Deliverable 6.4

Second Responsible Robotics Expert Group Meeting

D6.2

First Responsible Robotics Expert Group Meeting

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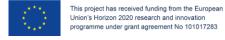| VERSION	DATE	REVIEWER

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1. Executive Summary

The Robotics4EU projects Expert Group includes 14-members, 4 of which were added in 2023. It consists of representatives from previously funded EU projects, the robotics industry, citizens, and policy/decision-makers in robotics. The group has had two formal meetings during the duration of the project. One digital meeting on the 20. December 2021 and one physical meeting 13. March 2023. This Deliverable reports on the second of these meetings. It first describes the Expert Group members, secondly the topics that were discussed during the 2nd Expert Group meeting and concluding with key takeaways for the project.

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2. Robotics4EU Expert Group Members

The Robotics4EU Expert group consists of 14 experts in different areas of robotics. It is gender-balanced—with seven women and seven men, with members across European regions. The 14 Expert Group members are:

Cecilie Campbell, Manager of Center for Learning about Welfare Technology, ALV is a network organization owned by several municipalities and NTNU Ålesund
Country: Norway
Sector: Healthcare
Constituency: Public employees, policymakers

Cecilie Campbell works for the local government through a network organization located in the Ålesund municipality in Norway, where she is responsible for investigating, developing, and implementing Welfare Technology—technology that can help support the health, welfare, and social inclusion of older adults—including in long-term care facilities operated by the municipality.

Maja Hadziselimovic, Automation Engineer, SKAN AG
Country: Switzerland
Sector: Agile production
Constituency: Robotics community
Maja Hadziselimovic is an Automation Engineer at SKAN AG, which produces isolators, cleanroom devices, and decontamination processes for the biopharmaceutical industry. She was previously the national coordinator in Bosnia and Herzegovina for the European Robotics Week that featured public events highlighting the importance of robotics, also a member of the Board of Directors of euRobotics.

Ericka Jonson, Professor, Department of Thematic Studies, Linköping University
Country: Sweden
Sector: Healthcare
Constituency: Academia
Ericka Johnson is a Science and Technology and Medical Sociology scholar. Her research concerns how humans relate to technology, especially in healthcare settings, and how medical technology involves patients reconceptualizing human bodies and genders.

Morten Lind, Professor Emeritus, Department of Electrical Engineering— Automation and Control, <u>Danish Technical University</u>
Country: Denmark
Sector: General industrial settings
Constituency: Academia, industrial research
Morten Lind is a Professor Emeritus at the Danish Technical University and is associated with KAIROS TECHNOLOGY as a principal specialist. His research interests include automation design, supervisory control of complex industrial systems and infrastructures, functional modeling and application of agent technology, and knowledge-based systems in automation.

Federico Manzi, (from January 1, 2022) Researcher in Developmental and Educational Psychology, <u>Università Cattolica del Sacro Cuore</u>
Country: Italy
Sector: Developmental and Educational Psychology, Human-Robot Interaction
Constituency: Academia
Federico Manzi studies developmental and educational psychology in relation to technology, in particular to social robotics. His main research topic is the study of the Theory of Mind and psychological dynamics in human-robot interactions from a lifespan perspective.

Mirta Michilli, General Director, <u>Fondazione Mondo Digitale</u>
Country: Italy
Sector: General AI and robotics
Constituency: Citizen advocacy organization
Mirta Michilli is the Co-Founder and General Director of Fondazione Mondo Digitale, a non-profit organization founded by the City of Rome, the Lazio Region, and six major ITC companies in 2001. FMD promotes social and digital inclusion through innovative public education initiatives partnering with schools, companies, non-profit organizations, and local, regional, and national authorities.

Egil Petter Stræte, Senior Researcher, Ruralis - <u>Institute for Rural and Regional Studies</u>
Country: Norway
Sector: Agri-food
Constituency: Academia
Egil Petter Stræte is an agricultural economist with expertise in researching food-related restructuring and organization of innovation in firms and organizations; structural changes and power in food supply chains; rural development; and agricultural advisory service. His work has concentrated mainly on the food sector and agriculture, with a particular emphasis on the dairy sector.

