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D.1.1.1 Guidelines for MedSky Place Labs

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PP2 - ISD

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Executive summary

The deliverable *Guidelines for Astrotourism Place Labs (D1.1.1)* provides a **methodological framework** for establishing and running Astrotourism Place Labs as co-creation environments for sustainable astrotourism. Based on the **Living Lab model** and the **Quadruple Helix approach** (government, business, academia, civil society), the methodology ensures that new services are designed and tested with **broad stakeholder participation, inclusiveness, and environmental responsibility**.

The process begins with the **establishment of Place Labs**, composed of 6–10 stakeholders per region selected transparently to represent diverse perspectives. Kick-off meetings define responsibilities, shared visions, and data needs. The next stage is **co-creation of innovative services**, where methods such as **HOW–NOW–WOW**, **project-in-a-day**, and **hackathons** stimulate creativity and classify ideas by feasibility and originality.

Once services are identified, **testing and verification** take place through **hands-on workshops**, where service providers demonstrate their concepts to lab members acting as end users. Feedback is collected across six dimensions: **service quality, marketing potential, environmental impact, biodiversity effects, gender equality and inclusiveness, and socio-economic value**. Each region prepares a report, followed by **peer review and transnational scoring**, ensuring comparability and quality control across partner territories.

The guidelines then focus on **mainstreaming and upscaling**. Using **project-in-a-day workshops**, Place Labs co-design regional itineraries that combine new services with existing eco-tourism offers. These are peer-reviewed, refined, and merged into a **transnational itinerary** for joint promotion. The methodology further supports long-term planning through the development of a **Transnational Astrotourism Strategy** and **Regional Action Plans**, co-created via **world café workshops**. These documents define measures for **reducing light pollution, protecting biodiversity, and fostering inclusive, sustainable tourism growth**.

Underlying all steps are **five guiding principles of Living Labs**: **value** (delivering benefits to all stakeholders), **influence** (active role of participants), **sustainability** (balancing ecological, social, and economic aspects), **openness** (transparency and knowledge exchange), and **realism** (real-life testing and validation). Together, these guidelines create a **replicable and practical model** for developing Astrotourism services that are innovative, inclusive, and transferable across Mediterranean regions.

Background

To ensure a bottom-up approach and active stakeholder participation in each region, the **Astrotourism Place Labs** will be established in each testing region as a living lab consisting of **Quadruple Helix participants.**

The general focus of their work will be twofold:

1.) Support tourism-related businesses, especially those related to nature hiking, wildlife watching, and stargazing—activities of WP1&WP2.

2.) Co-creating policies for minimizing light pollution and raising awareness about the importance of nocturnal animals.

"Astrotourism" Place Labs will operate as **co-creation places using living lab methods** (e.g. world caffe, pecha kucha, project in a day, hackaton, etc...).

Living lab co-creation workshops (How-Now-Wow method) will be implemented to stimulate stakeholders' creative thinking and start the process of new tourism services development. Partner ISD (due to experiences of being ENoLL's Living lab evaluator) will provide the living lab method and coordinate the activity. Astrotourism place labs members will follow orientation to include equal number of men and women as much as possible..

Vulnerable groups (youth, elderly, disabled, etc.) will be actively included when preparing services to consider their special needs.

Place Labs will have a horizontal role over all 3 WPs:

- Supporting co-creation of Astrotourism services - connected to A1.2, A1.3

- Verification of Astrotourism services (economy, ecology, gender equality...) - transnational quality check questionnaire - connected to A1.3

- Mainstreaming and upscaling of Asto tourism on a regional level - WP2

- Transnational exchange of experiences and transferability - WP2

- Supporting the development of strategic focus from bottom-up perspective - WP3

Step 1 – Establishment of Astrotourism place labs

Astrotourism Place Labs will be established in each testing region as a living lab consisting of **Quadruple Helix participants.**

Partners who are responsible for establishment of Place Labs:

No.	Name of Partner	Country
LP	BSC Kranj	Slovenia
PP3	RERA	Croatia
PP5	Province Teruel	Spain
PP6	ADRAL	Portugal
PP7	CTDC	Montenegro
PP8	Regione Lazio	Italy
PP9	Region of Western Greece	Greece

Type of Stakeholders

Astrotourism Place Labs should be composed from different stakeholders of Quadruple Helix including local government, business stakeholders, academia and citizens. Place labs should be highly operative, having not too many or too few stakeholders. Therefore, each pilot partner should invite and select **6-10 stakeholders** from the following fields:

- **Local/regional government** (can be representatives of municipality or region)

- **Business stakeholders** (any type of business located in the area of intervention or with some specific knowledge from the field of intervention – preferable tourism related SMEs)

- **Academia** (university or school or research)

- **Civil society** (can be any kind of NGOs, or interested citizens (opinion makers) of the area)

Stakeholders should be selected in a transparent process, e.g. through an open call, available on web site or social media. Additionally specific stakeholders could be invited to ensure high quality and interested stakeholders from 4 upper mentioned fields. During the process stakeholders could be replaced or additional stakeholders joined, according to specific site-situation.

Initial Astrotourism place lab meeting - Timeline: September – October 2025

The initial meetings of the Astrotourism Place Labs node team should include the following activities:

- Presentation of the project;
- Presentation of the place labs tasks and drafting more detailed work plan and schedule of activities;
- Open discussion about different aspects of astrotourism (questions below)
- Plan to engage the broader public and community voices to ensure broad participation in future activities.

Some important questions that could be asked in this step are the following:

- What is situation of astrotourism in the area, could it be improved ?
- Who are the local stakeholders, that could be interested in Astrotourism?
- What is our shared vision for the future of Astrotourism and what role does nature play in that future?
- What do you think about the light pollution? What measures could be taken to minimize it?
- What data, expertise and other resources do we need to improve Astrotourism in the area?
- Are there any additional resources or calls for advancement of Astrotourism?
- How can we work together, what are needs of the place lab members?
- What do we want to achieve, and what metrics will we use to evaluate and monitor success?

The most important results of this step include the following:

- A team of experts actively involved in all activities;
- A strategic, integrative vision of the place labs and a work plan of activities;
- Compilations of relevant data and other resources needed to implement the plan;
- Realistic expectations for stakeholder participation.

Step 2 – Supporting co-creation of Astro Tourism services - connected to A1.2

Place Labs will have a horizontal role over all 3 WPs. Below is description of the place lab integration into different activities of the project.

Activity 1.2 Development of innovative eco-tourism services related to astrotourism

One of the main project impacts will be creating eco-tourism services based on the "dim sky" as an important ecosystem asset. Night sky-related services are among the most environmentally friendly, including stargazing sites, off-grid hotels and camping sites, hiking-astronomy tours, observatories and planetariums, romantic dining, etc.

Within this activity, each Astrotourism site (LP, PP3, PP5, PP6, PP7, PP8, PP9) will develop and test at least one new "Astrotourism" related service.

Services will be ideated and developed with a co-creation approach using the following steps:

1.) Selection of appropriate territory and micro location

2.) Identification of existing similar activities and stakeholders (mailing lists for invitations)

3.) Public calls for expression of interest for services (short call, obligation to participate at co-creation workshop)

4.) Co-creation workshops will be held in all territories using methods HOW-NOW-WOW to inspire applicants

5.) Full call for full applications.

6.) Received applications will be evaluated by regional Astrotourism Quadruple Helix members within Astrotourism Place Labs

6.) The highest scored application will be selected and supported by offering start-up services (for example: promotional material, branding, business plans, web sites, consumables etc..). Partners are free to choose the services based on the local needs.

Workshop 1 - Co-creation workshops will be held in all territories using methods HOW-NOW-WOW to inspire applicants

Methodology for Co-Creation Workshops on Astrotourism Services - Using the HOW–NOW–WOW Method with Quadruple Helix Stakeholders

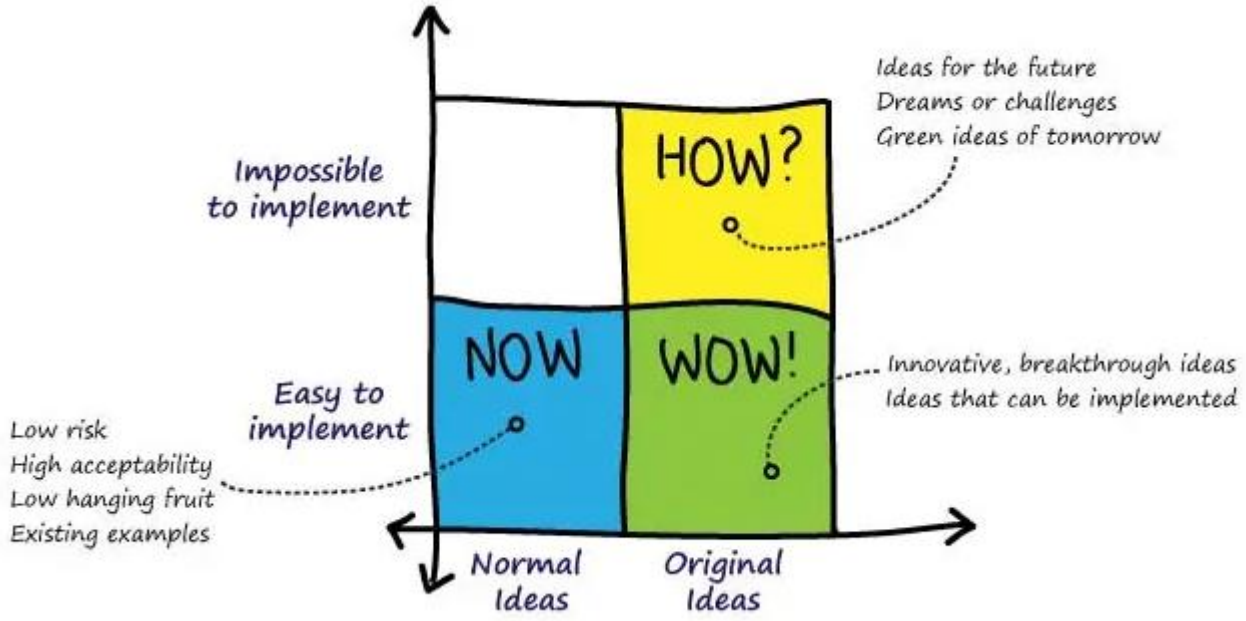
1. Purpose of the Workshop

The workshop aims to:

