



[www.star-ai.eu](http://www.star-ai.eu)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°956573

# **STAR COLLABORATION WITH AI4EU PLATFORM**

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# STAR PROJECT OVERVIEW

- Start date: 1 January 2021
- End date: 31 December 2023
- Overall budget € 5 999 253,75



Project Coordinator





# BACKGROUND & MOTIVATION

- AI systems in industrial plants must be safe, trusted and secure
- They must comply with emerging regulations (e.g., EP Proposal for an AI Regulation)
- Challenges:
  - Inaccuracy and Unreliability of Industrial Data
  - New Opportunities for AI (Cyber)Security Attacks
  - Transparency and Explainability
  - Slow and Hazardous Interactions between AI Systems and Manufacturing Environments
  - Human Centric AI Systems & Humans-Robots Collaboration
  - Risk-based Classification and Regulatory compliance



## STAR'S VISION

Reference Project and Catalyst for Trusted and Human Centric AI in Manufacturing addressing Security, Safety and Human-Robot Collaboration

Implement and Demonstrate the transition to Industry 5.0 in terms of Human Centric Manufacturing & Robot Collaboration

# STAR PERFORMS WORLD-CLASS CUTTING-EDGE EDGE AI RESEARCH

## Explainable AI

Why did you do this?: Explain to Factory Workers the AI systems operation – Increase transparency & trust

## Active Learning

Robot-to-Human: Is this piece defected? Query human when not sure and accelerate Knowledge Acquisition for AI

