REELER

POLICY RECOMMENDATIONS FOR RESPONSIBLE ROBOTICS

THE REELER PROJECT

Responsible Ethical Learning in Robotics

S&D

European Parliament

AARHUS UNIVERSITY

Ab.Acus

DE MONTFORT UNIVERSITY LEICESTER

UNIVERSITY OF HOHENHEIM 1818

"This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731726"

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Robots: Realism and Imaginaries!

Where is the voice of the actual users?

Where is the social dimension in technology development?

About REELER

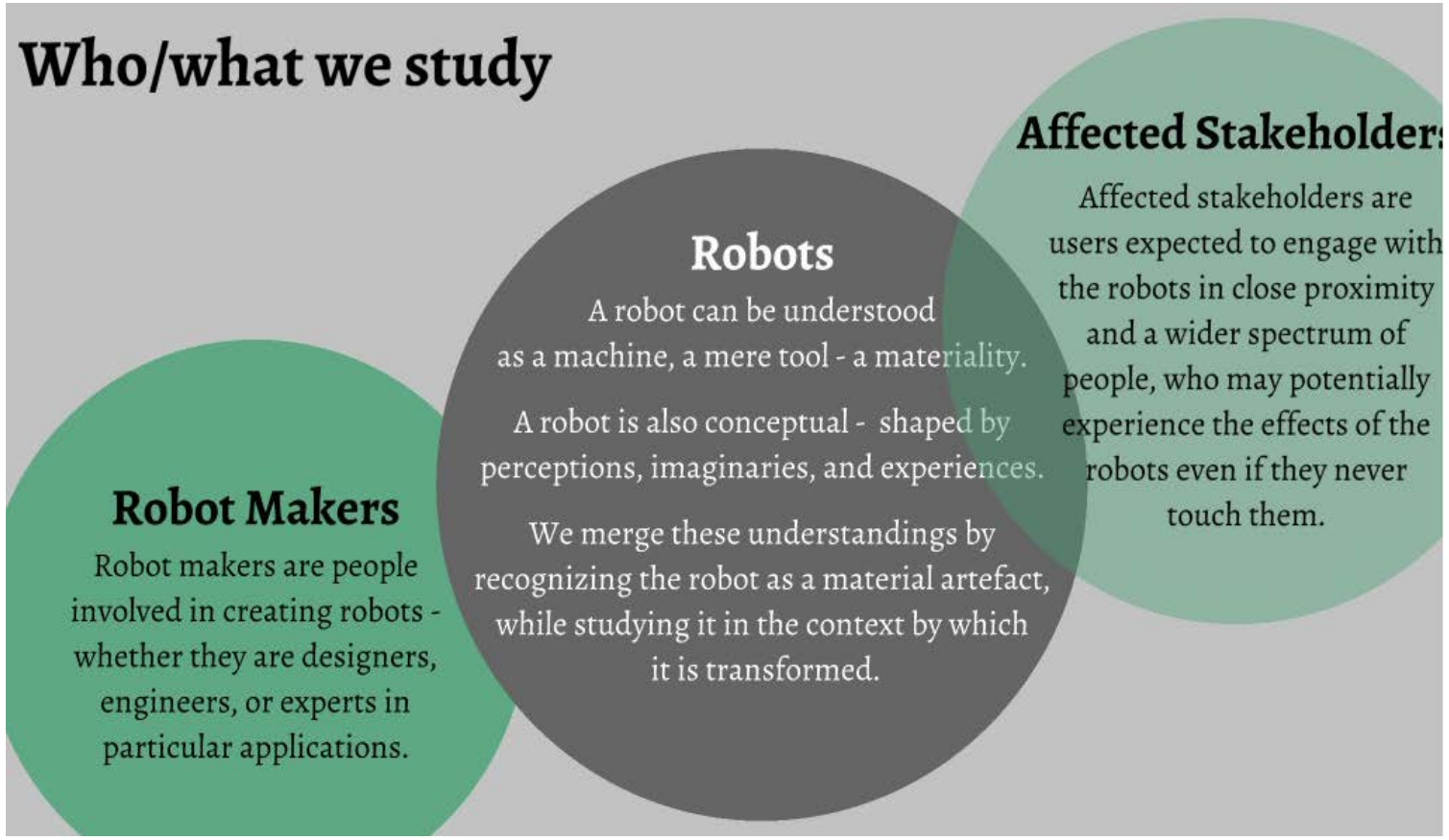
The REELER partners

Aarhus University: Coordinator & Prof. of Anthropology, Cathrine Hasse

Ab.Acus srl: Impact partner & R&D Director, Maria Bulgheroni

De Montfort University: Prof. of Ethics Kathleen Richardson

Hohenheim University: Prof. Of Innovation Economy, Andreas Pyka



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About REELER

Who/what we study

Robot Makers

Robot makers are people involved in creating robots - whether they are designers, engineers, or experts in particular applications.

Robots

A robot can be understood as a machine, a mere tool - a materiality.

A robot is also conceptual - shaped by perceptions, imaginaries, and experiences.

We merge these understandings by recognizing the robot as a material artefact, while studying it in the context by which it is transformed.

Affected Stakeholders

Affected stakeholders are users expected to engage with the robots in close proximity and a wider spectrum of people, who may potentially experience the effects of the robots even if they never touch them.

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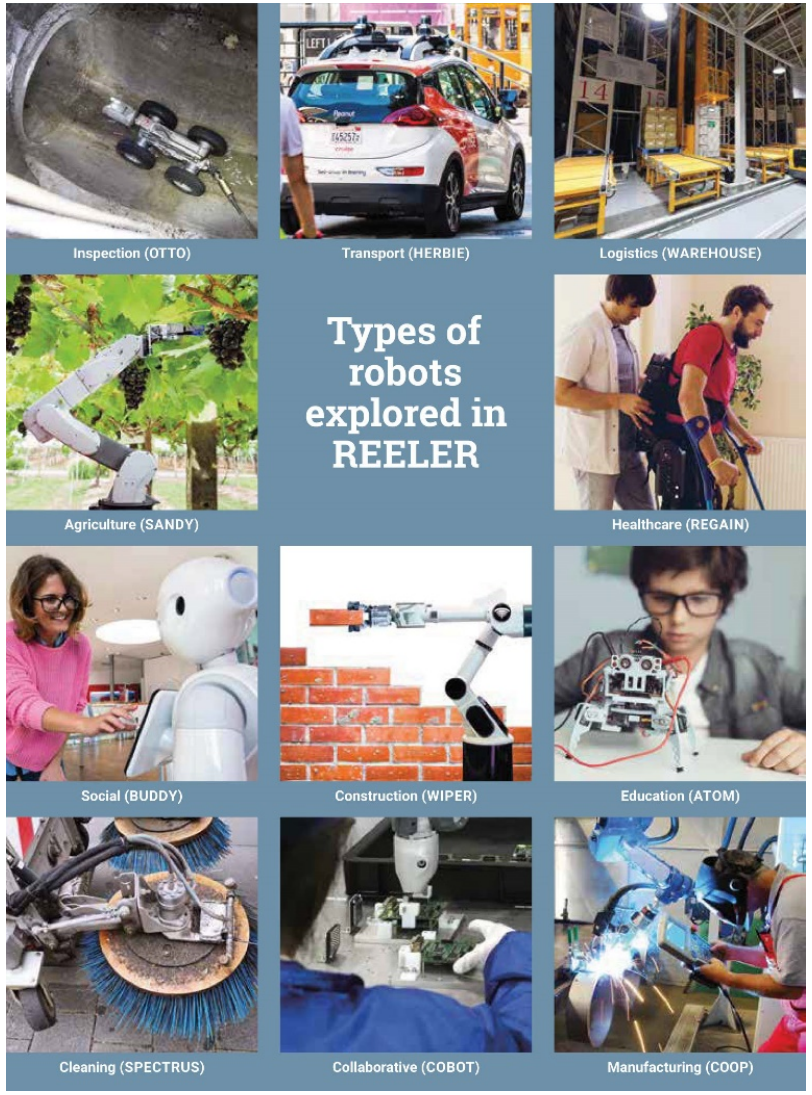
Innovative research in robotics

The first ethnographically lead research project in robotics and DG connect.

