



HAL
open science

Exploring the Activities and Outcomes of Living Labs: Insights for meeting stakeholder expectations

Elodie Pillon

► **To cite this version:**

Elodie Pillon. Exploring the Activities and Outcomes of Living Labs: Insights for meeting stakeholder expectations. WOIC 2023, Nov 2023, Bilbao, France. <hal-04281582>

HAL Id: hal-04281582

<https://hal.science/hal-04281582v1>

Submitted on 13 Nov 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

Exploring the Activities and Outcomes of Living Labs: Insights for meeting stakeholder expectations

Pillon, Elodie
CESI LINEACT - Rouen
epillon@cesi.fr

Abstract:

Open innovation is a key concept in innovation management that encourages collaboration, knowledge sharing, and co-creation. Living Labs, as collaborative innovation structures, are well-suited for implementing open innovation. They serve as user-centered ecosystems for testing and validating user-oriented solutions in real-life conditions. While existing literature explores various dimensions of Living Labs, empirical research on practical implementation activities and outcomes is lacking. This study aims to address this gap by investigating the activities deployed within a Living Lab to support innovation projects. By examining a specific Living Lab in a territorial context, the research aims to provide insights into the mechanisms and processes that foster synergies among Living Lab actors and territorial stakeholders. The findings highlight the importance of collaboration, co-creation, and animating diverse ecosystems to maximize the impact of Living Lab initiatives on territorial ecosystems. It also underscores the role of the Living Lab as an ecosystem facilitator. For Living Lab managers and policymakers, the study provides practical insights on key activities that foster collaboration and meet stakeholder expectations.

Key words: Living Lab, stakeholders, activities, outcomes, collaboration

1. Introduction.

Open innovation is now a major concept in the field of innovation management. This approach promotes collaboration, knowledge sharing, and co-creation, allowing for the exploration of ideas and resources from diverse sources (Chesbrough & Crowther, 2006). By opening up to external partners such as customers, suppliers, universities, and other stakeholders, organizations can enhance their innovation capacity. In this context, Living Labs have emerged as collaborative innovation structures particularly suited for implementing open innovation (Westerlund & Leminen, 2011). They rely on external sources to innovate (Bergvall Kareborn & Stahlbrost, 2009) and create connections among different actors to facilitate collaboration as well as the development and validation of new products or services. Generally defined as user-centered innovation ecosystems (Huang & Thomas, 2021), Living Labs represent physical (or virtual) spaces for co-creation, testing, and validation of user-oriented solutions in real-life conditions (Della Santa et al., 2022) with the aim of addressing problems (Almirall et al., 2012; Westerlund & Leminen, 2011) including the social, technological, and economic challenges of a territory (Rodrigues & Franco, 2018; Voytenko et al., 2016).

Research on the concept of Living Labs is multidisciplinary (Leminen & Westerlund, 2019) and explores various aspects such as the definition of the concept (Janin & Pecqueur, 2013), key

characteristics (Hossain et al., 2019; Westerlund et al., 2018), the role of users (Leminen et al., 2015), user motivation (Bergvall Kareborn & Stahlbrost, 2009), types of services they provide (Schuurman et al., 2019), and their main contribution to the innovation process (Dekker et al., 2020). One of the most commonly used approaches to understanding Living Labs seems to be the study of innovation and collaboration activities (Hossain et al., 2019), including trials, validation, experimentation, and co-creation. The specialized literature explores these different dimensions in detail, providing valuable insights into the characteristics of Living Labs and the benefits they offer. However, while it is essential to understand how Living Labs work in specific situations (Hossain et al., 2019), empirical research on the practical implementation of activities and the resulting outcomes is lacking (Paskaleva & Cooper, 2021; Veeckman et al., 2013). Our study aims to fill this gap by addressing the following research question: What activities are deployed within a Living Lab to support innovation projects?

By deeply exploring a specific Living Lab situated within a particular territorial context, we strive to provide a better understanding of the specific activities that can be carried out within a Living Lab. From a theoretical standpoint, by identifying key activities and their resulting outcomes, we will shed light on the mechanisms and processes that foster the development of synergies between Living Lab actors and territorial stakeholders. On a managerial level, our research will offer practical insights to Living Lab managers and policymakers by highlighting activities that can be undertaken to maximize the impact of these initiatives on the territorial ecosystem while addressing the needs of stakeholders. In doing so, we hope to contribute to a better understanding of management practices and the enhancement of open innovation policies.

