
The GEOSS Knowledge Base:

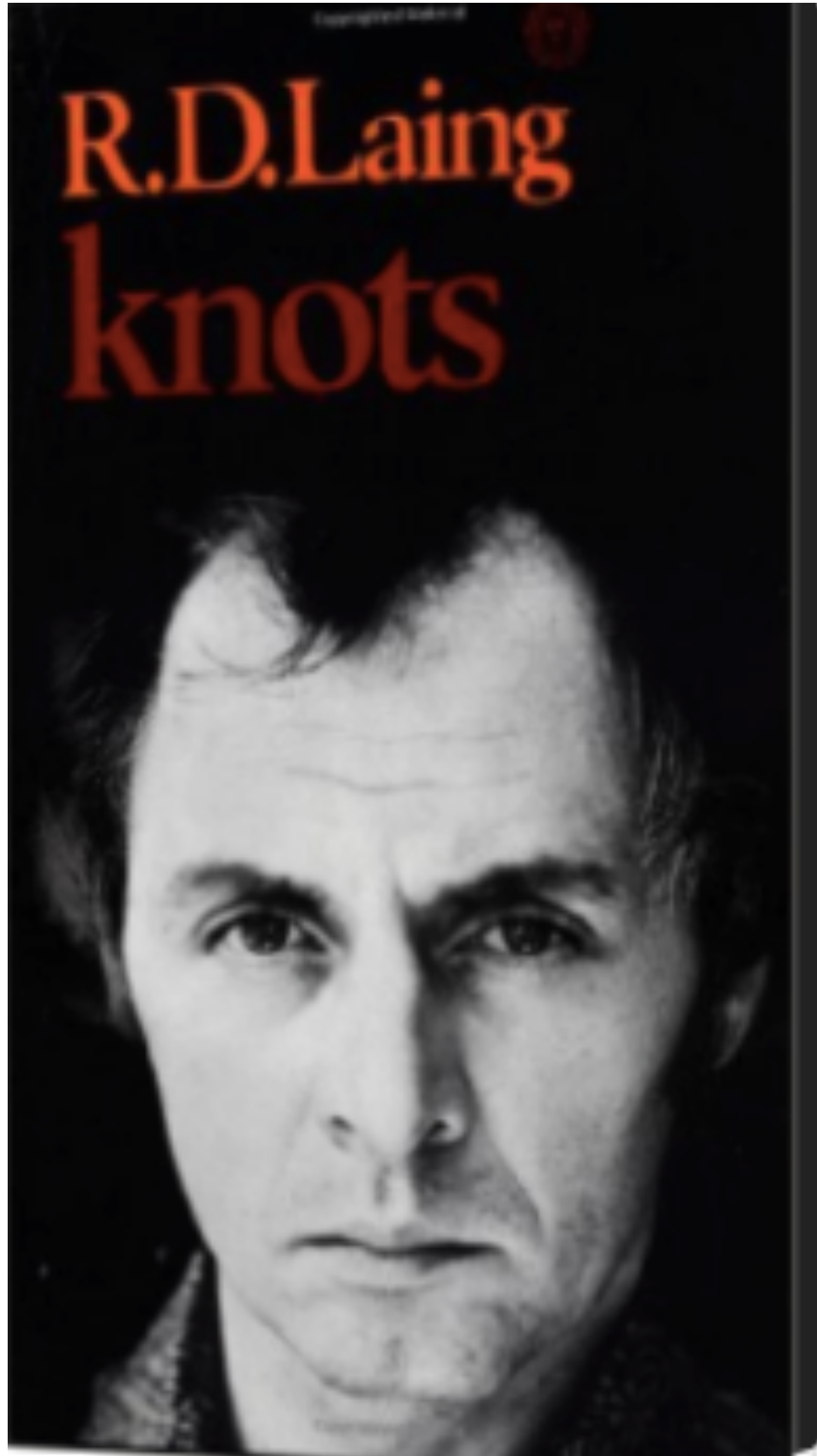
Bringing it all together

The GEOSS Knowledge Base: *Bringing it all together*

Ministerial Guidance in 2014:

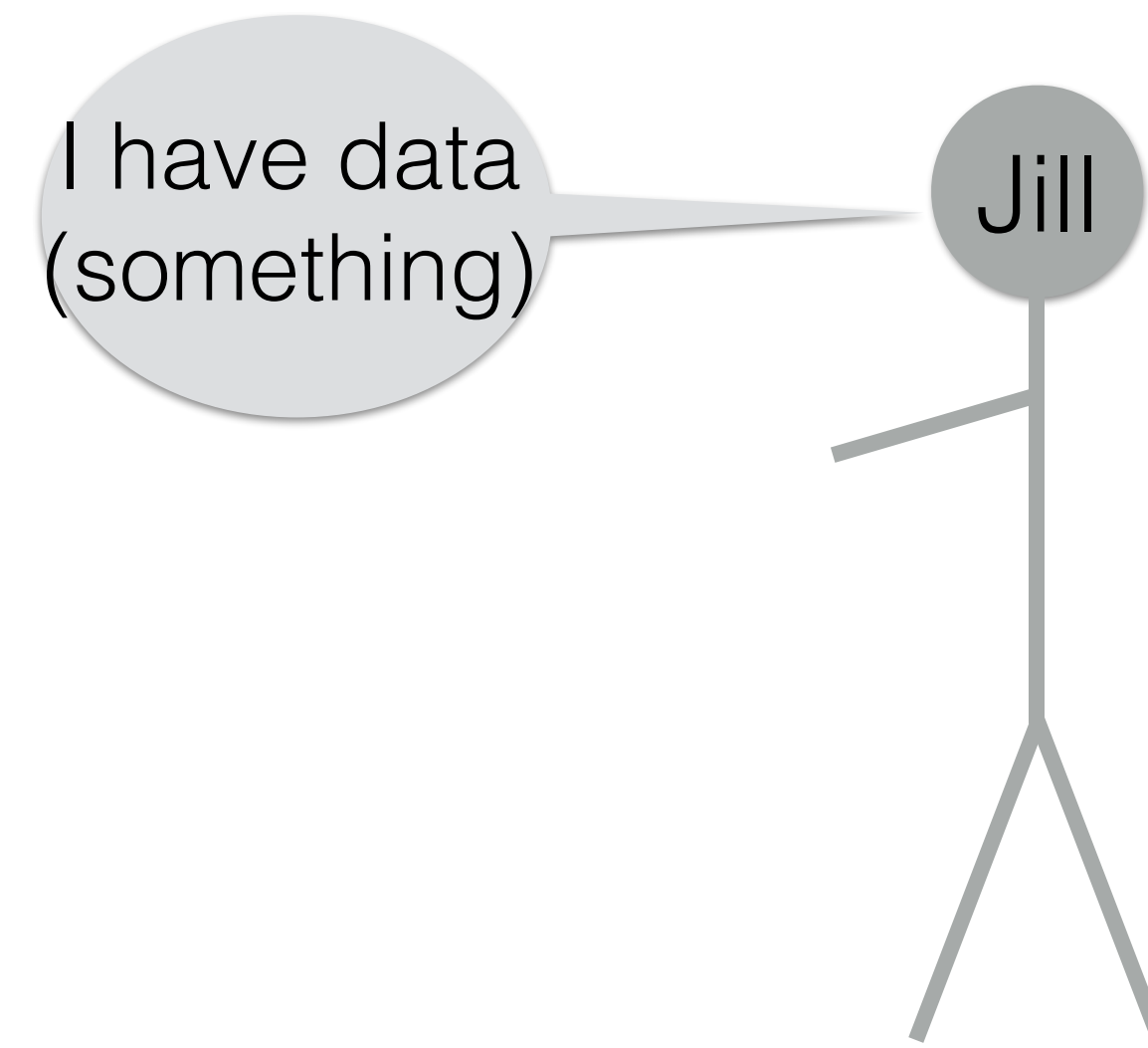
“Develop a comprehensive interdisciplinary knowledge base defining and documenting observations needed for all disciplines and facilitate availability and accessibility of these observations to user communities.”

The GEOSS Knowledge Base: *Bringing it all together*

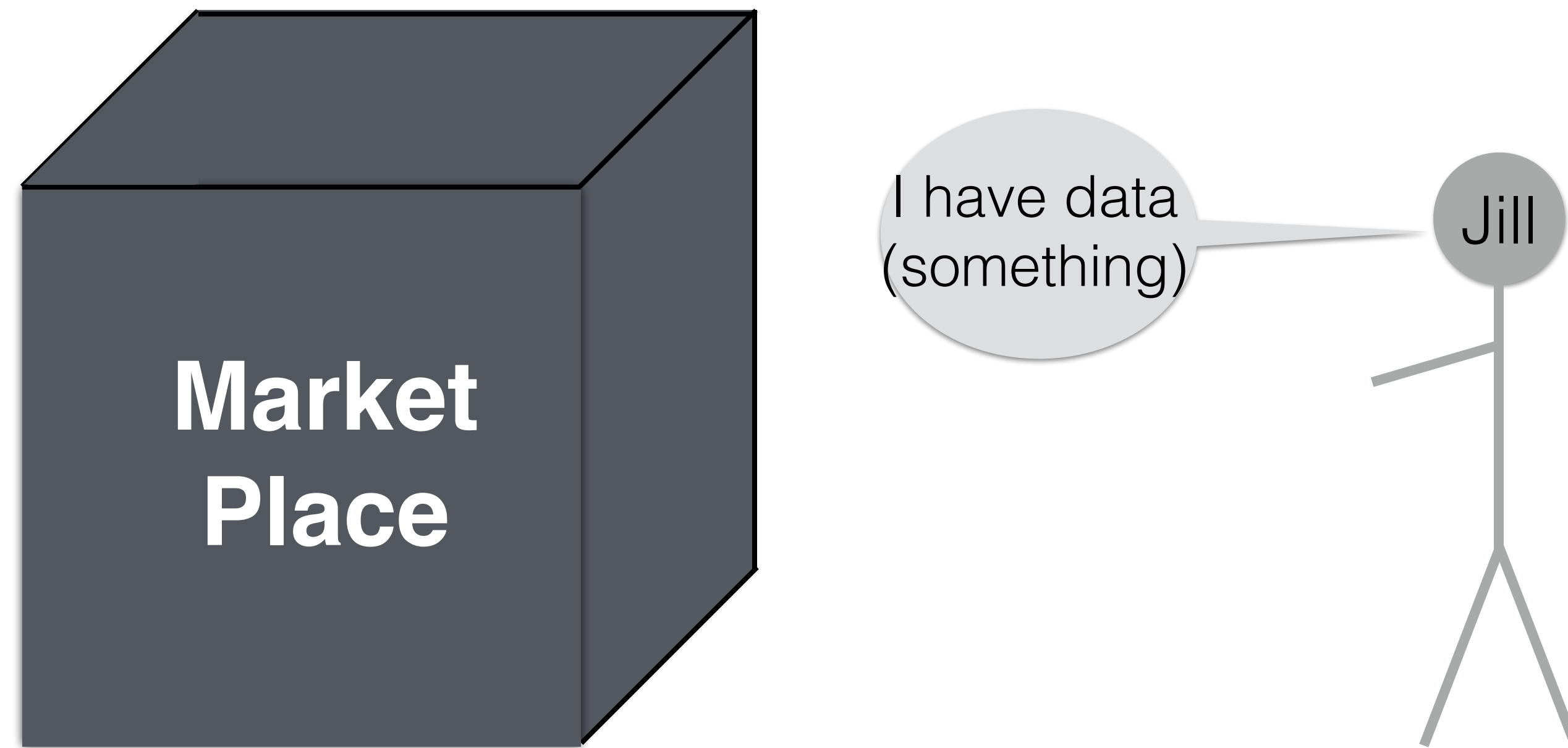


A series of dialogue-scenarios, which can be read as poems or plays, describing the "knots" and impasses in various kinds of human relationships.

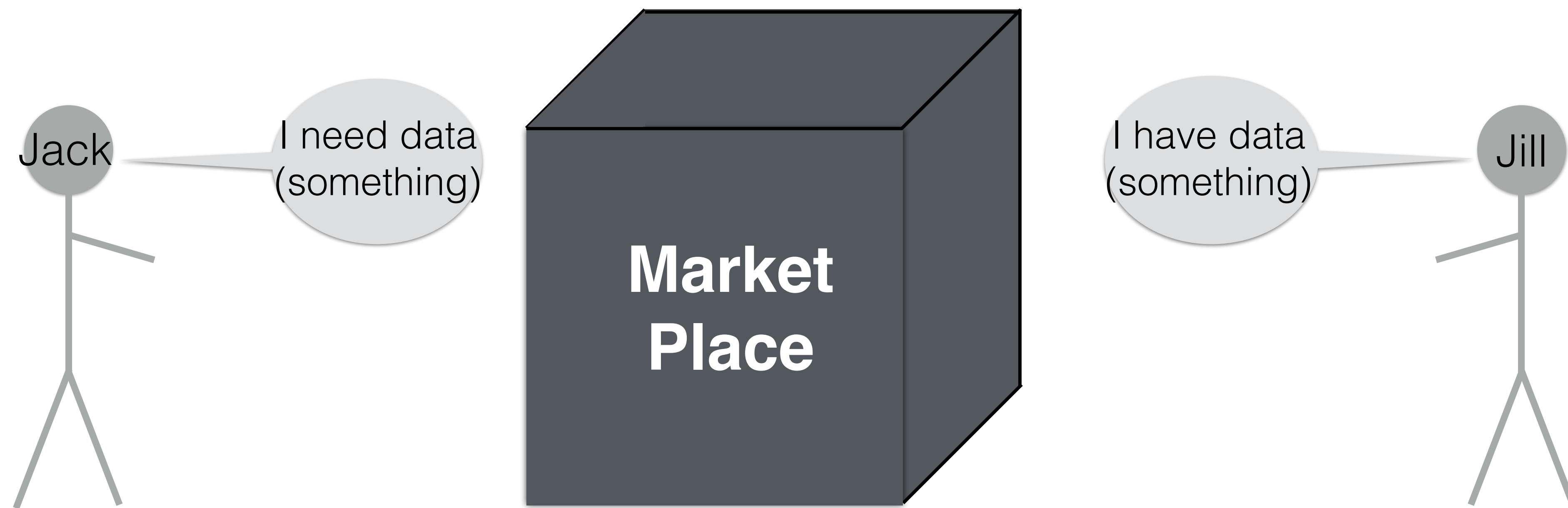
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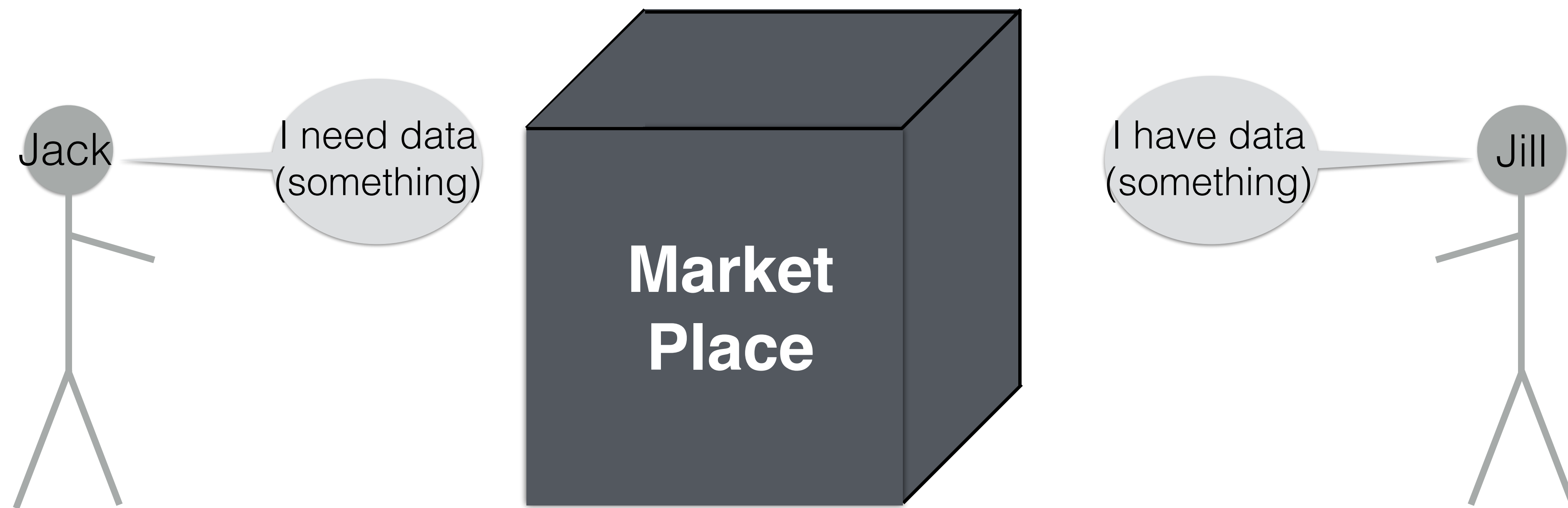


The GEOSS Knowledge Base: *Bringing it all together*



Gap: a “I need X” is not matched or connected to a “I have X”