- Co-design innovative Astrotourism services that combine environmental stewardship with sustainable economic opportunities.
- Exploration of involvement of quadruple helix stakeholders — **government, industry, academia, and civil society** — to ensure holistic, place-based solutions.
- Inspire potential service developers to move from concept to implementable ideas, aligned with sustainable tourism principles and local/regional strategies.
- Create a portfolio of service ideas categorised into **HOW**, **NOW**, and **WOW**, ready for further development in Euro-MED project frameworks.

The HOW–NOW–WOW Framework

- **NOW** – Services that can be implemented immediately using existing resources, technologies, and regulatory frameworks (high feasibility, low originality).
- **WOW** – Highly original but also feasible Astrotourism service concepts with strong market appeal and environmental benefit (high feasibility, high originality).
- **HOW** – Ambitious, visionary services requiring new technology, policy shifts, or significant investment (low feasibility now, high originality).



Potential workshop Participants

- **SMEs & Potential Service Developers:** Tourism operators, hospitality providers, Hotels, Restaurants, outdoor tourism organizers, tourist agencies, tech firms (AR/VR, stargazing equipment producers), start-ups focusing on tourism, nature conservation, and creative industries.
- **Government & Local Authorities:** Tourism boards, environmental protection offices, urban/rural planning departments.
- **Academia & Research:** Universities, observatories, environmental scientists, cultural heritage experts.
- **Civil Society:** NGOs, local community groups, amateur astronomers, citizen science groups.

For this workshop participation of **SMEs & Potential Service Developers** is mandatory, others contribute with opinions and refinement.

Workshop Flow (Half-Day Example)

Step 1 – Welcome & Scene-Setting (15 min)

- Introduce the Euro-MED project context and astrotourism concept.
- Present local natural assets (e.g., low-light areas, observatories, heritage sites), market trends, and sustainability guidelines.
- Explain HOW–NOW–WOW categorisation.

Step 2 – Immersion & Inspiration (15 min)

- Showcase **examples of astrotourism services** from other regions (e.g., guided astrophotography tours, night-time biodiversity walks, VR star navigation experiences).
- Share **local data**: light pollution maps, seasonal night-sky events, potential synergies with gastronomy, cultural heritage, or wellness tourism.
- Invite a short talk from an **astronomer or tourism innovator** to spark creativity.

Step 3 – Problem & Opportunity Framing (20 min)

- In small groups, identify **local challenges** (e.g., light pollution, accessibility, infrastructure gaps) and **unique opportunities** (e.g., seasonal celestial events, iconic landscapes, cultural narratives).
- Use guiding questions:
    - What experiences could we offer under the Night Sky theme?
    - How can we integrate conservation, education, and economic value?
    - Who are the target audiences (domestic, international, niche travellers)?

Step 4 – Idea Generation (30 min)

- Silent brainstorming: 5–10 ideas per participant on sticky notes.
- Round-robin sharing to build on others' concepts.
- Encourage bold, imaginative thinking — from high-end astro-lodges to citizen science night walks.

Step 5 – Mapping into HOW–NOW–WOW (30 min)

- Place each idea on a large feasibility/originality grid (physical or digital).
- Discuss placements:
    - **NOW** examples: organising guided stargazing nights using existing parks and volunteers.
    - **WOW** examples: developing an immersive AR star navigation trail linked to local myths and folklore.

    - **HOW** examples: building a cross-border Night Sky reserve with joint branding and advanced telescope facilities.

Step 6 – Concept Development (45 min)

- Select **top 2–3 WOW ideas** for rapid prototyping:
    - Define the **service concept** (experience, target users, seasonality, pricing).
    - Map **partners** and resource needs.
    - Identify **quick wins** and potential **barriers**.
- Record details on an **Idea Canvas** for each selected service.

Step 7 – Wrap-Up & Next Steps (30 min)

- Present each group's WOW ideas to the full workshop.
- Agree on a follow-up process:
    - Validation of ideas.
    - Development into business cases or pilot projects.
    - Possible inclusion in joint Euro-MED or regional applications.

Roles & Materials

- **Lead Facilitator:** Guides the session, ensures balanced participation.
- **Co-Facilitators:** Manage group work, idea mapping, and documentation.
- **Rapporteurs:** Capture key points and decisions.

Materials Needed:

- Large HOW–NOW–WOW grid (printed or on whiteboard).
- Sticky notes (3 colours), markers.
- Light pollution maps, tourism asset maps (optional).
- Idea Canvas templates.
- Digital collaboration tools for online/hybrid format (e.g., Miro, MURAL).

Workshop Outputs

- Categorised portfolio of Astrotourism service ideas for each territory.
- 2–3 priority WOW concepts with preliminary development plans.
- Stakeholder commitments to advance selected concepts.
- Basis for creating a **Mediterranean Astrotourism Network**.

Success Factors

- Create an inspiring setting — if possible, hold part of the workshop outdoors in a low-light area or planetarium.
- Use visuals and storytelling to connect astronomy with local culture.
- Ensure diversity in groups to blend scientific, business, and community perspectives.
- Keep the focus on **sustainable, low-impact tourism**.

5.) Full call for full applications

Stakeholders will be invited to submit the full application for development of innovative astrotourism services.

Proposal for the content part of the call (full call):

Below is proposal for the content part of the full call for astrotourism services. Partners may use it or develop their own application. Applications should be in local languages to reach maximum number of potential interested stakeholders.

Part A – Project Identification:	Title of the service
Part B – Partnership Details:	Lead partner, co-partners (if exists), contact details (name of entity, mail, telephone, contact person…)
Part C – Problem analysis and context	➢ Describe the **main challenge(s)** the service will address (e.g., environmental, social, economic). ➢ Show how these challenges are relevant to the **Astrotourism context**. ➢ Explain the **local/regional/territorial context**: why is this an issue in your territory?
Part D - Project objectives and expected results.	➢ **Define** overall objective(s): **the long-term change the service contributes to (aligned with programme goals).** ➢ **Define** specific objectives: **concrete and measurable results the service will deliver.** ➢ **Link each objective to a** challenge **identified above.**
Part E - Target groups and final beneficiaries.	➢ **Identify** target groups *(direct users/participants):* ➢ **Explain** how they will be involved **in the service).** ➢ **Clarify** expected benefits **for each group** *(economic, environmental, social).*
Part F – Description of service	Please describe the service (what would include), its location, operation, equipment needed, branding and promotion and business model aspects.
Part G - Innovative aspects and transnational cooperation benefits.	Explain what is *new* compared to existing solutions (methodology, technology, governance model, partnerships).
Part H – Proposed budget	How much funds would you need to start business?
Part I – What support do you need from project	What support would you expect from the project (please note, that project can not fund directly your institution, but can provide services (web site, promotional material, business plan, small scale equipment, testing studies, etc…)
Signature and date	Sign, stamp, date

Proposal of the evaluation criteria for full call

Partners may use the proposed evaluation criteria or develop their own.

