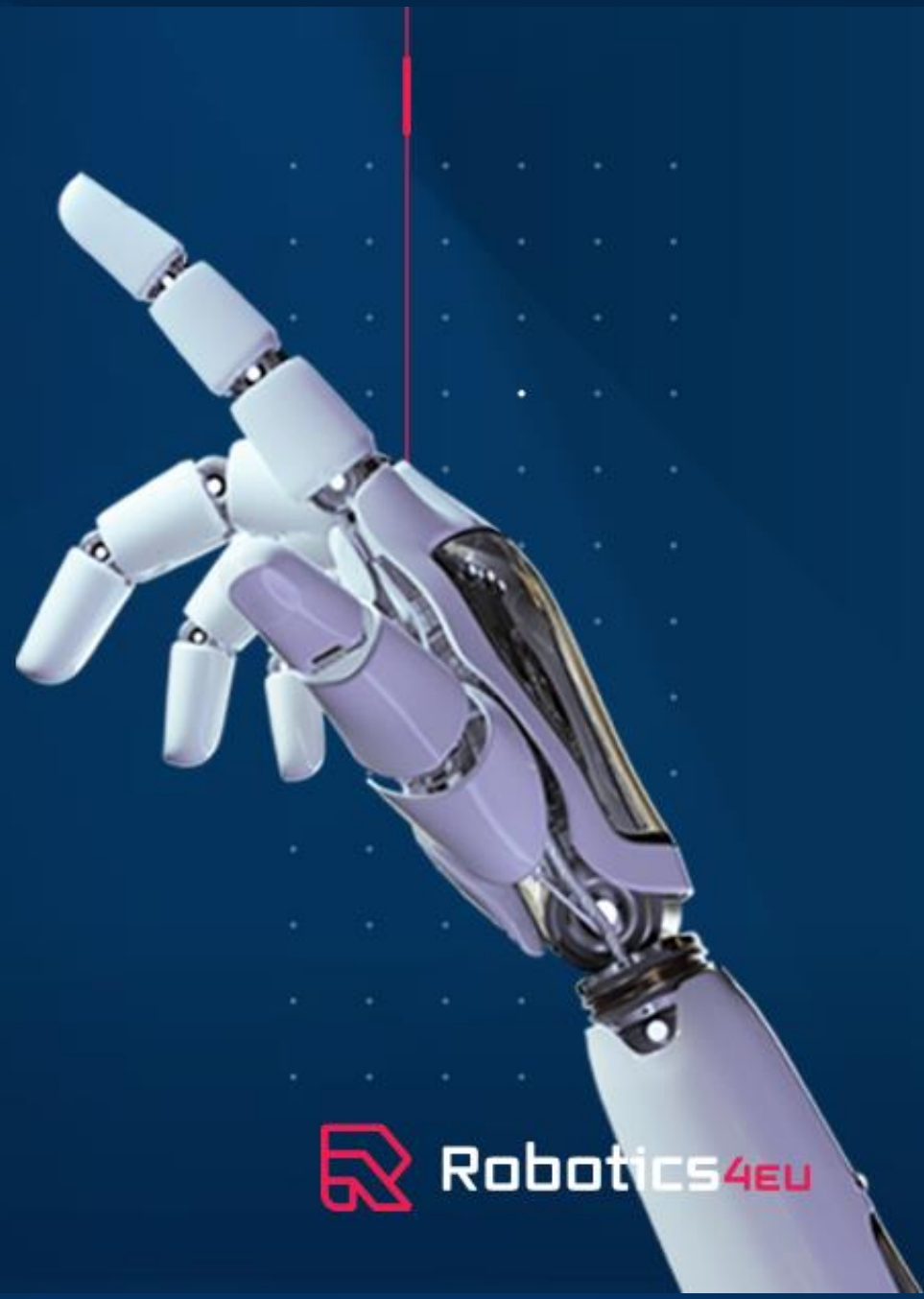
Robotics with and for Society

Boosting Widespread Adoption of Robotics in Europe



www.robotics4eu.eu

Robotics4EU

Adra-e - ADR CONFERENCE

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Coordinator of Robotics4EU project

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Robotics4EU
Boosting Wider Adoption of Robotics in Europe

Who we are?

Robotics 4 EU is composed by **7 organisations from 6 EU countries** representing expertise in robotics in four application areas of the project and non-technological aspects of robotics.