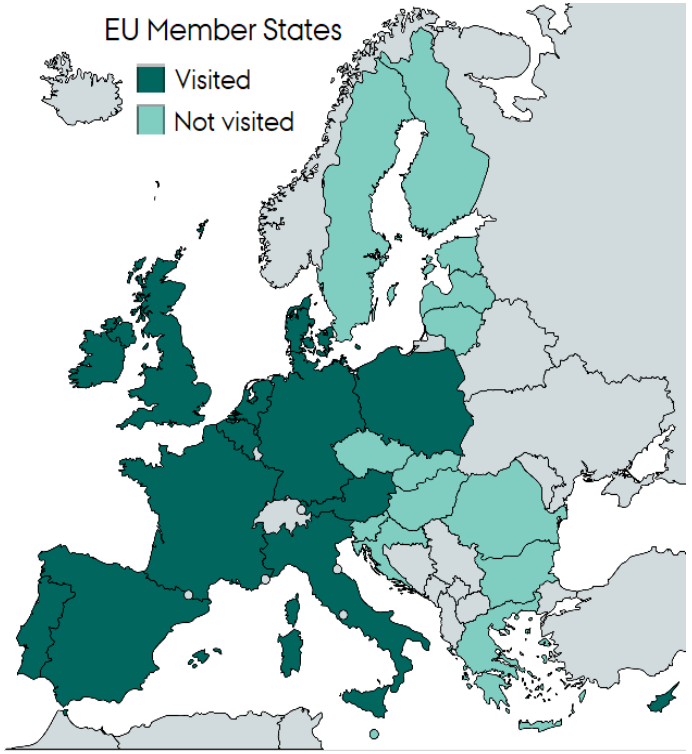
Highly intedisciplinary research involving
Anthropology
Innovation Economics
Engineering

This Social Science and Humanities approach offers new perspectives on robots!

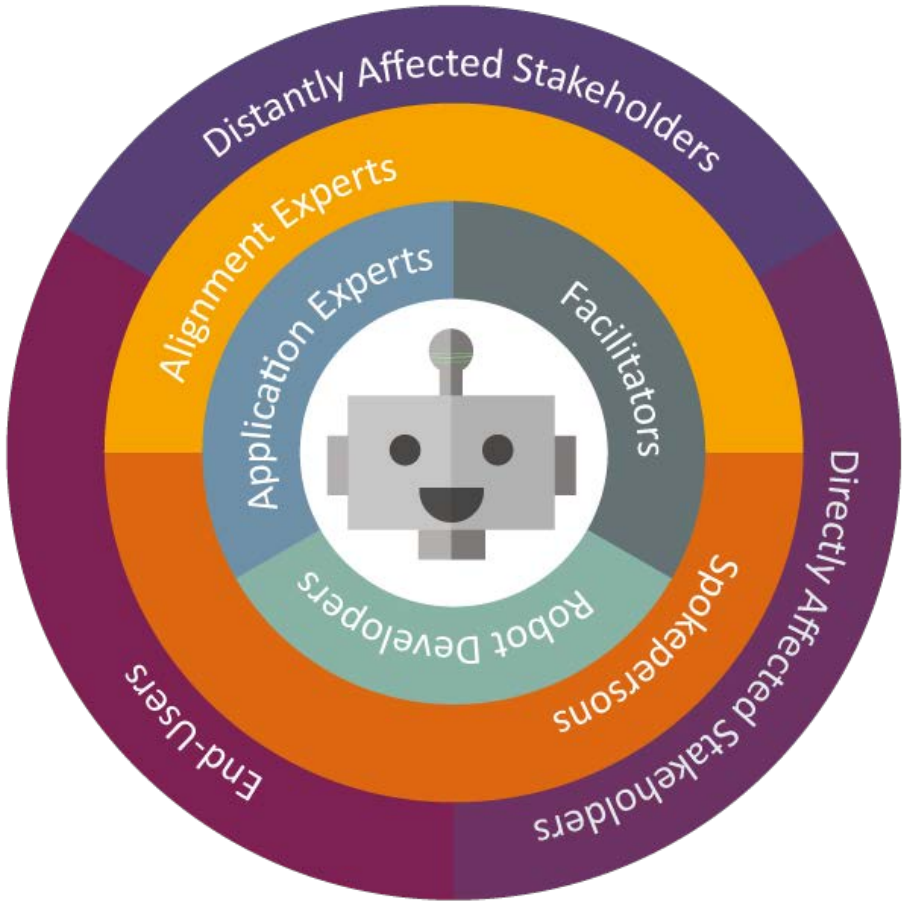
Multi-variation approach



- Multi-variation approach looking across 11 different types of robots.
- Interviewed 177 people across Europe.
- Focus on patterns across cases gives generic and relevant results for the development of robotics and AI.
- Today's healthcare examples represent patterns across all REELER cases.



Human Proximity Model



REELER has developed a Human Proximity Model (HPM) to explain the complexity and understand the gap between robot makers and affected stakeholders.

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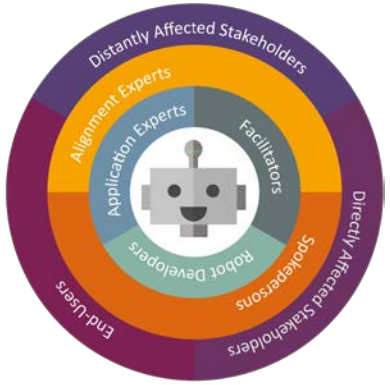
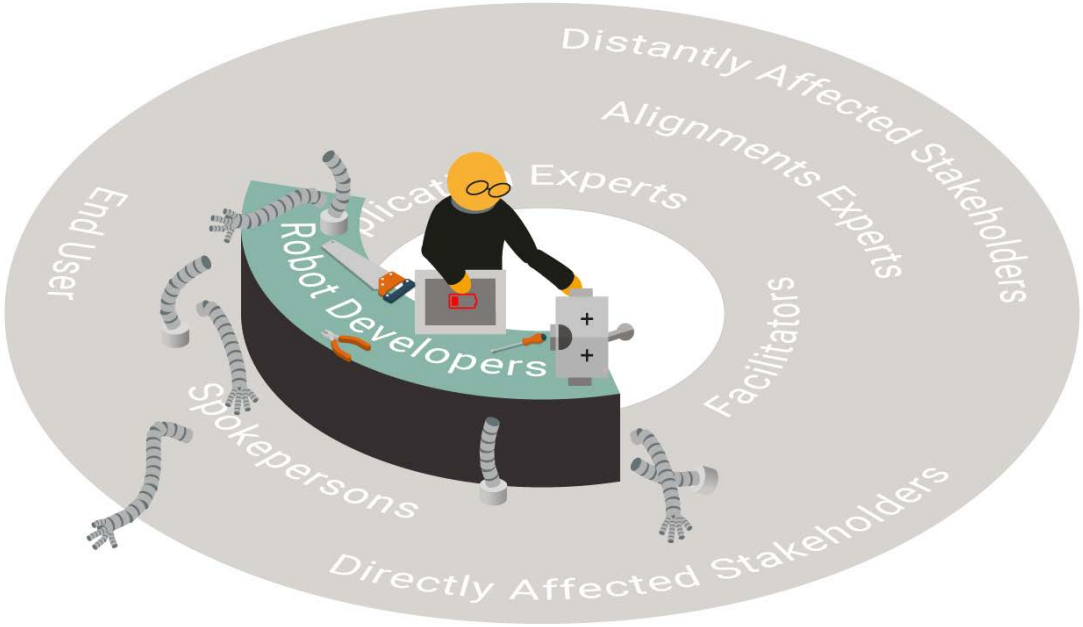