Criterion	What evaluators check	Weight	Score (0–5)
C. Problem Analysis & Context	Clarity and relevance of the problem addressed; evidence provided; link to local/regional Astrotourism challenges.	10%	
D. Objectives & Expected Results	SMART objectives; alignment with programme goals; realistic and measurable results.	15%	
E. Target Groups & Beneficiaries	Identification of relevant user groups; benefits for local communities; inclusiveness (schools, SMEs, citizens).	10%	
F. Description of Service	Quality and feasibility of service concept: location, visitor experience, operation model, equipment, branding, promotion, business model.	25%	
G. Innovation & Transnational Cooperation	Novelty of the service compared to existing offers; creative aspects; potential for replication across territories; added value of partnerships.	15%	
H. Proposed Budget	Coherence between budget and proposed service; realistic use of funds; cost-efficiency.	10%	
I. Support Needed from Project	Appropriateness of requested support (branding, business plan, crowdfunding, testing). Fit between needs and project support offer.	5%	
Sustainability & Astrotourism Compliance (cross-cutting)	Evidence that service protects night-sky quality, minimises light impact, and integrates sustainability (environmental, social, economic).	10%	

Scoring Scale

0 = Not addressed
1 = Very poor (major gaps, unrealistic)
2 = Poor (some relevance, little detail)
3 = Adequate (meets minimum requirements)
4 = Good (clear, well developed, minor gaps)
5 = Excellent (comprehensive, innovative, highly convincing)

Proposal of the template for description of the service

Question / Explanation	Answer
Name of Partner (preparing the report):	
Country / Region:	
Title of the Astrotourism Service:	
Service Provider (organisation / SME / individual):	
Summary of the Service *Max. 300 words. Short description, target audience, location, duration, seasonality, unique selling point.*	
Problem Addressed and Context *Max. 400 words. Explain what problem or opportunity the service responds to, its relevance, and evidence.*	
Objectives and Expected Results *Max. 300 words. Outline objectives and expected results for visitors, community, and environment.*	
Target Groups and Beneficiaries *Max. 250 words. Define primary target groups, final beneficiaries, and inclusiveness aspects.*	
Detailed Description of Service *Max. 800 words. Describe visitor journey, assets used, compliance, interpretation, equipment, operations, marketing, business model.*	
Innovation and Transnational Aspects *Max. 300 words. Highlight innovation, replication potential, and transnational cooperation benefits.*	
Environmental, Social and Economic Impact *Max. 400 words. Explain expected impacts in environmental, social, and economic dimensions.*	

Step 3 - End user testing and verification of Regional Astrotourism Services A1.3

Within the first testing stage, the **members of Astrotourism Place Labs will test the service in the form of a "hands-on workshop"**, where the service provider (selected in A1.2) will showcase the service to participants. Using the living lab approach, the service provider will be able to get relevant feedback on the different aspects of the service: **quality control, marketing, environmental impact, impact on nature and biodiversity, gender aspect and equal opportunities**. The report will be prepared in each region separately and later ***peer-reviewed by Transnational Astrotourism Quadruple helix, composed of stakeholders from all partner countries.*** Services will be finally transnationally ***evaluated and scored using economic, environmental and social criteria focusing on tourism potential and marketing.***

Methodology for Testing Astrotourism Services in Place Labs

1. Testing Approach

- **Format:** Hands-on workshop in each region.
- **Participants:** Service provider (selected in A1.2) + Place Lab members (Quadruple Helix stakeholders).
- **Method:** Living lab approach (co-creation, real-user testing, iterative feedback).
- **Output:** Regional report + peer review + transnational evaluation.

2. Structure of the Testing Workshop

1. **Introduction (30 min)**
    - Partner presents MedSkyTour project and testing of service
    - Service provider present the service concept, objectives, and expected outcomes.
2. **Service Demonstration (1–3 hours)**
    - Service provider showcases the service as realistically as possible (guided night walk, astronomy session, VR demo, etc.). If service is developed, service provider implements service with quadruple helix members as service end users.
    - Stakeholders participate as “test users.”
3. **Feedback Collection (45 min –1 hour)**
    - Structured group discussions in mixed Quadruple Helix groups.
    - Individual evaluation forms to collect systematic feedback.

4. **Wrap-up (15 min)**
    - Summary of key feedback points.
    - Agreement on next steps and improvements.

3. Evaluation Dimensions

Each Place Lab evaluates services across **six local testing dimensions**:

- **Quality control:** Visitor experience, service reliability, professionalism of guides.
- **Marketing potential:** Branding, attractiveness, communication clarity, reachability.
- **Environmental impact:** Light-pollution prevention, energy/resource use, ecological sensitivity.
- **Impact on nature & biodiversity:** Effects on nocturnal species, compliance with conservation rules.
- **Gender equality & inclusiveness:** Accessibility for women, men, children, elderly, people with disabilities; non-discriminatory practices.
- **Socio-economic value:** Potential for job creation, local partnerships, community benefits.

Proposal of the questions to gather feedback on service Demonstration

Quadruple helix members fill in evaluation as feedback on Service Demonstration.

Astrotourism Place Lab – Service Testing Feedback Form

This form is to be used by members of the Astrotourism Place Labs during the hands-on workshop testing stage. Please evaluate the showcased Astrotourism service across the listed dimensions. Use the 0–5 scoring scale and add comments where relevant.

Evaluation Dimension	Score (0–5)	Comments
Quality of the service (visitor experience, professionalism, reliability)		
Marketing potential (branding, attractiveness, communication clarity)		
Environmental impact (light pollution prevention, ecological sensitivity)		
Impact on nature & biodiversity (effects on nocturnal species, conservation compliance)		
Gender equality & inclusiveness (accessibility for women, men, children, elderly, people with disabilities)		
Socio-economic value (jobs, local partnerships, community benefits)		
Overall Impressions		
What did you like most about the service?		
What could be improved?		

Scoring Scale:
0 = Not addressed / very poor
1 = Poor
2 = Fair (some relevance, little detail)
3 = Adequate (meets minimum requirements)
4 = Good (clear, well developed)
5 = Excellent (comprehensive, convincing)

Based on testing and Astrotourism quadruple helix members' feedback the owners of Astrotourism service will be able to improve their service and tailor it to the needs of end users.

Verification Methodology for Astrotourism Services

1. Purpose

To ensure that developed Astrotourism services are **credible, sustainable, and aligned** with the programme's horizontal principles by involving both **Astrotourism Place Lab members** and **civil society representatives**.

2. Who Verifies?

- **Astrotourism Place Lab members** (quadruple helix: government, business, academia, citizens).
- **Civil society representatives** with expertise in sustainability, gender equality, equal opportunities, or non-discrimination.
- **End-users / citizens** invited to test the service and provide feedback.

3. Verification Process

1. **Service Demonstration:** The selected service is showcased in real conditions (pilot run).
2. **Feedback Collection:** Participants complete a structured **verification form** covering all four criteria.
3. **Group Discussion:** Civil society reps lead a discussion on horizontal principles.
4. **Scoring & Reporting:** Results are aggregated in a **Verification Report** per site.
5. **Transnational Comparison:** Reports are shared and reviewed across all project partners.

Proposal of the Astrotourism service verification form

This form is to be used during the end-user verification of developed Astrotourism Services. Verification should be carried out by Astrotourism Place Lab members and civil society representatives, with a focus on horizontal principles: sustainable development, equal opportunities, non-discrimination, and equality between men and women.

Verification Criterion	Score (0–5)	Comments
1. Impact on tourism and the local economy *(Check if the service attracts visitors, supports local SMEs, and strengthens tourism offer.)*		
2. Social impact (employment, safety, education…) *(Check if the service creates jobs, enhances safety, provides education or training opportunities.)*		
3. Environmental impact *(Check if the service protects nature, species, and nocturnal animals, and complies with Med Sky principles.)*		
4. Impact on horizontal principles *(Check if the service ensures equal opportunities, non-discrimination, and equality between men and women.)*		

Scoring Scale:
0 = Not addressed
1 = Very poor
2 = Poor
3 = Adequate
4 = Good
5 = Excellent

Step 4 – Mainstreaming and upscaling Astro tourism on regional level 2.3

Within activity 2.3 the **Astrotourism itineraries** will be developed for each of the 8 regions based on developed and verified Astrotourism services (Activity 1.2 & 1.3) and existing services within the regions.

These 7 itineraries will then be joined into a transnational itinerary composed of all participating regions used for the transnational promotion of astrotourism, focusing on eco-travel tourists who would like to experience different regions' tourist offerings next time they consider vacation destinations.

LP1, PP3, PP5, PP6, PP7, PP8 and PP9 will prepare promotional videos about itineraries in their territory.

Partners will develop itineraries and test them transnationally through the peer review process. After the peer review, the final version of the itinerary will be prepared.

Astrotourism Place Labs members will be included in the activity through co-creation workshop. The proposed workshop method will be "**project in a day**".

1. Purpose of action:

- To support creation of **7 regional Astrotourism itineraries**, each combining:
  - Newly developed & verified astrotourism services (from A1.2 & A1.3).
  - Existing complementary services (e.g. gastronomy, wellness, eco-transport, local culture).
- To merge them into **1 transnational astrotourism itinerary** for joint promotion to eco-travel audiences.
- To ensure itineraries are **tested, peer-reviewed, and refined** for quality and sustainability.

2. Process Steps:

Step 1 – Regional Mapping (Desk & Field Work)

- Identify all Astrotourism services (new + existing).
- Map complementary offers: accommodation, gastronomy, transport, cultural/heritage, outdoor activities.
- Ensure each itinerary has **3–5 core Med Sky experiences** + supporting eco-tourism services.

Step 2 – Co-Creation Workshop with Place Labs ("Project in a Day")

- Astrotourism Place Lab members brainstorm and structure itineraries.
- Stakeholders ensure balance: eco-travel value, local culture, sustainability, and inclusiveness.
- Output: draft regional itinerary structure.

Step 3 – Itinerary Drafting

- Partners prepare detailed itineraries (day-by-day / thematic package).
- Include logistics: access, seasonality, eco-transport options, booking channels.
- Design promotional elements (name, logo, storyline).

Step 4 – Transnational Peer Review

- Each region presents its itinerary to other partners.
- Peer partners assess clarity, attractiveness, feasibility, sustainability.
- Feedback collected, revisions made.

Step 5 – Finalisation & Promotion

- Final regional itineraries compiled.
- Transnational itinerary produced (integrated package across 7 regions).
- Each partner (LP1, PP3, PP5, PP6, PP7, PP8 and PP9) produces a **promotional video**.
- Transnational video or campaign highlights all itineraries.

