

RiHEI

Ecosystem transformation for sustainable and responsible job creation and enterprise

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Co-funded by the European Union

FACULTY OF MANAGEMENT University of Lodz

TUM int TUM International GmbH The University Company

MARTIN-LUTHER UNIVERSITÄT HALLE-WITTENBERG

KUTAISI INTERNATIONAL UNIVERSITY



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INTRODUCTION

The role of universities has evolved significantly in recent decades, extending beyond education and research to include active participation in regional development.

Universities are now **key players** in fostering innovation, entrepreneurship, and sustainable economic growth within their regions.

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INTRODUCTION

- This toolkit is designed to help universities understand and enhance their role in regional innovation ecosystems.
- It provides practical tools, strategies, and case studies that illustrate how universities can drive regional development, support sustainable job creation, and contribute to the growth of enterprises.

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RIECOLAB MODEL – THE BASE OF THIS TOOLKIT

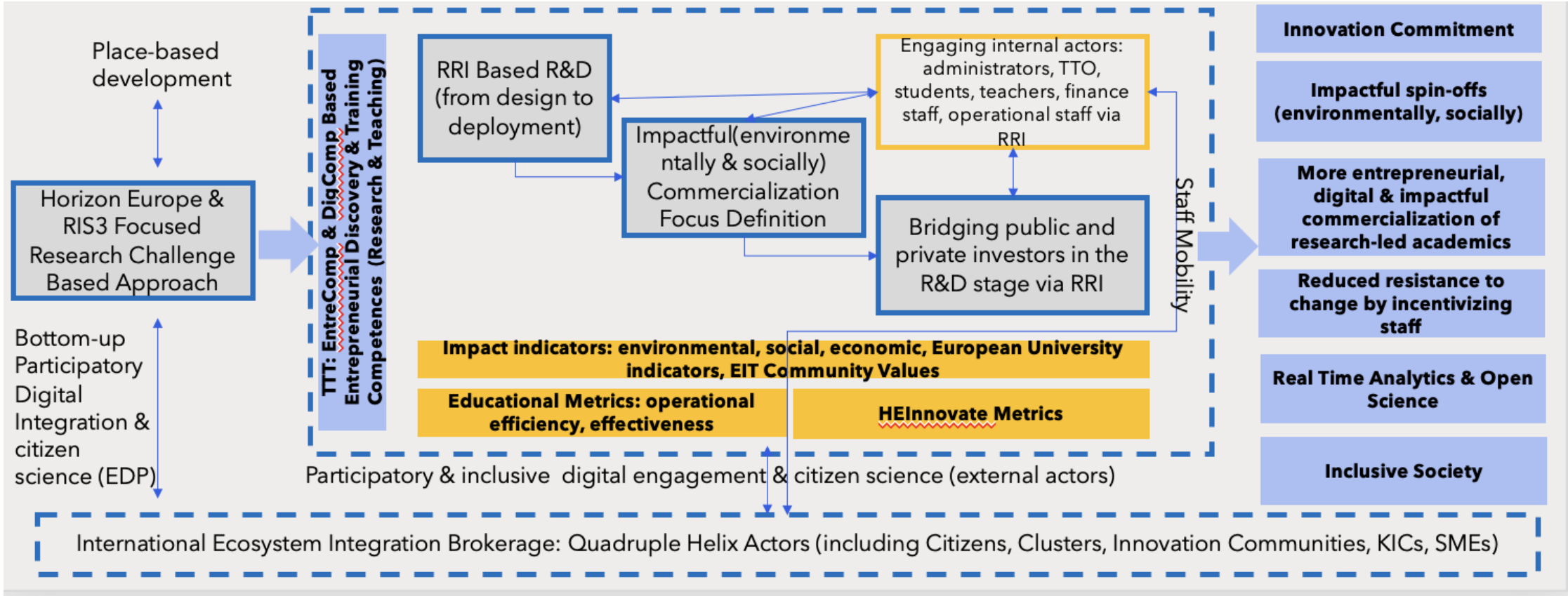
The RiEcoLab's vision for a commercially-oriented, research-led university is not only to excel in research and innovation but also to **enhance its role as a successful teaching institution**, where educators can effectively guide students toward entrepreneurship.

Responsible Research and Innovation (RRI) plays a crucial role in this by engaging internal actors, including non-research-focused teaching staff, with commercially-oriented research.



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RIECOLAB MODEL



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REGIONAL INNOVATION ECOSYSTEM

Definition of innovation ecosystems

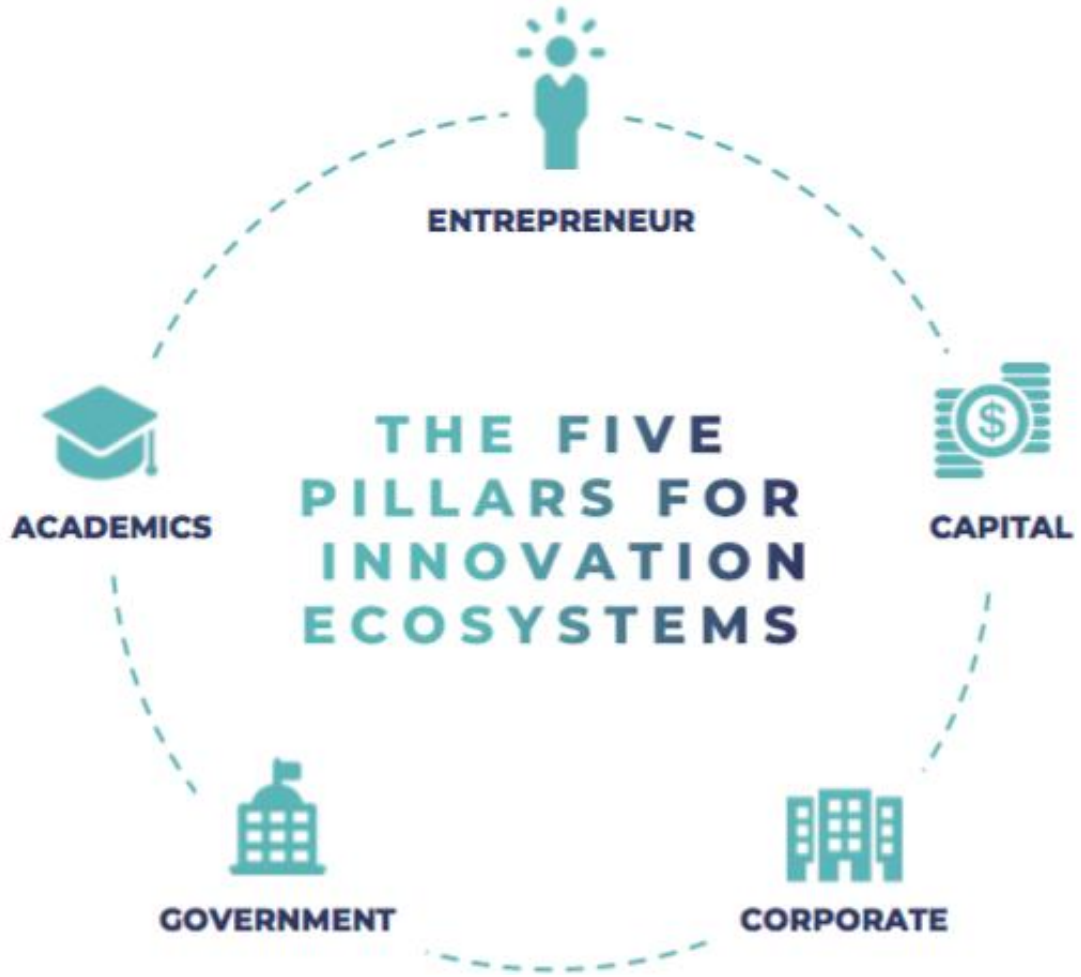
A regional innovation ecosystem refers to the network of interconnected institutions, organizations, and individuals that contribute to innovation within a specific region. This ecosystem includes **universities, businesses, government agencies, and non-profit organizations,** all of which play critical roles in driving economic growth and innovation *(Wiyono et al., 2022)*.

- A key tenet of the regional innovation system (RIS) approach is the inclusion of localized innovation networks rooted in specific sociocultural contexts *(Isaksen et al., 2018)*. This is because **geographical proximity** is crucial for certain types of knowledge exchange and fostering trustful collaboration among stakeholders *(Cooke, 2004)*.

- These innovation networks, comprising a triple helix of industry, university, and regional government, along with agencies and institutions, form the core components of a RIS, which are systemically interdependent *(Asheim et al., 2019)*.

REGIONAL INNOVATION ECOSYSTEM

Actors in an Innovation Ecosystem



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Importance of innovation ecosystems

Innovation ecosystems are essential for:

- **fostering creativity**
- **promoting technological advancements**
- **supporting the commercialization of research**

By facilitating collaboration among different actors, innovation ecosystems help to **accelerate the commercialization of research and the development** of new products and services *(Klimas & Czakon, 2021)*.

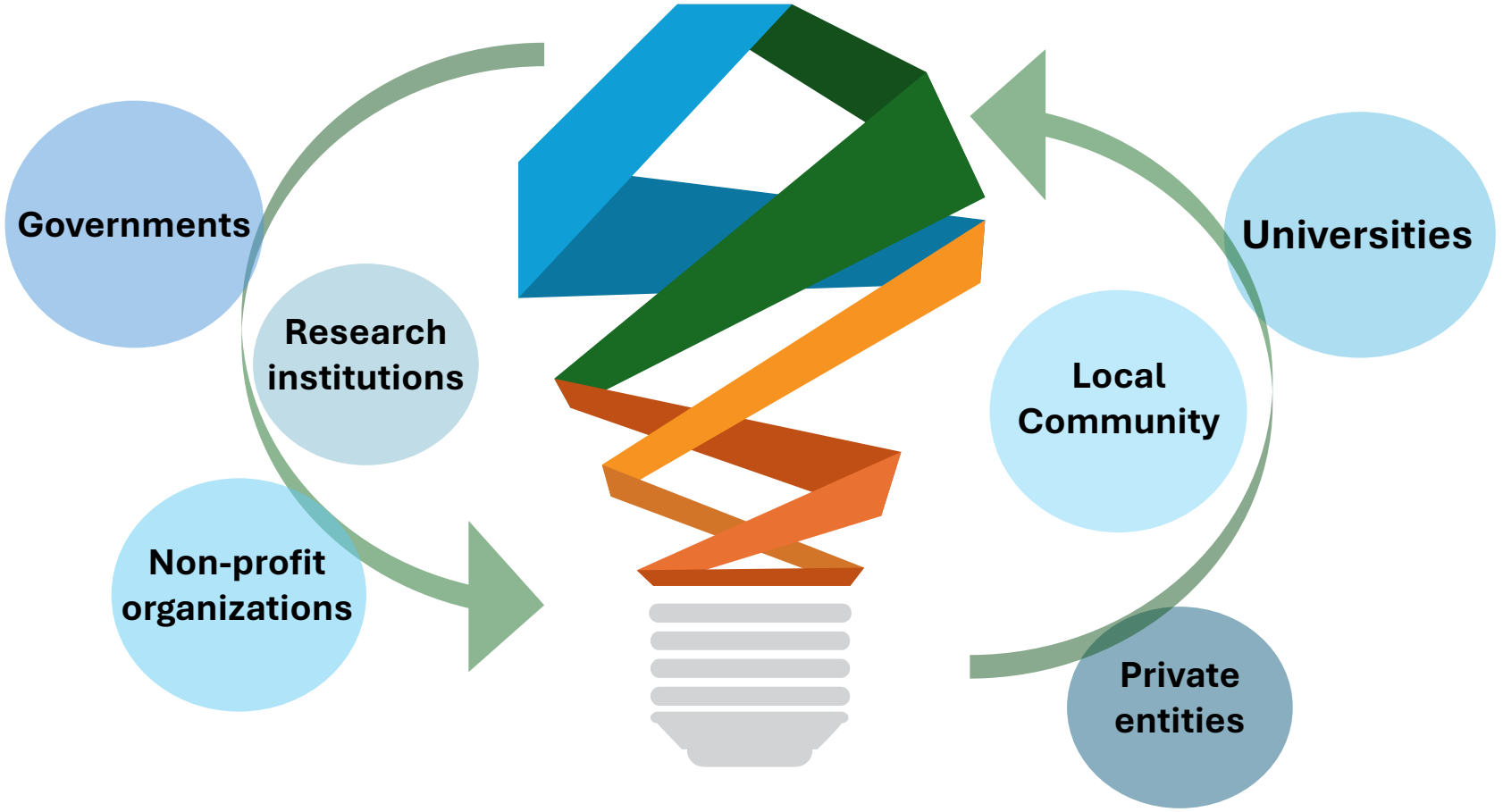


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Importance of innovation ecosystems

They create an environment where ideas can flow freely, leading to the development of **new products, services, and business models** that drive economic growth.