Robot developers

Robot Developers:

People with technical expertise, whose role is to develop robots in whole or in part.

- Mechanical engineers
- Computer scientists
- Industrial designers



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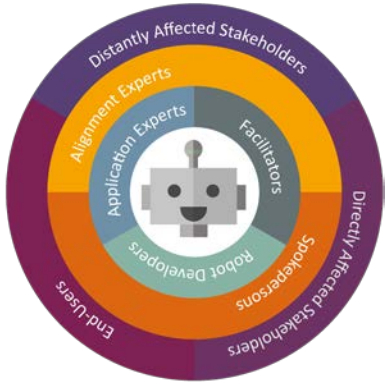
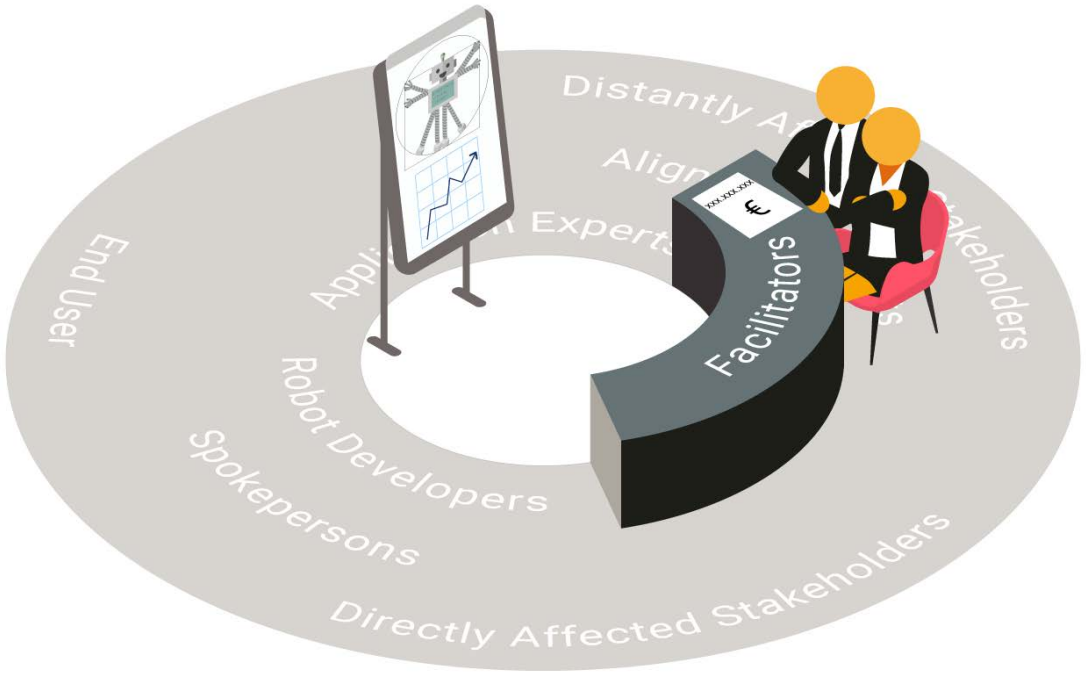


Facilitators

Facilitators:

Decision-makers who set the framework for development. This includes people with legal, regulatory, or bureaucratic expertise, and people who facilitate funding, access to market, or testing.

- Funding bodies
- Regulatory agencies
- Lawyers
- Marketing or public-relations



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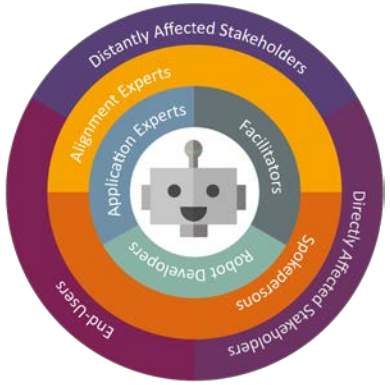
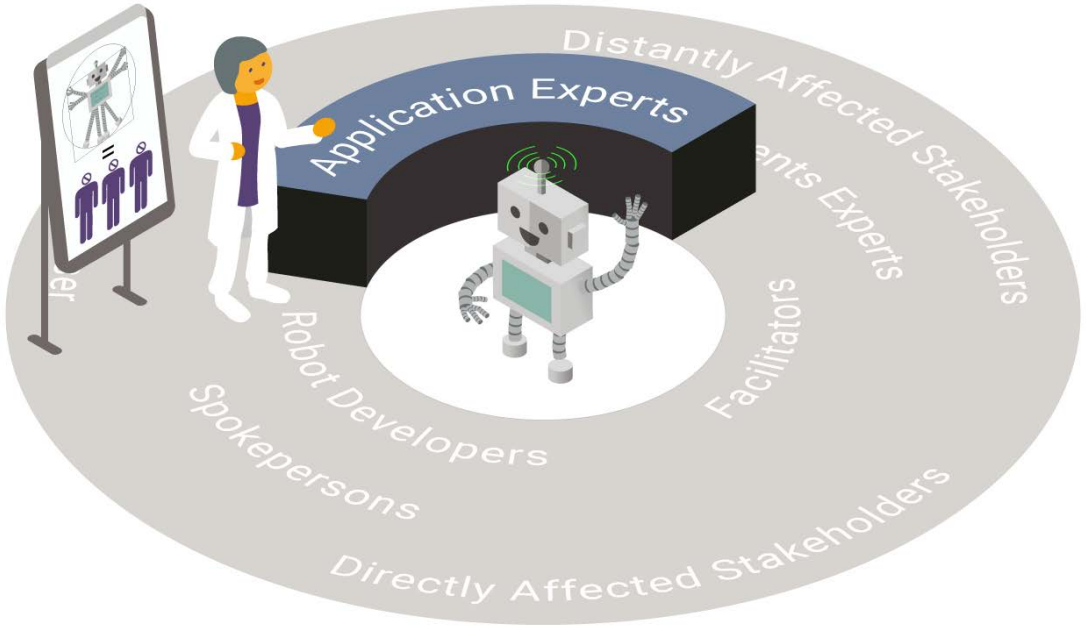


Application Experts

Application Experts:

People with an expertise in the application area or sector of the given robot. They share their expertise with developers, and are often robot buyers.

