Distance LAB
Living Labs' Network
Concept Paper

Prepared by Zane Zeibote, Dāvis Vītols,
University of Latvia

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Contents

1. Introduction

1.1. Background

In the context of the Distance LAB project the Living Labs (LL) are planned to be developed to ensure cooperation between local co-creation LL which will be united into International Multidisciplinary Living Lab Network (IMLLN) or Living Labs Network (LLN). The IMLLN is a part of the Distance LAB HUB's action model together with service sets combined into service production models. Therefore, the LL involving local stakeholders will contribute to networking, expert and peer-to-peer support in the changing business environment. And tested service sets combined into service production models will facilitate business development in partner regions and countries of the Baltic Sea Region, and beyond.

1.2. Objective

The objective is to use the Living Labs (LL) approach to involve local and external stakeholders in co-creation, use of created innovative services, networking and collaboration. Thus the LL methodology includes co-creation and user-driven approach with the engagement of multiple stakeholders (values of the Quadruple Helix) which will act as the backbone in further activities.

Living Labs (LL) are known as rapidly emerged forms of local/regional level experimentation and a governance tool to drive innovative sustainable development. The living lab process, which integrates both user-driven centered research and open innovation, is based on a maturity spiral concurrently involving a multidisciplinary team in the following **four main activities important for the Distance LAB project:**
- Co-creation: bring together new services and prepare them for application
- Exploration: engage all stakeholders, especially user communities, at the earlier stage of the co-creation process
- Experimentation: test services to experience live scenarios with a number of users
- Evaluation: assess new services and innovative concepts in real life situations.

1.3. Results: Distance LAB project deliverable 2.5. Living Labs blueprint

This deliverable provides input for the project's Output 3: HUB's action model, to ensure cooperation between local co-creation LL which will be united into International Multidisciplinary Living Lab Network (IMLLN) and service sets combined into service production models.

In the Distance LAB project context a **Living Labs Network Blueprint** is a strategic framework that outlines the structure, processes, and guiding principles for connecting and operating multiple Living Labs in a coordinated and synergistic way. It serves as a foundational reference for designing, implementing, and scaling collaborative innovation ecosystems across regions, sectors, or thematic areas.

2. Living Labs Network concept development

To understand how the Living Labs Network can be developed, its conceptual framework must be created. It is based on the relevance of Living Labs and their network as a widespread experimentation tool to co-create, prototype, test and upscale innovative solutions to (local) needs in real-life, devoted to the experimentation feature with citizen engagement throughout the process, with the main goal of explore the effect of innovation on users and society and to better calibrate the relevant requirements. The key word "requirements" plays a relevant role in defining the project methodology that bets for the efficacy of the tool, that is only possible when all the current and future requirements and conditions for the products and the services to be tested in the living lab and potentially commercialized in the market, were fully known, and considered. [1]

2.1 Theoretical considerations and examples

According to scientific research Living Labs refer to user-centered, open innovation ecosystems based on a systematic user co-creation approach integrating research and innovation processes in real life communities and settings (Ballon & Schuurman, 2015). Living Labs are both practice-driven organizations that facilitate and foster open, collaborative innovation, as well as real-life environments and arenas where both open innovation and user innovation processes, can be studied and subject to experiments, and where new solutions are being developed. Leminen (2013) defines Living Labs as: "physical regions or virtual realities, or interaction spaces, in which stakeholders form public-private-people partnerships (4Ps) of companies, public agencies, universities, users, and other stakeholders, all collaborating for creation, prototyping, validating, and testing of new technologies, services, products, and systems in real-life contexts".

Living Labs became increasingly visible after the creation of the European Network of Living Labs (ENLL) - an umbrella organization for Living Labs around the world, which was initiated by the Finnish EU Council Presidency in 2006. According to ENoLL, the Living Lab is known as is the most prominent concurrent method for stakeholder engagement in innovation ecosystems, typically used for quadruple helix settings. In addition, Living Labs are user-centred, open innovation ecosystems based on systematic user co-creation approach, integrating research and innovation processes in real life communities and settings[2]. Living Labs encompass diverse contexts, such as local innovation activities started by citizens out of a desire to improve their everyday lives and the development activities of citizens, companies, non-profit organizations and other stakeholders in developed societies (Nystrom et al., 2014). Furthermore, they can also be driven by different actors, such as users, providers, enablers and utilizers, and this affects the focus and duration of the collaborative innovation effort (Leminen et al., 2012). In general, they offer a

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[1] Commission Staff Working Document: Regulatory learning in the EU. Guidance on regulatory sandboxes, testbeds, and living labs in the EU, with a focus section on energy. Brussels 29.8.2023 SWD (2023) 277/2 Final.
[2] Home - European Network of Living Labs , Living Labs networkEuropean Network of Living Labs (enoll.org)

space for testing, validation, development and co-creation in all stages of a design and commercialization process (Buhl et al., 2017; Leminen et al., 2017a).