Proposal of methodology for project in a day workshop

What is a "Project in a Day" Workshop?

"Project in a Day" is a **structured, one-day co-creation process**. Instead of spending weeks drafting ideas, stakeholders work **intensively in a single day** to produce a **draft version of the itinerary**. The approach is highly structured but also collaborative, bringing together diverse participants to concentrate their knowledge, creativity, and practical experience on one clear objective. Instead of spreading discussions and planning over weeks or months, the process condenses it into an intensive one-day session, with the result that participants leave the workshop with a tangible draft product ready for further refinement.

The workshop usually begins with a short introduction and inspiration phase, where participants review background information, examples of similar projects, or key challenges to be addressed. The group is then divided into smaller working teams that tackle specific aspects of the project in parallel, such as defining objectives, identifying activities, mapping stakeholders, or considering feasibility and sustainability. Throughout the day, the teams work through guided exercises that keep them focused and practical, gradually shaping their ideas into a coherent structure. Facilitators play a crucial role by guiding discussions, providing templates, and ensuring the process stays on track.

At key moments, the teams come back together to share interim results, compare perspectives, and integrate their findings into a consolidated draft. The workshop ends with a "pitch" session, where groups present the proposed project or plan, and the collective feedback is used to refine and validate the outcome.

The strength of the Project in a Day method is its efficiency and inclusiveness. It enables participants to co-create a realistic, well-structured draft while maintaining the sense of ownership that comes from working together intensively. It is especially useful for designing action plans, tourism itineraries, or service concepts, where clarity, stakeholder involvement, and concrete outputs are needed quickly. In the context of astrotourism, the Project in a Day workshop ensures that government representatives, SMEs, researchers, and citizens can jointly design itineraries or action measures that are both ambitious and practical, reflecting diverse needs but converging on a shared plan.

The method is:

- **Inclusive:** all stakeholders (government, business, academia, civil society) contribute equally.
- **Focused:** one clear output (a regional Med Sky itinerary draft).
- **Creative:** participants use mapping, storytelling, and group design tools.

- **Practical:** results are concrete, not theoretical – by the end of the day, a usable draft exists.

Participants – Who Should Join?

Each **Astrotourism Place Lab** (6–10 people) should include:

- **Local/regional government** (tourism office, protected area managers).
- **Business stakeholders** (tourism SMEs, guides, hospitality providers).
- **Academia/research** (universities, observatories, schools).
- **Civil society** (NGOs, community groups, citizen representatives).

The diversity ensures the itinerary reflects **multiple perspectives** – market, sustainability, community, and science.

Step-by-Step Agenda for the Workshop (One Full Day)

Step 1 – **Welcome & Introduction** (15 min)

- Facilitator explains the workshop goal: **"By the end of today, we will have created the draft Astrotourism Itinerary for our region."**
- Facilitator presents MedSkyTour project and Interreg Euro-MED programme.
- Facilitator explains methodology and workflow of the workshop.
- Quick round of introductions: each participant shares their role and why Astrotourism matters to them.
- Overview of Med Sky principles (light protection, biodiversity, sustainability).

Step 2 – **Inspiration Question session** – participants are asked to answer questions (on post it notes) – Facilitator collects them and prepares summary - (1 hour)

- What makes our region unique at night compared to other places?
- What is our "Med Sky story"? (myths, traditions, science, landscapes) ?
- What are the best spots in our region to experience the night sky with minimal light pollution?
- What kind of infrastructure do we already have (trails, observatories, safe parking, eco-lodging)?
- If you were a visitor, what would surprise or inspire you most about experiencing our night skies?
- Which local services or attractions (food, culture, wellness, transport) could enrich a Astrotourism itinerary?
- Where are the gaps (e.g., accessibility, signage, eco-transport)?

Step 3 – **Drafting Itineraries** – participants are asked to answer questions (on post it notes) – Facilitator collects them and prepares summary - (1-2 hours)

Split participants into **2–3 mixed groups** (each with government, business, academia, civil society represented). Give each group **flipchart paper, markers, sticky notes, and itinerary templates**.

First each group selects their **visitor types**. Examples:

- Eco-travellers who want authentic and sustainable experiences.
- Families with children (fun + education).
- Schools / educational groups.
- Astronomy enthusiasts / photographers.
- Wellness tourists (combining relaxation and night-sky experiences).

SERVICES

- Which Astrotourism services must be included as the main attractions?
- Are they available all year round, or seasonal?
- What **local offers** strengthen the package? (e.g., eco-lodges, gastronomy, cultural storytelling, wellness).
- How do these create a **balance between night and day experiences**?
- How do we adapt the itinerary to winter vs. summer?
    - In winter: shorter days, longer nights → more astronomy, less hiking.
    - In summer: longer days → more cultural, plus late-night stargazing.
- Are there **special events** (meteor showers, solstices, festivals) to integrate?

TRAVEL

- How will tourists travel between locations? - is **eco-transport** possible (bikes, electric shuttles, hiking trails)?
- What's the realistic **travel time** between stops?
- Are there safety or accessibility issues at night?

ACCOMODATION

- Which accommodations fit the theme? (eco-lodges, farmhouses, community stays, small hotels).
- Do they comply with Med Sky principles (no excessive lighting, low environmental impact)?

VISUALISATION & STORYLINE

- Give it a title (e.g., "Stars over Teruel", "Montenegro by Moonlight").
- Add a theme or story (mythology, science, eco-adventure).
- Sketch a map or flowchart showing stops and activities.

Step 4 – **Presentation of results & discussion** – (30 minutes)

Participants presents their outcomes to other group(s). Other group(s) provide feedback to participants.

Step 5 – Co-creation of Astrotourism Strategy and Action Plan

Within Activity 3.4 the partnership will prepare the first **Transnational Astrotourism Strategy**, which will define long-term goals and priorities for Astrotourism and provide the framework for ensuring that tourism development goes hand in hand with biodiversity protection. The strategy will describe the main focus areas of Astrotourism, including biodiversity aspects, and will present the current state of light pollution in participating regions, alongside ambitions and targets for its reduction. It will also outline the rationale for introducing and enforcing Med Sky policies and set out long-term objectives for tourism and environmental protection in the partner territories. The strategy will be developed under the leadership of the Lazio Region, with active contributions from all other partners, and will undergo quality control coordinated by PP3 and PP4. The preparation process will combine regional baseline analysis, consultations with Astrotourism Place Labs, and a peer review across partner territories to ensure both quality and ownership.

Building on the transnational strategy, each of the eight regions will then develop a **Regional Astrotourism Action Plan** for the next seven years. These action plans will translate the shared vision into concrete, locally adapted measures for reducing light pollution, developing Astrotourism, raising awareness, and participating in transnational Astrotourism initiatives. They will also follow the Transnational Astrotourism Standards and **will be prepared through co-creation with quadruple helix stakeholders**, ensuring the involvement of research institutions, businesses, government bodies, and civil society actors. Each Action Plan will define clear responsibilities, a timeline, and indicators for monitoring, ensuring that measures are realistic and measurable. The plans will address not only tourism growth but also environmental stewardship and inclusiveness, ensuring that equal opportunities and non-discrimination are respected in the development of Astrotourism services and experiences.

The result of this activity will be a solid combination of one transnational strategy and eight regional action plans, creating a clear roadmap for the long-term development of Astrotourism across Europe. Together, these documents will provide a lasting foundation for reducing light pollution, protecting biodiversity, strengthening regional economies, and positioning the partner territories as leaders in sustainable astro-tourism.

Regional Action Plans will be supported with co-creation **world caffe workshop**, where Astrotourism Place Lab members will constructively participate.

Proposal of methodology World Caffe Workshop

The **World Café workshop** is a participatory method that brings people together for structured but informal conversations, designed to generate collective knowledge and concrete ideas. The setting is arranged like a café, with small tables where groups of four to six people sit together. Each table hosts a focused discussion on a guiding question, while participants rotate between tables in several rounds. This rotation allows ideas to circulate, connect, and evolve as participants bring insights from one group to another. One person remains as the "table host" to summarise what has already been discussed and to capture new contributions.

The method works particularly well when a project needs to gather diverse perspectives from stakeholders and create ownership of outcomes, since it gives everyone an equal chance to contribute. Its informal café-like atmosphere encourages creativity, open dialogue, and collaboration across backgrounds. After several rounds of discussion, the whole group gathers for a "harvest," where the key points from each table are shared, clustered, and synthesised into a set of collective insights. These outcomes can then be transformed into a draft strategy, action plan, or recommendations.

The strength of the World Café lies in its ability to balance inclusivity and structure. It is flexible enough to adapt to different topics, from policy design to community planning, yet focused enough to produce tangible outputs. Because it draws on the wisdom of many stakeholders, it often reveals connections, opportunities, and solutions that would not have surfaced in a traditional meeting format. This makes it particularly suitable for developing Astrotourism Action Plans, where cooperation between government, business, academia, and civil society is needed to align tourism development with biodiversity protection and community benefits.

The World Café workshop will enable partners and stakeholders to **jointly design the Regional Astrotourism Action Plan** for the next 7 years. Through rotating group discussions, participants will develop **concrete measures** across the four main action areas:

1. Minimising light pollution
2. Developing Astrotourism
3. Awareness raising
4. Transnational cooperation

The method ensures inclusiveness by gathering perspectives from **government, business, academia, and civil society**, in line with the Quadruple Helix approach.

