

INNOVATION ECOSYSTEM STRATEGY TOOL

**CENTER FOR RESPONSIBLE RESEARCH
AND INNOVATION – CeRRI**
AT FRAUNHOFER IAO

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**INCLUDING
SAMPLE
ANALYSIS
TEMPLATE!**

**CENTER FOR
RESPONSIBLE
RESEARCH AND
INNOVATION**
AT FRAUNHOFER IAO

Throughout our research, we develop new approaches and methods to guide technology development and innovation in a way that starts with and serves society. To us, collaboration and participation offer an opportunity to develop broadly accepted, sustainable solutions in close cooperation with stakeholders from all spheres of the innovation ecosystem. Embracing such collaborative innovation processes, we develop novel solutions for businesses, public clients, and local municipalities.

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FUTURE-PROOF INNOVATIONS NEED COLLABORATION

The stakes are high for research and innovation: Not only are they expected to ensure competitiveness among businesses but also to sustainably strengthen innovation at the national level and act upon some of society's most pressing challenges. The skills needed to **kick-start innovation** are scattered across sectors, ranging from science across industry, to politics and society itself. Increasingly, actors from different societal spheres are required to join forces in order **to fruitfully combine knowledge and resources** to develop and implement innovations which are not only technologically feasible but socially desirable as well.

By integrating diverse perspectives, novel, creative and hitherto disregarded solutions which are **more closely aligned** with the specific target group's needs can be developed. Consequently, their potential for realization and implementation grows exponentially.

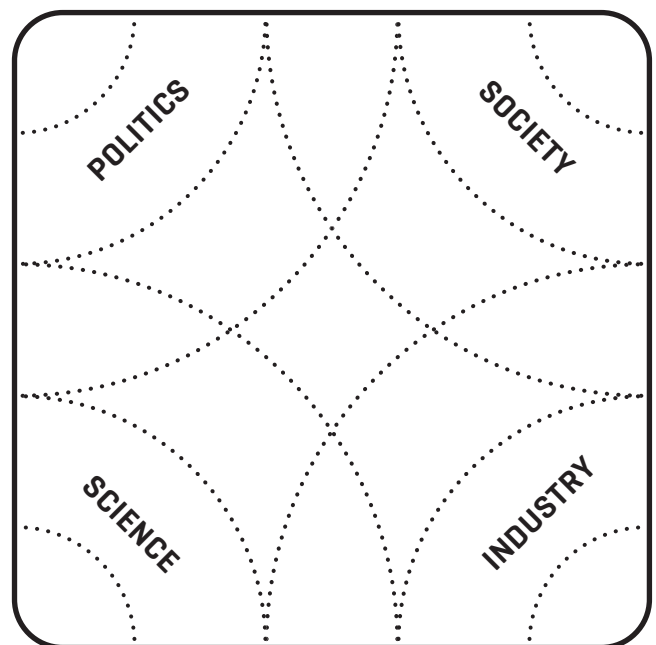
What is more, ecosystem actors themselves **profit immensely**: They take up innovation impulses, tap into technological as well as societal trends and potential. Our research shows: Organizations working collaboratively show a better understanding of future trends, are able to adapt their respective structures and business models more easily and are one step ahead in terms of attracting young professionals.

KNOWLEDGE IS EVERYWHERE

As both innovation research and practice have repeatedly shown, the knowledge to successfully leverage innovation is not held by science and industry alone. Quite the contrary, representatives from politics and the wider society bring important knowledge and competencies to the table: They are experts on societal values and needs or governmental standards and regulation concerning novel technologies.

This decentralized way of producing knowledge **fundamentally changes the distribution of roles and tasks throughout innovation processes**. For actors from politics and society, this implies taking on a more active role in innovation moving forward. Equally, science and industry are required to re-evaluate and re-define established roles.

ECOSYSTEM MAP



Against this background, the ecosystem map graphically lays out those sectors and societal sub-systems that need to be considered for the development of future-proof innovations. The tool nudges its users to not only reflect upon the roles of individual ecosystem actors but locate them within the different sectors of **science, industry, politics and society** instead.

DESIGNING COLLABORATION IN INNOVATION ECOSYSTEMS

Whereas the positive impact of collaborative innovation processes on the quality of their respective outcome is clearly evident, their practical implementation often proves challenging.