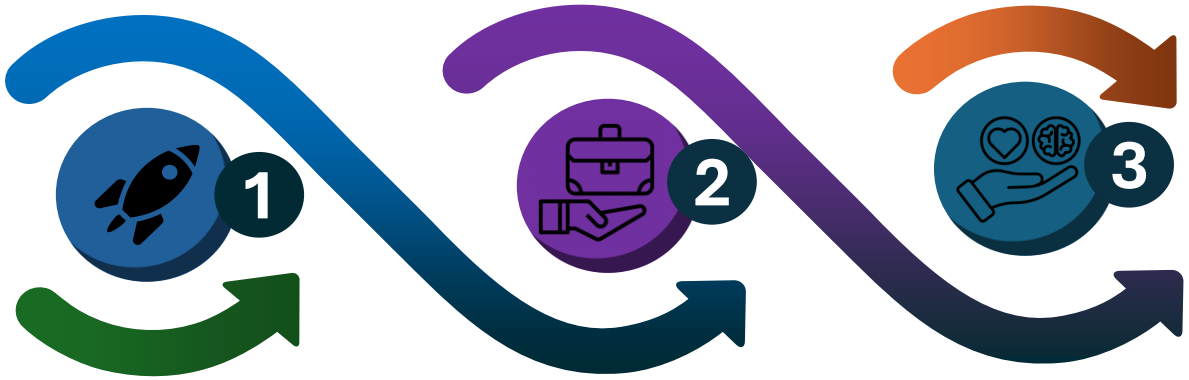


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Importance of innovation ecosystems

Regional innovation ecosystems play a pivotal role in:



Promoting economic growth

Job creation

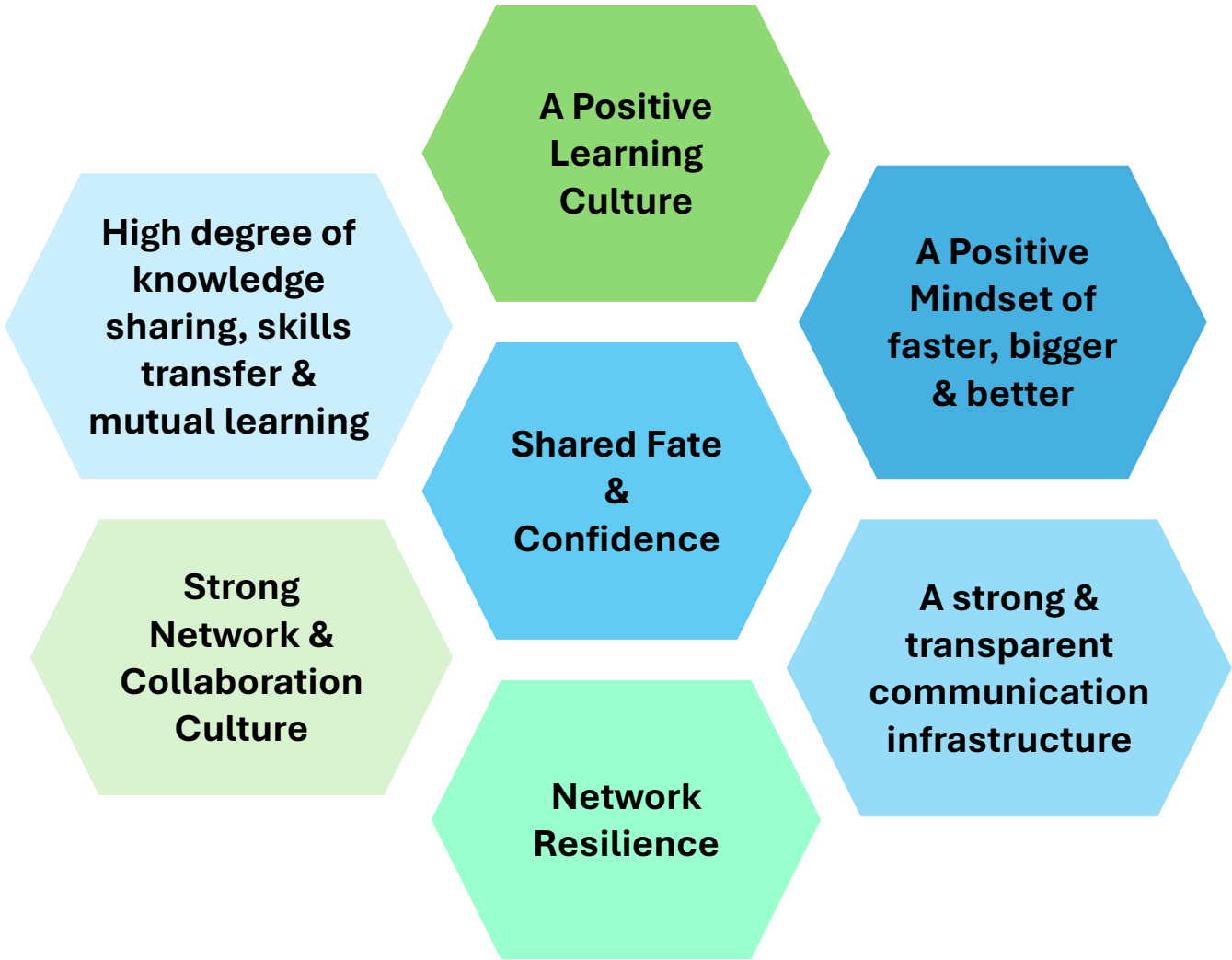
Social well-being

Effective regional innovation ecosystems promote inclusivity by engaging a wide range of stakeholders, including marginalized communities, ensuring that the benefits of innovation are broadly shared.

Sustainable innovation practices within these ecosystems address environmental challenges and promote green technologies, contributing to long-term environmental sustainability *(Farinha et al., 2020)*.

REGIONAL INNOVATION ECOSYSTEM

Building blocks of innovation ecosystems



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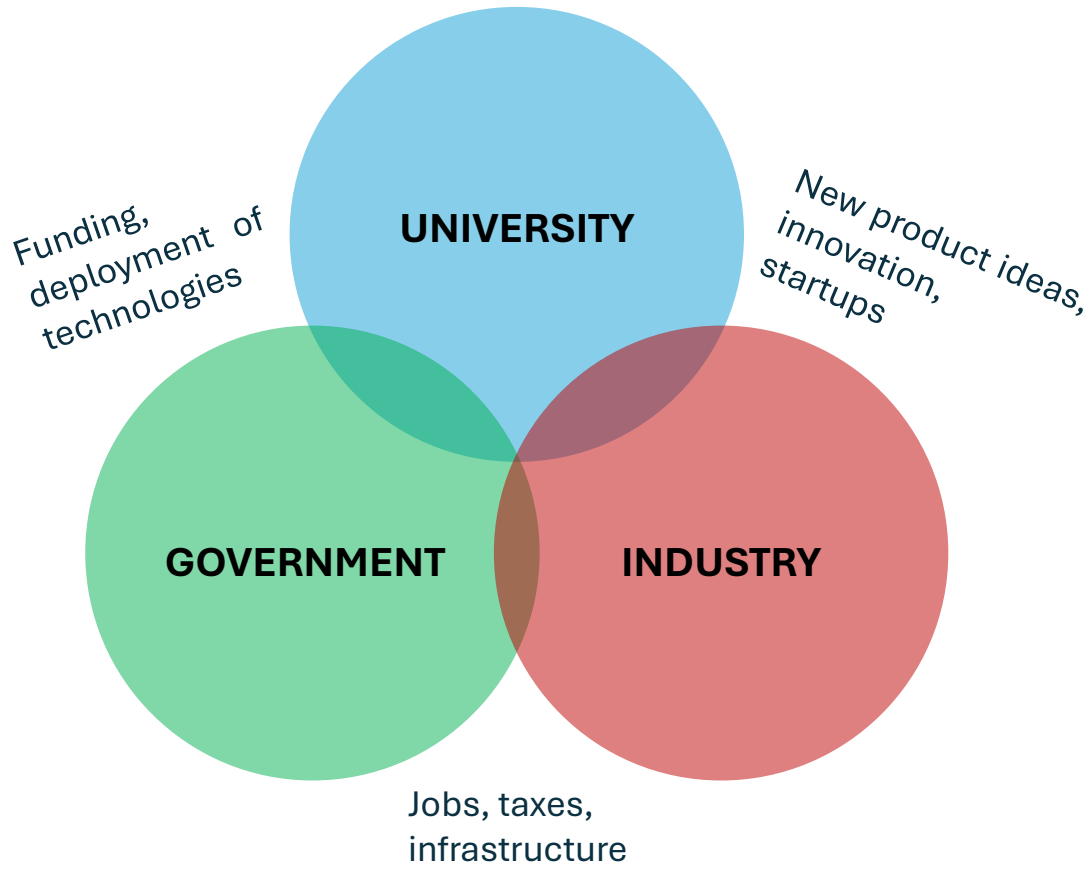
REGIONAL INNOVATION ECOSYSTEM

Key actors and collaboration

The success of a regional innovation ecosystem depends on the **collaboration between key actors,** including universities, industry partners, government agencies, and civil society. Each of these actors brings unique strengths and resources to the table, making it possible to address complex challenges and seize new opportunities.

According to the **triple helix model** *(Etzkowitz & Leydesdorff, 1997, 2000),* the interactions among industry, government, and universities drive innovative performance.

Effective collaboration is crucial!



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REGIONAL INNOVATION ECOSYSTEM

Key actors and collaboration

Expanding on this model, Carayannis and Campbell (2009) introduce a **fourth helix:** organized civil society, represented by users and non-governmental organizations. These ecosystems comprise a diverse array of actors, including academic institutions, businesses, government bodies, non-profits, and intermediary organizations.



In this context, an **innovation ecosystem** can be defined as co-innovation networks where actors from organizations involved in knowledge production, wealth creation, and norm control interact to form co-evolving and interdependent relationships, both directly and indirectly, across geographical boundaries. These networks then integrate new ideas and approaches from various internal and external sources into a platform that generates shared values for the sustainable transformation of society *(Cai et al., 2020)*.

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Resources and institutional framework

- A **strong institutional framework** is necessary to support innovation within a regional ecosystem. This framework includes *policies, regulations, and funding mechanisms* that encourage **research and development, entrepreneurship,** and **knowledge transfer**.
- **Universities** play a key role in shaping this framework and ensuring that it aligns with the needs of the region. By advocating for supportive policies and providing access to resources, universities can help create a conducive environment for innovation *(NBER, 2023)*.
- These resources enable research and development activities, support startups, and foster innovation-driven growth by providing the necessary foundation for innovation activities *(OECD Reviews of Regional Innovation, 2023)*.



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Knowledge flow and culture of innovation

The **flow of knowledge and information** within the ecosystem is critical for:

→ Innovation
→ Transfer of scientific and technical knowledge
→ Market insights
→ User needs
→ Societal challenges.

This interconnectedness enhances the overall innovative capacity of the region *(MIT D-Lab, 2019)*.



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The Role of Universities in Shaping RIE

- Universities have long been recognized as critical players in fostering regional innovation and economic growth, with their multifaceted roles extending far beyond traditional teaching and research functions.

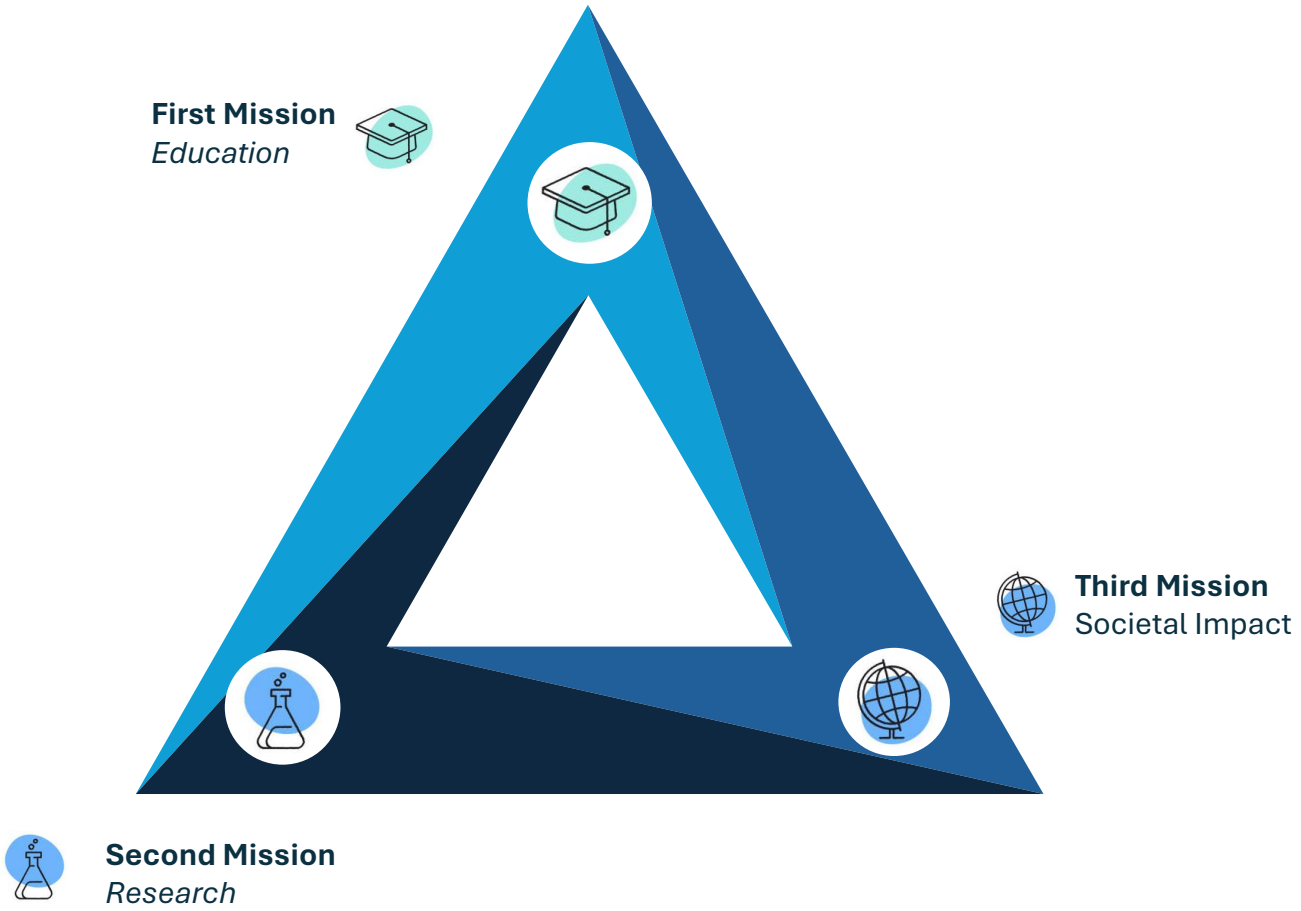
- At the core of this transformative shift is the concept of the **"third mission"** of universities, which encompasses their active engagement with the wider community, industry, and policymakers to drive societal and economic impact *(Čajka et al., 2023)*.

