Collective Intelligence for Policy Design: A Theory of Change based Approach

Francesco Molinari, mail@francescomolinari.es

Porto, 9 May 2025

https://erafabric.eu/about/era-fabric-project



Funded by the European Union

Defining the field

- **Collective intelligence** in policy design and analysis refers to the enhanced problem-solving and decision-making capabilities that emerge from the collaboration of many individuals, often facilitated by technology.
 - This approach leverages diverse knowledge and perspectives to improve policy outcomes.
 - Its added value consists in the capacity of groups to collectively outperform individuals in cognitive tasks crucial for policymaking, such as problem-solving, innovation, prediction, and creativity.
 - This value is frequently amplified by the use of technological tools.
- The terms '**group intelligence**' and 'collective intelligence' are often used interchangeably in the literature.

Porto, 9 May 2025

Defining the challenge

- Identify the distinctive characteristics of a **new policy instrument** that should fulfil some recognised gaps in the current scenario of the ERA (European Research Area).
- More specifically:

"Develop and **test** a **networking framework** in support of Europe's **R&I ecosystems**, building on existing capacities, in order to **strengthen excellence** and maximise the value of **knowledge creation, circulation and use**".

[COM/2020/628/final. Online at: https://eur-lex.europa.eu/legalcontent/EN/TXT/?uri=COM%3A2020%3A628%3AFIN]

• A networking framework can be thought of as a structured system of relationships, connections, and interactions between diverse actors (individuals, organizations, institutions) aimed at facilitating collaboration, knowledge sharing, resource mobilization, and ultimately, the achievement of common goals.

Porto, 9 May 2025

Our interpretation of the challenge (1)



Map credit: Ricardo Mateis, ERA_FABRIC consortium

Our interpretation of the challenge (2)



Promote the valorisation of R&I results

within European economies and societies





Alternative development and testing models

• Waterfall



Images source: Pezzotta, G., Cavalieri, S., & Gaiardelli, P. (2012). A spiral process model to engineer a product service system: an explorative analysis through case studies. *CIRP Journal of Manufacturing Science and Technology*, *5*(3), 214-225.

• Iterative



Porto, 9 May 2025

Our chosen option: Theory of Change (ToC)

Improves the **Waterfall model** because:

- Requirements are generic / indetermined / impossible to assess
- Design results cannot be superimposed without any discussion with stakeholders / beneficiaries
- Testing is difficult (resembles more a proof of concept)

Improves the **Iterative mode**l because:

- There is no time / space for multiple prototypes
- Despite its cyclical nature, development and testing are still linear (at each cycle)
- Objectives (aka the policy challenge) are possibly the only stable thing in this scenario

Porto, 9 May 2025

How was it structured

- A ToC can be defined as a comprehensive and systematically structured depiction of how and why a desired change is expected to happen in a particular context.
 - It outlines the causal linkages between some ultimate goals or impacts, a number of intermediate outcomes, and a set of activities that are expected to generate those.
 - It's a sort of "reverse engineering exercise".
- Our ToC refers to the (expected) change that the adoption of the new policy framework should bring to the AS-IS scenario of R&I at the regional and national levels in the EU, and to the implications of such a change for future ERA policy.
 - Elements of such a change were provided by the EC document quoted above (and the Horizon Europe call we took part in).
 - The ToC can be visualised as follows.

Porto, 9 May 2025

The (so-called) ERA_Hub ToC

"Maximise the value of knowledge"	 Facilitate dynamic knowledge exchange between sectors, regions, and countries, allowing innovations to spread and develop. 	Increase R&I impacts, particularly at local level	The ERA becomes
			more
"Strengthen excellence" (of EU R&I)	 Provide spaces for collaboration where diverse actors (researchers, industry, policymakers) co- create solutions and align on common goals. 	Reduce fragmentation of EU regional ecosystems	integrated and able
,			to valorise
"Build on existing capacities"	 Equip regions with frameworks and tools to develop, adapt, and align policies with broader European Research Area objectives. 	Resolve inconsistencies of regional R&I policies	R&I results
DIMENSIONS	FUNCTIONS	OUTCOMES	IMPACTS
Porto, 9 May 2025	Francesco Molinari		9

Picture credit: The Author, ERA_FABRIC consortium

So far, so good with development...

... now, what about testing?



Original drawing by David DePatie and Friz Freleng

Porto, 9 May 2025

The problem of attribution

- This approach contains a tautology, or a conundrum: it posits that the dimensions of the ERA_Hub (= networking framework) concept are those three and not others.
- Also for that reason, but in fact because of the irrepeatable nature of socio-economic change, it misses the possibilities offered by a **counterfactual analysis**, comparing the change effects induced by different versions of the concept, within identical or analogue testing conditions / environments.
- This leaves the questions "what works (or worked), for whom, and why" practically unattended.

Porto, 9 May 2025

Adopted solution: Contribution Analysis

- An alternative approach to counterfactual analysis, aimed at constructing a plausible 'contribution story' that explains the contribution of a project, intervention or programme to its expected and/or identified outcomes and impacts.
- It is based on six steps, described in the following slides, which require the involvement of **as many domain experts as possible** (=group intelligence).
- CA allows assessing causal questions and inferring causality in interventions by putting all their steps along a causal chain – or 'contribution story' – that links actions and events to outcomes.