The consortium brings together multiple stakeholders from both public and private sector.

The specific activities under the project will create the best complementary cooperation possible, by creating collaboration with the civil society and robotics community and strengthening robotics ecosystem capacities.

Teamwork

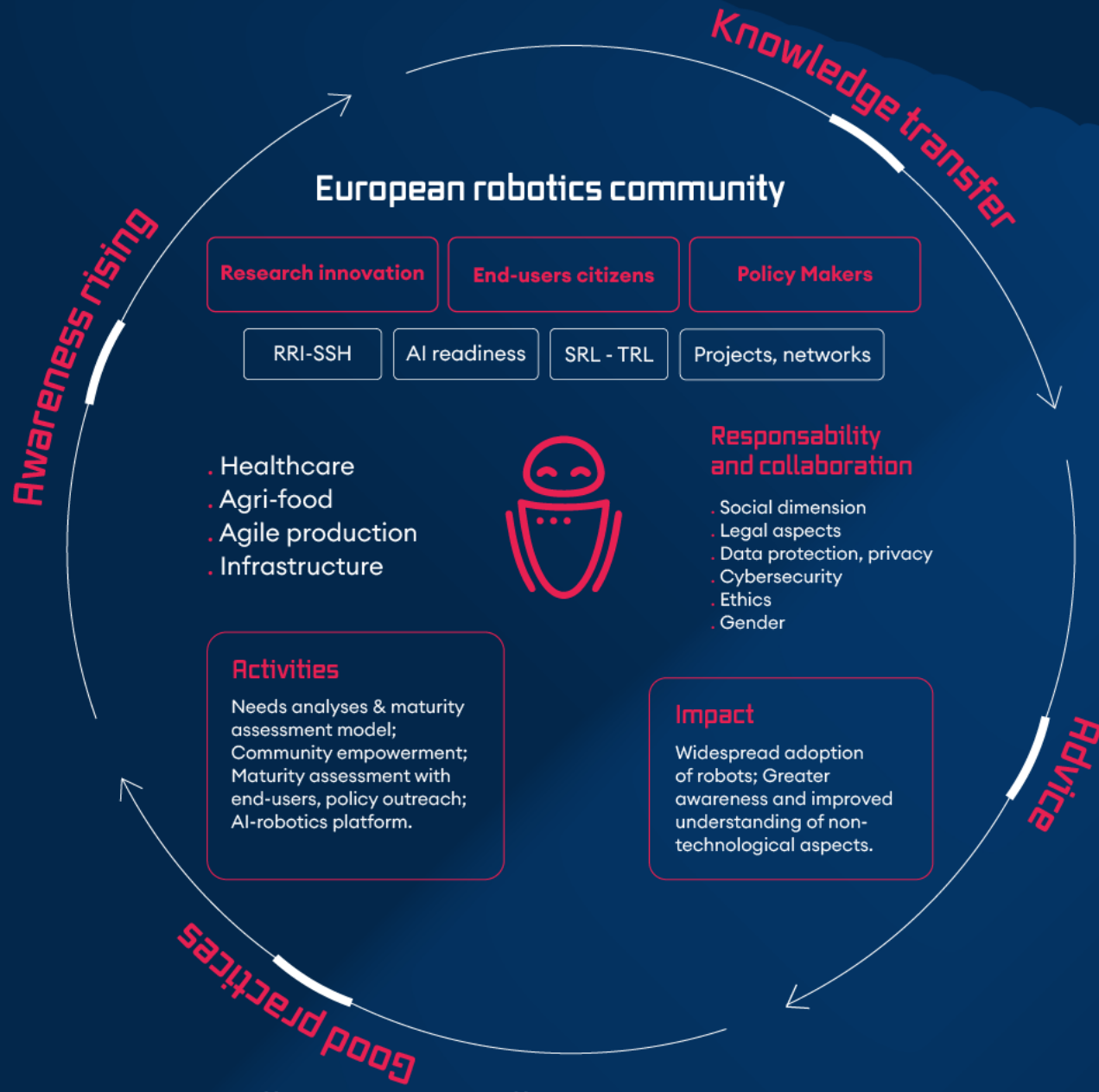

Robotics4EU
Boosting
Wider
Robotics
agri-food
healthcare
EUROPEAN ROBOTICS FORUM
ERF2022
ROTTERDAM
28-30 JUNE
eu ROBOTICS
UNIVERSITY OF TWENTE.
Responsible robotics
maturity assessment model

Project Overview

Aim:

to ensure more widespread adoption and societal acceptance of (AI based) robotics by implementing the principles of responsible robotics

To create and empower the responsible robotics community by raising awareness, organizing events and developing a tools to measure the maturity and societal impact of robots



robotics ethical, legal and social issues

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Core principles

- Integration of technological and societal readiness concepts
- Responsible research and innovation (RRI)

✓ SSH engagement, gender diversity, ethics, end-users engagement)

- Responsible robotics and AI readiness
- Synergies with other robotics and responsible ICT projects and initiatives

Goal 1. UNDERSTAND.

