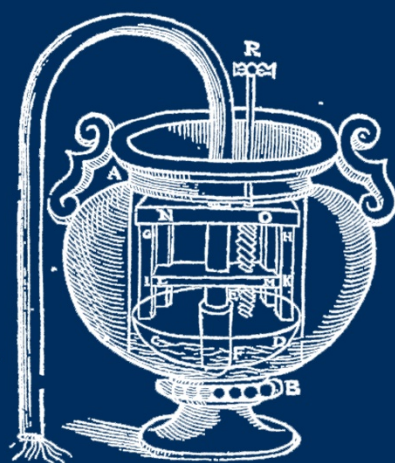


Can AI Enhance Inclusion?

**A Participatory Approach to Defining and
Evaluating New Technological Innovations**



5/2026

**Maddalena Bartolini, Elena Ragazzi,
Elia Moscoso Thompson, Caterina Rizzo,
Alice De Luca, Monica Gori, Katia Lupinetti,
Mauro Migliavacca, Lisa Sella, Michela Spagnuolo**

<i>Direttore</i>	Elena Ragazzi
<i>Direzione</i>	CNR-IRCrES <i>Istituto di Ricerca sulla Crescita Economica Sostenibile</i> Strada delle Cacce 73, 10135 Torino, Italy Tel. +39 011 3977612 segreteria.ircres@cnr.it www.ircres.cnr.it
<i>Sede di Roma</i>	Via dei Taurini 19, 00185 Roma, Italy Tel. +39 06 49937809 / Fax +39 06 49937808
<i>Sede di Milano</i>	Via Corti 12, 20121 Milano, Italy Tel. +39 02 23699501 / Fax +39 02 23699530
<i>Sede di Genova</i>	Corso Ferdinando Maria Perrone 24, 16152 Genova, Italy Tel. +39 010 6598798

Comitato di Redazione

Grazia Biorci, Igor Benati, Antonella Emina, Serena Fabrizio, Lucio Morettini, Susanna Paleari, Anna Perin, Emanuela Reale, Secondo Rolfo, Andrea Orazio Spinello, Isabella Maria Zoppi.



<https://www.ircres.cnr.it/produzione-scientifica/>

I Working Paper del CNR-IRCrES rappresentano il punto di vista degli autori e non riflettono necessariamente quello dell'Istituto nel suo complesso.

The Working Papers published by CNR-IRCrES represent the views of the respective author(s) and not of the Institute as a whole.

CNR-IRCrES Working Paper 5/2026



settembre 2026 by CNR-IRCrES

Can AI Enhance Inclusion?

A Participatory Approach to Defining and Evaluating New Technological Innovations

MADDALENA BARTOLINI^a, ELENA RAGAZZI^a, ELIA MOSCOSO THOMPSON^b, CATERINA RIZZO^c, ALICE DE LUCA^d, MONICA GORI^d, KATIA LUPINETTI^b, MAURO MIGLIAVACCA^c, LISA SELLA^a, MICHELA SPAGNUOLO^b

^aCNR-IRCrES, Consiglio Nazionale delle Ricerche, Istituto di Ricerca sulla Crescita Economica Sostenibile, Italy

^bCNR-IMATI, Consiglio Nazionale delle Ricerche, Istituto di matematica applicata e tecnologie informatiche “Enrico Magenes”, Italy

^cDISFOR, Dipartimento di Scienze della Formazione, Università di Genova, Italy

^dIIT, Istituto Italiano di Tecnologia, Italy

corresponding author: maddalena.bartolini@cnr.it

ABSTRACT

This paper examines whether and how participatory approaches can shape the innovation process in robotics and artificial intelligence to enhance the inclusion of sensitive user groups. Technological applications increasingly influence individual and collective well-being, yet design and assessment processes often prioritize technical performance over lived impact. Focusing on a case study from the PNRR-funded RAISE project – “Urban Technologies for Inclusive Engagement” – this study analyses the conditions, potentials, and limits of involving users across the project lifecycle: from problem framing and specification, through co-design and development, to post-deployment evaluation.

Three research questions guide the work: (1) Is a participatory approach feasible within technology-driven innovation projects in robotics and AI? (2) What are the implications of participatory methods for each phase of the project lifecycle (definition, development, implementation, evaluation)? (3) How does participatory design influence the inclusion outcomes for targeted, sensitive user groups? To answer these questions, the paper combines descriptive account of the interdisciplinary project experience with qualitative evaluation of processes and outcomes, drawing on stakeholder interviews, co-design artifacts, and impact observations.

By linking participatory practice to technological assessment, the paper argues that centering user needs enables more relevant and socially robust innovations, while also exposing trade-offs and constraints (e.g., resource demands, representativeness, and evaluation complexity). This study contributes empirical evidence and a reflective framework for researchers and practitioners seeking to integrate inclusion-oriented participation into robotics and AI innovation.

KEYWORDS: Technology, User Center Design (UCD), Participatory evaluation, social inclusion, urban well-being

DOI: 10.23760/2421-7158.2026.005

HOW TO CITE

Bartolini, M., Ragazzi, E., Moscoso Thompson, E., Rizzo, C., De Luca, A., Gori, M., Lupinetti, K., Migiavacca, M., Sella, L., & Spagnuolo, M. (2026). *Can AI Enhance Inclusion? A Participatory Approach to Defining and Evaluating New Technological Innovations* (CNR-IRCrES Working Paper 5/2026). Istituto di Ricerca sulla Crescita Economica Sostenibile. <http://dx.doi.org/10.23760/2421-7158.2026.005>

INDICE

1.	INTRODUCTION	5
2.	PARTICIPATORY APPROACHES IN TECHNOLOGY DEVELOPMENT	6
3.	APPROACHES TO EVALUATION OF THE IMPACT OF AI AND ROBOTICS INNOVATIONS ON THE DAILY LIVES AND WELL-BEING OF INDIVIDUALS	9
3.1	Perception and evaluation in Human-Robot Interaction.....	9
3.2	Participatory approaches in technology evaluation	12
4.	THE ROLE OF EVALUATION IN RAISE SPOKE 1	13
5.	LESSONS AND TAKEAWAYS	14
6.	REFERENCES	16

1. INTRODUCTION

Technology increasingly permeates people's lives and daily social relationships, finding applications in all areas that concern individual and collective well-being. Of particular interest is technology related to robotics and artificial intelligence, which exhibit extraordinary potential to improve people's quality of life. Can the innovation process in this technological sector be shaped by the potential impact of technologies on the inclusion of fragile users? To this aim, it is essential to let the users' needs be the main driver for the development of new technologies and then accompany the technological assessment (performance of the developed tool) with an evaluation of the impact on individuals' lives.

The paper aims to discuss, starting from a specific interdisciplinary experience gained in the ongoing project "Urban Technologies for Inclusive Engagement", one of those defined by the PNRR-funded project RAISE (Robotics and AI for Socioeconomic Empowerment). The conditions, potentialities, and limitations of a participatory approach (Arnstein, 1969; Nygaard, 1979; Suchman, 1987; Ehn, 1993) throughout the innovation process will be discussed, starting from the construction and definition of technological products, passing through their development and implementation up to the evaluation of the outcomes.

