

2018

Participatory design for service robotics

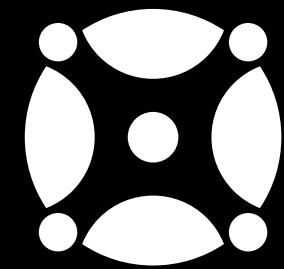
Valpreda, Fabrizio and Cataffo, Marco

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2018

Relating System Thinking and Design **Participatory Design for Service Robotics**

Authors:

Fabrizio Valpreda, Marco Cataffo



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Climate change

Uncertainty regarding weather events

Impact on productivity

Urgent need to reduce waste

Price and availability of energy

**Assessment and
monitoring food quality**

Increasing need for freshwater

Impact on natural resources

**Regulations,
documentation**

Availability of arable land

Average age of farmers increasing

Public awareness

Intensive farming

Increase efficiency

Fluctuating prices

Marketing

Urbanization

Economic growth

agriculture and farming **complex scenario**

When facing the issues concerning the agricultural practice nowadays, we encounter the amount of correlation among problems that leads us frame it as a **complex problem**.

As a serie of interrelating conditions, these problems are hard to be addressed simptomatically ad call for a **holistic approach**.

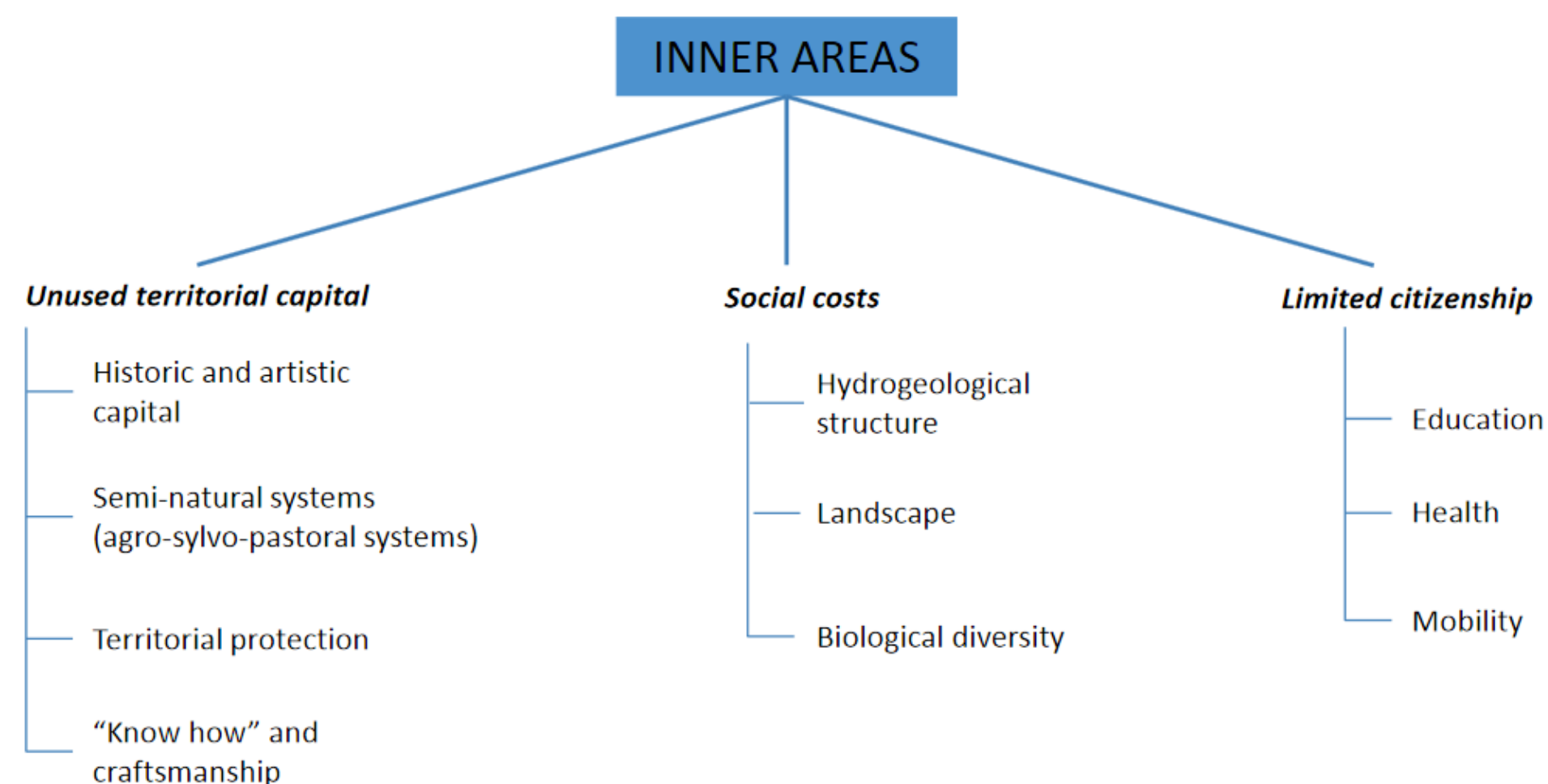
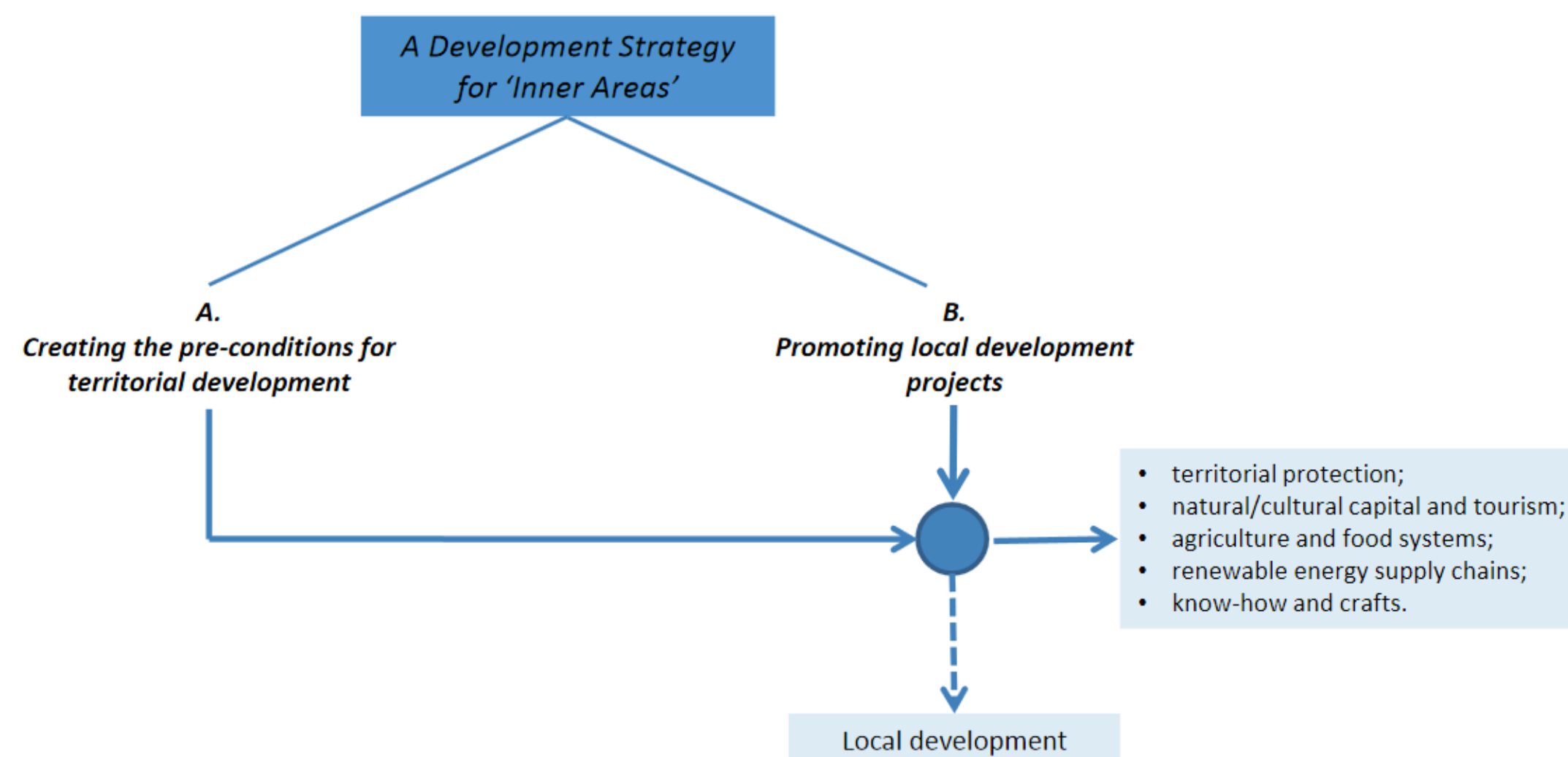