- Robotics community analyses;
- Policymakers consultation;
- Citizen consultation;
- Good practices of other projects;
- Societal Readiness Plan;
- Responsible robotics advocacy report.

Goal 2. COLLABORATE AND CO-CREATE.

Capacity Building
21 events about ethical, legal and socioeconomical aspects as well as data protection and cybersecurity.

Co-creation
4 co-creation workshops between companies and users to test robotics ideas.

Visibility of Robotics Solutions
Virtual itinerant exhibition - interaction with robots

Goal 3. EVALUATE.

- Responsible robotics maturity assessment model;
- A practical tool for the robotics developers and helps them to strategically plan and the uptake of the legal, societal and ethical aspects of robotics.

RESULTS STARTING FROM JANUARY 2021

Societal Readiness Levels concept for developing and assessing robots

Societal Readiness Plan in Robotics4EU

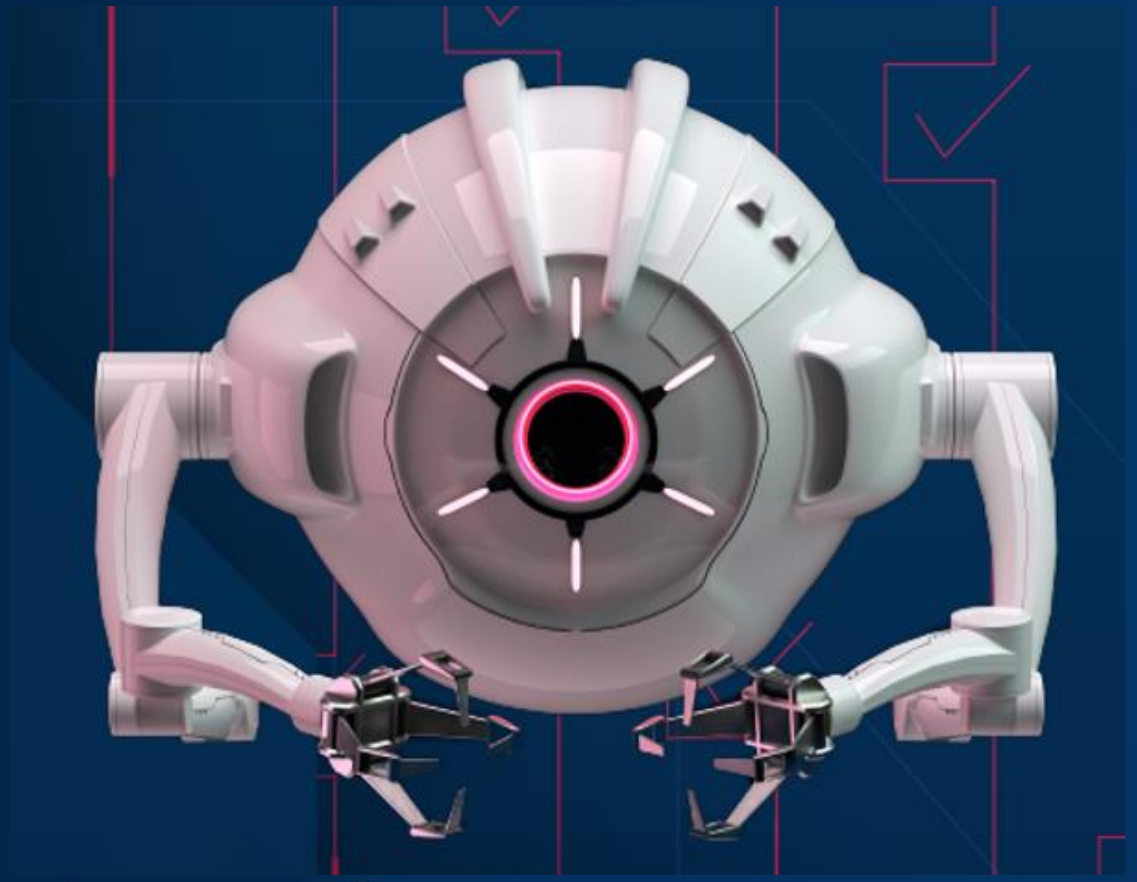
One of the first activities of the Robotics4EU project was to develop a Societal Readiness Plan. This helped us think critically about the broad concept of Societal Readiness Levels as they relate to robots in our four sectors. Robotics4EU will explore how the SRL scale can work in practice and advise robot makers about how specifically they can use it to improve their products, and thus, society as a whole. This is important because, although the concept of SRL is becoming more widespread, there still isn't an agreed upon methodology to measure it.

