Uncovering Living Labs' Activities and Outcomes: Key Insights for Stakeholder Expectations

Elodie Pillon

Uncovering Living Labs' Activities and Outcomes: Key Insights for Stakeholder Expectations

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

Abstract:
This article presents a research study on the activities and outcomes of Living Labs, which are collaborative innovation structures that involve various stakeholders in the innovation process. The study aims to provide insights into the practical implementation of Living Labs and their resulting outcomes. The literature review highlights the importance of understanding the activities conducted within Living Labs and their outcomes, but notes that there is a lack of empirical research on the subject. The study uses a participatory case study methodology to examine the activities and outcomes of a specific Living Lab, with a focus on the "Rouen Smart Mobility for All" project. The findings of the study contribute to the understanding of the mechanisms that promote the development of synergies between Living Labs and territorial stakeholders, and provide practical insights for the implementation of Living Labs.

Key words: Living Lab, collaborative innovation, stakeholders, activities, outcomes, co-creation

1. Introduction.

Living Labs have emerged as structures for collaborative innovation particularly suited to open innovation implementation (Westerlund & Leminen, 2011). These Living Labs rely on external sources to innovate (Bergvall Kareborn & Stahlbrost, 2009), create connections between different actors to facilitate collaboration, as well as the development and validation of new products or services. Generally defined as user-centric innovation ecosystems (Huang & Thomas, 2021), Living Labs represent physical (or virtual) spaces for co-creation, testing, and validation of user-oriented solutions under real-life conditions (Della Santa et al., 2022) to address issues integrating the social, technological, and economic challenges of a specific territory (Rodrigues & Franco, 2018; Voytenko et al., 2016).

Research on Living Labs is multidisciplinary (Leminen & Westerlund, 2019) and explores various aspects such as concept definition (Janin & Pecqueur, 2013), key characteristics (Hossain et al., 2019; Westerlund et al., 2018), the role of users (Leminen et al., 2015), their motivation (Bergvall Kareborn & Stahlbrost, 2009), or the types of services they provide (Schuurman et al., 2019). One of the most commonly used approaches to understand Living Labs appears to be the study of activities related to innovation and collaboration (Hossain et al., 2019), including testing, validation, experimentation, and co-creation. Specialized literature explores these dimensions in detail, providing a thorough understanding of the practices implemented within Living Labs, valuable insights into their characteristics, and the benefits they offer to participants. However, although it is essential to understand how Living Labs operate 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 examining activities within a specific Living Lab and answering the research question "What activities are deployed within a Living Lab to support innovation projects?". By delving deeply into a specific Living Lab within a particular context, we aim to gain a better understanding of the activities that can be conducted within an Living Lab. From a theoretical standpoint, we will shed light on the mechanisms that promote the development of synergies between the Living Lab and territorial stakeholders. On a managerial level, our research will provide practical insights by highlighting activities that can be undertaken to meet the needs of stakeholders.

2. Theoretical background.

2.1. Living Labs.

Living Labs have emerged due to the growing awareness of challenges (and frequent failures) in the commercialization of science, which often struggles to move beyond the stages of basic research and development (Leminen & Westerlund, 2019). The value of innovation no longer solely lies in superior technical qualities, but rather in its alignment with the needs, capabilities, and aspirations of end-users (Veeckman et al., 2013). Consequently, Living Labs have established themselves as environments for collaborative and open innovation, offering a third place where businesses, end-users, researchers, and other stakeholders can collaborate to develop and support innovation projects addressing the challenges of a specific territory. These co-creation spaces encourage interactions among different actors, facilitate knowledge and resource sharing, and allow real-world experimentation (Eriksson et al., 2005). Living Labs are characterized by their participatory approach, involving end-users from the early stages of the innovation process. Their active contribution helps better understand user needs and expectations, thus facilitating the development of more tailored solutions (Almirall & Wareham, 2009). Living Labs are often situated in urban or regional environments, allowing them to be rooted in local realities and tackle territory-specific challenges (Bergvall Kareborn & Stahlbrost, 2009).