Is a participatory approach possible/feasible in a technology-driven project? Which implications are related to the project's life cycle? Which consequences are there for the inclusion of targeted groups? We want to present and discuss how some methods and tools of User Center Design (UCD) were applied and paired with a participatory design of impact evaluation. UCD is an interactive design process in which researchers and designers focus on the users and their needs in each phase of the design process. In UCD, researchers use investigative (e.g., surveys and interviews) and generative (e.g., brainstorming, focus groups, evaluative brainstorming) methods and tools to develop an understanding of user needs, starting from the design of the technologies to the evaluation phase of the process.

This article aims to highlight the multidisciplinary and transdisciplinary contribution in the different stages of the project: from listening and identifying users' needs, passing through an interdisciplinary design of complex and multi-user technologies to evaluating people's perceptions and acceptability of the AI devices developed on the impact these may have on their wellbeing and inclusion.

Evaluation is a core step of this user-centered approach because technologies must work and respond to the identified needs, generating a perceivable change in people's lives. In other terms evaluation, the effectiveness of technological innovations can be assessed from two different perspectives:

- a technical one (validation), understanding if the device works for what it was designed (it improves the user's skills, it enables them to do a specific job, ...). This evaluation requires technical and field competencies
- An evaluation of the social impact on the users and on society. It evaluates innovations in the societal context; it may be differentiated with respect to different target populations and includes recommendations to mitigate harmful impacts and enhance virtuous ones.

Assessing the effects of AI and robotics on people and societies involves challenges at the micro and macro levels because these technologies encounter local, national, and global social and cultural systems.

In this paper, we will briefly review the user-centered approaches, describing how they were implemented as well in an extensive program implemented during the project (section 2). In section 3, we will discuss how quantitative and qualitative approaches can be used to evaluate the impact of new robotics and AI technologies. The evaluation approach of the case study is presented in section 4, alongside how it was integrated into the technology design. Finally, we draw some conclusions, discussing the takeaways from this experience.

2. PARTICIPATORY APPROACHES IN TECHNOLOGY DEVELOPMENT

Many of today's challenges require communal efforts and the integration of a wide array of competencies. In addressing these complex issues, including diverse stakeholders, especially those often excluded from the problem-solving process, is crucial. Failure to do so can result in theoretically sound solutions but ineffective when applied in real-world scenarios. This is especially evident in challenges involving technological development, where different perspectives and priorities arise not only among stakeholders behind the development of technology but also between these stakeholders and the end-users¹. This need for a more holistic development and design approach has given rise to participatory approaches, or collaborative frameworks, in which all stakeholders are involved in every part of the development process.

The relationship between technology and participatory approaches has been shaped by several influential scholars. Although coming from different disciplinary backgrounds, these scholars contributed to a common understanding that technological systems should be shaped through the active involvement of the people affected by them. Kristen Nygaard (1979, 1996) pioneered Participatory Design by advocating the direct involvement of workers in the development of technological systems, emphasizing democracy and empowerment in the workplace. His approach argued that technology is not neutral and that workers should have a voice in technological decisions that influence their working conditions. His work established the democratic foundations of participatory design by linking technological development to issues of power, workplace democracy, and social justice. Pelle Ehn (1988, 1993) further developed these ideas, viewing users as co-designers whose practical knowledge is essential to the design process. He argued that users are not merely sources of information but active co-designers whose experiences and expertise are essential for creating meaningful technological solutions. His work highlighted the value of collaboration between designers and users and helped institutionalize participatory methods within Human-Computer Interaction (HCI). Lucy Suchman (1987) contributed through her theory of situated action, highlighting that technology use is embedded in social and contextual practices, which makes user involvement crucial for effective design. In her research, Suchman demonstrated that human interaction with technology is shaped by specific social and contextual circumstances rather than by fixed plans or predefined procedures. This insight challenged traditional system design approaches and reinforced the need to involve users in design processes to understand their real practices and environments. Her work emphasized that technology should be designed with sensitivity to the complex, situated nature of human activity. Sherry Arnstein's Ladder of Citizen Participation (1969) provided a framework for assessing the degree of influence participants have in decision-making processes, distinguishing genuine participation from symbolic involvement.

More recently, scholars such as Elizabeth B.-N. Sanders and Pieter Jan Stappers (2008) have advanced the concept of co-design, promoting the active engagement of users and stakeholders throughout innovation processes.

Together, these contributions have established participation as a key principle in the development of human-centered technologies.

In fact, these approaches are key to ensuring that technologies are user-friendly, relevant to the end-users, and effective in satisfying their needs. In essence, despite having potential drawbacks, such as the lack of a strong hierarchy of project members, participatory approaches democratize the development of new technologies by equalizing the roles of all stakeholders involved in a technological project.

A scenario in which participatory approaches recently gained significant popularity is climate change and the related challenges it generates in the agricultural environment (McPhee, 2021) (Cruz-Pérez, 2023) and the use of the soil. Indeed, the innovation flows of agriculture, and agri-

¹ The difference between the stakeholders' perspective and the user's one becomes evident when the use of technology responds to a person's need, but its use is mediated by another person (generally a professional. Examples of intermediate stakeholders may be doctors, caregivers, teachers mediating the use of the technology for people with diseases, impaired people or pupils.

food sectors follow their own rhythm and specificities, misaligning the precious efforts of the stakeholders involved.

Among the different participatory approaches that are being used, one of the most common is the Living Lab (LL). A LL is a collaborative innovation environment that involves multiple stakeholders, including users, researchers, and businesses, to co-create solutions to real-world challenges (Hossain, Leminen, & Westerlund, 2019). The core idea is to foster innovation through collective ideation and user-centered design, centralizing the end users to the process and ensuring that the solutions developed meet their needs effectively. Participatory approaches to urban planning are also very good examples of inclusion of key stakeholders in the decision-making process (Shamsuzzoha et al., 2021) as well as participatory design experiences of rehabilitative technologies in schools (Caltenco et al., 2016; Magnusson et al., 2015), up to recent interest in the specific areas of AI and robotics (Boenig-Liptsin, 2017).

The concept of Living Labs is versatile and adaptable, leading to multiple definitions and applications depending on the project's objectives. LLs can range from observing and analyzing everyday user behaviors (European approach) to hosting demonstrations of prototypes (North American approach) (Hossain, Leminen, & Westerlund, 2019). They can exist as physical spaces or operate entirely virtually, adapting to the needs and context of the project.

The ongoing project Urban Technologies for Inclusive Engagement (RAISE - Spoke 1, s.d.), one of those defined by the PNRR-funded project RAISE (Robotics and AI for Socioeconomic Empowerment), contributes to the RAISE goal of enhancing the innovation capacity of the city of Genoa (Liguria, north-western Italy) through a specific focus on urban technologies that may improve accessibility to the city offers and social inclusion as well.