2. Theoretical background.

2.1. Definition of Living Lab.

Living Labs have emerged from the growing awareness of the challenges (and frequent failures) of commercializing science, which often struggles to move beyond the stages of fundamental research and development (Leminen & Westerlund, 2019). The value of innovation no longer resides solely in superior technical qualities but rather in its alignment with the needs, capabilities, and aspirations of users (Veeckman et al., 2013). As such, Living Labs have emerged as collaborative and open innovation environments, providing a third place where businesses, users, researchers, and other stakeholders can collaborate to develop and support innovation projects that address the challenges of a specific territory. To anchor themselves in local realities and address the specificities of territories, Living Labs are often situated in urban or regional environments (Bergvall Kareborn & Stahlbrost, 2009). These co-creation spaces encourage interaction among different actors, facilitate the sharing of knowledge and resources, and enable real-life experimentation (Eriksson et al., 2005). They facilitate interaction among various stakeholders, encouraging the sharing of expertise, co-design, and co-implementation of innovation projects (Baccarne et al., 2015). The active involvement of users in the innovation process promotes the adoption and diffusion of innovations (Bergvall Kareborn & Stahlbrost, 2009; Leminen et al., 2015). By providing a real-world context for testing prototypes, evaluating their functionality, and gathering feedback from users (Hossain et al., 2019), and with an iterative approach, Living Labs allow for adjustments and improvements to the proposed solutions, thus enhancing their market acceptance. Additionally, Ballon et al. (2018) identify several objectives of a Living Lab, such

as aligning innovation processes and outcomes with user preferences and practices, discovering unexpected uses, identifying solid business models and revenue sources, promoting cooperation among stakeholders, allowing specific stakeholder groups to influence design characteristics, fostering acceptability, and reducing failures.

Living Labs are characterized by their participatory approach, involving users from the early stages of the innovation process. Their active contribution helps in better understanding their needs and expectations, thus promoting the development of more suitable solutions (Almirall & Wareham, 2009). User-centered innovation can significantly reduce costs compared to producer-centered innovation (Von Hippel, 2007). The involvement of users can range from passive participation, where their role is limited to providing feedback on specific technologies, products, or services, to active participation where they co-create new solutions (Leminen et al., 2015). However, although Living Labs are associated with active user participation, in practice, users often remain passive during the innovation process and are less involved (Nyström et al., 2014). Leminen et al. (2014) identify four roles that users can adopt within a Living Lab: informants, testers, contributors, and co-creators. Beyond users, the existing literature on Living Labs emphasizes the presence of multiple stakeholders (Bergvall Kareborn & Stahlbrost, 2009) in innovation activities, resulting in complex partnerships and fostering links between universities and industry, as well as between large companies, SMEs, and startups. This often leads to the formation of what is called public-private-person partnerships (Hyysalo & Hakkarainen, 2014). These stakeholders, represented by actors from different spheres of society, can play various roles. Westerlund & Leminen (2011) identify four roles: enablers, providers, utilizers, and users. Enablers support Living Lab activities by promoting them or providing financial support or space. They are typically public actors, funders, or non-governmental organizations such as cities or municipalities. Providers bring essential knowledge and expertise to innovation support activities. They mainly consist of universities, training institutes, or consultants. Utilizers are the organizations (public or private) that benefit from the innovations resulting from Living Lab activities. Finally, as mentioned earlier, users are citizens who participate in Living Lab activities. By integrating a Living Lab, stakeholders generally have specific expectations. For example, communities may seek to initiate citizen-government dialogue, integrate innovation into an environment, or stimulate a value chain with structural effects on the territory. Investors may aim to reduce time to market or research and development time. Users may want to actively contribute to the improvement/creation of innovations or enhance their skills. Businesses may seek to develop, validate, and integrate new ideas or establish partnerships with other companies or users. Finally, researchers may benefit from privileged access to communities in the field and new ways to valorize their research. Thus, by integrating a Living Lab, each stakeholder can contribute to the territory while addressing their own needs.

In summary, Living Labs play a crucial role in promoting open innovation by providing a space for collaboration, co-creation, and experimentation. Their participatory approach and proximity to users foster the development of innovative solutions that are tailored to the needs of stakeholders and the specificities of territories. They enable a range of actors to identify mutual interests, address emerging challenges related to society and businesses, and pursue common projects with practical applications and real-world impact.

2.2. Activities and outcomes of Living Labs.

Living Labs are collaborative innovation environments that enable the detection, prototyping, validation, and refinement of complex solutions in multiple real-life contexts (Ballon et al., 2018).

These spaces provide a platform for co-creation, exploration, experimentation, and evaluation, deploying a set of iterative activities throughout the different stages of an innovation process. Huang and Thomas (2021) highlight that studies on co-creation methods and activities are relatively scarce due to a lack of conceptual and methodological knowledge in early studies (Bergvall Kareborn & Stahlbrost, 2009; Leminen & Westerlund, 2017).

Through participatory research methods such as discussions, surveys, or observations (Hossain et al., 2019), Living Labs work closely with stakeholders to identify emerging needs and challenges. Co-creation is facilitated by recruiting user panels with specific characteristics to develop and test products and services (Schuurman & De Marez, 2012), as well as by actively involving users in the innovation process through workshops, roundtables, or hackathons (Huang & Thomas, 2021). Although specific co-creation methods have not yet been established according to Følstad (2008), various methods such as analysis of system logs or automatically collected behavioral data, ethnographic methods, questionnaires, focus groups, and observations are listed, allowing for data collection to stimulate co-creation potential. With these tools, Living Labs provide a framework for conducting real-world experiments in real environments. This enables the testing and evaluation of prototypes, gathering user feedback, and making iterative improvements to ongoing innovations under development (Hossain et al., 2019). Lastly, by organizing various types of activities or workshops, Living Labs raise awareness among users and stakeholders about innovation, new technologies, and collaborative working methods. This contributes to strengthening the skills of the actors involved in the innovation process.