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Ott Velsberg, Government Chief Data Officer, [Estonian Ministry of Economic Affairs and Communications](#)
Country: Estonia
Sector: General AI and robotics
Constituency: Policymaker
Ott Velsberg is the Chief Data Officer for the Estonian government. He oversees the strategic coordination of data science and data governance in Estonia, including domains like artificial intelligence and open data. He is also a Ph.D. researcher in the Department of Informatics at Umeå University. His research concentrates on the use of information systems in the public sector, with a special focus on the use of the Internet of Things (IoT).

Diane Whitehouse, Principal eHealth Policy Consultant, [European Health Telematics Association (EHTEL)](#)
Country: Belgium
Sector: Healthcare
Constituency: Multi-stakeholder
Diane Whitehouse is a Principal eHealth Policy Analyst at EHTEL. Her focus over time has been on the societal, organizational, ethical, and innovation aspects of digital health, eHealth, including telemedicine. Her career background has covered work in the European Commission's DG CNECT on ageing, disability, and health.

Francisco Javier Péres Grau, Head of Perception and AI, [Advanced Centre for Aerospace Technology, CATEC](#)
Country: Spain
Sector: Inspection and maintenance of Infrastructure
Constituency: Robotics community
Francisco Javier Pérez Grau works on projects related to avionics and unmanned aerial systems, especially those associated with computer vision, perception technologies, and autonomous systems.

Eduard Fosch-Villaronga, [Associate Professor and Director of Research at eLaw - Center for Law and Digital Technologies](#)
Country: The Netherlands
Sector: legal and regulatory aspects of robot and AI technologies
Constituency: Robotics community and governance
Dr. Eduard Fosch-Villaronga Ph.D. LL.M M.A. is Associate Professor and Director of Research at eLaw - Center for Law and Digital Technologies at Leiden University (NL). Eduard is an ERC Laureate and investigates the legal and regulatory aspects of robot and AI technologies.

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Scott Robbins, Research fellow at CASSIS, Universität Bonn and founding member of the Foundation for Responsible Robotics
Country: Germany
Sector: Artificial Intelligence Ethics, Meaningful Human Control, Ethics of Technology, Data Ethics
Constituency: Robotics community and governance
Dr. Robbins` research focuses on understanding what machine learning powered machines should and should not do in order to retain meaningful human control over them. He is skeptical of Artificial Intelligence as a grand solution to societal problems and argues that Artificial Intelligence should be boring. He has published in peer-reviewed journals such as AI & Society, Science and Engineering Ethics, and Minds and Machines.

Irina Shklovski, Professor of Communication and Computing at the University of Copenhagen
Country: Denmark
Sector: interdisciplinary, technology ethic, communication and Computing
Constituency: Robotics community
Dr. Irina Shklovski works across many disciplines, focusing on ethics in technology development, information privacy, social networks, and relational practices. Her projects address responsible technology design, data governance, online information disclosure, the use of self-tracking technologies, data leakage on mobile devices and the sense of powerlessness people experience in the face of massive personal data collection.

Monica Schofield, Director International Cooperation & EU Office bei Tutech Innovation GmbH
Country: Germany
Sector: International Cooperation and EU Funding system expert
Constituency: Robotics community
Monica Schofield currently heads the business area Consultancy and Competence Development and is Director International Cooperation. She is responsible for leading a team providing services for researchers at Hamburg University of Technology and external clients to help them make optimal use of the opportunities provided by European funding programmes for research, innovation and regional development.

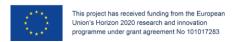# 3. Meeting overview and discussion points

○ 3.1 Participants & overview

The second Robotics4EU Expert group meeting took place on **March 13, 2023,** as physical meeting with attendance of 10 experts and 16 consortium members from XXX partner organizations, in total there were 26 participants for the meeting.