Living Labs facilitate interaction among various stakeholders, encouraging expertise sharing, co-design, and co-implementation of innovation projects (Baccarne et al., 2015). Through their proximity to end-users, Living Labs actively involve them, thereby promoting the adoption and diffusion of innovations (Bergvall Kareborn & Stahlbrost, 2009; Leminen et al., 2015). They also serve as conducive environments for experimentation and validation of innovation projects. They provide a real-world framework for testing prototypes, evaluating their functionality, and gathering feedback from end-users (Hossain et al., 2019). This iterative approach enables adjustments and improvements to proposed solutions, thus strengthening their market acceptance. Ballon et al. (2018) identify several objectives of an Living Lab, such as aligning innovation processes and outcomes with user preferences and practices, discovering unexpected uses, identifying viable business models and revenue sources, promoting cooperation among stakeholders, enabling specific stakeholder groups to influence design features, promoting acceptability, and reducing failures.

2.2. Stakeholders.

The literature on Living Labs emphasizes the presence of multiple stakeholders (Bergvall Kareborn & Stahlbrost, 2009), particularly highlighting the quadruple helix model, which involves

collaboration among businesses, universities, public administration, and citizens (Hyysalo & Hakkarainen, 2014) in innovation activities (Westerlund & Leminen, 2011). Westerlund & Leminen (2011) identified four roles adopted by these stakeholders: enablers, providers, users, and beneficiaries. Enablers support Living Lab activities by promoting them or providing financial support or physical space. These are typically public actors, funders, or non-governmental organizations such as cities or municipalities. Providers bring essential knowledge and expertise to support innovation activities, mainly universities, training institutes, or consultants. Users are organizations (public or private) that benefit from innovations resulting from Living Lab activities. Broadly, an Living Lab enables a set of actors to identify mutual interests, address emerging societal and entrepreneurial challenges, and undertake joint projects with practical applications and real-world impact. Lastly, users are citizens who participate in Living Lab activities. User involvement 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, users generally remain passive during the innovation process and are thus less involved (Nyström et al., 2014). Leminen et al. (2014) identify four roles that users can adopt within an Living Lab: informants, testers, contributors, and co-creators.

2.3. Results and outcomes of Living Labs

A significant portion of the literature on Living Labs describes the innovation activities conducted within them. Overall, Living Labs facilitate the detection, prototyping, validation, and refinement of complex solutions in various real-world contexts through a cycle of activities (co-creation, exploration, experimentation, evaluation). However, there is still a lack of empirical research on the practical implementation and associated outcomes of Living Labs. Veeckman et al. (2013) demonstrate that the Living Lab environment shapes the projects undertaken and that it is necessary to consider inputs and expected outcomes in order to revise innovation activities accordingly. Schaffers and Turkama (2012) explain that product and service innovations are typical outcomes of Living Labs. However, Hossain et al.'s (2019) literature review reveals that outcomes can be tangible or intangible. Tangible outcomes may include designs, products, prototypes, and solutions. For example, these may include new products or services developed and validated within the Living Lab framework. Intangible outcomes, on the other hand, refer to concepts, ideas, intellectual property rights, knowledge, and services. These intangible outcomes may take the form of new methodologies, patents, or scientific publications. Thus, Living Labs generate a diversity of outcomes, whether concrete or more abstract. However, the literature highlights the importance of carefully considering inputs (objectives, resources, etc.) and expected outcomes in order to adapt activities conducted within the Living Lab. Indeed, it is the Living Lab environment that shapes the projects undertaken and the resulting outcomes.

3. Research methodology.

Given our exploratory approach, we conducted a participatory case study within the framework of the "Rouen Smart Mobility for All" project, aiming to to completely rethink the mobility system to design an offering that encompasses all modes, services, and uses. The case study allows for an in-depth exploration of the functioning of a specific Living Lab in its real context. One of the actions involves launching a Living Lab, named Mix, with the objective of

making the Rouen Normandy Metropolis a reference territory for inclusive innovations and experiments in the field of mobility.