Veeckman et al. (2013) emphasize that in a Living Lab, innovation projects are shaped through the interaction and engagement of users, researchers, businesses, and other stakeholders. By understanding the specific contributions of each stakeholder and identifying the desired outcomes, innovation activities can be tailored to the needs and goals of each party. For example, if the goal is to develop a new product that meets user needs, co-creation and experimentation activities can be strengthened to foster active user involvement and obtain valuable feedback. Similarly, if the expected outcome is the successful adoption of an innovation in the market, it is essential to consider user expectations and preferences from the early stages of the development process. Validation and evaluation activities can be implemented iteratively to gather user feedback and adjust innovations accordingly. Therefore, the environment of a Living Lab influences the nature and direction of innovation projects. Thus, innovation activities are connected to the contributions and expected outcomes. To assess the effectiveness of a Living Lab's activities, particular attention should be given to the resulting outcomes. Schaffers and Turkama (2012) explain that product and service innovations are typical outcomes of Living Labs. However, Hossain et al. (2019) reveal in their literature review that outcomes are not only tangible (designs, products, prototypes, and solutions) but can also be intangible (concepts, ideas, intellectual property rights, knowledge, and services). Veeckman et al. (2013) specify that outcomes are closely linked to the environment and chosen innovation approach. Leminen et al. (2012) show that outcomes depend on:

Strategic intention, which refers to individual or common collaboration motives.

- Passion or the willingness of users or ecosystem partners to participate and collaborate within the community.
- Knowledge and skills of the Living Lab.
- The quantity and availability of resources.

- The number of different partners in the Living Lab network.

3. Research methodology.

Given the exploratory approach in this study and the research question, we conducted a qualitative study, and more specifically a participatory case study. This research approach involves active participation of researchers in all phases of the case study. It aims to integrate the perspectives and knowledge of the actors involved in the studied situation.

3.1. The Living Lab Mix.

Our case study is conducted within the framework of the project « Rouen Mobilité Intelligente pour Tous" (Rouen Smart Mobility for All) which seeks to completely rethink the mobility system to design an offering that encompasses all modes, services, and uses. One of the actions is to launch a Living Lab, with the objective of making the Rouen Normandy Metropolis a reference territory for inclusive innovations and experiments in the field of mobility. The Living Lab "Mix" is a physical space based in Rouen (France) launched in January 2021. It focuses on 12 general interest missions:

- Territory observation: Study current and future users of mobility.
- Creation and valorization of common goods: Promote citizen inclusion and social acceptability of innovation projects.
- Public and local stakeholders' awareness of environmental and societal transition related to mobility.
- Constitution and development of a citizen innovation panel to generate innovative ideas and support projects led by third parties.
- Establishment of citizen-user specifications as a basis for future collaborative projects in the territory.
- Identification and selection of innovation projects in the mobility of goods and people.
- Facilitation of access to open data from the territory (Open Data) and utilization of non-open data to derive added value in innovation projects.
- Connecting and facilitating collaboration processes among partners to implement mobility experiments in the territory.
- Networking with other national, European, and international Living Labs or third places.
- Attractiveness and promotion of the territory by organizing and participating in exhibitions and seminars focused on citizen inclusion in innovation projects.
- Communication and promotion to enhance visibility of the territory and highlight ongoing collaborative projects.
- Contribution to third-party initiatives such as Rouen European Capital of Culture 2028 and digital, environmental, and energy transitions.

To date, 36 partners divided into 6 colleges have joined the Mix. The 6 colleges are:

- The main funders.
- Local authorities and government departments.
- Users.
- Professional associations and sectors.
- Companies and technology.

- Research and higher education.

3.2. Data collection.

The data were collected as part of a research-intervention approach. This involved participation in four co-creation workshops organized by Mix (between December 2020 and May 2023) with the different stakeholders. For the first co-creation workshop, before the official launch of the Living Lab, 25 participants representing 20 different structures (belonging to the overall mobility ecosystem of the region) were present. This session was dedicated to gather individual motivational factors for joining the Living Lab project and identify the actors in the territory and their positioning within the project. For the second co-creation workshop, 49 participants representing 39 different structures were present. This session was dedicated to present a first draft of the service offering based on the needs identified during the first session and to gather participants' expectations towards the Living Lab project. To define the service offer, each participant had to vote for the most interesting proposed services. It aimed to co-construct the MIX collaborative innovation process, which will enable all partners to bring forward innovative mobility issues that will give structure to the region. The third and fourth co-creation workshop were only for partner membership in the aim to identify the key success factors for a collaborative project conducted within the Living Lab framework. So 14 participants representing 13 different structures were present to:

- Build a project compass to select projects
- Share visions of the needs of such a collaborative project
- Identify for each partner: how are they involved? What resources do they bring ? And what are your constraints?

