

# The Living Lab Approach:

## A Guide to Open Innovation

June 2022



## TABLE OF CONTENTS

---

**1**

**INTRODUCTION TO LIVING LABS**

---

**4**

**OUR LIVING LAB: HEALTHCARE  
LIVING LAB CATALONIA (HCLLC)**

---

**2**

**ENoLL: THE EUROPEAN NETWORK OF  
LIVING LABS**

---

**5**

**HCLLC CASE STUDIES**

---

**3**

**LIVING LAB METHODOLOGY**

---

**6**

**TAKE-HOME MESSAGES**

---

**7**

**REFERENCES**

# 1. INTRODUCTION TO LIVING LABS

**1.**  
The Origins  
of Living Labs

**2.**  
Definitions

**3.**  
Key Elements

**4.**  
Stakeholder  
Engagement



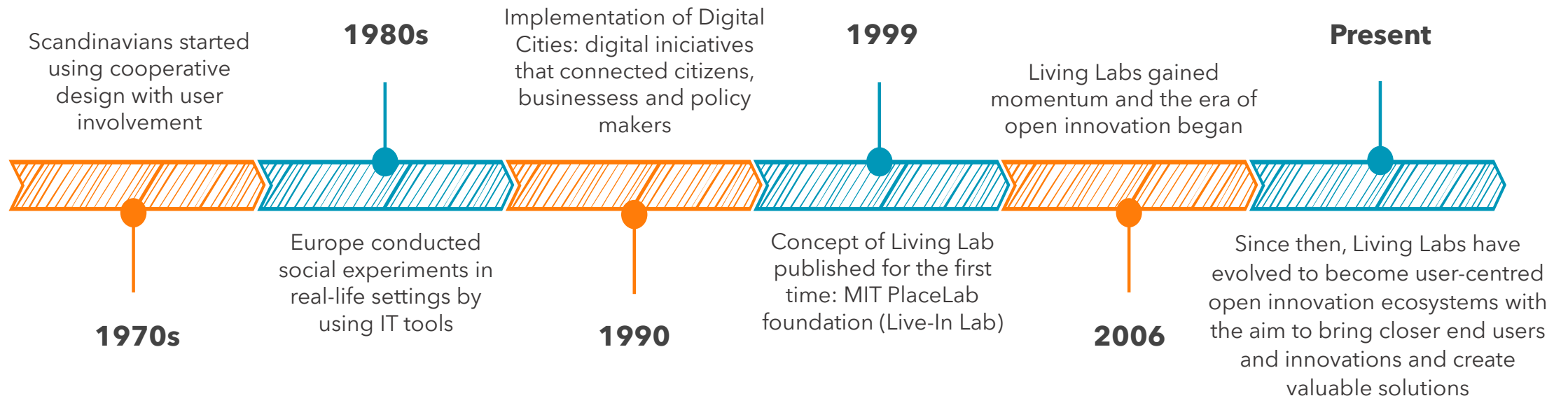
## THE ORIGINS OF LIVING LABS




Living Labs emerged as a tool to **bridge the existing gap** between **innovative solutions** and **end-users' real needs**.

To do so, Living Labs abandoned the traditional setting of a laboratory and opened themselves up to real-life environments to co-create with end users valuable innovations that would fit their needs.

Let's trace back to the beginnings of co-creation methodologies...




## INTRODUCTION TO LIVING LABS: WHAT IS A LIVING LAB?



*"Living Labs are open innovation catalysts, multi-stakeholder organizations with a user-centred approach, that aim to co-create innovative solutions with end-users in real-life environments."*

**- Healthcare Living Lab  
Catalonia, 2022**




*"Living Labs are defined as user-centred, open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real life communities and settings."*

**- EnoLL, 2015**



*"Living labs are environments for innovation and development, where users are exposed to new ICT solutions in (semi) realistic contexts, as part of medium or long-term studies targeting evaluation of new ICT solutions and discovery of innovation opportunities."*

