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Map of projects and initiatives related TO THE same concept as Tr@nsnet

Partner Responsible
CIRCE – Technology Center for Resources and Energy Consumption

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E3.1.3 – Map of projects and initiatives related to the same concept as Tr@nsnet

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Table of contents

1. Introduction

Tr@nsnet project aims to contribute to the Energy Transition (ET) challenge by defining a new Living Lab (LL) model in the context of Open Innovation (OI). The objective is to create a **generic and transferable model** of LLs so that it can also be used by universities.

The Transnet project is divided into 3 task groups (TG), with TG3 being in charge of designing the new living lab model to address the challenges of the energy transition. This particular report is part of the deliverables foreseen in TG3 that will feed into the design of the new living lab model resulting from the project. The aim of the report has been to review the current status of the Harmonization Cube methodology proposed by the European Network of Living Labs (ENoLL) and adoption degree on existing living labs.

The model will be based on existing technology demonstrators (Smart Light, IoT Home, electrical and thermal generation, etc...) and the creation of new demonstrators (second life of electric batteries, water cycle and mobility) allowing testing and validating new technological developments and business models. The proposed LL model will combine the model of The Living Labs Harmonization Cube (HC-EnoLL) methodology of the European Network of Living Labs (ENoll), with the Regulatory Sandbox (RS) tool, taking into account market demands and regulations of the different proposals and innovative contributions that are emerging within the framework of the ET.

According to the European Network of Living Labs (ENoLL), a living lab is described as "*an open innovation environment in real-life settings in which user-driven innovation is fully integrated within the cocreation process for new services, products and societal infrastructures*",

There are plenty of definitions out there stating what a living lab is, but maybe one of the most accurate was the definition coined by J-G Geadell: "*a living lab is a user-centred, open-innovation ecosystem, integrating concurrent research and innovation processes, within a public-private-people partnership*".

*The concept is based on a **systematic user co-creation approach** integrating research and innovation processes through exploration, experimentation and evaluation (3E) of innovative ideas, scenarios, concepts and related technology **in real life use cases**."*

2. The Harmonization Cube (LLHC) method

Although the Living Lab concept was introduced long ago in the Helsinki Manifest from 2006, their factual proliferation and widespread use is relatively new, becoming a rapidly evolving tool for driving user-centric innovation in different fields of human activity. Massachusetts Institute of Technology (MIT) in Boston was the first to introduce education facilities for students to perform real-world projects, which expanded later to living labs.

These predominantly experimental environments are physical or virtual and are **characterized by real-world conditions** for innovation initiatives, such as prototyping, testing, business models associated with inventions that promote them in the market, or ways to actively engage users in the innovation process.

In contrast to traditional experimental environments, in living labs, **end-users contribute** equally to innovation activities working hands-on with the professionals, rather than just being observed to get behaviour data. This approach it's called **co-creation**. For this reason, Living Labs needs an **appropriate governance and management organization** to support open innovation projects and collaboration when it comes to intellectual property rights for example.

Concerns regarding definition, harmonization and good practices have been widely addressed since early 2000's and thus, many different conclusions have been brought to light along this period, each of them really valuable given the socio-economic context where it was assessed.

The Living Lab Harmonization Cube (LLHC) method was developed in 2008 by Telematica Instituut during the CoreLabs project within the European Network of Living Labs (ENoLL). Initially it was called "interoperability cube for harmonizing Living Labs" and was intended as a **discussion facilitator** between Living Labs on the topic of sharing experience, tools and bridging the most common gaps to harmonize different living labs. This methodology basically aims the **evaluation and comparison** of Living Labs.

This method addresses the following **six aspects** of a living lab: User participation, service creation, infrastructure, governance, innovation results, and methods and tools. Each aspect corresponding to the face of the cube is further decomposed into a 6x3x3 matrix.

As shown in Figure 1, the rows of the matrix cover the three development phases of the living lab (construction, sustainability, scalability) from top to bottom, and the left-to-right columns are the organizational, living lab. Indicates contextual and technical issues.