- A building developer for a construction robot
- A dairy owner for a milking robot



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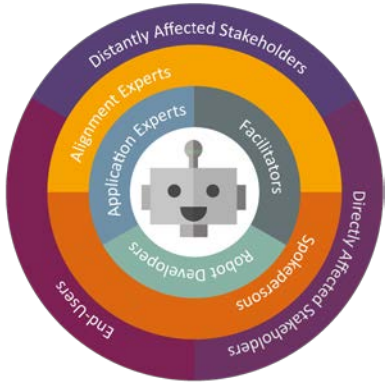

The inner circle of robotics

Robots are developed in an inner circle of robotics.

The social dimension is lacking, when there is a gap between those who design robots and those who use, and are affected by, robots.

Consequence: Normative design?

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Normativity in design processes

1. **Normative body size**
2. **Normative cognitive skills**
3. **Normative environmental understanding**

Result: Robots are designed on normative understandings that are not tailored to real-life people.

Consequence: The robot creates problems instead of solving problems.
Resistance to use or sabotage of robots.

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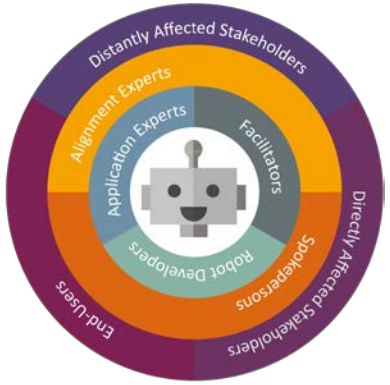
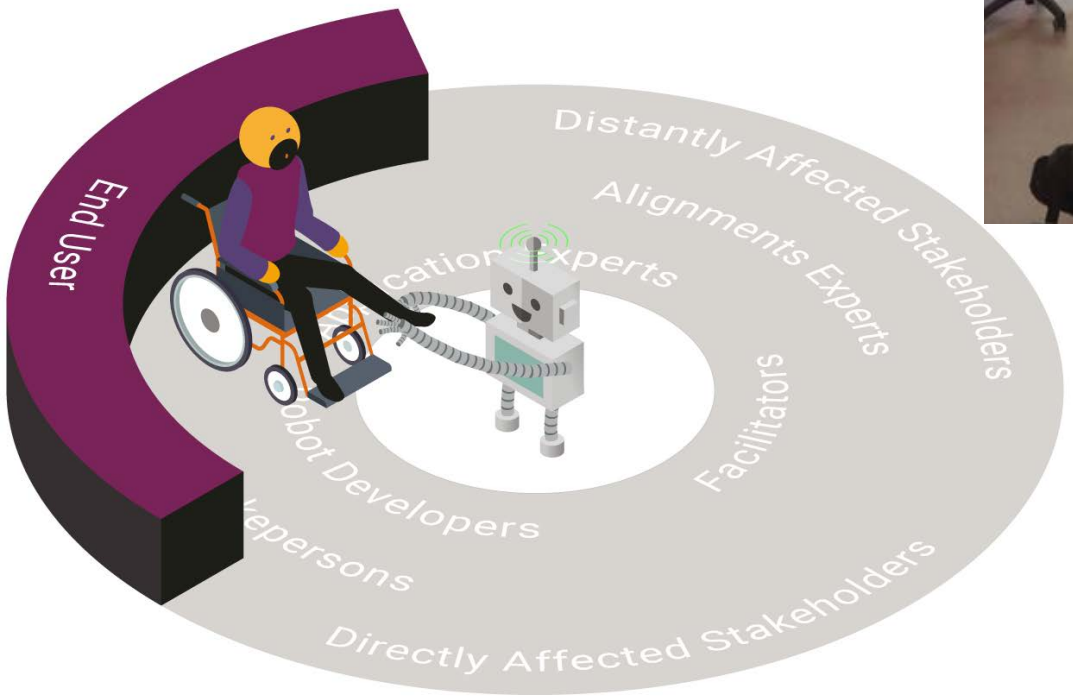


End-users

End-Users:

People who will use (operate or interact with) the robot directly.

- Patient using a rehabilitation robot.



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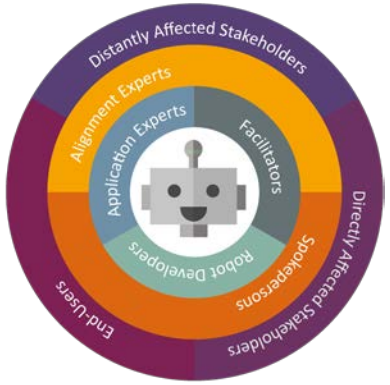

Directly affected stakeholders

Directly Affected Stakeholders:

People who are not using the robot, but must accommodate and collaborate with and around it.

- Family member assisting patient with use of a rehabilitation robot.
- Nurse interacting with the robot.

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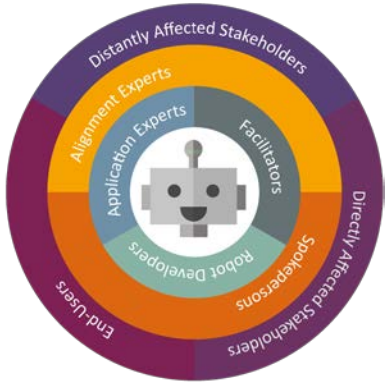
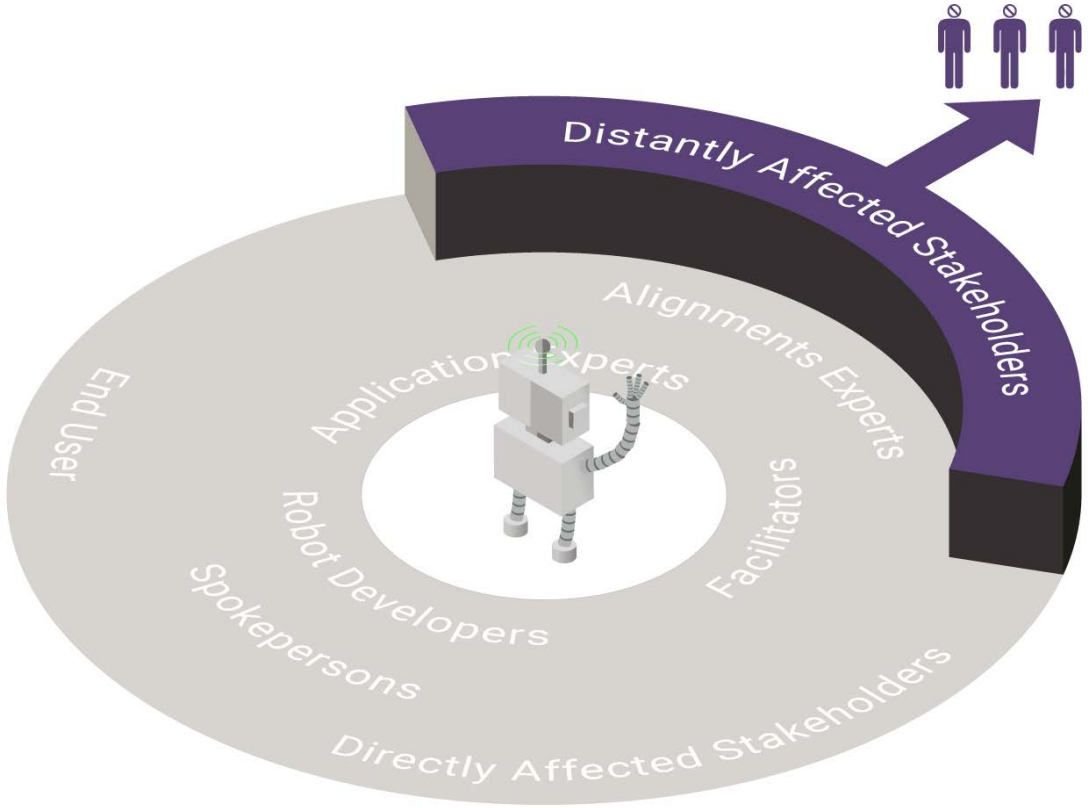