The Living Lab's approach has advantages and disadvantages which are explored in Table 1. Following the analysis of the disadvantages presented in the Table, stakeholders engagement and skillful management of the Living Lab are the most important factors to benefit from existing advantages and achieve success. These findings must also be considered in the Distance LAB project concept when developing partners' Living Labs and IMLLN.

Table 1. Advantages and disadvantages of Living Labs concept

Advantages	Disadvantages
● High potential for innovation (thanks to the multidisciplinary and multi-stakeholder approach)	● Not a direct path to a short-term solution
● High potential for systematic learning and replication of innovations	● Needs large investments in terms of coordination, organization, management, and supportive tools
● More sustainable solutions thanks to the integration of all stakeholders' requirements	● Experimentation entails failures
● Closed gap between product production and uptake	● Successful stakeholder participation requires particular expertise
● Reduced risk of policy and business failure	● Successful co-creation requires a particular mindset
● Better match with local, cultural, and institutional contexts and creativity potentials	● Working according to the living lab approach may
● Better utilization of existing knowledge and inventions	● Requires actors to abandon their usual culture and/or way of working

Source: Steen et al,.(2017).

Veeckman et al. (2013) found that, despite more than a decade of Living Labs activities all over Europe, empirical research into their practical implementation and related outcomes is lacking. The only systematic review of studies of Living Labs from this perspective was conducted by Schuurman et al. (2015). These authors also concluded that empirical evidence about their performance is lacking, while Hossain et al. (2019, p. 986) found that "understanding how Living Labs perform in multifaceted situations, as well as the power distribution in the networks and governance, is essential".

According to the ENoLL the number of Living Labs in the network since its' launch in 2006 are more than 460, with over 150 active Living Labs subscribing to the ENoLL network worldwide. The concept of Living Lab became a strong theme in the EU's Seventh Framework Program 2007–13, mainly in the fields of smart services and e-governance (Paskaleva et al., 2015). In the Horizon 2020 programme innovation, the topic of Living Labs evolved within the field of collaborative co-creation processes and structures for innovative solutions to large societal challenges mainly in transport, energy use and ICT. More recently, Living Labs have been presented as useful instruments to detect community needs, improve local development and support and integrate technological and social innovations in policies and local governance processes (Paskaleva et al., 2015) as well as helping to make a city smart (Nesti, 2017; Paskaleva and Cooper, 2017).

Why a Living Lab? The public innovation instrument chosen to facilitate multi-stakeholder engagement, co-creation, and the alignment of interests is the Living Lab, given that it enables all stakeholders to contribute their vision, especially businesses (SME), the ultimate recipients of services. In this sense, the Living Lab is the most appropriate mechanism to address the objectives of the Distance LAB project.

The Living Lab will provide a novel hybrid approach to the experimentation space, which, being fundamentally a living lab aimed at testing the pilots by the end users to facilitate market approach. This will also make it possible to identify potential regulatory barriers if any, as well as provide a collaboration platform for stakeholders and end users.

2.2 Conceptual framework of the Distance LAB Living Labs Network development

Following theoretical considerations and examples, as well as taking into account specifics of the Distance LAB project the **Living Labs Network (LLN)** has been defined as a collaborative, user-centered innovation ecosystem made up of multiple Living Labs that work together to co-create, test, and validate new solutions in real-life environments. Each individual Living Lab typically focuses on a specific domain (e.g., smart cities, circular economy, agro-food, etc.), but the network connects them allowing them to share knowledge, tools, best practices, and outcomes.

Furthermore, the Distance LAB project's aim is to build an international and multidisciplinary network involving multiple countries and various areas of activity. Therefore, an **International Multidisciplinary Living Labs Network (IMLLN)** has been defined as a globally connected platform or alliance of Living Labs that brings together stakeholders from diverse disciplines—such as technology, design, social sciences, business, and policy—to collaboratively develop, test, and scale innovative solutions in real-life environments across borders.