**- Følstad, 2008**



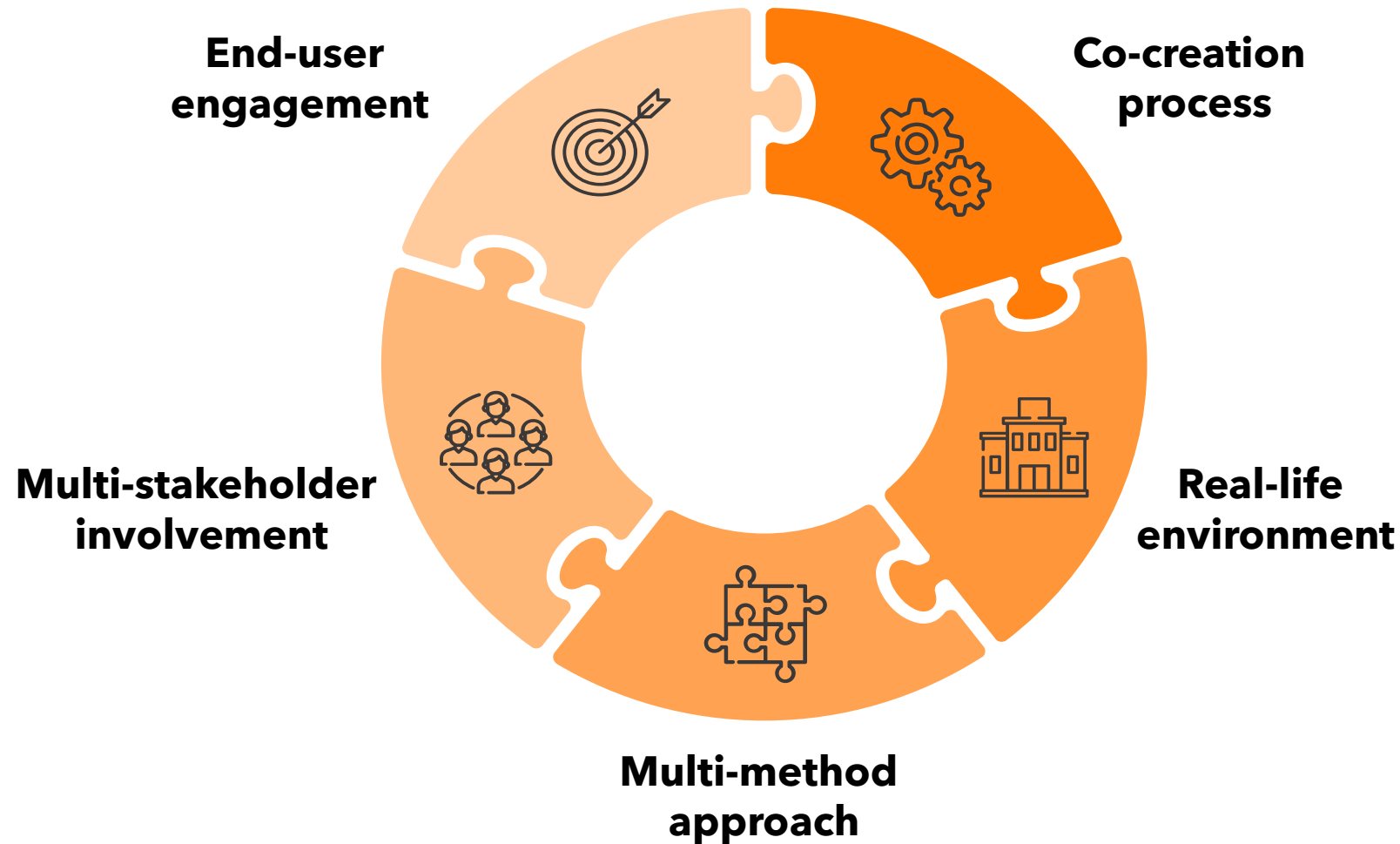
*"Physical regions of virtual realities, or interaction spaces, in which stakeholders from public-private-people partnerships (4Ps) of companies, public agencies, universities, users, and other stakeholders, all collaborating for creation, prototyping, validating and testing of new technologies, services, products, and systems in real-life contexts."*

**- Leminen and Westerlund,  
2012**

## INTRODUCTION TO LIVING LABS: KEY ELEMENTS

There are multiple definitions and perspectives of what a Living Lab is, as it is an **ever-evolving concept**.

However, the key elements that define and shape Living Labs are:



## INTRODUCTION TO LIVING LABS: KEY ELEMENTS



Living Labs follow a user-centred innovation process, where users are the key to a successful product design and actively participate in the co-creation process from the very beginning.

### END-USER ENGAGEMENT



Living Labs try to emulate the end-setting where the innovation will be used in order to gain a global overview of the final context and extract solid conclusions based on innovation usage in real-life conditions.

### REAL-LIFE ENVIRONMENT



Collaboration between all stakeholders involved is needed in order to unite forces and create an open innovation space where new ideas can be harvested. In the co-creation process, users are not considered subjects but active actors as they play a key role from the beginning to the end of the process. This process extracts valuable knowledge for all stakeholders involved.

### CO-CREATION PROCESS



Implementation of user-centred methodologies which may vary and can be modified depending on the needs and purposes of each organization.

### MULTI-METHOD APPROACH



Inclusion from expert representatives of different fields is crucial for knowledge integration and design innovation. Stakeholders are represented in the Quadruple Helix as valuable actors from the public sector, private sector, academia, and society.

### MULTI-STAKEHOLDER INVOLVEMENT

## INTRODUCTION TO LIVING LABS: STAKEHOLDER ENGAGEMENT

One of the most important parts of a Living Lab is the **cooperation** between the different **stakeholders** involved, which allows for new **insights and knowledge** to be generated while also creating an optimal environment for **fostering innovation**.

This concept is reflected in the **Quadruple Helix representation**, where the different actors involved in the innovation process exchange and combine knowledge in order to accelerate the transfer of innovation and co-create innovative solutions for real-life problems.

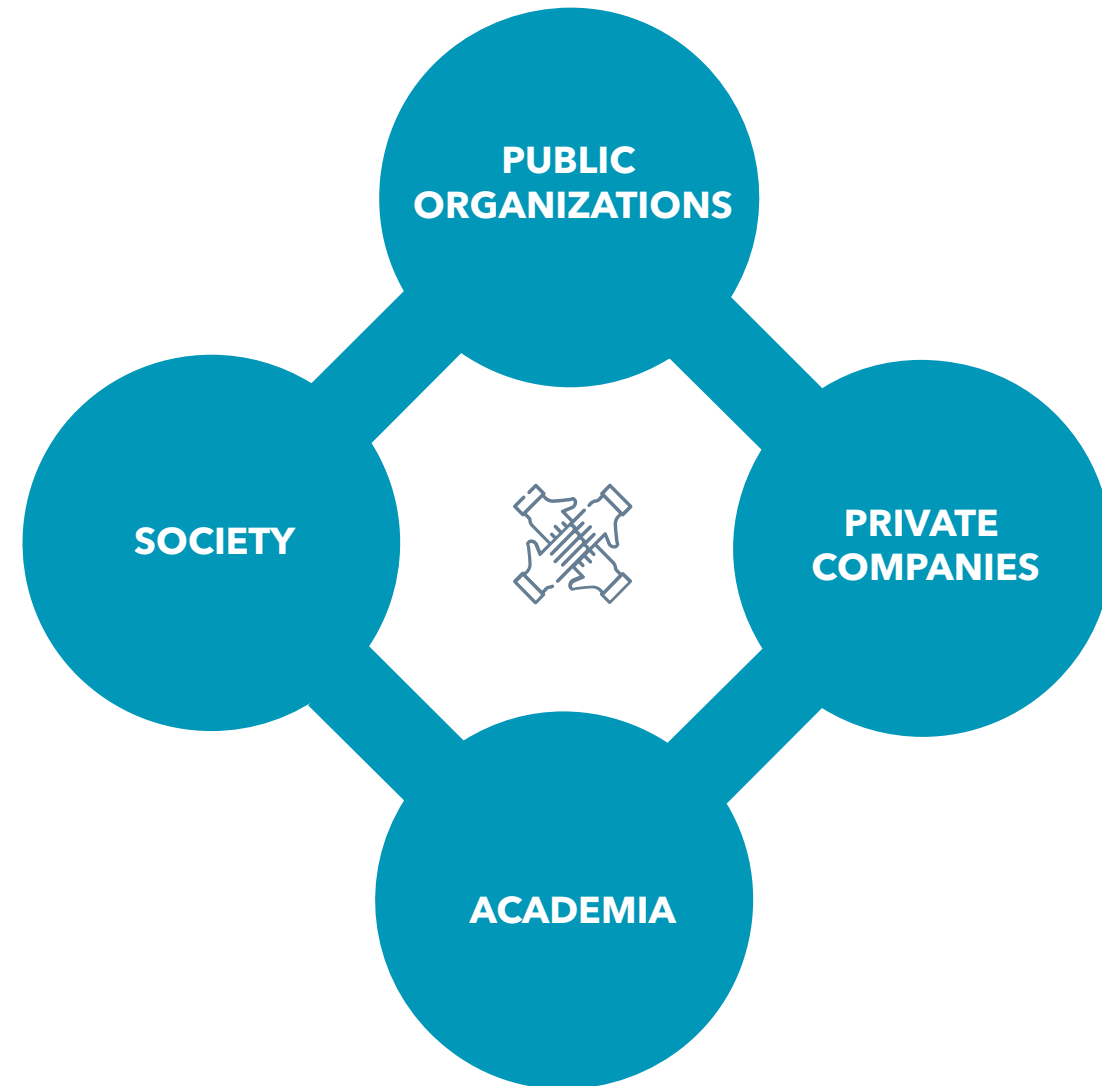
The stakeholders involved in the Living Lab Quadruple Helix are the following:



The stakeholders' degree of engagement needs to be assessed depending on the type of activity carried out and based on the objective of the study, the motivation of each stakeholder, and the membership model created by the Living Lab.



### LIVING LAB QUADRUPLE HELIX





## **2. ENoLL: THE EUROPEAN NETWORK OF LIVING LABS**



## ENoLL: KEY STAKEHOLDERS AND NETWORK

The [European Network of Living Labs \(ENoLL\)](#) is the international association of benchmarked Living Labs around the world. Its aim is to **promote Living Labs** in order to enable their global implementation.

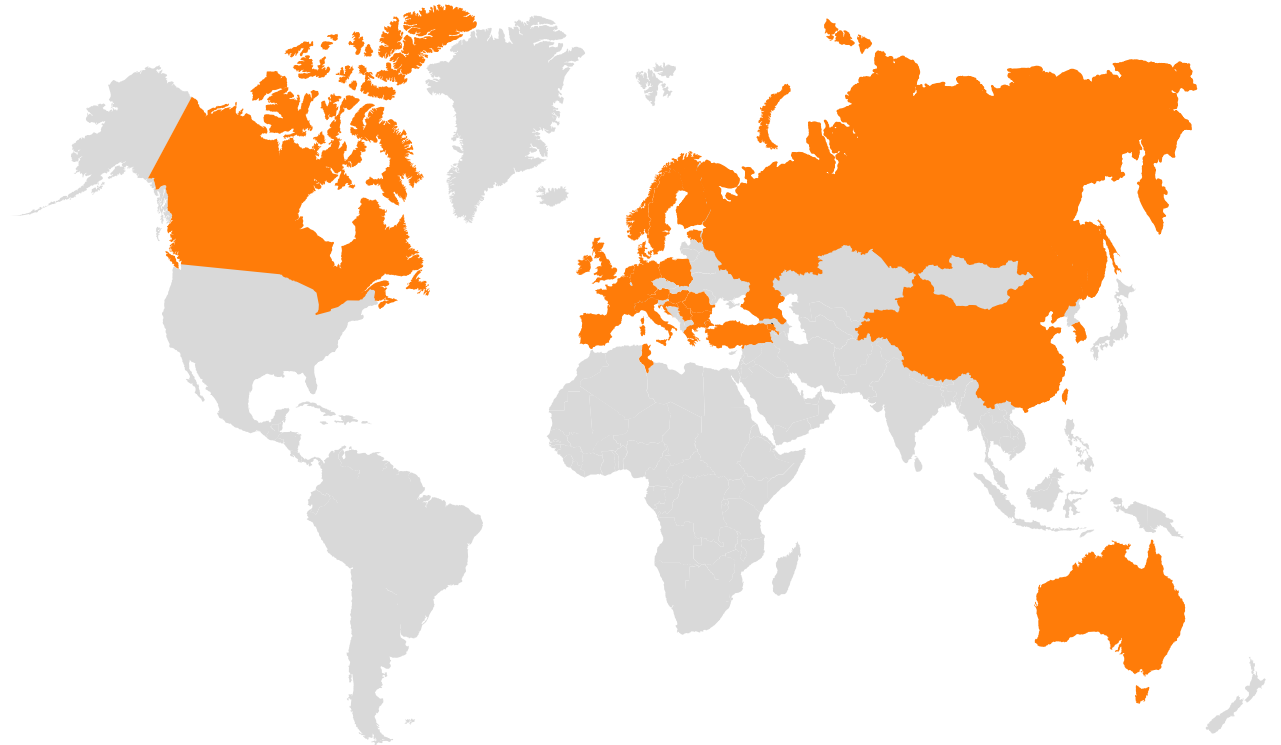
The network and its members provide **innovation services** to public institutions, private companies, academia, and citizens.

ENoLL facilitates knowledge exchange, joint actions and project partnerships between its more than 480 members in Europe and worldwide.



**European  
Network of  
Living Labs**

### CURRENT LIVING LABS NETWORK



## 3. LIVING LAB METHODOLOGY

**1.**

**Introduction to  
the LL  
methodology**

**2.**

**The Open  
Innovation  
Process**

**3.**

**Phases of the  
Open Innovation  
Process**



### AIM



The Living Lab approach is aimed at **obtaining innovative solutions** with the **active participation** of all stakeholders and the valuable **involvement of end-users** in each step of the process.