Distantly affected stakeholders

Distantly Affected Stakeholders:

People who will likely never operate, use, or interact directly with the robot, but may nevertheless be affected by it.

- Physiotherapist or helper made superfluous.



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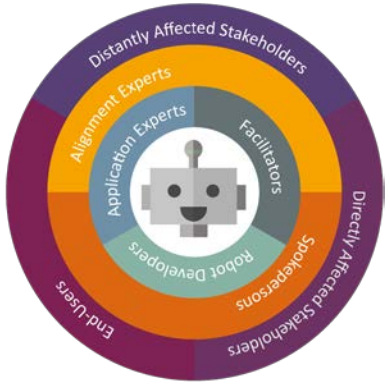
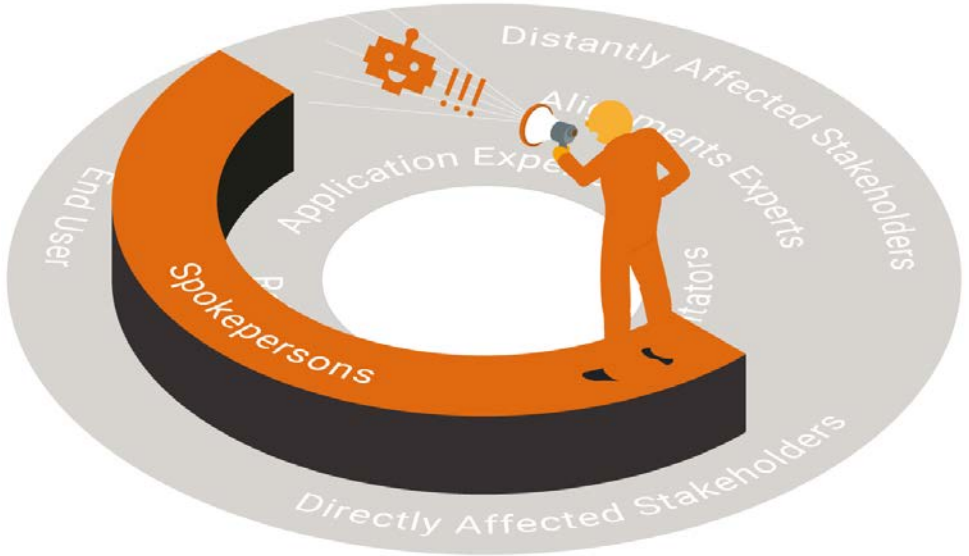


Spokespersons

Spokepersons:

An intermediary who speaks on behalf of recipients based on their own experiences.

- A municipality wishing to introduce the robot technology
- A manager.



REELER Working Paper Series
Responsible Ethical Learning with Robotics

Feeding assistive robotics, socio-technological imaginaries, and care

The case of Bestic

Niels Christian Mossfeldt Nickelsen
Aarhus University

Working paper 1, version 2.0, November 2017

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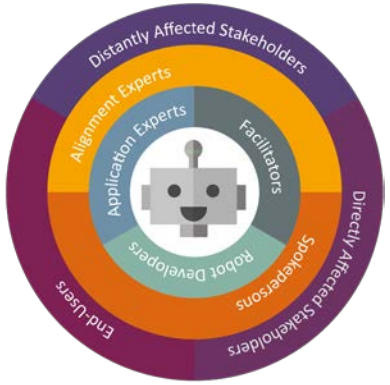
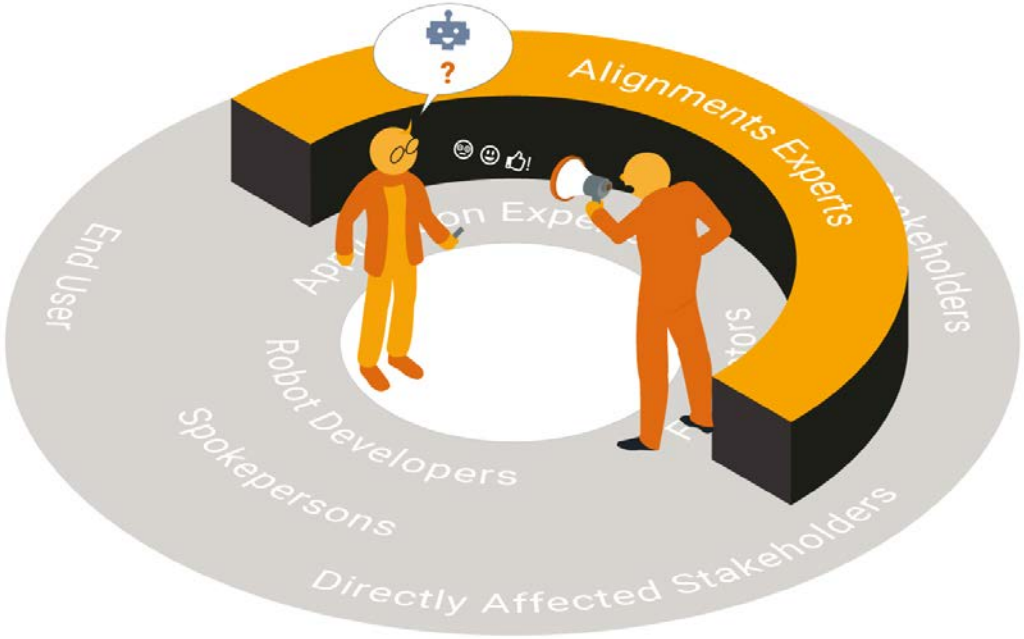


A new suggestion: Alignment Experts

Alignment Experts:

- A new profession
- Knowledge of anthropology, Ethics, robotics/AI, and business economy.
- An intermediary seeking to align robot makers and affected stakeholders based on empirical knowledge of both.
- Alignment experts should have an expertise in Social Sciences or Humanities (SSH) and knowledge of robotics/ engineering.



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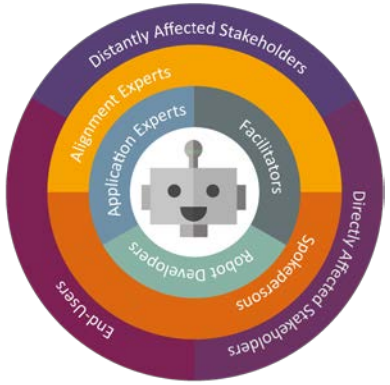

Main recommendations

See more at: https://responsiblerobotics.eu

Two main recommendations to ensure ethical and responsible robot design

1. Develop and disseminate tools that enhance robot developers' awareness of what is to be gained from collaborating with and taking end-users and affected stakeholders' perspectives into account early on in the development phase.

