



Faculty of Design

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Systemic Relational Insights: A new hybrid intelligence approach to make sense of complex problems

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Systemic Relational Insights

**A new community-AI hybrid
intelligence approach to make sense
of complex problems**

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ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA
CORSO DI LAUREA IN DESIGN
DEL PRODOTTO INDUSTRIALE

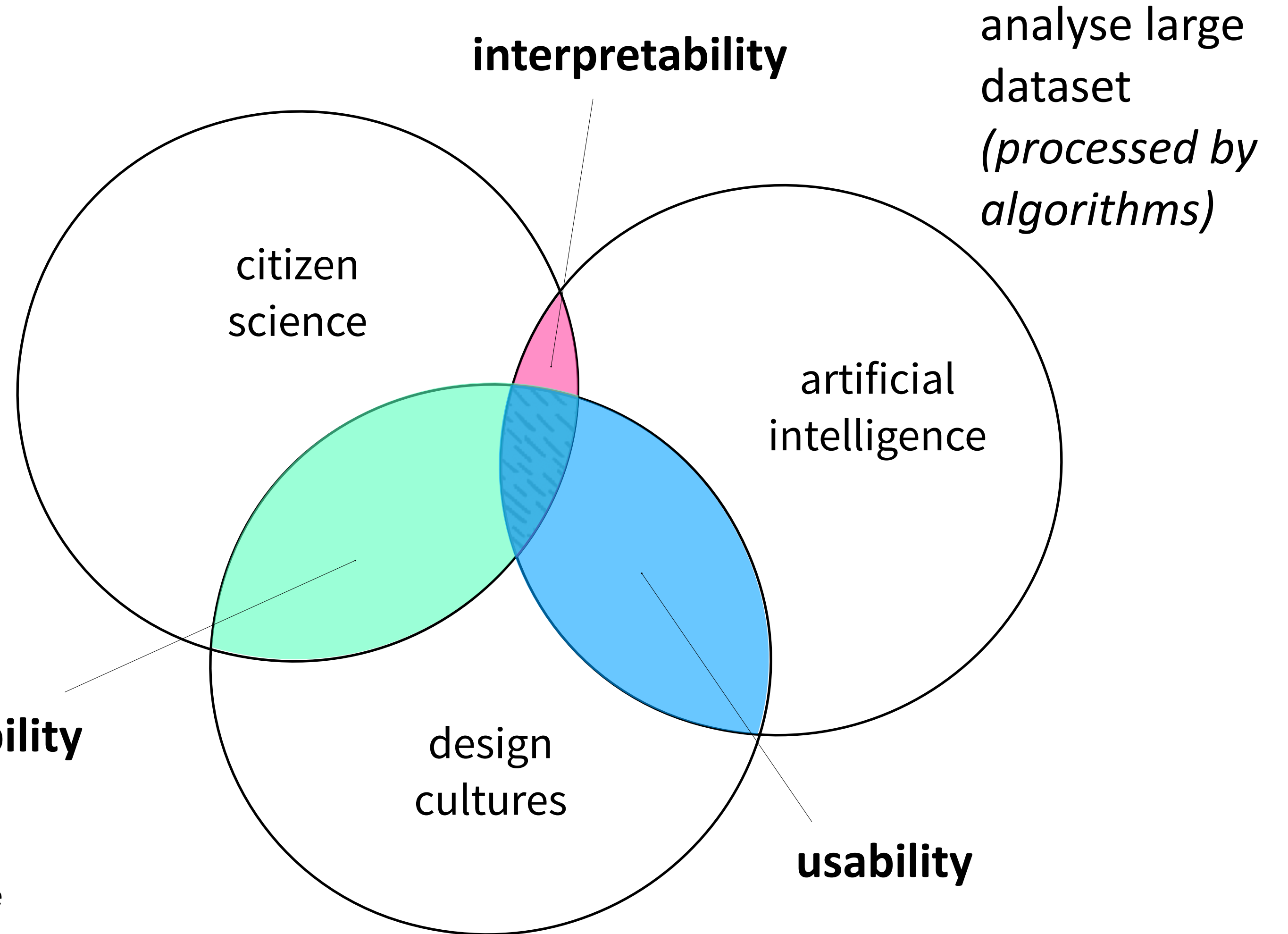


Advanced
Design



Data and knowledge-driven relations as interpretation tool

citizens as sensors
collecting data,
(processed by researchers)



My doctoral research had to deal with investigating the design of citizen science processes. It therefore tended to be exploratory, at least in its first phase, before becoming more practically design-oriented.

The perspective that was most congenial to me and that I found most interesting was that of investigating the aspects relating to digital technologies and artificial intelligence.

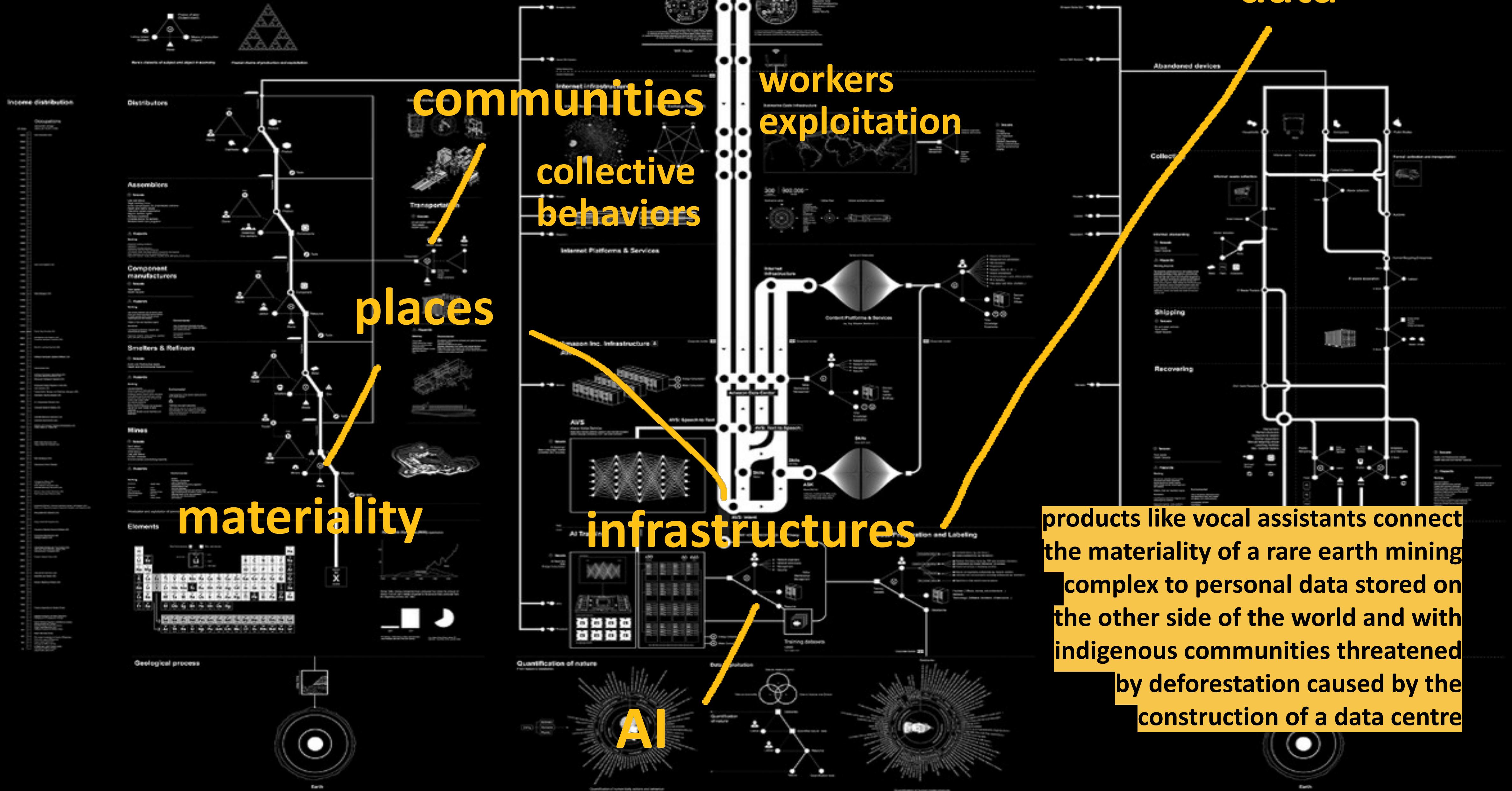
Most of all, I found particularly stimulating the fact that at the intersection of these disciplines there are different models of interaction with data and technology. So, a lot of complexity entered in the room....