In short, this project aims to develop AI and robotics applications that improve the quality of life in urban context by enabling personalized access and services of the urban context, addressing issues raised by diverse population groups that express a varied set of capabilities and frailties. The holistic nature of RAISE - Spoke 1 encompasses all stages of technological development, from concept to design and final implementation, driven by a bottom-up, participatory approach. This ensures that solutions are user-driven rather than solely based on scientific advancements, boosting the inclusiveness of our efforts.

Thus, in the context of RAISE - Spoke 1, the Living Lab approach was adopted and is now acting at different levels and for different groups of stakeholders. For citizens, LL acts as a co-creation, testing and experimentation laboratory, as an intermediary between citizens and technology developers. LL will be also used to engage governmental organizations in the technology adoption process, and local companies for technology transfer actions. The use of LL approaches reflects also its widespread adoption in recent years (ENoLL, s.d.), and the urban context in Italy is well suited for developing Living Labs (Mobility as a Service for Italy, s.d.).

In the first year of activity of the project, several thematic LL meetings were organized, focusing on co-creating innovations between technological partners and specific urban ecosystem domains. This ecosystem was divided into four main areas: the mobility domain, the education domain, the leisure domain, and the cultural domain. In line with the European approach, the initial LLs aimed to assess the personal abilities impacting well-being within the urban ecosystem, prioritizing user needs and abilities. More precisely, we organized and coordinated four Living Labs, one per domain we defined, plus a second Living Lab inside the Festival della Scienza 2023, the main annual science festival held in Genoa. The first four LL consisted of technological and non-technological project partners, and the total participation for each LL ranged from 20 to 45 people. Regarding the non-technological partners, we involved experts of target populations related to the urban context, such as clinicians and school staff. The fifth LL was organized as an interactive laboratory inside the festival, in which a scientific animator asked the participants to express desires and ideas regarding the urban context given a set of technologies. This LL saw more than 100 people participating, including schools. Of notice is that this fifth LL was directly on the end-users, rather than population experts.

As expected in this context, the raw data gathered in all the LL was very heterogeneous because of the different expertise, vocabulary, and necessities of the different participants. We opted for the derivation of a series of user story like narratives that depict the end users in common

situations that could be improved or resolved through robotics and AI, based on feedback from LL. In total, we collected 65 user story like narratives, structured as “As an END_USER, I need THIS_TOOL to do THIS_TASK.”. This extensive collection of data was then analyzed to structure a demonstrator for each domain. The first result of this process is a detailed series of user needs derived from the stories. A need in this context reflects real-world problems, desires, or challenges experienced by individuals or communities in their everyday context.

The first domain to complete its development process was the mobility domain, culminating in the so-called mobility demonstrator. To avoid misunderstandings, with demonstrator we intend a complex aggregate of technologies, including functional components, that will be tested by multiple user communities. With this goal in mind, in the mobility domain we identified six primary needs, related to city accessibility (both physical and digital), security, and more. The needs are crucial as they induce a multi-classification of the user stories, driving significantly the design of the demonstrator as well as its validation process. Indeed, by observing the needs while keeping an eye on the user stories, 18 technological solutions were proposed: these proposals addressed the identified requirements from one or more need and naturally defined five different stages of a demonstrator on mobility. In this context, stages are derived from the general technological component scope and, for this demonstrator, are the optimal route planning, the training/simulation of the solution, guidance, assistance, and assistance in the fruition of specific environments. This classification served as basic framework upon which to build the demonstrator.

This process was done in parallel with multiple double-checks on all the data gathered and derived from the LL, such as the user stories, the needs, and the components through further LL. For further details, we schematize the findings of this process in Table 1.

Table 1. The quantification of the findings derived from the LLs on the mobility domain, that constitute the foundations of the mobility demonstrator of RAISE - Spoke 1.

THE SCHEMATIZATION OF THE DATA GATHERED FROM THE LL REGARDING THE MOBILITY DEMONSTRATOR		
Element	#	Details
User stories	20	• [...] • As a person with multiple sclerosis (fatigue/exhaustion) I would like to be able to identify routes to reach places of interest. • As a visually impaired child, I would like to know which games in the play area are suitable for me • [...]
Needs	6	1. Access to City Information - Users can access real-time urban information, event notifications, and relevant data to make informed decisions and actively engage with their environment. 2. Autonomy - Users have the freedom to navigate the city independently using infrastructure status updates, digital services, and adaptive technological supports tailored to their abilities and the city's current conditions 3. Orientation - Enhance city navigation by providing efficient, personalized directional guidance for users. 4. Safety - Ensure a safe urban environment with protective measures and crime prevention systems for physical and psychological well-being 5. Reducing Mobility Difficulties - Minimize mobility hazards for individuals with special

		needs based on their abilities in the urban environment 6. Access to services - Ensure convenient and inclusive access to city facilities and local public services to enhance individuals' urban experiences.
Technological components	18	• [...] • Virtual training • Optimal and personalized path computation • Outdoor comfort assessment • [...]
Demonstrator stage	5	• optimal route planning: to find the best path based on the state of the user and the city • the training/simulation of the solution: to explore virtual scenarios to be faced in the future • guidance: to give directions to the user while moving • assistance: to give assistance in unwanted situations that might happen while moving • assistance in the fruition of specific environments: to assist the user in specific situations that could require assistance

3. APPROACHES TO EVALUATION OF THE IMPACT OF AI AND ROBOTICS INNOVATIONS ON THE DAILY LIVES AND WELL-BEING OF INDIVIDUALS

The social impact assessment that the use of artificial intelligence devices has on the communities involved is a crucial phase of innovation and exploitation. When examining the socio-economic effects of robotics and AI, it is essential to consider the economic impact as well as their influence on individual well-being and social inclusion (Das & al. 2023). AI devices have been evaluated primarily by their economic impact, analysts and social scholars increasingly recognize human well-being and societal inclusion as important measures of the effects of new technologies. While issues of employment and basic income are often discussed, the diverse and widespread impacts of AI and robotics on human agency in daily life, emotions, physical and mental health, as well as urban, ecological, and social systems, deserve thorough consideration. In the context of the RAISE project – encompassing a wide variety of new technologies based on AI and robotics – Spoke1's goal is to develop solutions to help people enjoy the city and its services. For this reason, impact evaluation should be focused on variables able to capture, for each group and with special attention to fragile citizens, the effect that technology adoption has on inclusion and, ultimately, on well-being.

In the following sections, we will present and discuss two complementary approaches to evaluating the social impact of robotics, AI, and other emerging technologies. In section 3.1, we focus on more quantitative approaches, seeking to translate the appreciation of humans for technologies to numerical scales. In section 3.2, we discuss, on the other hand, the opportunities connected to qualitative and participatory approaches that can be applied both in the identification of outcome indicators and for the impact assessment.