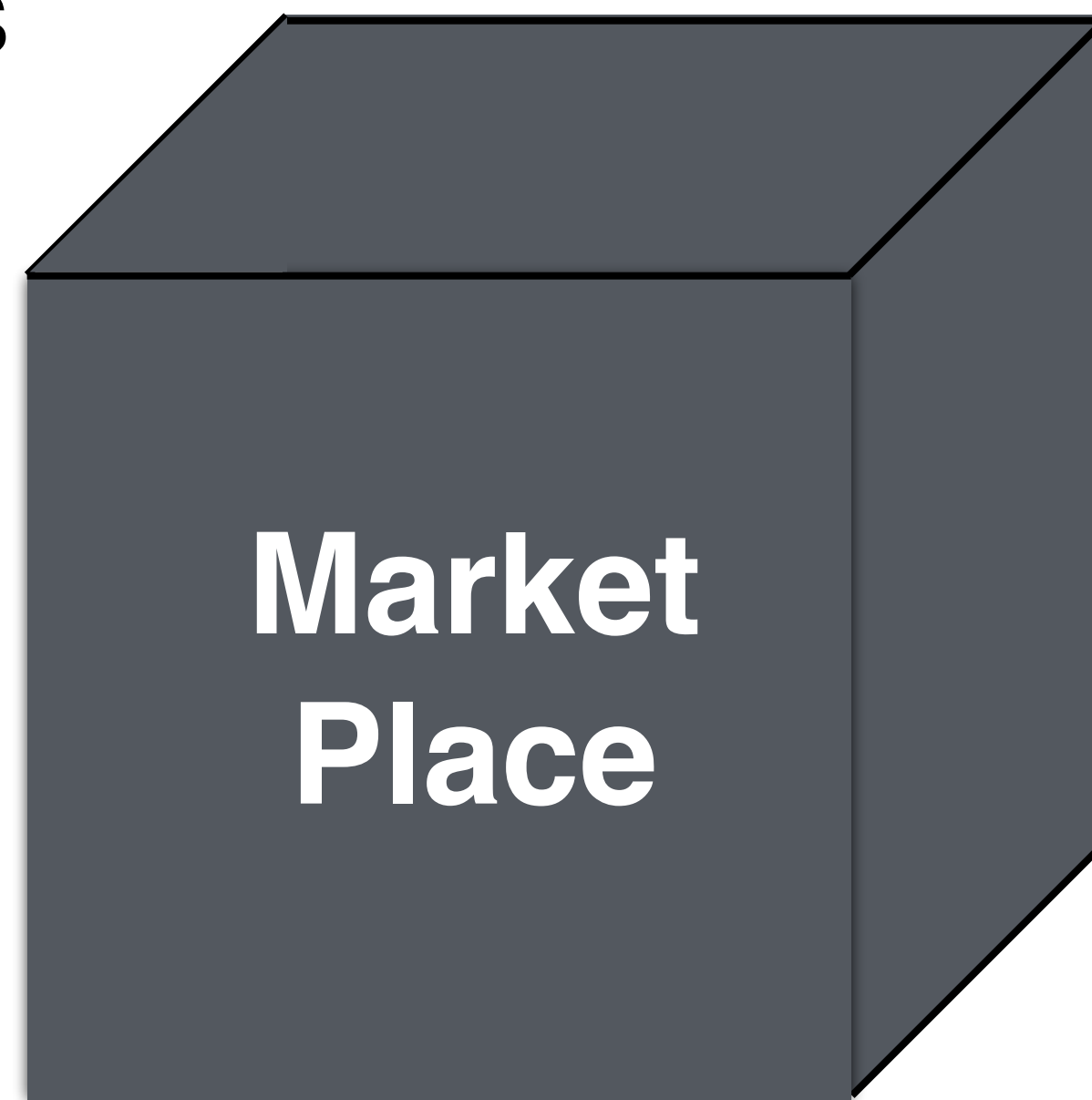
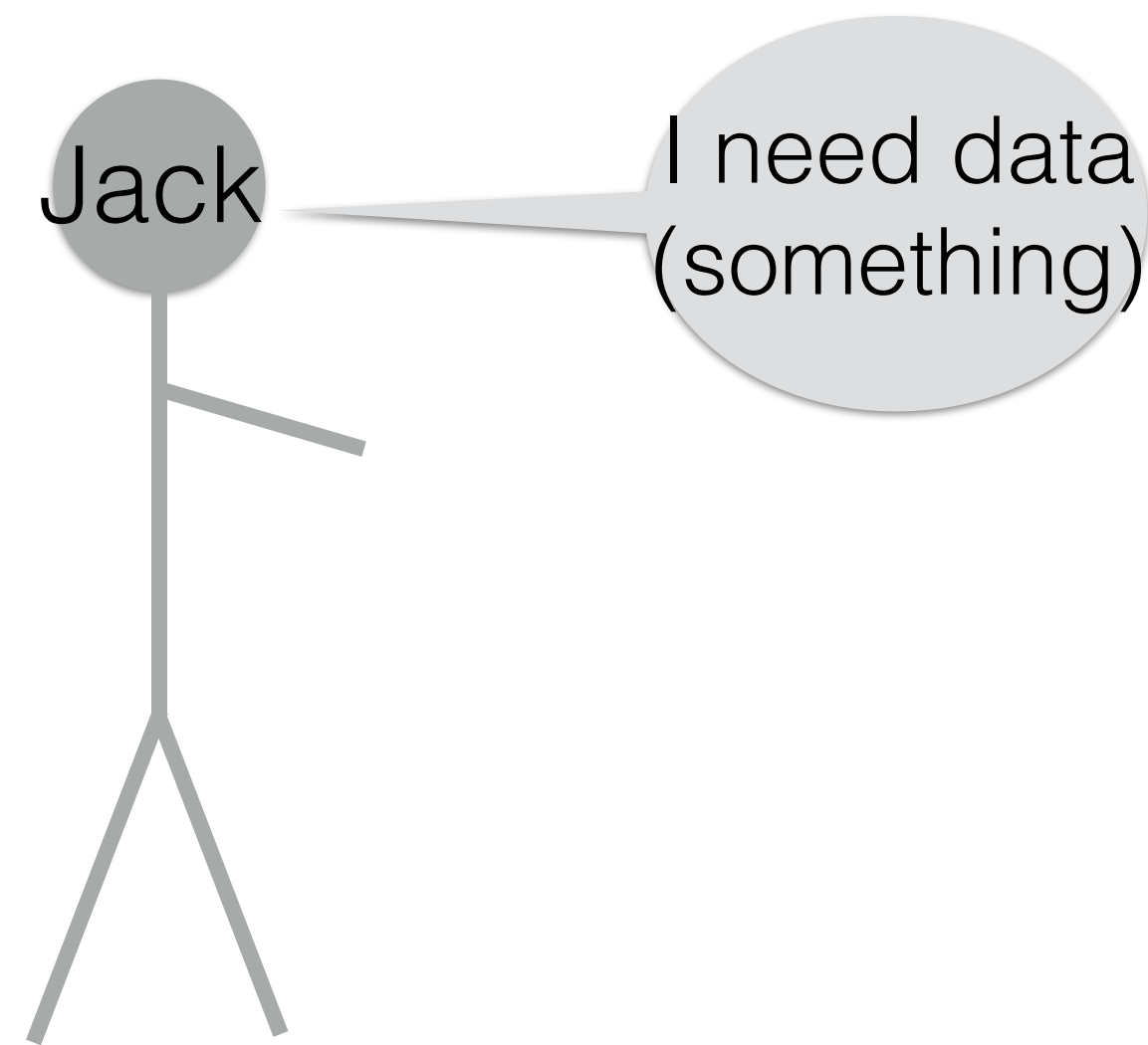
The GEOSS Knowledge Base: *Bringing it all together*



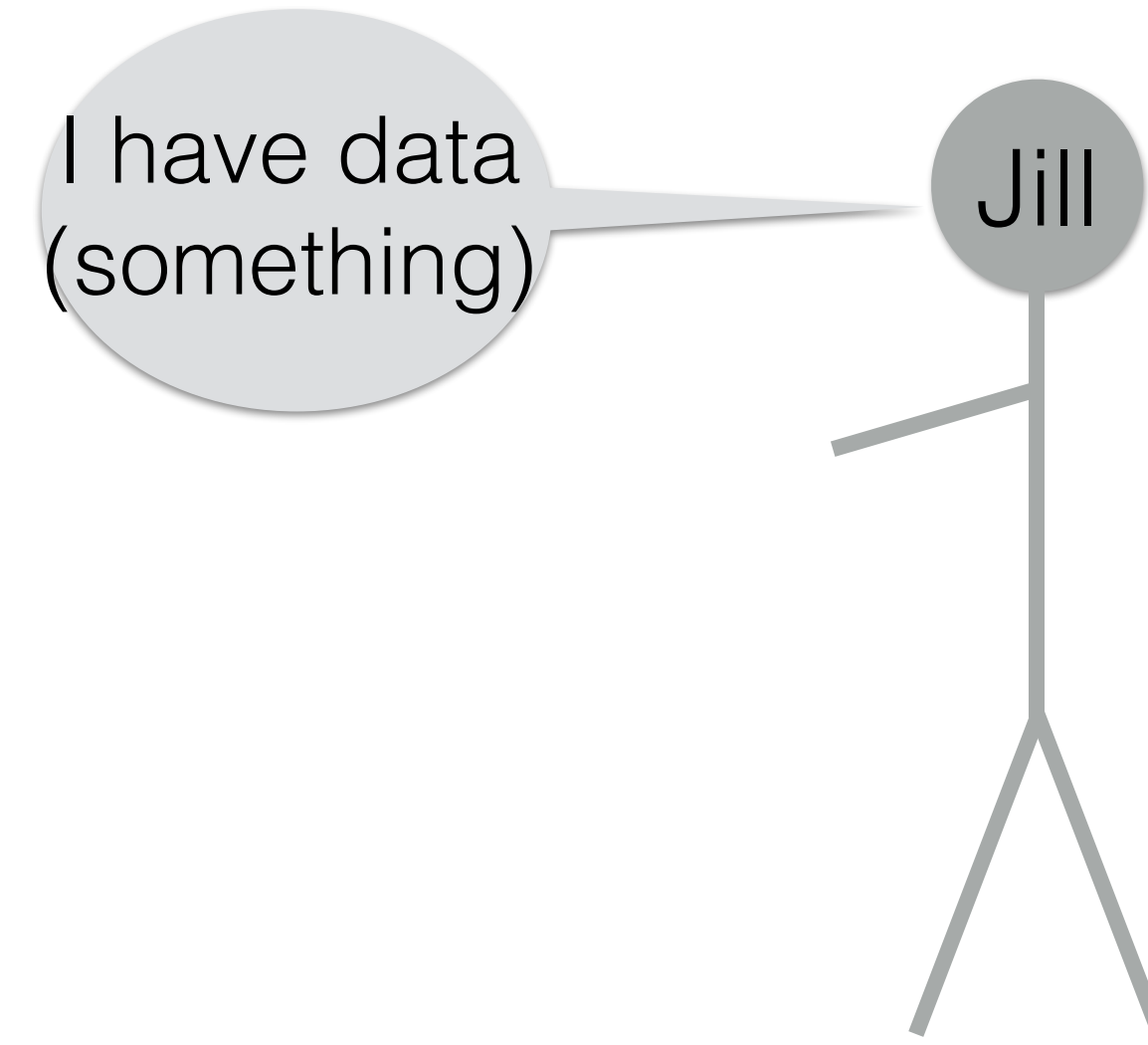
Gap: “X is needed” is not matched or connected to a “There is X”

The GEOSS Knowledge Base: *Bringing it all together*

Jack knows what he needs



Jill knows what is essential to have



The Market Place is for experts and Jack and Jill are in the same expert community

The GEOSS Knowledge Base: *Bringing it all together*

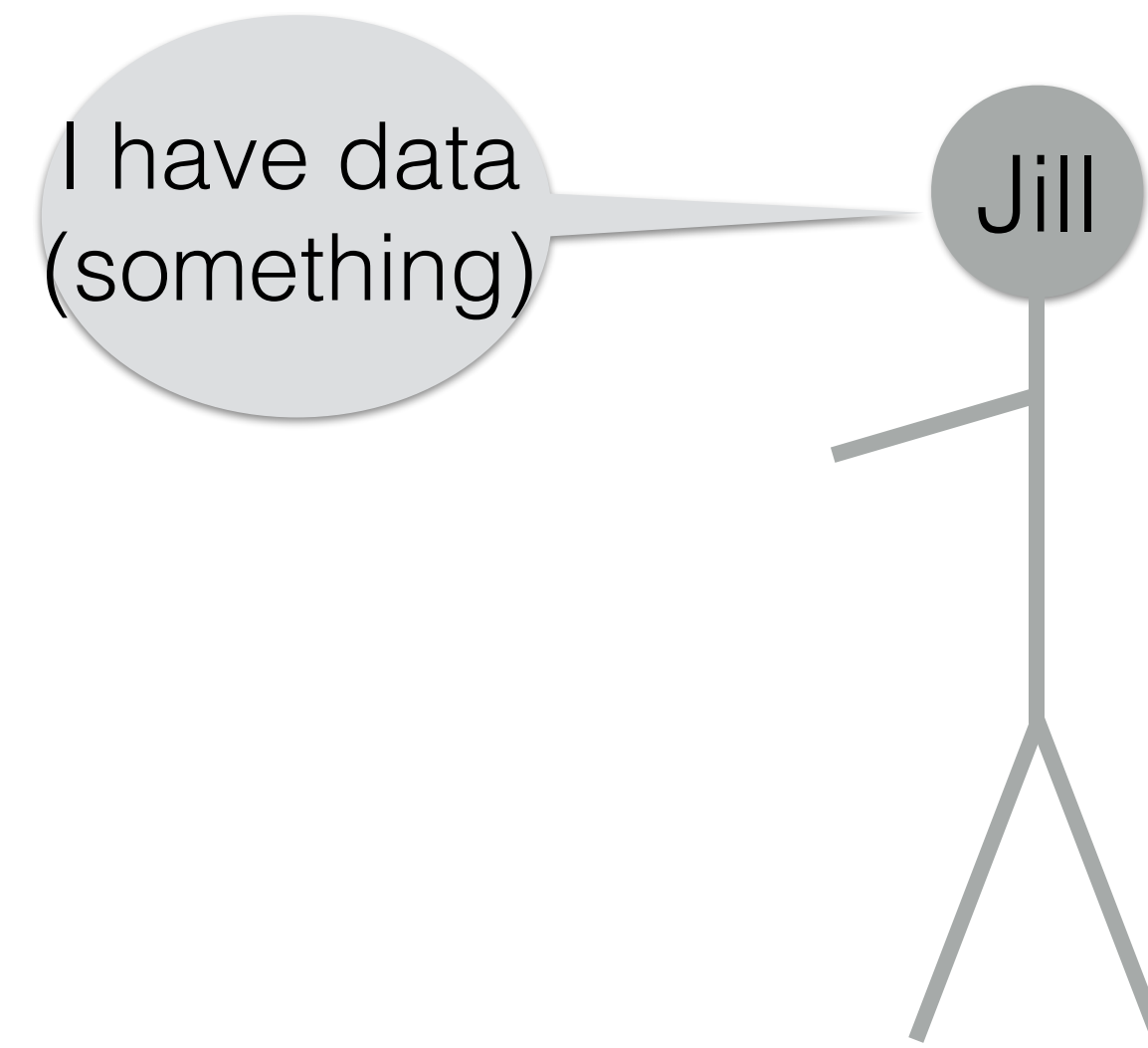
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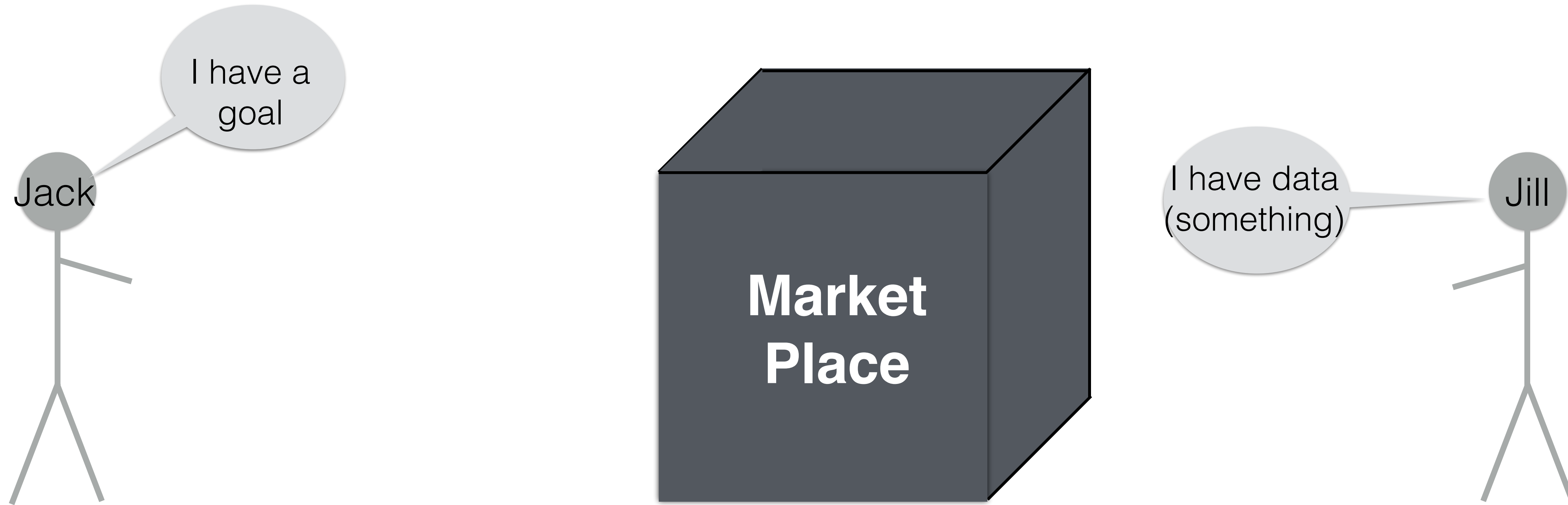
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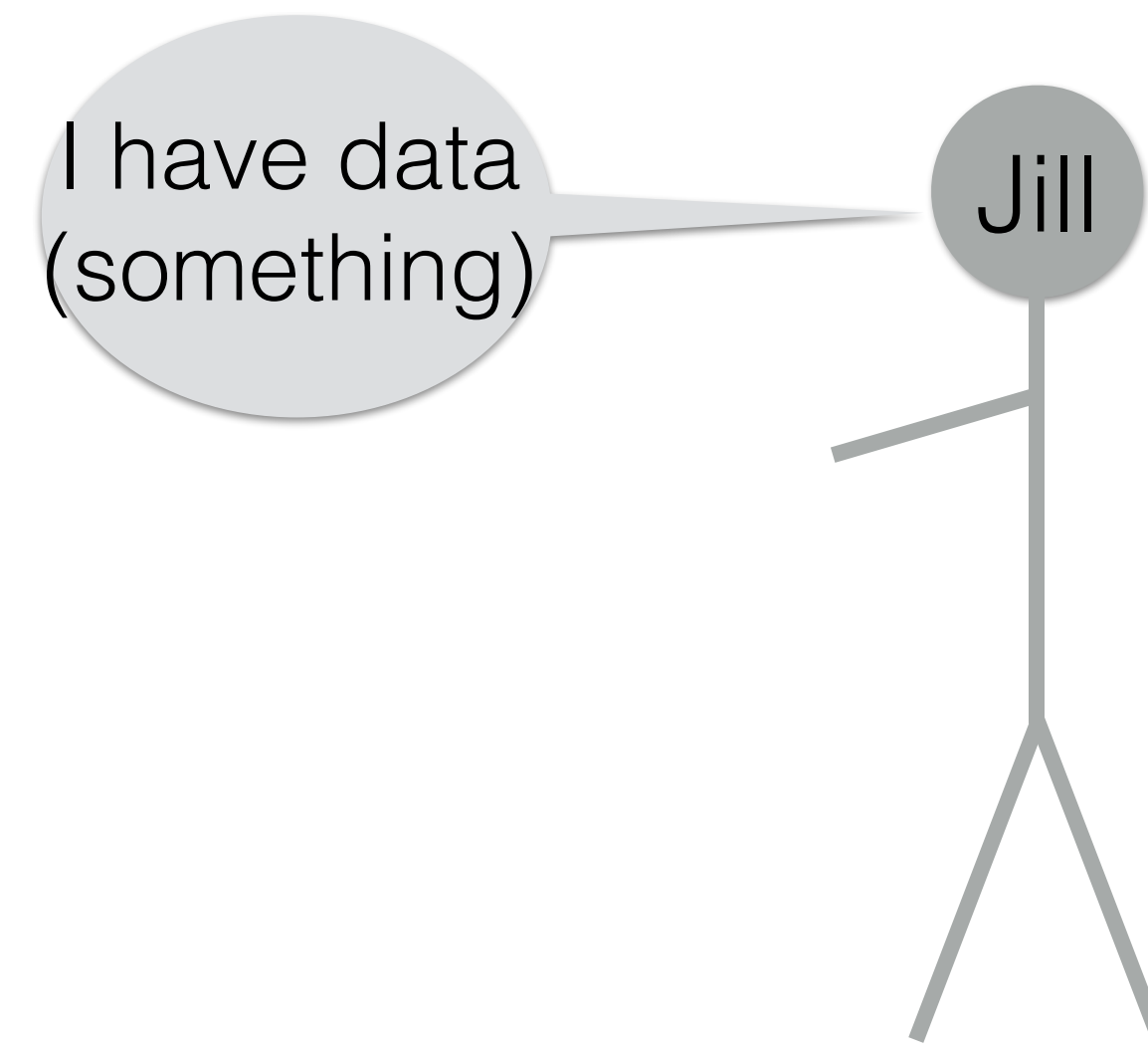
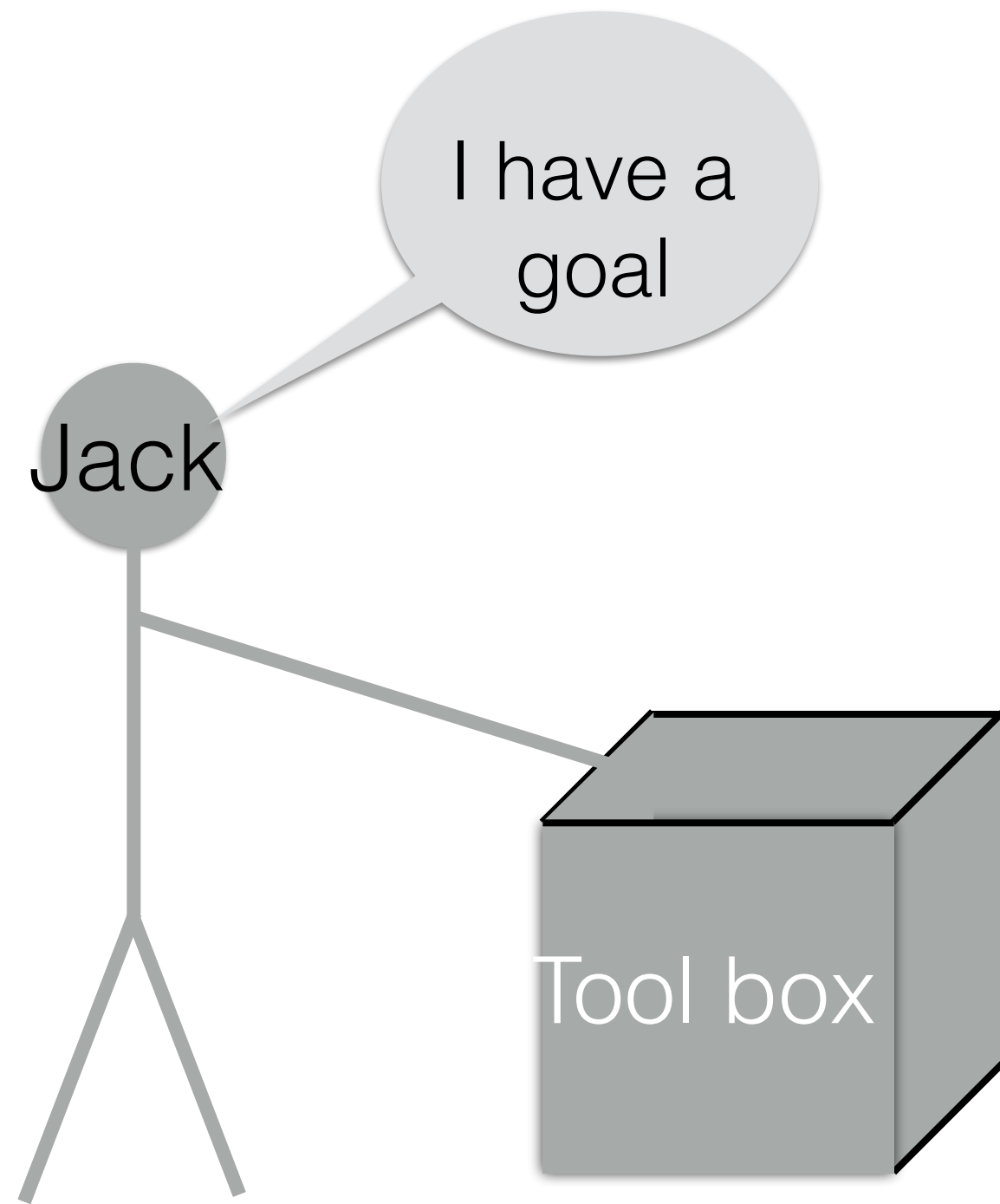
Expert-Based Approach