collect data by people and systems
(processed by the designer)

**Design for the real world,
but which 'world'?, what 'design'?, what 'real'?**
Out of the studio and into the flow of socio-natural life
Elements for the cultural studies of design
The ontological reorientation of design
**In the background of our culture: rationalism, ontological
dualism, and relationality**
Outline of ontological design
Designs for the pluriverse
Design for transitions
**Autonomous design and the politics of relationality and the
communal**

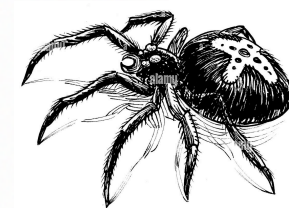
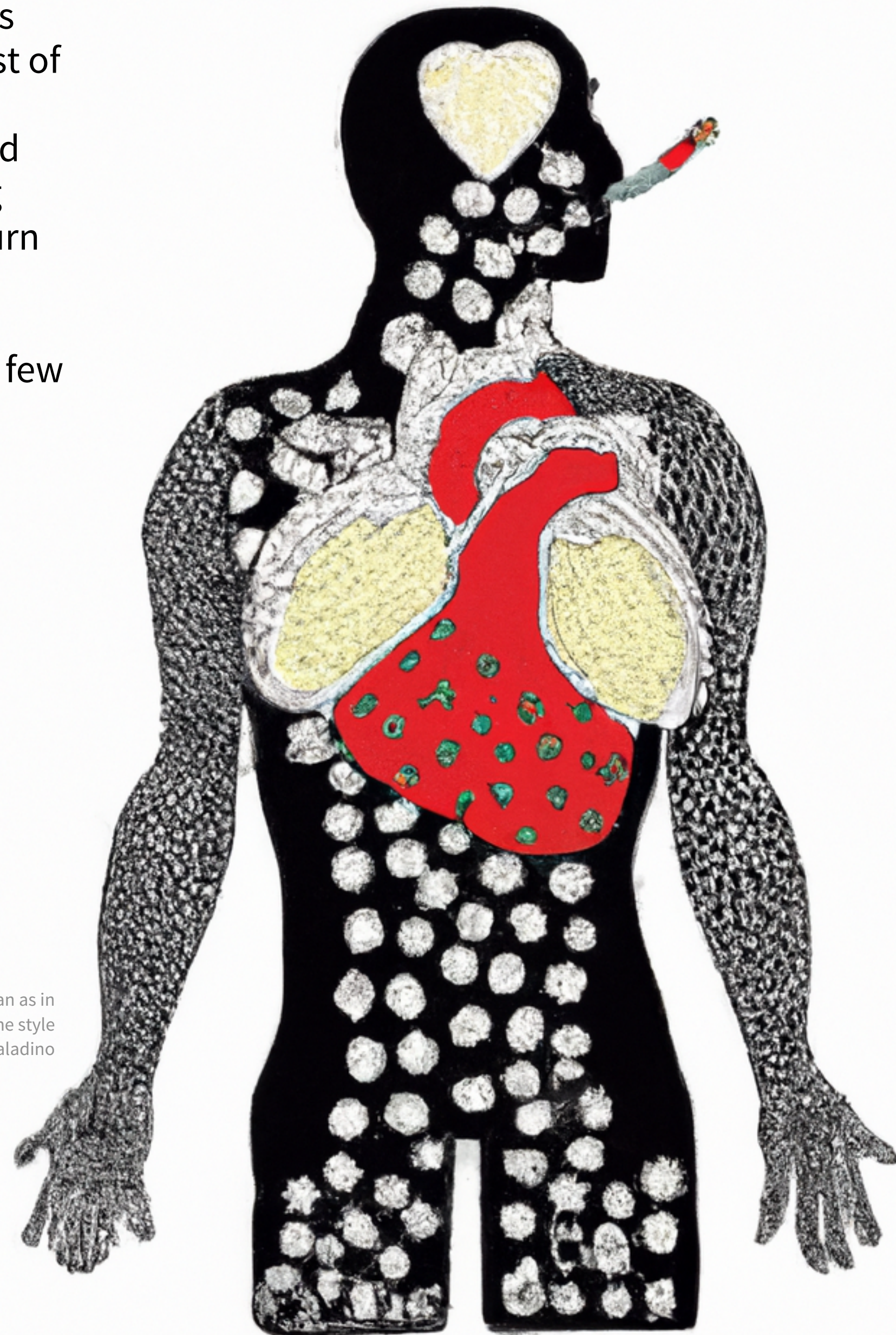
Anatomy of an AI system

An anatomical case study of the Amazon echo as a artificial intelligence system made of human labor



So this idea of interconnectedness really started to be the protagonist of my exploration.

As you know, many disciplines and movements faced this fascinating ideas that has inspired the new turn of my research, like Cybenetics, Relationality-Oriented systems, Posthumanism, just to mention a few



the sight of the spider triggers sensations, such as the acceleration of the heartbeat, that increases the rate of breathing. Everything's interconnected.