Expert group	Robotics4EU
1. **Federico Manzi**, Università Cattolica del Sacro Cuore	1. **Mette Simonsen**, DBT
Cecilie Campbell, Ålesund Kommune	2. **Anneli Roose**, CIVITTA
Egil Petter Stræte, Institute for Rural and Regional Studies	3. **Lucas de Bont**, CIVITTA
Ericka Johnson, Linköping University	4. **Anton Hvidtjørn**, DBT
Irina Shklovski, University of Copenhagen	5. **Ramona Dremljuga**, CIVITTA
6. **Monica Schofield**, Tutech Innovation GmbH	6. **Roger A. Søraa**, NTNU
7. **Scott Robbins**, Universität Bonn	7. **Yu Cheng**, NTNU
8. **Maja Hadziselimovic**, SKAN AG	8. **Joana Martinheira**, LOBA
9. **Eduard Fosch-Villaronga**, Leiden University	9. **Jovita Tautkeviciute,** CIVITTA
10. **Ott Velsberg**, Estonian Ministry of Economic Affairs and Communications	10. **Mark Kharas**, NTNU
	11. **Candela Bravo**, LOBA
	12. **Anne Kalouguine**, LNE
	13. **Naja Kilime**, DBT
	14. **Thomas Gitsoudis**, AgriFood Lithuania DIH (AFL)

Table 1 Participants of the Expert Group meeting

The following experts were unable to meet physically, but will be engaged in further advice and expertise on project deliverables:

Experts unable to attend
1. **Mirta Michilli**, Fondazione Mondo Digitale
2. **Morten Lind**, Professor Emeritus
3. **Francisco Javier Perez**, CATEC
4. **Diane Whitehouse**, EHTEL
5. **Anu Puusaag**, AIRE / Tehnopol

The meeting (agenda is in Appendix 1) was moderated by Roger A. Søraa (NTNU) & Ramona Dremljuga (CIVITTA) divided into three main parts.

- First, project coordinator Anneli Roose (Civitta) gave a detailed overview of the whole project with key insights this far, focusing on core principles and ho Robotics4EU will create and empower the EU-wide responsible robotics community representing robotics innovators from companies and academia in the four application areas, as well as citizens/ users and policy/ decision makers.
- Secondly, the consortium members were briefly introduced, and each Expert Member had three minutes to introduce themselves, their expertise and background.
- Thirdly, and for the main part, we focused on two key aspects of the project: the Maturity Assessment Model & the policy overviews. The project web platform was also discussed towards the end, but was given less priority as the experts had fewer comments on this than on the two main themes.

○ **3.2 Discussion on Maturity Assessment Model (MAM)**

3.2.1 Discussion with experts on the MAM

The discussion on the MAM was organised in the following way:
First, a general presentation of the process of development of the Maturity Assessment Model was given. We then tried to give some example requirements for each of the areas, slightly reformulating them for the purpose of the presentation. The requirements that were presented were the following:

Ethics:
- The robot communicates with the user about the reason why it made its decisions.
- Warn the user and the humans in the vicinity of the robot about the proper attitude to adopt for a totally safe interaction with the robot.
- Take into account possible limitations of the user and other humans (such as disabilities).
- Software is controlled for age, gender and minority bias - appropriate testing datasets.

Socio-Economics:
- The robot producer should be exemplary in the automation of their development process.
- The final user has control over the speed and frequency of the activities of the robot.
  Workers are not isolated by the robot workspace, possibility to work in teams to balance work well-being and productivity
- Regions with a large vacant workforce inside the same economic area are privileged for the manufacturing - employment opportunity to disadvantaged areas. Cost of transportation is taken into account

Data:
- Let user know what type of data is collected about him/her and his/her environment, both online and offline.
- The data susceptible to be shared with third parties is minimized and specified.
- Training covers cyber security issues

Legal:
- The robot designer is aware of regulations that apply to his/her robot (robot specific and sector specific).
- The robot and remote systems comply with the GDPR.
- Contribution to regulation - directly or through industrial association.