**Market
Place**

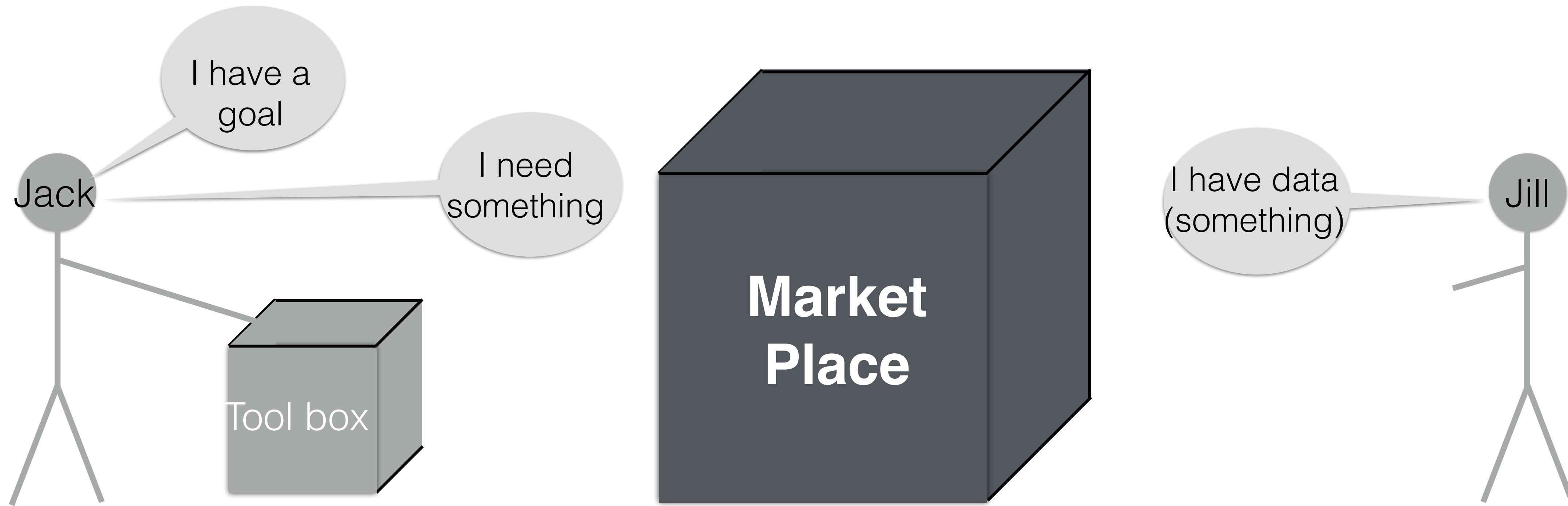
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Sustainability and Policy Making



The GEOSS Knowledge Base: *Bringing it all together*





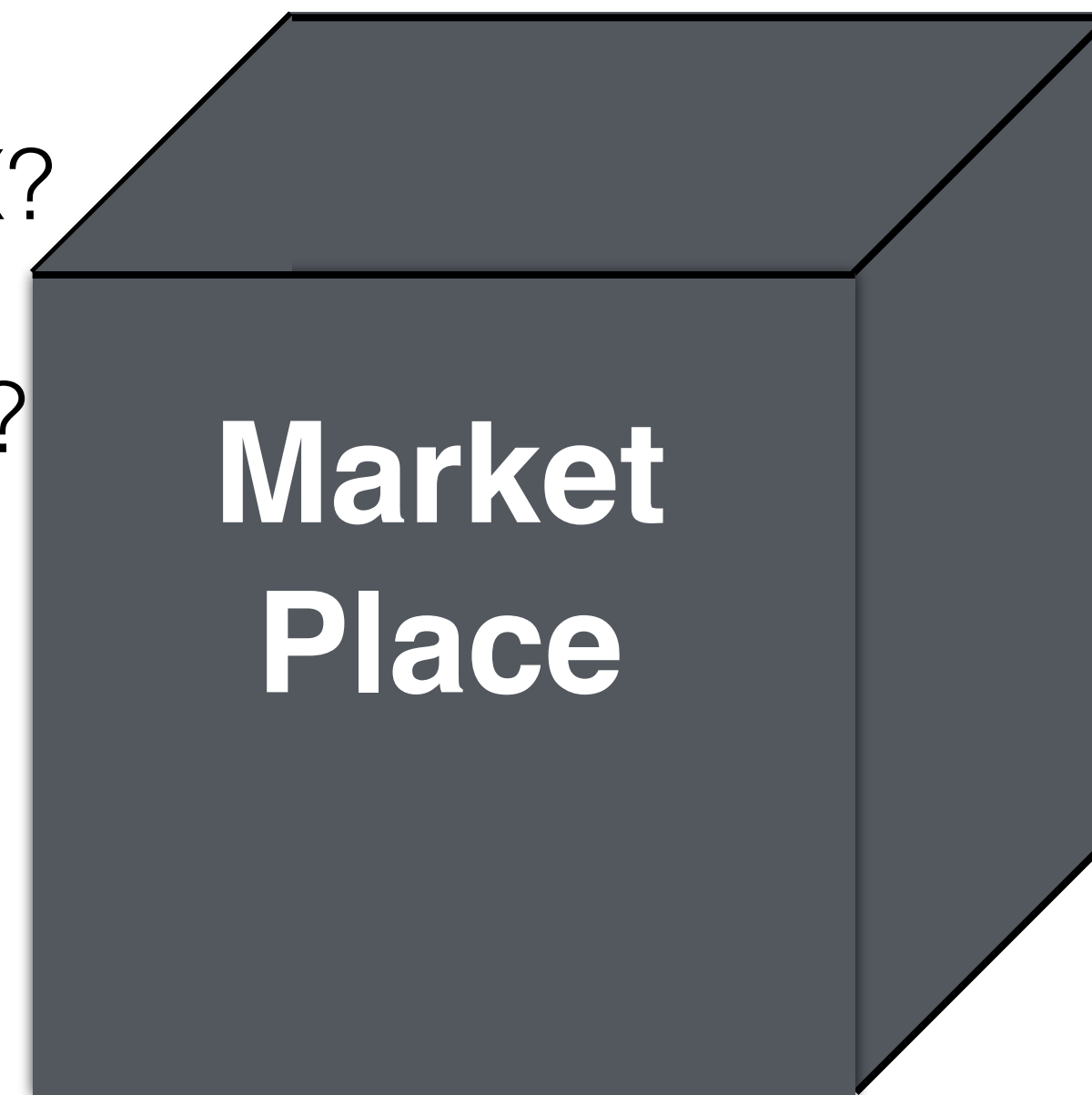
Questions (Qs)



Qs about “X is needed”:

- Who is Jack?
- With whom is Jack networking?
- How specific does Jack have to describe X?
- What does he need X for?
- What is the value of Jack having X?
- How can Jack find X?
- What is Jack willing to do to get X?

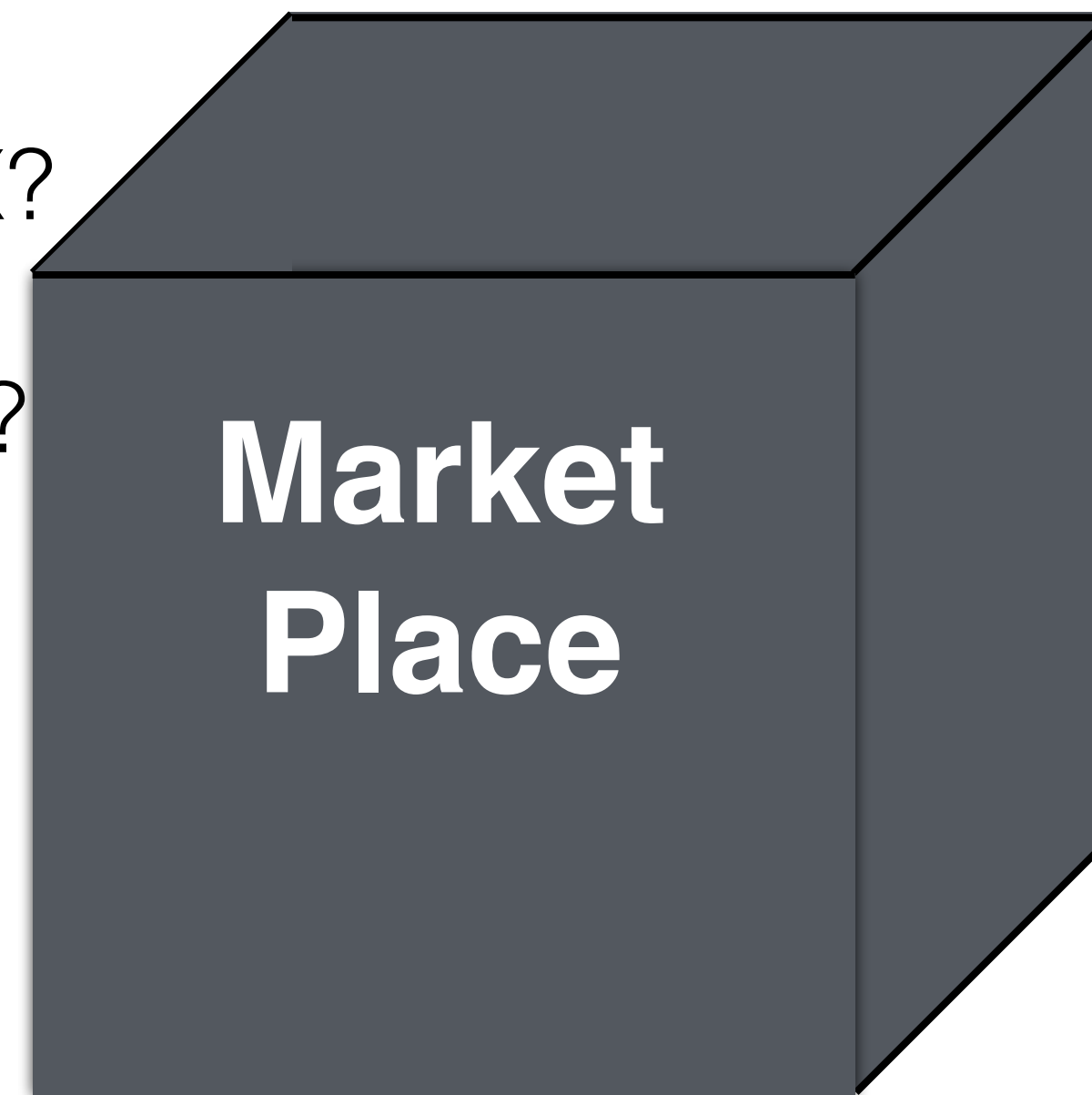
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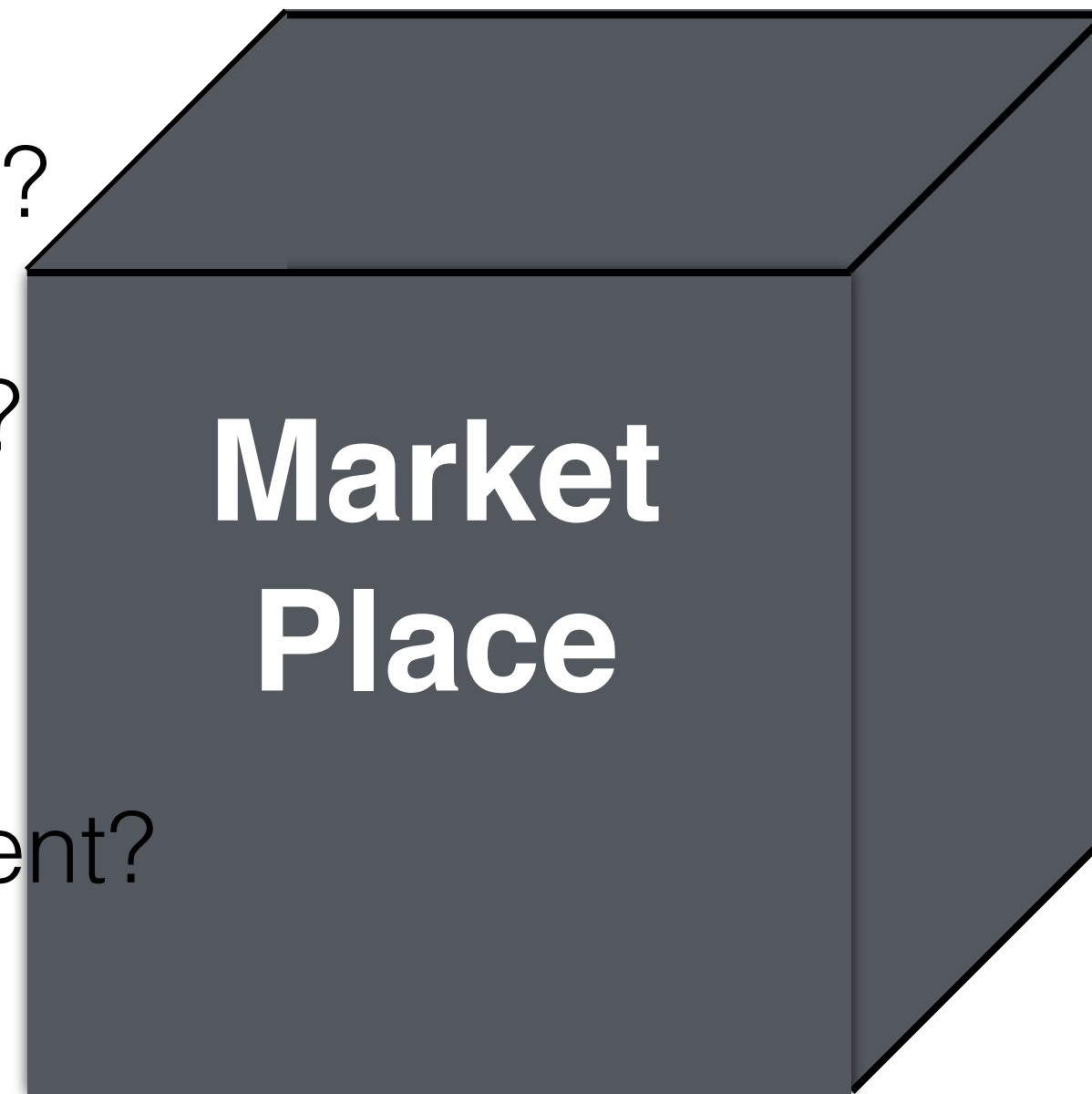
Qs about “There is Y”:

- How specific does Jill have to describe Y?
- What does Jill want for giving access to Y?
- How can Y be accessed?

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Questions (Qs)



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Questions about “Y matches X”:

- Does Y match X?
- Is the available information sufficient?
- Matching algorithm?

The GEOSS Knowledge Base: *Bringing it all together*

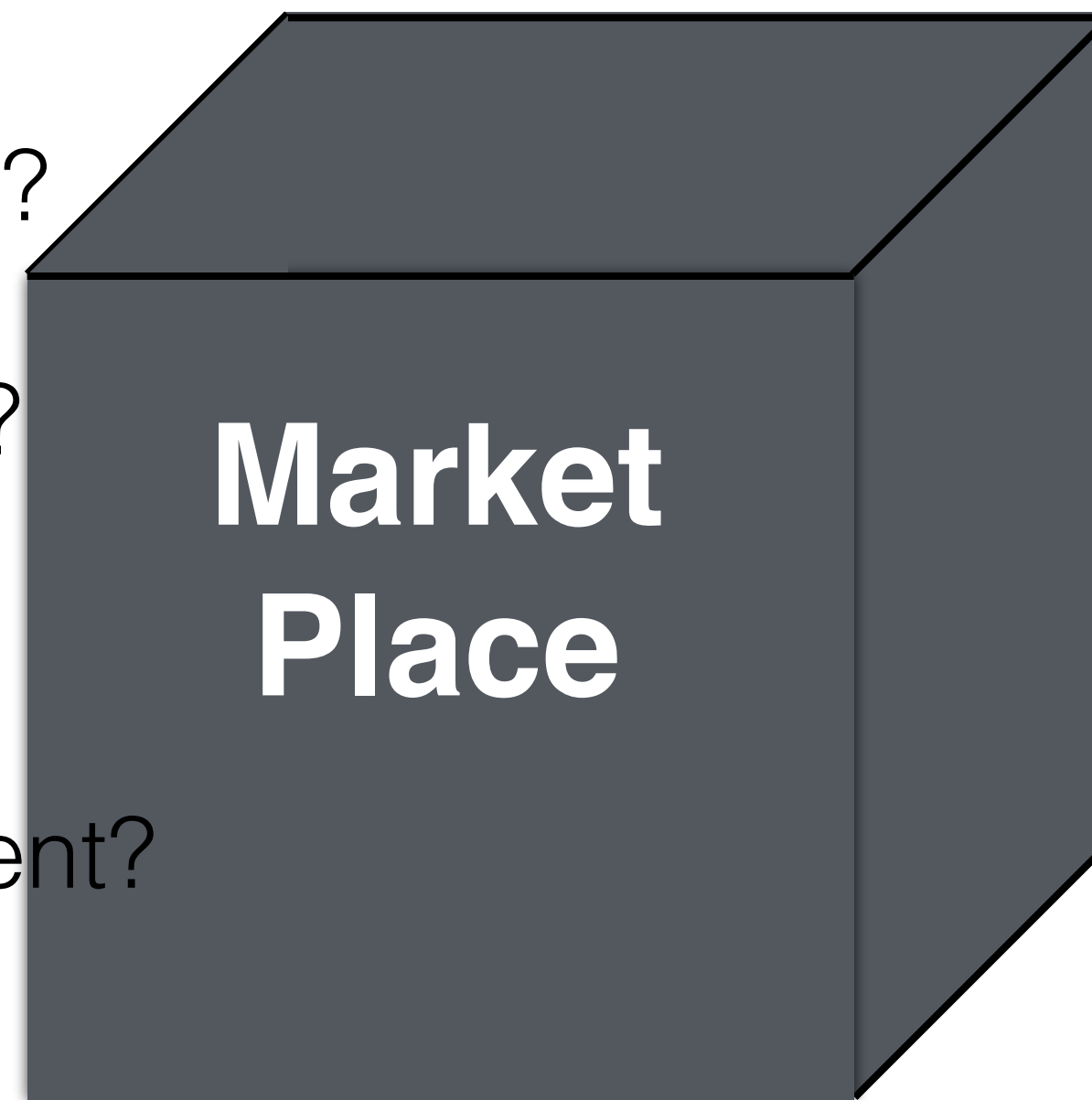
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Questions (Qs)



Qs about “There is Y”:

- How specific does Jill have to describe Y?
- What does Jill want for giving access to Y?
- How can Y be accessed?

Questions about “Connecting X and Y”:

- Connecting algorithm?
- Is there someone that can create X out of Y?