Figure II.3 - A local development strategy



territorial development inner areas

.local biodiversity

.direct producer consumer relationships

.policy and governance: **top down** procedures

.social, economical and ecological **framing**



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.agriculture
intensive

**engineering design
innovation**

.market driven growth

.mass^{DEMO}production

.monoculture

.waste unwise

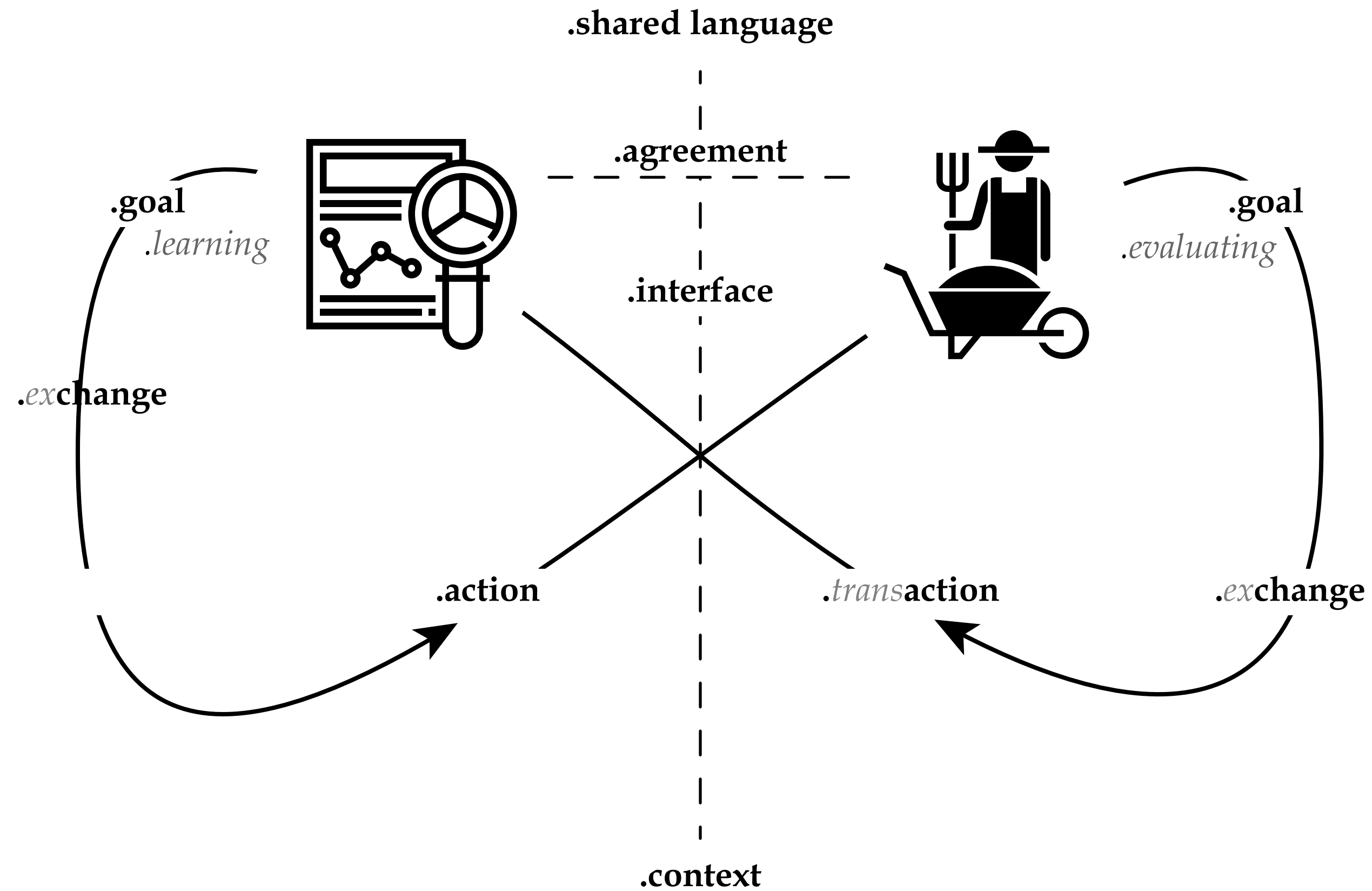
.tech
monolithic