## Simulated Reality

Shorten Reinforcement Learning Cycle through Simulation – Useful for Safety

## Human Centric Digital Twins

What-if-Analysis with the Human in Loop

## Safety Zones Detection

Optimal Deployment of Automated Mobile Robots

## (Cyber)Security for AI Systems

Protection of AI Systems against Adversarial Attacks

### STAR: ENABLING SAFE, SECURE & ETHICAL AI IN MANUFACTURING



Explainable & Transparent AI Systems



Active Learning & Simulated Reality for Human-AI Collaboration



Virtualized Digital Innovation Hub for Safe & Secure AI in Manufacturing



Cyber Security Solutions for AI Systems in Manufacturing



Human-Centric Simulations for Safe AI in Manufacturing

### EXPECTED IMPACT

INCREASED INTELLIGENCE & FLEXIBILITY OF PRODUCTION LINES

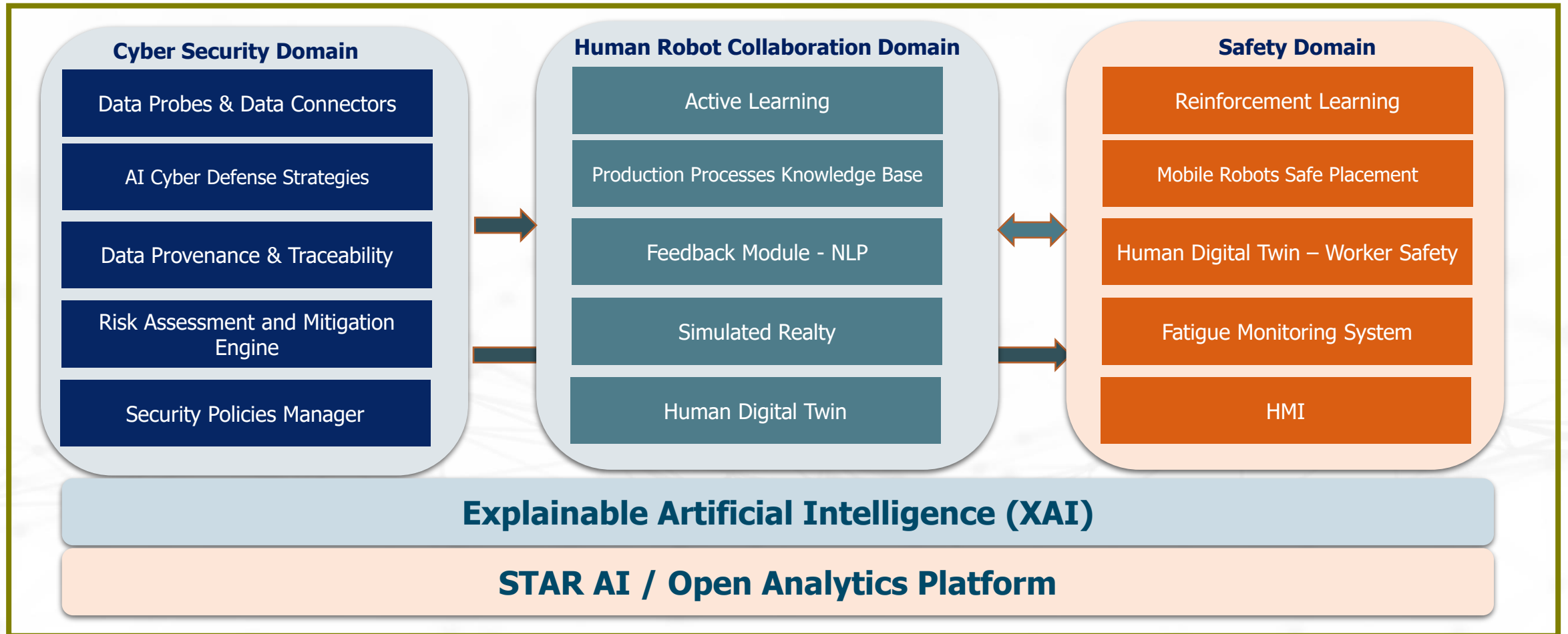
SAFE HUMAN-ROBOT COLLABORATION AT SCALE

FASTER UPTAKE OF AI SOLUTIONS (QUALITY4.0, CO-BOTS)

ETHICAL IMPACT IN MANUFACTURING IN-LINE WITH HLEG RECOMMENDATIONS

RESEARCH (E.G., SIMULATED REALITY, ACTIVE LEARNING, EXPLAINABLE AI) PLACING EU AT FOREFRONT OF GLOBAL AI R&D

# HIGH-LEVEL REFERENCE ARCHITECTURE MODEL (3 DOMAINS)



# STAR AI OUTCOMES (AI4EU INTEGRATION CANDIDATES)

## Supervised Machine Learning Models for AI Cyber-defence

- Notably Deep Learning

## Machine Learning Pipelines for Manufacturing

- Supporting Various Use Cases

## Reinforcement Learning Systems

- Mobile Robots
- Simulated Reality

## Active Learning

- Human Robot Collaboration

## Explainable AI (XAI) Models

- Various Models for Manufacturing Use Cases (e.g., SHAP, LIME variants)



# STAR & AI4EU COLLABORATION

## AI4EU Catalogue

- STAR would like to make available AI Models & Pipelines in the Catalogue

## AI4EU Experiments

- STAR could contribute manufacturing experiments over AI4EU Platform & Tools

## AI4EU Manufacturing Vertical

- Natural AI4EU Space for Interacting with STAR

# EXPECTATIONS FROM THE STAR & AI4EU COLLABORATION

## Integration & Linking of AI Assets (Priority: \*\*\*)

- STAR contributing AI Assets to AI4EU
- E.g., Machine Learning, Deep Learning, Reinforcement Learning, XAI, ...

## Integration & Linking of AI Use Cases (Priority: \*\*)

- End to-End pipelines
- Experiments

## Integration and Linking of Training Assets (Priority: \*\*)

- STAR mainly accessing training assets
- STAR can contribute training (e.g., how-to tutorials) on its assets

## Integration and Linking of General Information (Priority: \*)

- News, Newsletters, Cluster (ICT-38) Information etc.

# OTHER ICT-38 PROJECTS: THE AI-MAN CLUSTER

AI-PROFICIENT

ASSISTANT

COALA

Knowledge

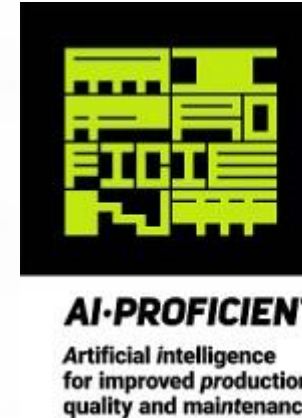
MAS4AI

STAR

Teaming.AI

XMANAI

EU-Japan.AI



knowlEdge

EU-Japan.AI



teaming.ai



MAS4AI

# AI-MAN CLUSTER: AREAS OF COLLABORATION

Explainable AI in Manufacturing

Human Robot Collaboration

Use Cases of AI in Manufacturing

Human Factors & AI in Manufacturing

Training of Human Workers on AI - Operator 4.0 Training

Ethical & Legal Aspects of AI in Manufacturing/Industry

AI Interoperability and Multi-Agent Systems

Open source platforms for AI pipelines in manufacturing

Trustworthy AI



# QUESTIONS

## How to integrate STAR AI Assets in AI4EU?

- Acumos? Documentation? Tutorial? SSO?
- What do we need to know?
- What are the technical requirements (e.g. Platform, languages etc.)