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University Third Mission

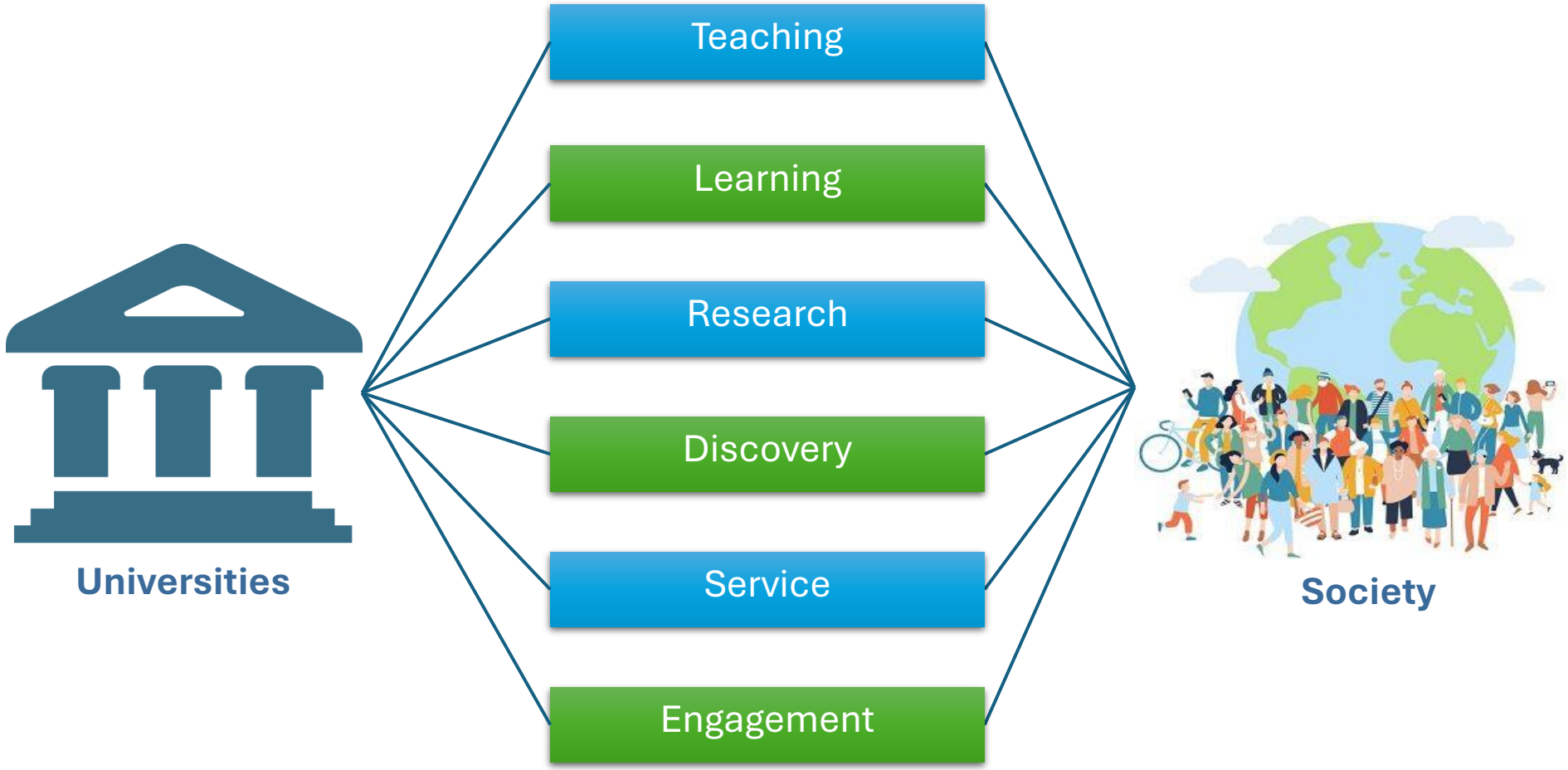
The third mission of universities refers to their role in **contributing to socio-economic development**, complementing their primary missions of education (first mission) and research (second mission). This third mission encompasses a broad range of activities aimed at generating **societal impact**, **driving innovation**, **and supporting regional development.**



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University Third Mission



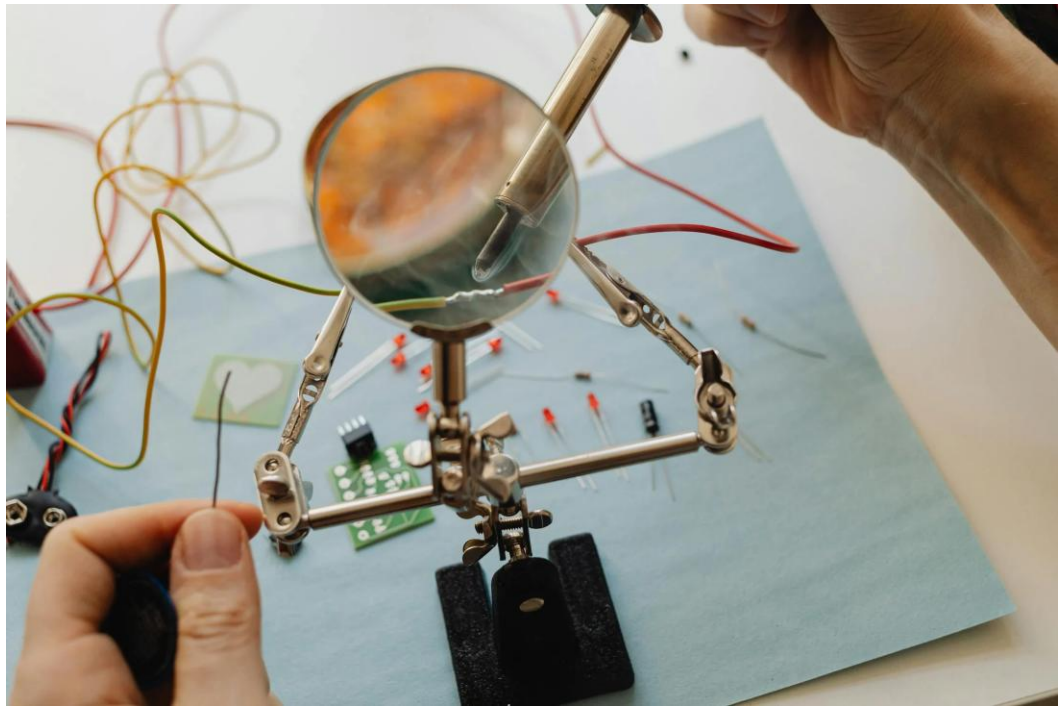
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University Third Mission

A critical aspect of this mission is knowledge transfer and technology transfer, where universities play a crucial role in transferring knowledge and technology to industry and society through activities such as **patenting, licensing,** and **commercialization of research outcomes.**

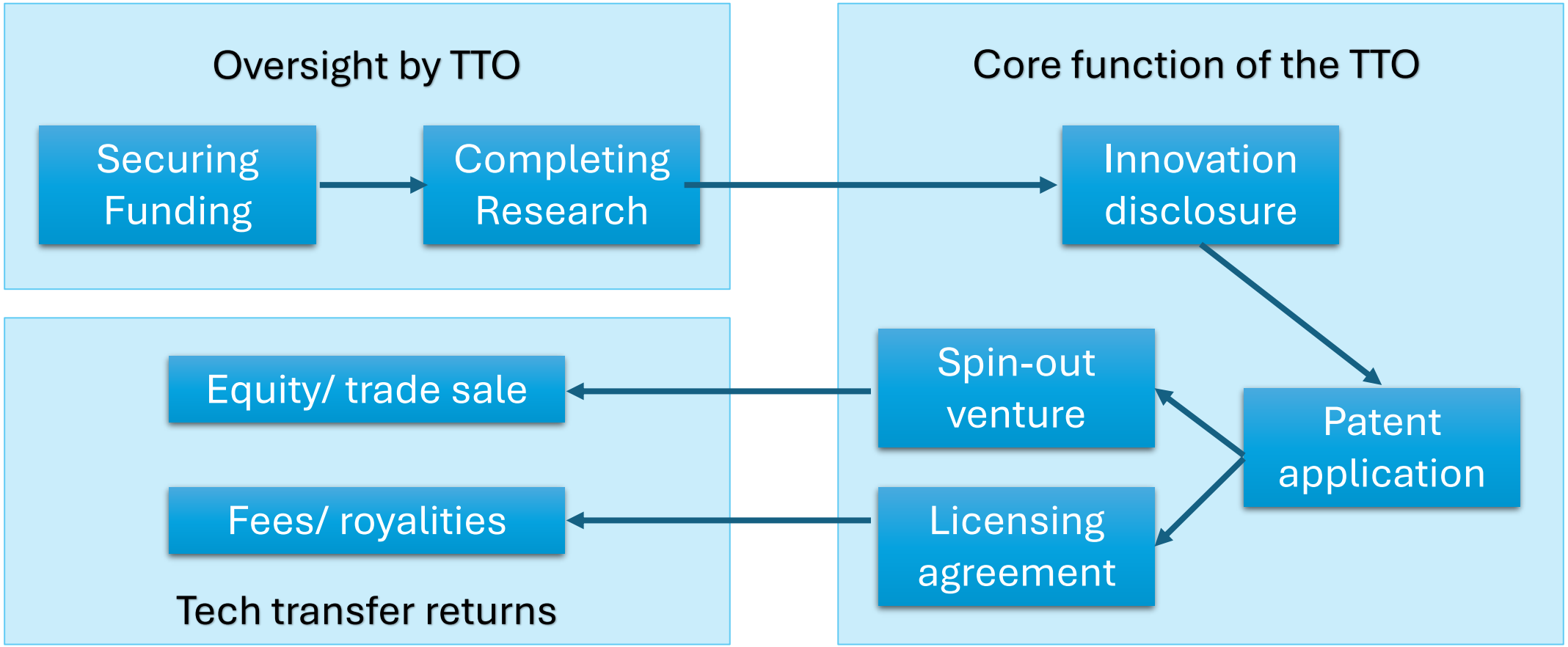
Technology transfer offices (TTOs) within universities facilitate these processes by connecting academic researchers with businesses and entrepreneurs *(Perkmann et al., 2013; Rasmussen & Borch, 2010)*.



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University Third Mission



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Entrepreneurial University

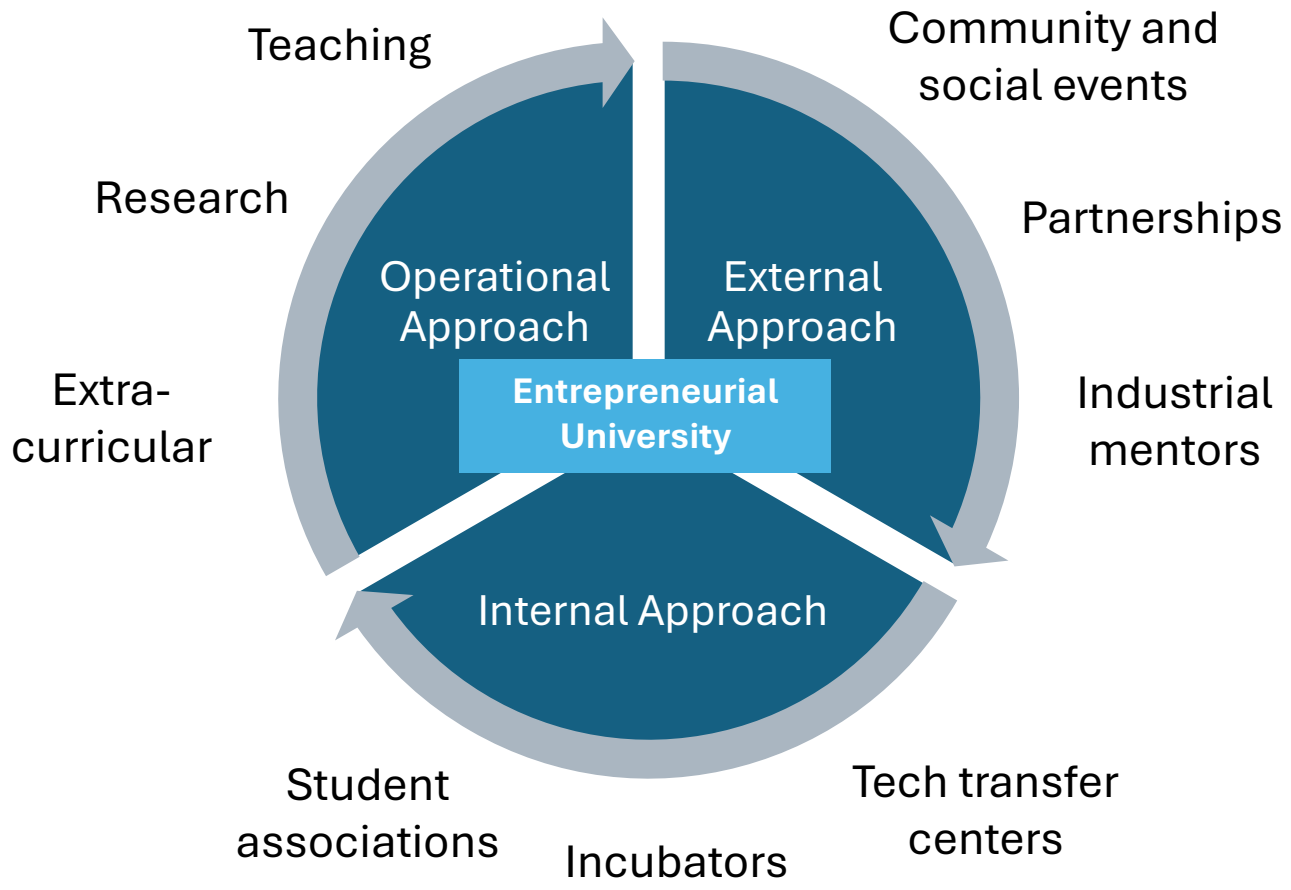
The concept of the entrepreneurial university has gained prominence as universities increasingly recognize their role in fostering innovation and entrepreneurship.

An entrepreneurial university **fosters a culture of innovation, creativity, and risk-taking,** encouraging students, faculty, and staff to explore entrepreneurial opportunities and pursue innovative projects. It provides comprehensive support for startups and spin-off companies, including access to incubation facilities, seed funding, mentorship, and networking opportunities *(Guerrero & Urbano, 2012)*.

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Entrepreneurial University

These institutions offer incentives and recognition for entrepreneurial activities, including financial rewards, promotion criteria that value entrepreneurial achievements, and awards for innovation and entrepreneurship *(O'Shea et al., 2007)*.