Participants

- Invite 10–15 participants per region (Astrotourism Place lab members + citizens, experts, etc…).
- Ensure balance of quadruple helix: local/regional authorities, SMEs and business networks, researchers/universities, NGOs/citizens.
- Send participants a short **background briefing**:
    - Presentation of the project
    - Results of Astrotourism service testing
    - Transnational strategy framework
    - Purpose of the Action Plan

Venue & Materials

- Room with 2–3 round tables (4–6 people each).
- Flipcharts, markers, post-its, large paper "tablecloths" for doodling/writing.
- Dot stickers for prioritisation ("dot voting").
- Projector for plenary inputs (optional).

Facilitators & Roles

- Lead facilitator: **Guides agenda, manages time.**
- Table hosts (1 per table): **Stay at table during rotations, summarise previous discussions to new arrivals.**
- Rapporteur: **Collects outputs and prepares synthesis.**

Opening & Introduction (15 min)

- Welcome and explain objectives: *"We are here to co-create the Regional Astrotourism Action Plan for the next 7 years."*
- Present background: Transnational Strategy highlights, role of Action Plans.
- Explain **World Café process**: small-group conversations, rotating tables, building collective wisdom.

Round 1 – Actions for Minimising Light Pollution (30-45 min)

Guiding question: "What concrete actions can we take in our region to reduce light pollution in the next 7 years?"

Examples to inspire discussion:

- Retrofitting public lighting with Astrotourism compliant fixtures.
- Establishing curfew regulations for lighting.
- Engaging businesses and households to adopt low-impact lighting.
- Mapping and monitoring light pollution annually.

Process:

- Groups brainstorm freely.

- Record on flipchart/tablecloth.
- After 20 minutes, participants rotate; table host summarises.
- Continue building on previous ideas.

Round 2 – Actions for Development of Astrotourism (30-45 min)

Guiding question: **"What actions are needed to make Astrotourism a long-term success in our region?"**

Examples:

- Support training for Astrotourism guides.
- Develop eco-transport options for visitors.
- Create packages combining Astrotourism services with gastronomy/culture.
- Introduce certification/branding for Astrotourism.

Process same as Round 1.

Round 3 – Awareness Raising Actions (30-45 min)

Guiding question: **"How can we raise awareness among citizens, schools, visitors, and policymakers about the value of Med Sky protection?"**

Examples:

- Public stargazing events.
- Citizen science campaigns (measuring sky brightness).
- School programmes and competitions.
- Media and social media campaigns.

Round 4 – Transnational Actions (30-45 min)

Guiding question: **"How can our region contribute to joint international Astrotourism initiatives and benefit from transnational cooperation?"** *If our region wants to be visible and competitive in the international Astrotourism movement, what concrete steps must we take together with other regions and global initiatives?"*

Examples:

- Join International Dark Sky Association (IDA) or UNESCO initiatives.
- Develop cross-border itineraries with neighbouring regions.
- Organise joint promotional campaigns across partner territories.
- Share data and best practices at annual Astrotourism conferences.

Harvesting Session – Collecting Insights and conclusions (45 min)

- Each table host presents **results** from their table.
- Facilitator clusters actions on a wall/board under four categories.
- Participants use **dot voting** to prioritise the most impactful and feasible actions.
- Rapporteur captures results into a **draft Action Plan matrix** (Action – Stakeholder – Timeline – Resources – Indicators).
- Explain follow-up: partner team will draft the full Action Plan and circulate for comments.
- Thank participants and highlight their role in shaping the region's Astrotourism future.

Step 6 – Final Conference

The **Transnational Astrotourism Tourism Festival**, organised by PP9 Region of Western Greece, will serve as the final conference of the project and represents a key milestone for promoting astrotourism and consolidating cooperation among partners.

Astrotourism Place Lab members will be invited to the event as contributors, co-creators, and ambassadors Astrotourism in their territories. **Each partner (LP1, PP3, PP5, PP6, PP7, PP8, PP9) is expected to bring at least two stakeholders from their regional Place Lab**, ensuring balanced representation of the quadruple helix model, including local government, businesses, academia, and civil society. **Travel costs for these stakeholders will be covered by the sending partners.**

Place Lab members will be actively involved in different parts of the festival programme. During the **Astrotourism workshop, nocturnal animal-watching events, and the study trip to a Astrotourism protected area**, they will engage both as participants and multipliers, sharing their regional experiences while gaining inspiration for future development. Within the **international co-creation summer school**, Place Lab members will collaborate with service providers from other countries to design innovative Astrotourism services. Their participation in the **transnational hackathon** will be particularly important, as new joint tourism offers will be prototyped by mixed teams from at least two countries. This process will ensure that the services emerging from the event reflect real transnational cooperation, creativity, and sustainability. End users will then test and score these services, with the best-rated concept receiving recognition and visibility through a promotional plaque and dissemination activities.

In addition to these structured sessions, Place Lab members will act as ambassadors during the festival, engaging with citizens, policymakers, and EU-level decision-makers. They will contribute to the **"Dim Night" initiative**, encouraging communities to switch off lights for one night each year as a symbolic and practical step towards reducing light pollution. Their participation in discussions and side-events will strengthen the link between local action and transnational visibility. Finally, Place Lab members will be invited to witness and support the **signing of the Astrotourism Cooperation Declaration**, confirming long-term commitment to Astrotourism strategies and action plans by both partners and local/regional decision-makers.

Their contributions will not only add credibility to the festival but also ensure that the final event becomes a genuine platform for knowledge exchange, innovation, and citizen engagement. A comprehensive report of the event will be prepared, highlighting the involvement of Astrotourism Place Lab members as a key success factor for the long-term sustainability of Astrotourism initiatives across Europe.

ROADMAP FOR PLACE LABS

STEP	ACTIVITY IN AF	Title of action	Timeline	WORKING TEMPLATE TO USE
1	1.1.	Establishment of Astrotourism Place Labs*	October – Nov. 2025	ANNEX 1: REPORT ON ESTABLISHMENT OF ASTROTOURISM PLACE LABS
2	1.2	1.) Selection of appropriate territory and micro-location 2.) Identification of existing similar activities and stakeholders 3.) Public calls for expression of interest for services development;	Dec. 2025 - January 2026	No templates
2	1.2	Co-creation workshop (HOW-NOW-WOW) method*	February – March 2026	ANNEX 2: HOW-NOW-WOW workshop
2	1.2	Launch of the full call for Astrotourism Services	March - April 2026	See page 13
2	1.2	Received applications will be evaluated by regional Astrotourism Quadruple Helix members within Astrotourism Place Labs	May 2026	See page 14
2	1.2	The highest scored application will be selected and supported by offering start-up services	May – Sept. 2026	See page 15
3	1.3	End user testing of MedSkyTour service	Sept–Nov 2026	ANNEX 3: END USER TESTING REPORT
3	1.3	End user verification of MedSkyTour service	Nov 2026–Feb 2027	ANNEX 4: END USER VERIFICATION REPORT
4	2.3	Project in a day workshop to design Astrotourism itineraries**	2026 - 2027	ANNEX 5: PROJECT IN A DAY WORKSHOP REPORT
5	3.4	World caffe workshop to design regional AstrotourismAction plans**	2026 - 2027	ANNEX 6: WORLD CAFFE WORKSHOP REPORT

*Establishment of place lab and workshop can be combined, if needed, but not breaching final deadline
** Workshops can be combined, if timeframe of 2.3 and 3.4 will allow.

Living Labs - theory

Innovation emerges from the gap between existing products, services, or solutions and the evolving needs and expectations of end users. It is the process of creating new or significantly improved offerings that generate value for individuals, organizations, or society.

A core component of innovation is iterative learning, where mistakes and failures are systematically analyzed to extract insights and guide future actions. This reflective process strengthens the innovation cycle by turning unsuccessful attempts into opportunities for improvement.

Innovation can be driven from the “outside-in” through systematic analysis of customer needs, or be “customer-pulled,” where direct engagement with users uncovers unmet or latent needs. Both approaches aim to align development efforts with real-world demands, thereby increasing the relevance and adoption potential of the resulting solutions.

While innovation often entails substantial costs, high uncertainty, extended timeframes, and significant risk, a user-centred approach can mitigate these challenges. By understanding what users truly want and need, innovators can reduce development inefficiencies and improve success rates.

The living lab methodology offers a structured way to achieve this alignment. As a user-centred, open innovation ecosystem, it brings together multiple stakeholders—such as industry, academia, government, and citizens—to co-create, test, and refine solutions in real-life environments. This collaborative and iterative setting bridges the gap between concept and market, ensuring that innovations are both technically sound and socially accepted.

Closed versus Open Innovation

Today, innovations are no longer developed within a single organisation but involve private and public several players. Due to this fact, information and communication technology (ICT) are critical in all aspects of innovation – from product-service innovation to business model innovation to management innovation. Innovation processes are becoming more open and collaborative and usually include a network of partners, customers, and other stakeholders.