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.eliciting knowledge

context
lifestyle
drivers

conversation theory
second order cybernetics
participatory design

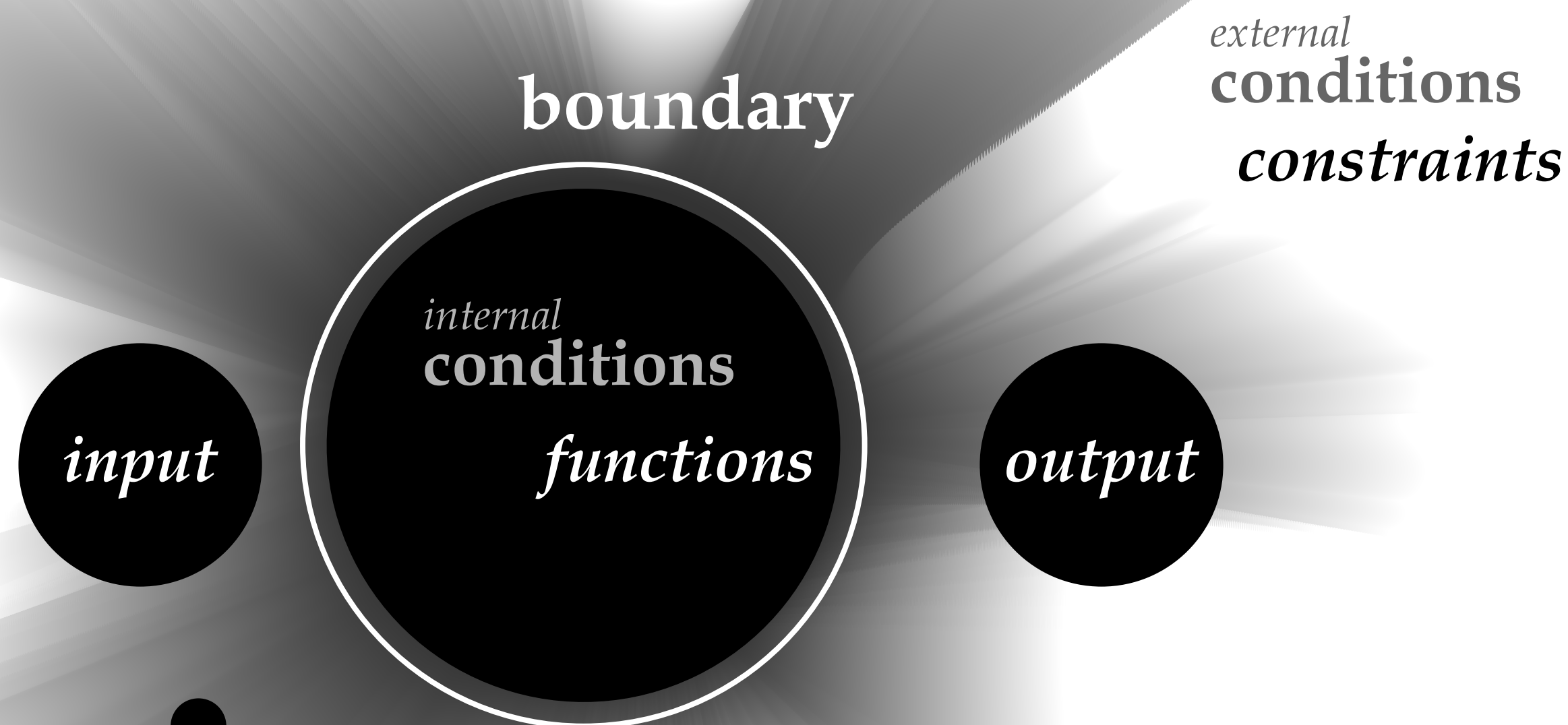
.user engagement
.abstraction
.structure
.purpose explicitation



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/'madju:l/
noun

each of a set of standardized parts or independent units that can be used to construct a more complex structure, such as an item of furniture or a building.