To allow for fruitful collaboration among diverse actors, some key questions must be answered:

- How is the shared innovation goal defined?
- What kind of function or role is taken on by each actor throughout the collaborative process?
- What kind of formats are being implemented to facilitate collaboration?
- Which kind of resources does each actor bring to the table [input]?
- What is the specific benefit each actor gains from collaboration [output]?

Every single one of the above-mentioned factors must be compatible with each of the innovation ecosystem actors' specific characteristics - yet, they must also be aligned on a system level.

INNOVATION ECOSYSTEMS ACCORDING TO CARAYANNIS AND CAMPBELL 2009 In an innovation ecosystem, people, culture and technology meet and interact to promote creativity, kick-start inventions and speed up innovation across scientific and technological disciplines in the public as well as the private sector. Principles of co-existence, co-evolution and co-specialization lie at the heart of any innovation ecosystem.

THE INNOVATION ECOSYSTEM STRATEGY TOOL

The Strategy Tool provides you with an initial basis for assessing your unique ecosystem. It allows you to **reflect upon** different actors engaged throughout the ecosystem, the roles they take on as well as the resources and benefits that are part and parcel of your collaborative innovation efforts. The **visualization** allows you to think through the design of the innovation ecosystem. Beyond that, it invites you to determine **future formats for collaboration** and strategically plan for the engagement of additional actors.

The tool is based upon up-to-date, scientific research on the allocation of roles in innovation ecosystems carried out by the Center for Responsible Research and Innovation.

The following pages offer a comprehensive outline of the roles as well as an exemplary case used to explain the function of the Innovation Ecosystem Strategy Tool. The inner part contains the analytical tool. Get to know your ecosystem! For a more in-depth analysis of potentials and a strategic advancement of your ecosystem, do not hesitate to get in touch!

ROLE OVERVIEW

1 THE COLLABORATION DESIGNERS

Who is providing the basis for multi-stakeholder collaboration?



1A

INTERACTION ENABLERS

Who is designing and moderating processes and formats for collaboration and exchange?



1B

GATEKEEPERS

Who is endowed with a network of critical contacts and resource access?



1C

STRATEGISTS

Who is developing/ determining the strategy to be pursued collectively across the ecosystem?



1D

ADMINISTRATORS

Who is taking on administrative tasks concerning the ecosystem as a whole?

4 THE KNOWLEDGE SUPPLIERS

Who is supplying specialized knowledge to the ecosystem?



4A

EXPERTS

Who supplies expert knowledge in response to concrete ecosystem questions and challenges?



4B

CONTEXTUALIZERS

Who is on top of the wider discourse and potential side issues relevant to the innovation ecosystem?



4C

PIONEERS

Who is introducing the most recent research insights and [technology] trends to the innovation ecosystem?



5A

TASK PROVIDERS

Who is defining the agenda and tasks to be tackled by the ecosystem?

7 THE IMPLEMENTERS

Who can implement the solution?



7A

DRIVERS

Who is claiming ownership to drive the project forward?



7B

DEVELOPERS

Who is translating ecosystem output into products or services?



7C

BUSINESS MODELLERS

Who is drafting a suitable business model for the solution?



8A

PROVIDERS

Who is providing the solution to the target group?

5 THE PILOTS

Who can ensure the innovation ecosystem's success?

8 THE DISTRIBUTORS

Who may distribute the solution?

Based on our empirical research, we identified 23 roles typically taken on by actors throughout collaborative innovation processes. These roles or functions may be performed by actors from different disciplinary, professional and sectoral backgrounds. Depending on the innovation context, for example, „Resource Suppliers“ may be political funding agencies, corporations or foundations. Individual actors may take on a number of different roles over time or simultaneously.

2 THE DONORS

Who is providing material resources to the ecosystem?



2A

RESOURCE SUPPLIERS

Who is supplying basic material resources to the innovation ecosystem?



2B

INVESTORS

Who is investing material resources into specific ecosystem activities?

3 THE KNOWLEDGE WORKERS

Who is closing the research gaps?



3A

KNOWLEDGE CREATORS

Who is conducting research to supply the ecosystem with specialized knowledge?



3B

QUALITY GUARDS

Who is evaluating/ guaranteeing quality and scientific standards throughout the innovation process?


innovation's relevance?



5B

NEEDS EXPERTS

Who ensures needs alignment?