Education & Engagement:
- Use of open-source software when it does not impact security
- End-users are included in the design process
- Collaboration with a research laboratory in the early stages of development

This presentation sparked some discussion. We decided to organise the discussions table by table, with one topic to discuss at each table and a mediator from the project present at the table to take notes and answer questions. A Miro workspace was used to share the requirements with the experts and allow them to comment on each specific requirement.

Centre the human:
Several experts commented on the incorrect use of the term "stakeholder" in some requirements. We are changing the vocabulary to be more precise. However, as the group pointed out, it is not possible at the time of conception to identify all the people impacted by the system. There needs to be a careful formulation of accountability requirements, and perhaps a separation between identification of affected parties and liability identification.
The control of the user over the robot should be "meaningful" - this needs to be further developed.

Education and engagement:
Overall for all the requirements on this topic, the experts have requested more detail (how to score engagement in partnerships, use of open-source software, communication) and more precise definitions (what is a research institution, what is an end-user, etc). This feedback is being addressed in the reformulation of the topics, to have simple yes or no questions.

Legal:
The experts suggested that the requirements should include safety standards relevant to robotics. One of the experts shared an online tool that could be used for recommendations on applicable regulations:
https://www.safearoundrobots.com/toolkit/documentfinder

The group commented on GDPR: compliance is limited to personal data, if the robot is not gathering personal data it is not necessary to comply with GDPR.

Contribution to regulation may be increasing the risk of decentralization. Suggestion to use accessible Shared Data Repository.

Comments that could not be categorised:

One of the groups suggested that the risk assessment should be made public (similar to medicine side effects) and that there should be a checklist explaining why a particular robot is safe to the public. It was also recommended that there be an ombudsman office where citizens can complain, ask questions of follow up on a case.

Several experts raised a warning on that the aim of the model is not clear : who is going to make use of the MAM? Related to this, the general structure of the model was criticized as not being concrete and understandable enough. It was advised to narrow down and reorganize the whole model.

It was also suggested to divide the policies into mandatory, recommended and voluntary. However, we need to find whether this can be integrated with a tool such as the MAM, as the assessments are not currently mandatory. Similarly, some experts would prefer if the requirements were divided based on perspective: users, government, industry. This is an interesting perspective, but not simple to integrate in terms of structure. We are taking these suggestions into account in the way the questions are formulated.

3.2.2 Next steps & takeaways

The main takeaway from this expert consultation was constructive criticism on the purpose and the presentation of the MAM. This has led us to go back to more clearly define the end-users of the model and their motivations. We are also changing the structure of the tool in order to present the results in a more intuitive way.

The main actions being taken for the development of the MAM following the conclusion of this meetup are the following:

- Change the issue categories (in particular "ethics" and "education and engagement" as they do not represent easily understandable issues). We are also going to develop sub-categories in order to have more explainable scores.
- Change the structure of the tool to present results with more significance (the development is ongoing at the time of writing this report, but the risks and associated mitigation measures will be assessed separately in order to output a risk and a mitigation score in addition to the global assessment score. This will allow the user to have a better understanding of the reasons for this score.
- Implement some of the remarks in the "recommendations" part of the final tool.

These modifications are being currently implemented and will be complete before the next Expert Group Meetup. This next iteration will allow us to gather more feedback and fine-tune the changes.

○   3.3 Discussion on policy overview

The discussion on policy overview included two parts: general discussion with experts on their experience of providing recommendations or creating policy documents and a workshop on the non-technical aspects of robotics.

3.3.1 Discussion on experience in communicating and advocating for placing the non-technical aspects in the agendas for robotics
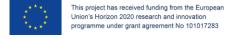- **Ott Velsberg** shared his experience in creating policies for data and AI in Estonia. He mentioned the following points:
  - From the experience of creating policies on a national level, recommendations should be actionable, measurable, implementable.
  - How to enforce non-technical aspects?
    - Non-binding white papers
    - Guidances published by national agencies.
    - Fostering transparency as a practical approach.
  - Barrier: companies, especially in small countries, do not have the finance and capacity to comply with the requirements.