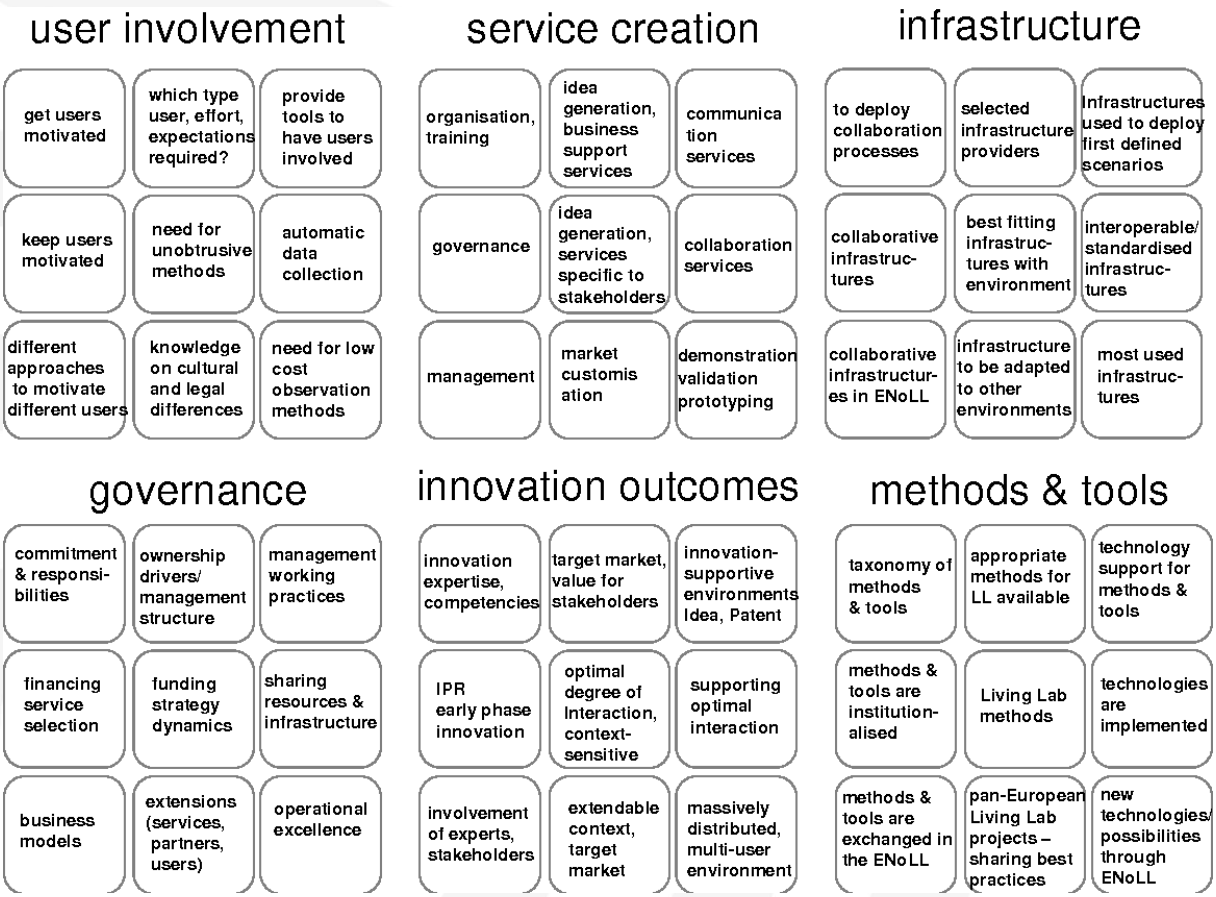

Figure 1 - 6x3x3 Harmonization Cube Matrix

3. Experiences and Case Studies

Barely to no data or references at all were found at ENoLL official channels at the moment this report was done, and the very few pieces of information found on internet come from academic repositories such as *Google Scholar* or *Research Gate* where articles with indirect references to the HC-ENoLL were uploaded many years ago.

In order to get real feedback rather than a theoretical one, we have so far assessed several living labs, academic articles and EU Commission H2020 programme outcomes.

All the experiences presented vary depending on the context and approach associated to the living lab method and innovation practice. However, the common elements of the Living Lab approach were all related: multi-method approach, user engagement, multiple stakeholder participation, real-world setup, and co-creation.