5C

NAVIGATORS

Who is advising the ecosystem on [political, societal, economic or technological] implementation of solutions?

6 THE ATTRACTORS

Who is enabling interactions beyond the ecosystem?



6A

TRUST BUILDERS

Whose organizational form or reputation is helping the ecosystem's public image?



6B

OPERATIONALS

Who needs to be considered to ensure operational and acting capacity?

8 THE ENFORCERS

Who is translating solutions?



8B

ENFORCERS

Who is translating solutions into social innovations [legislation, strategies, guidelines etc.]?



8C

MULTIPLIERS

Who is advertising and promoting the solution?

9 THE CONSUMERS

Who is the innovation aimed at?



9A

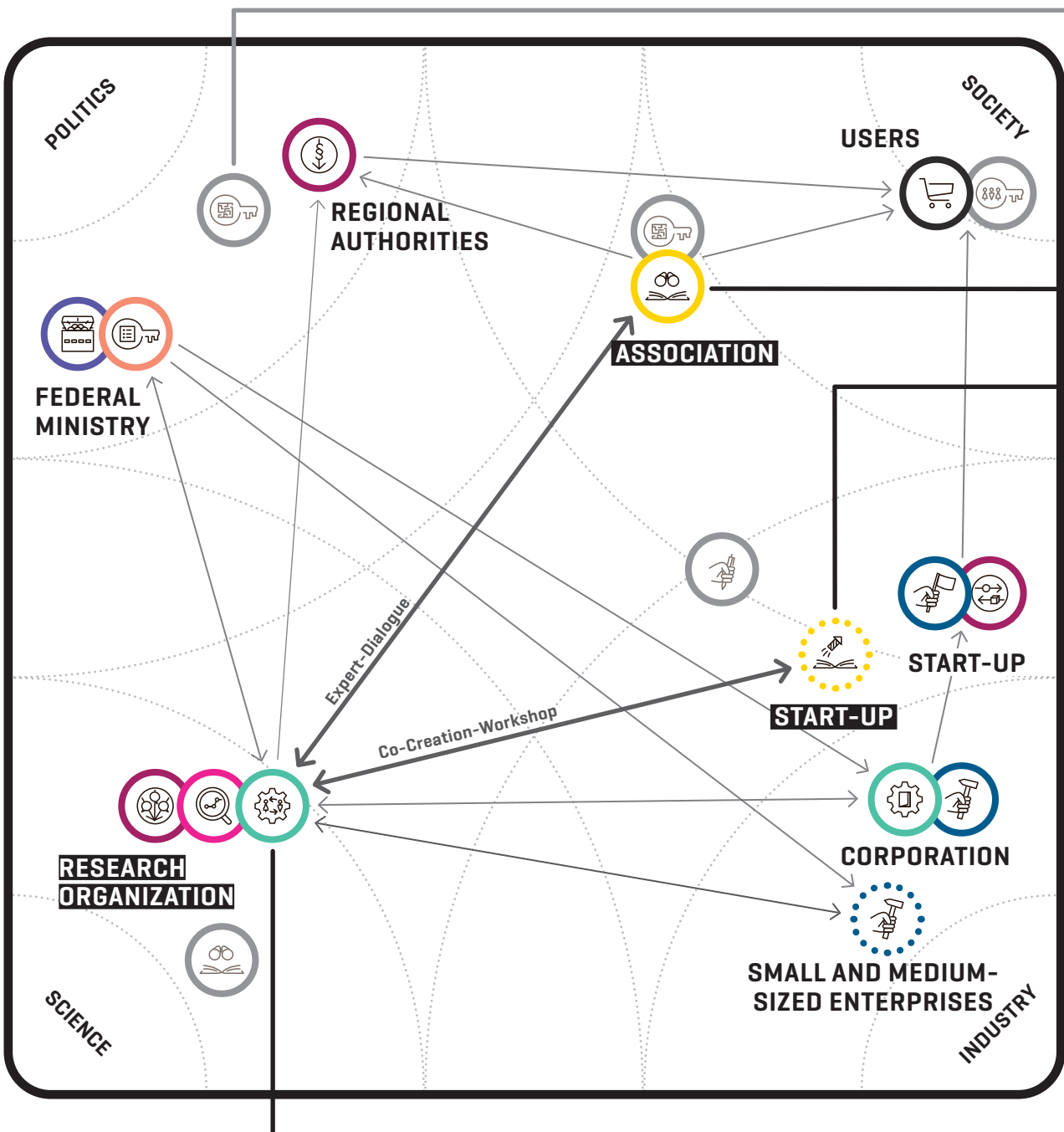
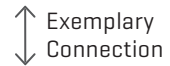
CONSUMERS

Who is the innovation target?