In order to gather as much data as possible on both the context of the Living Lab Mix and its activities, we also attended the general assemblies of Mix, participated in partner-focused events, and collected the documents produced during various co-creation workshops. In addition, we had an meeting with the director of the Living Lab to have a better understanding of the aim of the Living Lab Mix and its missions. Additionally, we collected information on events designed to introduce the Living Lab to potential partners or provide progress updates to funders.

4. Results and discussion.

4.1. Results.

As innovation activities are connected to stakeholders, their needs, and the targeted objectives (Veeckman et al., 2013), it is essential to identify these stakeholders and their needs. The 20 participants' structures at the first session for identify individual motivational factors for joining the Living Lab project could be grouped into 4 categories:

- Communities (3 structures)
- Mobility (5 structures)
- Academic research (6 structures)
- Energy (6 structures)

The collection of individual motivations (by structure) regarding the Living Lab project (Table 1) has highlighted four main axes of motivations:

- Initiating multi-partner projects and collaborations with the ecosystem.
- Experimenting and testing solutions that meet identified territorial needs.
- Imagining and co-constructing mobility services with citizens and prefiguring new uses.
- Identifying and understanding user expectations.

Examples of verbatim comments	Motivation
"Collaborating to explore new avenues." "Co-constructing." "Sharing data and working together."	Initiating multi-partner projects and collaborations within the ecosystem
"Testing solutions with a targeted panel." "Engaging with users, benefiting from their feedback."	Experimenting and testing solutions that address identified territorial needs.
"Imagining new forms of transportation and new uses." "Generating ideas for the benefit of citizens."	Imagining and co-constructing mobility services with citizens and prefiguring new uses.
"Addressing users' mobility expectations." "Understanding the genuine needs of residents in the Rouen Normandie Metropolitan area."	Identifying and understanding user expectations

Table 1: Individual motivation of participants regarding the Living Lab project

These four main axes of motivations encompass two different scales. On the macro scale, which refers to the scale of service provision: Initiating multi-partner projects and collaborations with the ecosystem. This dynamic initiated with the ecosystem should align with its needs. This can include projects, as well as events, roundtable discussions. On the micro scale, for the other three levers, referring to methodologies and approaches related to user-centered innovation that can be applied to projects. Regarding participants' expectations of the living lab, the main purpose of the Living Lab is identified unanimously by the majority of groups: to promote the cross-pollination of actors (professionals, general public) and their participation in the development of future mobility through user-centered innovation methodologies, known as Living Lab approaches. This notion of user-centered innovation is reflected in a number of verbatim: "expression and gathering of needs", "co-creation", "testing", and "experimentation". However, we highlight that companies refer more to the concept of experimentation than other participants do: "testing services and benefiting from user panels." We also note that the partners expect the Living Lab to provide an "access to a unique database for the region". Overall, the Living Lab Mix should thus address three ambitions: i) Supporting and equipping Living Lab projects and partners, ii) initiating and conducting innovative collaborative projects, and iii) fostering and animating a diverse ecosystem and an open space. Accompaniment activities address the need to experiment and test solutions that meet identified territorial needs. Activities related to the initiation of innovative collaborative projects will enable the envisioning and co-construction of mobility services with citizens, prefiguring new uses, as well as identifying and understanding user expectations. Meanwhile, fostering and animating a diverse ecosystem and an open space allow for initiating multi-partner projects and collaborations with the ecosystem.

About the expectations of stakeholders towards the Living Lab, a quarter of the participants were local authorities, a quarter from mobility-related players, a quarter from ecosystem structures (incubators and clusters), followed by a smaller proportion of 16% from academic players and 6% energy-related players. Stakeholders in mobility, energy, and academic research expect to benefit from a forward-looking perspective on trends and innovations, integrate into a structured ecosystem, receive support in project calls, receive individual support in project implementation, enhance project maturity, and improve project quality through public exposure and feedback. Incubators and clusters have the specific need to identify innovative startups. All actors want to be able to identify the right interlocutor to address an identified need, have an assessment of project profitability, support innovation diffusion, and provide public/user access. The stakeholders seek to identify mutual interests, address emerging societal challenges, and undertake joint projects with practical applications and real-world impact. Finally, the following activities have been selected:

- Innovation and usage monitoring in coordination with the ecosystem: Keeping track of emerging trends and user behaviors to inform the development of innovative solutions.
- Organization of networking events (B2B, general public): Facilitating opportunities for stakeholders to connect, collaborate, and share knowledge.
- Organization of working groups, pooling of resources, and structuring projects: Bringing together diverse stakeholders to collaborate on projects, share resources, and ensure project success.
- Support for local councilors to encourage and train them in the challenges of innovative mobility: Assisting and empowering local councilors to understand and address the challenges of implementing innovative mobility solutions.
- Nugget detection: Identifying promising ideas, concepts, or technologies with potential for further exploration and development.
- Monitoring of RFPs and funding: Keeping track of relevant project funding opportunities and providing guidance on the application process.
- Connection with relevant stakeholders: Facilitating connections and collaborations between the Living Lab and stakeholders who can contribute to and benefit from its activities.
- Project evaluation: Assessing the performance, impact, and outcomes of projects to ensure their effectiveness and identify areas for improvement.
- Support for strategic project definition: Assisting in the strategic planning and definition of projects to align with the Living Lab's objectives and maximize their impact.
- RFPs identification: Identifying and disseminating information about request for proposals (RFPs) that align with the Living Lab's focus areas.
- Targeted partner search: Identifying potential partners who can contribute expertise, resources, or collaboration opportunities to projects.
- Support in project implementation: Providing guidance, resources, and assistance in implementing projects effectively.
- Support for small-scale implementation: Assisting in the implementation of pilot projects or small-scale initiatives to test and validate innovative ideas.
- Final project evaluation: Conducting a comprehensive assessment of completed projects to evaluate their outcomes, impact, and success.
- Innovation promotion: Promoting and showcasing innovative solutions and ideas to inspire others and foster a culture of innovation.

- Public readiness for innovation: Engaging and preparing the public for embracing and adopting innovative mobility solutions through awareness campaigns and education initiatives.
- Consultation on challenges: Seeking input and feedback from stakeholders on challenges and opportunities in the field of innovative mobility.
- Conducting satisfaction surveys: Gathering feedback from stakeholders and users to assess their satisfaction, gather insights, and identify areas for improvement.

In terms of deliverables, stakeholders expected that the Mix propose:

- Events, conferences, and publications to disseminate information and knowledge.
- Newsletter to keep stakeholders updated on the latest developments.
- Webinars/conferences for remote participation and knowledge sharing.
- Address book to maintain a network of relevant contacts.
- Collaborative digital platform for effective collaboration and knowledge exchange.
- Collaborative projects that foster cooperation among stakeholders.
- Conferences specifically designed for elected representatives to educate and engage them in the challenges of innovative mobility.
- Training courses/workshops to enhance skills and knowledge.
- Challenges to encourage innovative solutions and ideas.
- Coordinated events that bring together various stakeholders for networking and collaboration.
- Web page as a dedicated online presence for the Living Lab.
- Targeted networking activities to connect with specific stakeholders.
- Evaluation files/project notes to assess and measure the success of projects.
- Advice on gaining maturity in project development and implementation.
- Workshops and working groups for in-depth discussions and collaboration.
- Recommendations for improvements and future actions.
- Proposal/presentation to relevant RFPs for funding opportunities.
- Meetings with thematic players to explore synergies and collaborations.
- Editing workshops to refine project documentation and materials.
- Iterations to fine-tune and improve project outcomes.
- (Co)production of project components to achieve desired results.
- Experimentation strategy, implementation, and results to test and validate innovative solutions.
- Creation of support, implementation, and administration of evaluation to ensure effective project management.
- Marketing campaign to raise awareness and promote innovation.
- Solution referencing to highlight successful solutions and encourage their adoption.
- Communication with the public through social networks and events to engage and inform them.
- Public access and feedback during project implementation to incorporate user perspectives.
- Demonstrator to showcase and demonstrate innovative solutions.
- Social acceptance measures to assess the impact and acceptance of projects.
- Survey results to gather feedback and insights from stakeholders and users.

These outcomes will enable us to assess whether the Living Lab is meeting stakeholders' expectations, and to monitor the activities implemented.

Stakeholder need	Activity	Outcome
A forward-looking vision of trends and innovations.	Innovation and usage monitoring coordination with the ecosystem	<ul style="list-style-type: none"> ➤ Events ➤ Conferences ➤ Publications
Integrating a structured ecosystem	Organization of networking events (B2B, general public)	<ul style="list-style-type: none"> ➤ Newsletter ➤ Webinaires / conferences
	Organization of working groups, pooling of resources, structuring projects.	<ul style="list-style-type: none"> ➤ Address book ➤ Collaborative digital platform ➤ Collaborative projects
	Support for local councilors to encourage and train them in the challenges of innovative mobility	<ul style="list-style-type: none"> ➤ Conferences for elected representatives ➤ Training courses / workshops
Identify innovative startups	Nugget detection	<ul style="list-style-type: none"> ➤ Challenges
Description of RFPs	Monitoring of RFPs and funding	<ul style="list-style-type: none"> ➤ Coordinated events ➤ Web page
Identify the right player to meet an identified need	Connection with relevant stakeholders	<ul style="list-style-type: none"> ➤ Targeted networking
Reinforcement of project maturity.	Project evaluation	<ul style="list-style-type: none"> ➤ Evaluation file / project note ➤ Advice on gaining maturity
	Support for strategic project definition	<ul style="list-style-type: none"> ➤ Workshops ➤ Working groups ➤ Recommendations
Individual support in setting up projects	RFPs identification	<ul style="list-style-type: none"> ➤ Proposal / presentation to relevant RFPs
	Target partner search	<ul style="list-style-type: none"> ➤ Meet thematic players
	Support in projects implementation	<ul style="list-style-type: none"> ➤ Editing workshops ➤ Iterations ➤ (co)production of parts
Enhance project quality through public exposure and feedback	Support for small-scale implementation	<ul style="list-style-type: none"> ➤ Experimentation strategy, implementation and results
Evaluation of project returns	Final project evaluation	<ul style="list-style-type: none"> ➤ Creation of the support, implementation and administration of the evaluation.