2. Develop alignment experts as a new profession, where people are educated in methods of aligning the views and visions of robot makers and affected stakeholders. Alignment experts can also give voice to distantly affected stakeholders, when relevant.

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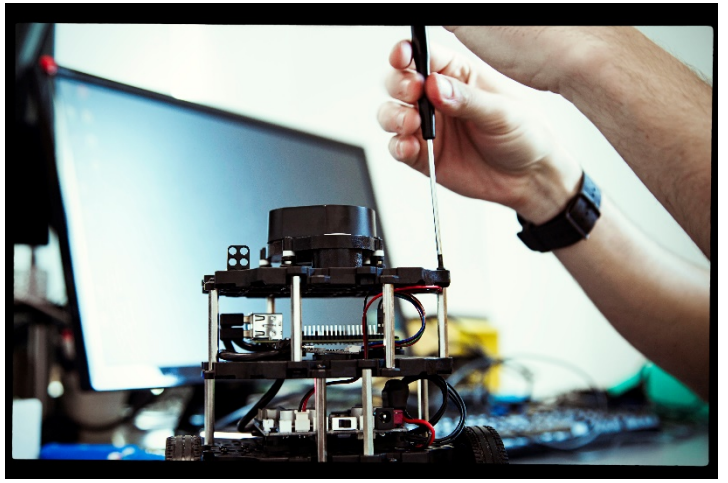
Be open minded: Take the user's perspective

Imaginaries

Reality



Technicalities

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Multidisciplinarity: Learn to work together

1. Share the goal
2. Listen to each other

EFN

Positive impact of robots on nurses' workload

10 December 2019

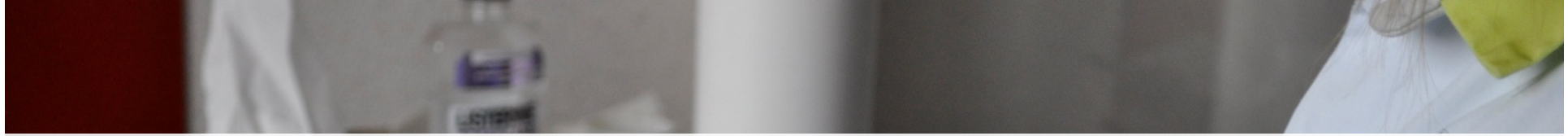
NURSES VOICE

EUROPEAN FEDERATION OF NURSES ASSOCIATIONS

Juan Jose Fernandez, EFN Policy Advisor

Established in 1971, the EFN represents over 36 National Nurses Associations and its work has an effect on the daily work of 3 million nurses throughout the European Union and 6 million in Europe.

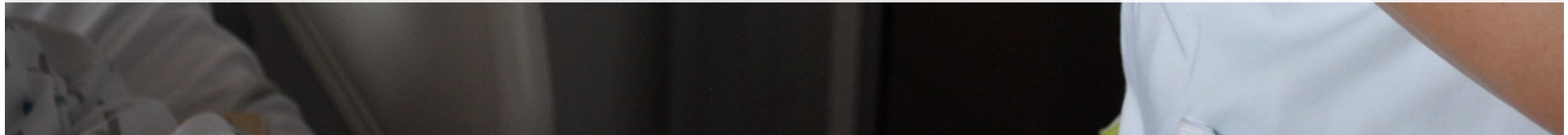
The EFN has **digitalisation** and **end-user engagement** of the health and social care services **high on its political agenda**.

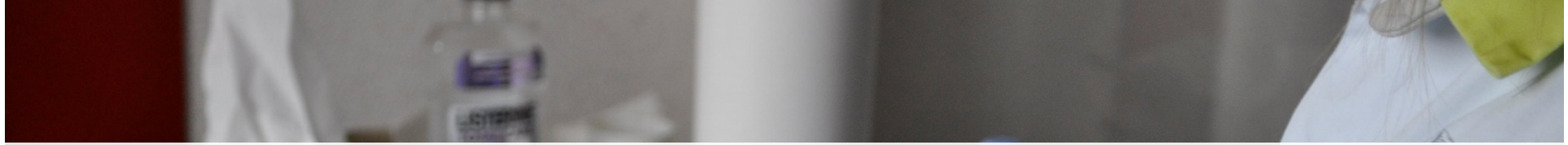


To achieve <u>end-user engagement</u> in robotics and digital innovation, developers need to:

1. **Foster a co-creation environment:** digital tools should empower patients and frontline nurses, moving towards an integrated care system based on proactive/empowered health-aware patient/citizen. We need to ensure that the digital/data revolution supports and facilitates the shift towards a resilient health and social care ecosystem.

2. **Create fit-for-purpose solutions**: requirements and mechanisms co-designed with the end-user are key to ensure the utility and suitability of the developed solutions. It is important in the requirement phase to provide the consortium with the nurses' views and expertise in making a solution fit-for-purpose; identifying, assessing, and bringing in good practices examples.

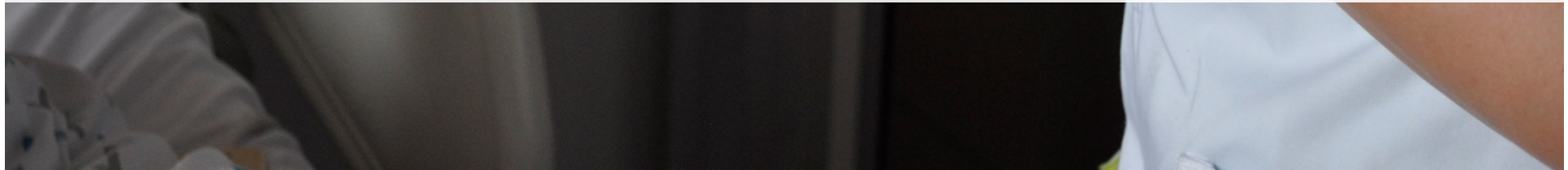


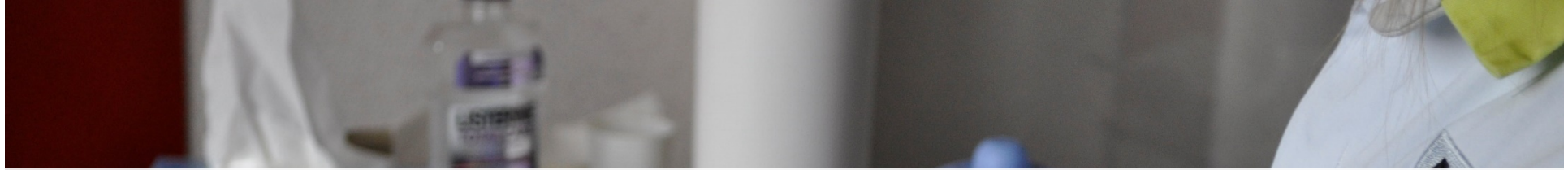


To achieve <u>end-user engagement</u> in robotics and digital innovation, developers need to:

3. **Empower patients and citizens:** face key challenges such as patient empowerment, patient safety, chronic disease management, diagnosing, home-care logistics, hospital logistics, skills and independent living. It is key to move towards a system based on needs (unmet needs), safety and quality, including quality of life.