THE TOOL IN ACTION

In the following, the tool's implementation is illustrated by means of an exemplary innovation ecosystem with different actors collaborating on a fictional project.

ECOSYSTEM ANALYSIS Focusing on four actors, the analysis shows how said actors perform their respective roles as part of the ecosystem whilst collaborating with other actors. In doing so, opportunities and challenges of collaboration are exemplified and options for further ecosystem development are laid out.



CASE STUDY – PROJECT MOVE2025 To develop and implement a new ridesharing service operating on hydrogen-powered vehicles for the city, different actors' competencies need to be made accessible and fruitfully integrated throughout a collaborative innovation project. The ecosystem aims to introduce an innovative solution, including an appropriate and novel business model. To guarantee successful implementation, stakeholders are

keen to ensure social desirability and acceptance, consider all relevant actors' interests and support the process through complementing government regulations.

→| **The analytical depth that may be reached with the help of this tool can only be scratched here. The symbols signal where information was omitted for the sake of conciseness.**

MINISTRIES OR AGENCIES ON FEDERAL OR STATE LEVEL

ROLE The ecosystem is missing collaboration partners taking on the role of political Navigators 5c →|

INPUT AND OUTPUT Adoption of roles and responsibilities respectively must be promoted through an incentive model attractive to political actors. Input of resources on the one and benefits of outputs on the other hand need to be balanced.

SOCIAL INTEREST GROUP IN THE MOBILITY SECTOR

ROLE As Contextualizers 4b, members of the social interest group take part in an expert dialogue. →| Engaging the interest group as a Navigator 5c in the innovation ecosystem is a particularly promising path to enhance innovation capacity. →| As a Navigator 5c, it may advise the project on successful implementation. However, the ecosystem is currently lacking appropriate formats to continuously gather feedback and discuss interim results with the actors.

INPUT AND OUTPUT The actor is supplying know-how through an expert dialogue. →|

ESTABLISHED START-UP FOCUSED ON NEW MOBILITY SOLUTIONS

ROLE Start-up employees are invited to take part in a co-creation workshop as Pioneers 4c →|

INPUT AND OUTPUT The actor is envisioned to supply innovative solutions and know-how on recent technological developments to the ecosystem. Participating in the workshop implies an additional, personal expense for the actor. Still, the actor may profit from contacts established throughout the workshop. The collaboration's revenue model is clear to the actor, however, it is not tailored to its specific needs and motivations: For collaboration to succeed in the long term, the revenue model must be adapted to justify the substantial investments arranged by the start-up.

PUBLIC RESEARCH ORGANIZATION IN THE MOBILITY SECTOR

ROLE As an Interaction Enabler 1a, it designs collaboration in the ecosystem. It defines the design of innovation processes and advertises participation to relevant actors. Implementing goal-oriented methods and formats, it allows for the exchange of knowledge among actors. For this purpose, it supplies translation services to support communication between lay people and actors of different expertise, technical language and hierarchies. As a Knowledge Creator 3a, it then brings together that knowledge in the ecosystem, integrates it into its own research and through these means, leverages new insights. As a Multiplier 8c, it communicates insights and research results to funding institutions, advertises the ecosystem's cause and collaboratively developed solutions to both political and private actors and advises those on strategies for implementation in their own daily practices. The actor has access to any resources and competencies necessary to perform its different roles in the ecosystem successfully.

INPUT AND OUTPUT The actor supplies staffing and employees' know-how as well as contacts to relevant collaboration partners to the ecosystem. The actor profits off of the Resource Supplier's 3a funding, the collaboration partners' know-how, as well as reputational gains made possible by acting as a representative of the innovation ecosystem and its output and follow-up projects that might result from that. Individual employees may use the project and its impact to boost their personal reputation and qualification. The collaboration's revenue model is clearly defined: Resource input and benefits gained by the actor are balanced and oriented towards its needs and motivations.