- **Eduard Fosch** shared his work in **the [COVR project](#)**. His main point was regarding the regulation approach - to make data available and let policy makers know that the data is available for them to use.
- The whole group discussed the concept of **trust,** which is mentioned in the *EC Coordinated Plan on Artificial Intelligence 2021 Review.* Experts agreed that trust cannot be applied to technologies, and it can only be applied to organisations and people. Expectation for people to build trust in technologies assumes the leap of faith.

3.3.2.   Workshop   on   the   non-technical   barriers   and   recommendations
Based on the previous work of the project on identifying the non-technical barriers to robotics adoption, the expert group was asked to work on these barriers by prioritising them, commenting and suggesting the solutions to tackle them.

The 5 groups of issues were discussed by experts. Below are presented the main take-aways from each of the topics discussed.

SOCIO-ECONOMIC ISSUES

Digital divide, insufficient protection of workers' rights, raising skill gap and loss of worker autonomy were identified as the most important socio-economic issues. In summary, discussion on socio-economic issues focused on two dimensions broadly:
1. Impact of automation to workers:
   a. One of the key issues – digital divide. Adoption of robotics requires a new skill set. Rising skill gaps and skill depreciation becomes an important issue.
   b. Change in work conditions raises a question of what work is? The policies should be developed towards ensuring more rights for workers

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    c. The concept of "technological push" was deliberated in terms of worker rights, loss of autonomy and unemployment.

2. Impact of automation on economic policies:
    a. The fundamental problem is the uneven distribution of wealth in light of automation
    b. The income tax schemes need to be revised in terms of automation
    c. The work-day structure and compensation need to be adapted (6h work day)

EDUCATION AND ENGAGEMENT ISSUES

Education issues, lag in the development of the education sector and insufficient public engagement were identified as the most important barriers. In summary, the discussion revolved around the following questions / issues:

- With the forecasted scale of automation potential and application possibilities, the educational system is lagging in the development of the skills needed: starting from the elementary curriculum to the preparing researchers.
- General data literacy is needed to understand the risks and benefits of sharing the data
- Public engagement must be of high quality. There are plenty of resources on the engagement, but the structures and interdisciplinary methods are largely missing
  - Solution: bottom-up, social group-led conversations about Robots (Robotics4EU approach) was great method
- Question was raised on general public empowerment:
  - Should the public have the ability to choose the use of tech?
  - What is the general public?
- If a company increases transparency - to a body that can understand, not to the general public.
- Local level: open communication with general public in simple general understanding narrative
- Science education TV programs every week
- Require public articles on scientific papers, open lectures, practical academic placement—e.g. Academics working on an actual real-world problem.

LEGAL ISSUES

- Unclear and unharmonized regulations.
- Lack of legal rights awareness related to data and technology.
- Lack of global governance
- Lack of and lag in regulatory development were identified as the most important topics.
- In summary, the discussion revolved around the following questions / issues:
- The regulatory development must go hand in hand with the testing efforts of the robots:
  - Including exploration of regulatory landscape by developers early in the development.
  - Creating testing zones that include the focus on regulation, as well, as co-creation with end-users and regulatory evaluation.
    - Tools as MAM can be of use in this approach.

- The discussion on the legal issues territorial coverage must be clearly defined by feasibility of the scope of regulation:
  - The feasibility and desirability of global governance must be discussed.
  - Legal framework cannot be extraterritorial.
  - Instead of EU vs National regulation, focus on reducing the barriers.
- Harmonisation should happen as bottom-up approach (company level > national level).
- More projects on regulatory developments are needed, as well as more lawyers included into the development of robotics.
- Overregulation risks blocking innovation, while under regulating risks taking risks.
- People's legal rights must be emphasised.
- Recommendation to create forms of legal resources to support contestability and to provide formal structures for holding manufacturers and deployers of robots to accountable.
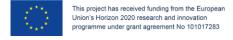
ETHICAL ISSUES

