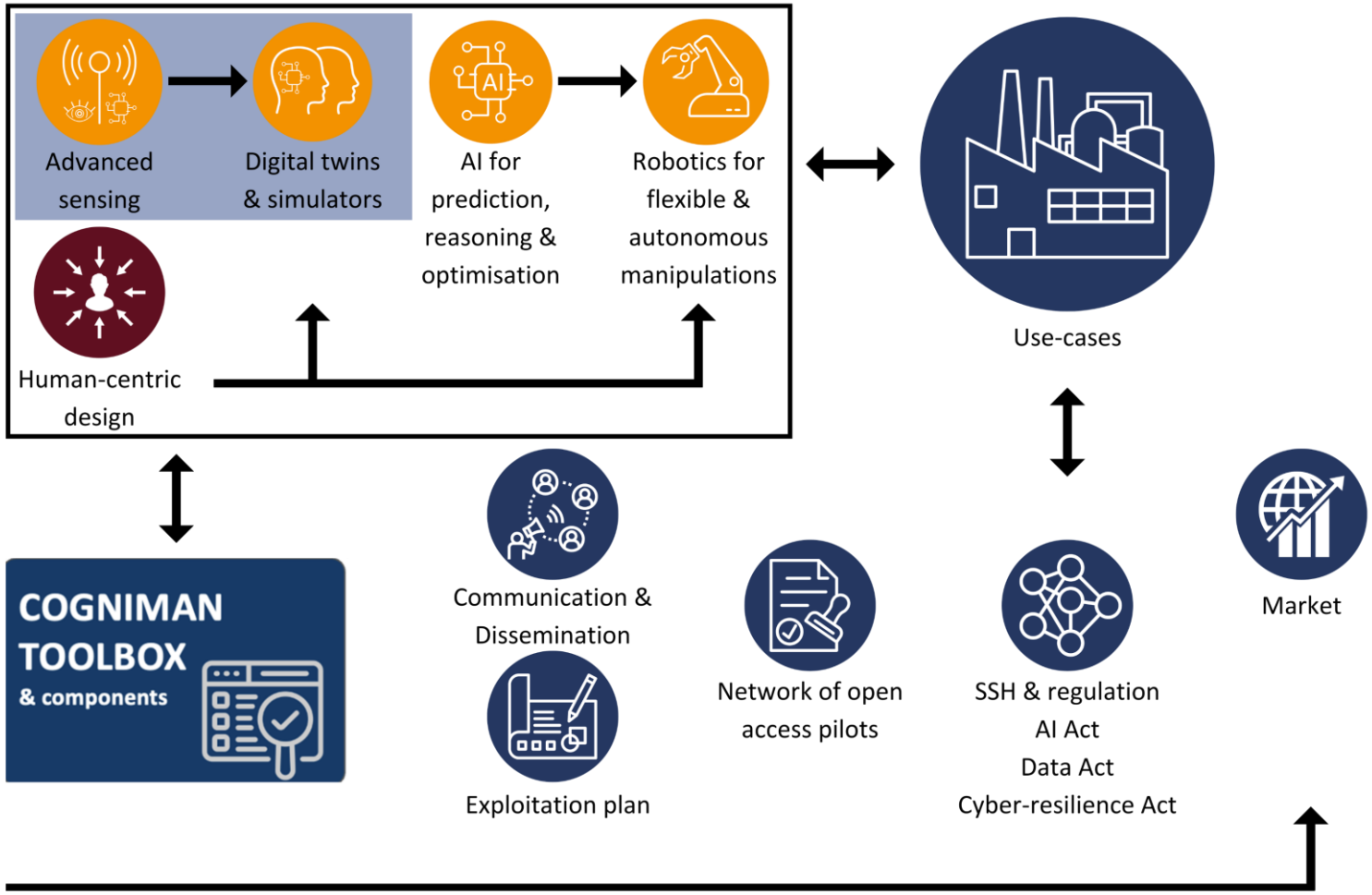
**Challenge**

- Difficult inventory in outdoor areas
- RFID not suitable due to metal content in the parts