Cybenetics

Relationality-Oriented systems

Posthumanism

DALL·E 2022-10-12 21.55.04 - black and white figure of man as in ancient anatomy drawings, with colored heart and lungs in the style of Mimmo Paladino

“Relationality-oriented system science is a new research field where we try to understand and grasp systems as substance in which human, **tangible and intangible artifacts are interdependent and function together.**”

The view of such relationality-oriented system can be applied for all systems in which humans are concerned and involved.”

System thinking

system are networks of interactions between actors and elements entangled in multiplicity of relations

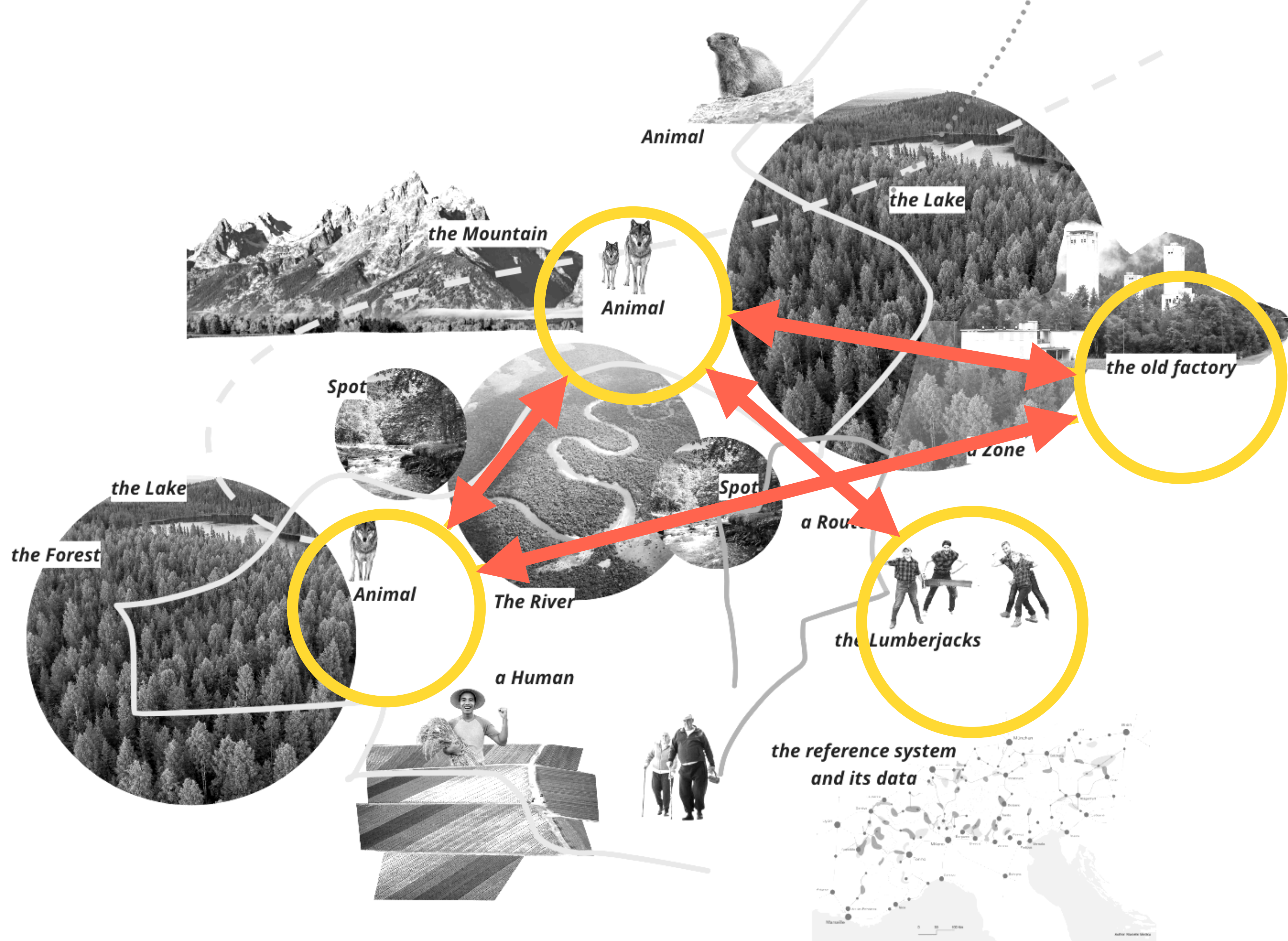


Nodes vs edges

let's move weights onto edges

The inquiry techniques we are all accustomed to, are based on static classifications justified by the fact that demographic and ethnographic data are often the only available tools, and are the type of information on which the social sciences have elaborated the most.

So, we use to favour nodes over edges of the network of actors we study, missing a lot of informations and the opportunity to integrate new perspective to inform the design process



**how to design new forms of
representation of the interactions
between the environment,
communities and world knowledge
to help solving complex problems?**

4 perspective pillars



A Systemic (and
Advanced*
Design)perspective



Local to global to future
scenarios



Science, traditional
knowledge and
heterogeneous
sources of information



A shift toward
relationality (nodes vs
edges)