Support for the dissemination of innovations.	Innovation promotion	<ul style="list-style-type: none"> ➤ Marketing campaign ➤ Solution referencing,
Public/users access	Preparing the public for innovation	<ul style="list-style-type: none"> ➤ Communication with the public (social networks / events).
	Consultation on challenges	<ul style="list-style-type: none"> ➤ Public access and feedback during project implementation ➤ Demonstrator ➤ Social acceptance measures
	Conducting satisfaction surveys	<ul style="list-style-type: none"> ➤ Survey results

Table 2 : Summary of activities and outcomes in relation to identified needs

4.2. Discussion

Through the activities and outcomes identified by stakeholders, we can define the expected impacts of the Living Lab Mix on the territory:

- Foster the creation of an inclusive and sustainable mobility innovation community.
- Develop and test innovative mobility solutions to meet specific territorial needs.
- Enhance existing mobility services through the integration of technologies and new approaches.
- Actively involve citizens in co-creating and making decisions regarding mobility projects.
- Strengthen the skills of stakeholders in the field of sustainable and innovative mobility.
- Facilitate the diffusion and transfer of knowledge among the actors of the Living Lab Mix.
- Establish strong partnerships among different actors in the mobility sector.
- Position Rouen Normandy Metropolis as an innovation hub in mobility.

These impacts contribute to achieving a more inclusive, sustainable, and efficient mobility in the region of Rouen Normandy Metropolis, while fostering collaboration among stakeholders and promoting the adoption of innovative mobility solutions. The expected impacts of the Living Lab Mix on the territory need to be measured using a dashboard, which is often identified as a gap in Living Lab practices. Through this study, we can identify several insights:

- The main categories of actors involved in the Living Lab Mix are communities, mobility-related entities, academic research institutions, and energy-related organizations.
- The motivations of the actors include initiating multi-partner projects, experimenting with solutions to meet territorial needs, co-creating mobility services with citizens, and understanding user expectations.

- The expectations of the actors towards the Living Lab Mix include networking opportunities, information dissemination, collaborative projects, skill enhancement through training, and support for project implementation.
- The activities of the Living Lab Mix are focused on monitoring the ecosystem, initiating multi-partner projects, evaluating and supporting proposed projects, experimenting and testing solutions to address identified territorial needs, co-creating mobility services with citizens, identifying user expectations, and preparing the public for innovation.
- A key outcome identified is the creation of a diverse and open ecosystem, which is an activity expected by all actors.

These insights provide a deep understanding of Living Lab management practices and the improvement of open innovation policies. They highlight the importance of collaboration, co-creation, and animating diverse ecosystems to maximize the impact of Living Lab initiatives on territorial ecosystems. The presence of multiple stakeholders, as mentioned in the literature (Bergvall Kareborn & Stahlbrost, 2009), is well reflected in the Living Lab Mix framework through the 6 partner colleges and the participants in the various co-creation workshops. However, we notice that citizens were not consulted during the co-creation workshops and are not part of the partners. The Mix explains that their involvement in the project will be the subject of related workshops. It is also worth noting that in the defined activities, citizens (the primary target users of soft mobility systems) seem to be consulted only for feedback on specific technologies, products, or services. In line with the work of Nyström et al. (2014), users remain less involved, and therefore, they appear to have a passive role in the innovation process, as defined by Leminen et al. (2015). However, a significant number of workshop participants expressed support for "the creation and provision of panels." This underscores the importance of fully involving citizens throughout the innovation process, from identifying needs to experimenting with future services.

The literature indicated that the activities of a Living Lab can be summarized as detecting, prototyping, validating, and refining complex solutions in real-life settings through a loop of activities (co-creation, exploration, experimentation, evaluation). While we do find these steps within the Living Lab Mix framework, the federation and animation of the diverse ecosystem emerge as a key activity expected by all stakeholders. Just as the environment of a Living Lab shapes the undertaken projects (Veeckman et al., 2013), it also appears to shape the activities conducted within it. In the case of the Living Lab Mix, although the identified objective is to make Rouen Normandy Metropolis a reference territory for inclusive innovations and experiments in the field of mobility, it seems that the stakeholders expect the Living Lab Mix to help them strengthen collaborations and expand their network, particularly by facilitating their interaction with other actors in the territory or by providing access to a unique database consolidating regional data. This highlights the importance of facilitating and developing access to local data. Thus, the Living Lab Mix must not only facilitate the innovation process but also address the relational dynamics gaps within the ecosystem. Lastly, although Schaffers and Turkama (2012) explain that product and service innovations are typical outcomes of Living Labs, most of the defined outcomes for the Living Lab Mix, such as the address book, a collaborative digital platform, or collaborative projects, are neither services nor products and appear to be more intangible. This can be explained by the fact that the activities were

defined based on the articulated needs of stakeholders, and these same stakeholders participated in defining the outcomes that will enable a relatively reliable measurement of whether the Living Lab Mix meets their expectations or not.