Launched in January 2021, the "Mix" Living Lab focuses on 12 missions, including user observation, citizen inclusion, and collaboration facilitation. Currently, 36 partners are involved. Data collection involved participation in four co-creation workshops by Mix from December 2020 to May 2023. These workshops engaged stakeholders in defining needs, expectations, and key success factors. Additional data were collected through participation in general assemblies of the Mix Living Lab, events organized by partners, as well as the analysis of internal documents. This qualitative research integrates the perspectives and knowledge of all involved actors to comprehensively understand the studied situation. The analysis focused on identifying Living Lab activities, stakeholders' needs and expectations, as well as expected outcomes.

4. Results.

The results outline the importance of identifying stakeholders and their motivations in Living Lab projects, particularly focusing on the initial session's participant structures and their identified needs. Various activities were selected to address stakeholders' needs (Table 1), including innovation monitoring, networking events, project structuring, and project evaluation. Deliverables expected from the Living Lab include events, publications, a collaborative digital platform, training courses, challenges, and targeted networking activities .

Stakeholder need	Activity	Outcome
A forward-looking vision of trends and innovations.	Innovation and usage monitoring coordination with the ecosystem	➢ Events ➢ Conferences ➢ Publications
Integrating a structured ecosystem	Organization of networking events (B2B, general public)	➢ Newsletter ➢ Webinaires / conferences
	Organization of working groups, pooling of resources, structuring projects.	➢ Address book ➢ Collaborative digital platform ➢ Collaborative projects
	Support for local councilors to encourage and train them in the challenges of innovative mobility	➢ Conferences for elected representatives ➢ Training courses / workshops
Identify innovative startups	Nugget detection	➢ Challenges
Description of RFPs	Monitoring of RFPs and funding	➢ Coordinated events ➢ Web page
Identify the right player to meet an identified need	Connection with relevant stakeholders	➢ Targeted networking
Reinforcement of project maturity.	Project evaluation	➢ Evaluation file / project note ➢ Advice on gaining maturity
	Support for strategic project definition	➢ Workshops ➢ Working groups

		➢ Recommendations
Individual support in setting up projects	RFPs identification	➢ Proposal / presentation to relevant RFPs
	Target partner search	➢ Meet thematic players
	Support in projects implementation	➢ Editing workshops ➢ Iterations ➢ (co)production of parts
Enhance project quality through public exposure and feedback	Support for small-scale implementation	➢ Experimentation strategy, implementation and results
Evaluation of project returns	Final project evaluation	➢ Creation of the support, implementation and administration of the evaluation.
Support for the dissemination of innovations.	Innovation promotion	➢ Marketing campaign ➢ Solution referencing,
Public/users access	Preparing the public for innovation	➢ Communication with the public (social networks / events).
	Consultation on challenges	➢ Public access and feedback during project implementation ➢ Demonstrator ➢ Social acceptance measures
	Conducting satisfaction surveys	➢ Survey results

Table 1 : Summary of activities and outcomes in relation to identified needs

4.1. Identification of stakeholders and their motivations.

The analysis identified the various stakeholders involved in the Mix Living Lab and understood their specific motivations (Figure 1). These stakeholders can be grouped into four main categories: communities, mobility, academic research, and energy.
Actors belonging to the "communities" category seek to engage in improving mobility within their neighborhoods and living areas. They want the Living Lab to consider their specific needs and usage patterns to design mobility solutions tailored to them. The "mobility" category encompasses businesses, associations, and organizations directly linked to various transportation services and modes. Their main motivation is to experiment with new innovative solutions, position themselves on emerging innovations, and co-create mobility offerings with users that address the challenges of the territory. On the "academic research" side, university institutions and research centers aim to conduct applied research in the field of mobility, leverage their knowledge and expertise, and engage in projects with concrete impact on the ground. Lastly, actors in the "energy" sector seek to engage in the energy transition of mobility by experimenting with sustainable mobility solutions and participating in discussions on energy-related challenges associated with transportation.