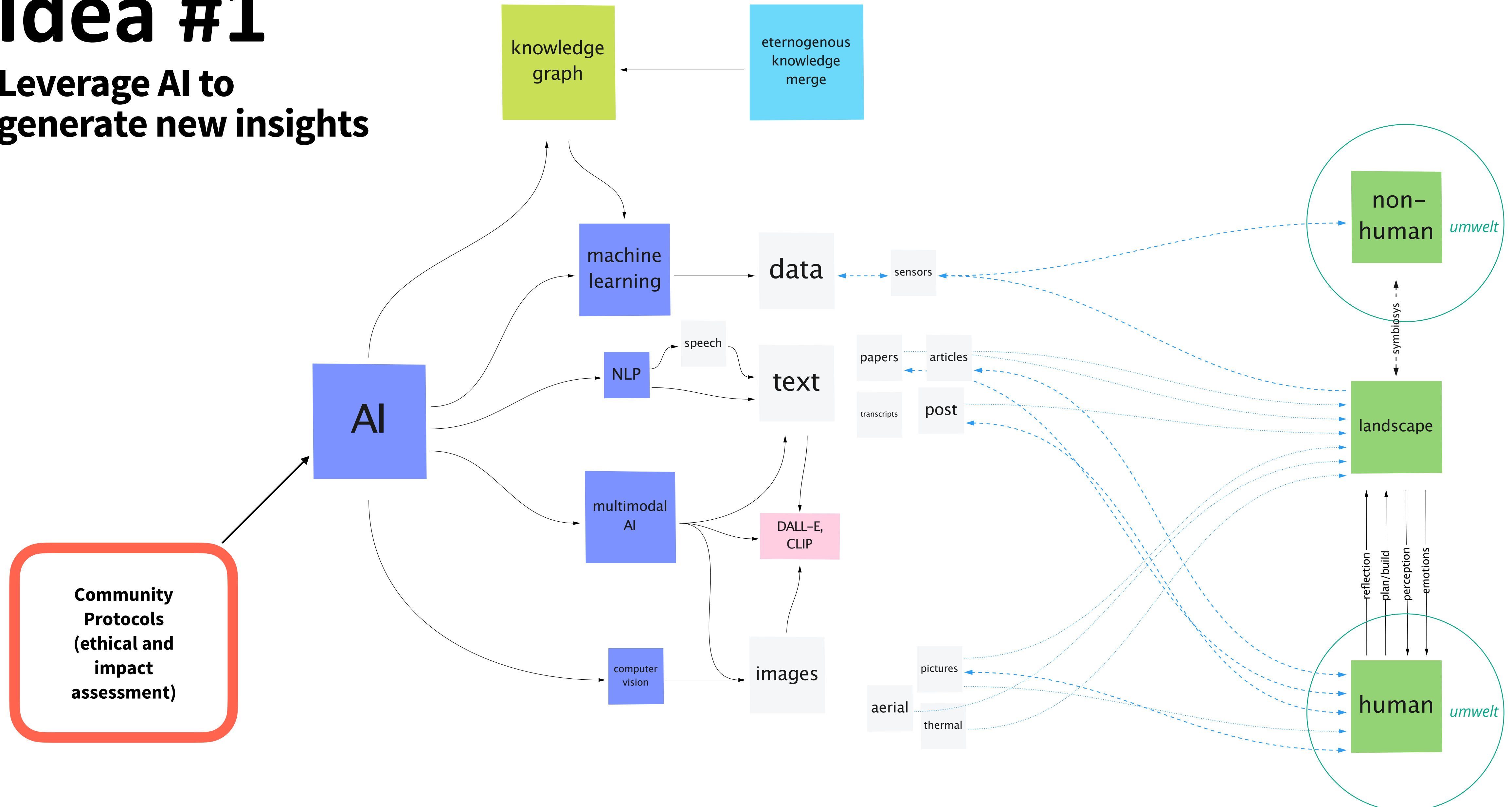
* future oriented approaches to the anticipation of design scenario and solutions

#RQs

- **Can we leverage a radical relational / network science oriented perspective, to obtain new insights from complex systems?**
- **is it possible to design a new research process enabled by AI technology that combines heterogeneous knowledge and data?**
- **Can we embed local community-science approaches in it?**

Idea #1

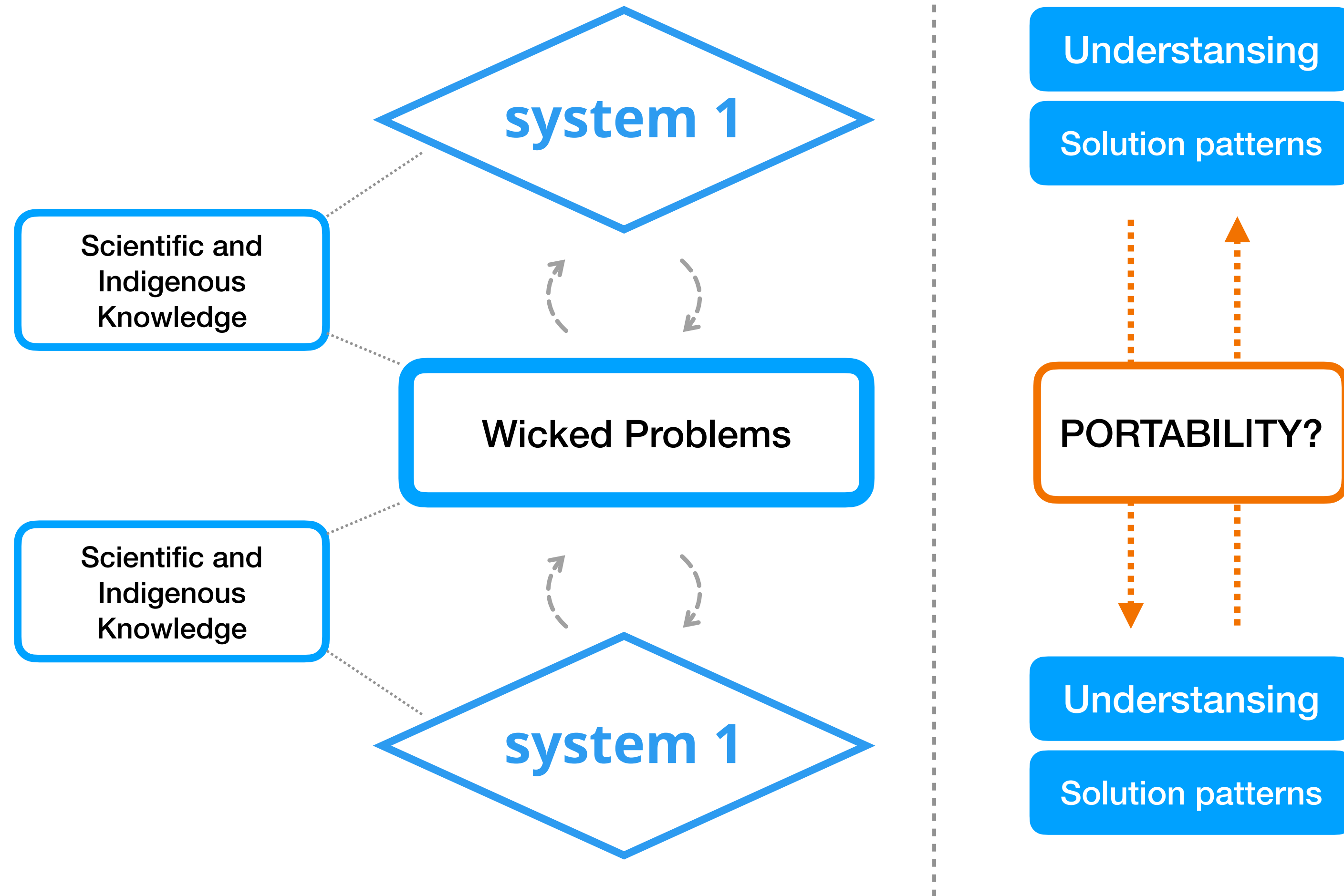
Leverage AI to generate new insights



Idea #2

Parametrize to make socio-techno-natural systems comparable

(if comparable, strategies and approaches could be transferred among them)