INNOVATION ECOSYSTEM STRATEGY TOOL

This tool allows you to reflect upon your own innovation ecosystem and the kind of partnerships it functions on. You may use it to analyse current innovation projects, evaluate past collaborations and plan ahead.

1. INNOVATION PROJECT

- Think about a **concrete innovation project** that you are eager to implement with the help of the innovation ecosystem. Is it a product or service? Which kind of change is it that you want to bring about?
- Name and describe the project using the free space on the left!

2. TAKING STOCK

- With **which actors** (organizations, persons) do you collaborate to **realize the innovation project**?
→ Write down your innovation partner in the "ACTOR'S NAME" field.
Tip: Start with yourself ("YOUR NAME")! What is your role in the innovation process?
→ Assign an "ABBREVIATION" to each actor.
- Using the **role overview**, think about **which roles these actors are taking on** throughout the collaboration process.
→ Write down each role in the corresponding field. **Note:** An actor may take on more than one role.
- In the "INPUT/OUTPUT" field, note which kinds of resources each actor is providing to the innovation project and the benefits those actors are gaining from collaboration.

Exemplary Actor

CeRRI FRAUNHOFER IAO - CeRRI		
1A INTERACTION ENABLER	Know-how, Staffing, Infrastructure, Reputation, Network	Know-how, Money, Impact, Qualification
2A KNOWLEDGE CREATOR		

ABBREVIATION YOUR NAME

ROLE 1 <small>NUMBER, NAME</small>	INPUT	OUTPUT
ROLE 2 <small>NUMBER, NAME</small>		

ABBREVIATION YOUR NAME

ROLE 1 <small>NUMBER, NAME</small>	INPUT	OUTPUT
ROLE 2 <small>NUMBER, NAME</small>		

ABBREVIATION YOUR NAME

ROLE 1 <small>NUMBER, NAME</small>	INPUT	OUTPUT
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ABBREVIATION YOUR NAME

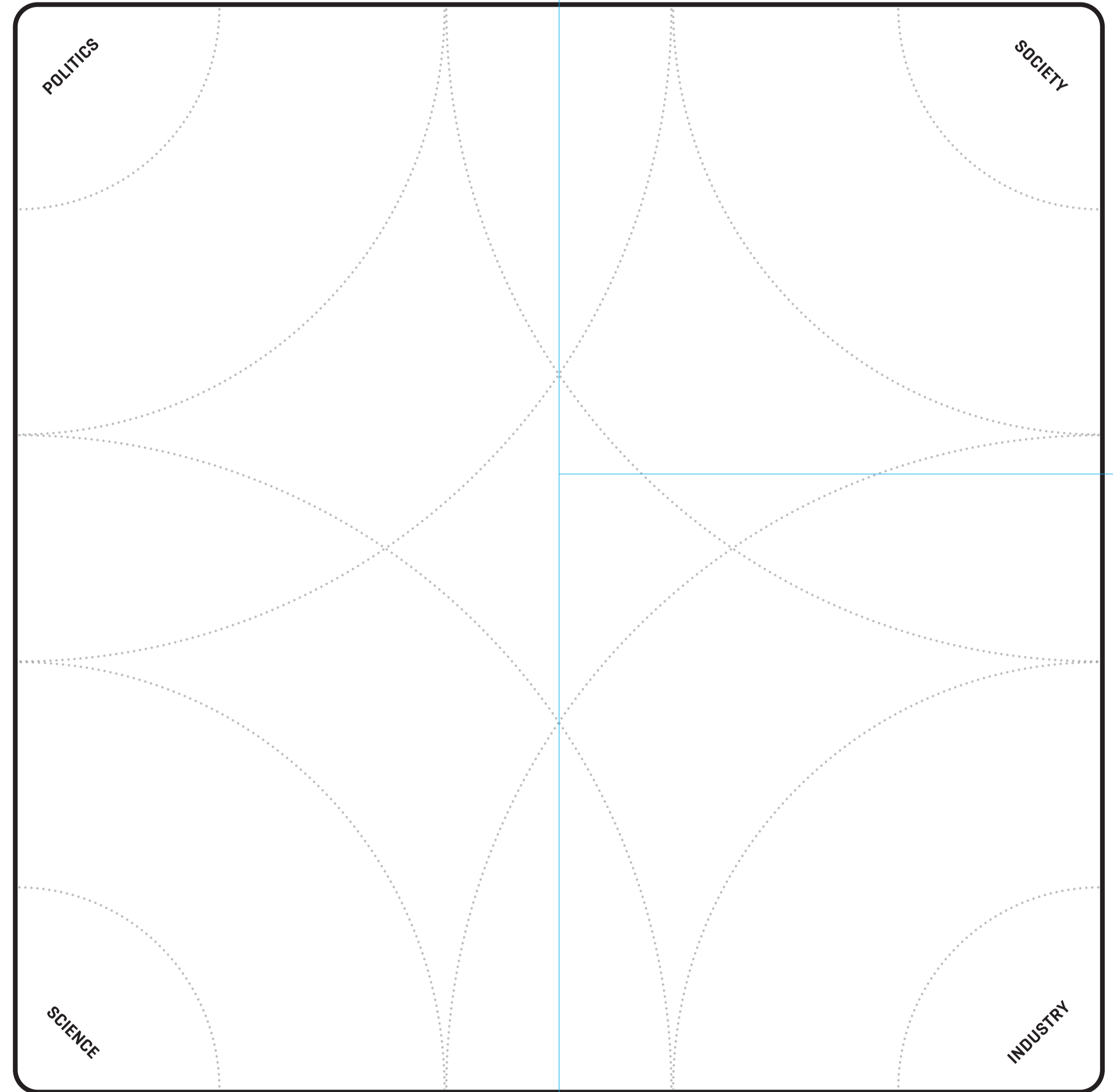
ROLE 1 <small>NUMBER, NAME</small>	INPUT	OUTPUT
ROLE 2 <small>NUMBER, NAME</small>		