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The Role of Smart Specialization

Smart specialization is a strategic approach to regional innovation that focuses on **identifying and leveraging a region's unique strengths and competitive advantages.**

- It involves prioritizing specific sectors, technologies, or industries where the region has the potential to excel and achieve a competitive edge.

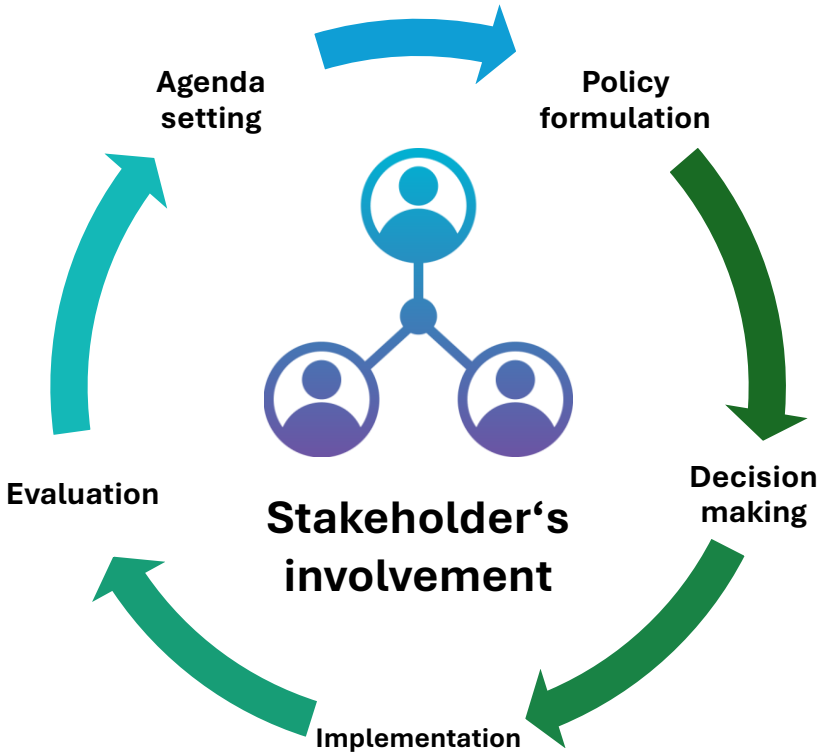
- Smart specialization aims to enhance the efficiency and effectiveness of regional innovation policies by concentrating resources and efforts on areas with the highest potential for impact *(Foray et al., 2018; McCann & Ortega-Argilés, 2016)*.

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The Role of Smart Specialization

The **Entrepreneurial Discovery Process (EDP)** is a central element of smart specialization. It involves stakeholders from academia, industry, government, and civil society collaborating to identify regional strengths, opportunities, and innovation niches. This bottom-up process ensures that smart specialization strategies are grounded in local knowledge and capabilities *(Gianelle et al., 2016)*.

Regions with well-defined smart specialization strategies are more attractive to investors and businesses, as the focus on specific niches and the presence of a supportive innovation ecosystem create favorable conditions for investment and business growth *(Radosevic & Stancova, 2018)*.



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Case Studies of Strong Performing Ecosystems

Several regions have successfully developed strong innovation ecosystems with the active involvement of universities. For example:

1. **Lombardia** is a top innovation region in Europe, known for its strong industrial base, extensive university and research networks, and effective public-private partnerships. The region excels in advanced manufacturing, life sciences, and digital technologies. Initiatives like the **Lombardy Technological Cluster for Aerospace** and the **Lombardy Green Chemistry Association** highlight its commitment to innovation through specialized clusters.





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Case Studies of Strong Performing Ecosystems

2. Stockholm is consistently ranked as one of Europe's most innovative regions. It benefits from a strong entrepreneurial culture, significant investments in research and development, and a high concentration of tech startups.

The region is known for its excellence in ICT and life sciences, bolstered by institutions like the KTH Royal Institute of Technology and Karolinska Institute. Stockholm's innovation ecosystem is supported by a **collaborative environment** that promotes knowledge sharing and commercialization of research outcomes *(European Innovation Scoreboard, EC, 2024)*.



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Case Studies of Strong Performing Ecosystems

3. The Helsinki-Uusimaa region is another top performer, known for its strong digital economy and sustainable innovation practices. The region hosts several world-class universities and research centers, including Aalto University and the University of Helsinki, which drive innovation through interdisciplinary research and industry collaboration. The **area's focus on clean technologies and smart city solutions** positions it as a leader in sustainable development and digital innovation *(Regional innovation scoreboard, EC, 2023)*.



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Case Studies of Strong Performing Ecosystems

4. Oberbayern, located in Germany is a hub for high-tech industries and research institutions. The region is home to major companies like Siemens and BMW, as well as renowned universities such as the Technical University of Munich. Oberbayern excels in fields like automotive technology, aerospace, and biotechnology. The strong linkages between industry, academia, and government in Oberbayern foster a dynamic innovation ecosystem that drives regional and national economic growth *(European Innovation Scoreboard, EC, 2024)*.



REGIONAL INNOVATION ECOSYSTEM

Tools that measure the progress of regional ecosystems

1. EU Regional Competitiveness Index (RCI) 2.0 (2022 Edition)

Basic Pillars:

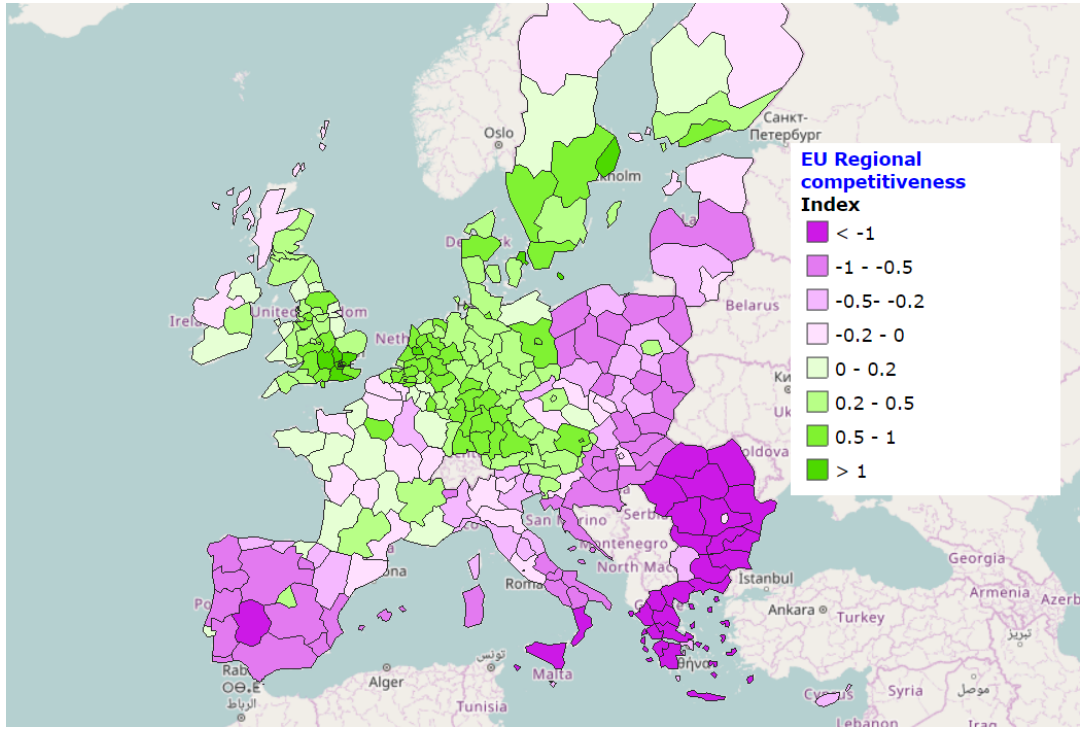
- Institutions
- Macroeconomic stability
- Infrastructure
- Health
- Basic Education

Innovation Pillars:

- Technological readiness
- Business sophistication
- Innovation

Efficiency Pillars:

- Higher education and long-life learning
- Labour market efficiency
- Market size



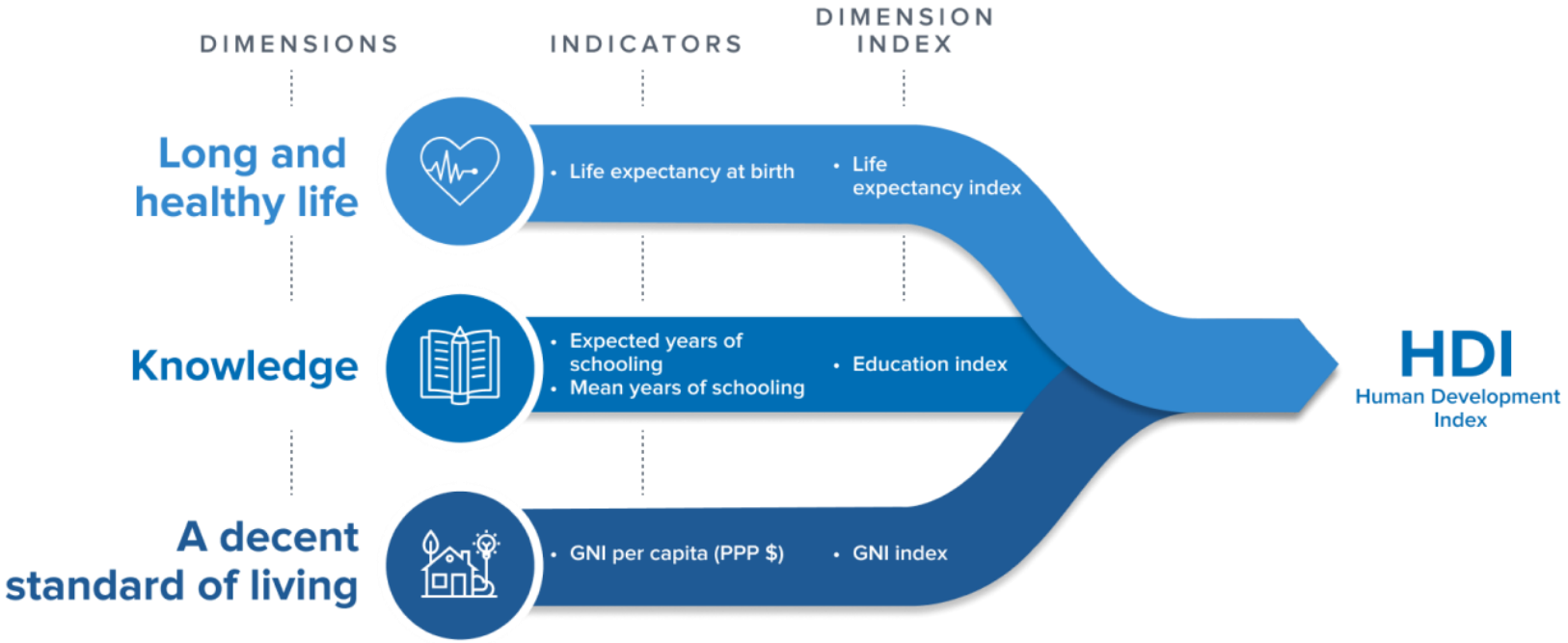
https://ec.europa.eu/regional_policy/assets/regional-competitiveness/index.html#/

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REGIONAL INNOVATION ECOSYSTEM

Tools that measure the progress of regional ecosystems

2. Human Development Index (HDI)



https://hdr.undp.org/data-center/human-development-index#/indicies/HDI

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REGIONAL INNOVATION ECOSYSTEM

Tools that measure the progress of regional ecosystems

3. European Innovation Scoreboard (EIS)

Innovation Leaders

Denmark	149.3	▲ 0.5
Sweden	146.2	▲ 0.2
Finland	140.6	▼ 0.7
Netherlands	138.3	▼ 0.5

Strong Innovators

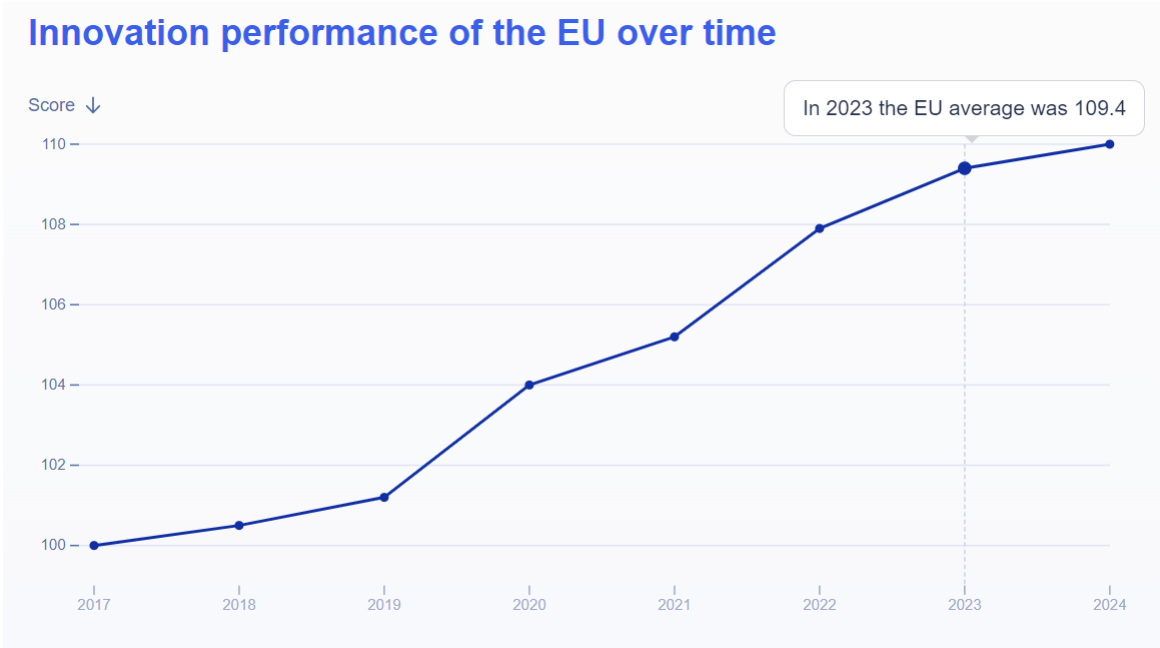
Belgium	136.0	▼ 0.2
Austria	127.9	▼ 1.2
Ireland	124.5	▲ 2.1
Luxembourg	123.3	▼ 2.5
Germany	122.8	▼ 3.4
Cyprus	116.9	▲ 3.3
Estonia	115.3	▼ 2.9
France	114.4	▲ 0.3

Moderate Innovators

Slovenia	100.1	▲ 1.5
Spain	98.9	▲ 2.0
Czechia	98.7	▲ 2.3
Italy	98.6	▲ 0.8
Malta	96.8	▼ 1.9
Lithuania	92.0	▲ 3.7
Portugal	91.8	▲ 0.5
Greece	85.3	▼ 1.0
Hungary	77.6	▲ 2.1

Emerging Innovators

Croatia	76.6	▼ 0.1
Poland	72.5	▲ 3.3
Slovakia	71.6	▲ 1.5
Latvia	59.0	▼ 0.2
Bulgaria	50.6	▲ 1.9
Romania	37.4	▼ 1.6



https://projects.research-and-innovation.ec.europa.eu/en/statistics/performance-indicators/european-innovation-scoreboard/eis-2024#/

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REGIONAL INNOVATION ECOSYSTEM

Tools that measure the progress of regional ecosystems

4. Global Entrepreneurship Monitor (GEM)

The data collection engine powering GEM research is composed of two complementary tools:

- **Adult Population Survey (APS):** explores the role of the individual in the lifecycle of the entrepreneurial process, not only on business characteristics, but also on people's motivation for starting a business.
- **National Expert Survey (NES):** the purpose of this survey is to assess the status of the Entrepreneurial Framework Conditions in each economy at a given point in time.

https://www.gemconsortium.org



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REGIONAL INNOVATION ECOSYSTEM

Tools that measure the progress of regional ecosystems

5. Smart Specialisation Platform (S3 Platform)

Smart Specialisation Strategies foster knowledge-based growth in EU regions and countries. They are crucial to achieving a smarter, sustainable and inclusive Europe.