5. Conclusion.

Open innovation emphasizes collaboration, knowledge sharing, and co-creation to tap into diverse sources of ideas and resources. Living Labs have emerged as collaborative innovation structures that are particularly well-suited for implementing open innovation strategies (Westerlund & Leminen, 2011). These user-centered innovation ecosystems serve as physical or virtual spaces for co-creation, testing, and validation of user-oriented solutions in real-life conditions, addressing a wide range of social, technological, and economic challenges in a given territory (Almirall et al., 2012; Della Santa et al., 2022; Huang & Thomas, 2021; Westerlund & Leminen, 2011). While extensive research has been conducted on various aspects of Living Labs (Hossain et al., 2019), there is a lack of empirical studies on the practical implementation of activities and their outcomes (Paskaleva & Cooper, 2021; Veeckman et al., 2013). This study aims to bridge this gap by examining the activities deployed within a specific Living Lab, providing insights into the mechanisms and processes that facilitate collaboration and synergies among Living Lab actors and territorial stakeholders.

We employed a participatory case study, to explore the Living Lab Mix, a physical space in Normandy, that aims to foster inclusive innovation and experimentation in the field of mobility. The study involved active participation from researchers and various stakeholders through co-creation workshops and data collection from different sources. The findings revealed four main categories of stakeholders: communities, mobility-related entities, academic research institutions, and energy-related organizations. These stakeholders expressed motivations such as initiating multi-partner projects, experimenting with solutions to meet territorial needs, co-constructing mobility services with citizens, and understanding user expectations. The stakeholders' expectations from the Living Lab Mix included networking opportunities, dissemination of information, collaborative projects, skill enhancement through training, and support in project implementation. The activities of the Living Lab Mix were found to align with these expectations. They are focused on watching the ecosystem, initiating multi-partner projects, assessing and supporting proposed projects, experimenting and testing solutions to address identified territorial needs, co-creating mobility services with citizens, identifying user expectations and preparing the public for innovation. Additionally, federating and animating a diverse and open ecosystem was identified as a key activity expected by all stakeholders. Different outcomes have been also identified by stakeholders according to their expectations and allow to identify the expected impacts of the Living Lab Mix on the territory. In this way, the Living Lab will be able to set up a dashboard to measure its impact on the region (a point often identified as a lack for Living Labs).

More broadly, this study contributes to a better understanding of Living Lab management practices and the enhancement of open innovation policies. The results underscore the importance of collaboration, co-creation, and animating diverse ecosystems to maximize the impact of Living Lab initiatives on territorial ecosystems. It also highlights the role of ecosystem

facilitator expected of the Living Lab by stakeholders. From a managerial perspective, this research provides practical insights for Living Lab managers and policymakers by identifying key activities that can be undertaken to foster collaboration among stakeholders and address their specific expectations.

The remainder of this study will focus on the implementation and monitoring of these actions, in order to better understand how they can impact the region and whether they really meet the expectations of stakeholders.

References:

- Almirall, E., Lee, M., & Wareham, J. (2012). Mapping Living Labs in the Landscape of Innovation Methodologies. *Technology Innovation Management Review*, 2(9), 12–18. <https://doi.org/10.22215/TIMREVIEW/603>
- Almirall, E., & Wareham, J. (2009). Innovation: A question of fit - The Living Labs approach. *Proceedings of the IADIS International Conference WWW/Internet 2009, ICWI 2009*, 2, 349–353.
- Baccarne, B., Schuurman, D., & Marez, L. De. (2015). Facilitating Quintuple Helix innovation with Urban Living Labs Basti. *XXVI ISPIM Conference – Shaping the Frontiers of Innovation Management*, June.
- Ballon, P., Van Hoed, M., & Schuurman, D. (2018). The effectiveness of involving users in digital innovation: Measuring the impact of living labs. *Telematics and Informatics*, 35(5), 1201–1214. <https://doi.org/10.1016/j.tele.2018.02.003>
- Bergvall Kareborn, B., & Stahlbrost, A. (2009). Living Lab: an open and citizen-centric approach for innovation. *International Journal of Innovation and Regional Development*, 1(4), 356. <https://doi.org/10.1504/ijird.2009.022727>
- Chesbrough, H., & Crowther, A. (2006). Beyond high-tech: early adopters of Open Innovation in other industries. *R&D Management*, 36(3), 229–236.
- Dekker, R., Franco Contreras, J., & Meijer, A. (2020). The Living Lab as a Methodology for Public Administration Research: a Systematic Literature Review of its Applications in the Social Sciences. *International Journal of Public Administration*, 43(14), 1207–1217. <https://doi.org/10.1080/01900692.2019.1668410>
- Della Santa, S., Tagliazucchi, G., & Marchi, G. (2022). How does the space influence Living Labs? Evidence from two automotive experiences. *R&D Management*, 1–16. <https://doi.org/10.1111/radm.12554>
- Eriksson, M., Niitamo, V.-P., & Kulkki, S. (2005). State-of-the-art in utilizing Living Labs approach to user-centric ICT innovation - a European approach. *Technology*, 1(13), 1–13. http://openlivinglabs.i2cat.cat/documents/SOA_LivingLabs.pdf
- Følstad, A. (2008). Living Labs for innovation and development of information and communication technology: a literature review. *The Electronic Journal of Virtual Organizations and Networks*, 10(August), 99–131.
- Hossain, M., Leminen, S., & Westerlund, M. (2019). A systematic review of living lab literature. *Journal of Cleaner Production*, 213(March 2019), 976–988. <https://doi.org/10.1016/j.jclepro.2018.12.257>
- Huang, J. H., & Thomas, E. (2021). A Review of Living Lab Research and Methods for User Involvement. *Technology Innovation Management Review*, 11(9–10), 88–107. <https://doi.org/10.22215/TIMREVIEW/1467>
- Hyysalo, S., & Hakkarainen, L. (2014). What difference does a living lab make? Comparing two health technology innovation projects. *CoDesign*, 10, 191–208. <https://doi.org/10.1080/15710882.2014.983936>
- Janin, C., & Pecqueur, B. (2013). *Les Living Labs : Définitions, enjeux, comparaisons et premiers retours d'expériences*.
- Leminen, S., Nyström, A. G., & Westerlund, M. (2015). A typology of creative consumers in living labs. *Journal of Engineering and Technology Management - JET-M*, 37, 6–20. <https://doi.org/10.1016/j.jengtecman.2015.08.008>