3.1 Perception and evaluation in Human-Robot Interaction

Assessing how individuals perceive AI and robotic technologies is one of the key aspects of understanding the social impact of new technologies on sociality and well-being. This section contains a review of the main measurement scales of human-robot interaction. These scales

analyze factors such as trust, anxiety, acceptance, perception, and attitudes of individuals in accessing, using, and understanding the impacts of technological and AI devices on their daily lives, with a specific focus on vulnerable users. In the next phase of the research, the review will be subject to a selection aimed at extrapolating the scales and items that can best investigate the impact of technology on well-being and social inclusion in urban contexts.

Human-robot interaction (HRI) is a multidisciplinary field with contributions from human-computer interaction, artificial intelligence, robotics, natural language processing, design, sociology, psychology, and philosophy. Early research on HRI began in the 1970s, but the focus on methodology and techniques for empirical research started around the 1990s and has increased over the past two decades.

HRI is declined in the dimensions of acceptability, detectable prior to interaction with the technology (ex-ante), and acceptance after use (ex-post). Acceptability and acceptance are prerequisites for collaboration to occur between individuals and robotic or AI systems, and these factors depend on the perception that individuals develop toward technology devices.

HRI measurement scales are techniques used to assess various aspects of interactions between humans and robots, including perceptions, attitudes, behaviors, and experiences of users when interacting with robotic and AI systems. They provide standardized methods for collecting data to help researchers and developers better understand the dynamics of HRI interactions and guide the development of more inclusive and socially acceptable robotic technologies.

The following scheme (Table 1) outlines the scales mainly used in academic studies and research to measure human interactions with robots.

Each scale differs from the other ones in terms of semantic characteristics and the number of items. All scales require respondents to indicate their level of agreement on a numerically varying continuum where each point corresponds to a different degree of agreement.

Each item is linked to a specific construct: attitudes towards technology interaction in various situations, evaluation of their influence, including social impact, intention and ease of use, and perceived utility. Some scales have specific areas of application, such as the *ASOR Scale*, which measures attitudes toward social assistance robots, focusing on how individuals perceive these robots in roles that assist and support human activities. The *Ethical Acceptability Scale* evaluates ethical considerations associated with robotic technologies applied to therapies for children with autism spectrum disorders.

The *Godspeed Questionnaire* evaluates acceptance and attitudes towards social robots, including dimensions such as trust, attractiveness, and intention for social interaction (*Godspeed Series 2*), and dimensions such as perceived safety, ease of use, and interaction effectiveness (*Godspeed Series 3*).

Some scales are oriented towards estimating negative attitudes towards new technologies - *Negative Attitudes toward Robots* (NARS) scale, while others integrate both positive and negative attitudes - *Multi-Dimensional Robot Attitude Scale*.

Other scales investigate the intensity of social relationships, including perceptions of closeness and social inclusion, like the *IOS Scale*, or the social acceptability of robots, like the *Robotic Social Acceptability Scale*. Finally, the *Technology Specific Expectation Scale* aims to detect user expectations prior to encountering and interacting with a robot.

The scales shortly reviewed here can be applied for an impact assessment, to observe if the use of technology alters the initial attitude of the user. Nevertheless, for the impact to be detectable, it is necessary to plan extensive experimentations. Short trials or pilot experimentations out of the real-life context will most likely not cause significant changes in the pre-post assessment. On the other hand, these scales are fundamental to testing the ground for generalized adoption of the envisaged technologies. The attitudes, skills, and accessibility of the population are important to foresee possible bottlenecks and plan correctly the diffusion of the innovation to enhance its inclusiveness and a fair societal impact.

Tabella 2. Human-Robot-Interaction Survey Scales

Scale	Description	Reference
Attitudes Toward Socially Assistive Robots (ASOR) Scale	Measures attitudes specifically towards socially assistive robots	Damholdt, M.F. et al. (2016). A generic scale for assessment of attitudes towards social robots
Ethical Acceptability Scale	Evaluates ethical considerations associated with robotic technologies	Peca, A. et al. (2016). Robot Enhanced Therapy for Children with Autism Disorders: Measuring Ethical Acceptability
Godspeed Scale (Questionnaires Series 2 and 3)	Evaluates acceptance and attitudes towards social robots, including trust and attractiveness	Bartneck, C. et. al. (2009). Measurement Instruments for the Anthropomorphism, Animacy, Likeability, Perceived Intelligence, and Perceived Safety of Robots
Inclusion of Other in the Self (IOS) Scale	Measures the intensity of social relationships, including perceptions of closeness with robots	Aron, A. et al. (1992). Inclusion of Other in the Self Scale and the Structure of Interpersonal Closeness
Multi-Dimensional Robot Attitude Scale	Assesses attitudes towards robots across emotional responses, trust, and perceived benefits/risks	Ninomiya, T. et al. (2015). Development of the Multi-dimensional Robot Attitude Scale: Constructs of people's attitudes towards domestic robots
Negative Attitudes toward Robots (NARS)	Measures negative attitudes towards robots, including fear, aversion, and perceived insecurity	Nomura, T. et al. (2006). Measurement of negative attitudes toward robots
Robot Social Acceptability Scale (RSAS)	Evaluates the social acceptability of robots, including trust and perceived intimacy	Powers, A. et al. (2008). Anthropomorphic Interactions with a Robot and Robot-like Agent
Technology Specific Expectation Scale	Measures expectations specific to technology, including impacts of robots on daily life	Alves-Oliveira, P. et al. (2015). An empathic robotic tutor for school classrooms: Considering expectation and satisfaction of children as end-users

In RAISE - Spoke 1 a task is devoted to this ex-ante assessment of the impact on communities and territories. For the purposes of the research, the characteristics of the territorial context in which the questionnaire is administered will determine the selection of scales and items. Considering that the survey will be conducted among the entire population of the intervention area, the level of the user's interaction with technologies will be investigated through specific questions aimed at assessing access to technology, frequency of use, types of devices used, and digital skills. Therefore, the results of this research phase will relate to the construct of acceptability rather than the acceptance of technology. Acceptance, in contrast, refers to the actual adoption and usage of technology, which will be assessed exclusively among the target populations using the demonstrators.

3.2 Participatory approaches in technology evaluation

The choice of a participatory evaluation raises questions of power not only in defining problems but also in formulating alternatives (Murray, 2002). In this project is useful to activate feedback processes between the public and researchers with a view not only to the development of technologies but above all to enhance their impact on the well-being of individuals and society.

In Raise - Spoke1, in coherence with the UCD adopted for the development of technologies based on LL and described in section 2, we want to adopt a participatory evaluation approach in which public collaborators, researchers, and evaluators are directly involved in planning, conducting, and analyzing the evaluation (Zukoski et al., 2017).

This approach has many similarities with what is called public involvement and stakeholder engagement to capture the perspective of the people involved and to rebalance power among the participants. This approach was jointly agreed upon by all stakeholders. Participatory evaluation has been successfully used to evaluate public involvement (Teodorowski et al., 2023; Zukoski & Bosserman, 2017; Palumbo & Congiu, 2009).