Idea #1

Leverage AI to
generate new insights



Idea #2

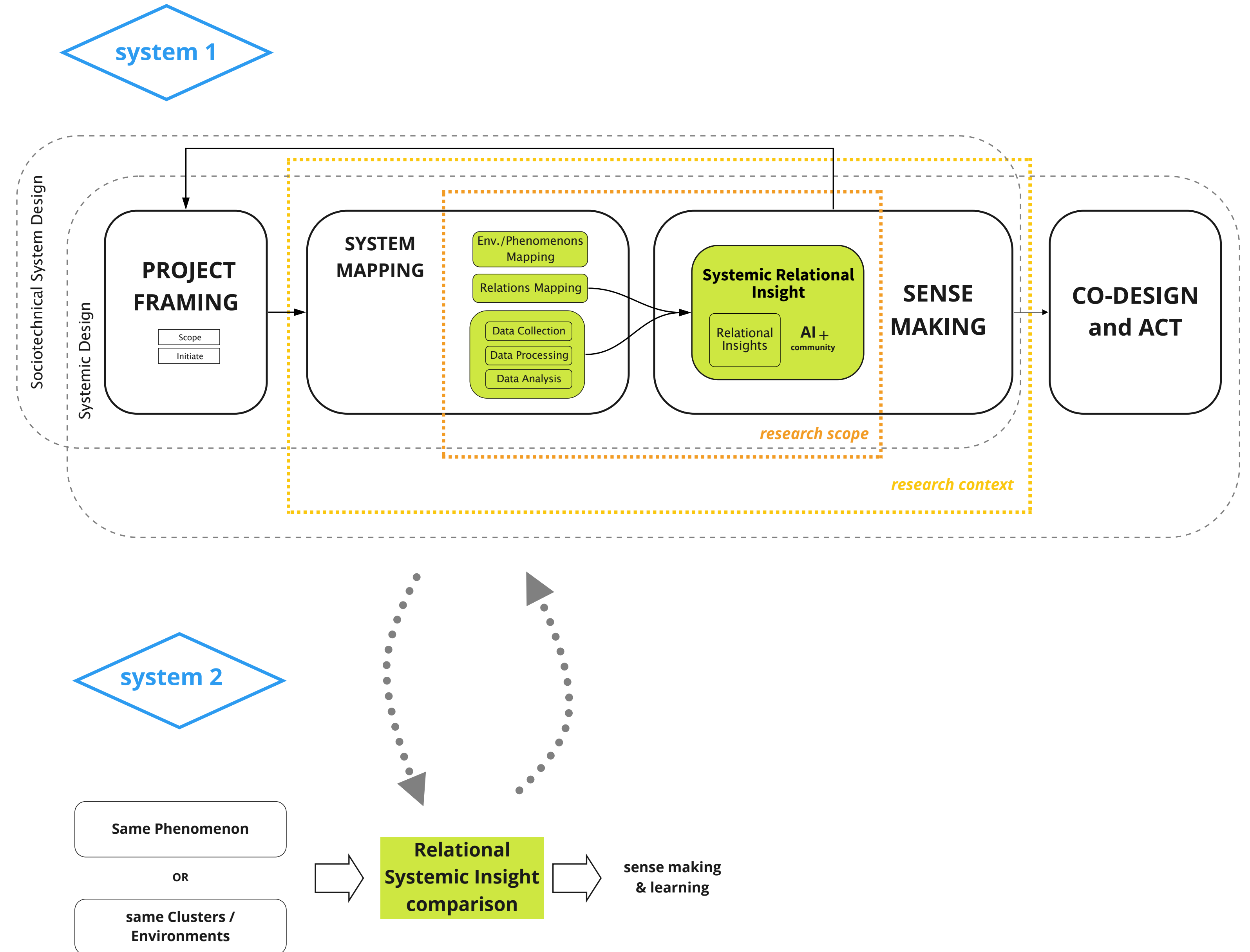
Parametrize to make
socio-techno-natural
systems comparable



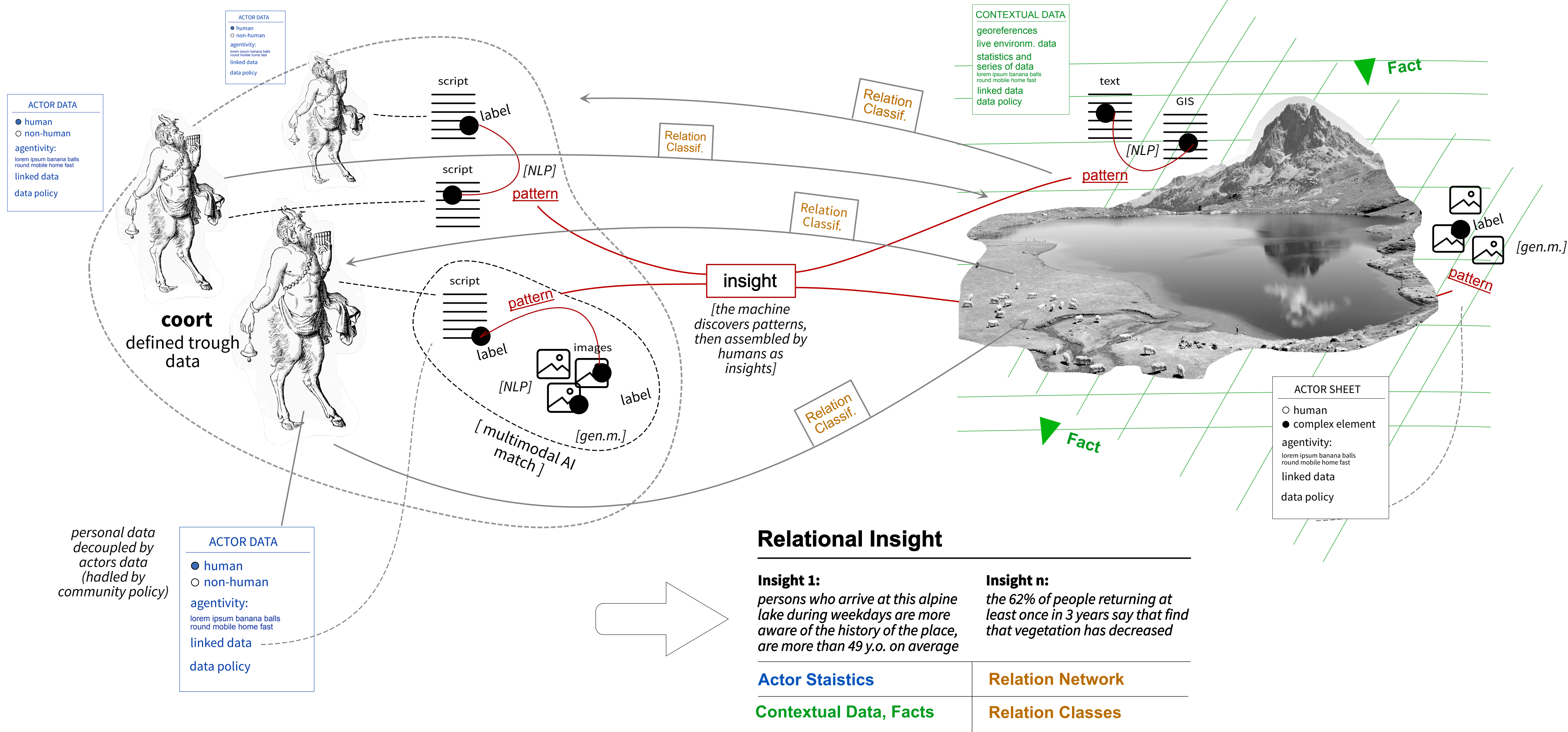
**Embed #1 + #2 in a
general framework**