Sustainability and Policy Making

System State



Time

Sustainability and Policy Making

System State

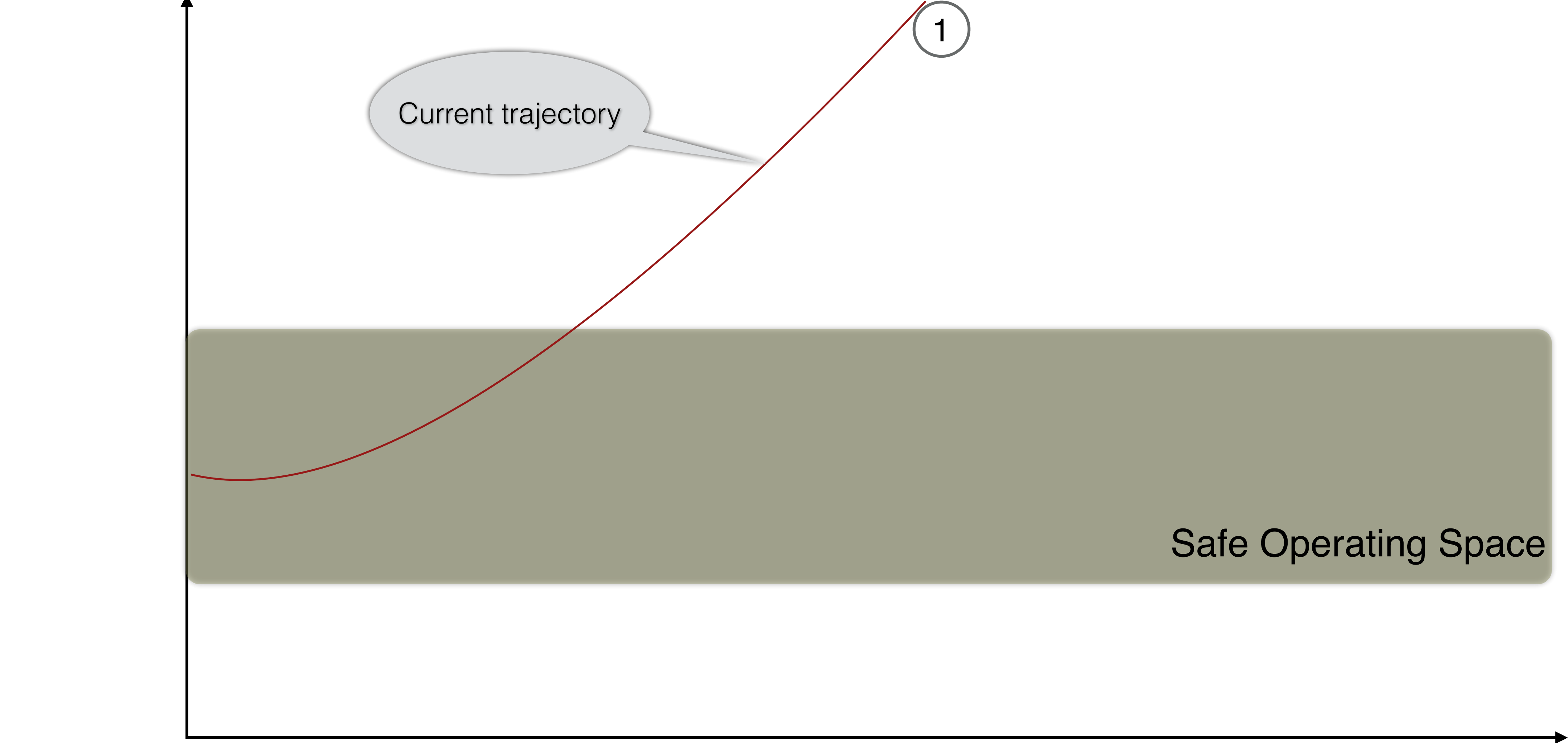


Safe Operating Space

Time

Sustainability and Policy Making

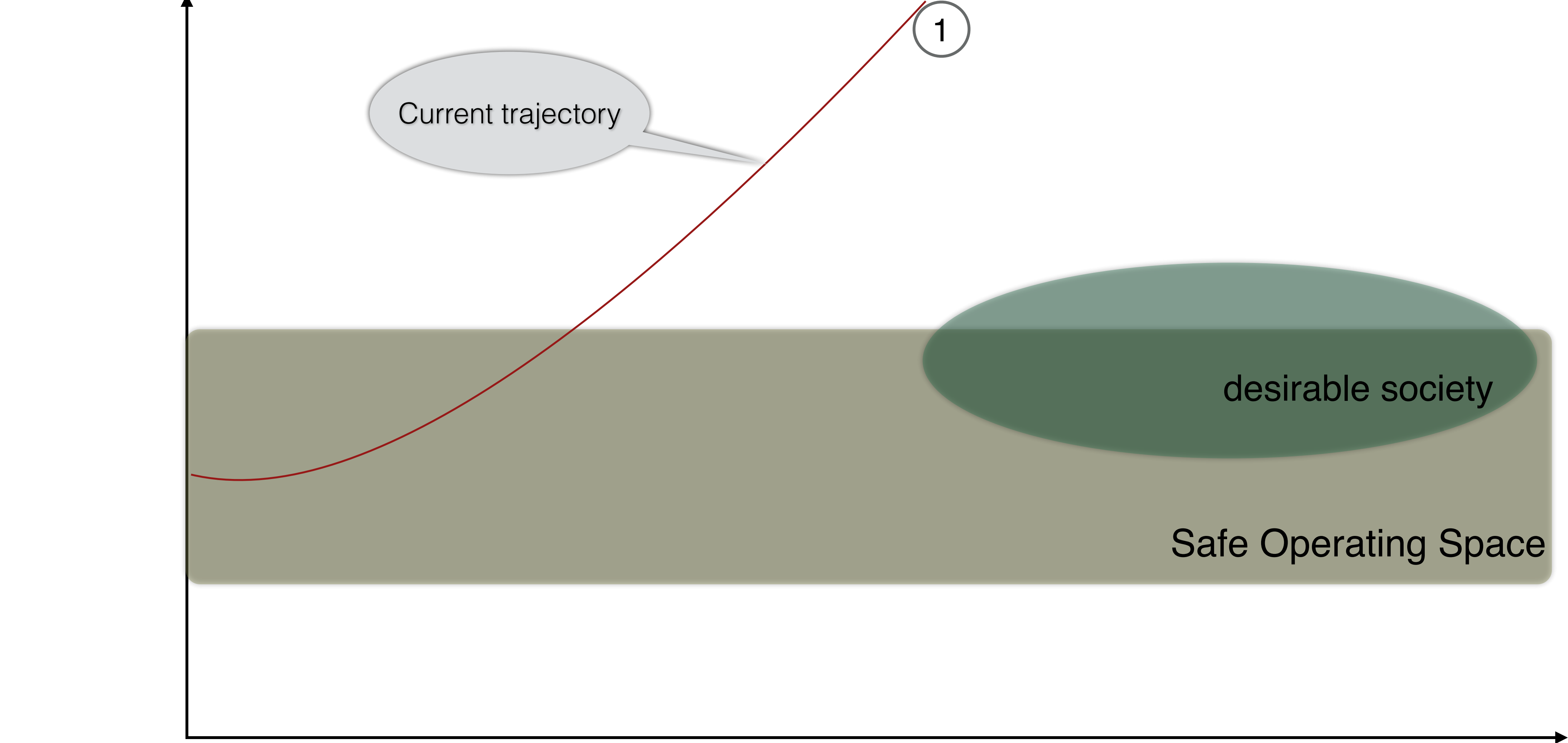
System State



Time

Sustainability and Policy Making

System State



Current trajectory

1

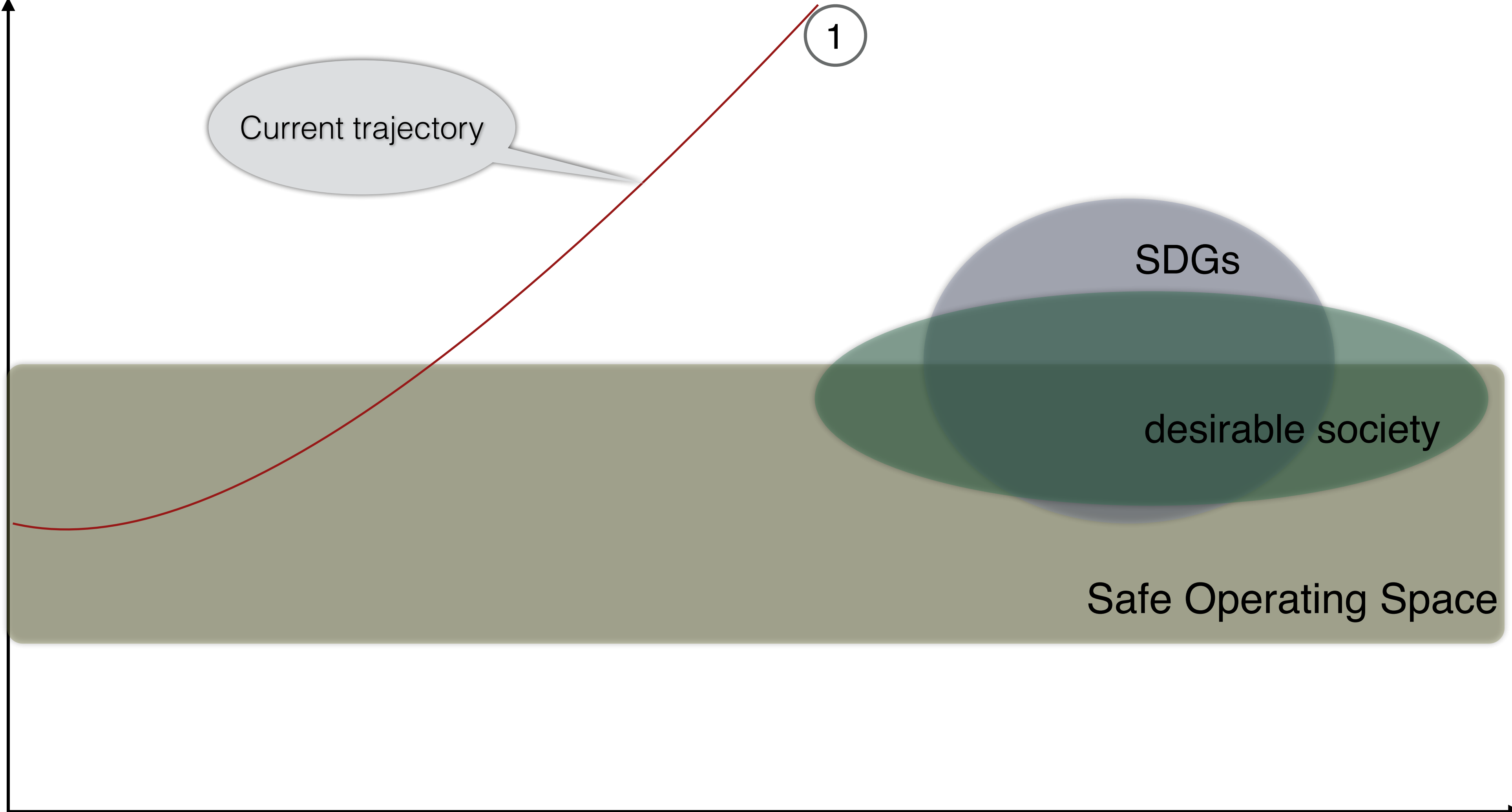
desirable society

Safe Operating Space

Time

Sustainability and Policy Making

System State



Current trajectory

1

SDGs

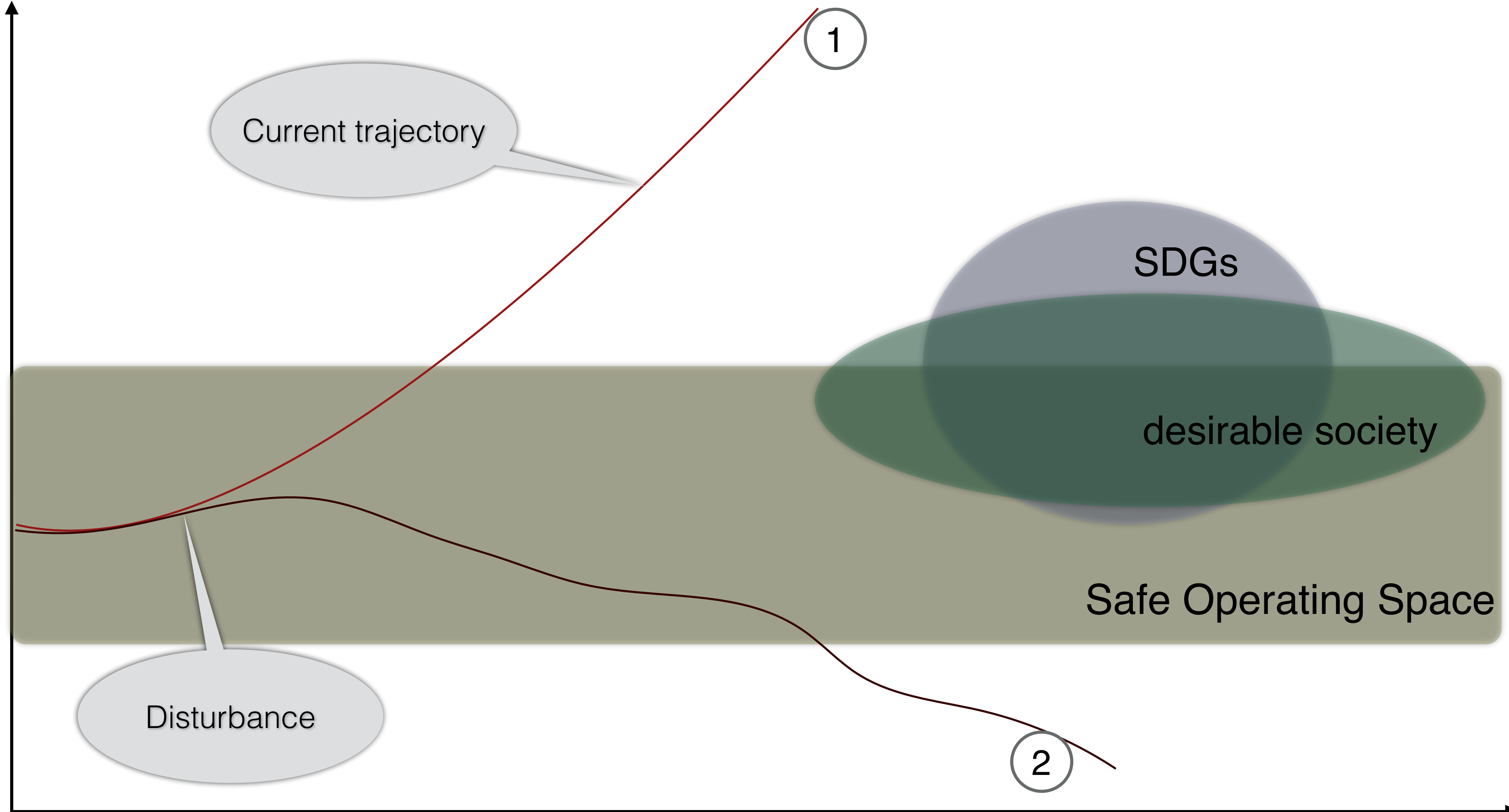
desirable society

Safe Operating Space

Time

Sustainability and Policy Making

System State



Current trajectory

1

SDGs

desirable society

Safe Operating Space

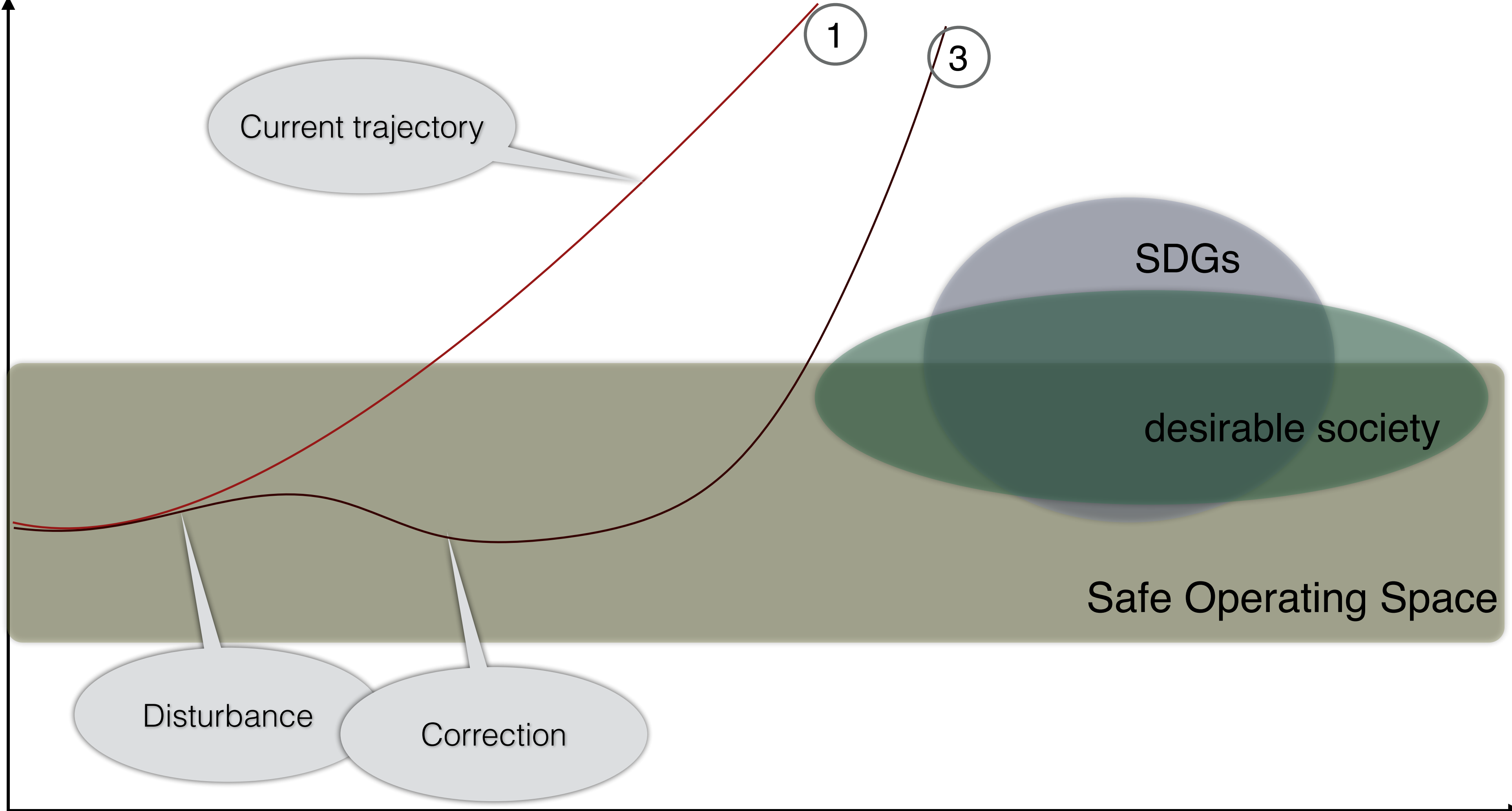
Disturbance

2

Time

Sustainability and Policy Making

System State



Current trajectory

1

3

SDGs

desirable society

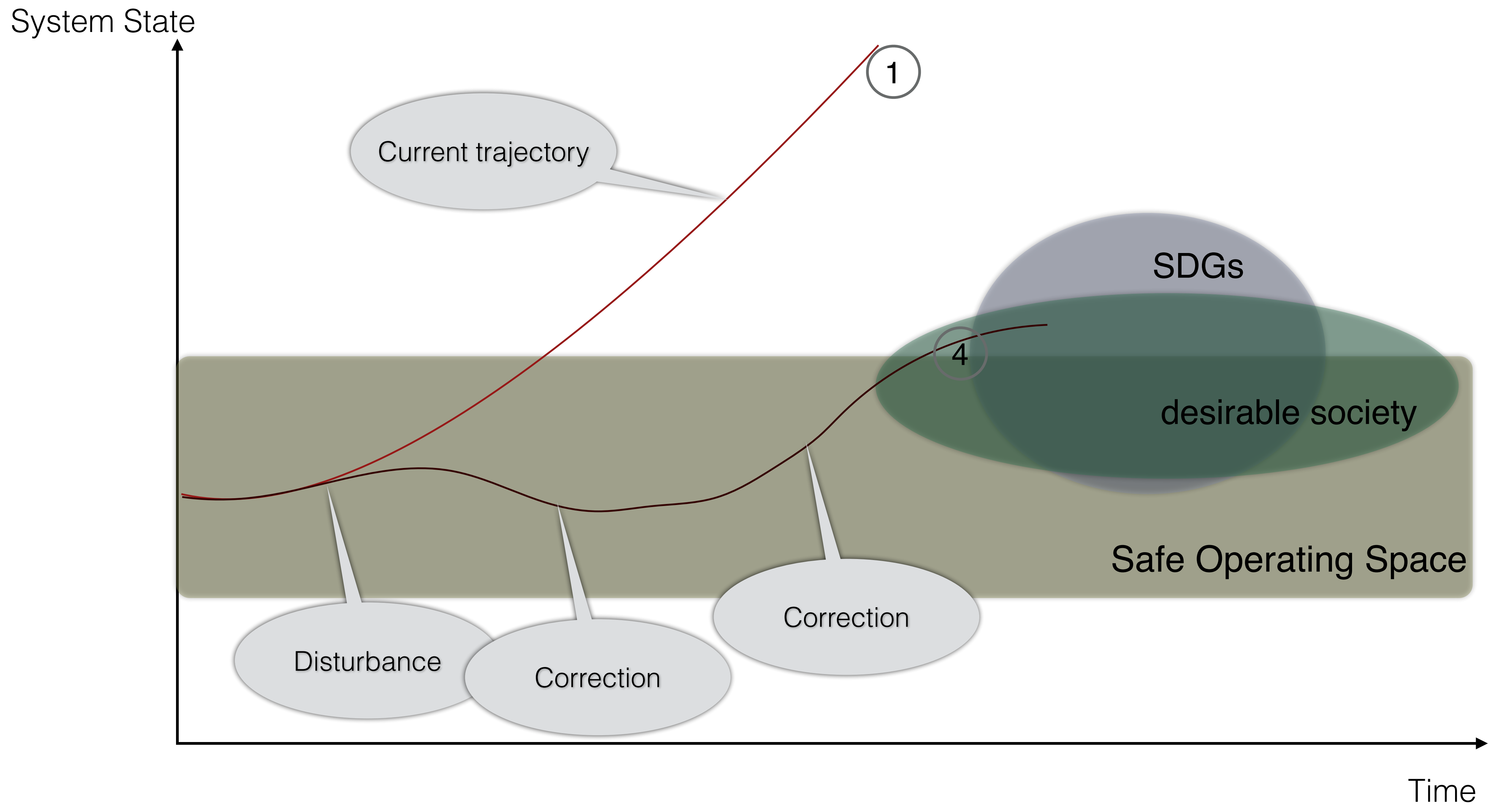
Safe Operating Space

Disturbance

Correction

Time

Sustainability and Policy Making



- What might happen?