Pillars:

1. Localisation
2. Prioritisation
3. Participation

https://s3platform.jrc.ec.europa.eu

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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

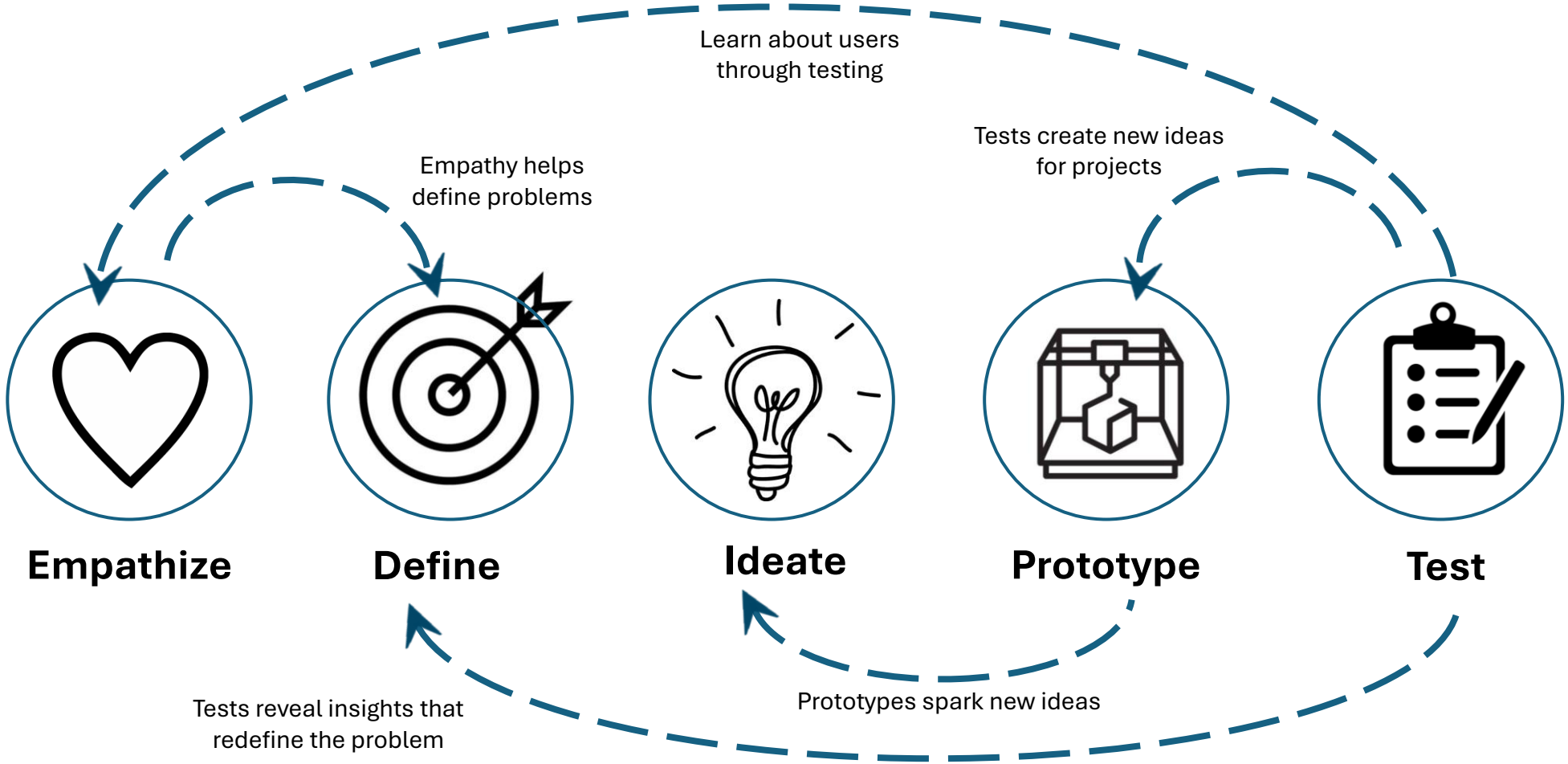
Instrument 1: Design Thinking for Co-design Public Open Spaces

Designed as a practical guide, the Design Thinking instrument provides a comprehensive approach to help users overcome challenges and identify opportunities in the co- design of public open spaces. It is based on the principles of Design Thinking and offers a range of strategic tools and actionable steps aimed at delivering integrated solutions through measures that include identifying stakeholders and understanding the needs of the local community.

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DESIGN THINKING

A non-linear process



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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

Instrument 2: Promote your Research Communication

This instrument would be comprising user-friendly guidelines designed to assist researchers in promoting their findings, primarily through social media. The guidelines would offer best practices for creating engaging posts, selecting appropriate channels, leveraging visual aids, using keywords or hashtags for increased visibility, and tailoring communication for diverse audiences

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PROMOTE YOUR RESEARCH COMMUNICATION

Benefits for researchers and institutions:

- Greater relevance, accountability and transparency of research outcomes
- Making early career researchers' research more visible in the field
- Enhance reputation and impact of research
- Opportunity in obtaining research fundings
- Reaching the stakeholders
- Informing, raising awareness of science-related topics
- Getting involved with audiences including people outside the science community
- Science embedded in the daily life



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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

Instrument 3: Visual Methodologies for Landscape Observatory

Visual Methodologies for Landscape Observatory is a training course for implementing and utilizing visual instruments to work and communicate with the community and interested stakeholders on spatial and landscape planning approaches to landscape enhancement and raising the quality of life. It is an approach to unifying the production of art and visual communication methods to scientific production and landscape research.

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VISUAL METHODOLOGIES FOR LANDSCAPE OBSERVATORY

Target group(s):

- Various stakeholders interested in the topics of territorial planning, enhancement of ecological and societal landscape networks, as well as raising the quality of living.

Benefits:

- Empowerment to communicate knowledge, ideas, views, and needs on inherited landscape values as well as gathering new knowledge from other groups.
- The benefit for architects and planners will be double - firstly, they can get more input from the population and all communities involved in the planning, and secondly, they can offer a clearer idea of their design choices during planning development.
- For citizens and administrators, the benefit will be knowledge of the issues involved in the planning process and a more integrated awareness of planning development

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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

Instrument 4: (Human) Ecosystem Integration Lab

(Human) Ecosystem Integration Lab serves as a digital instrument, found within a dedicated tab on the BETTER Life website. This instrument is designed for the active participation of Quadruple Helix stakeholders—universities, businesses, administrations, and NGOs—in engaging with the community. Its focus lies in facilitating discussions and collaborations related to research in life sciences.

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HUMAN ECOSYSTEM INTEGRATION LAB

Benefits:

- Efficient Collaboration: enables stakeholders to easily connect and collaborate, share insights, expertise, and resources, fostering interdisciplinary collaborations.
- Research Dissemination: short abstracts and keywords are used for the rapid dissemination of research topics to a broader audience.
- Enhanced Visibility: stakeholders can showcase their expertise and interests through a common platform, enhancing their visibility within the community.



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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

Instrument 5: Academic Bridge

The platform is a digital hub (website) designed to foster collaboration between municipalities (initially as stakeholders, with potential to include additional stakeholders operating in Quadruple Helix in the future) and researchers. The platform's design can be expanded to accommodate other stakeholders in addition to municipalities, and researchers could be given the capability to propose topics, further enhancing the platform's collaborative aspect.

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ACADEMIC BRIDGE

Benefits for Researchers:

- Direct insight into the real-world challenges faced by municipalities.
- Opportunities for impactful and locally engaged research.
- Platform that showcases researchers' expertise.
- Publication Opportunities
- Enhanced Funding Prospects

Benefits for Municipalities:

- Access to academic expertise and possibilities to consult their problems with academia.
- Solutions to local issues backed by research.
- Increased visibility of their challenges within the academic community.
- Streamlining the bi-directional knowledge transfer between governance and science and research actors.
- Innovation Acceleration
- Capacity Building

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INSTRUMENTS FOR UNIVERSITIES TO BECOME SOCIALLY ENGAGED

Instrument 5: A Boardgame for a better understanding of the advantage of collaboration

The game focuses on teaching the importance of engaging science and cooperative initiatives to address and manage societal and environmental challenges. The players assume the role of different organisational entities within the game scenario. Each player will have their own targets, while also striving to cooperate with other players to reach shared and communal goals. The goals within the game are aligned with the current EU Biodiversity Strategy 2030.

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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

Governments depend on universities for research insights that inform policy-making, while universities rely on government funding and policy support.

Effective collaboration between these institutions leads to:

→ creation of knowledge
→ technological advancements
→ public policies that benefit society as a whole

(Bok, 2013)



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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

Challenges:

Governments often focus on short-term policy goals, while universities are more oriented toward long-term research and education. This difference in focus can lead to conflicts in setting priorities, allocating resources, and achieving the desired outcomes of joint projects *(Etzkowitz & Leydesdorff, 2000)*.

Lengthy approval processes, rigid regulations, and multiple layers of authorization can slow down the implementation of collaborative projects, particularly in fast-moving fields like technology and innovation, where delays can result in missed opportunities. Limited communication and engagement are also significant obstacles.

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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

Challenges:

Effective collaboration requires ongoing communication between universities and government bodies, but many partnerships suffer from insufficient dialogue, leading to misunderstandings and missed opportunities.

Regular communication channels and platforms for dialogue are often lacking, making it difficult to align goals and share information effectively *(Etzkowitz & Leydesdorff, 2000)*.

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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

Proposed solutions:

- Establishing joint research initiatives that align with government priorities can help bridge the gap between short-term policy needs and long-term academic research.

- Creating formal communication channels, such as regular meetings, joint committees, and dedicated liaison offices, is essential for ensuring ongoing dialogue and collaboration.



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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

- Universities can further enhance their cooperation with government bodies by **aligning their research agendas with public policy goals**. By closely monitoring policy developments and engaging with policymakers, universities can tailor their research to address government priorities, increasing the relevance and impact of their work.
- **Facilitating knowledge transfer and innovation** is another critical strategy. Universities play a key role in the innovation ecosystem by transferring knowledge and technology to the public and private sectors.
- Governments can support this process by creating favorable regulatory environments, funding technology transfer offices, and incentivizing collaboration between universities and industry.

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HOW CAN UNIVERSITIES BETTER BOOST THEIR COOPERATION WITH GOVERNMENTAL BODIES

Universities also have a role in policy advocacy. They can shape public policy by:

→ participating in policy development processes
→ offering expert testimony
→ publishing policy briefs
→ engaging in public consultations.

Initiatives like MIT's **OpenCourseWare**, which provides free access to educational materials, have helped build public trust and increase the impact of academic research *(MIT OpenCourseWare, n.d.)*.

https://ocw.mit.edu/



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06 Test beds & living labs

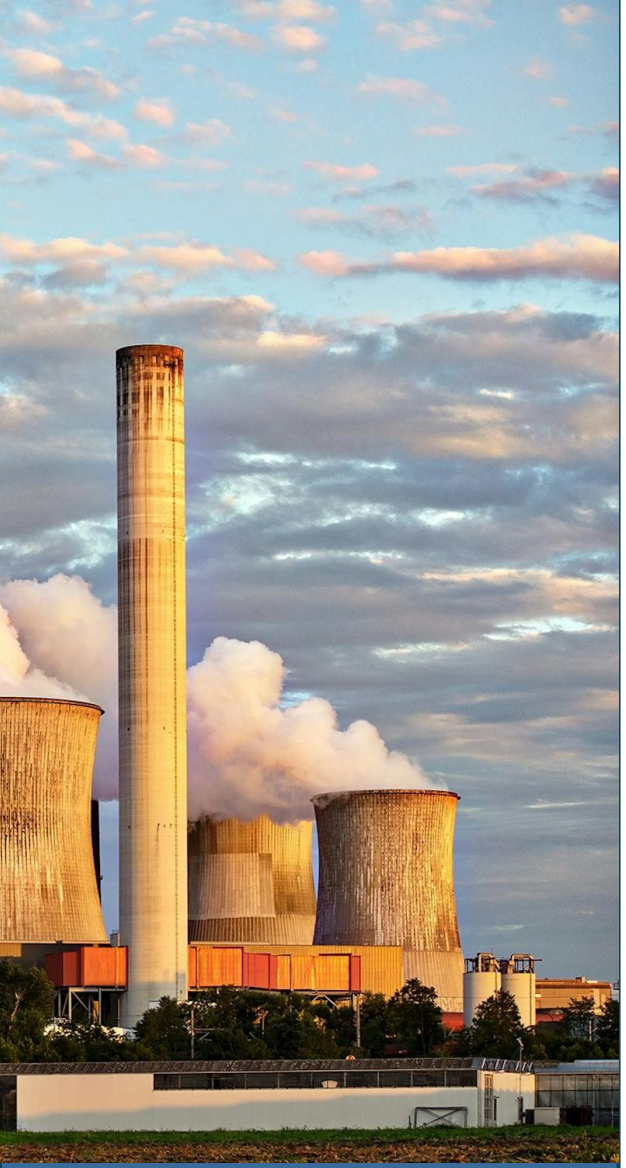
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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Industrial clusters are defined by the close proximity of related industries, which can include:

- Manufacturers
- Suppliers
- Service providers
- Research institutions

Michael Porter, a leading scholar on the topic, defines clusters as "*geographic concentrations of interconnected companies and institutions in a particular field*" that can lead to increased productivity, innovation, and new business formation *(Porter, 1998)*.

HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

As knowledge hubs, universities are essential in generating groundbreaking research that can lead to technological breakthroughs and innovations.

This research, when effectively transferred to industry, can drive the development of new products, services, and processes, thus significantly contributing to the competitiveness of industrial clusters.



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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Knowledge Hubs



Science-based evidence

Knowledge transfer

Aligment to research agendas

Development of tools and technologies

Expert opinion

RiHEI

HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Recent studies have highlighted the importance of university-industry collaborations in fostering innovation, noting that regions with strong ties between academic institutions and local industries tend to exhibit higher levels of innovation and economic growth *(Perkmann et al., 2021)*. These collaborations often lead to the creation of new technologies and startups, which can act as catalysts for the growth of industrial clusters by attracting investment and talent to the region.

In addition to their role as knowledge hubs, universities are pivotal in the **development of human capital** necessary for cluster development. By aligning their curricula with industry needs, universities can ensure that their graduates possess the skills and knowledge required by firms within the cluster.

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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Strategies for Enhancing University Support for Industrial Clusters

1. Strengthening Industry-Academia Partnerships

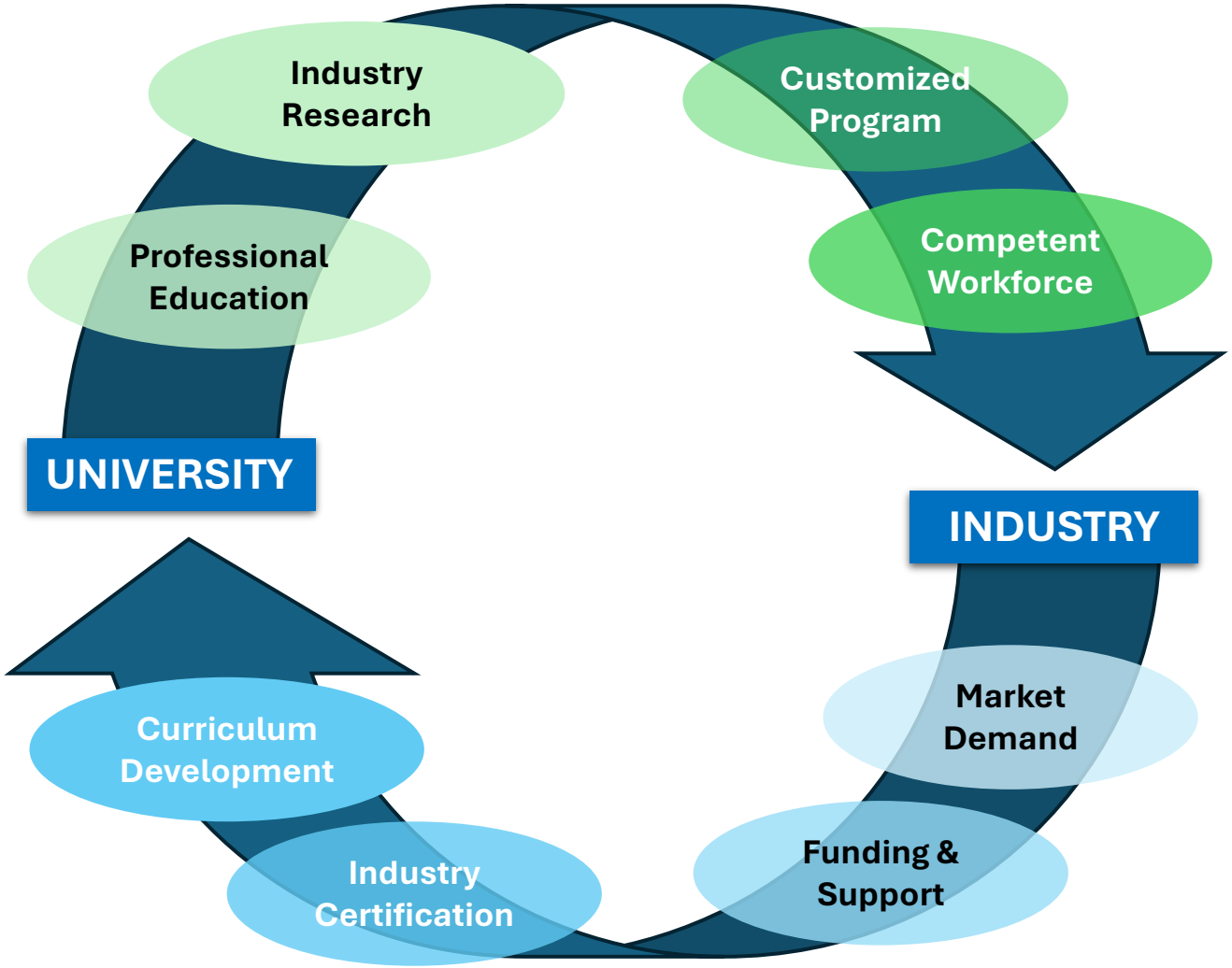
Universities can enhance their collaboration with industry through joint research initiatives, consortia, and R&D partnerships. These collaborations facilitate the transfer of knowledge from academia to industry and provide universities with valuable insights into the practical challenges faced by industry, which can inform future research directions.



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Strategies for Enhancing University Support for Industrial Clusters

Stregthening Industy-Academia Partnerships



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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Strategies for Enhancing University Support for Industrial Clusters

2. Curriculum and Talent Development

Universities should design their curricula to align with the current and future needs of industry. This can involve:

→ incorporating industry-relevant content

→ offering specialized training programs

→ providing opportunities for students to gain hands-on experience through internships and programs.

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Strategies for Enhancing University Support for Industrial Clusters

Curriculum and Talent Development



01 **Assessing the Educational Needs**

02 **Formulating objectives and learning goals**

03 **Designing the curriculum with desired learning experiences**

04 **Implementation**

05 **Evaluation**



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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Strategies for Enhancing University Support for Industrial Clusters

3. Entrepreneurship and Innovation Ecosystems

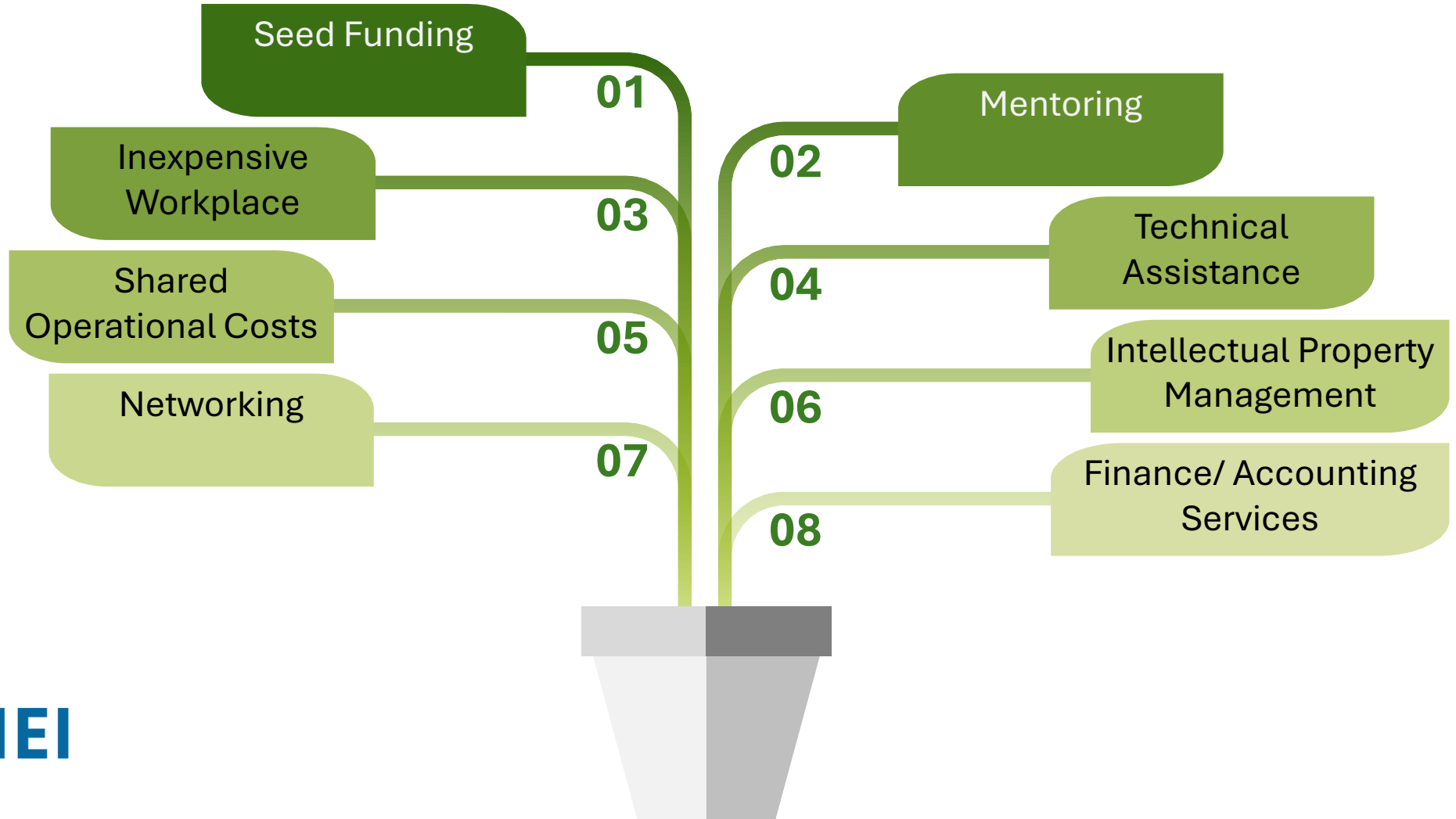
Universities can foster entrepreneurship by supporting the **creation of spin-offs, start-up incubators, and accelerators.**

→ **Technology Transfer Offices (TTOs)** play a vital role in this process by facilitating the commercialization of university research and supporting the development of new ventures.

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Strategies for Enhancing University Support for Industrial Clusters

How do Incubators help Startups?



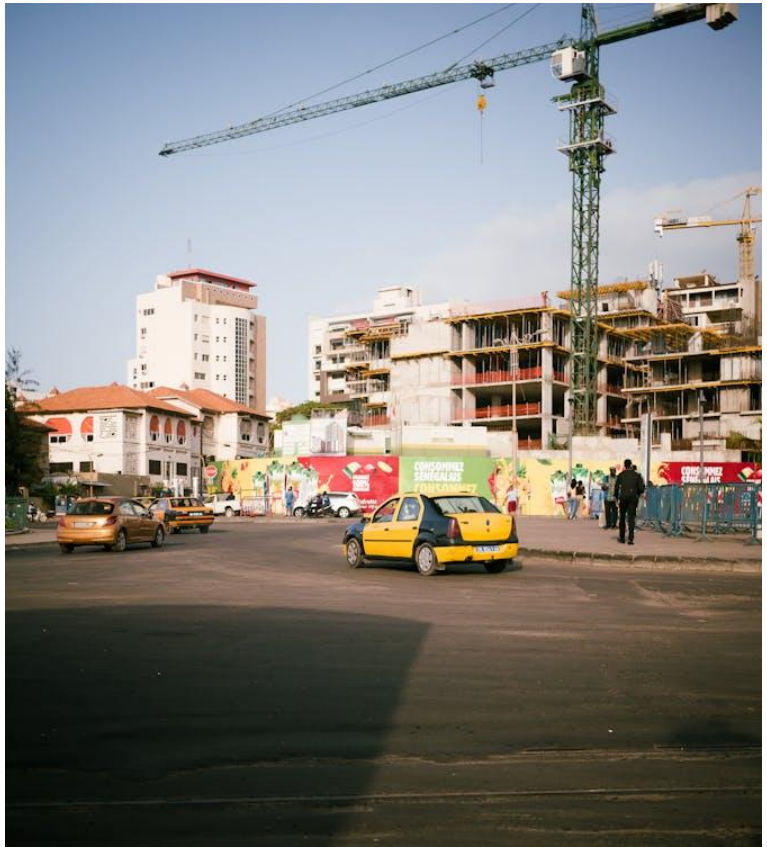
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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Strategies for Enhancing University Support for Industrial Clusters

4. Policy Advocacy and Regional Development

Universities can actively participate in regional development initiatives by advocating for policies that support cluster growth, contributing to the formulation of regional innovation strategies, and engaging in regional development agencies.