## What is the AI4EU Contact Person for STAR?

## What are the next steps?

- Next Meetings?



# STAR & ICT-38 CLUSTERS MARKETPLACES

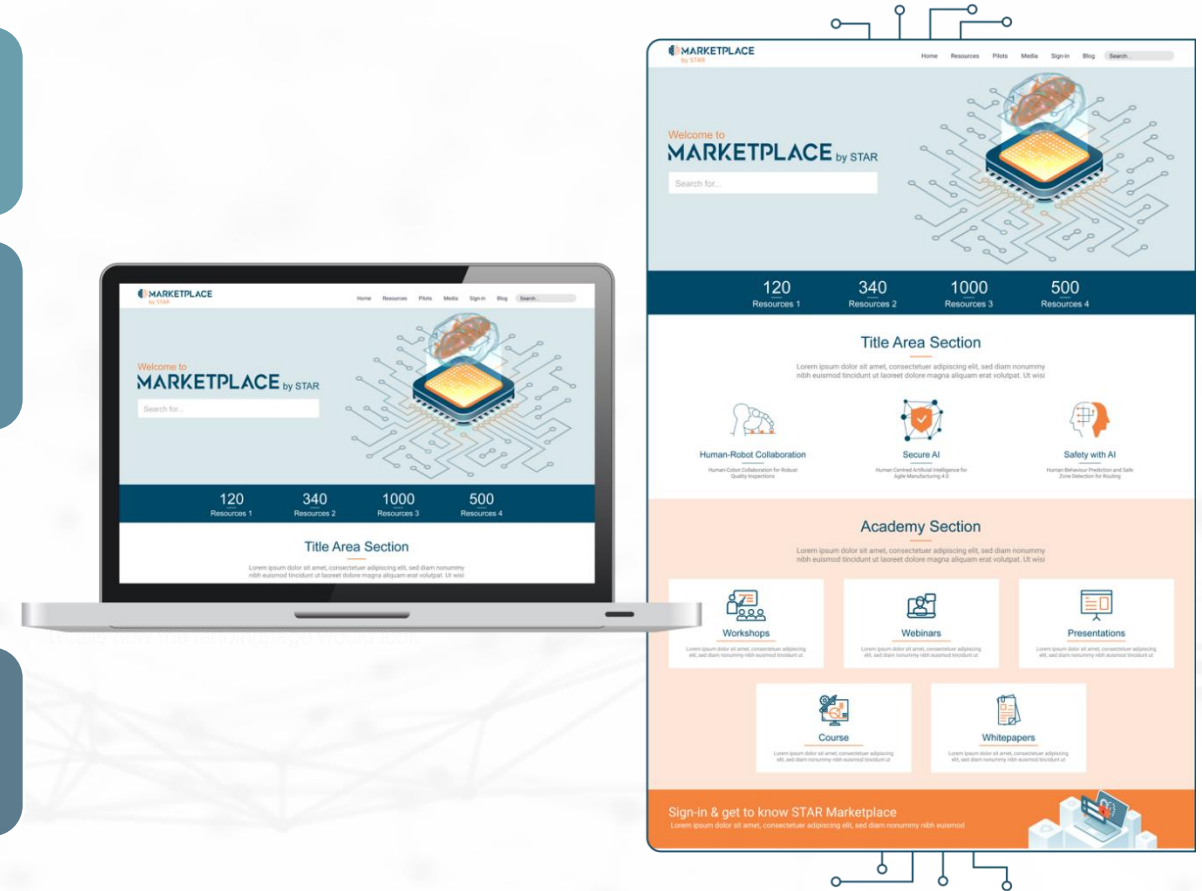
Synergies with AI4EU

Critical Mass of Assets

- AI Assets
- Training Resources

Linking & Cross Marketing

- Community Building



# THANK YOU FOR YOUR ATTENTION

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