- What might happen?
- Possible threads and hazards

- What might happen?
- Possible threads and hazards
- Knowing the system trajectory

- What might happen?
- Possible threads and hazards
- Knowing the system trajectory

} System Knowledge

System knowledge
Current state and trends

- What might happen?
- Possible threads and hazards
- Knowing the system trajectory
- What do we want to happen?

} System Knowledge

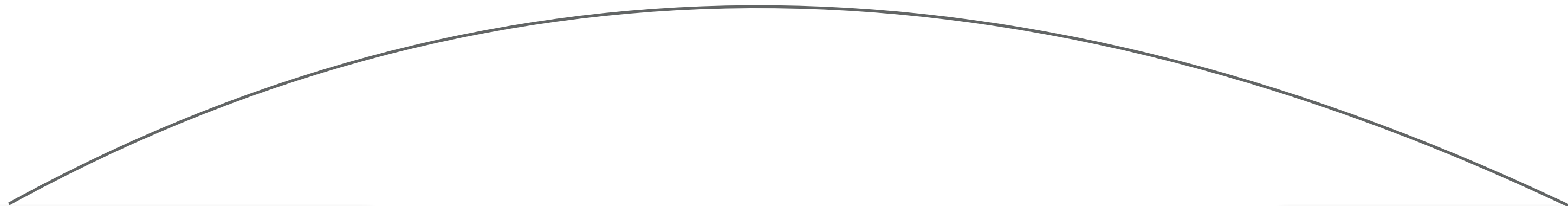
System knowledge
Current state and trends

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} System Knowledge
} Goal Knowledge

System knowledge
Current state and trends

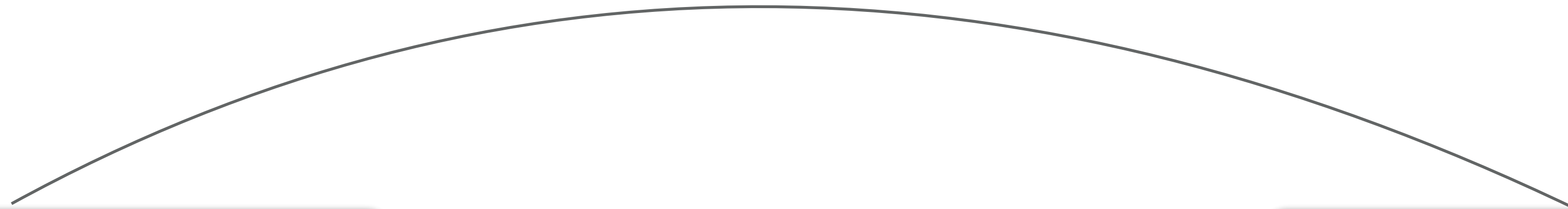
Goal knowledge
desirable future



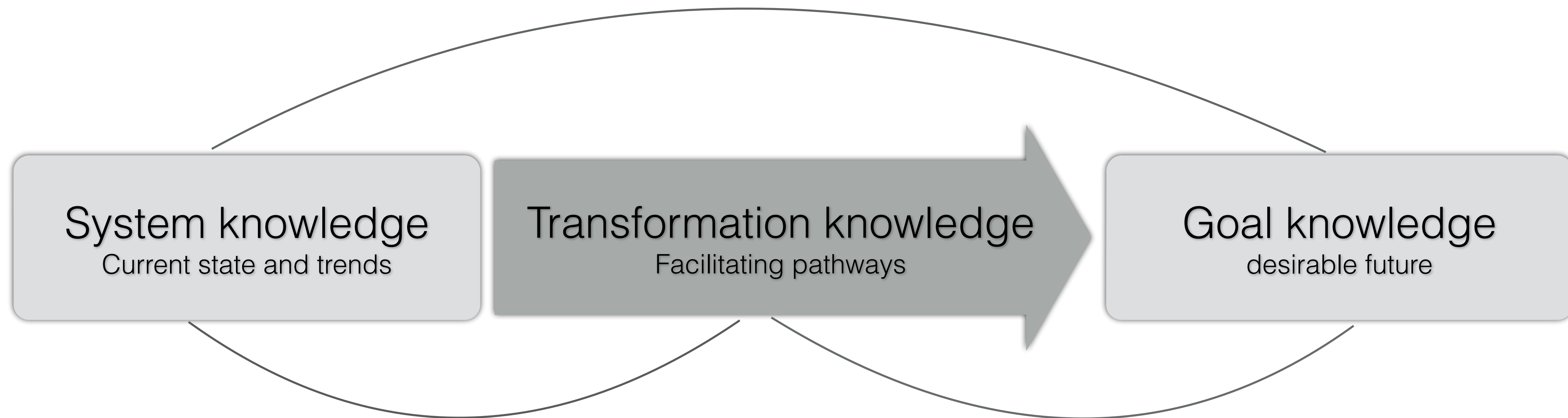
- What might happen?
 - Possible threads and hazards
 - Knowing the system trajectory
 - What do we want to happen?
 - How can we impact the system trajectory?
- } System Knowledge
- } Goal Knowledge

System knowledge
Current state and trends

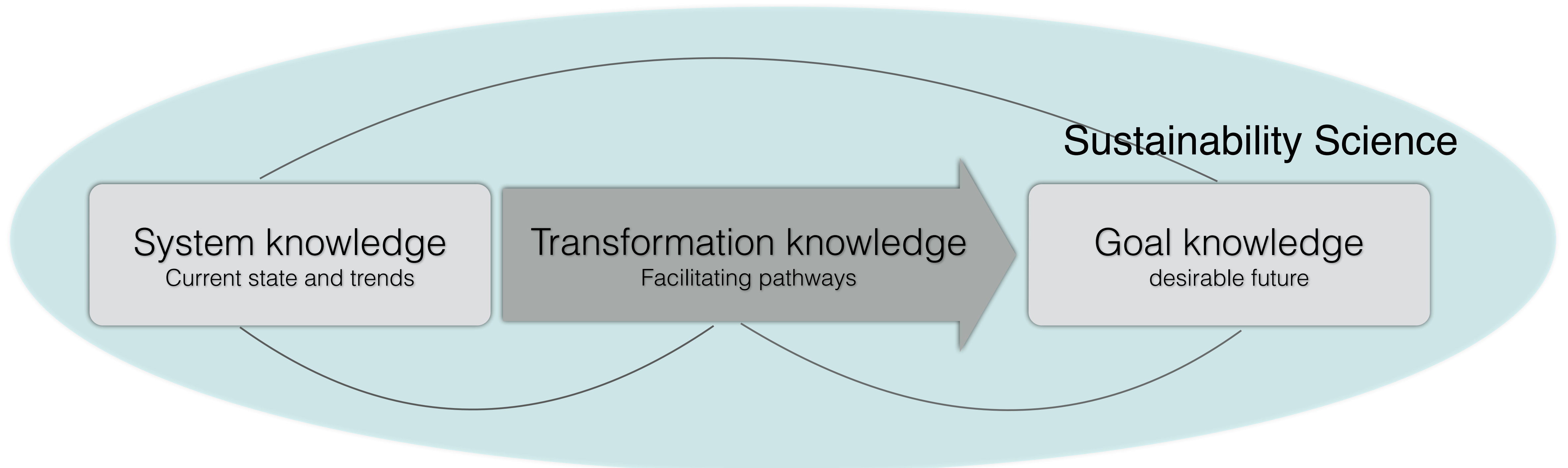
Goal knowledge
desirable future



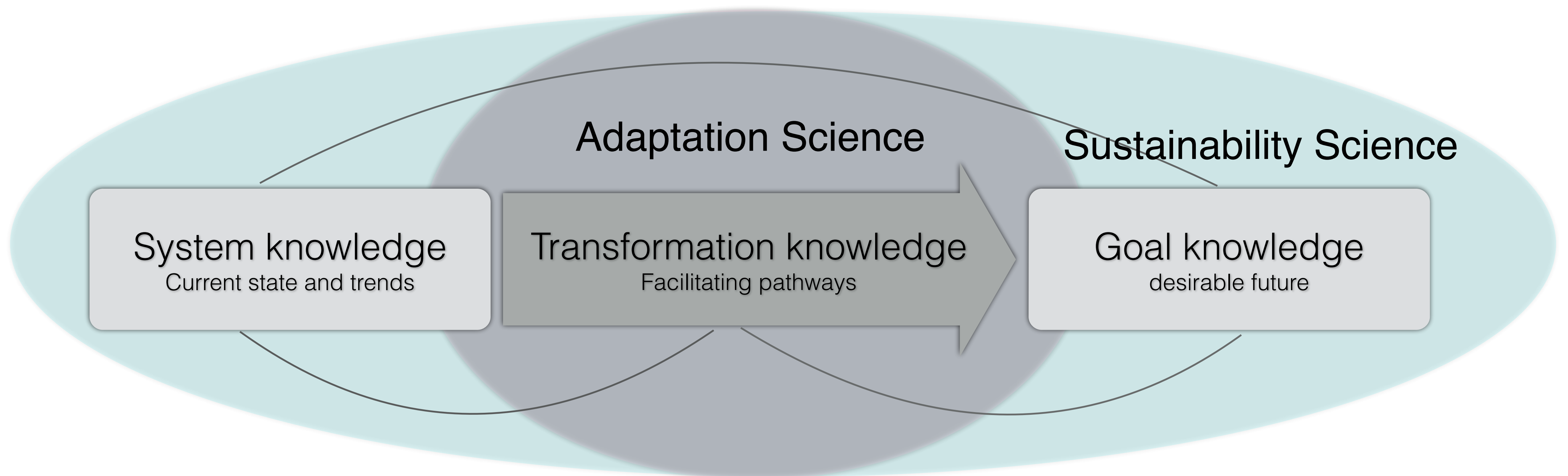
- What might happen?
 - Possible threads and hazards
 - Knowing the system trajectory
 - What do we want to happen?
 - How can we impact the system trajectory?
- } System Knowledge
- } Goal Knowledge
- } Transformation Knowledge



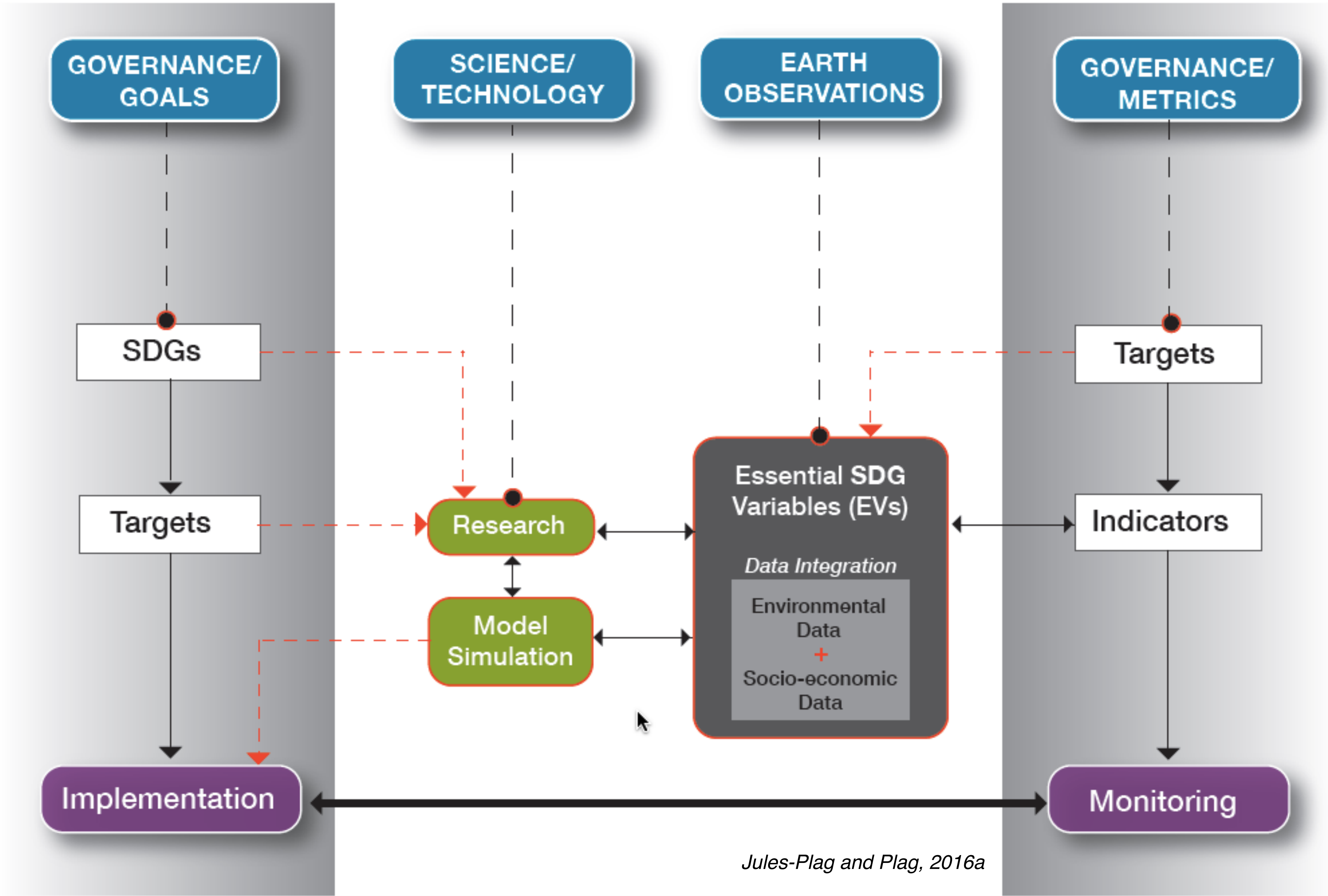
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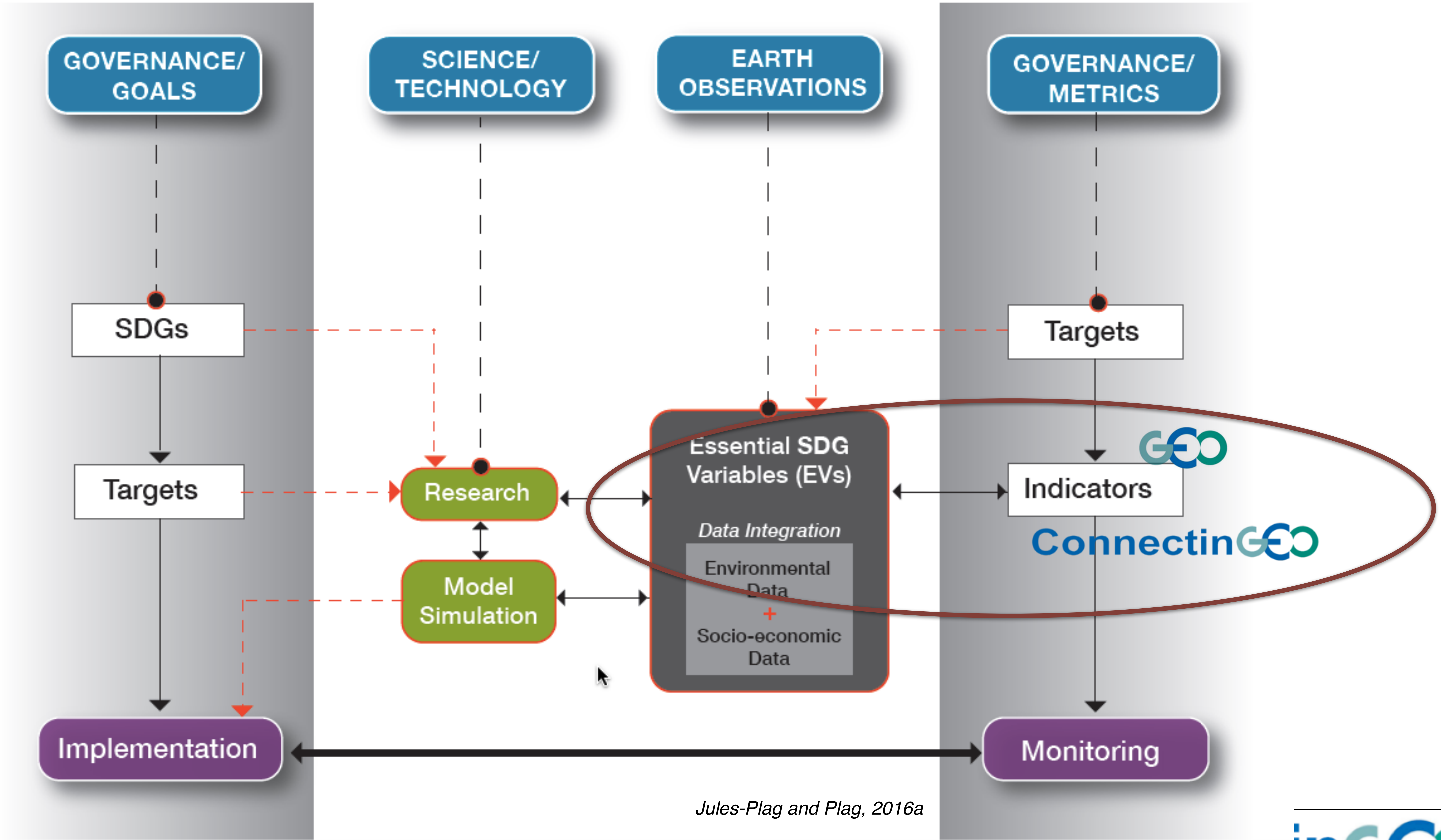