Innovative  
solution

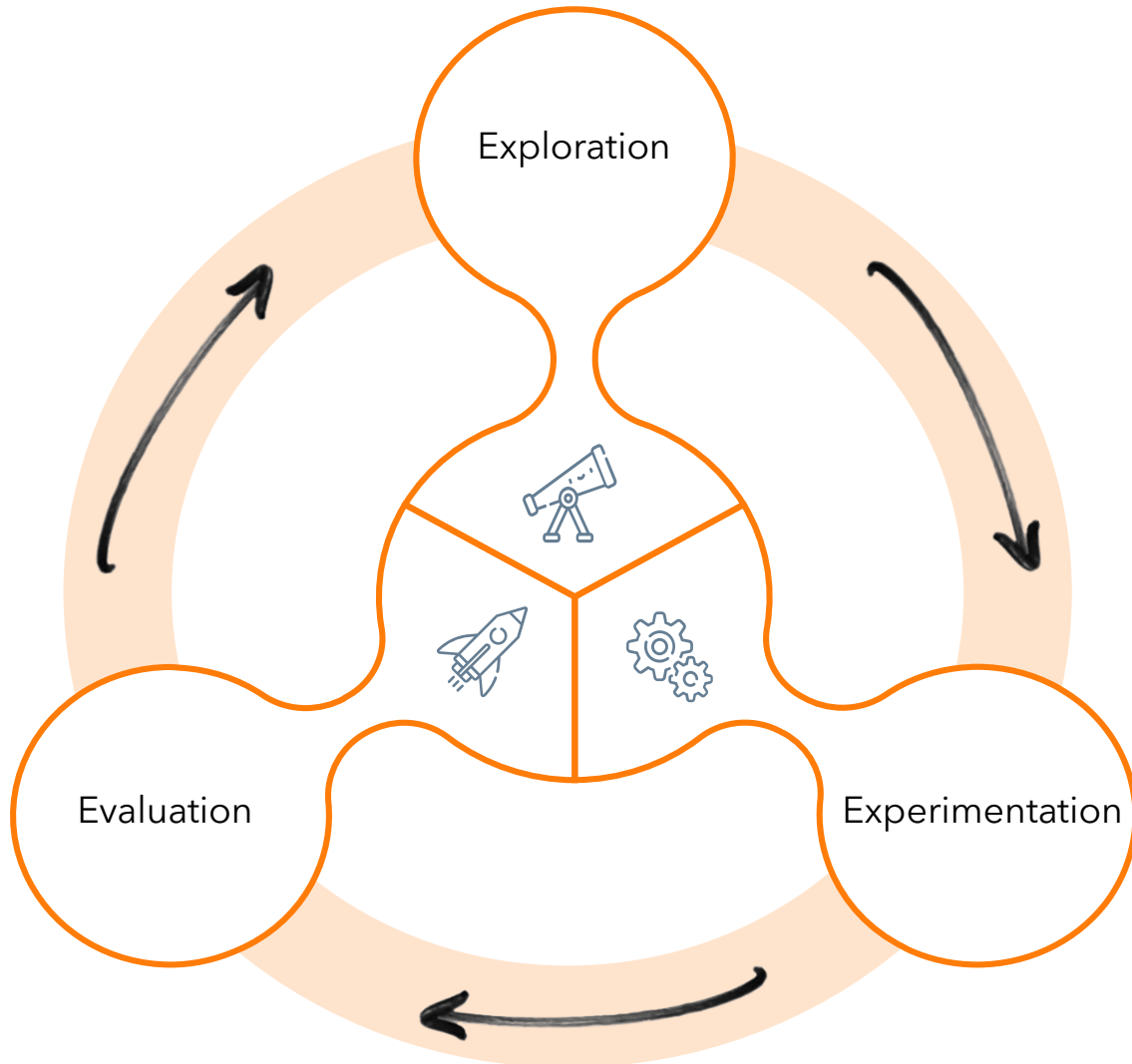


There is not only a single Living Lab approach, as the methodology is constantly evolving and each specific Living Lab can customize and adapt its own according to its purpose.

However, the common fundamental methodology on which most Living Labs are built from is the implementation of an **open innovation process**.

## LIVING LAB METHODOLOGY: THE OPEN INNOVATION PROCESS

The Living Lab approach is based on the **open innovation process**, which is defined by the steps followed from the idea conception to its implementation with the cooperation and feedback from the stakeholders involved.



The process is divided into three main phases:

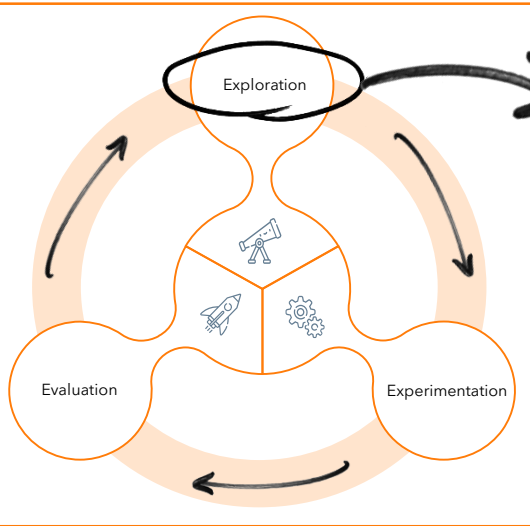
- **Exploration**
- **Experimentation**
- **Evaluation**

Other phases, such as Planning and Implementation can be added into the process depending on each Living Lab methodology.

A key characteristic of the open innovation process is that it is a **user-centred iterative methodology** based on a **co-creation approach** that allows to go back in the process and re-evaluate some previous stages based on end users' feedback.