Embed #1 + #2 in a general framework

First prototypal model of a research and design framework that could be applied at systemic level. It introduces this idea of the **Systemic Relational Insight** that has to be seen as a new scientific device, a digital archive (or an ID card) containing data, policies and network configurations cable to make fresh and artificial intelligence processed research insights to make (some) sense out of systems complexity



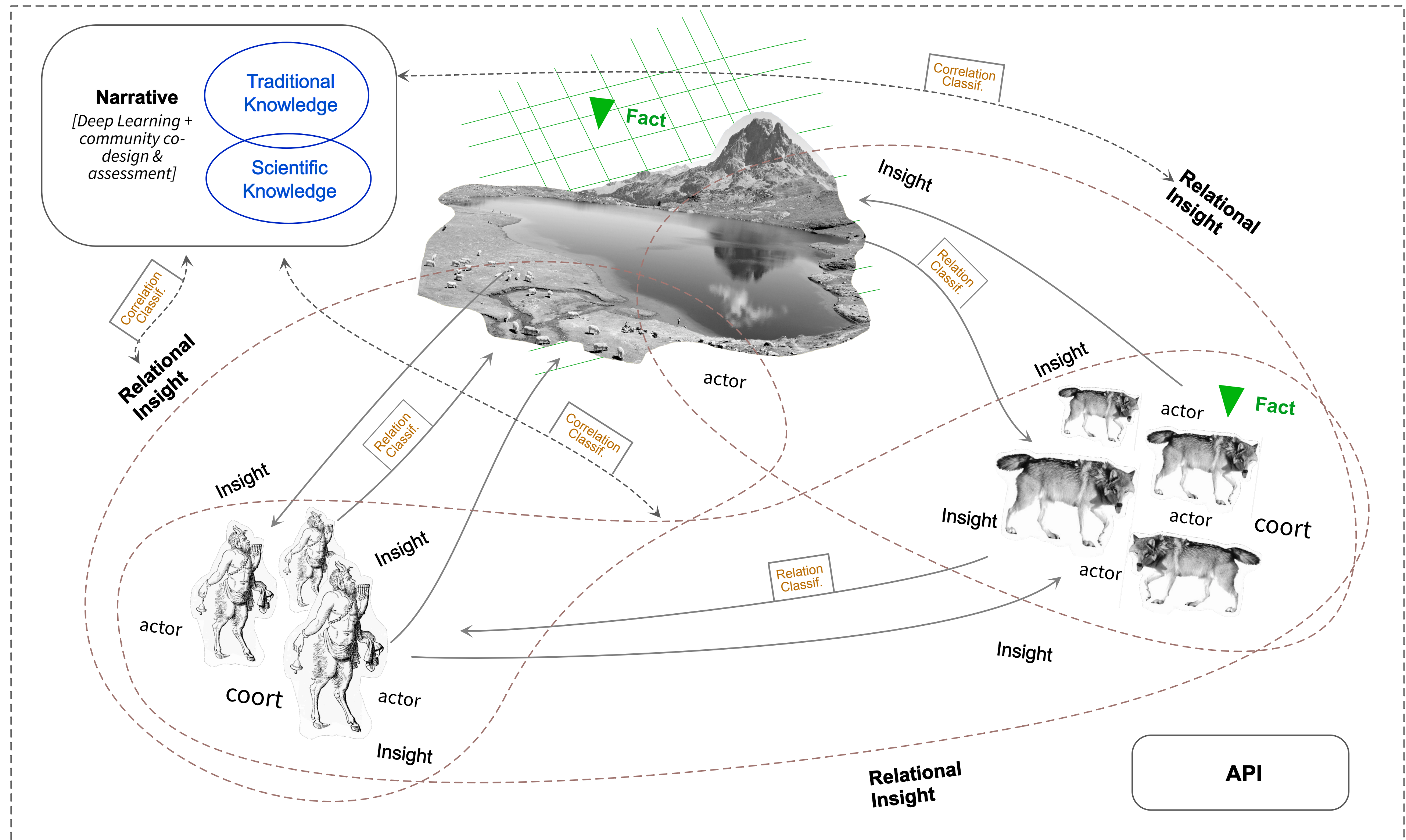
Relational Insight



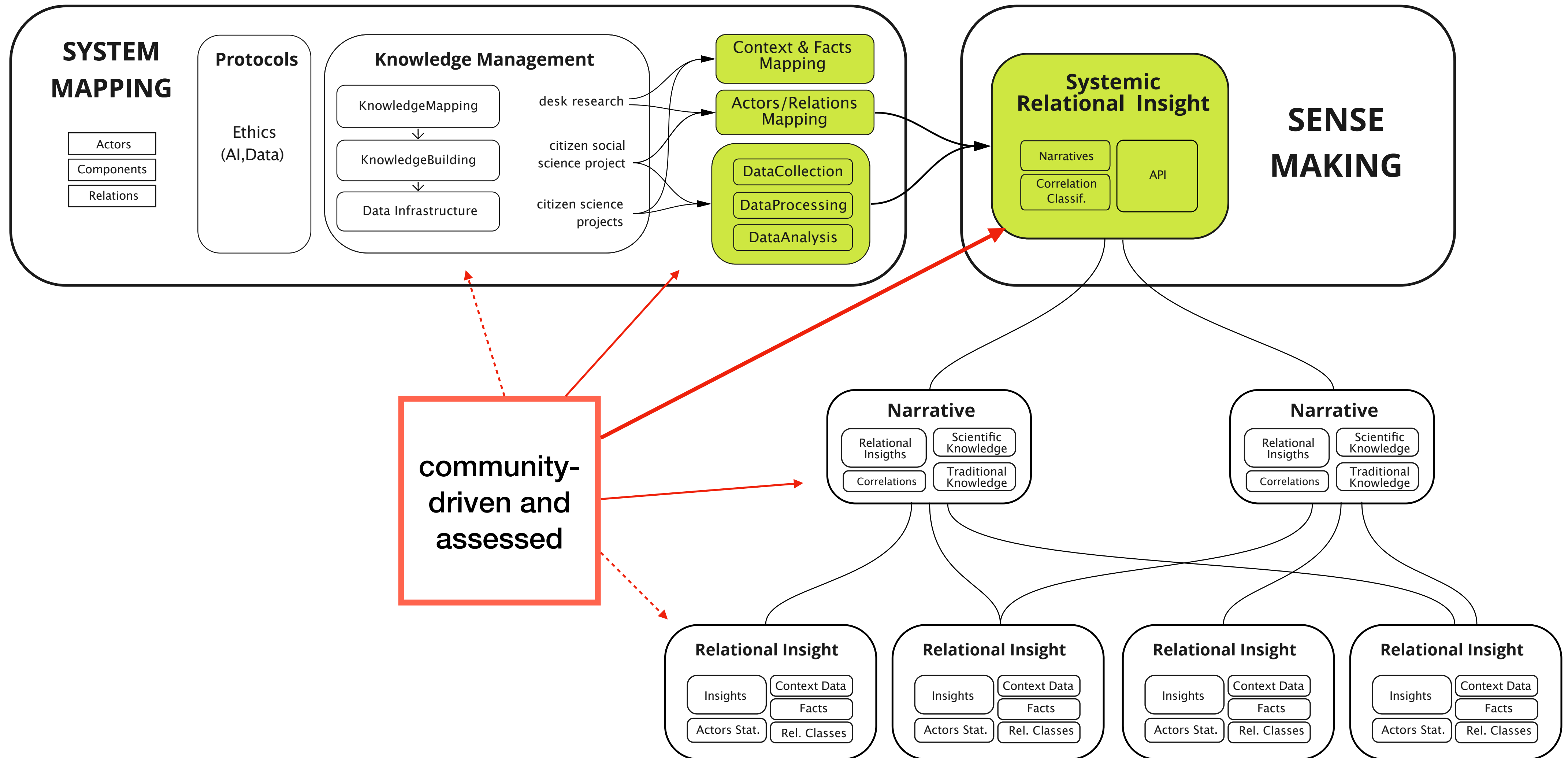
Systemic Relational Insight

“The minimum recognizable configuration of valid narratives and knowledge that enables comparison between two socio-technical-natural systems”

It is composed by multiple Relational Insights connected to relevant scientific research from open access catalogues through an algorithm assessed by the community