Among others, we can highlight the following:

- ENoLL questionnaire on 52 members. Reference.
- U4IoT Consortium - user engagement for large scale pilots on the internet of things. Reference.
- UNaLab – Urban Nature Labs study case. Reference.
- IMEC LivingLabs – M-Resist wearables study case. Reference.
- Bristol Living Lab: Reference.
- ViTEF + P4P. Reference.

The highlights brought up by these experiences show some important lessons from experiments aimed at attracting stakeholders and focusing on the end-user.

The most immediate conclusion is that the Harmonization Cube methodology was created 14 years ago by the time this report was issued, and the socio-economic and geo-political contexts have dramatically changed during this long timelapse. Although the motivation and purpose of the methodology are still applying, it has sprouted a lot of new methodologies, frameworks and best practices closely matching with the new challenges sparked during this accelerated **VUCA** (*Volatile, Uncertain, Complex and Ambiguous*) world.

Further toolkits have been developed and published by ENoLL in an effort to keep themselves and their members competitive with updated and state-of-the-art content. Likewise, the 3 phases of the innovation process initially proposed by ENoLL has been further divided into 3-5 iterations.

Bristol Living Lab, for example, uses the **Quadruple Helix** to segment their living lab stakeholder ecosystem dividing them into public sector, universities, companies, and citizens. They also integrated this concept within their in-house methodology called "*Bristol Approach to Citizen Sensing*" adapting different methodologies to their particularities way of doing business.

We have clustered below a list of links and URLs of some of public content to enlarge information:

- ENoLL | Knowledge Materials.
- Evaluation and Practice of Interactive Value Production in Living Labs.
- Sustainable Transport in Upper Austria – Case Study for Setting up a Living Lab Concept to Accelerate Innovations.
- Living Lab Handbook for Urban Living Labs developing Nature-Based Solutions.
- U4IoT Living Lab Methodology Handbook.
- Moving toward Generalizability? A Scoping Review on Measuring the Impact of Living Labs.

4. Key Takeaways and Learnings

Living Lab Definition

Alcotra EU Project used a similar structure of the Unique Selling Proposal to build their definition, *"...is a place where stakeholders co-create new products, services, business and technologies under real-life environments and virtual networks in multi-contextual spheres."*

LL Contribution

Actual living labs operate and have different purposes than they had 14 years ago when the Harmonization Cube methodology was developed, and we can broadly divide into two groups depending on the value they deliver to their ecosystem and unique contribution to the innovation loop: democratic **engagement platform** or **co-creation** tool.

LL Benefits

Living labs provide safe spaces for co-experimenting with innovation in the public sector close to a user/stakeholder context, while still removing pressures, risks and ethical concerns of innovation from everyday practices.

Importance of End-user involvement

"...being in direct and permanent contact with end-users creates the perfect environment for serendipity and opportunities".

The LL-HC Purpose:

A common way to describe and evaluate a living lab is needed for two reasons:

- sharing experiences and tools between living labs and,
- linking key characteristics of living labs to concrete results.

The latter is especially important in directing research and investment in real laboratories and extending their relevance and longevity.

The LL-HC Usefulness:

The fact of having created it 14 years ago and the lack of official information suggests that this is an obsoleted methodology that has been deprecated in favour of others.

However, it has shown to be a very effective method to harmonise living labs and standardising different aspects for an easier **characterisation**, being massively useful at early stages such as "living lab conceptualization" or "launching" but having the need to be complemented with other methodologies more focused on later stages when running and operating a living lab. Within the project, the Open Innovation perspective is key to complement HC-ENoLL when it comes to design a generic and transferable living lab model.

Future Work:

There is little emphasis on the assessment and evaluation on the performance of living lab activities, and thus it must be reinforced integrating for the operation phase concepts like KER (Key Exploitable Results), OKR (Objectives and Key Results) or KPI (Key Performance Indicators) among others, commonly used not only in private sector but also in most public tenders nowadays.

Business model concerns must also be addressed to foresee LL survivability and economic sustainability, to ensure they can continue their activity and contributing to the ecosystem along time.

Likewise, and as mentioned above, LLs need an appropriate governance and management organization to support the projects they host, not only regarding Intellectual Property Rights (IPR) but also from regulatory perspective.