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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Case studies on University-Industry Collaboration

1. Silicon Valley and Stanford University

- Stanford University's role in the development of Silicon Valley is a prime example of how a university can catalyze the growth of an industrial cluster.
- Through its technology transfer initiatives, entrepreneurial support, and close ties with industry, Stanford has played a central role in the region's emergence as a global innovation hub *(Kenney, 2000).*

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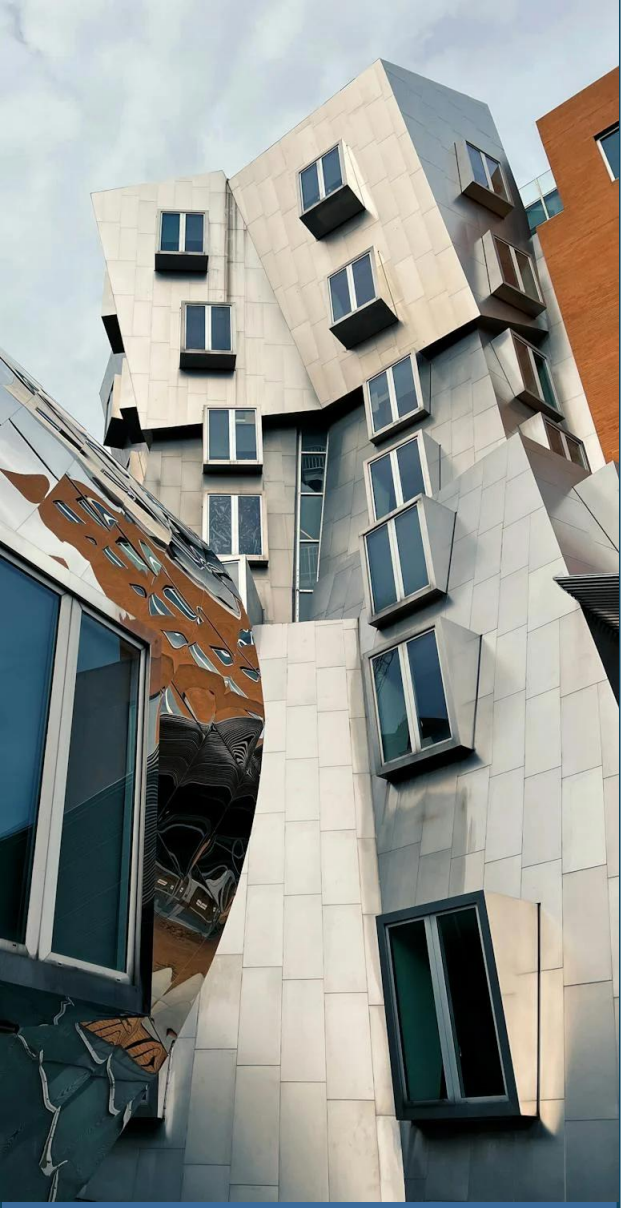
HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Case studies on University-Industry Collaboration

2. Cambridge Cluster (Silicon Fen) and the University of Cambridge

- The University of Cambridge has been instrumental in the development of the Cambridge Cluster, also known as Silicon Fen.
- The university's research excellence, combined with its proactive approach to technology transfer and start-up support, has helped establish the region as a leading center for high-tech industries *(Garnsey & Heffernan, 2005).*

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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Case studies on University-Industry Collaboration

3. MIT and the Boston Biotech Cluster

- The Massachusetts Institute of Technology (MIT) has significantly contributed to the growth of the Boston biotech cluster.
- Through its strong focus on life sciences research, technology transfer, and collaboration with industry, MIT has helped make the Boston area one of the leading biotech hubs in the world *(Powell, Koput, & Smith-Doerr, 1996)*.

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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Case studies on University-Industry Collaboration

4. RWTH Aachen University and the Aachen Cluster

- RWTH Aachen University in Germany has played a crucial role in the development of the Aachen industrial cluster.
- The university's emphasis on applied research, close collaboration with industry, and involvement in regional innovation networks have made it a key player in the region's economic development *(Foray, 2014).*

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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

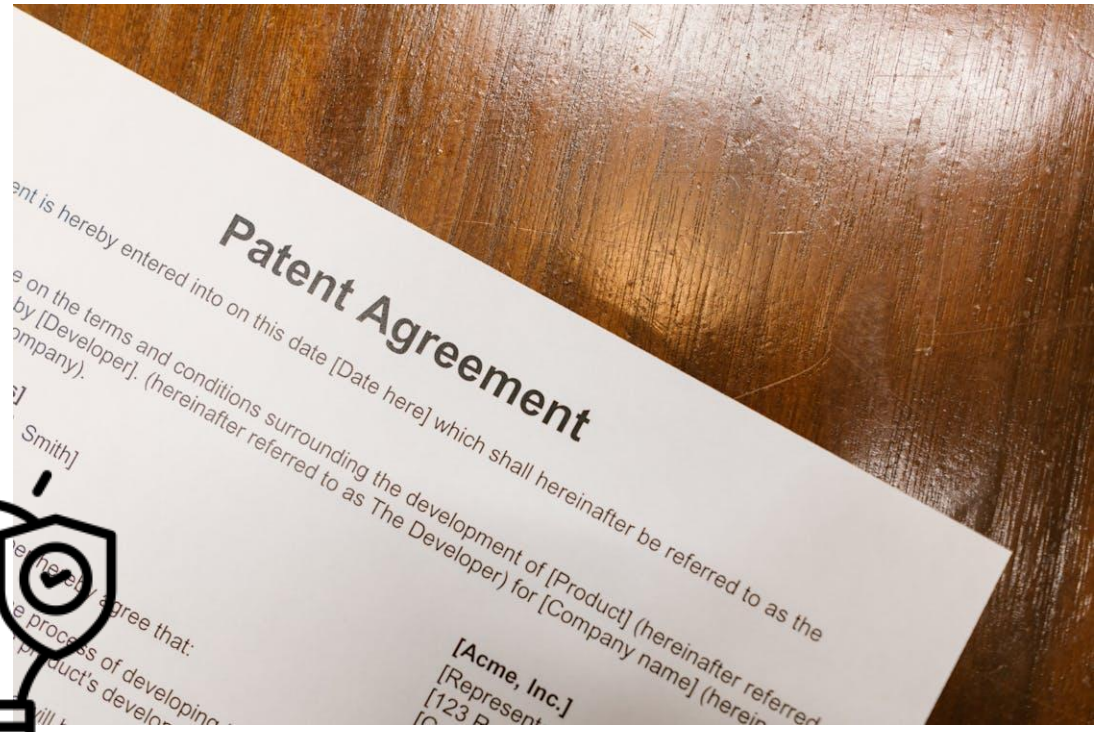
Despite the significant contributions that universities can make to cluster development, several challenges and barriers must be addressed to enhance their effectiveness.

→ One of the key issues is the institutional and cultural divide between universities and industry, as they often operate under different priorities and timelines, making it essential to bridge these gaps for effective collaboration.

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HOW CAN UNIVERSITIES BETTER SUPPORT THE GROWTH OF INDUSTRIAL CLUSTERS

Intellectual property (IP) management is another contentious issue in these collaborations, necessitating clear agreements and frameworks to ensure that both parties benefit equitably from the commercialization of research.



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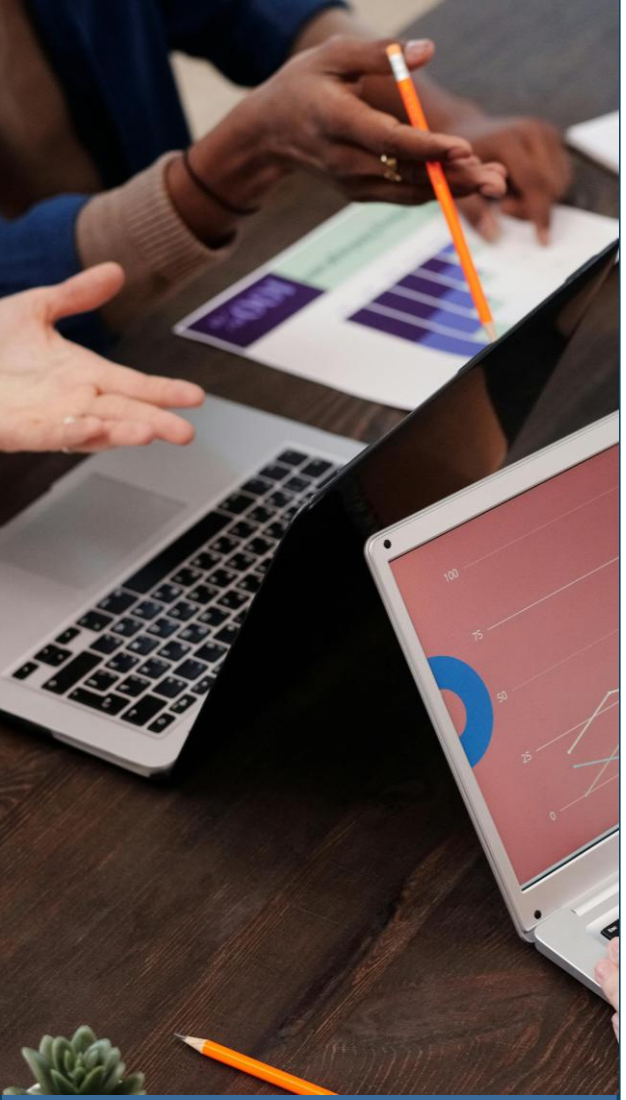
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TEST BEDS & LIVING LABS

Definition

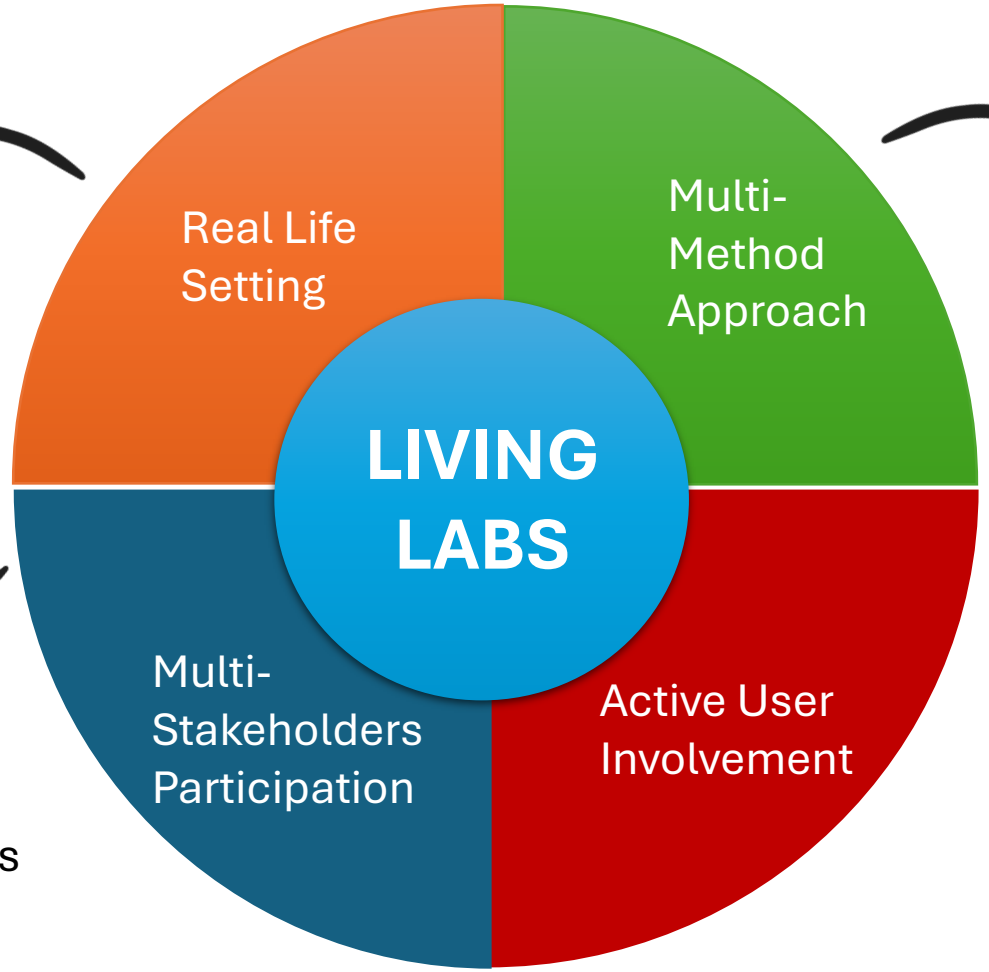
A living lab is a **user-centered, open-innovation ecosystem that brings together research and innovation processes within a public-private-people partnership**, emphasizing co-creation and real-life experimentation.

In these environments, **users actively engage** in the development process, ensuring that the outcomes are both innovative and aligned with societal needs.

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TEST BEDS & LIVING LABS

TRANSLATE
Needs/Priorities
Opportunities/Challenges



IDEATE & EXPLORE
Technological-Social Industrial Innovations

DEFINE & EXCHANGE KNOWLEDGE
Eco Solutions
Capacity Building
Adaptive & Transformative Management
Strategies/Policy Recommendations

ANALYZE & CO-CREATE
Socio-Economics
Future Scenarios & Transition Pathways

RiHEI

TEST BEDS & LIVING LABS

Originating in the early 2000s through initiatives by the European Union and global entities, the living lab concept was developed to enhance innovation by creating spaces where stakeholders could collaborate, iterate, and develop solutions in real-world contexts.

Key characteristics of living labs include:

→ active user involvement
→ research conducted in real-life settings
→ participation from multiple stakeholders—such as academia, industry, government, and citizens
→ collaborative development of solutions through iterative prototyping and testing

(Almirall & Wareham, 2018; Leminen & Westerlund, 2017)

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TEST BEDS & LIVING LABS

Living Labs vs. Traditional Research Environments

Living labs differ significantly from traditional research environments, which typically operate in controlled, isolated settings and follow a linear process where solutions are developed based on hypotheses and tested later in real-world scenarios.

In contrast, living labs are dynamic and iterative, enabling experimentation and testing to occur simultaneously within the actual environment where the solutions will be applied.



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TEST BEDS & LIVING LABS

Living Labs vs. Traditional Research Environments

This approach offers several key advantages over traditional research:

- **enhanced relevance**
- **accelerated innovation**
- **stronger user engagement**

Users who are involved in the development process are more likely to adopt and support the resulting innovations *(Schuurman & De Marez, 2015; Bergvall-Kåreborn & Ståhlbröst, 2018)*.



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TEST BEDS & LIVING LABS

Examples of Living Labs Around the World

Several living labs around the world have demonstrated the power of this approach to innovation. Some notable examples include:

1. The European Network of Living Labs (ENoLL)

A network of living labs across Europe that focuses on various areas of innovation, including smart cities, healthcare, and energy.

https://enoll.org/

European Network of Living Labs



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TEST BEDS & LIVING LABS

Examples of Living Labs Around the World

2. MIT Media Lab's Living Labs

Focused on exploring the intersections of technology, design, and everyday life, MIT's living labs have been at the forefront of innovative research in areas such as urban planning and digital technology.