ABBREVIATION YOUR NAME

ROLE 1 <small>NUMBER, NAME</small>	INPUT	OUTPUT
ROLE 2 <small>NUMBER, NAME</small>		

3. LOCALIZING STAKEHOLDERS

- **Localize each actor** in the ecosystem. Use the corners and the different sectors they indicate for orientation.
→ Copy the respective abbreviations to where the actor is located on the ecosystem map.
- Consider how exactly **actors are collaborating**.
→ If you are sure about their means of collaboration (e.g. through workshop participation) connect actors amongst each other with a line.
- Indicate the form of collaboration on the connecting line.



4. BROADENING THE ECOSYSTEM

- Take a look at the **role overview** and determine **which roles are missing in your ecosystem**. Which important competencies and resources cannot be supplied by your current innovation partners?
→ Whenever you identify a "MISSING ROLE", write it down in the designated field.
- Consider which persons and organizations would be suited to **take on the role** that is currently missing and make your ecosystem more efficient.
→ Refer to the list of "POTENTIAL ACTORS" for inspiration and note your ideas in the list provided on the right-hand side.
→ If possible, localize said roles in the ecosystem map.

POTENTIAL ACTORS

POLITICS Charitable Think Tanks, Ministries, Local Politics, Funding Agencies, Business Support Agencies

INDUSTRY Associations & Chambers, Start-Ups, Large Enterprises, Small and Medium Enterprises, Incubators, Hubs, Platforms, Investors, Industrial Promotion, Clusters & Networks

SCIENCE Applied Science, Basic Research, Universities, Departmental Research (Federal & State Level)

SOCIETY Interest Groups & Associations, Foundations, Press & Media, Citizens, NGOs, Libraries & Museums

ABBREVIATION MISSING ROLE

ABBREVIATION MISSING ROLE

ABBREVIATION MISSING ROLE

ABBREVIATION MISSING ROLE

ABBREVIATION MISSING ROLE

ABBREVIATION MISSING ROLE

5. ANALYZING HIDDEN POTENTIALS

- **BLIND SPOT** Which area of the ecosystem map has listed no or only few innovation partners? Which actors are active in said area? Which functions and roles respectively could they take on as part of the innovation ecosystem?
- **HIDDEN POTENTIAL** Which actors are currently not adding value to the innovation ecosystem? How and what could these actors contribute moving forward?
- **LACKING INCENTIVES** For which actors is there an imbalance of resources contributed and benefits received? What could motivate said actors to engage in collaboration efforts?
- **MISSING LINKS** Which actors lack a format to enable fruitful collaboration? Which formats might be suited to allow each actor to perform its function within the innovation ecosystem?