module interface protocol

- .highly interconnected
- .lowcost interactions
- .unbundling
- .natural buffer

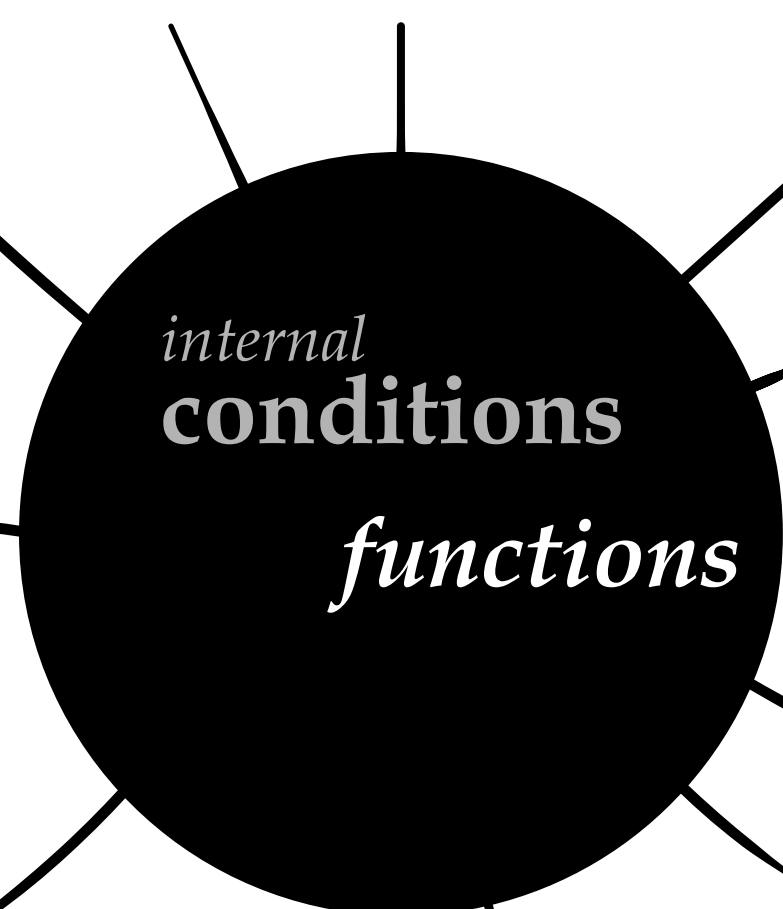


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complex problem solving



adaptivity

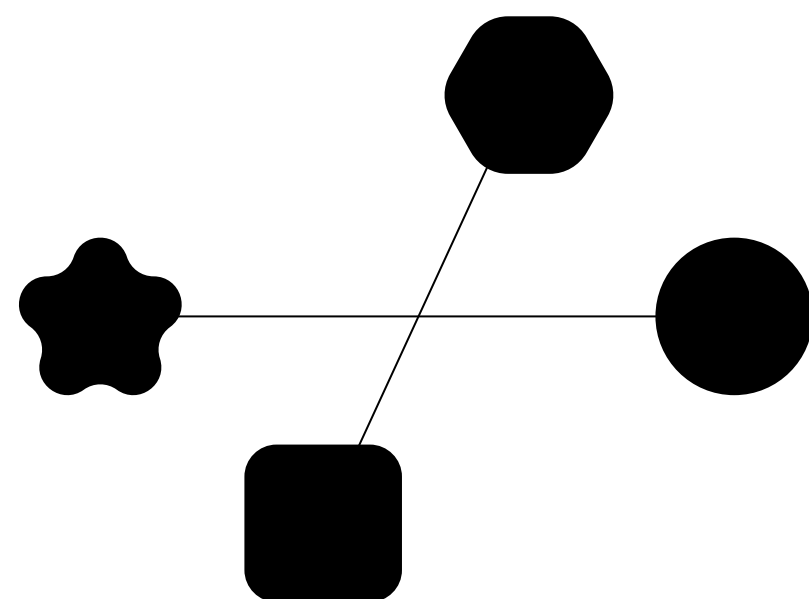
Elements in the system are almost fully autonomous. Each node contributes to providing the system's infrastructure and maintaining the system. Thus, they require more engagement and responsibility from each node in the network but can result in exceptionally robust systems.