Key Characteristics:

- **International Scope**: Operates across countries, fostering cross-cultural collaboration and knowledge exchange.

- **Multidisciplinary Approach**: Involves experts and practitioners from various fields to address complex, systemic challenges.

- **User-Centered Innovation**: Focuses on co-creation with end users, ensuring solutions are relevant, accepted, and sustainable.

- **Real-Life Testing Environments**: Implements and evaluates innovations in actual community or industry settings, rather than controlled lab conditions.

- **Collaborative Governance**: Includes stakeholders from academia, industry, government, and civil society in decision-making and project execution.

The **main objective** of the Distance LAB IMLLN is to accelerate innovation by leveraging the strengths of diverse disciplines and global perspectives, enabling the development of scalable and impactful solutions to complex challenges like environmental sustainability, digital transformation, urbanization, etc.

2.3 Useful examples of Living Labs

There are a huge number of examples of Living Labs. The following examples could be of an interest for the Distance LAB partners to explore:

- **Limerick's Citizen Innovation Lab[3]** (Ireland) using digital tools to create a citizen-sourced open-data portal to promote local policy and regulatory change.
- **EIT Health[4]** has launched a programme of user validation labs (ULabs), where different actors of the innovation ecosystem support innovator start-ups to test their solution with final users (patients, clinicians and medical staff).
- **Helsinki Living Labs[5]** was launched in 2007 to act as a connector between companies and the public sector interested in collaborating with Living Labs. The organization facilitates activities in Helsinki and surrounding cities, encompassing eight Living Labs, together with associated organizations of developers, enablers, and utilizers
- **Happy Aging[6]** is an integrated network and living lab in Belgium for user centered innovation in elderly care, which offers a real life environment for companies and healthcare organizations to develop innovative concepts for elderly care.
- **The Living Lab for the Internet of Things (IoT), Italy[7]** the Living Lab focuses on development of Integrated sensor and communication systems to connect plants and exchange data between machinery and machine operators. It provides a platform for companies and researchers to collaborate on IoT projects.

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[3] https://www.limerick.ie/discover/explore/areas-limerick/georgian-neighbourhood-limerick/citizen-innovation-lab

[4] https://eithealth.eu/news-article/eit-health-living-labs-and-test-beds-programme/

[5] https://rural-urban.eu/living-lab/helsinki

[6] https://www.in4care.be/getitdone

[7] https://www.ip4fvg.it/en/living-lab-iot-internet-of-things/#

- **Copenhagen Solutions Lab, Denmark**[8] the Living Lab supports the development of the city through testing and implementation of intelligent and data-driven solutions that support the needs of the city and its citizens. The activities in this living lab can be categorised within 4 themes - People and Flows, environment and climate, air quality, and smart city networks.
- **Laurea Living Labs, Finland**[9] Living Labs focuses on providing a multidisciplinary approach to ideas and needs in service innovation, user-centric design, international collaboration, learning environment, and smart specialization.

3. Methodological framework for developing Living Labs

To create the Living Labs Network, firstly the Living Labs must be developed and local stakeholders involved. Secondly, individual Living Labs must be willing to unite and form a joint network to extend their activities outside of the borders of their regions and countries.

The design, implementation and deployment of a Living Lab requires the application of a range of methods, tools and techniques to achieve their goals. Some key actions are: identify multi-stakeholder requirements, set targets, develop transition plans, and use measurements, benchmarks, qualitative and quantitative evaluations of progress, combined with further insights from relevant stakeholders. Therefore, a Living Lab should explore and address the links among social, environmental and economic issues at the same time as these topics do not exist in isolation.

3.1 Methodological approach for the Distance LAB project

Initially, Living Labs must have a clear perspective about their purpose, tasks and participants which will be involved and willing to cooperate in the living lab's environment.

Purpose and tasks:

- **Development of innovation** - Living Labs aim to develop an innovation or a product, and not only, for example, to test or implement a pre-developed solution.
  - ➢ Distance LAB: develops services pilots and a platform for providing online services to provide new opportunities for businesses.
- **Co-creation -** The participating actors together give shape to the innovation process.
  - ➢ Distance LAB: stakeholders are invited to come together to cooperate on the joint platform.
- **Exploitation, replication and knowledge transfer** – gathering feedback from users, further development of services.
  - ➢ Distance LAB: launches the platform, gathers feedback from users, disseminates and communicates the information to target groups, ensures exploitation and sustainability.