## LIVING LAB METHODOLOGY: EXPLORATION PHASE



The first step of the innovation process is known as the '**exploration phase**':



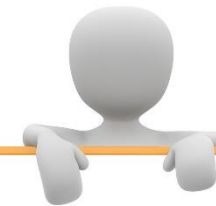
This phase aims to **conceive and conceptualize an innovative idea** that fits end-user needs, and is feasible for market implementation.

The key to doing that is to understand the **current practices** of **end users** so as to create a product or service that covers their needs.



In a Living Lab environment, the exploration phase can be carried out using **co-creation** and **brainstorming** activities where end users give their valuable experience and express their current needs.

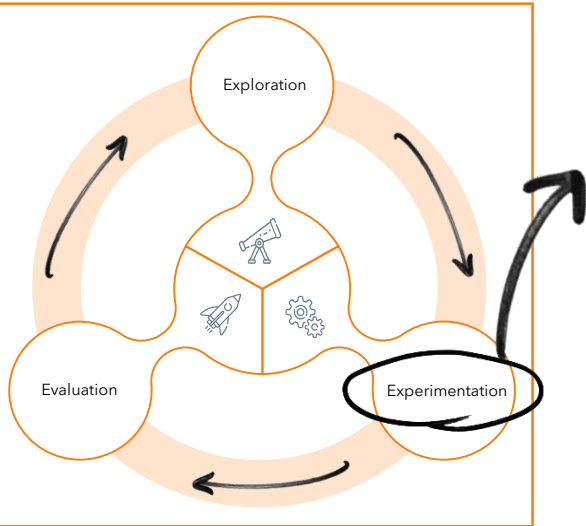
You can think of the exploration phase as a blank canvas, where you **brainstorm** different innovative ideas and end up choosing the best fit.



### TIP:

Performing a benchmark study in this phase will allow you to get deeper insights into the current trends.

## LIVING LAB METHODOLOGY: EXPERIMENTATION PHASE



The second step is the '**experimentation phase**':



The aim of this stage is to **transform the concept** into a **functional prototype** of the innovation. This step involves prototype design, development and testing.

The distinctive feature of the Living Lab approach is that the experimentation, specifically the testing step, is carried out in **real-life environments** which try to emulate the settings in which the innovation will be used.



The prototype can be designed, developed, and tested through **co-creation activities** involving end users and various iterations until the innovation is suitable for end users' needs. Prototype testing is performed to assess its **key functions** and **properties** through usability tests.

From the experimentation activities one can gain **valuable end-user knowledge** which will either make the developed prototype proceed to the next stage or it will have to be re-evaluated.

## LIVING LAB METHODOLOGY: EVALUATION PHASE

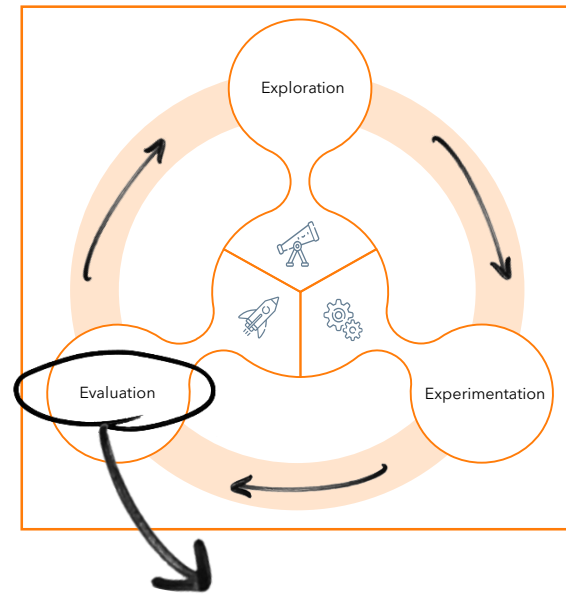
The final phase is known as the '**evaluation phase**':



This stage aims to **implement the innovation into the market** and assess whether it is market-fit.

There are different types of studies which can be performed, such as a pilot study or an adoption study. These activities may allow to **detect and re-assess functionalities** of the innovation.

In this stage, it is fundamental to evaluate the current market scene, develop a marketing and communication strategy, and other initiatives which may help to **boost and add value** to the innovation in order for it to **reach the market**.





## 4. OUR LIVING LAB: THE HEALTHCARE LIVING LAB CATALONIA

**1.**

Introduction  
to our  
Living Lab

**2.**

Network  
of partners

**3.**

Methodology

**4.**

Services



## HEALTHCARE LIVING LAB CATALONIA (HCLLC): INTRODUCTION TO OUR LIVING LAB



The **Healthcare Living Lab Catalonia** (HCLLC) is a Living Lab specialized in the **health** and **social** fields.



Its mission is to bring together healthcare centres, technology centres and Living Labs throughout Catalonia and **connect them to innovative SMEs and start-ups** from all over Europe, allowing for a faster prototyping, testing and validation of their innovative solutions.

By means of an internationally recognized methodology, the HCLLC is able to **accelerate the time-to-market** of innovative solutions.



The HCLLC offers its services to advise and methodologically guide start-ups, SMEs and companies that want to prototype, test and/or validate innovative solutions in real-life environments with end users in the fields of **medical devices, *in vitro* diagnostics, and digital health**.

## HEALTHCARE LIVING LAB CATALONIA: NETWORK OF PARTNERS

It is a singular initiative of **Leitat** that has the mission of turning Catalonia into a **Living Lab of reference** and, for this reason, it has a vast network of collaborating entities that include the **main health centres** and **innovation referents** throughout the country and, on the other hand, the main **associations of health and social centres** in the country.