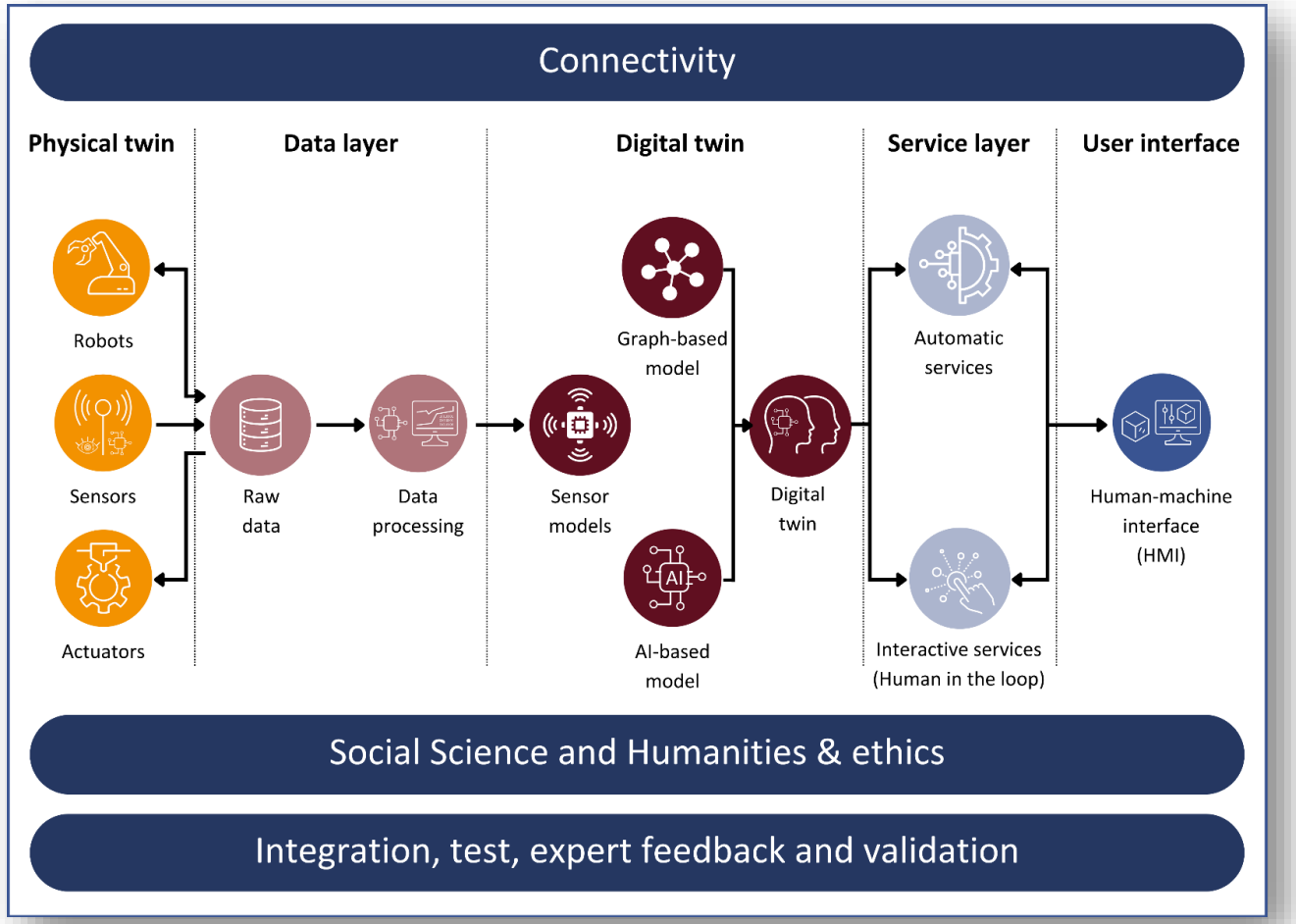
**COGNIMAN solutions**

- Drones to identify the products
- System revealing the location of the products in real-time

# COGNIMAN enabling technologies



# COGNIMAN architecture




- Aims at improving manufacturing processes through advanced technology integration and sustainability in Industry 5.0

# COGNIMAN consortium


1 NORCE
2 SINTEF
3 3B
4 EYDE CLUSTER
5 IBM
6 CROOM MEDICAL
7 3B
8 EIT Manufacturing
9 montimage
10 IRT JULES VERNE MANUFACTURING THE FUTURE
11 ita
12 IDEKO MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE
13 GOIMEK
14 ALDAKIN
15 deepblue
16 ABS

# Gaps and future challenges

## Generalise the COGNIMAN toolbox

Additional sensors, models, DTs...

## Further human-robot collaboration

Autonomous behaviour prediction

## Wide adoption of the developed technologies

Minimise learning curve and boost acceptability

## Compliance with and adaptation of applicable regulations

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# Thank you!

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