Support for Implementation and Monitoring of SDGs



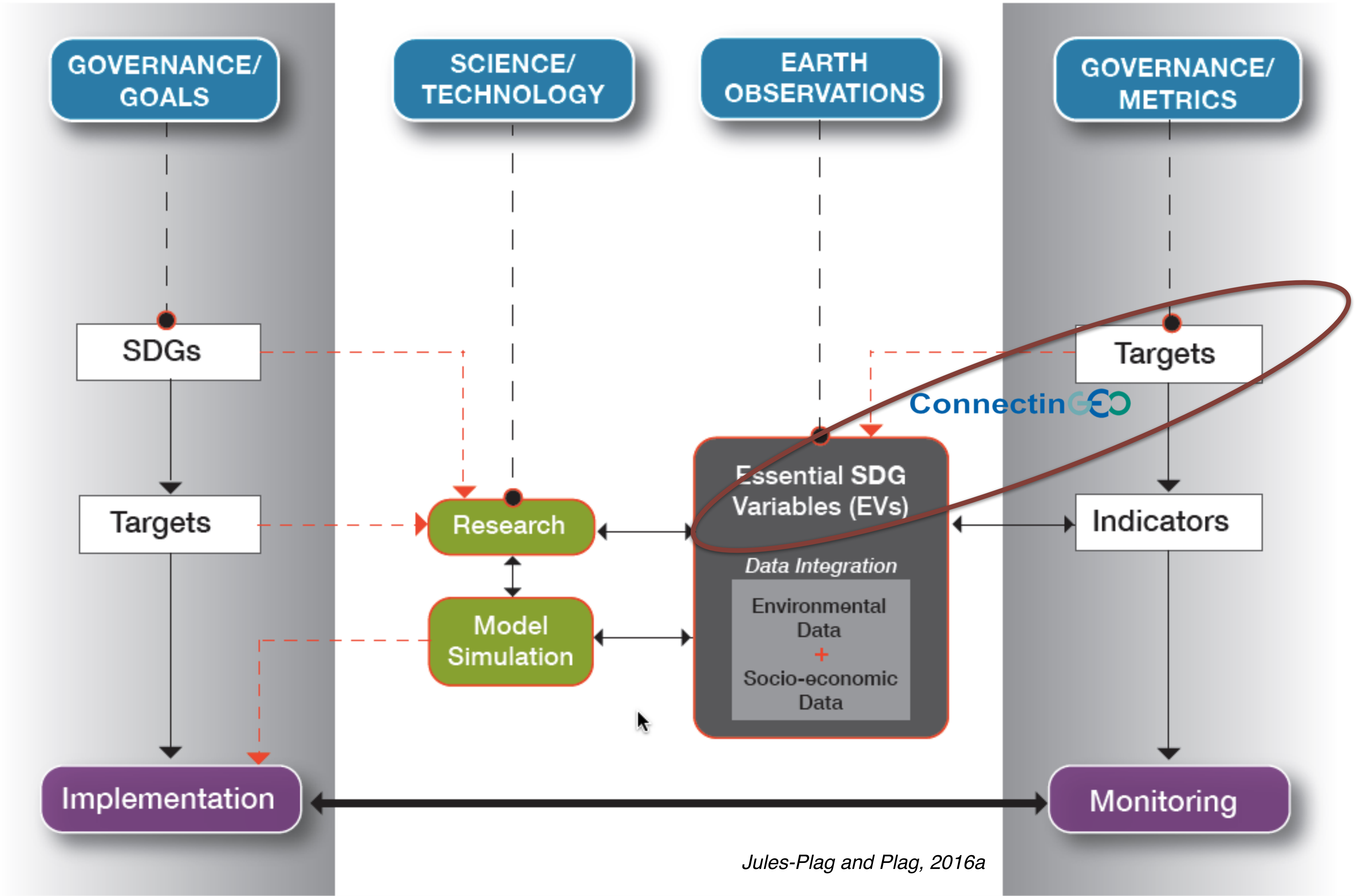
Jules-Plag and Plag, 2016a

Support for Implementation and Monitoring of SDGs



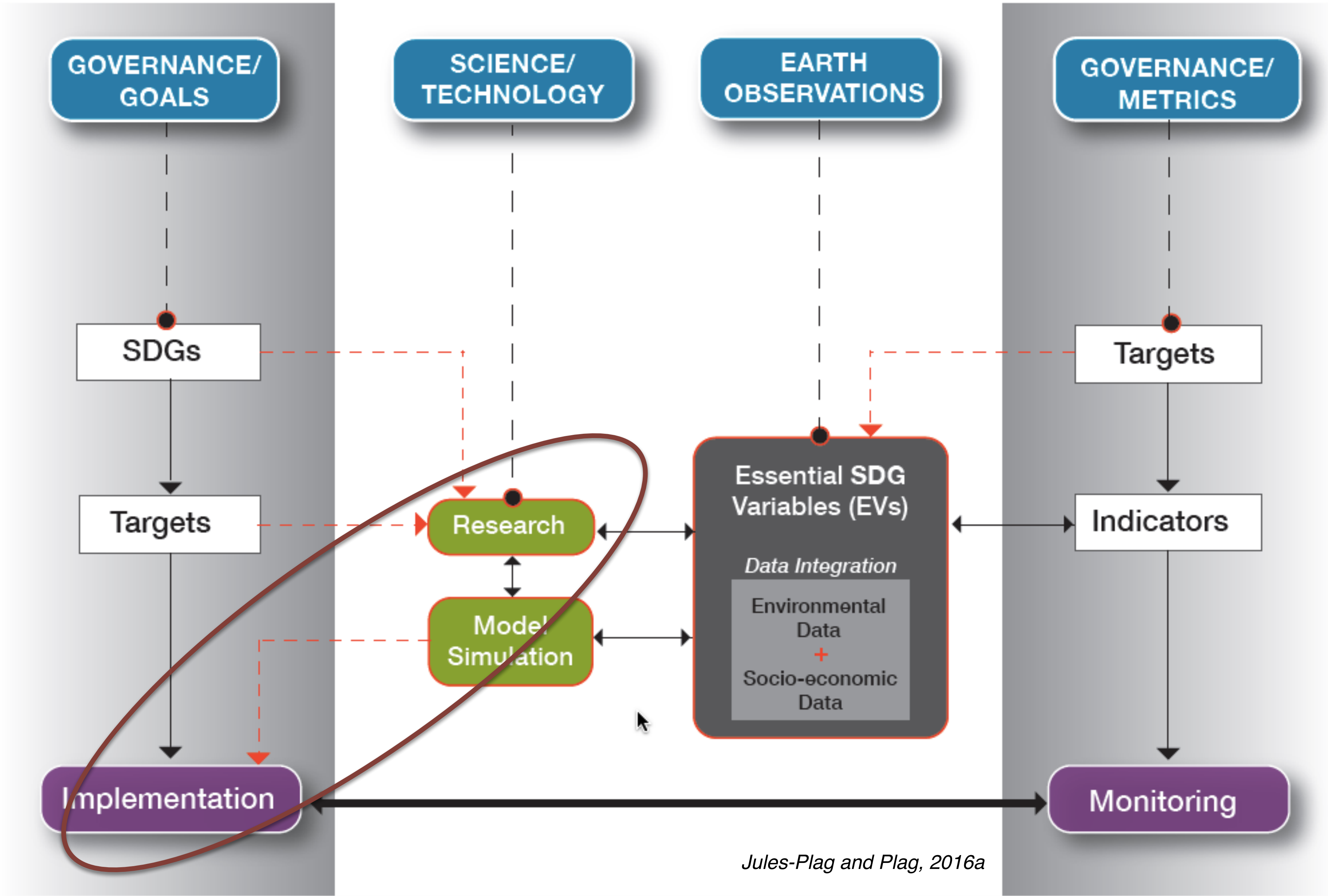
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Support for Implementation and Monitoring of SDGs



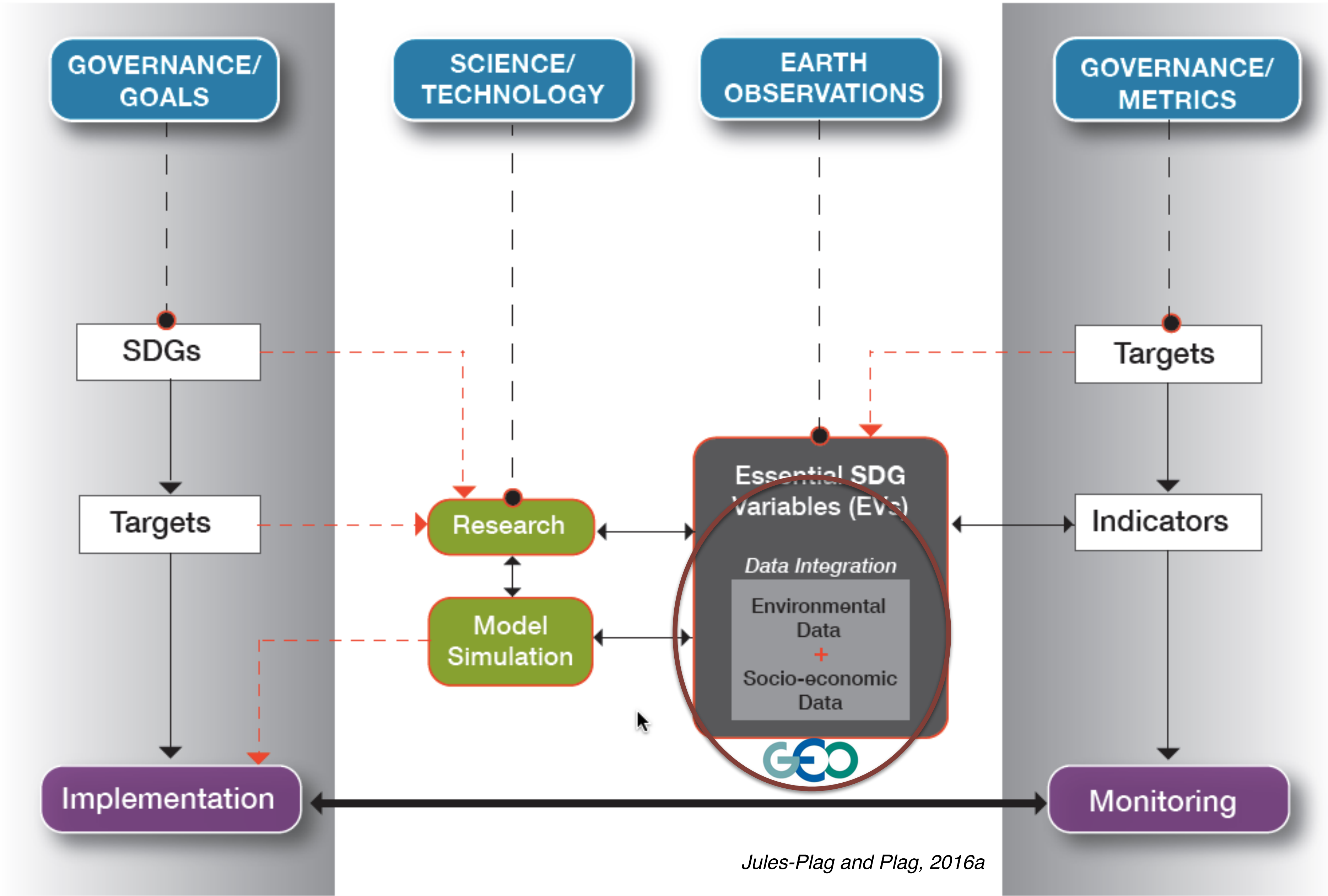
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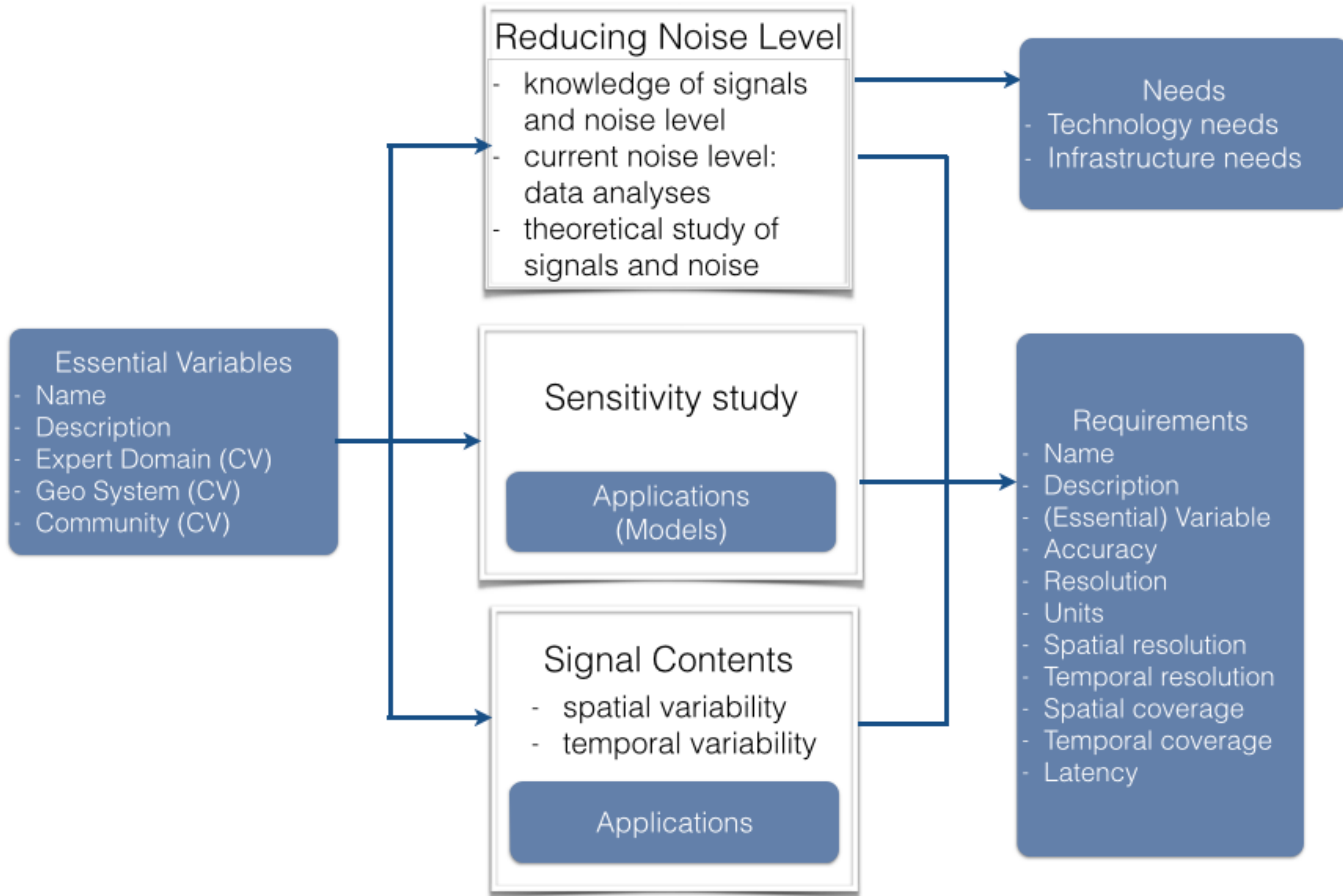
Jules-Plag and Plag, 2016a

Support for Implementation and Monitoring of SDGs

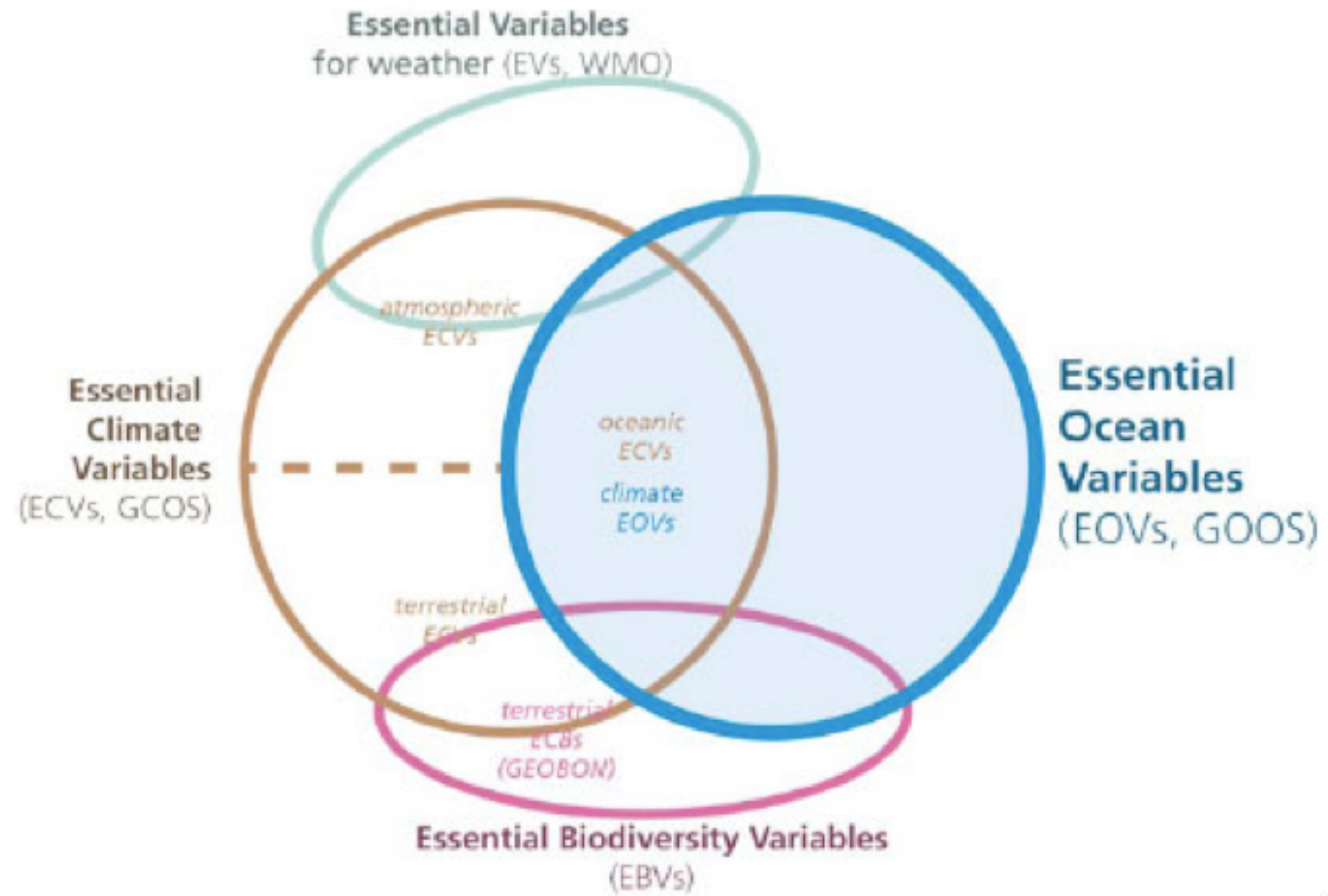


Jules-Plag and Plag, 2016a

From EVs to Requirements



EVs: Expert-Based Approach



EVs: Expert-Based Approach

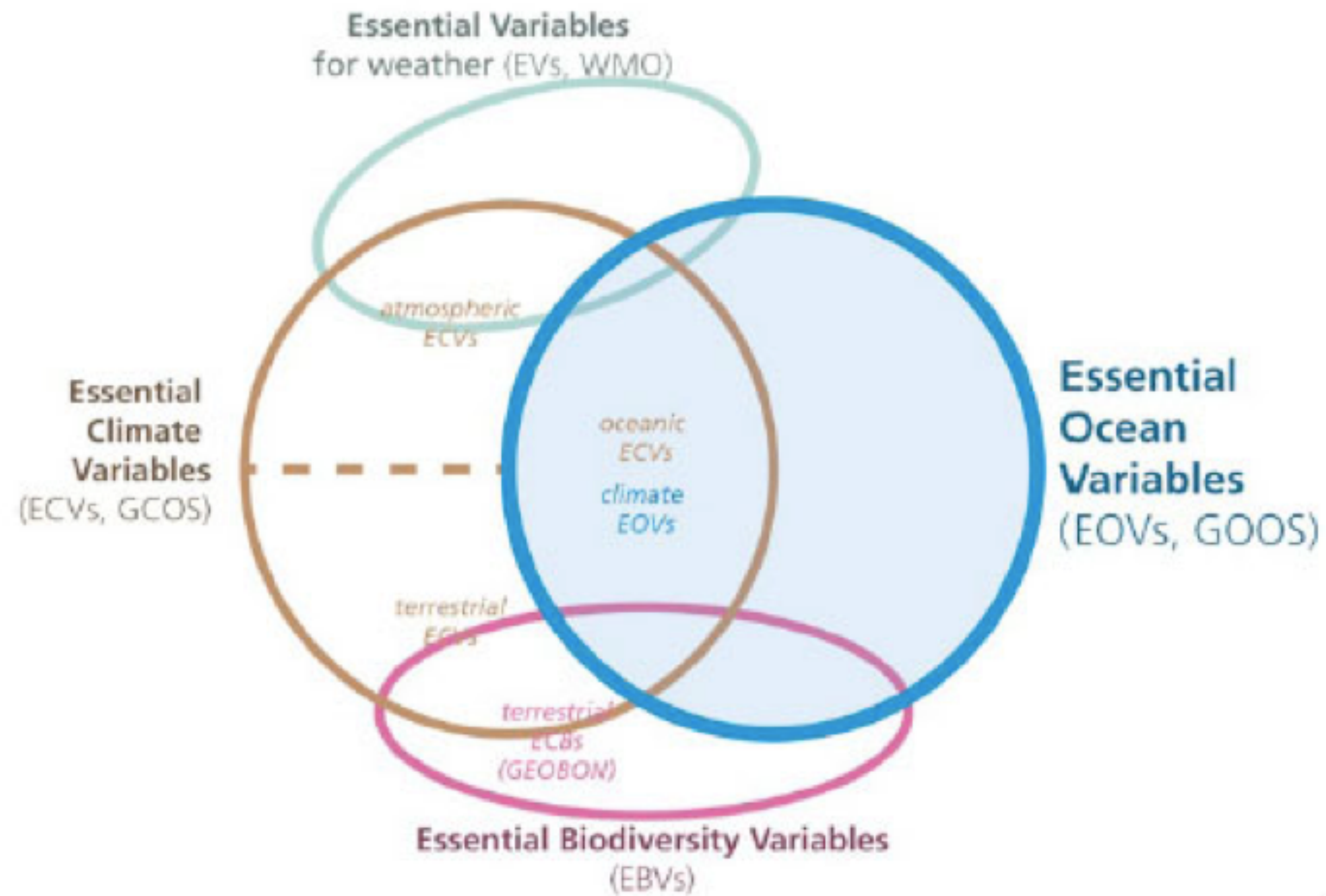


Table 1. Synthesis of EVs status

GEO New SBA (+ Climate)	Themes (according to the Bari's Workshop)	EV name	Domain and/or system component	Status of EV discussion (initial, medium, advanced)	Relevant communities, conventions, others initiatives	Other relevant GEO SBAs
Biodiversity and Ecosystem Sustainability	Biodiversity			Advanced	GEOBON, CBD, Ramsar Convention	
		Genetic composition (Co-ancestry, Allelic diversity, Population genetic differentiation, Breed and variety div.)				
		Species populations (Species distribution, Population abundance, Population structure by age/size class)				