Regardless of their profile, stakeholders involved in the Mix Living Lab have common expectations towards this structure. Whether they are local authorities, mobility-related entities,

or research institutions, they expect the Living Lab to facilitate collaboration among different actors, support them in implementing their projects, and contribute to improving the quality of these projects. More specifically, stakeholders want the Living Lab to enable them to identify the right contacts, have an overview of ongoing projects and innovations, and receive support in planning and implementing their initiatives. They also expect the Living Lab to promote the dissemination and adoption of developed solutions, through a better understanding of citizens' needs and usage patterns.

Figure 1 : Stakeholders and their motivations for integrating the Living Lab Mix.

4.2. Living Lab activities to meet stakeholders' needs.

In order to address the identified needs of all stakeholders, the Mix Living Lab has deployed a series of activities () organized around three main ambitions (Figure 2).

The first ambition is to support and equip the projects and partners of the Living Lab. This begins with activities to monitor trends and emerging innovations, conducted in close coordination with the ecosystem of actors. This monitoring feeds into reflection and guides the development of new solutions tailored to the challenges of the territory. The Living Lab also regularly organizes networking events, whether they are B2B meetings or events open to the general public. These networking opportunities facilitate connections between different actors and promote knowledge sharing. Finally, the Living Lab plays a structuring role in setting up collaborative projects by assisting in the pooling of resources and skills among partners.

The second ambition is to initiate and lead innovative collaborative projects. This involves detecting "nuggets" - ideas, concepts, or technologies that show particular promise - which can then be further explored and developed. The Living Lab also supports local elected officials by providing training and raising awareness about the challenges of innovative mobility, to facilitate the implementation of solutions on the ground. Additionally, regular

evaluation of projects is conducted to measure their effectiveness and impact, and to identify areas for improvement.

Lastly, the third ambition is to unite and animate a diverse ecosystem and an open space. This includes identifying relevant stakeholders and connecting these different actors to facilitate collaborations. The Living Lab also provides support in the strategic definition and operational implementation of projects, assisting project leaders in responding to calls for projects and finding necessary funding.

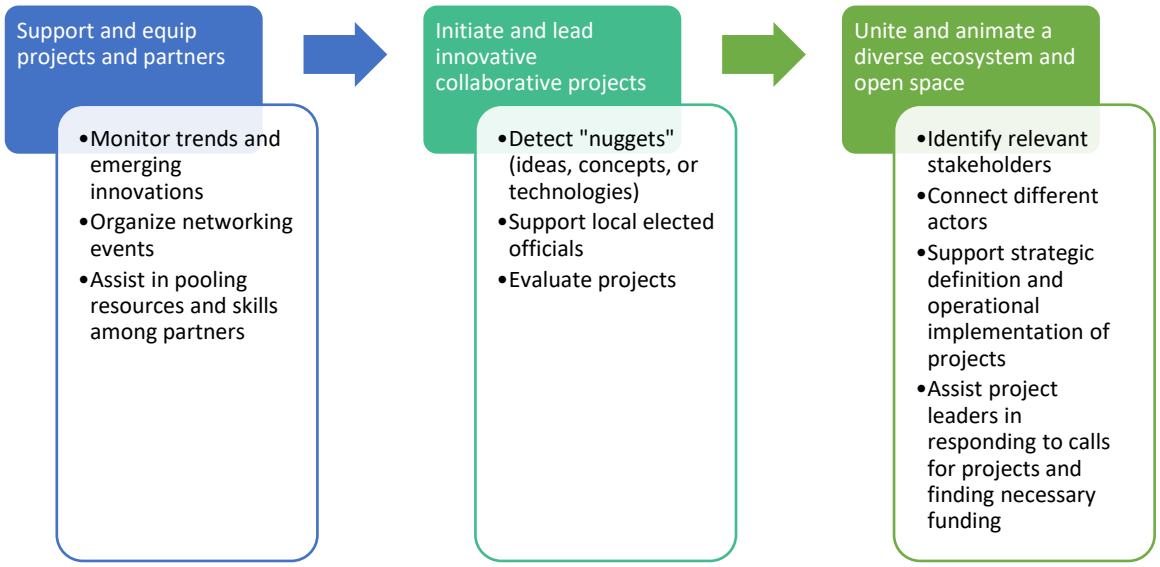

Figure 2 : Summary of activities of the Living Lab Mix

4.3. Results and expected deliverables of the Living Lab

In addition to the various activities deployed, the Mix Living Lab has defined a set of expected results and deliverables (Figure 3) that will allow for the evaluation of its effectiveness and impact on the territorial ecosystem.

