Factsheet #3.

Needs Analysis of the Robotics Community

This factsheet is based on research conducted for the Robotics4EU report "Robotics community, citizens and policy makers needs analyses" (D1.2).

What we did

The main objective of the analysis was to gain insight into the main issues in relation to deployment of robotics, including the current practices, shortcomings and the needs and readiness of the stakeholders.

More specifically, the aim was to understand whether and to which extent the nontechnological aspects of robotics (ethics, legal, socioeconomic, data, privacy, gender) hinder the widespread adoption of (AI-based) robots in Europe. As Robotics4EU focuses on the areas of healthcare, inspection and maintenance of infrastructure, agri-food, and agile production, it was also important to understand whether there are any differences regarding concerns between the four areas.

The following activities were carried out in order to provide the analysis:

· Desk research to identify the main stakeholders and issues in connection to the deployment of robotics,

· Collection of good practices,

· Online surveys with **1232 responses** and **60 interviews** in **15 countries** with policymakers, robotics community members and the general population.

What we found

1
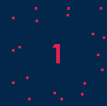
Current issues related to deployment of robots

The issues associated with deployment of robots were concluded into five categories: socio-economic, ethical, data, legal and education and engagement.

Socio-Economic Analysis

· Fear of tech unemployment
· Loss of worker autonomy
· Rising inequality in earnings
· Rising skill gaps and skill depreciation
· Uneven distribution of wealth
· Insufficient protection of worker rights (gig-economy)
· Policy issues
· Geographical disparity
· Digital divide
· Environmental problems

Ethics

· Safety and security at the workplace
· Lack of responsibility and accountability
· Lack of transparency & liability
· Infringements of traditional and cultural norms and values
· Gender inequality
· Insufficient protection of the minority groups
· Human rights abuse
· Negative impact on peace

Data

· Surveillance issue
· Lack of informed consent
· Lack of data control
· Lack of contestability

- Vulnerability of cyber physical systems
- Cyberwarfare (social & political manipulation)
- Data theft (network security)
- Unbalanced power in data ownership

Legal
- Intellectual property infringement
- Lack of global governance
- Lack of and lag in regulatory development
- Lack of GDPR compliance
- Unclear and unharmonized regulations
- Lack of legal rights awareness related to data and technology

Education and Engagement
- Insufficient public engagement
- Lack of methods and empowerment
- Education issues (lack of resources, knowledge availability and informal science education)
- Lag in the development of education sector
- Lack of trust in science
- Insufficient empowerment of the general public

2

Good practices from other projects

Good practice actions were divided into six categories, covering a range of solutions for uptake issues: Healthcare, Agri-food, Agile production, Inspection and Maintenance, Human-Robot collaboration and Community. Good practices were sorted and presented in a publication toolbox, containing all the resources published by the researched projects. It was found that projects tend to only address the issues that are directly related to their specific fields of expertise and universal concerns (such as cybersecurity or data protection) are likely to be neglected. However, **addressing the general matters concerning the entire robotics and technology field can be critical.**

// 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

3

Robotics community readiness and robots' acceptability

The identified top concerns affecting the robotics uptake were technological unemployment (in socio-economic), safety (in ethics), surveillance (in data), harmonized regulation (in legal) and the lack of education (in education and engagement).

When inquiring about robots' acceptability, stakeholders tend to be of the opinion that **industrial robots (non-collaborative) performing specific tasks are already widely accepted.** The stakeholders considered that on the whole, the first hindrance towards integration of intelligent robots in society lies in their technological immaturity. Once such robots have proven their usefulness and efficiency in performing a task, a focus must be given on the **absence of direct negative impact on the user** (safety, privacy, understandability, etc.).

4

Cooperation between policymakers and robotics community

Collaboration between the policymakers and the robotics community is **limited in its productivity due to the lack of communicatio**n and also technical knowledge possessed by the policymakers.

Common goals of boosting widespread adoption of robotics can only be reached by building networks and sharing objective information in universal terms understandable to all robotics community members, policymakers and the general public.

What's next?

We are presenting the following key points as considerations in planning the upcoming activities of the Robotics4EU project and also as general guidelines when promoting widespread use of robots.

1. The **conversation between policymakers and robotics producers** needs to be improved and policymakers need to be made aware about the specific **needs of the robotics community**.

2. In developing robots that interact with humans the focus should be in providing **smoother interactions** in order to provide robots that are more user-friendly. They must have a better **sensitivity to their environment** (more sensors, more complex decisions, more interactivity).

3. **Safety and privacy** are challenges which stand out as concerns and these should be aggressively addressed. **Robots must be safe**, they must be able to deal correctly with hazardous environments, and above all they must react properly/safely in the vicinity of humans. In addition, **privacy of individuals should be ensured** and the discreetness of social robots should be a critical design element.

4. As technological unemployment is still a major concern, it is important to showcase that robots are advantageous for work and are not intended to replace humans. There is a big need for **communication to address these fears related to robots** taking away peoples' jobs and to promote the true benefit for human well-being.

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follow us on

@robotics4eu

contact us

info@robotics4eu.eu