EVs: Expert-Based Approach

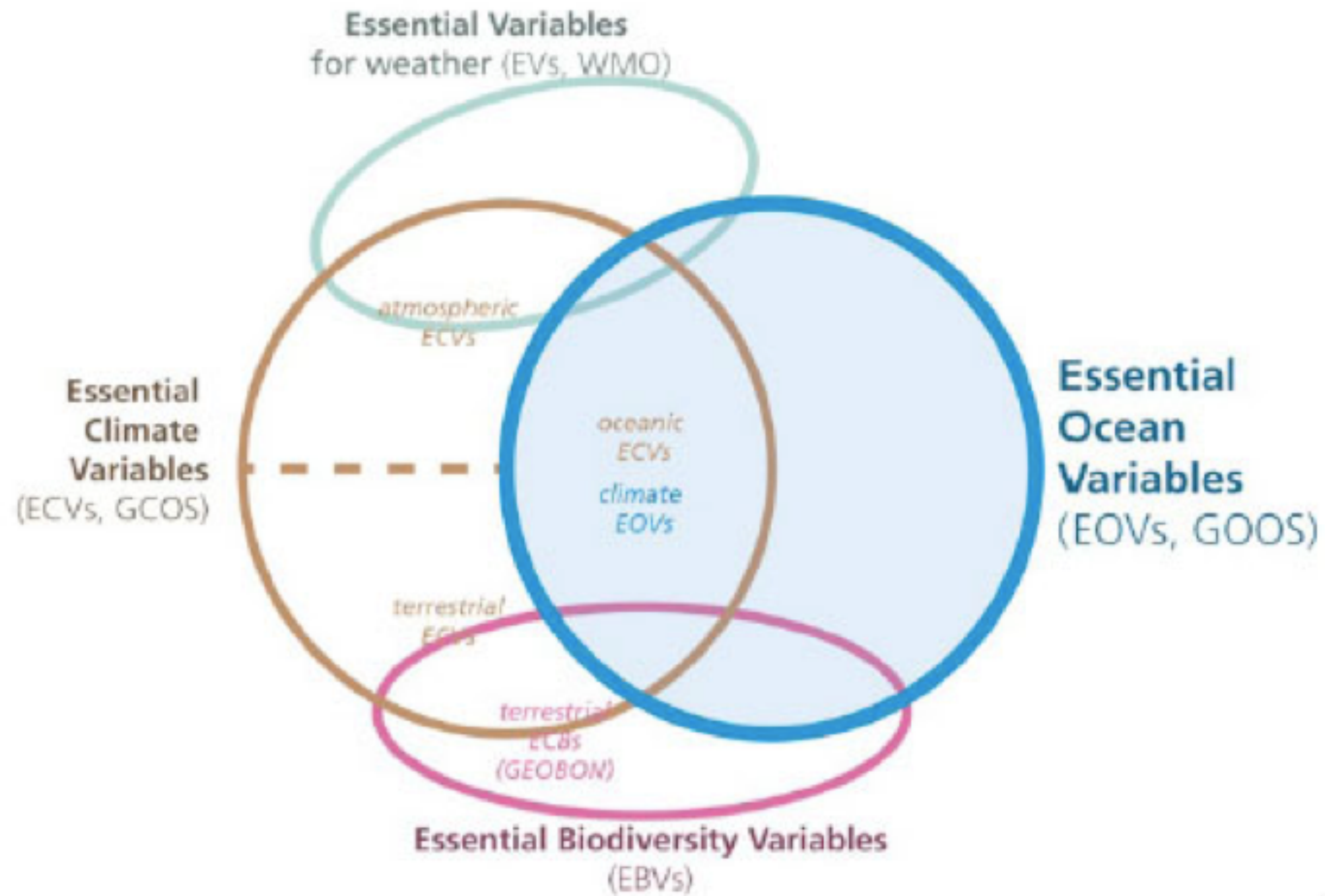
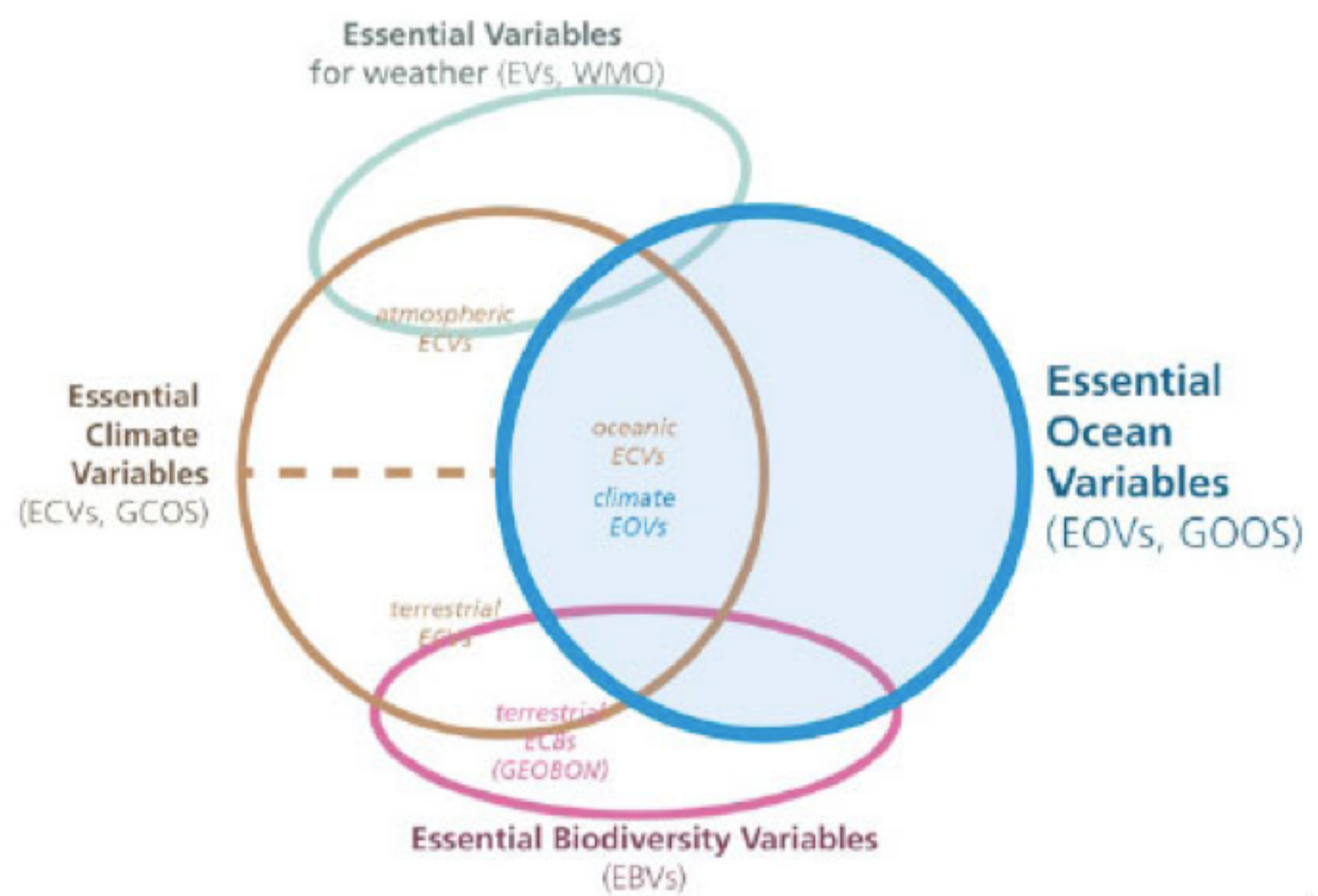


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Disaster Resilience	Disasters			Initial	Sendai Framework	
Energy and Mineral Resources Management	Energy			Initial	IRENA, IEA	
		Ocean (fixed and floating offshore wind, wave, tidal, currents, OTEC)	Ocean			Ocean
		Temperature (sea-surface, sub-surface and deep-sea)	Ocean			Biodiversity & Ecosystems, Ocean, Weather
		Bathymetry	Ocean (Renewable energy)			Ocean
		Current (speed, direction)	Ocean (Renewable energy)			Ocean
		Tidal (min, max, sea surface elevation)	Ocean (Renewable energy)			Ocean
		Wave (height, direction, period)	Ocean (Renewable energy)			Ocean
		Wind speed and direction	Ocean (Renewable energy)			Ocean

EVs: Expert-Based Approach



Jill agrees with Jill about what is essential

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Jill tries to find out what Jack needs

GEO GI-18:

Earth Observations in Service of the
2030 Agenda for Sustainable
Development

Jill tries to find out what Jack needs

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EARTH OBSERVATION AND GEOSPATIAL INFORMATION RESOURCES FOR SDG MONITORING



	Population distribution	Cities and infrastructure mapping	Elevation and topography	Land cover and use mapping	Oceanographic observations	Hydrological and water quality observations	Atmospheric and air quality monitoring	Biodiversity and ecosystem observations	Agricultural Monitoring	Hazards, disasters and environmental impact monitoring
1 No poverty										
2 Zero hunger										
3 Good health and well-being										
4 Quality education										
5 Gender equality										
6 Clean water and sanitation										
7 Affordable and clean energy										
8 Decent work and economic growth										
9 Industry, Innovation and Infrastructure										
10 Reduced Inequalities										
11 Sustainable cities and communities										
12 Responsible consumption and production										
13 Climate action										
14 Life below water										
15 Life on land										
16 Peace, Justice and strong Institutions										
17 Partnerships for the goals										

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- Hazards, disasters and environmental impact monitoring

For more information please contact:

GEO Secretariat – 7 bis, avenue de la Paix, CP 2300 – CH-1211 Geneva 2, Switzerland

E-mail: secretariat@geosec.org – Telephone: +41 (0) 22 730 85 05

www.earthobservations.org

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Many other GEO Initiatives are including SDG monitoring in their implementation plan

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EVs: Goal-Based Approach

SDG



Target

Target 6.3: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Indicator

6.3.1 Percentage of wastewater safely treated

6.3.2 Percentage of bodies of water with good ambient water quality

Jill, can you provide...?

Essential Variable

Water usage
Wastewater treated

Water quality

Jack wants ...

Governance/policy

Socio-Economic

Infrastructure

Environmental

Jules-Plag and Plag, 2016b

EVs: Goal-Based Approach

SDG



Target

1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance

Indicator

1.4.1* Proportion of the population living in households with access to basic services

Essential Variable

Water Supply S.

Electricity Supply S.

Sewage S.

...

Communication S.

Public Health S.