Chesbrough (2003) compares the Open Innovation model with the Closed Innovation model. In the Closed Innovation world, all the stages that lead to an innovation occur within the firm's boundaries. It is, in fact, a single-company linear model (pipeline from pure scientific research to

commercial application). In contrast, Open Innovation allows external ideas to enter the firm's stream of innovation at any stage – external resources (e.g. ideas, patents, etc.) receive the same importance as internal ideas. Similarly, interior ideas can be sent outside the boundaries of the firm, especially if they cannot be exploited inside.[1]

Openness is concerned with opening the innovation process with a flow of knowledge in two directions: inflow and outflow. The outflow of knowledge implies innovation activities that leverage existing technological capabilities outside the organisation's boundaries. The inflow of expertise relates to innovation activities that focus on capturing and benefiting from external sources of knowledge (Huizingh, 2011; van de Vrande et al., 2009). In Living Labs, the emphasis is on the inflow direction, where several stakeholders are invited to participate in the innovation process.[2]

Chesbrough defines Open Innovation in two steps. Firstly, he explains the features of Closed Innovation, and afterwards, he describes the contrast between Closed Innovation and Open Innovation. Closed Innovation is managed as a closed vertical integrated process of innovation. On the contrary, Open Innovation cooperates across boundaries to create and commercialise innovations.

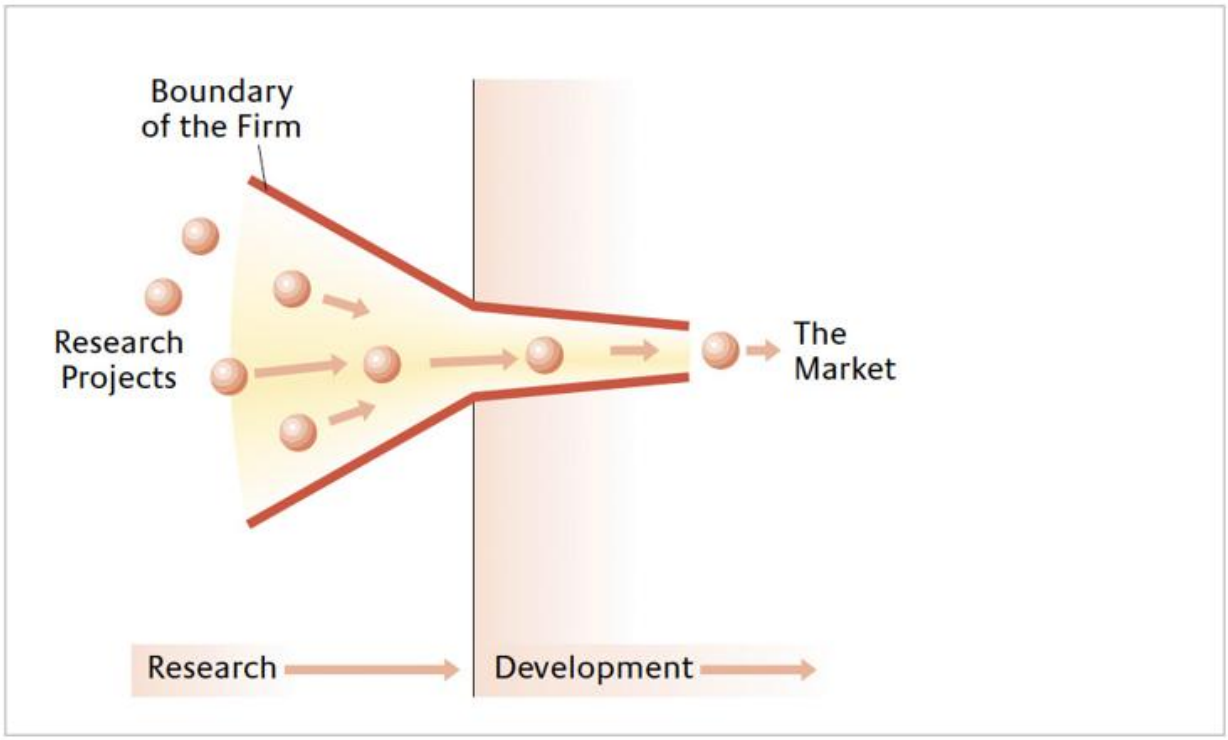
Napaka! Vira sklicevanja ni bilo mogoče najti.1 illustrates the Closed Innovation model, where a ll these stages of innovation are implemented within and under the firm's guidance. The firm does not include ideas and influences from the outside and keeps all its ideas inside. Typical industries which use the Closed Innovation model are Nuclear and Military Industries where "non-proliferation of technology and protection remain important." The Closed Innovation model thrives in several research-driven industries.[3]

[1] Gabison Garry and Annarosa Pesole. 2014. Open Innovation, User Innovation and Social Innovation. An Overview of Models of Distributed Innovation 2014, Report EUR 27035 EN.
Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC93533

[2] Ståhlbröst Anna.2012.A Set of Key-Principles to Assess the Impact of Living Labs. January 2012.International Journal of Product Development 17(1-2):60-75, Luleå University of Technology.

[3] Gabison Garry and Annarosa Pesole.2014. Open Innovation, User Innovation and Social Innovation. An Overview of Models of Distributed Innovation. Report EUR 27035 EN 2014.
Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC93533.

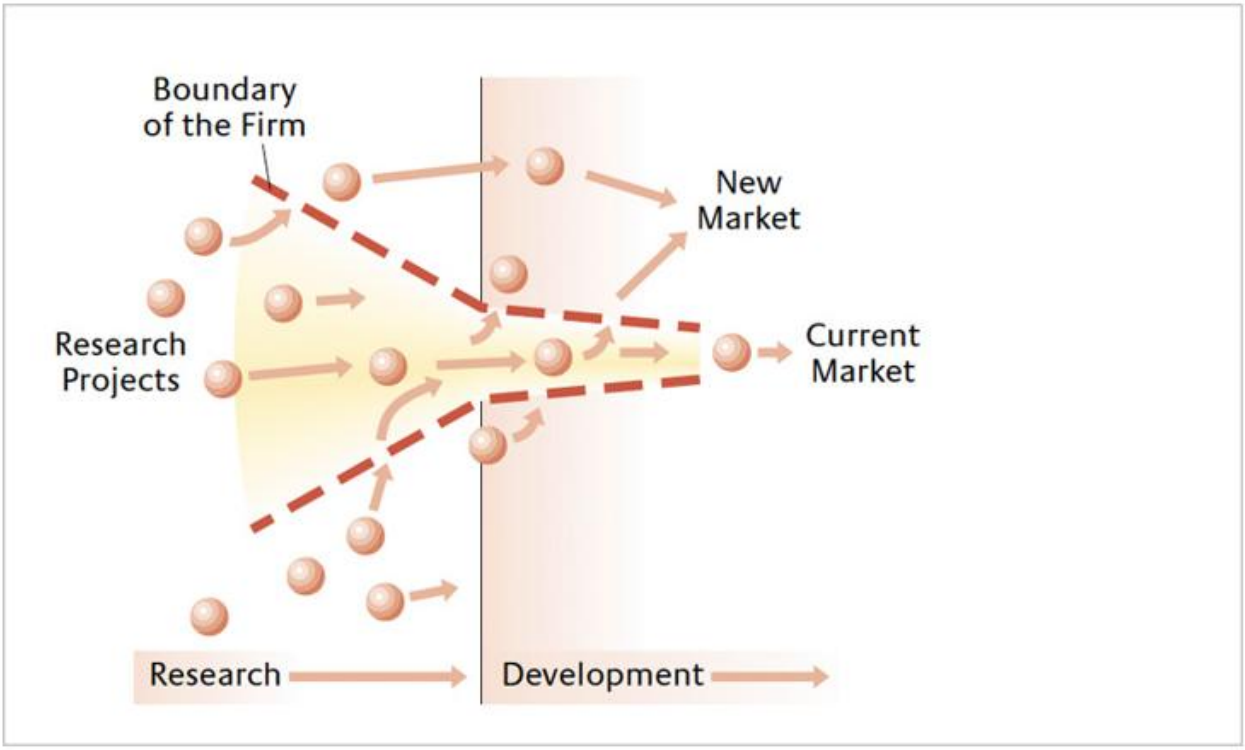
Figure 1| Closed Innovation model



Source: Henry W. Chesbrough. Spring 2003. The Era of Open Innovation. Massachusetts Institute of Technology MIT Sloan Management Review. Vol. 44, No. 3, Reprint #4435 Available: https://sloanreview.mit.edu/article/the-era-of-open-innovation/?switch_view=PDF

In Open Innovation, ideas and influences from the outside can come in during the research and development stages to influence the process. As shown in **Napaka! Vira sklicevanja ni bilo m ogoče najti.**2, ideas can also leave the firm during these stages and may be taken up by outside entities

Figure 2: Open Innovation model



Source: Henry W. Chesbrough. Spring 2003. The Era of Open Innovation. Massachusetts Institute of Technology MIT Sloan Management Review. Vol. 44, No. 3, Reprint #4435 Available: https://sloanreview.mit.edu/article/the-era-of-open-innovation/?switch_view=PDF

More than a decade later, Chesbrough and Bogers underline the importance of using the term Open Innovation precisely. Chesbrough defines open as the flowing and unrestrained knowledge exchange from one entity to another. Open can also mean free, as in gratuitous. However, Open Innovation often coexists with market transactions such as licensing fees (Chesbrough, Vanhaverbeke, & West,2014).