Survey among the robotics community

1232 responses from robotics community, policymakers and citizens

60 interviews held

50 projects engaged



Projects involved to the needs analyses

// Healthcare

DIH-HERO	FAROS	TRACEBOT
LIFEBOTS	ARS	SENSAGAIN
EWARE	MAGNIFY	NEUHEART
PROST	SMARTSURG	OPENDR

// Inspection and maintenance of infrastructure

RIMA	DRAPEBOT	AERIAL-CORE
CURSOR	HARMONY	PILOTING
BADGER	SHERLOCK	

// Agri-food

AGROBOFOOD	COROSECT	ICT-AGRI-FOOD
SMARTAGRIHUBS	FLEXIGROBOTS	NEFERTITI
GROW	ROBS4CROPS	S3 HIGH TECH
GREEN PATROL	IOF2020	FARMING
FITOSTINGER	BACCHUS	EURAKNOS
CANOPIES	OPENDR	

// Agile production

TRINITY	SCALABLE 4.0	OPENDR
DIH²	ACROBA	SOPHIA
I4MS	SESAME	FLEXROP
GROWBOT	SHERLOCK	
PROBOSCIS	RECONCYCLE	

// Community

HUBIT	SIENNA	INBOTS

// Human-Robot Collaboration

CYBERSPEED	SEED	ROBOTS
REFILLS	PREDICTIVE	REELER

Robotics community readiness and robots' acceptability

- **Fear of technological unemployment**
- **Safety and security** at the workplace as well as responsibility and accountability issues
- **Data issues are not proactively addressed** (no tools developed, but important for drone-related solutions)
- **Industrial robots performing specific tasks are widely accepted** but robots that interact with their environments – **intelligent robots** – are generally not considered technologically ready for wide-spread implementation
- **Performance of the technology** is important: *what is the use of having a robot if it is nothing but a toy?*
  - "Technological advance", "better sensitivity to environment", "proven efficiency", "more than a demonstrator" were commonly mentioned keywords
- The **acceptance of intelligent robots is expected to happen „naturally"** as they become more commonly used

Cooperation between policymakers and robotics community

- Collaboration between the policymakers and the robotics community is limited due to the **lack of communication** and technical knowledge possessed by the policymakers

- Shortcomings were identified regarding providing **objective information about the available robotics solutions** and their capabilities

- Solutions offered:
  - make information transparent and available to all the stakeholders
  - establish systematic cooperation models
  - In overall means of progress are **education and clear governance** and **additional certification procedures**

Citizen consultations

GlobalSay

A global consultation about robotics on the wishes and concerns of 700 citizens

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Key Takeaways

- The consultation focused on getting insights into what citizens think about the non-technological issues regarding robotics, the potential benefits and risks, and which barriers there might be to the wide adoption of robotics in society.

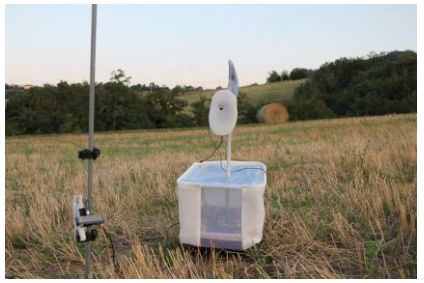
- The Derivable 4.1 identify citizens wishes and concerns related to robotics:
  - Most participants had a positive attitude towards robots.
  - The biggest worries concerned military and defense robotics, robotics in healthcare, and robotics with a high level of Artificial Intelligence (AI).
  - **Fear of unemployment** due to technological advancement is one of the major barriers amongst citizens.
  - Citizens considered **accountability** to be the most important ethical issue when developing responsible robotics.
  - Citizens had a wish for additional **regulation** within the area of robotics. Particularly, they pointed to international governments and institutions (like the EU) to take responsibility for this regulation.