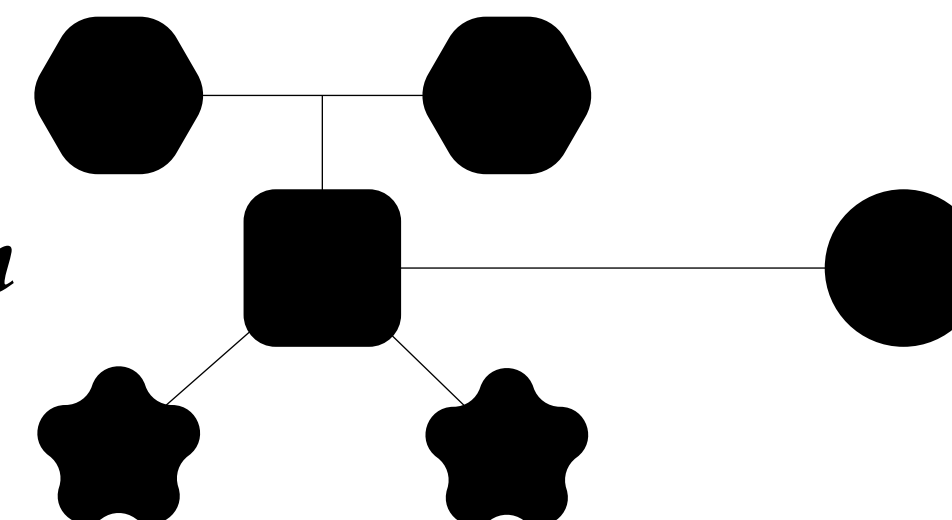
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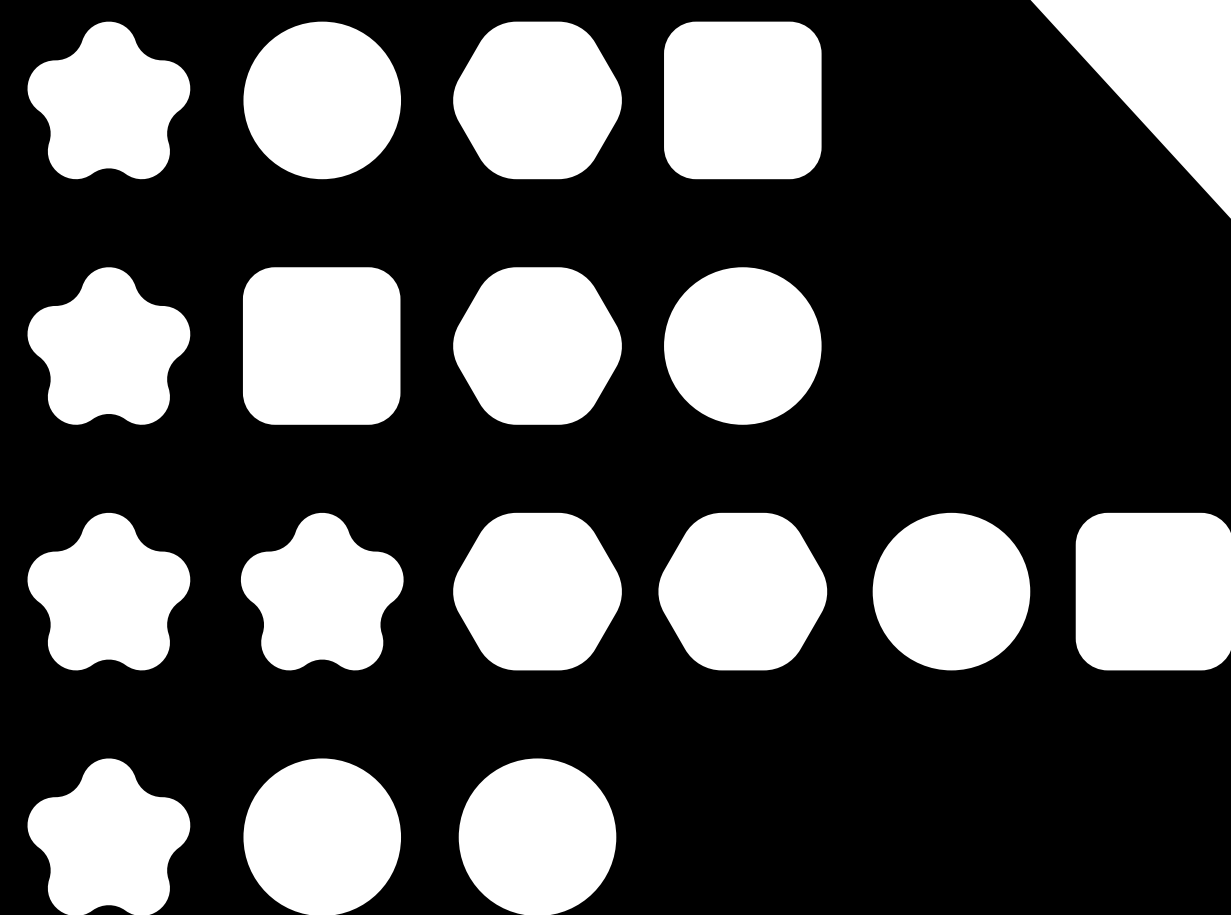
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*autonomous
customization*