In this contribution, we want to underline the importance of methodologies and tools of Emancipatory and Participatory Research (Arciprete, Nannini & Ciani, 2023; Massari & Pellegrini, 2021). Group techniques (focus group; evaluative brainstorming) and narrative laboratories collect people's perceptions not in the forms of opinions but in the forms of experience and representation of opportunities and risks of AI.

Among the participatory approaches, the technique called evaluative brainstorming (Parente & Rossana, 2018; Bezzi, 2013) seems to be the most suitable since it allows the adoption of a bottom-up philosophy (the one chosen by the project) and for the definition of evaluation designs. It is a participative approach in which an evaluator, experienced in qualitative evaluation techniques, helps the stakeholders (both technology developers and the end users or the beneficiaries) to focus on their preferences and to agree on dimensions and variables. Evaluative brainstorming (Bezzi, 2013; Bartolini, 2016) is a group technique considered as an evolution of classic brainstorming. Its purpose is to explore semantically a concept/issue/phenomenon and produce indicators through an inductive method. It is a consensual and group technique aimed at reaching a set of shared conceptual dimensions based on a collective synthesis.

As part of the evaluation research, this type of brainstorming allows us to explore the project and analyze and evaluate the technologies implemented by the scientists involved. The use of evaluating brainstorming (Bezzi, 2013) in innovation contexts aims for a systematic analysis of the perception of the technologies by the communities and evaluation of the impacts from the different perspectives of the social actors involved.

On a methodological level, it consists of three phases. There is a first **creative phase** when all the participants are invited to express themselves freely and produce words and phrases – called strings by Bezzi (2013) – meant as the participants' linguistic utterances. Then the evaluative brainstorming moves to a **classificatory phase**, in which the facilitator cooperates with the participants in grouping strings into shared classes. This is a crucial phase, peculiar to evaluative brainstorming. The classes and their dimensions (or sub-groups) are not set a priori, it is the group that suggests new groupings string by string. The third and final phase is devoted to **synthesis**; the group revises the classes and makes further choices to create more coherent or specific sub-groups, adding, correcting, or eliminating strings. The third phase has a deductive purpose. Classes and dimensions become, in fact, the indicators suggested for the evaluation of the impact of the examined technologies during pilot experimentations.

The use of this group technique that actively involves participants is consistent with the initial choice to engage communities through Living Labs (LL) and will also validate its results. Indeed, the results of the sessions may be used to analyze whether there is a correspondence between the user stories and the needs that emerged from the LL and the classes, dimensions, and indicators that emerged with the evaluative brainstorming to characterize the users' needs.

4. THE ROLE OF EVALUATION IN RAISE SPOKE 1

Spoke 1 is not represented by a set of coherent, albeit independent sub-projects, but rather as an integrated ecosystem where each task provides and receives contributions from the others. Evaluation activities can help by giving systematic and explicit form to these information flows. In consideration of this, evaluation is addressed by different tasks to ensure better linkage with the other research and implementation activities and good timing. In coherence with the general philosophy of the project, the evaluation designs for the different developed systems of technologies (called “demonstrators”) are defined in a framework that is *Adaptive* (it includes recurring revisions based on the implementation phases of the demonstrators, in order to adapt it to the constraints of the real experiments) and *Integrated* since it is based on the involvement of *Evaluators*, *Researchers working at the development* of the demonstrators from a technological point of view, researchers and internal stakeholders *testing the application* of the demonstrators with *end users* (validation of the framework).

The first evaluation step is represented by the evaluation of the impact on individuals, based on the observed outputs and outcomes of the demonstrators, thus carrying out an ex-post evaluation. This will include both technical validation and a proper evaluation of impact. Technical validation of demonstrators is done by experienced and specialized researchers and focuses on the direct output of the innovation. It is intended to highlight the performances with respect to specific dimensions directly influenced by the device (the individual sees better, moves better, and can practice some activity in autonomy. The goal is to have a technical validation of the device, by answering the evaluative question(s):

- Do these technologies work for what they were developed for?
- Is there any facilitation after the technology use?

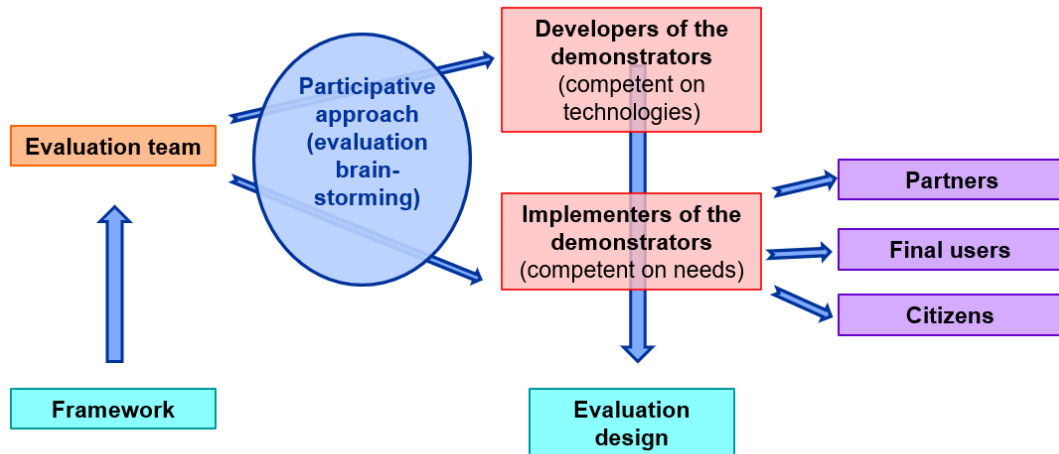
Evaluation, on the other hand, intends to apply methods and tools that can verify how end users can benefit from the developed technology (outcomes). the purpose is to understand if the physiological or functional improvements observed thanks to validation assessment are able to produce real improvements in the life of the individual (e.g., the individual improves his autonomy, his ability to communicate, his school performance, his well-being or the ability to get help in case of illness). The goal is to answer the evaluative question:

- are these technologies useful for responding to the needs of the individual by increasing their well-being and inclusion?

The results of the evaluation on the individuals, together with other information sources, will finally be used to assess the potential impact of developed technologies on the local territory and on user communities.

The process adopted to integrate evaluation activities in the innovation and experimentation process starts from the definition of the evaluation framework, a pivotal document that defines all aspects of how an evaluation will be conducted. It presents the objectives of the evaluation, the role and responsibilities of the actors, the key elements to be decided in each evaluation design, and how these decisions should be made.

Figure 1. From the framework to the evaluation design



The participatory approaches play a fundamental role in operationalizing the framework into practical evaluation designs, while taking into account the features of the technology and the users' needs.