Denmark

South Korea

Business ideas validation

- **https://www.robotics4eu.eu/surveys/**



16 workshops with 810 participants organized

Webinar Recording

Takeaways from the healthcare workshops

Robots in healthcare, especially if AI-based, seen as new members of society that need to be integrated and to behave trustable. This could be due to their direct and indirect involvement in the care of the vulnerable (as well as their presence in physical places where that care is practiced).

- The main concerns were:
  - The robots' capacity for **empathy**;
  - The robots' **behavioral predictability** (e.g., reaction to emergency, vulnerability to hacking);
  - The robots' potential for **discriminating** against particular groups (also as a consequence of the skewed demographics of creators & programmers);

  - The **role of robots**: workers who should have rights and pay taxes, or tools for slave labor? It was pointed out that both views open up the danger of new inequalities:
  - The robot-worker may be a competitor to human workers (leading to skill depreciation and loss of autonomy);
  - The robot-tool may become a luxury item.

Takeaways from the agri-food workshops (1)

- Main issue topics identified in the workshops are:
  - Technological unemployment;
  - Trust;
  - Liability and accountability;
  - Standardization and regulation.

- People are aware of the non-technological issues in robotics; however, they still identify that more communication on the topic should be taking place with an intentional focus on non-technological issues;

- The community-building attempts have proven to be demanded, as participants have used the platform of the workshops to connect and establish further engagement opportunities.

Takeaways from the agri-food workshops (2)

- Socio-economic and educational challenges.
- Lack of financing, lack of knowledge and talents, lack of trust in robotics solutions – the technology effectiveness and data security issues, but also a lack of information and knowledge sharing.

Issue area	Challenges
Socio-economic challenges	Investment attraction, the lack of trust in robotics, restructuring of the workforce, acceptance, monopolisation of the sector due to the uneven adoption of technology and high barrier of entry.
Ethical challenges	The robots replacing the humans (decreased job availability and human labour appreciation); Data sharing issues; the responsibility for robot actions.
Legal challenges	The law legislations delay, Licences for data sharing and handling, Lack of safety legislations for robotics, lack of clarity in regulations,
Data management	Data security, data storage issues, data mistakes
Educational and Engagement processes	The lack of talent and specialists; Lack of information and educational programs, lack of interest in agricultural education in general.

Takeaways from the inspection and maintenance workshops (1)

- Main issue topics identified in the workshops are:
  - Technological unemployment;
  - Trust;
  - Liability and accountability;
  - Standardization and regulation.

- People are aware of the non-technological issues in robotics; however, they still identify that more communication on the topic should be taking place with an intentional focus on non-technological issues;

- The community-building attempts have proven to be demanded, as participants have used the platform of the workshops to connect and establish further engagement opportunities.

Takeaways from the inspection and maintenance workshops (2)

Issue area	Challenges
Socio-economic challenges	Changes in labour structure and fear of unemployment, user acceptance, costs of installing robots, trust in the robot
Ethical challenges	Responsibility and liability issues, privacy issues, bias and prejudice, impacting dignity of human workers, gender equality, social stratification
Legal challenges	Standardisation issues, safety, liability and accountability, lack of regulation
Data management	Privacy, surveillance issues, cyber security, data management and interpretation, encryption, certification procedures
Educational and Engagement processes	Lack of training in robotics for inspection, lack of awareness, lack of communication with the general public, inequality of access, lack of collaboration between industry and educational institutes, lack of success stories.

Responsible Robotics Maturity Assessment Model

WHAT IT IS?

- A self-explanatory list of **checkpoints to assess the** societal maturity of a robot
- It comes with instructions for performing the assessment and scoring

HOW TO USE?