4. **Build trust**: citizen and patient' trust is a central concept in developing digital tools requiring data sharing, therefore, patients and Healthcare Professionals, in particular nurses, should be more involved in the data sharing governance. Due to the close relation nurses develop with the patients, families and informal carers, nurses are ideally placed to create trust from citizens towards EHR solutions.

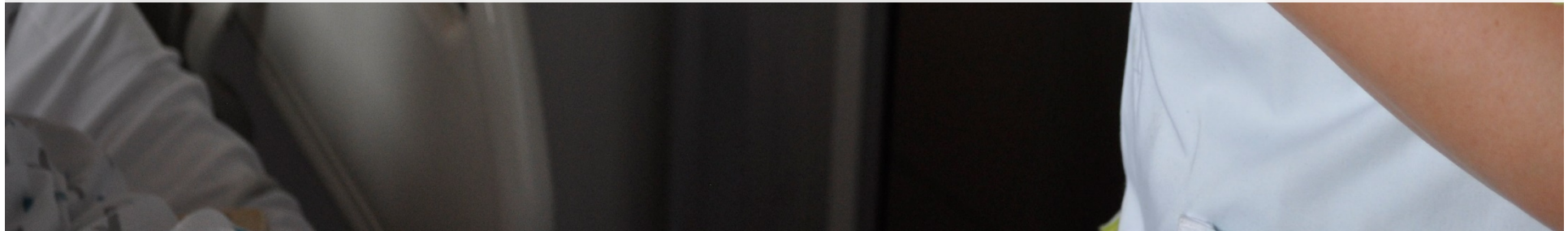




To achieve <u>end-user engagement</u> in robotics and digital innovation, developers need to:

5. **Achieve clinical relevance:** The developed solutions need to respond to patients' needs and support frontline professionals in care delivery. Involving nurses since the start of the co-design process will lead to the development of tools able to support nurses and allow them to spend more time with patients, increasing the direct-patient care time.

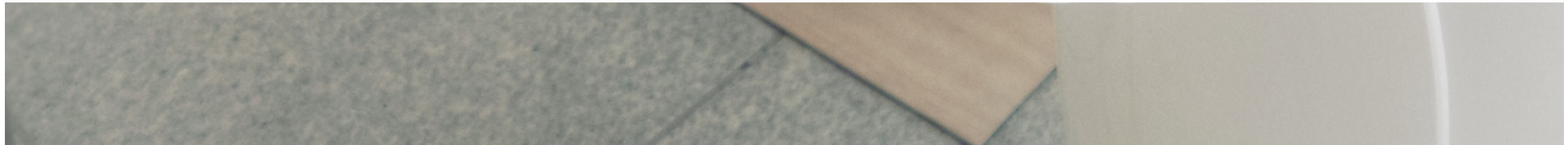
6. **Test and measure outcomes**: it is important to evaluate the state of implementation of the solution from a user's/end-users point of view and provide a qualitative evaluation and feedback on their state of development and uptake.



In **nursing care**, **robotics** can…

- Nurses are natural innovators ready to embrace new technologies that decrease their workload – such as co-designed robots.
- There are different types of nursing tasks (mostly those that are indirect nursing) that are able to be taken over by robots to different extents.
- Robotics can strengthen primary care and assist scaling up the continuity of care.
- Integrating robots in the nursing care process can help recruit young nurses, especially if it cuts down on mundane and unpleasant tasks.

However! **->** End-user engagement is key throughout the whole process of designing the new robot.



Classification of Nurse Tasks: Direct and Indirect Nursing

Interoperable EHRs at user edge (InteropEHRate)

Coordinated by Engineering Ingegneria Informatica (ENG - Italy).

Project objective: Realise an open, standardized and unique European extended-EHR and provide European citizens with a complete view of their health history, shareable with health operators and researchers.

Duration of the project: 42 months. Started: 01-01-2019

Citizen-centred EU-EHR exchange for personalised health (Smart4Health)

Coordinated by UNINOVA – Instituto de Desenvolvimento de Novas Tecnologias (Portugal)

Project objective: To develop, test and validate a platform prototype for the smart4health citizen-centred health record with integrated ability for data donor ship to the scientific community, enabling citizens to manage, collect, access and share own health data.

Duration of the project: 50 months. Started: 01-01-2019

2020 WHO YEAR of NURSING

EFN Nursing Now European Region

Priority Topics

Nursing Education – for EU DIR55/Art31

Nursing Led Clinics – Workforce/skills Composition

GET IN TOUCH

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Citizen involvement and Innovation network

By Professor Kathleen Richardson, De Montfort University and
Professor Andreas Pyka, Hohenheim University

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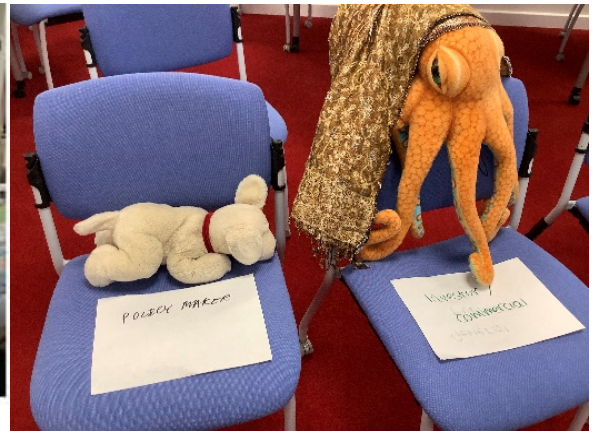
Citizen Involvement



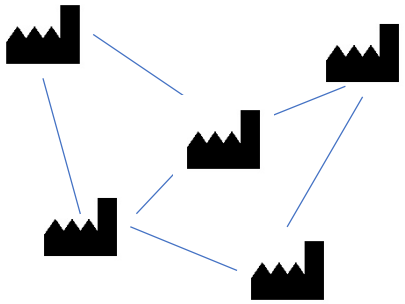
Deliberation about health robots

Two outreach tools tested:

- Sociodrama
- Mini-publics

See more at https://responsiblerobotics.eu

Innovation Network



Inter-firm innovation network

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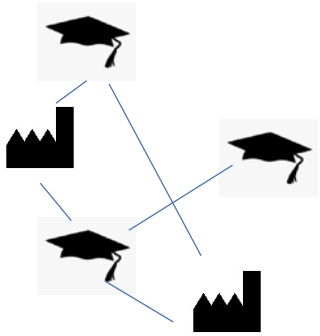

university-industry network

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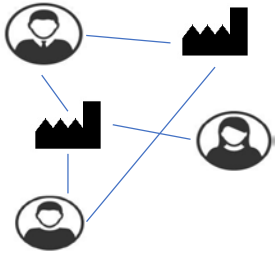