The bottom-up integrated approach of RAISE - Spoke 1 may be represented (in a simplified way) by an 8-step process:

- a. Survey of available technologies and skills.
- b. Living Labs in which user communities could test the technologies to take informed decisions
- c. Living Labs with user communities on needs and requirements
- d. Work on the user stories
- e. Definition of demonstrators
- f. Evaluation brainstorming to identify expected outcomes and impact evaluation indicators.
- g. Interviews with the developers to understand the cycle of change of the components of demonstrators
- h. Focus group with the potential beneficiaries of the demonstrators to evaluate the perception of impact of technologies in terms of expected benefits and potential risks

In our context the evaluation brainstorming becomes a part of the cyclical relationship between the innovation developers and the user communities so that technological innovation represents a tool for improving their well-being and the inclusion of citizens, breaking the increasingly real risk that technology defines our needs, interests, and desires. Within Spoke 1, we were then guided by some questions to clarify the different roles and responsibilities. When enhancing people's quality of life, what should be the primary focus? Can the innovation process be shaped on the potential impact of technologies on the inclusion of fragile users?

Based on continuous feedback, the dialogue between evaluation and technological research allows for coherence between technological development and social priorities. The use of participatory evaluation tools is intended to guarantee this reflexivity and circularity, which is useful both in the evaluation of the process and for the outcomes themselves.

5. LESSONS AND TAKEAWAYS

At an *in-itinere* evaluation stage, it is impossible to state if the technologies developed so far will effectively and consistently meet the needs of the people involved, even though researchers and engineers interviewed seem satisfied with the experience so far. For this reason, our

conclusions will focus on the lessons that can be taken to correctly plan and manage a project life cycle with a bottom-up approach.

The RAISE - Spoke1 experience showed that a participatory, bottom-up approach to technology design is possible. Although the project is still ongoing, it shows how the participatory approach connotes all its phases. User-centered philosophy has been adopted in a circular way both in the design of technologies and in their evaluation. Of course, this is not the first experience in applying a UCD of technologies, but the challenge relied on the highly multi-disciplinary nature of the project and in the complexity of the demonstrators. Demonstrators are indeed not a single product/technology, but a system of technological devices and software components that are integrated and targeted by several user communities. Consequently, this implied the coordination of various research and innovation partners and the involvement of several stakeholders with different competences and backgrounds. On the one hand, this causes an increase in complexity but, on the other hand, it reflects clearly the richness and high potential of the project.

Given the organizational complexity, we experienced difficulties aligning the development and evaluation schedule. The time needed to harmonize the teams, sometimes also in relation to the different terminology used, caused a delay in the overall schedule and therefore the process described in the above sections will be completely and effectively applied only in the domains addressed, and surely limited in a few of them. To overcome this critical point, the timing of complex projects involving heavily participatory approaches should dedicate a reasonably long time to the co-creation phase, including a tight control on the alignment among design, implementation, and evaluation.

It is indeed usually underestimated, while preparing executive plans, the time factor. Bottom-up processes are long by nature and may become longer when the involved communities are not used to working together and have yet to experience this type of approach previously. The consequent delays can force the re-design or cancellation of scheduled activities. For example, in RAISE - Spoke1, the Living Labs and other participatory activities were mostly limited to stakeholders, i.e., representatives of the targeted user categories, but not directly with the people who will test and use the technologies in the future. More concretely, the work was done with healthcare staff and not directly with the patients or disabled people, with school managers rather than teachers, pupils, and students (involved in festival evaluation but not in formal Living Labs). The challenge of the project is, therefore, to try to involve the final targeted users, taking advantage of the technology testing phase. This can be obtained thanks to evaluation activities, which will represent an opportunity to listen to user communities, understand their perception of the AI devices developed, and detect whether they have brought greater inclusion and well-being. A final lesson from this experience is that the commitment required by the participatory approach of all parties involved is critical.

User communities are amenable to this need-driven process, and availability to engage with research is greatest where needs are greater. Scientific communities may find it more difficult, given the enormous demands of interdisciplinary and transdisciplinary research. Scientists have difficulty working together on scientific domains and must be willing to invest in a shared language and culture (Sella et al., 2024). A virtuous element of the RAISE experience is the interdisciplinary dialogue within the partnership and the willingness to keep alive the relationship with the different user communities that have expressed requests and needs, but it is an effort that should not be underestimated.

RAISE is a project with twofold complexity because it combines multiple technologies and skills on the one hand, multiple needs and user communities on the other, with an approach that is not additive but integrative. Complexity is a richness, but it opens greater risks in implementation and project management. The participatory approach can be an element with which to facilitate the integration process, considering its multidimensionality.

In conclusion, the participatory approach inherent in evaluative research enables the elicitation of perspectives from diverse user groups, transforming them into active contributors through the provision of feedback, advice, and suggestions. This process allows various beneficiary categories to perceive themselves as pivotal actors and essential contributors to initiatives aimed at enhancing urban well-being for the broader community.

6. REFERENCES

- Alves-Oliveira, P., Ribeiro, T., Petisca, S., di Tullio, E., Melo, F.S., & Paiva, A. (2015). An empathic robotic tutor for school classrooms: Considering expectation and satisfaction of children as end-users. In Tapus, A. et al. (eds). *Social Robotics*. ICSR 2015. Lecture Notes in Computer Science, 9388, pp. 21-30. DOI: 10.1007/978-3-319-25554-5_3.
- Arciprete, C., Nannini, M. & Ciani, F. (2023). Le potenzialità della ricerca emancipatoria nella pratica del lavoro con gli utenti. *RIV Rassegna Italiana di Valutazione*, 87, pp 51-68, DOI: 10.3280/RIV2023-087004.
- Aron, A., Aron, E.N., & Smollan, D. (1992). Inclusion of Other in the Self Scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63(4), pp. 596-612. DOI:10.1037/0022-3514.63.4.596.
- Arnstein, S.R. (1969). A Ladder of Citizen Participation. *Journal of the American Institute of Planners*, 35(4), pp. 216-224.
- Bartneck, C., Kulić, D., Croft, E., & Zoghbi, S. (2009). Measurement instruments for the anthropomorphism, animacy, likeability, perceived intelligence, and perceived safety of robots. *International Journal of Social Robotics*, 1(1), pp. 71-81. DOI: 10.1007/s12369-008-0001-3.
- Bartolini, M. (2016). La costruzione di dimensioni teorico concettuali per la valutazione di una politica di contrasto alla dispersione scolastica: l'applicazione del brainstorming valutativo. *RIV Rassegna Italiana di Valutazione*, 2015/63, pp. 83-102. DOI: 10.3280/RIV2015-063006.
- Bezzi C. (2010). *Il nuovo disegno della ricerca valutativa*. FrancoAngeli.
- Bezzi, C. (2013). *Fare ricerca con i gruppi. Guida all'utilizzo di focus group, brainstorming, Delphi e altre tecniche*. FrancoAngeli.
- Bezzi C., & Baldini I., (2006). *Il brainstorming. Pratica e teoria*. FrancoAngeli.
- Boenig-Liptsin, M. (2017). AI and robotics for the city: Imagining and transforming social infrastructure in San Francisco, Yokohama, and Lviv. *Field Actions Science Reports. The journal of field actions*, Special Issue, 17, pp. 16-21.
- Caltenco, H., Magnusson, C., Rydeman, B., Finocchietti, S., Cappagli, G., Cocchi, E., Ben Porquis, L., Baud-Bovy, G. & Gori, M. (2016). Co-Designing Wearable Technology Together with Visually Impaired Children. *International Journal of Mobile Human Computer Interaction*, 8(4), pp. 68-84. DOI: 10.4018/IJMHCI.2016100104.
- Cruz-Pérez, N., Rodríguez Alcántara, J., Rodríguez-Martín, J., Moujan, C., Jeunese, I., & Santamarta, J. (2023). *Living labs as participatory and community learning applied to regional development*. EDULEARN23 Proceedings, pp. 6421-6424. [10.21125/edulearn.2023.1707](https://doi.org/10.21125/edulearn.2023.1707)
- Damholdt, M.F., Olesen, M.H., Nørskov, M., Hakli, R., Larsen, S., Vestergaard, C., & Seibt, J. (2016). A generic scale for assessment of attitudes towards social robots: The ASOR-5. *Robophilosophy/TRANSOR*, 290, pp. 45-47. DOI: 10.3233/978-1-61499-708-5-45.
- Das, R., Mitra M., & Singh, C. (Eds). (2023). *Era of Artificial Intelligence: The 21st Century Practitioners' Approach*. Chapman and Hall/CRC. <https://doi.org/10.1201/97810>
- Ehn, P. (1988). *Work-Oriented Design of Computer Artifacts*. Arbetslivscentrum.
- Ehn, P. (1993). Scandinavian Design: On Participation and Skill. In D. Schuler, & A. Namioka (Eds.), *Participatory Design: Principles and Practices*. Lawrence Erlbaum.
- ENoLL European Network of Living Labs. (14 June 2024). *Who We Are*. <https://enoll.org/about-us/>.
- Hossain, M., Leminen, S., & Westerlund, M. (2019). A systematic review of living lab literature. *Journal of cleaner production*, 213, pp. 976-988.
- Magnusson, C., Rydeman, B., Finocchietti, S., Cappagli, G., Porquis, L.B., Baud-Bovy, G. & Gori, M. (2015). *Co-located games created by children with visual impairments*. *MobileHCI '15*. Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct, pp. 1157-1162. DOI: 10.1145/2786567.2794350.
- Massari, M., & Pellegrino, V. (cur.). (2021). *Ricerca sociale ed emancipazione. Tra saperi, pratiche e percorsi di indagine*. Genova University Press (GUP).