- Leminen, S., & Westerlund, M. (2017). Categorization of Innovation Tools in Living Labs. *Technology Innovation Management Review*, 7(1), 15–25. <https://doi.org/10.22215/timreview1046>
- Leminen, S., & Westerlund, M. (2019). Living labs: From scattered initiatives to a global movement. *Creativity and Innovation Management*, 28(2), 250–264. <https://doi.org/10.1111/caim.12310>
- Leminen, S., Westerlund, M., & Kortelainen, M. (2012). A recipe for innovation through living lab networks. *ISPIIM*.
- Leminen, S., Westerlund, M., & Nyström, A. G. (2014). On becoming creative consumers - user roles in living labs networks. *International Journal of Technology Marketing*, 9(1), 33–52. <https://doi.org/10.1504/IJTMKT.2014.058082>
- Nyström, A. G., Leminen, S., Westerlund, M., & Kortelainen, M. (2014). Actor roles and role patterns influencing innovation in living labs. *Industrial Marketing Management*, 43(3), 483–495. <https://doi.org/10.1016/j.indmarman.2013.12.016>
- Paskaleva, D. K., & Cooper, D. I. (2021). Are living labs effective? Exploring the evidence. *Technovation*, 106(May), 102311. <https://doi.org/10.1016/j.technovation.2021.102311>
- Rodrigues, M., & Franco, M. (2018). Importance of living labs in urban Entrepreneurship: A Portuguese case study. *Journal of Cleaner Production*, 180, 780–789. <https://doi.org/10.1016/j.jclepro.2018.01.150>
- Schaffers, H., & Turkama, P. (2012). Living Labs for Cross-Border Systemic Innovation. *Technology Innovation Management Review*, 2(9), 25–30. <https://doi.org/10.22215/timreview605>
- Schuurman, D., & De Marez, L. (2012). *Technology Innovation Management Review Structuring User Involvement in Panel-Based Living Labs*. September, 31–38. www.timreview.ca
- Schuurman, D., Herregodts, A. L., Georges, A., & Rits, O. (2019). Innovation management in living lab projects: The innovatrix framework. *Technology Innovation Management Review*, 9(3), 64–73. <https://doi.org/10.22215/TIMREVIEW/1225>
- Veeckman, C., Schuurman, D., Leminen, S., & Westerlund, M. (2013). Linking Living Lab Characteristics and Their Outcomes: Towards a Conceptual Framework. *Technology Innovation Management Review*, 3(12), 6–15. <https://doi.org/10.22215/timreview/748>
- Von Hippel, E. (2007). Horizontal innovation networks—by and for users. *Industrial and Corporate Change*, 16(2), 293–315.
- Voytenko, Y., McCormick, K., Evans, J., & Schliwa, G. (2016). Urban living labs for sustainability and low carbon cities in Europe: Towards a research agenda. *Journal of Cleaner Production*, 123, 45–54. <https://doi.org/10.1016/j.jclepro.2015.08.053>
- Westerlund, M., & Leminen, S. (2011). Managing the Challenges of Becoming an Open Innovation Company: Experiences from Living Labs. *Technology Innovation Management Review*, 1(1), 19–25. <https://doi.org/10.22215/timreview489>
- Westerlund, M., Leminen, S., & Habib, C. (2018). Key Constructs and a Definition of Living Labs as Innovation Platforms. *Technology Innovation Management Review*, 8(12), 51–62. <https://doi.org/10.22215/timreview/1205>