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[8] https://cphsolutionslab.dk/

[9] https://www.laurea.fi/en/research/laurea-living-labs/

Participants:

- **Users, private actors, public actors, and knowledge institutes (Quadruple Helix)** - Actors from these four groups must be active contributors to the innovation and development process taking place within a Living Lab.

The Distance LAB Living Lab development methodology must be based on the co-creation and user-driven approach with the engagement of multiple stakeholders which will act as the backbone to test and verify new services models.

The Quadruple Helix approach must be used to bring together the public sector, industry, academia and civic society, namely main stakeholders and end users. The Quadruple Helix is the most commonly used organizational set-up for ecosystem collaboration and also often used for business clusters. (Figure 1)

Figure 1. *Quadruple Helix model.*

Source: https://grrip.eu/why-is-quadruple-helix-engagement-so-important/
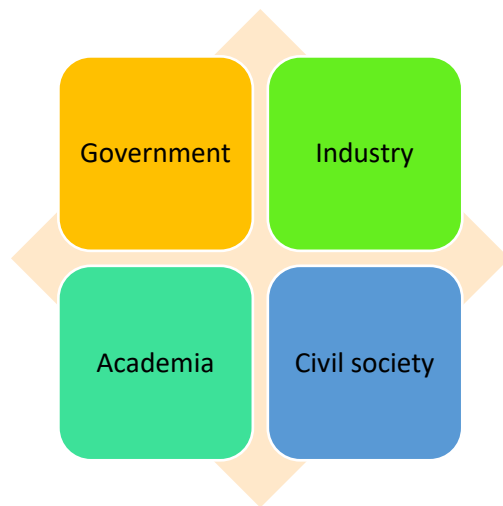
The role of each actor in Living Labs concept:

- **Government (Public Sector)**: This helix represents government agencies and institutions. Government plays a crucial role in creating policies, regulations, and providing resources to support innovation.
- **Industry (Private Sector)**: This helix encompasses businesses, corporations, and industries. The private sector is responsible for driving economic growth, creating jobs, and producing goods and services. Collaboration with other sectors in the Quadruple Helix Model helps in aligning business goals with societal needs and fostering innovation.
- **Academia (Knowledge Sector)**: This helix includes universities, research institutions, and educational organizations. Academia is essential for generating new knowledge, conducting research, and educating the workforce. Collaboration with the other helixes enables the transfer of knowledge from academic institutions to practical applications in the real world.

- **Civil Society (Social Sector)**: This fourth helix represents non-governmental organizations (NGOs), community groups, and citizens. Civil society brings in the perspective of societal values, ethics, and social needs. In the Quadruple Helix Model, involving civil society helps ensure that innovation aligns with ethical considerations and addresses the broader interests of the community.

It is important that all Quadruple Helix actors are motivated to participate in the Living Lab. If the stakeholders cannot be convinced that a Living Lab is in their interest, then it will not yield integrated solutions and long-term social, economic, and environmental sustainability. Therefore, project partners must communicate the goal of the project in an appealing way, which can provide a continued incentive for stakeholders to support and join the Living Lab.

4. Distance LAB local Living Labs development process

It has been envisaged that initially local co-creation Living Labs will be developed through virtual and/or face-to-face workshops in each partner region. Each partner will be responsible for communicating within its own network in a clear and effective way. The key principles of the LL include openness (gathering many stakeholders from target groups with various expertise and competence), continuity (establishing trustful long-lasting relations between stakeholders), empowerment (enabling users to actively be engaged in the innovation process), realism (involved with real-users in real-life settings during the development of the innovation), and spontaneity (detecting and analyzing emerging need and ideas of stakeholder).

According to the project application, at least three countries (partners and target group) will take part in the pilot of living lab collaboration and establish the virtual International Multidisciplinary Living Labs Network (IMLLN). Living Labs are a local and shared activity that acts as a networking and development hub that continues on in the online platform. These activities and their results are visible and open in the online platform. In the pilot the activities of local Living Labs are shared to create the hub action model online and offline to support the collaboration of participating countries.

This deliverable will provide an input for the HUB's action model, to ensure cooperation between local co-creation Living Labs which will be united into IMLLN and by service sets combined into service production models and made available on the HUB's platform. The IMLLN will contribute to networking, expert and peer-to-peer support in the changing business environment, while the service sets will facilitate business development in partner regions, countries of the Baltic Sea Region, and beyond.