Lack of responsibility and accountability, cultural variations and infringements were discussed most extensively by the experts. The summary of the discussions:

- Cultural variations in human rights and ethical implications make a universal ethical stance impossible. "Our way" of doing human rights is very different in another country - there cannot be a universal approach or standard that considers the solutions 100% ethical.
- Human rights, gender inequality, minority groups, etc. All need to be considered in EVERY aspect of the development.
- Categories assume that design, production, and use are under the same regulatory area, which is not the case.
- Method is key in finding ethical issues, and it should be specific to the project's context. Ethical issues of one project are not the ethical issues of another project.
- Biggest issue is what is defined as ethics. See: MIT Ethical Review. All topics are too vague and too big to consider as barriers.
- The solution is to invite affected users and anticipate future issues through future-exercise.

DATA ISSUES

Surveillance issues, vulnerability of cyber physical systems and unbalanced power in data ownership were identified as the most important topics. in summary, the discussion revolved around the following questions / issues:
- It is meaningful to talk about data issues in the application context, i.e., healthcare, agri-culture, I&M. There are different issues within the different areas.
- Data control, stewardship, consent and contestability were discussed.
- Solutions:
  - General education about data can help us to solve all these issues
  - For EC: do not overregulate. Ensure that requirements can easily be implemented by EU companies and don't negatively impact their competitiveness

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017283

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- o Transparency and competence to consider this is of overall importance. Media and independent organisations (ombudsman) can do that.

3.3.3. Next steps & takeaways

The workshop on the barriers have provided the guidance on the further work for the policy recommendations. The main take-aways and directions can be summarised as follows:

- The categories of the identified barriers need revision, as some are too general, overlapping, or not focusing on the exact issues. The prioritisation and comments by experts provided the grounds for the further work in distilling the most important barriers
- The importance of the context (geographically/culturally and in terms of application domain / use) was mentioned in almost all discussion groups. The generalisation of the barriers does not allow to arrive at the actionable solutions. The application context is crucial to understand the problem.
- Identified barriers must be discussed in various levels:
  - By robot development and use stages: design, development, testing, manufacturing, adoption
  - By the end-user group: general public, specific context, vulnerable groups?

4. Summary & takeaways

The Robotics4EU project's held a physical Expert Group meeting held March 13, 2023, with 10 of 14 Expert Group members present. The members represents previously funded EU projects, the robotics industry, citizens, and policy/decision-makers in robotics. Firstly, the project coordinator, Anneli Roose, provided an overview of the project, while the consortium members briefly introduced themselves and their expertise, and then the meeting focused on two key aspects of the project: the Maturity Assessment Model (MAM) and policy overviews. These are two main outcomes that have been flagged by the project itself and by the commission.

For the policy recommendations, the experts provided guidance for further work on how to operationalize the project results into policy recommendations. The key takeaways were the need to revise identified barriers as some are too general and do not focus on specific issues, the importance of considering the context in terms of geography, culture, and application domain, and the need to discuss identified barriers by robot development and use stages as well as end-user groups. Prioritization and comments from experts will be used to distil the most important barriers further.

The experts discussed next steps for the project and identified areas that require further research or development, such as creating a well integrated web platform solution. This will be followed up by the project moving forward.

Appendix 1: Agenda

Time	Workshop schedule
From 6:30 am	Breakfast served at hotel
10:00–10:30	Welcome by PI Robotics4EU Anneli Roose (15min) & intro to Robotics4EU team (2min per partner)
10:30–11:00	Presentation of Expert Group members (3min each), Roger Søraa
11:00-11:30	Intro to Maturity Assessment Model (MAM), by Anne Kalouguine
11:30-11:45	Coffee break
11:45-13:00	Discussion of MAM, by Anne Kalouguine
13:00-14:00	Lunch
14:20-15:30	Policy implications, Jovita Tautkevičiūtė
15:30-15:45	Coffee break
15:45-16:45	Policy recommendations, Jovita Tautkevičiūtė
16:45-17	Discussion on web platform, Lucas de Bont
17:00	Meeting ends

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