In their book, Chesbrough and Vanhaverbeke (Chesbrough, Vanhaverbeke, & West,2014) emphasise that Open and Closed innovation are the two extremes of a spectrum along which most business models can be found. The spectrum they describe is a function of how in-house research and development is involved in product development.[4]

The User Innovation model is focused on exploring user motives for innovation. The User Innovation model encourages a collaborative and co-creation process, where users share tasks

[4] Ibidem

and the cost of developing innovative products and services, and afterwards, users freely reveal their results.

According to von Hippel (2013), users are firms or individuals that "expect to benefit from using a product or a service, in contrast to manufacturers that expect to benefit from selling a product or a service." Therefore, users who contribute to developing an innovative product or service will adapt the innovation to their specific needs. The user-innovators, although they freely reveal the innovation, will benefit more significantly from using this innovation than free-riders. The innovation may only partially fulfil the latter's needs.

The reason for choosing the customisation of innovations instead of purchasing innovation is that user (needs are heterogeneous and, therefore, may only be partially satisfied by manufactured innovations. In addition, in an efficient innovation system, other users may adopt and further improve the innovation and make it more valuable.[5]

Living Labs

The European Network of Living Labs (ENoLL) defines Living Labs as follows on its website: „Living Labs (LLs) are open innovation ecosystems in real-life environments using iterative feedback processes throughout a lifecycle approach of innovation to create sustainable impact. They focus on co-creation, rapid prototyping & testing, and scaling-up innovations & businesses, providing (different types of) joint value to the involved stakeholders. In this context, Living Labs operate as intermediaries/orchestrators among citizens, research organisations, companies, and government agencies/levels."[6]

Considering the environment aspect, many different types of Living Lab environments exist, research Living Labs focusing research on different areas of the innovation process, corporate Living Labs, having a physical place where they invite other stakeholders (e.g. users) to co-create innovations, organisational Living Labs where the members of an organisation co-creatively develop innovations, intermediary Living Labs where independent partners are invited to innovate at a neutral arena collaboratively, and Living Lab as a project, where the Lab exists during a project's lifetime to support the innovation process in that project and closes when the project

[5] Gabison Garry and Annarosa Pesole. 2014. Open Innovation, User Innovation and Social Innovation. An Overview of Models of Distributed Innovation 2014, Report EUR 27035 EN.
Available at: https://publications.jrc.ec.europa.eu/repository/handle/JRC93533a

[6] The European Network of Living Labs (ENoLL) https://enoll.org/about-us/what-are-living-labs/, accessed November 2022

ends. New concepts of Living Labs develop constantly.[7]

Although Living Labs exist in different environments and he many purposes, they share certain common elements:

- Multi-method approaches: there is no single Living Lab methodology, but all Living Labs combine and customise different user-centred, co-creation methods to best fit their purpose.
- User engagement: this is already rooted in the origins of Living Labs; the key to success in any activity is to involve the users at the beginning of the process.
- Multi-stakeholder participation: involving all relevant stakeholders is crucial, even if the focus is on users. These include all the quadruple helix actors: public and private sector representatives, academia, and people.
- Real-life setting: a particular characteristic of Living Labs is that the activities occur in real-life settings to gain a thorough overview of the context.
- Co-creation process: this is a process where activities are designed as top-down experiments, benefiting from users being involved as contributors and co-creators. The Living Lab approach strives for mutually valued outcomes from all stakeholders actively engaging in the process.[8]

Living Labs' key principles[9]

The Framework of Living Lab research has no agreed definition of the concept or methodology for measuring their impact. To assess the impact of the Living Labs approach Anna Ståhlbröst in her paper "A Set of Key-Principles to Assess the Impact of Living Labs", proposed a set of principles. Ståhlbröst's paper explains that we can consider five fundamental principles in all living lab operations: value, influence, sustainability, openness, and realism.

Principles present the multi-perspective that should be applied in living lab operations to gain

[7] Ståhlbröst Anna A Set of Key-Principles to Assess the Impact of Living Labs. January 2012International Journal of Product Development 17(1-2):60-75, Luleå University of Technology
[8] 2017 - 2019 U4IoT Consortium.Living Lab Methodology Handbook.
Available at: https://www.scribd.com/document/366265932/U4IoT-LivingLabMethodology-Handbook

[9] Ståhlbröst Anna. A Set of Key-Principles to Assess the Impact of Living Labs. January 2012International Journal of Product Development 17(1-2):60-75, Luleå University of Technology

quality outcomes.

In the following text, the proposed five fundamental principles are not being used as “canons” but present one guidance set that Living Lab researchers can use.

The principles can also be considered the starting point for developing Living Lab principles that can extend upon the planned needs of the living lab management.

The fundamental principles described can be used in other innovation processes in different contexts.

Figure 3: Living Lab principles

KEY PRINCIPLE: VALUE

The main goal of a Living Lab is to create value for all stakeholders. Providing value for all engaged stakeholders is also a key to business success. To create value for customers/users, understanding their needs and motivations and how these needs should be met by innovation. The focus on understanding the needs allows organisations to increase the level of innovation and decreases the risks related to innovation development.

Living Lab processes support understanding the customer’s or user’s need for a specific product/ service and how intense their attraction or repulsion for that product/ service is in the real world. Living Lab processes allow users to test and experience the product/service to determine if it

provides value for them. Living Lab processes also give insights into *how users perceive value*. These insights can guide the innovation process *to deliver innovations perceived as valuable from a business and a customer perspective.*[10]

KEY PRINCIPLE: INFLUENCE

The principle of influence focuses on users' engagement as active, competent partners. Involving more stakeholders in the innovation process can improve the quality of the service being developed (Praest Knudsen& Bøtker Mortensen,2011). Today users' involvement and their influence shape society. Companies/organisations must understand that innovation should be based on users' needs and that users are heterogeneous. In this context, Living Lab partners should guide their creative power to enable users to make decisions while developing innovation.

In this case, decision-making power differs from related concepts such as participation, involvement, and engagement.

Bergvall-Kåreborn & Ståhlbröst stress that users can influence innovation processes for other reasons. Other reasons can be a democracy since people have the right to control things affecting their lives or learning reasons because the innovation team might want to learn more about the users and want to educate the users; or economic reasons, since knowing what the users want or need can make the innovation process more effective and efficient (Bergvall-Kåreborn & Ståhlbröst, 2008).

One important consideration is to be aware related to Living Lab activities is to be mindful that participants should be treated with respect due to investing time to participate in the innovation process, most often without any compensation for their involvement. It might occur that participants' suggestions cannot be developed in the current innovation stage of the product/service. Providing feedback to users about this fact is crucial to maintain their engagement in the process.

To take the step forward from participation or involvement to *influence,* domain *experts' and users' needs and ideas should be traceable in concepts, prototypes, and the finished product.* A critical issue that Living Labs needs to manage is ensuring that participation, influence, and responsibility

[10] Ståhlbröst Anna and Marita Holst. The Living Lab Methodology Handbook.2012.Social Informatics at Luleå University ofTechnology and CDT – Centre for Distance-spanning Technology, Sweden.

among different partners are balanced and harmonised by the ideology of the user influence of the project.[11]

KEY PRINCIPLE: SUSTAINABILITY

Human life depends on a healthy and natural environment, which is rapidly degrading (Watson et al.,2010).

According to that fact, sustainability should be considered worldwide to ensure a sustainable future. Although the international determination to achieve environmental sustainability has been articulated, considerable uncertainty remains at the individual, organisational, societal, and governmental levels about problems and proposed solutions related to a sustainable environment (Elliot, 2011). Forming a sustainable environment includes considering economic, ecological, and social aspects when creating innovations or new values.

Sustainability in Living Labs refers to the Living Lab operation's sustainability and the wider community. This principle is the least mature but essential for creating a lively society.

Sustainability can be defined as development that meets the present's needs without compromising future generations' ability to meet their needs. Many organisations have the potential to contribute to sustainable growth while improving productivity, lowering costs, and strengthening revenue. The environmental activities taken today in many organisations need to be improved. They can lead to different types of waste, such as unused resources, inefficient energy use, and emissions that decrease energy efficiency.[12]

Focusing on *sustainability,* Living Lab highlights *continuous learning and development* over time. Here, the research component of each Lab plays a vital role in *transforming the generated knowledge from Living Lab operations into models, methods, and theories.*

Living Labs must take responsibility for their ecological, social, and economic effects. The innovation processes supported by a Living Lab must address sustainability issues, for instance, by choosing suitable materials, implementing environmentally friendly procedures, and

[11] Ibid.
[12] Ibid.

considering the social and economic impact the innovation might have once implemented.[13]

KEY PRINCIPLE: OPENNESS

In the last twenty years development and management of innovations changed immensely. The changes relate to higher stakeholders' mobility, more accessible access to venture capital, and dispersed knowledge, which contributed to opening the innovation processes in many companies/organisations (van de Vrande et al.,2009)

Openness is crucial for innovation processes in Living Labs due to efforts to gather many perspectives to develop as attractive an innovation as possible. Opening innovation processes also can decrease market time and better utilise collective creativity (van de Vrande et al., 2009). However, cooperation demands different levels of openness between various stakeholders.

Living Labs can contribute to raising innovation capacities since collaboration within Living Labs enables cross and open collaboration between different stakeholders.

The principle of openness, therefore, enables including several different perspectives that can lead to more successful development of innovative ideas/products/services.