- Meant for **self-assessment** by the robot designer by using the checkpoints and guidance provided
- Reference for **third-party auditing**

Community platform with project results

3...2...1 Take-off!
Robospot just launched

Build your network

Discover and add upcoming Events

Check and upload Resources

Collaborate on projects

COLLABORATION

Expert Group advising the project on citizen consultations and maturity assessment model

Cecilie Campbell, ALV Møre og Romsdal, Norway

Mirta Michilli, Fondazione Mondo Digitale, Italy

Maja Hadziselimovic, euRobotics/SKAN AG, Bosnia and Herzegovina

Diane Whitehouse, EHTEL, Belgium

Ericka Johnson, Linköping University, Sweden

Federico Manzi, Catholic University of Milan, Italy

Francisco Javier Perez, CATEC, Spain

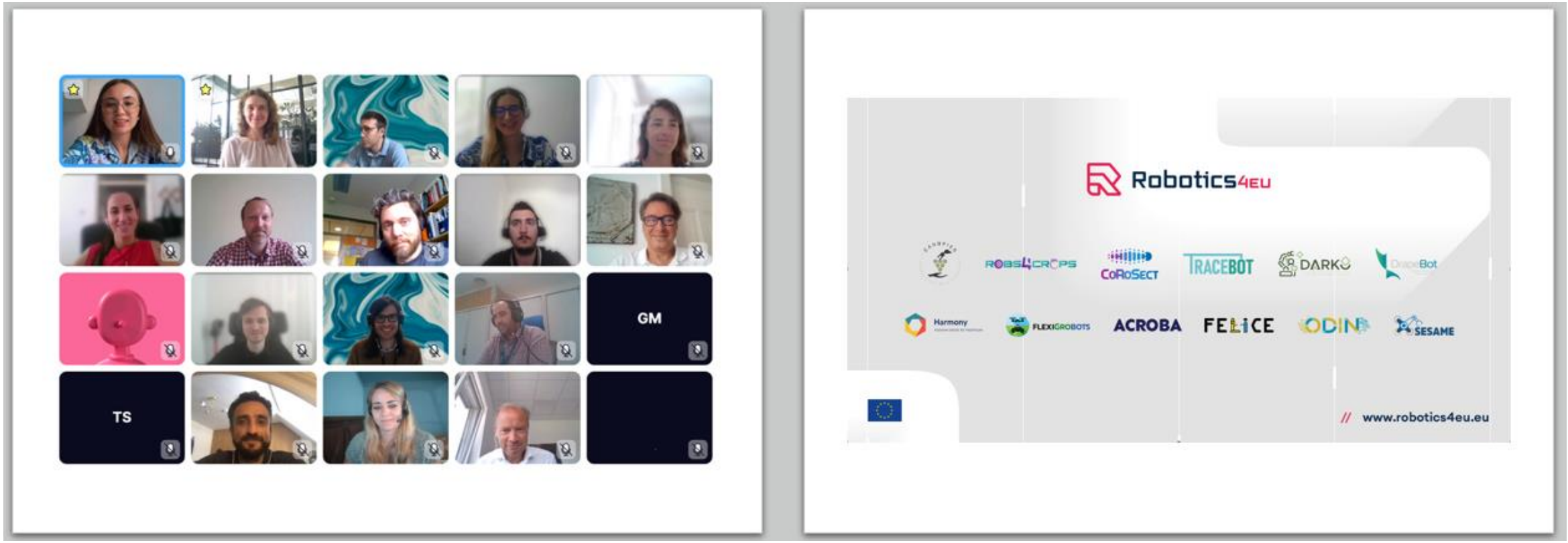
Egil Petter Stræte, Ruralis, Norway

Ott Velsberg, Government Chief Data Officer of Estonia

Morten Lind, Danish Technical University, Denmark

Roberto V.Zicari, Z-Inspection, Germany

ICT-46-2020 projects network



Memorandum of Understanding signed between the TechEthos cluster partners

NEXT ACTIVITIES

WHAT COMES AS NEXT?

- Robotics Maturity Assessment Model finalization (WP1)
- R4EU platform and collaboration with AI4Europe (WP2)
- Agile production workshops (WP3)
- Online citizen consultations and companies testing robotics ideas with citizens (WP4)
- Policy recommendations and input to standardization (WP4)
- Virtual Exhibition finalization (WP5)
- Collaboration with ADRA-e and euRobotics Socially Intelligent Robots and Societal Applications Topic Group (WP5)
- Expert Group workshop (WP6)

thank you

consortium

CIVITTA

robotex International

LOBA®

LABORATOIRE NATIONAL DE MÉTROLOGIE ET D'ESSAIS LNE

Fonden TEKNOLOGIRÅDET

AgriFood DIH Lithuania

NTNU Norwegian University of Science and Technology

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