In theory...

- 1. Set out the attribution problem
- 2. Update the initial ToC
- 3. Explore and discuss alternative outcome and impact generation mechanisms
- 4. Build the Contribution Story
- 5. Seek out additional evidence
- 6. Revise and strengthen the Contribution Story

In practice...



- 1. Set out the attribution problem
- 2. Update the initial ToC
- 3. Explore and discuss alternative outcome and impact generation mechanisms
- 4. Build the Contribution Story
- 5. Seek out additional evidence
- 6. Revise and strengthen the Contribution Story

Results 1/3 (beta)

"Maximise the value of knowledge" Contribution Story

FUNCTION

Knowledge Ecosystems:

"Dynamic networks of interactions among various entities, such as firms, research institutions, and individuals, that facilitate the creation, sharing, and utilization of knowledge"



By definition, these networks (hubs) should cut across the Porto, 9 May 2025 country borders!

Picture credit: The Author, ERA FABRIC consortium

Grasping the benefits of knowledge creation, sharing, diffusion, absorption, transformation and valorisation in different ways, because of:

Facilitate dynamic knowledge exchange

between sectors, regions, and countries,

allowing innovations to spread and develop.

- New public policies / regulatory changes in the same vertical domain or cutting across different vertical domains, or new alliances of different regions within the same country or between different countries, or
- · External shocks (e.g. on price/availability of natural resources), or
- New business strategies in the same vertical domain or cutting across different vertical domains, or
- New market needs/demands ←TRIGGERS
- New inventions/innovations rancesco Molinari

How By gathering and organising the users and producers of knowledge. orchestrate their interaction, and create market and societal value through delivering the best possible products and services.

Increase R&I impacts.

particularly at local level



OUTCOME

associated to the conception. design, implementation and evaluation phases.

Many known

risks can be

The ERA becomes more integrated and able to valorise R&I results

Results 2/3 (beta)

"Strengthen excellence" (of EU R&I) Contribution Story

Platform as in the EC jargon: (hub) meaning

the EC jargon: (hub) meaning a policy makers' community! See examples:

Multi-Stakeholder Platforms:

"Quadruple Helix stakeholders who come together in a seamless and uninterrupted discussion and deliberation on strategic priorities, actions and results evaluation"

- EU Knowledge Valorisation Platform
- European Circular Stakeholder Platform
- Zero Pollution Stakeholder Platform
- EU Forest and Forestry Stakeholder Platform
- Accelerating Clinical Trials EU MS Platform
- Mission Soil Platform, etc.
- Provide spaces for collaboration where diverse actors (researchers, industry, policymakers) co-create solutions and align on common goals.

Stakeholder discussions and deliberations create new pathways for policy innovation, triggered by the same events (or combinations thereof) as the hubs as knowledge ecosystems, such as

- New public policies / regulatory changes, or
- New alliances of different regions, or
- External shocks, or
- New business strategies, or
- New inventions/innovationsrancesco Molinari



 Notably, convergence is not only achieved at the level of R&I policies but also and more importantly
 in translating policies at the implementation level, thanks to the engagement of QH stakeholders in the co-creation of sustainable pathways to convergence. The ERA becomes ⇒ more integrated and able to valorise R&I results

Picture credit: The Author, ERA_FABRIC consortium

Results 3/3 (beta)

"Build on existing capacities" Contribution Story



Discussion: role played by CI

Idea crowdsourcing

 Harnessing the knowledge and experience of regional and academic stakeholders (the members of the ERA_Fabric consortium) who sit closest to the battlefield (where the framework should serve) and were mandated (by the project's work plan) to engage other local stakeholders in dedicated workshops.

Sense making exercise

 As a way of implementing the iterative development and testing model, the framework was more and more clearly defined while deepening its understanding by the engaged practitioners, who could also contribute with a revision of the initially stated policy challenge and/or ERA_Hub solution features

Conclusions and next steps

Implementation wise:

- We are now transitioning between Step 5 and Step 6 (based on a stakeholder survey and interviews)
- However, the three emerging dimensions were already presented publicly and successfully in September 2024 at an ERA conference in Brussels
- Curiously, the new Commission proposal (February 2025) for a Council Recommendation on the ERA leaves the topic completely unattended.

Methodology wise:

- The previous narrative confirms the viability and fertility of the chosen approach (based on a combination of ToC+CA+CI) with group intelligence helping reduce the level of arbitrariness of expert auditing and assessment that is implicit in both ToC and CA
- Limitations include the lack of operational details on how to structure the three dimensions. This may be the aim of a follow-up project.

Thanks for your attention 🙂

Francesco Molinari mail@francescomolinari.es



Original drawing by Ro Marcenaro for Servizi di Segreteria

https://erafabric.eu/about/era-fabric-project/



Funded by the



European Union

The opinions expressed in this presentation are solely of the author and do not engage any EU institution or agency.

Porto, 9 May 2025

Disclaimer:

Francesco Molinari

20