The key principle of *openness* emphasises creating an innovation process that is as open as possible with the stakeholders since *multiple perspectives bring power to the development process.* Openness is crucial for innovation processes in Living Labs to gather many views to develop as attractive an innovation as possible. Opening innovation processes also can decrease market time and better utilise collective creativity.[14]

KEY PRINCIPLE: REALISM

The living Lab approach requires that innovation activities are carried out in a realistic, natural, real-life setting. This is important since people cannot experience anything independent of the experience they get from being embodied in the world (Yoo,2010).

[13] Ibid.
[14] Ibid.

Orchestrating realistic use situations by understanding users' behaviour is one way to generate results valid for fundamental markets in Living Lab operations (Ståhlbröst et al., 2009). The principle of realism requires creating "realism" on different levels and correlating to other elements, for example, context, users, situations, and technologies. This principle does not distinguish between physical and online contexts. Instead, it is argued that activities carried out in both contexts are real and realistic to actors. Inspired by online reality, we say that IT-based tools and methodologies can function as twin-world mediators (Attasiriluk et al., 2009) that facilitate the interconnection between real-world devices and their virtual counterparts.

The principle can also be understood in that different stakeholders experience reality differently, depending on what is important and what motivates them.

We can observe two approaches in the Living Lab environment, enhancing realistic situations. The First approach tries to set up testing and evaluating in ways similar to the real world; in the second approach, testing and evaluating occur in users' real-world environment. The *reality aspect* is also considered by involving *real users rather than relying on personas* or other user-representative theories. [15]

Living Lab methodologies[16]

Living Labs are multi-stakeholder ecosystems with a diversity of goals and activities. Despite the variety, Schuurman (2015) made a distinction between three different levels of Living Lab phenomena in the literature review and experiences:

- The *macro or organisational level*: on the macro level, the stakeholders of the Living Lab are organised to enable and enhance innovation in the specific sectors or areas in the particular territory (city, region). Stakeholders cooperate in Public-Private-People partnerships (Leminen, 2013).
- The *meso or project level*: on the *meso level,* activities in the Living Lab are organised upon specifically chosen methodology to enhance innovation.

[15] Ibid.
[16]Schuurman, D. 2015. Bridging the gap between Open and User Innovation?: exploring the value of Living Labs as a means to structure user contribution and manage distributed innovation (Doctoral dissertation, Ghent University).
Available at https://biblio.ugent.be/publication/5931264/file/5931265.pdf
(Living Lab Methodology Handbook. 2017 - 2019 U4IoT Consortium).

- The *micro or user activity level*: on the *micro level*, many unrelated activities are implemented by users/stakeholders within the Living lab, but the Living Lab methodology, with the common elements and identified innovation process, is set up at the meso-level, where the projects are structured.

To connect the individual user involvement activities (micro level) with a methodological framework, Schuurman et al. (2013) also suggested that Living Lab projects can be compared to an experimental approach. This includes a pre-measurement, an intervention, and a post-measurement, where the intervention is equalled to the real-life experiment.

Upon the above suggestion, three main building blocks within Living Lab projects can be identified in the innovation development phases:

- EXPLORATION: getting to know the 'current state and designing possible 'future states'
- EXPERIMENTATION: real-life testing of one or more proposed 'future states'
- EVALUATION: assessing the impact of the experiment with regards to the 'current state' to iterate the 'future state'.

In the following sub-chapters, the characteristics and impacts of each stage are presented based on the nature of the user activities taking place at each location.

Exploration

The exploration phase includes activities in the innovation development phase from idea to concept or prototype. In this stage, stakeholders identify the key problem and potential tailored solutions. In general, the goal of the exploration phase is threefold: to understand the existing state of the art, discover the needs and wants of users and set up the measurements of future impacts of innovation.

The first step, understanding the existing state of the art, includes examining current habits, practices of target users, and their problems, also considering specific contexts. This step mainly uses methods and tools for observation, participation and in-depth interviews.

In the second step, activities focus on discovering the needs and wants of users. The second step helps identify opportunities to improve the existing state-of-the-art. We can use brainstorming, ideation, and co-creation techniques in this step. The main result of this step is a concrete concept

that can be co-designed in future efforts.

Therefore, the purpose of exploration is to enable new knowledge or technology inflow, benefiting from using external resources (Open Innovation approach).

At the closure of the exploration phase, a benchmark of the current state of the art can be done. An essential fact since understanding the current state is the key that allows to set-up measurement of future improvements and effects of innovation. Therefore, the third purpose of the exploration phase is to fix the pre-measurements.

Experimentation

In the experimentation phase, identified tailored solution is tested in the exploration phase in the prototype. For the Living Lab approach, the phase incorporates a fundamental principle, experimenting in a real-life setting. The degree of possible real-life testing relates to the maturity of the prototype. Prototypes can come in many forms, from tangible products to intangible services. The primary purpose of testing the prototype solution is to enable users to experience a new solution, which could potentially activate new users' habits and new ways of use.

The main goal of the experimentation phase is to collect and understand the users' reactions to the proposed solution. Depending on the maturity level, the prototype can be labelled as proxy technology assessments, user experience testing or field trials. Testing can be short to longer term and involve just a few or many users.

To conclude, the experimentation phase through the testing process provides an answer to either return to the exploration phase or proceed to the evaluation phase.

Evaluation

The goal of the evaluation phase is to evaluate the innovation. Evaluation builds on two already implemented phases, the exploration phase, where the existing state of the art is examined, and the experimentation phase, where users can test potential new solutions. The results of the two mentioned phases are compared- existing condition is benchmarked with new.

In the framework of Open Innovation processes, this stage is aimed at exploitation- using and benefiting from innovation. The goal is to launch a product/ service on the market. Therefore, the focus is on understanding the potential market. The activities in this stage should include market research, marketing strategy preparation and communication. With pre- and post-set measurement, developers should be able to quantify value propositions and determine price levels.

Stakeholders can also decide to implement post-launch activities, for example, monitoring, re-design or adding new functionalities based on new market groups, etc.

Quadruple Helix

The Quadruple Helix is a conceptual innovation framework that augments the well-established Triple Helix model—comprising academia, industry, and government—by integrating a fourth stakeholder: civil society or the public. This extension acknowledges that successful innovation hinges not only on institutional collaboration but also on alignment with societal needs and values.

Originally developed in the late 2000s, the Quadruple Helix reflects an evolution in innovation thinking, embedding citizen engagement, media influence, and social legitimacy into the knowledge creation process. It underscores that innovation is a socially embedded, context-sensitive endeavor.

The Triple Helix emerged in the 1990s to explain how universities, industries, and governments interact dynamically to drive innovation and economic development. Over time, scholars recognized that this triadic model overlooked the role of the public in shaping innovation. The Quadruple Helix remedies this by adding civil society, emphasizing media, cultural, and societal dimensions to innovation ecosystems.

Core Components of the Quadruple Helix

The model comprises four interdependent stakeholders, each playing a distinct role:

1. Academia – Generates foundational knowledge and research.

2. Industry – Translates knowledge into commercial and applied innovation.

3. Government – Creates enabling policy, regulation, and funding environments.

4. Civil Society / Public – Represents societal needs, cultural values, and public legitimacy.

In this model, knowledge flows through overlapping interactions, with each helix contributing unique forms of capital—intellectual, economic, political, and social.

The Quadruple Helix model offers distinct advantages that extend beyond the capabilities of traditional innovation frameworks. By embedding civil society into the innovation ecosystem, it introduces perspectives, priorities, and legitimacy that cannot be achieved through interactions between academia, industry, and government alone.

One of the most significant benefits is its ability to align innovation activities with real-world societal needs. Civil society actors bring lived experience, contextual knowledge, and insights into daily challenges that may be invisible to institutional stakeholders. This alignment ensures that innovations are not only technically and economically viable but also socially acceptable and culturally sensitive. The result is higher adoption rates, greater user satisfaction, and more sustainable long-term impact.

Involving the public in decision-making processes strengthens the democratic legitimacy of innovation policy and practice. Transparent, participatory processes can build trust between citizens and institutions, particularly in domains where skepticism toward technology or public spending is high. Trust is a crucial intangible asset, facilitating smoother implementation of innovation initiatives and reducing resistance to change.

The integration of the fourth helix fosters bidirectional knowledge flows. While academia and industry provide technical expertise and market insight, civil society offers feedback loops, user testing environments, and crowdsourced creativity. These interactions often result in co-creation, where solutions are shaped collaboratively from the earliest stages, significantly increasing the likelihood of market and societal success.

Ecosystems that draw on a wider diversity of actors are inherently more adaptable to disruption. The fourth helix acts as an early warning system, detecting emerging societal trends, cultural shifts, and potential risks. This capacity to anticipate change strengthens resilience, allowing the innovation system to pivot and adjust in real time.

By embedding civil society perspectives, the Quadruple Helix promotes policy coherence across sectors such as education, health, environment, and industry. This approach helps avoid siloed strategies and fosters a holistic, long-term vision for regional or national innovation agendas. It supports the creation of integrated policy packages that simultaneously address economic growth, social well-being, and environmental stewardship.

Finally, the model advances the principles of open innovation and responsible research and innovation (RRI). By encouraging transparency, mutual learning, and societal oversight, it mitigates ethical risks and ensures that innovation processes remain accountable to public values. This proactive stance reduces the likelihood of societal backlash, regulatory hurdles, or ethical controversies.

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