This network is continuously growing and, today, they are part of it:

Salut/Institut  
Català de la Salut



Vall d'Hebron  
Hospital



Bellvitge  
Hospital Universitari



Germans Trias i Pujol  
Hospital



Hospital Universitari de Girona  
Doctor Josep Trueta



Hospital Universitari  
Arnau de Vilanova Lleida

HJ23

Hospital Universitari Joan XXIII  
ICS Camp de Tarragona



Hospital  
de Viladecans

HTVC

Hospital de Tortosa  
Verge de la Cinta



IDIAP  
Jordi Gol



Hospital General de Granollers  
Hospital Universitari  
Fundació Privada Hospital Asil de Granollers



Mútua Terrassa



Corporació  
Parc Taulí

CST

CONSORCI SANITARI DE TERRASSA



XARXA SANTA TECLA  
Sanitària i Social

a Tarragona des de 1171

FUNDACIÓ HOSPITAL  
SANT PAU I SANTA TECLA



Fundació  
HOSPITAL d'OLOT  
COMARCAL DE LA GARROTXA



Germanes  
Hospitalàries  
BENITO MENNI CASM



son Espases  
hospital universitari



Clúster  
Salut Mental  
Catalunya



Fundació  
Salut Empordà



Hospital  
de Figueres  
Fundació Salut Empordà

HLAUNIÓ  
Associació d'Entitats Sanitàries i Socials

## HEALTHCARE LIVING LAB CATALONIA: NETWORK OF PARTNERS

In addition, the HCLLC has the seal of the European Network of Living Labs (ENoLL), is a Reference Site of the European Innovation Partnership on Active and Healthy Aging (EIP on AHA) and collaborates with EIT Health and the Centre for the Integration of Medicine and Innovative Technologies (CIMTI).