4.1 Preparation and implementation

The Group of Activities (GoA2.5) will prepare and design all contents for the hub based on the previous project's work and achievements. Planned activities will be built on the Deliverable 2.4 to design the HUB's services. After the services are designed, the first testing phase will start

which will involve main local stakeholders and end users. Stakeholders will then later be invited to join the Living Labs.

A co-creative design process will be organized at the project level to build on constructive, positive and inspiring co-creation sessions, in which the actors can engage in development activities in a setting that provides energy, enthusiasm, and productivity. After the learning phase the established Living Labs will start organizing co-creation sessions with their stakeholders.

Many cases studied show that low threshold, informal meetings requiring no obligatory attendance yield a higher rate of attendance and more development decisions than formal meetings. They offer safe environments for the various actor groups to freely exchange ideas and brainstorm. Together with the low threshold character of these meetings, this allows the participants to firmly focus on the innovation and the content, offering a breeding ground for creative thinking. Taking into account shifting to online settings, this is possible to organize co-creation sessions in both, online and onsite settings. However, leaving it only online would also not be recommended as people sometimes need to meet face-to-face, mingle and exchange. For these purposes there are different co-creation approaches which could be used for different forms of meetings.

Partners, who organize such meetings or sessions, should ensure that they speak in terms that are accessible to all participants and avoid using specialized terms. The intrinsic motivation of participants should be nourished during the co-creation sessions. The motivation of participants will also very much depend on demonstrating the relevance of the Distance LAB project to each of the actors, by reconfirming the shared interests and by promoting a sense of ownership and responsibility among them.

Furthermore, local co-creation LL will be designed to offer networking, expert and peer-to-peer support in the changing business environment. This will require spending more time in virtual meeting rooms to help remote businesses to understand services and support them as a number of remote businesses, as well as a need for remote services, will only continue growing. The creation of IMLLN to ensure transnational and international networking and collaboration will facilitate the access to these services. In addition, links and cooperation networks will be extended to existing local and global clusters, networks, incubators, DIHs and centers of innovation and excellence.

The IMLLN will operate online offering various activities through its member labs and networks, such as the local Enterprise Europe Network (EEN).

4.2. Living Labs in online settings

It is planned that the Distance LAB's activities will be largely organized online. Also, many activities of local LL and IMLNN will take place in an online setting. Nowadays, the ICT & Infrastructure outlines the role that ICT technology can play to facilitate new ways of cooperating and co-creating new innovations among stakeholders. Therefore, the most convenient and efficient

tool(s) to be used for LL and IMLNN must be identified. One of such tools could be the Ecosystem canvas model.

[Free Online Ecomap Maker and Examples | Canva](#)

This model allows effortlessly to create a visual depiction of the social and environmental influences impacting an individual's life with our complimentary ecomap generator. The extensive media library incorporates visual elements that illustrate the connections and dynamics influenced by family, society, and community. Online collaboration, employing free templates and a range of tools and features on Canva Whiteboards allows to craft and share ecomaps effectively.

Another identified tool is the **Ecosystem Mapping Template - Miro:**

[Ecosystem Mapping Template | Miro](#)

This template enables users to see their organization's customer's perspective. In addition, the Ecosystem Mapping Template also includes internal players and stakeholders, giving users the full picture of their customer experience in and out of the organization. Ecosystem Mapping allows us to understand the organization better, focusing on the customer's point of view. [10]

Furthermore, each stage of developing and operating a Living Lab requires a different tool to be applied, which needs to be considered by their managers. The methodological guideline, as well as specific co-creation tools must be designed in the project framework to support the development of Living Labs.

4.3 Involvement of stakeholders and users

Living Labs are complex partnerships, as they facilitate not only university–industry relationships but also relationships between large companies, SMEs, and startups, resulting in what is often referred to as public–private–people partnerships (4P's). They are mostly initiated and funded by policy makers with   national or regional policy objectives in mind (Katzy, 2012) where they function as "innovation intermediaries" to overcome the gap between R&D and market introduction (Schuurman et al., 2019).

A critical element of organizing a Living Lab is the involvement of stakeholders and end users. Therefore, methods for involving users, such as the Mapping user-innovation methodology must be exploited. This methodology is based on the following approaches reflected also in the Figure 2 (Imirall et al., 2012):

1. **User centered**. Users are mostly passive subjects of study. This is the case of usability testing, human factors, and applied ethnography.