Firstly, the Living Lab plans to produce a series of events, conferences, and publications aimed at widely disseminating knowledge and insights gained from its various initiatives. This will not only serve to showcase the work done but also to fuel reflection and innovation beyond the direct participants. A regular newsletter will complement this communication effort, keeping stakeholders informed of the latest developments. On a more collaborative level, the Living Lab aims to establish a shared digital platform, facilitating exchanges, resource sharing, and coordination among different actors. This tool will be supported by a contact directory, allowing everyone to easily identify relevant contacts within the ecosystem. Moreover, the Living Lab seeks to stimulate and support collaborative projects involving various categories of stakeholders. These concrete, co-built, and collectively tested initiatives will be major deliverables, illustrating the Living Lab's ability to rally stakeholders around innovative solutions. To develop the skills and knowledge of participants, the Living Lab also plans to offer training sessions, workshops, and seminars on topics related to innovation in the field of mobility. These

skill-building sessions will help strengthen the capabilities of the entire ecosystem. Finally, the Living Lab aims to foster the emergence of innovative ideas and solutions through the implementation of challenges or thematic calls for projects. These initiatives will mobilize a wide range of actors while providing a showcase to highlight the most promising innovations.

As a whole, these various deliverables, whether they are event-based, collaborative, educational, or incentivizing, aim to measure the effectiveness of the Mix Living Lab in meeting the expectations expressed by stakeholders. They will also serve as key indicators to track the impact of these initiatives on the development of an open and inclusive innovation ecosystem within the Rouen metropolitan area.

Figure 3 : Summary of outcomes of the Living Lab Mix

5. Discussion and conclusion.

This study delves into the internal workings of the Living Lab "Mix" within the broader framework of the "Rouen Smart Mobility for All" project. It highlights the crucial role of Living Labs in fostering innovation, collaboration, and network expansion among a diversity of stakeholders. At the core of this role lies the necessity for Living Labs to understand the specific expectations and motivations of different stakeholder categories, such as local authorities, mobility experts, researchers, and energy sector actors. This understanding enables Living Labs to finely adjust their activities, whether it's networking, supporting project implementation, or disseminating developed solutions. Living Labs thus emerge as indispensable nodes for cultivating open and inclusive innovation ecosystems at the local level. Through a range of activities spanning from event organization to co-building collaborative tools and supporting projects, they facilitate synergies and amplify the impact of undertaken initiatives. However, the study underscores the need for increased citizen involvement throughout the innovation process. Despite their user-centered approach, Living Labs often face passive citizen engagement. Increased citizen

participation, from needs definition to solution co-creation, is deemed essential for aligning innovations with the genuine expectations of the community.

From a managerial standpoint, this research provides actionable insights for Living Lab managers and policymakers, outlining key activities to strengthen collaboration and effectively meet stakeholder expectations. Additionally, it contributes to the theoretical understanding of the mechanisms underpinning Living Labs' ability to cultivate synergies within territorial ecosystems.

Although this study is anchored in a specific case, it yields transferable insights applicable to diverse Living Lab contexts, emphasizing the importance of considering the varied expectations and motivations of involved stakeholders. It also lays the groundwork for further exploration, particularly concerning pathways to enhance citizen participation in these collaborative innovation initiatives. Ultimately, this study reveals the intricate dynamics of Living Lab management, emphasizing collaboration, co-creation, and ecosystem animation as essential elements for maximizing their impact on territorial ecosystems. It underscores the crucial role of Living Labs as facilitators of innovation, collaboration, and network expansion while shedding light on stakeholders' expectations and offering practical guidance for optimizing their effectiveness in promoting inclusive and sustainable innovation within local ecosystems.

References:

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

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

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. (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., & 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., 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

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