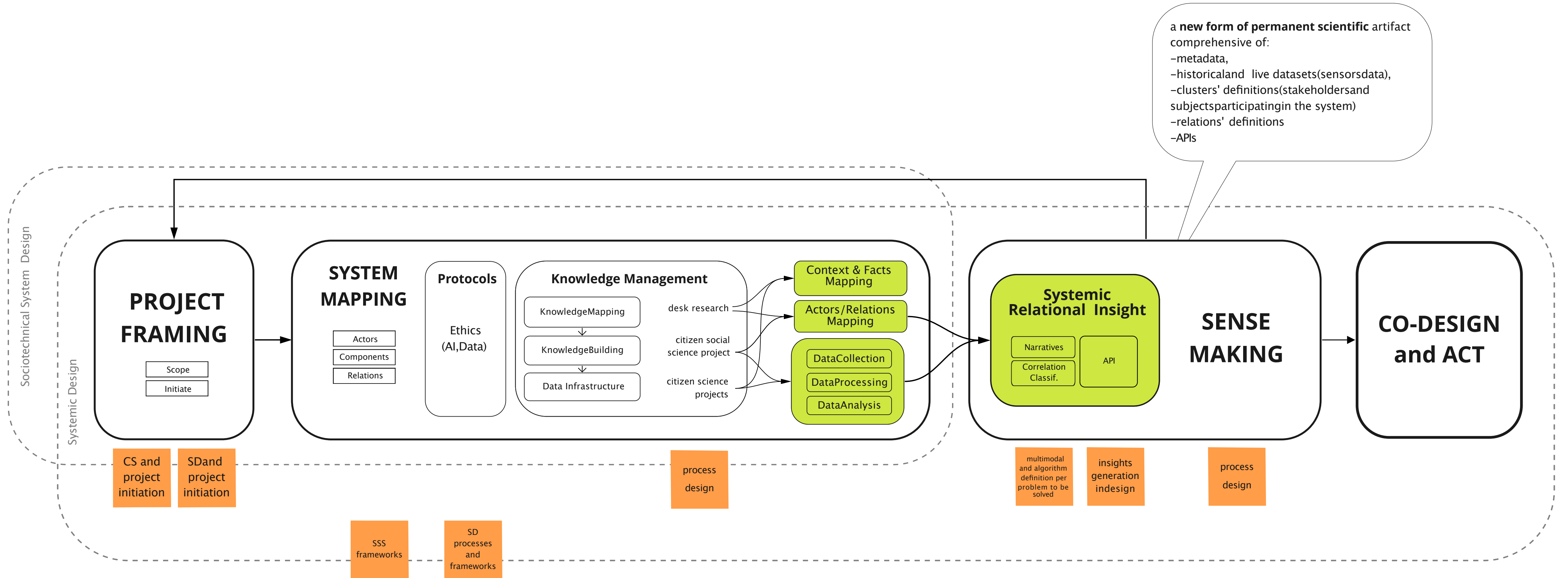


Nesting RIs within Systemic RIs



The framework

details and further research areas



Pitfalls and weaknesses

...just to kick off a looong reflection

Ethics

- powers leveling (community vs tech)
- data policies are challenging
- epistemic adaptability to different cultures

Technology

- multimodal AI is hard! (AI is hard)
- avoid epistemic AI lock-in effects (align two speeds: the one of system dynamics and the one of datasets)
- bias are going to be less impactful in AI, but the implementation of interpretability approaches requires resources

Processes

- overall complexity and articulation
- complexity of protocols needs to be shifted to the framework level to lighten practical application
- design/research team expertise requirements
- expendability of single tools