- McPhee, C., Bancarz, M., Mambrini-Doudet, M., Chrétien, F., Huyghe, C., & Gracia-Garza, J. (2021). The Defining Characteristics of Agroecosystem Living Labs. *Sustainability*, 13(4), 1718. <https://doi.org/10.3390/su13041718>
- Dipartimento per la trasformazione digitale (14 June 2024). *Mobility as a Service for Italy* <https://innovazione.gov.it/notizie/avvisi-pubblici/mobility-as-a-service-for-italy>
- Murray R. (2002). Citizens' control of evaluations. Formulating and assessing alternatives. *Evaluation*, 8(1), pp. 81-100.
- Ninomiya, T., Fujita, A., Suzuki, D., & Umemuro, H. (2015). *Development of the Multi-dimensional Robot Attitude Scale: Constructs of People's Attitudes Towards Domestic Robots*. In Tapus, A., André, E., Martin, J.C., Ferland, F., & Ammi, M. (Eds.). *Social Robotics*. ICSR 2015. Lecture Notes in Computer Science, 9388, pp. 482-491. https://doi.org/10.1007/978-3-319-25554-5_48
- Nomura, T., Suzuki, T., Kanda, T., & Kato, K. (2006). Measurement of negative attitudes toward robots. *Interaction Studies. Social Behaviour and Communication in Biological and Artificial Systems*, 7(3), pp. 437-454. DOI: [10.1075/is.7.3.14nom](https://doi.org/10.1075/is.7.3.14nom)
- Nygaard, K. (1987). *Computers for democracy in trade unions*. In P. Ehn, M. Kyng, & L. Suchman (Eds.), *Computers and Democracy: A Scandinavian Challenge* (pp. 391-402). Avebury.
- Palumbo, M. (2009). I poteri locali tra governance e partecipazione. In Palumbo, M., & Torrigiani, C. (Eds.). (2009). *La partecipazione tra ricerca e valutazione* (pp. 11-36). FrancoAngeli.
- Palumbo, M. (2010). La partecipazione che cambia la valutazione (e forse anche i valutatori?). *Rivista trimestrale di Scienza dell'Amministrazione*, 54(1). DOI: [10.3280/SA2010-004003](https://doi.org/10.3280/SA2010-004003)
- Palumbo, M., & Congiu D. (2009). Partecipazione e valutazione per il Piano Regolatore Sociale. In Palumbo, M., & Torrigiani, C. (Eds.). (2009). *La partecipazione tra ricerca e valutazione* (pp. 37-72). FrancoAngeli.
- Parente, G., & Rossana, L. (2018). Il brainstorming valutativo. Dalla teoria alla pratica di ricerca in contesti caratterizzati da resistenze all'innovazione. *RIV Rassegna Italiana di Valutazione*, 71-72, pp. 276-292. DOI: [10.3280/RIV2018-071014](https://doi.org/10.3280/RIV2018-071014).
- Peca, A., Coeckelbergh, M., Simut R., Costescu, C., Pintea, S., David D., & Vanderborght, B. (2016). Robot Enhanced Therapy for Children with Autism Disorders: Measuring Ethical Acceptability. *IEEE Technology and Society Magazine*, 35(2), pp. 54-66. DOI: [10.1109/MTS.2016.2554701](https://doi.org/10.1109/MTS.2016.2554701).
- Powers, A., Kiesler, S., Fussell, S. R., & Torrey, C. (2008). Anthropomorphic Interactions with a Robot and Robot-like Agent. *Social Cognition*, 26(2), pp. 169-181. DOI: [10.1521/soco.2008.26.2.169](https://doi.org/10.1521/soco.2008.26.2.169).
- RAISE - Spoke 1 (19 Jun 2024). *Urban technologies for inclusive engagement*. <https://www.raiseliguria.it/en/spoke-1-raise/>
- Sanders, E.B.-N., & Stappers, P.J. (2008). Co-creation and the new landscapes of design. *CoDesign*, 4(1), pp. 5-18.
- Sella, L., Ragazzi, E., Rota, F.S., Adamo, M., Scartazza, A., & Pennisi, M. (2024). Interdisciplinary Research in Critical Zone Studies: The Analysis of Land Use Change in the Italian Alps. *Scienze Regionali*, 2/2024. Doi: [10.14650/112148](https://doi.org/10.14650/112148).
- Shamsuzzoha, A., Nieminen, J., Piya, S., & Rutledge, K. (2021). Smart city for sustainable environment: A comparison of participatory strategies from Helsinki, Singapore and London. *Cities*, 114. DOI: [10.1016/j.cities.2021.103194](https://doi.org/10.1016/j.cities.2021.103194)
- Solaiman I. et al. (2025). Evaluating the social impact of generative AI Systems in Systems and society. In Hacker, P., Engel, A., Hammer S., & Mittelstadt, B. (Eds.). *Oxford Handbook on the Foundations and Regulation of Generative AI* (pp. 461-515). Oxford University Press.
- Suchman, L.A. (1987). *Plans and Situated Actions: The Problem of Human-Machine Communication*. Cambridge University Press.
- Teodorowski, P., Gleason, K., Gregory, J.J. et al. (2023). Participatory evaluation of the process of co-producing resources for the public on data science and artificial intelligence. *Res Invol Engagem*, 9(67). <https://doi.org/10.1186/s40900-023-00480-z>

Zukoski, A.P., Bosserman, C. (2017). Essentials of participatory evaluation. In Fetterman, D.M., Rodríguez-Campos, L., & Zukoski, A.P. (Eds.). *Collaborative, participatory, and empowerment evaluation: stakeholder involvement approaches*. Guilford Publications.