reconfiguration



time

adaptivity

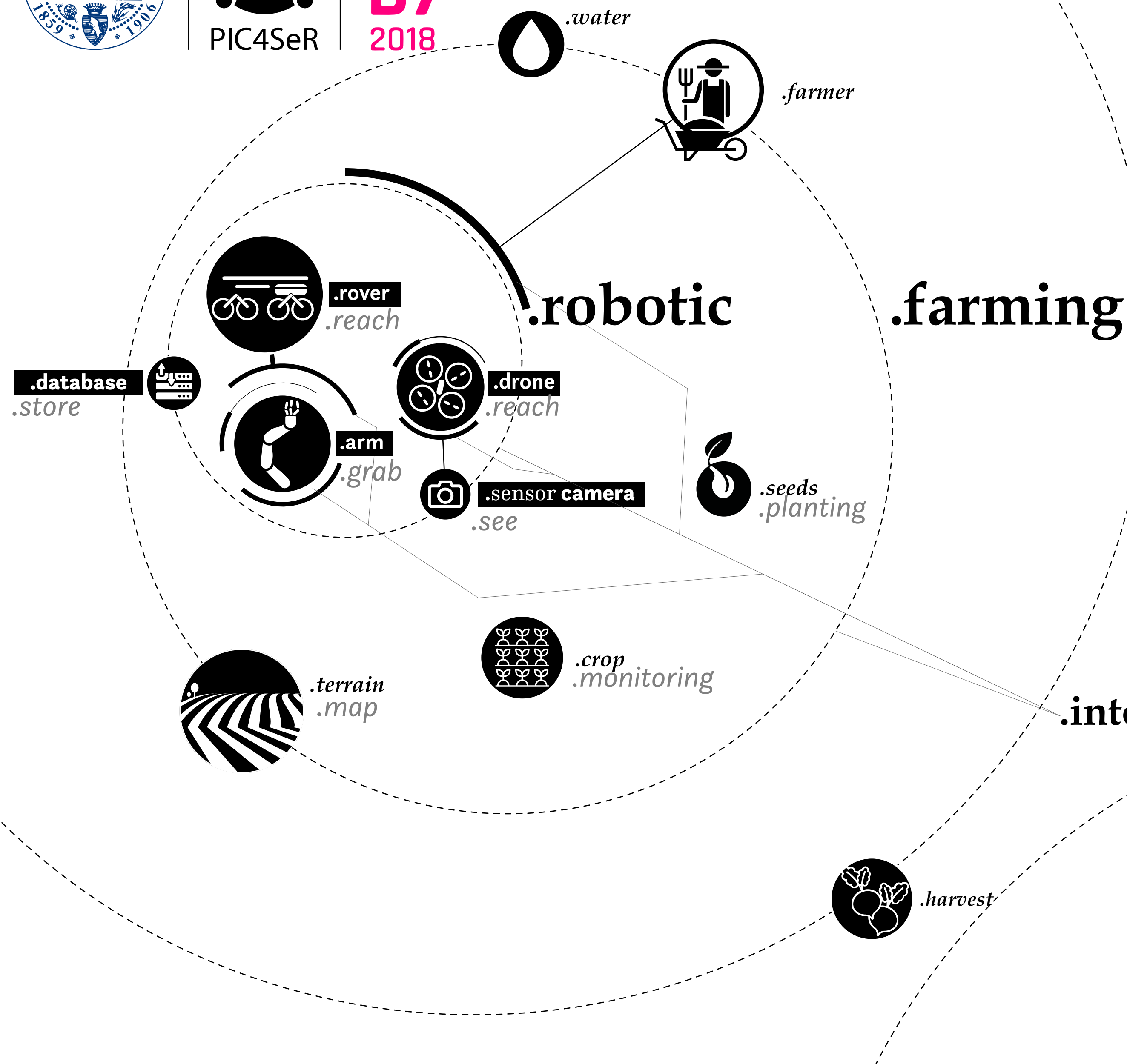
In complex adaptive systems, there is always a dynamic between agents and structure, that is, between the elements in the system and the system itself. Understanding this dynamic and the trade-off between being able to control the system vs. harnessing the uncontrollable resources of the users is a key consideration.