2. **Design driven**. Designers take the lead. Design-driven methodologies normally work in real-life environments; however, they are led by designers who seek to find novel solutions.

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[10] https://miro.com/templates/ecosystem-mapping/

3. **Participatory**. Users are considered on equal ground with the rest of the partners in a co-creative process. Participatory design, particularly the Scandinavian tradition, and generative design research belong to this category.

4. **User driven**. Where the user is the one who drives the innovation process. Such is the case of open source, lead users and Living Labs.

Figure.2. *Mapping user-innovation methodologies*
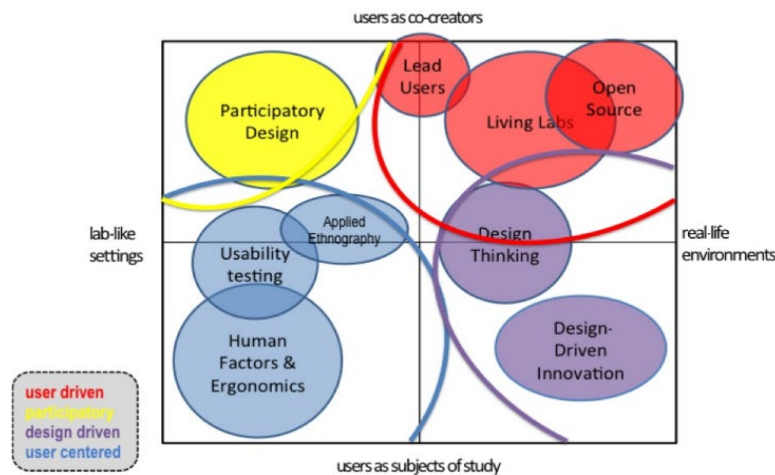
Source: lmirall, E., Lee, M., & Wareham, J. (2012).

For the success of the LL, it is important that all living lab stakeholders are included from the very beginning in order to arrive at the co-created and integrated solutions for the Distance LAB project. Ongoing work of project partners with stakeholders lays a good basis for their further involvement into local Living Labs.

4.4 Evaluation and refinement

Evaluation is another core component of the LL approach. During the evaluation phase, the product and the process are evaluated to check whether the goals and ambitions have been achieved. This evaluation is done at two levels: 1) functioning of the innovation itself and asks questions, such as: Does it work, can people operate it, do people use it? 2) questioning the innovation itself or the aim of the innovation, leading to questions, such as: Is this the right innovation given the aim or the problem it intends to solve? Does it have many, perhaps unexpected side effects? Will it be replicable? If so, under which conditions and at which scale?

Evolution should indicate what should be changed and improved. In this context the lessons learned in other places can be explored and applied. In this stage, the cooperation with knowledge institutions in Living Labs becomes important to facilitate the learning process and applying lessons learned to local LL. In the case of the Distance LAB project, this is a great opportunity to have a regular exchange between piloted local LL to learn from each other.

Stakeholders should also be a part of the monitoring and evaluation. In this process, stakeholders should be involved in formulating the indicators to be monitored and the criteria to be evaluated.

The evaluation is followed by the refinement of the innovation, namely further improving the LL in line with the iterative character of the living lab approach.

During refinement, the outcomes of the evaluation phase are used to go back to the appropriate development phase to solve the problems encountered and to better fit the stakeholders' needs. This process can take several rounds until the needs of all participants are satisfied.

Adjustments to and refinement of the co-created outputs should also be addressed in a co-creative manner. Using the co-creation approach must be used during the whole lifetime of a LL applying a relevant methodology for each specific case. Iterations should also be conducted in a process of co-creation, and the process, the tools, and the management can also be a subject to evaluation and improvement.

5. Conclusion

This document serves as a conceptual framework for further work on the Distance LAB project GoA2.5 and WP3 to accomplish the development of local Living Labs by partners' organizations, unite them into IMLLN and ensure efficient operation of individual labs, as well as the whole network.

Furthermore, the methodology for developing Living Labs will be created, co-creation sessions among the partnership organized and guidance provided for their Living Labs prototyping. The support for partners will be provided to set and launch their Living Labs in online settings. Also, materials, such as co-creation templated for both, online and offline use will be provided.

For creating the IMLLN and joining the Living Labs into one network, the IMLLN website will be created following the Living Labs Network Blueprint. It will also envisage that new Living Labs and innovation partners from everywhere will be able to join the IMLLN online in the future.

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