CNR-IRCrES Working Papers

2026

- N.4/2026 [HERA: Hierarchical Engine for Rating Assessment. A sector-specific hierarchical artificial intelligence framework for one-year-ahead corporate rating forecasting](#). Greta Falavigna.
- N.3/2026 [Il detective sociale: laboratorio di divulgazione delle scienze sociali per la scuola primaria](#). Antonella Emina, Anna Perin, Lisa Sella, Isabella Maria Zoppi.
- N. 2/2026 [Il calcio come infrastruttura sociale? Riflessioni ed esempi dal contesto italiano](#). Chiara D'Amato, Luca Tricarico.
- N. 1/2026 [Regolamentazione ambientale europea e impatti economici sulle imprese](#). Greta Falavigna, Giampaolo Vitali.

2025

- N. 9/2025 [Finanziamento delle comunità energetiche: attori, strumenti e aspettative dell'ecosistema ESG nel contesto italiano](#). Maksym Koltunov. Luca Tricarico, Adriano Bisello, Chiara D'Amato.
- N. 8/2025 [Importazioni, esportazioni e strategie green: il caso di studio della chimica in Italia](#). Greta Falavigna, Giampaolo Vitali.
- N. 7/2025 [Mapping international collaboration in Nanosciences and Nanotechnologies: a bibliometric and econometric study of South African research](#). Ugo Finardi, Jeanne C.M. Vallette d'Osia.
- N. 6/2025 [Dispersione salariale e performance nel calcio in Italia: un'analisi degli incentivi tra sforzo e risultato nella serie A \(2010-2022\)](#). Mario Nosvelli, Matteo Colzato.
- N. 5/2025 [Designing a multiple case study approach for studying universities' community engagement](#). Andrea Orazio Spinello, Valentina Carazzolo, Ugo Finardi, Stefania Frongia, Valentina Ghibellini, Emanuela Reale, Andrea Vargiu.
- N. 4/2025 [Tools and Methods for Assessing Active Ageing and Inclusion: The Rima Experimental Project](#). Lisa Sella, Nicola Pollo, Valentina Lamonica.
- N. 3/2025 [Sinfonie urbane: il ruolo della ritmanalisi nella rigenerazione degli spazi. Il caso di Piazza San Venceslao a Praga](#). Vittoria Virgili, Marco Marucci.
- N. 2/2025 [From Single to Multi-Project Participation: SME Absorptive Capacity in Horizon 2020](#). Loreta Isaraj.
- N. 1/2025 [Invecchiamento e welfare responsabile: la "condizione anziana" nelle periferie di Roma Capitale](#). Cristiana Di Pietro.

2024

- N. 5/2024 [National frameworks for universities' community engagement: perspectives from Italy, France and the UK](#). Valentina Carazzolo, Ugo Finardi, Emanuela Reale, Andrea Orazio Spinello.
- N. 4/2024 [DAPIL – Digital archive of pilgrimage literature. Un archivio digitale per la letteratura medioevale di pellegrinaggio](#). Giuseppe Cuscunà.
- N. 3/2024 [Thesaurus e glossario ragionato della lingua della IA e della robotica. Thesaurus and reasoned glossary of AI and robotic language](#). Grazia Biorci.
- N. 2/2024 [Comprendere le trasformazioni di San Lorenzo, Roma. Un tentativo di ordine concettuale tra gentrificazione e politica urbana](#). Antonia Astore, Luca Tricarico.
- N. 1/2024 [How to measure the social acceptability of alternative environmental management solutions in wetlands and other ecosystems](#). Lisa Sella, Francesca Silvia Rota, Nicola Pollo.

2023

- N. 5/2023 [Laboratori creativi sperimentali a distanza per la valutazione](#). Isabella Maria Zoppi, Antonella Emina.
- N. 4/2023 [Eco-innovations and labor in the European automotive industry: an econometric study](#). Anna Novaresio.
- N. 3/2023 [Climate change adaptation planning: tools and methods for effective and sustainable decisions](#). Filippo Fraschini, Marco Pregolato.
- N. 2/2023 [The effect of propensity to savings on rate of profit](#). Mario De Marchi.
- N. 1/2023 [UNESCO o non UNESCO? Quando il brand incentiva il turismo: il caso dei paesaggi vitivinicoli delle Langhe e del Monferrato](#). Orsola Borsani, Greta Falavigna.

2022

- N. 5/2022 [Logit statico, Logit dinamico e modelli hazard](#). Franco Varetto.
- N. 4/2022 [Evolution of Deep Learning from Turing machine to Deep Learning next generation](#). Greta Falavigna.
- N. 3/2022 [A Simulation Model of Technology Innovation of a Territory](#). Angelo Bonomi.

[Numeri precedenti/Previous issues](#)

Robotica e intelligenza artificiale stanno trasformando profondamente la vita quotidiana, incidendo su modalità di relazione, accesso ai servizi e partecipazione sociale. Ma chi definisce i problemi che queste tecnologie dovrebbero risolvere? E in che misura le persone cui sono destinate possono contribuire a orientarne lo sviluppo?

Attraverso l'esperienza del progetto RAISE *Urban Technologies for Inclusive Engagement*, questo volume esplora il ruolo degli approcci partecipativi nei processi di innovazione tecnologica, con particolare attenzione all'inclusione di gruppi di utenti vulnerabili. Dalla definizione delle esigenze alla co-progettazione delle soluzioni, fino alla valutazione degli impatti generati, l'analisi mette in luce opportunità, criticità e condizioni che rendono possibile una partecipazione effettiva all'interno di progetti avanzati di robotica e intelligenza artificiale.

Fondato su evidenze empiriche, interviste, attività di co-design e osservazioni sul campo, il volume mostra come il coinvolgimento degli utenti possa contribuire a costruire tecnologie più pertinenti, accessibili e socialmente robuste, evidenziando al contempo le sfide legate alla rappresentatività, alle risorse necessarie e alla misurazione degli effetti prodotti.

Un contributo rivolto a ricercatori, progettisti, decisori pubblici e professionisti interessati a comprendere come innovazione tecnologica e inclusione sociale possano essere pensate e realizzate congiuntamente.