A goal of the Living Labs program is to forge a "New Deal on Data," a framework for data ownership and usage that will balance the needs of companies, governments, and individuals.

https://www.media.mit.edu/groups/living-labs/overview/



TEST BEDS & LIVING LABS

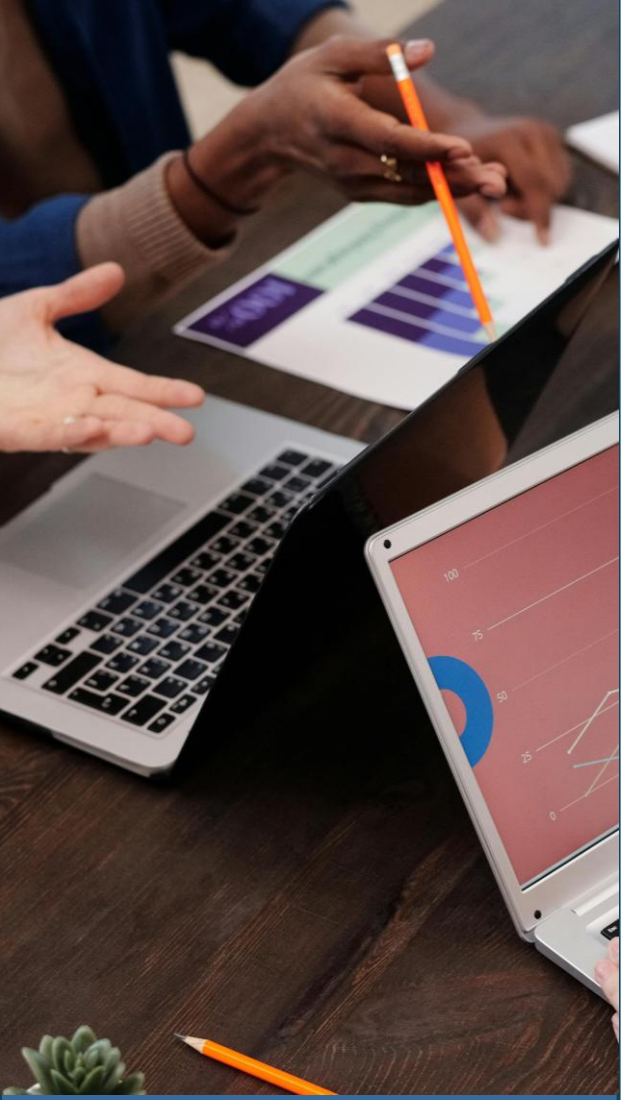
Examples of Living Labs Around the World

3. Helsinki’s Smart City Living Lab

Part of the larger effort to transform Helsinki into a smart city, this living lab focuses on developing and testing smart city solutions in collaboration with residents, businesses, and public institutions.



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TEST BEDS & LIVING LABS

How Can Universities Set Up Living Labs?

The initial phase of establishing a living lab within a university involves clearly **defining its objectives and goals**, ensuring alignment with the university's broader research agenda while addressing areas of both academic interest and societal need.

This process requires identifying specific challenges or opportunities the lab will tackle, such as:

- Sustainability
- Healthcare
- Digital innovation
- Urban planning

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TEST BEDS & LIVING LABS

How Can Universities Set Up Living Labs?

- Engaging with potential stakeholders—including faculty, students, industry partners, and the community—is crucial for gathering input and building support.

- Setting **measurable goals**, such as developing new technologies, creating educational opportunities, or addressing community challenges, is essential for guiding the lab's activities and ensuring its relevance and impact *(Schuurman & De Marez, 2015)*.



TEST BEDS & LIVING LABS

How Can Universities Set Up Living Labs?

Once the objectives are established → **designing the infrastructure of the living lab becomes the next critical step**.

- This design encompasses both physical and virtual elements tailored to the nature of the research and the needs of participants.

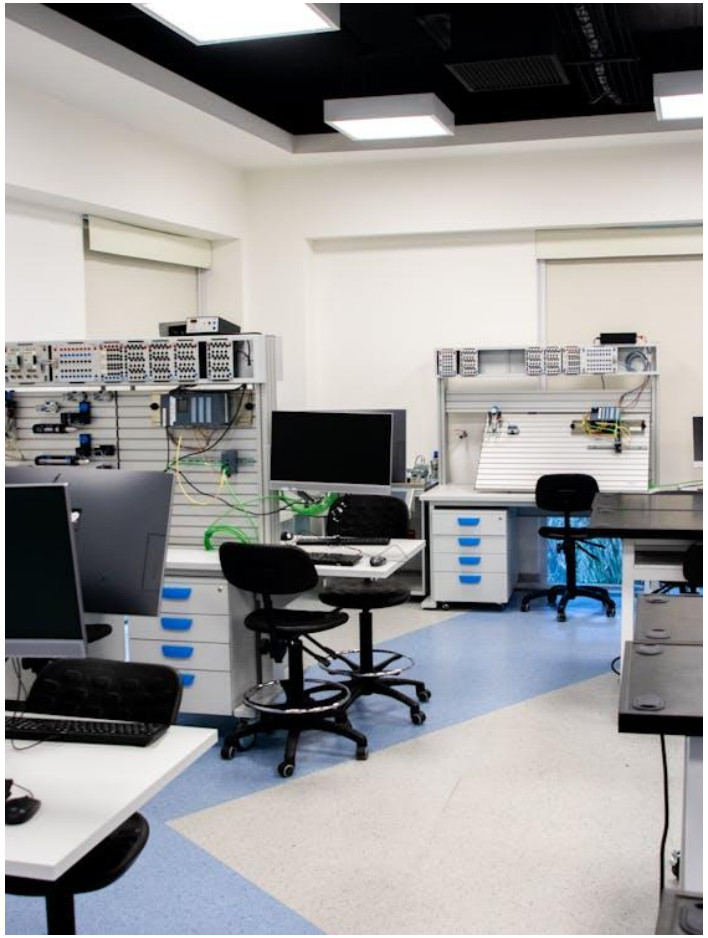
- The physical infrastructure might involve creating dedicated spaces like labs, workshops, or co-working areas within the university, designed to be flexible and adaptable for various research activities.

TEST BEDS & LIVING LABS

How Can Universities Set Up Living Labs?

- In the digital age, virtual components are equally important, including online platforms for collaboration, data sharing, and user interaction, which can extend the reach of the living lab by facilitating remote participation and broader dissemination of results.

- The lab should also be equipped with the necessary technology and tools, such as prototyping equipment, sensors, and data analytics tools, to support innovation *(Bergvall-Kåreborn & Ståhlbröst, 2018)*.



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TEST BEDS & LIVING LABS

How Can Universities Set Up Living Labs?

Additionally, **collaboration with other academic institutions** can enhance the lab's capabilities and broaden its impact. The role of multidisciplinary teams in these labs is crucial, as bringing together experts from various fields fosters a holistic approach to problem-solving and innovation.

To ensure long-term sustainability, universities must explore diverse funding sources, such as:

- government grants
- industry sponsorships
- private foundations
- internal university funding.

Developing a clear vision and strategy, building strong partnerships, focusing on user-centered design, and maintaining flexibility are all critical for overcoming challenges and securing the lab's future success *(Leminen & Westerlund, 2017).*

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TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs

Test beds serve as a cornerstone within living labs, providing a controlled environment where new technologies, processes, and innovations can be rigorously tested and refined before being deployed in real-world settings.

One of the primary functions of test beds in living labs is the testing and validation of new ideas. In a controlled environment, researchers can identify potential issues early in the development process and address them before scaling up.

In addition to testing and validation, test beds within living labs **facilitate rapid prototyping and iteration.** This environment enables researchers and developers to create prototypes, test them in near-real-world conditions, gather feedback, and then quickly iterate on their designs.

TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs

Another critical role of test beds in living labs is **data collection and analysis.**

Equipped with sensors and advanced data analytics tools, test beds can gather detailed information on the performance of new technologies or processes. This data is invaluable for researchers, as it provides insights that inform further development and refinement. This capability not only enhances the quality of the innovations developed but also ensures that they are grounded in empirical evidence *(Schuurman & De Marez, 2015).*



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TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs

- Test beds do not operate in isolation; **they are connected to real-world settings, user participation, and multi-stakeholder collaboration.** This interconnectedness is what sets living labs apart from more traditional research environments.

- By embedding test beds within a living lab, the entire innovation process becomes more holistic, with continuous feedback loops that involve users, industry partners, and other stakeholders. This approach increases the likelihood that the innovations developed will be successful when deployed in the real world *(Almirall & Wareham, 2018)*.

TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs

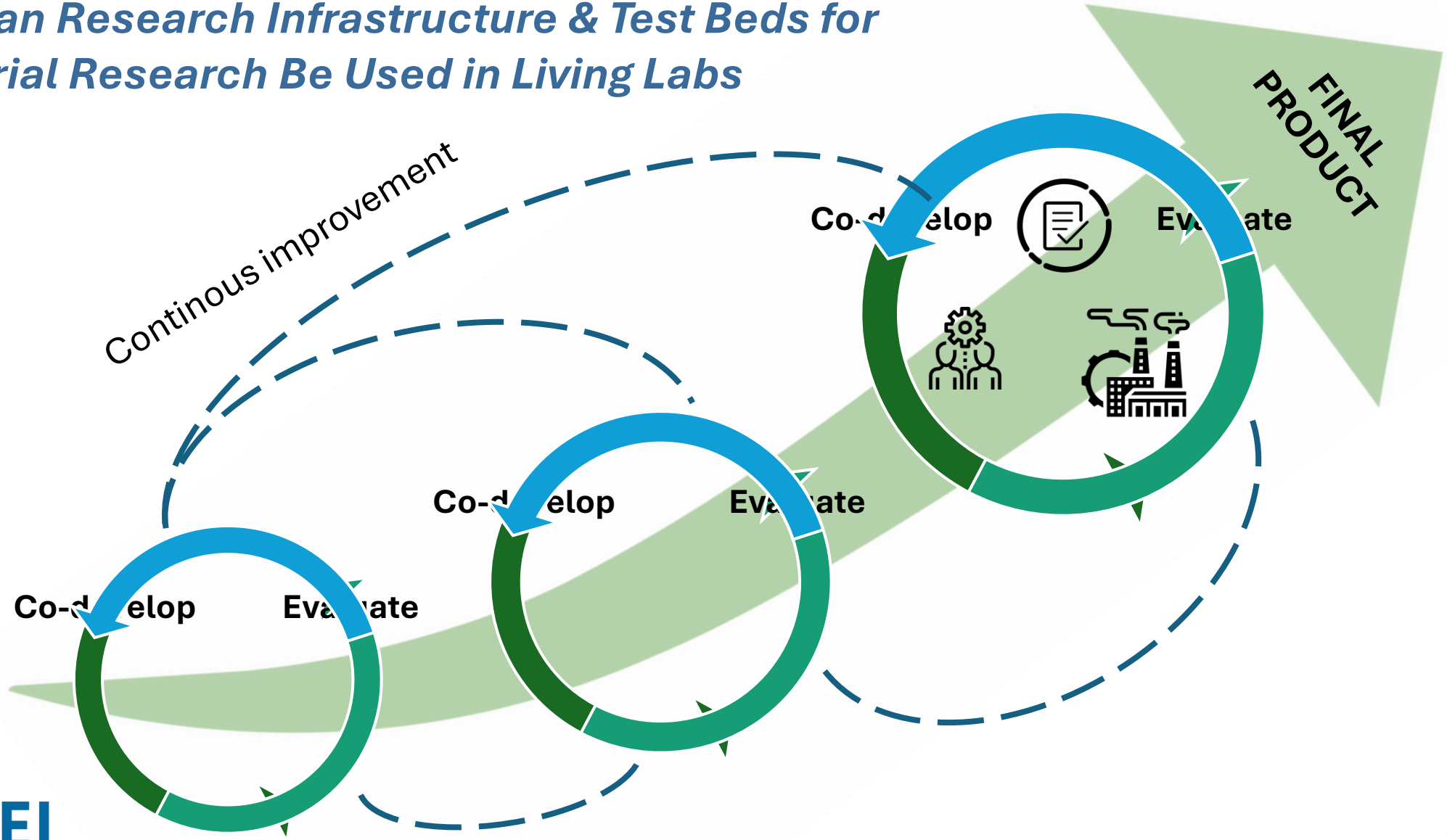
Industry involvement in living labs is particularly beneficial when it comes to addressing real-world challenges. Companies often have a deep understanding of the practical issues that need to be solved, which can help direct the focus of research in a living lab.

→ By working closely with industry, living labs can ensure that the solutions they develop are not only innovative but also have a clear path to market, increasing their impact and sustainability *(Bergvall-Kåreborn & Ståhlbröst, 2018)*.

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TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs



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TEST BEDS & LIVING LABS

How Can Research Infrastructure & Test Beds for Industrial Research Be Used in Living Labs

Integrating research infrastructure and test beds in living labs presents challenges, such as coordinating diverse stakeholders and balancing controlled testing with real-world relevance. When involving large industry partners or government agencies, differing priorities can complicate collaboration.

Strategies for Success:

1. Establish robust governance structures to manage stakeholder coordination.
2. Emphasize continuous feedback to maintain flexibility in living labs while ensuring rigorous testing.
3. Plan for scalability from the start, developing partnerships for real-world deployment to maximize innovation impact.



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CONCLUSION

- By offering detailed strategies and practical tools, the toolkit supports universities in enhancing their role as drivers of sustainable development. It underscores the importance of collaboration between academia, industry, government, and civil society, facilitated through innovative frameworks such as test beds and living labs.

- It emphasizes the need for universities to engage more deeply with external stakeholders, align their research agendas with regional and societal needs, and adopt responsible research and innovation practices.

- Ultimately, the toolkit aims to guide universities in their transformation into entrepreneurial and socially engaged institutions, capable of fostering economic growth, supporting industrial clusters, and contributing to the broader regional development goals in Georgia and beyond.



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