user-producer network

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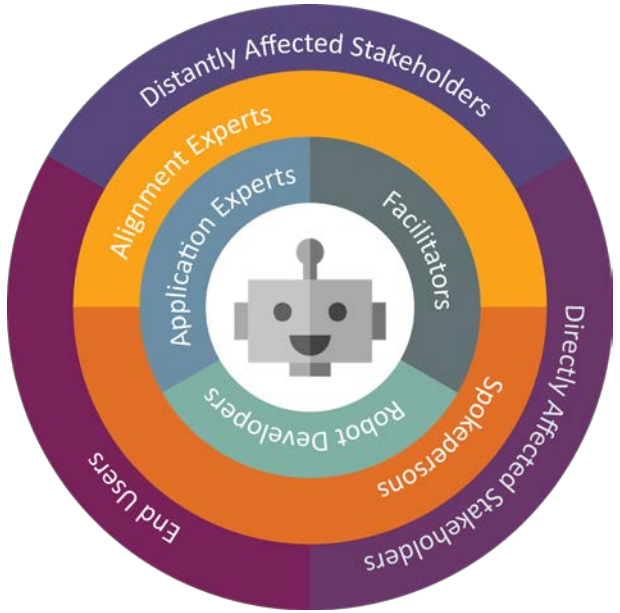
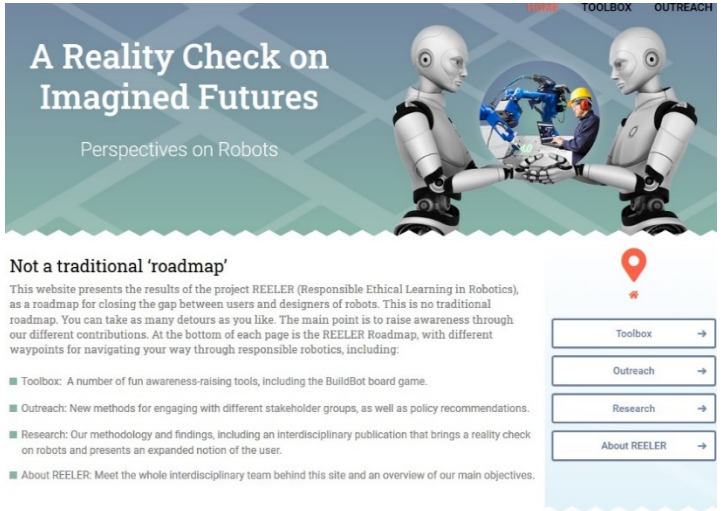


REELER's Human Proximity Model

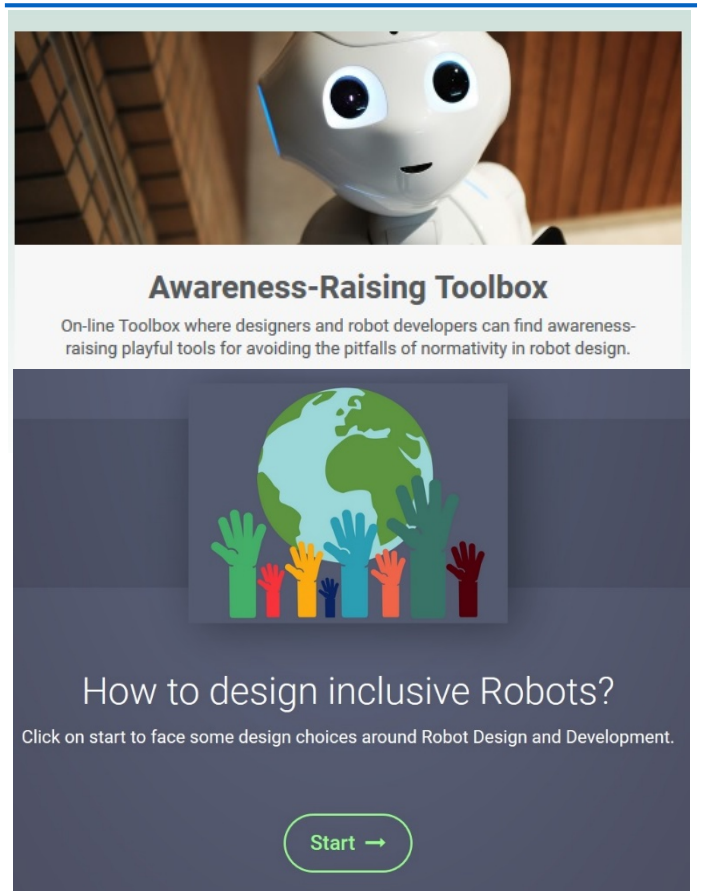
REELER's Policy recommendations
Panel debate

3 interdisciplinary awareness-raising tools

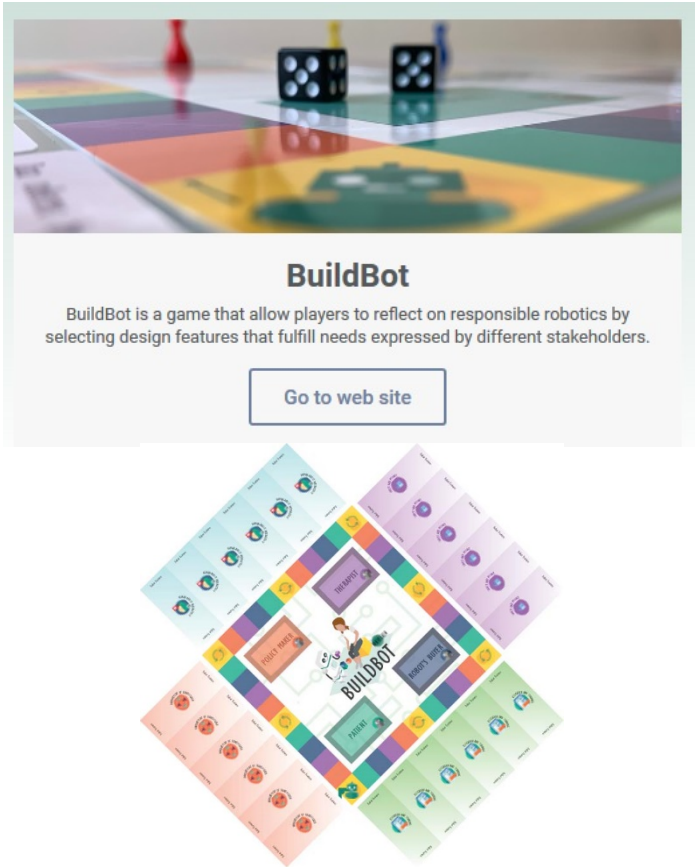
https://responsiblerobotics.eu



reelertoolbox.abacus.com



reelertoolbox.abacus.com /buildbot/



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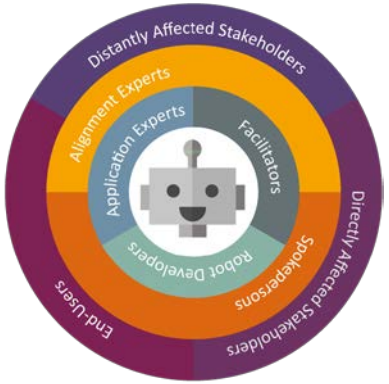

Main recommendations

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Questions for debate

What about the social dimension?

Do decision-makers make policy on an imagined world when affected stakeholders are not involved in robot development?

How can alignment experts help ground the robot imaginaries that are believed by politician and the general public to be real?

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See more at:

www.responsiblerobotics.eu

Feel free to contact
Coordinator Cathrine Hasse: caha@edu.au.dk

Thank you!