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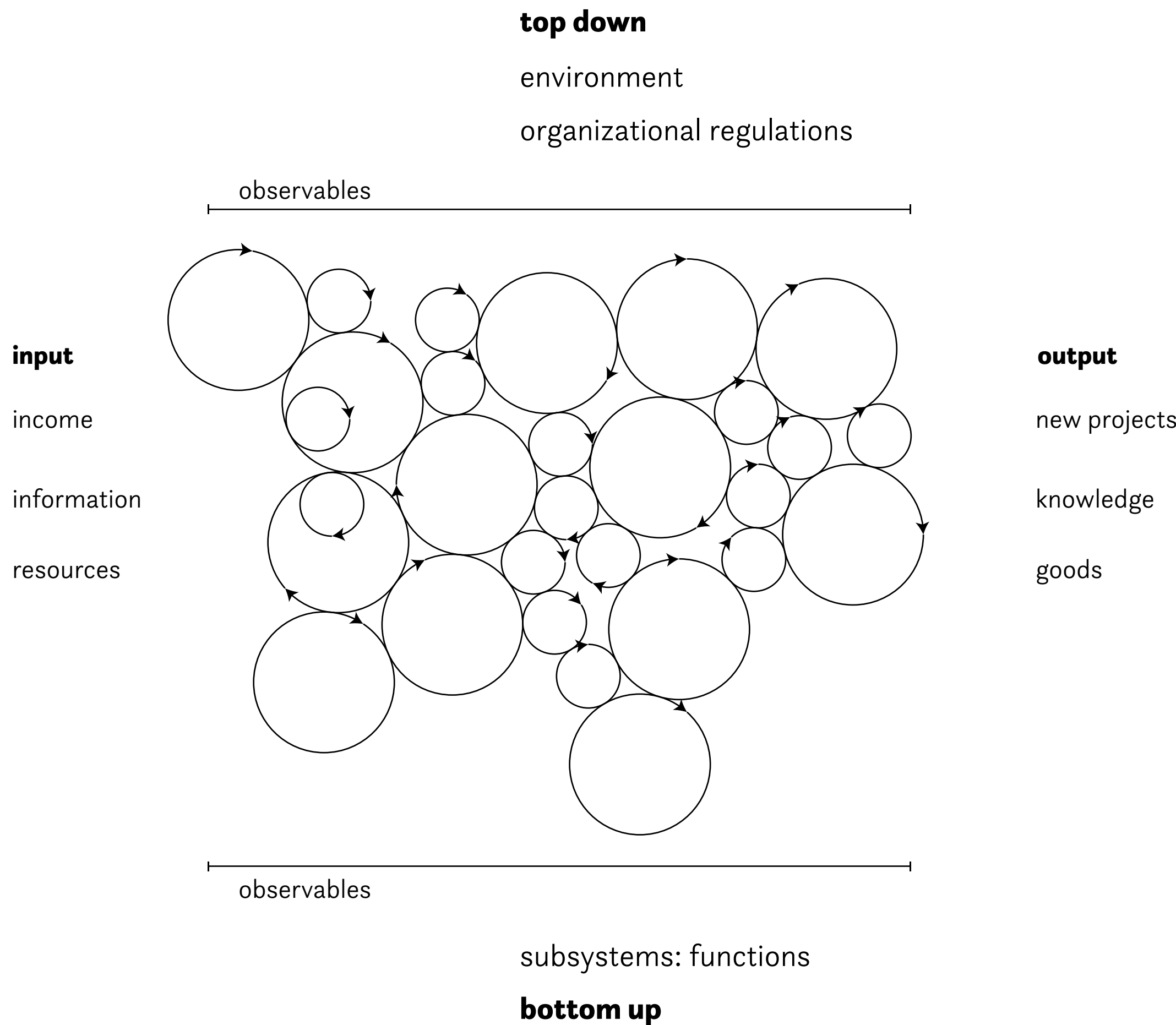
.inner area environment

nested
dynamic
socio-technical
product-service system
innovation

The creation of novel and competitively priced goods, processes, systems, services, and procedures that can satisfy human needs and bring quality of life to all people with a life-cycle wide minimal use of natural resources per unit output, and minimal release of toxic substances.

.interfaces

.urban environment



social complex adaptive system
~~innovation~~ emergence

The repeated action of external conditions and internal forces results in emergent behaviors of a complex adaptive sistem. It's social connotation strenghten the creative process also understood as **self-organization**