Promoting entity



Strategic alliance



Accredited member of



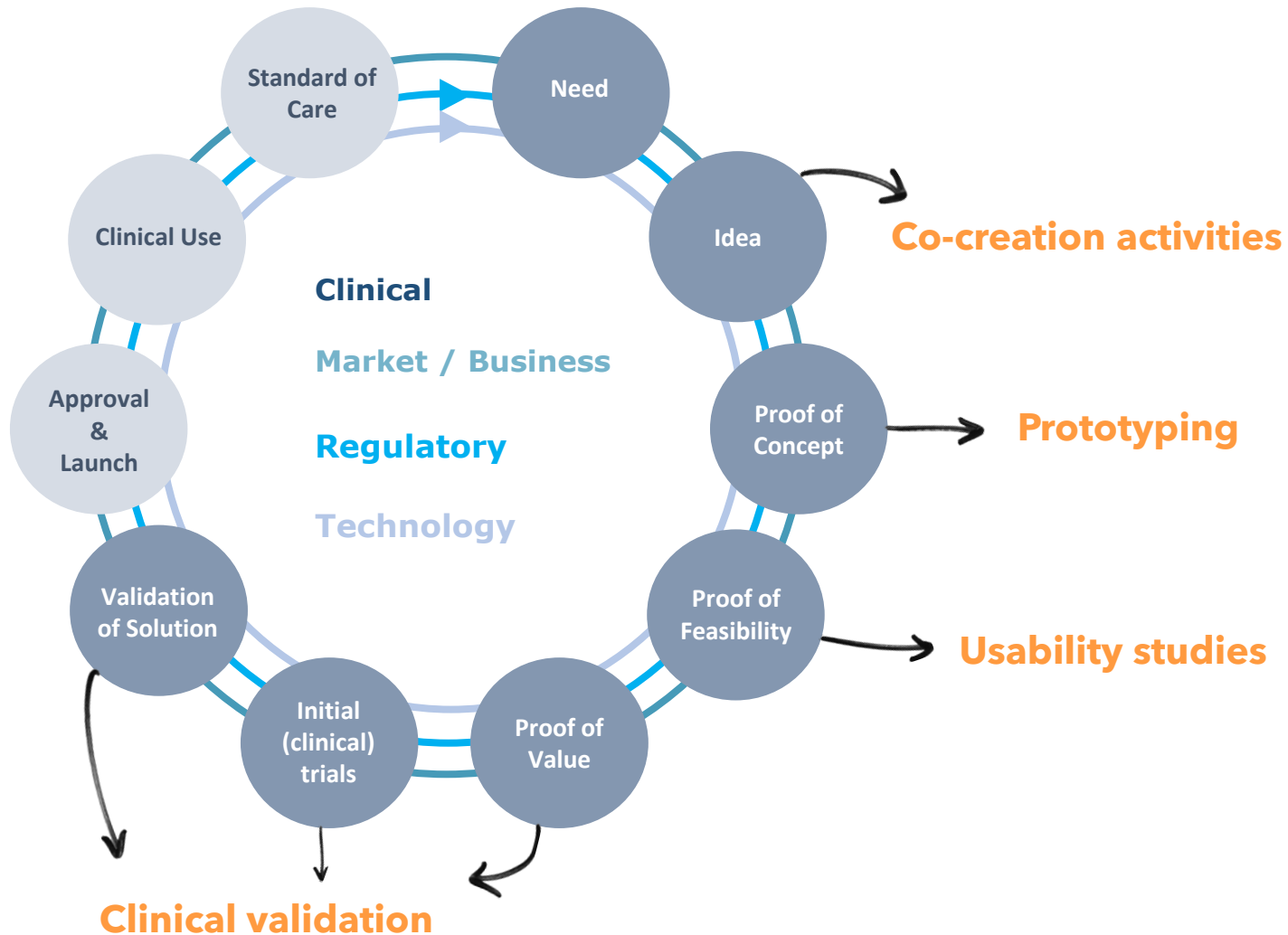
In collaboration with



Reference site of

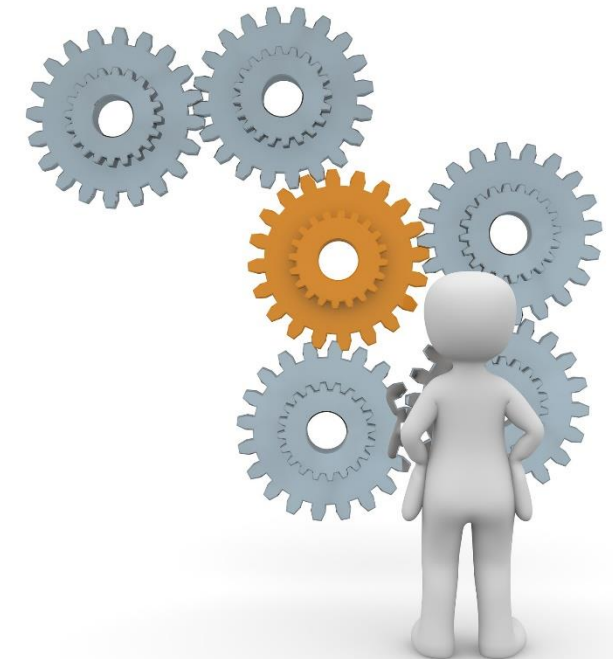


## HEALTHCARE LIVING LAB CATALONIA: METHODOLOGY

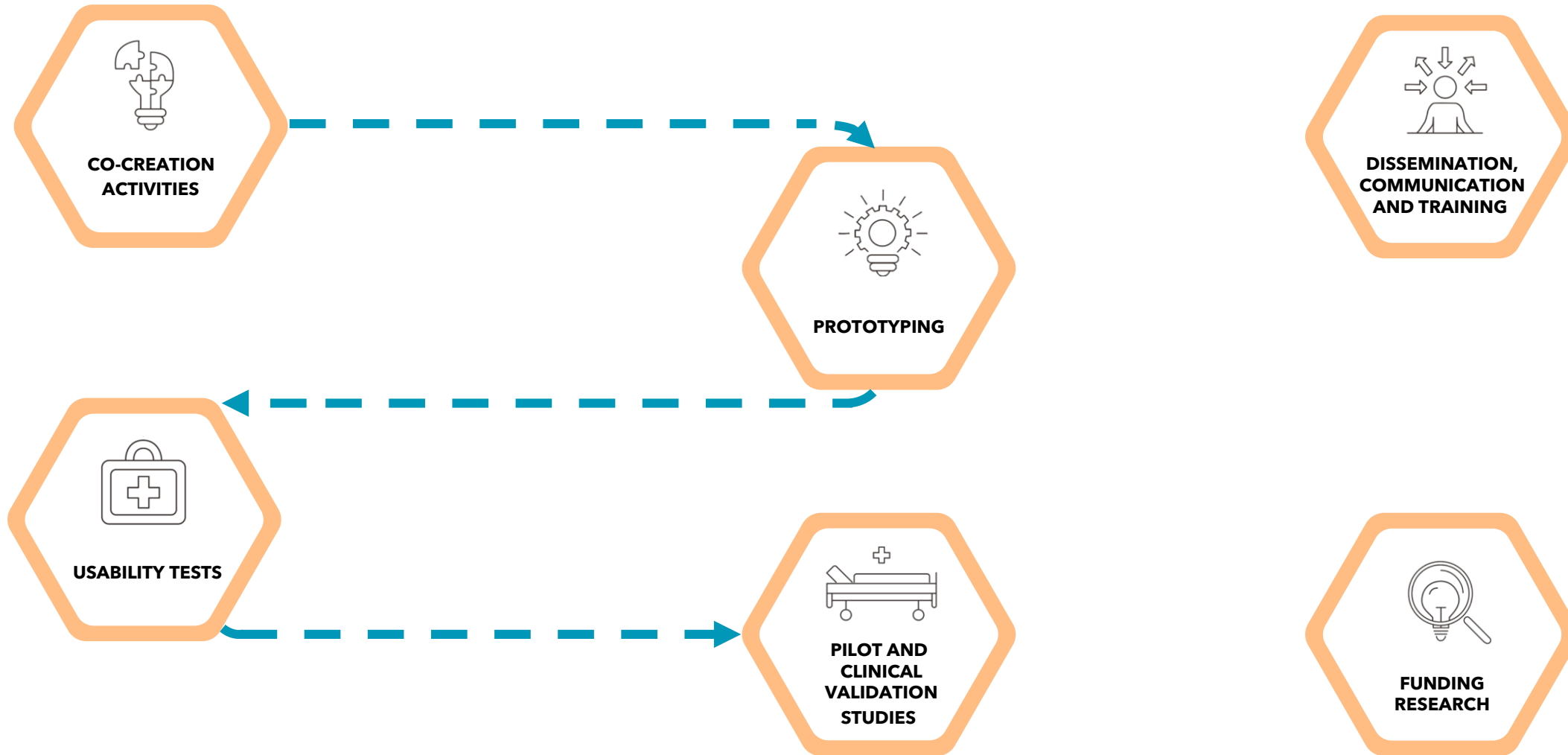


The Healthcare Living Lab services are based on **CIMIT's Healthcare Innovation Cycle** (Consortia for Improving Medicine with Innovation and Technology), a model of health and social innovation recognized and used by experts worldwide.

This methodology has been adapted by the **CIMTI** and the **HCLLC** to meet European needs.



## HEALTHCARE LIVING LAB CATALONIA: SERVICES



Through its methodology, the HCLLC centralizes all procedures, offers personalized support, and ensures the quality of the service provided.

## HEALTHCARE LIVING LAB CATALONIA: SERVICES



### CO-CREATION ACTIVITIES

In order to **involve end users** from the beginning and help innovative people to design solutions that solve **real needs**, the HCLLC organizes and executes co-creation activities of innovative solutions where the **collaboration of all stakeholders** involved is facilitated: citizenship (patients or healthy population), professionals from the health and social fields, universities, companies, and public entities.

The HCLLC has its own methodology to carry out these activities, involving the necessary people and obtaining high-value information.

Types of co-creation activities that are organized:

- Individual interviews
- Focus groups
- Willingness-to-adopt and willingness-to-pay studies



### PROTOTYPING

In order to **develop design** or **functional prototypes of innovative solutions**, the HCLLC uses Leitat's prototyping capabilities in the areas of Health and Biomedicine, Applied Chemistry and Materials, Advanced Engineering and Robotics.

Through prototyping, one can demonstrate **key functions** of products or services, **collect feedback** from end users, and **guide further** design and development.