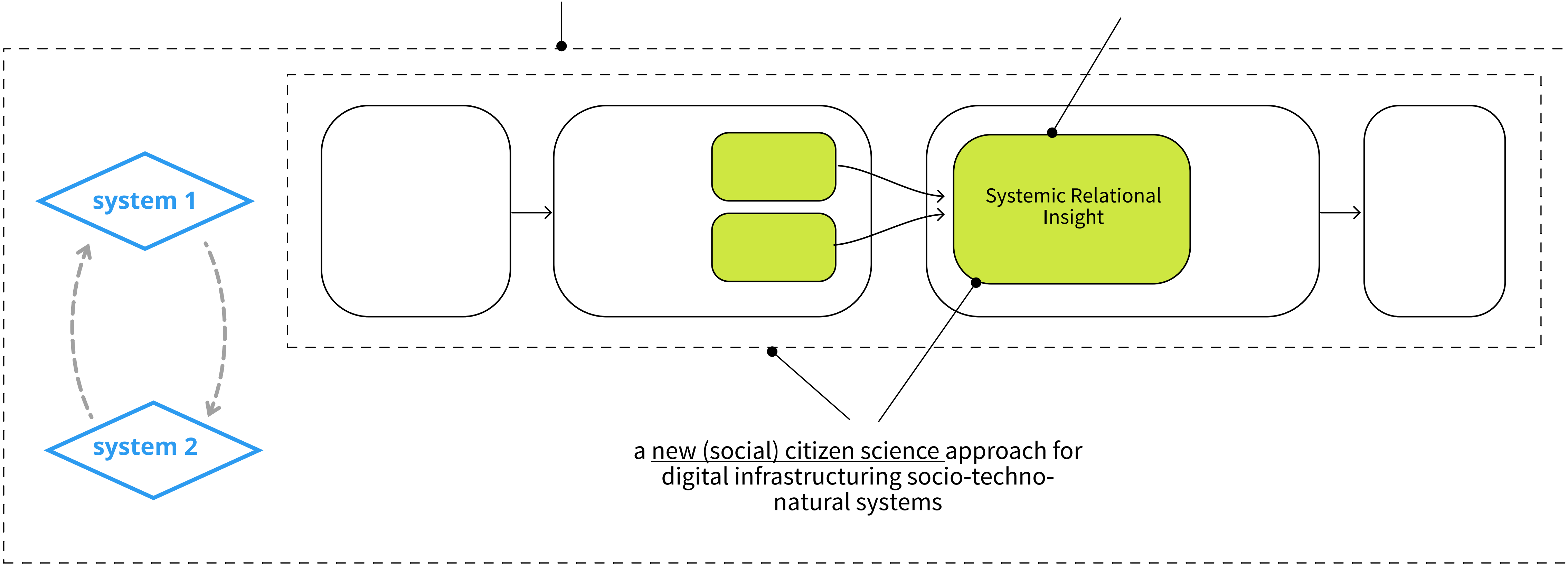
Research original contribution

a new relational/systemic design framework based on AI with community-in-the-loop about sensemaking in socio-natural environments

enabling comparison of different contexts to transfer solution patterns

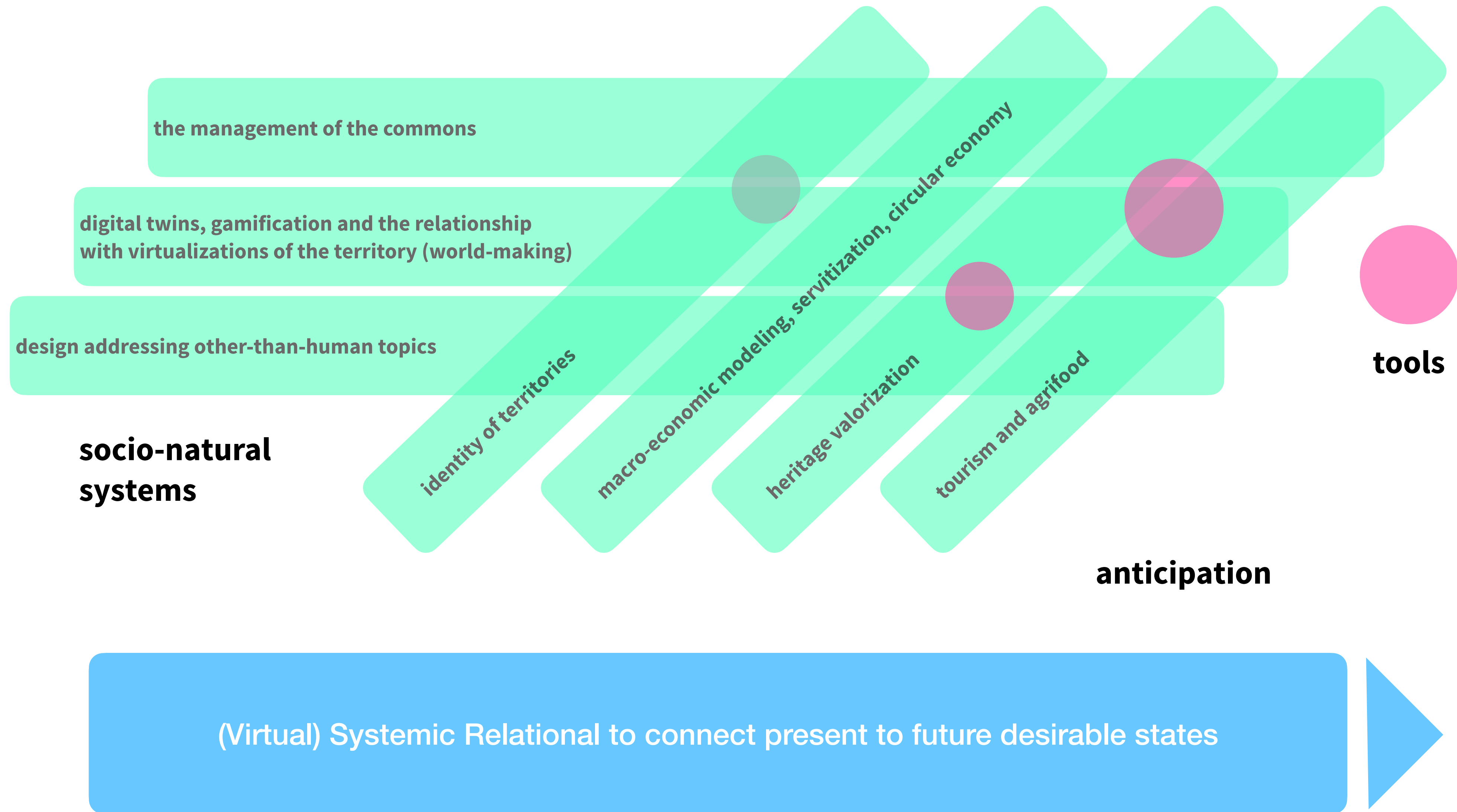
a new scientific format (or device) and research tool

scaling the potential to understand complex systemic environments



a new (social) citizen science approach for digital infrastructuring socio-techno-natural systems

Applications



Next Steps



An integrative desktop research activity will be covered in order to strength the theoretical foundations



implementation of the methodological framework regarding technology selection from the design process perspective



Through the case studies I'll develop and validate:

- general framework structure (phases and sub-phases), drawing on systemic design, participatory design and citizen science general models;**
- Relational Insight and Systemic Relational Insight structure with ontological, technical and procedural elements;**

thank you



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