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## HEALTHCARE LIVING LAB CATALONIA: SERVICES



### USABILITY TESTS

In order to evaluate **the ergonomics, design, usability and function** of a solution, the HCLLC organizes and executes usability studies where **end users test and evaluate innovative solutions**. The end users involved include citizens (patients or healthy population) and professionals from the health and social fields.

The HCLLC has its own methodology to carry out the entire process, from the definition of the necessary indicators to the execution of the study, and the delivery of a final report.



### PILOT AND CLINICAL VALIDATION STUDIES

In order to validate the **efficiency** and **effectiveness** of the developed solution in **real-life environments**, the HCLLC organizes and executes pilot studies and clinical validation studies with the collaboration of the health and social entities associated to the network.

The results obtained from these studies allow **the efficient and quick validation of solutions**, with a statistical sample that allows to generate evidence with significant results and with a minimum budget.



This information is essential to focus investment rounds and regulatory processes.





## HEALTHCARE LIVING LAB CATALONIA: SERVICES



**DISSEMINATION,  
COMMUNICATION  
AND TRAINING**

Within the framework of European projects, the HCLLC also acts as a key partner in the elaboration and execution of the **communication strategy** for the **dissemination of activities and results of projects** among stakeholders and citizens.

In addition, the HCLLC leads the **training and dynamization of interest groups** to ensure the involvement of end users from the beginning of each project.

The target audience of this service includes professionals from the health and social fields, research personnel, citizens, and the administration.



**FUNDING  
RESEARCH**

Through our expert team in research of national and international competitive funding, we **advise and guide** SMEs and start-ups on the most appropriate ways to **apply for competitive funding** according to their characteristics and needs.



We guide them through the **whole call application process**: from suitable call identification and partner selection to writing and submission of the competitive proposal.

## 5. HCLLC CASE STUDIES

**1.**

**Co-creation:  
Breaz Medical**

**2.**

**Usability:  
Rethink Medical**

**3.**

**Clinical  
validation:  
WIVI Vision**



### CASE STUDY: BREAZ MEDICAL



**Breaz Medical** is developing a new medical device to support healthcare professionals (in the pneumology area) in the identification and monitoring of chronic respiratory diseases, such as chronic obstructive pulmonary disease (COPD). The medical device includes an easy-to-use testing platform for patients, and results are easy to interpret for non-specialists' professionals.

**TESTED DEVICE STATUS:** End-process of the first functional prototype development.

#### THE NEED

- To **obtain feedback from healthcare professionals** on the solution.
- To **identify key features** to consider.
- To **understand the current clinical workflow** and the requirements for fitting into this practice.



#### THE ACTIVITIES

**Execution of two focus groups** with healthcare professionals from three Catalan hospitals. A total of **12 healthcare professionals**, including general practitioners, nurses and pneumologists, participated in the sessions, that were held in a virtual format.



#### THE MAIN MILESTONES

- **Understanding of the current clinical workflow** of patients with COPD.
- **Learning the pains and needs** of healthcare professionals regarding COPD.
- **Feedback from primary care healthcare professionals** on the usefulness of the solution.
- **Feedback from pneumologists and nurses** from the hospital outpatient area on the solution.



### CASE STUDY: RETHINK MEDICAL



[Rethink Medical](#) has developed T-Control®, a urinary catheter with a unique valve to increase the patients' comfort, improve the clinical practice and reduce infections.

**TESTED DEVICE STATUS:** Functional prototype.

#### THE NEED

- To **test the T-Control® prototype** by nurses who are responsible for performing urinary catheter insertions.
- To **compare the prototype** with the standard techniques and **obtain feedback**.



#### THE ACTIVITIES

Organization and execution of three days of **preclinical testing** in three Catalan hospitals. **12 nurses** participated in the **comparative study** with the T-Control® prototype and the standard techniques.



MútuaTerrassa



Bellvitge  
Hospital Universitari



#### THE MAIN MILESTONES



- **Feedback from the nurses** on the solution developed by the company.
- Better **understanding of end-users' pains and needs**.
- **Useful information to integrate** in the instructions for use of the solution.
- **Recruitment of an external trainer and evaluator** for the study.
- **Collection and creation of audio-visual material**.

### CASE STUDY: RETHINK MEDICAL



E-HEALTH TECHNICAL SOLUTIONS has developed [WIVI](#), a new immersive product based on 3D visualization which allows a comfortable and free way to assess the skills and capabilities of the visual system as well as the design and implementation of treatment by appropriate vision training for improvement and standardization.

**TESTED DEVICE STATUS:** Advanced development stage.

#### THE NEED

- **To validate the results** previously obtained in preclinical studies with a **clinical validation study**.



#### THE ACTIVITIES

Organization and execution of a **prospective observational study** with a **paediatrics research group** from a Catalan hospital. The sample size included **200 children** divided into two groups: children with healthy visual function and children with visual dysfunction diagnosis.



#### THE MAIN MILESTONES

- **Feedback** regarding methodology, clinical protocol, and study implementation.
- **Submission and approval** by an **Ethical Committee**.
- **Validation** of the solution with the **end users**.
- **Feedback from healthcare professionals** using the solution.





## **6. TAKE-HOME MESSAGES**



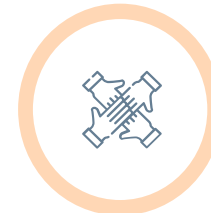
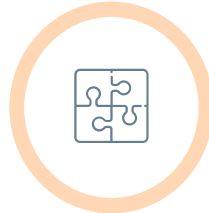
## TAKE-HOME MESSAGES



Living Labs are leading open innovation driving entities that bridge the gap between solutions and end-users needs by implementing a co-creation process.



The key elements of Living Labs are: end-user engagement, co-creation process, real-life environment, multi-method approach, and multi-stakeholder involvement.



Stakeholder engagement is fundamental for joint knowledge exchange, technology transfer and added value to the innovation.



Living Labs follow an evolving adaptable approach to the open innovation process but the main phases are: Exploration, Experimentation and Evaluation.



## HEALTHCARE LIVING LAB CATALONIA: TEAM



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