Governance/policy

Socio-Economic

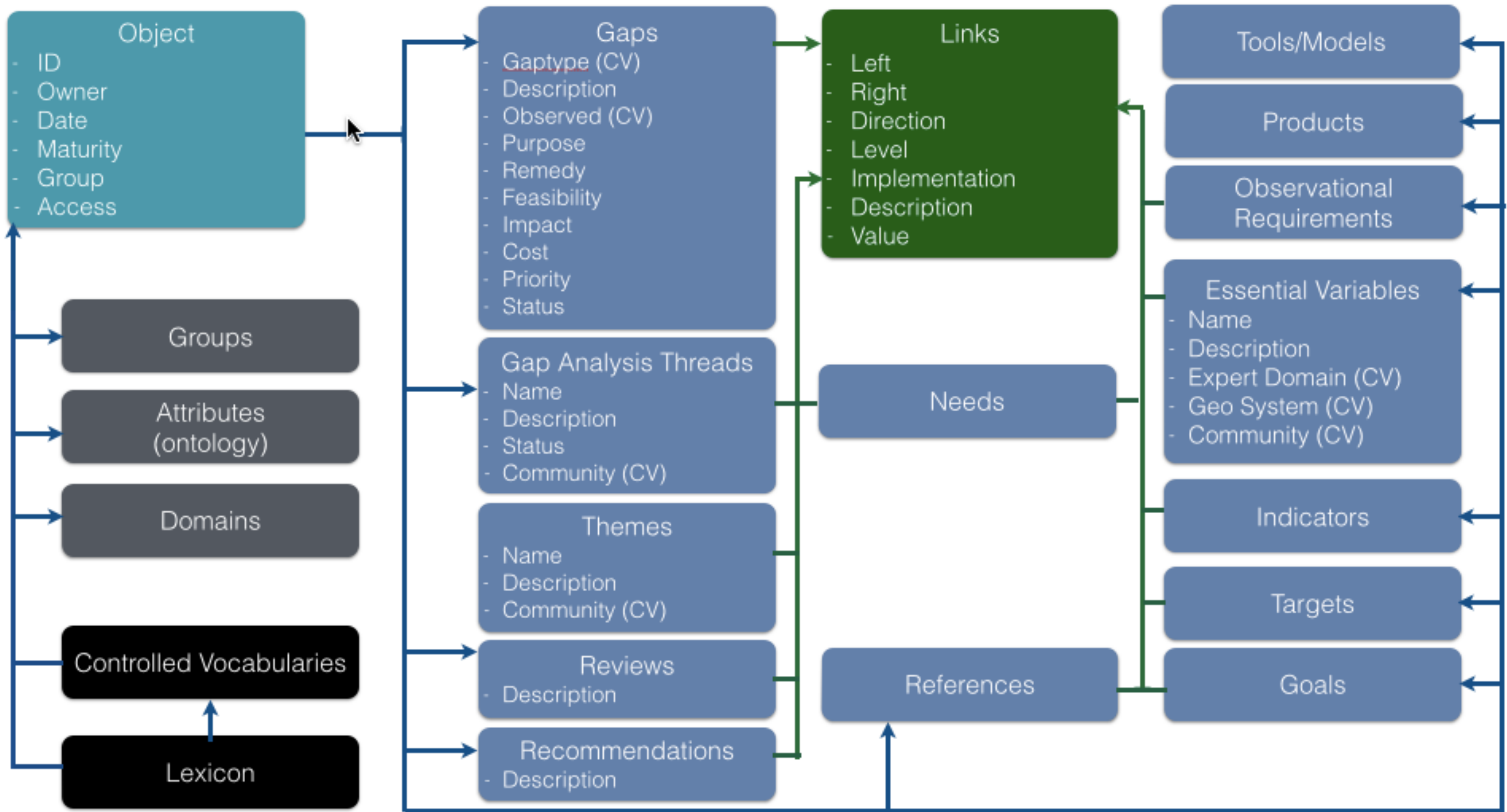
Infrastructure

Environmental

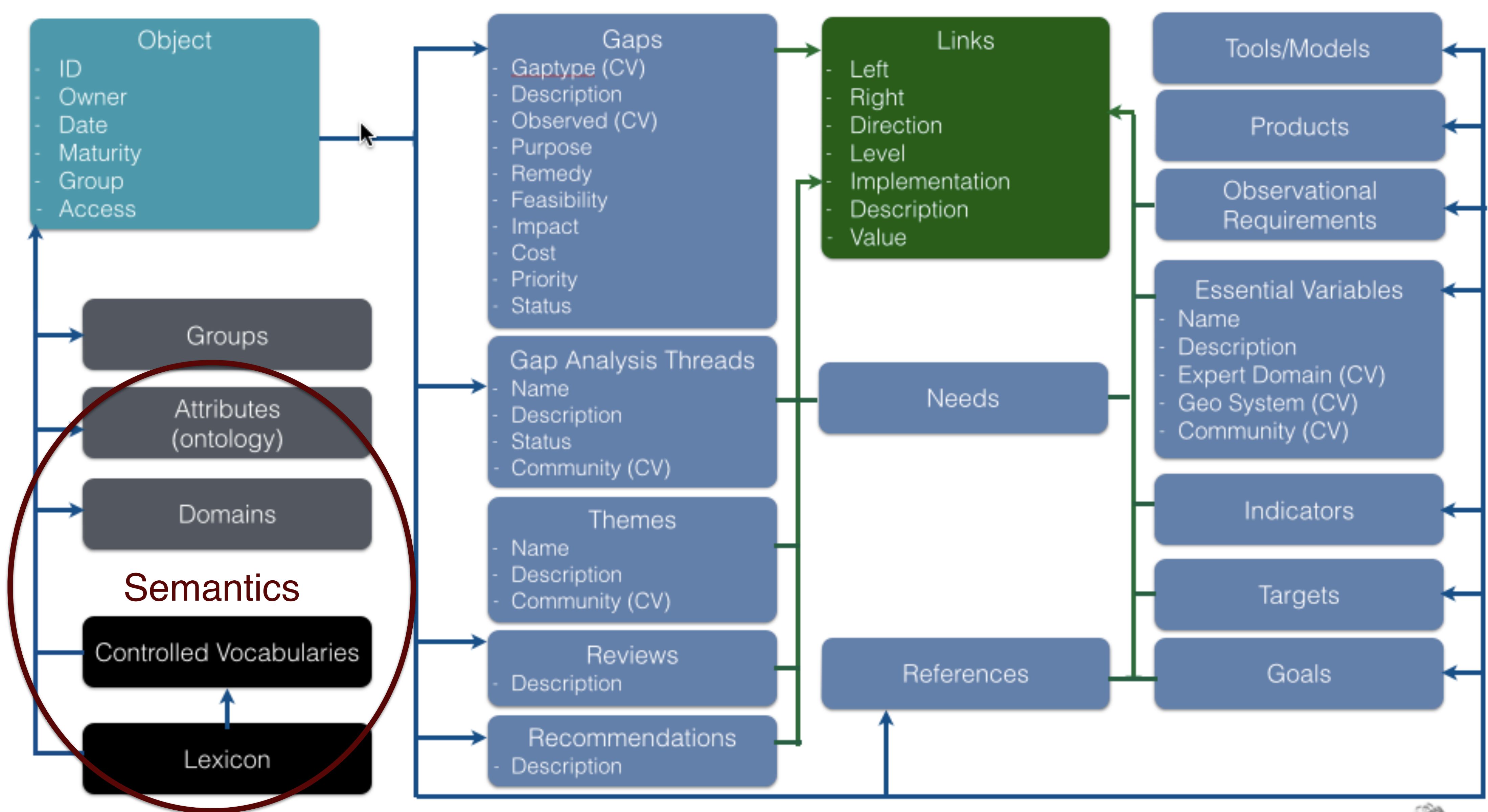
Jules-Plag and Plag, 2016b



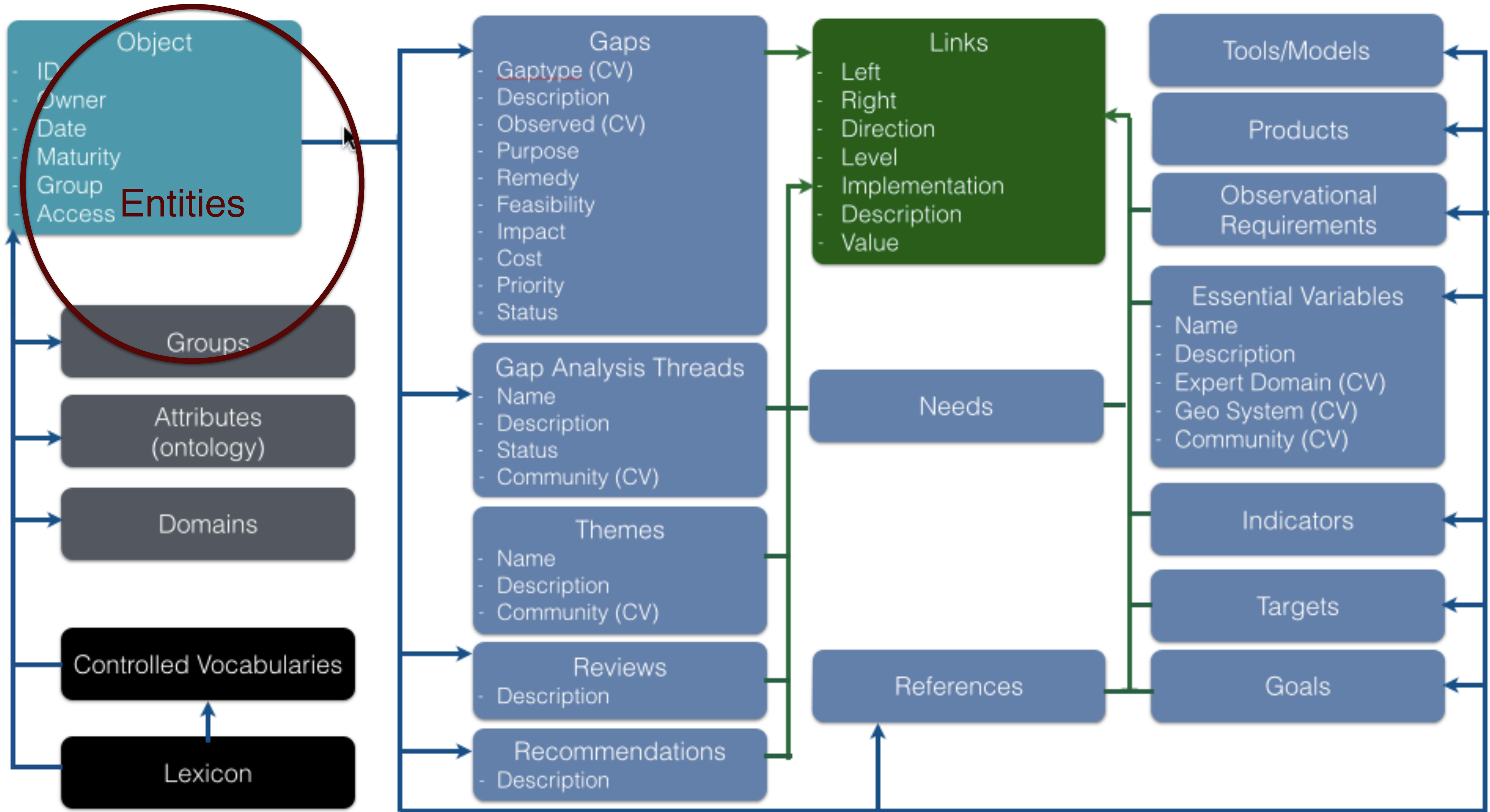
SEE-IN KB Data and Gap Model



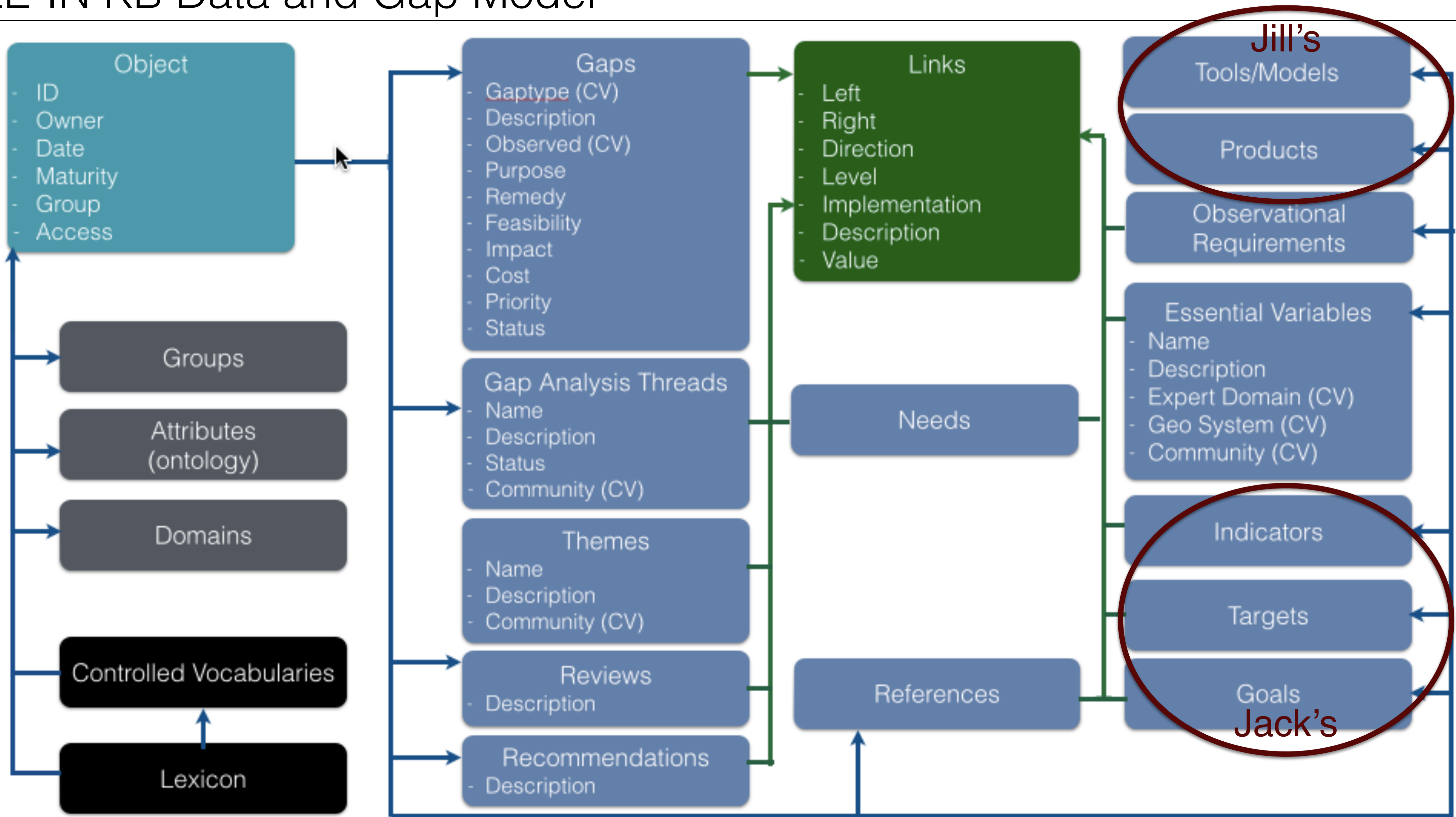
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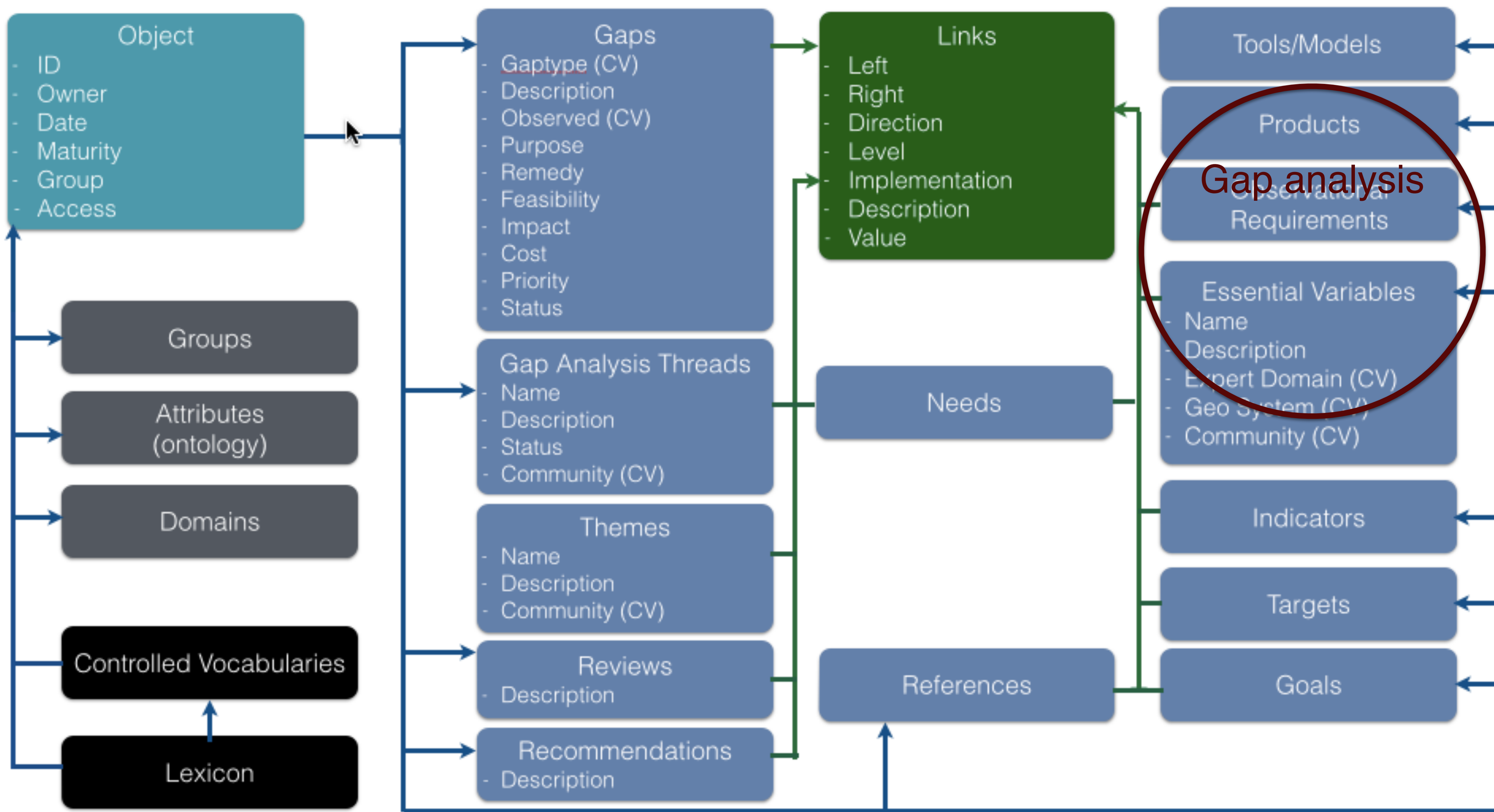
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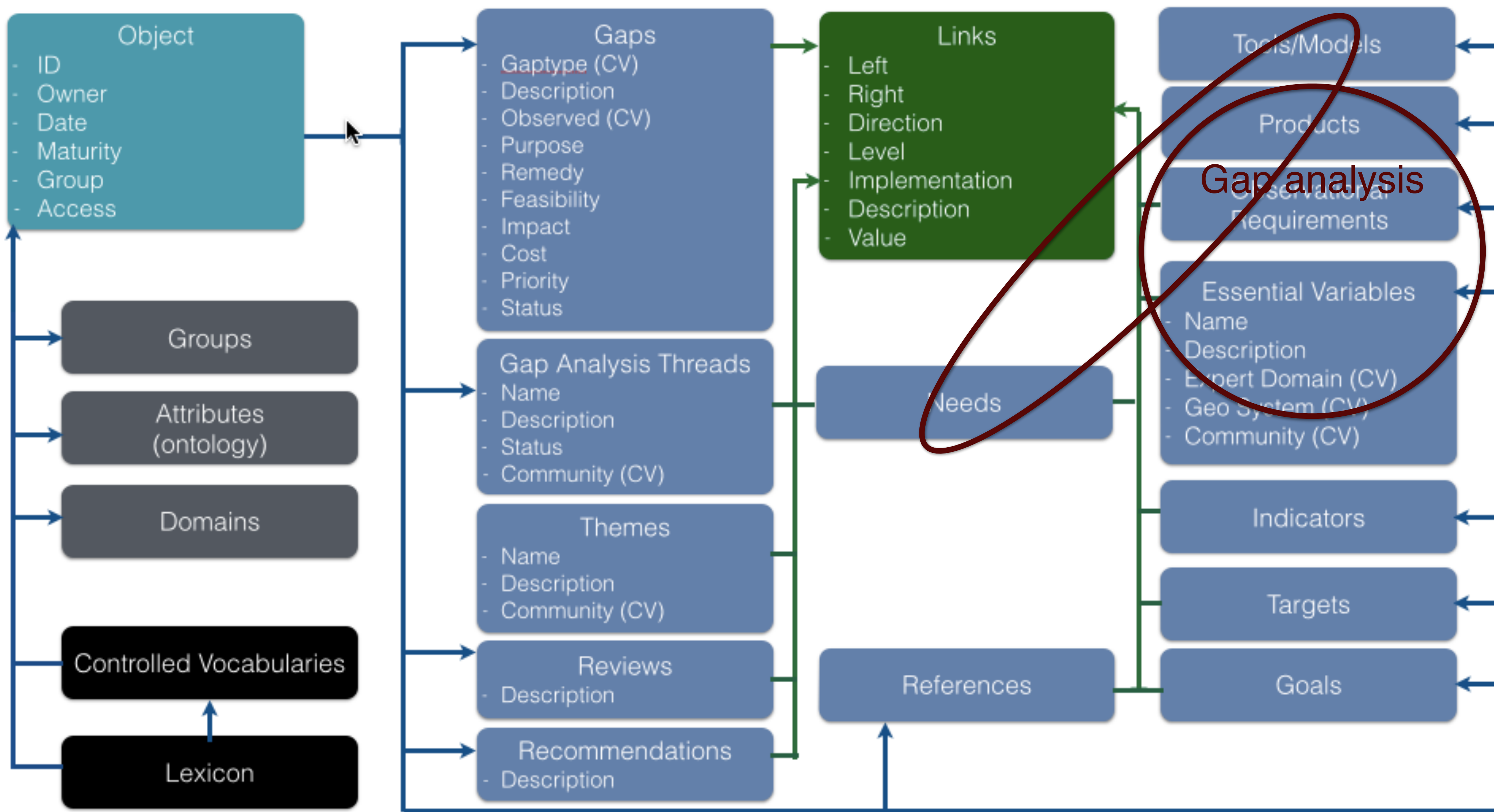
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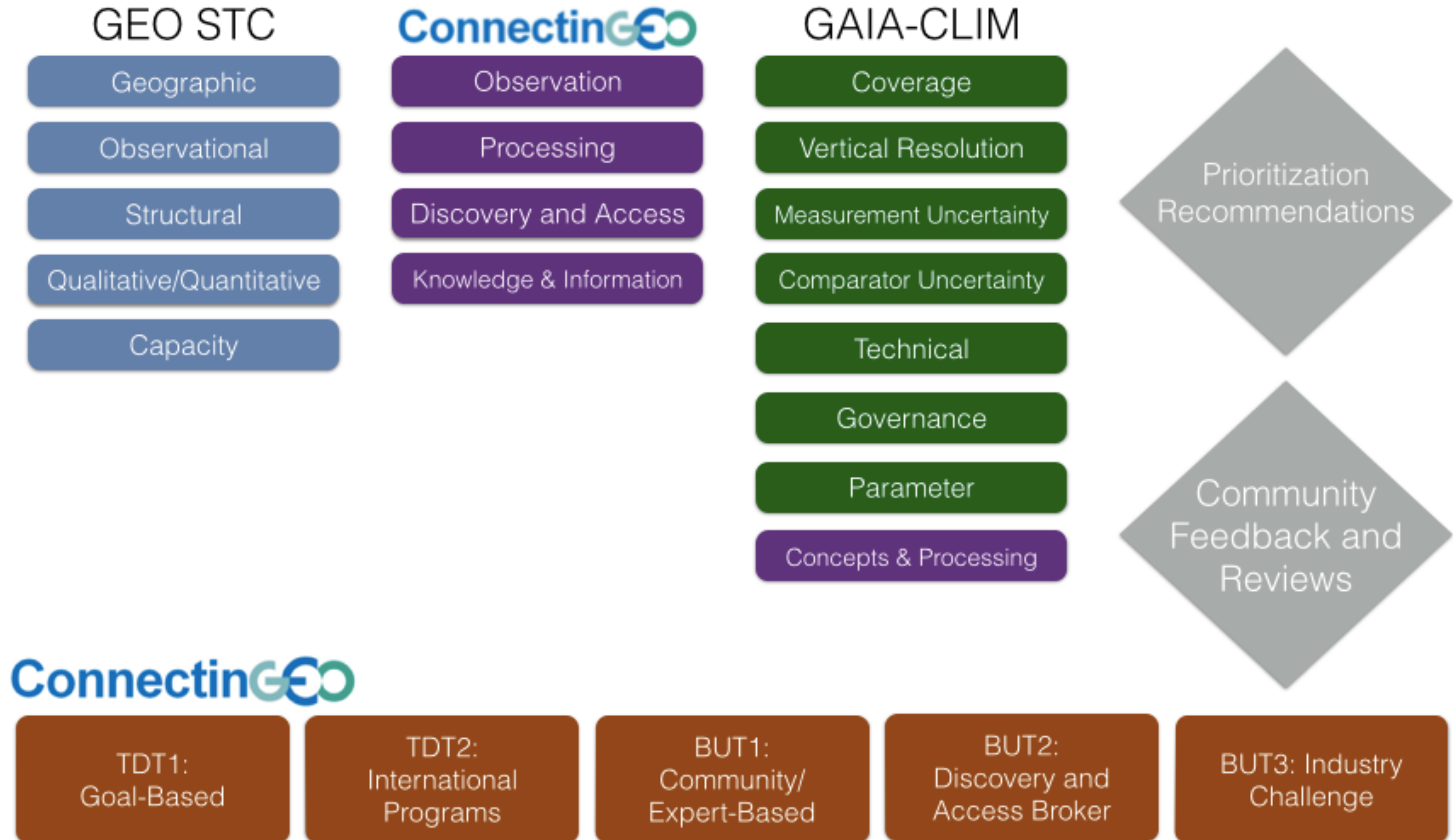
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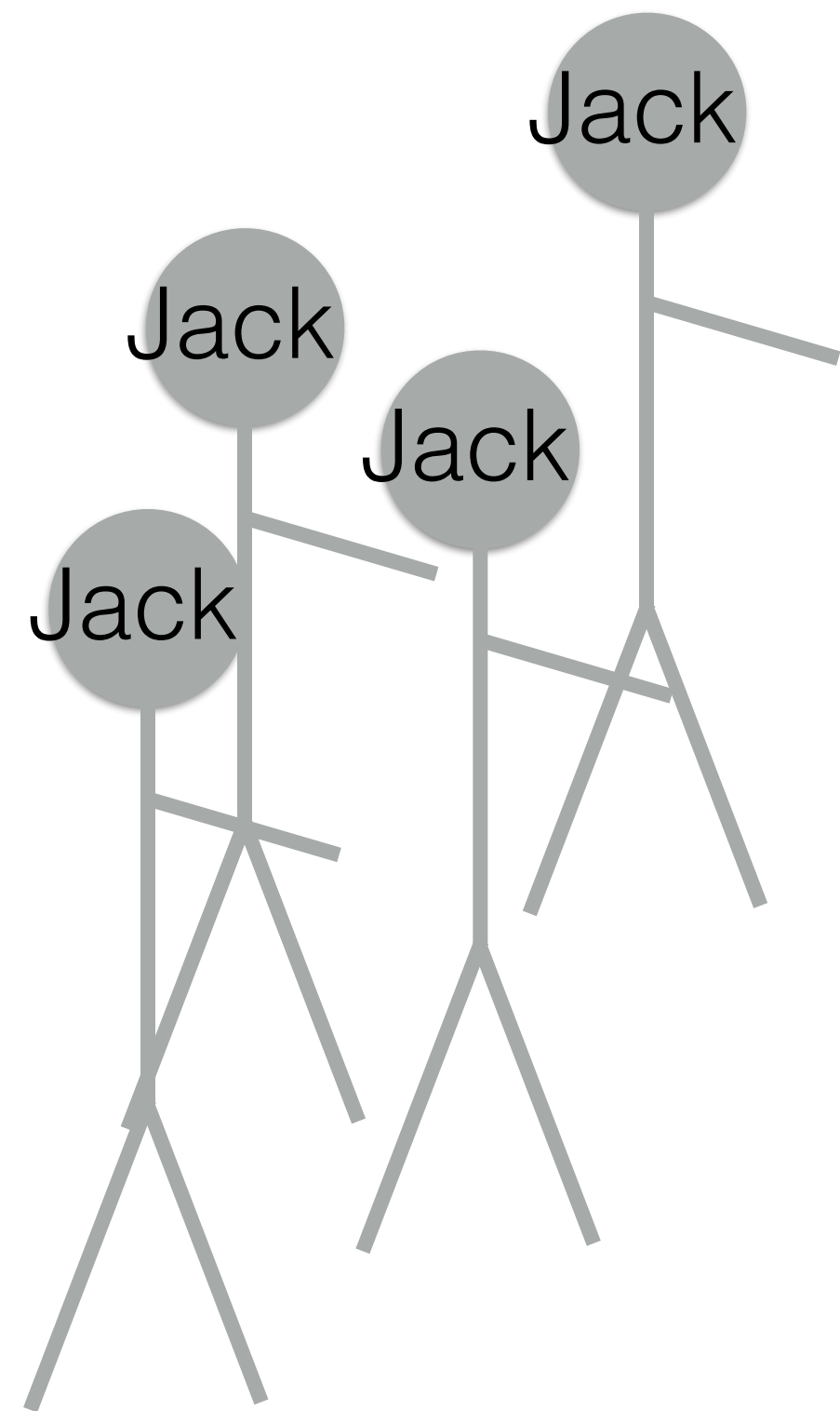
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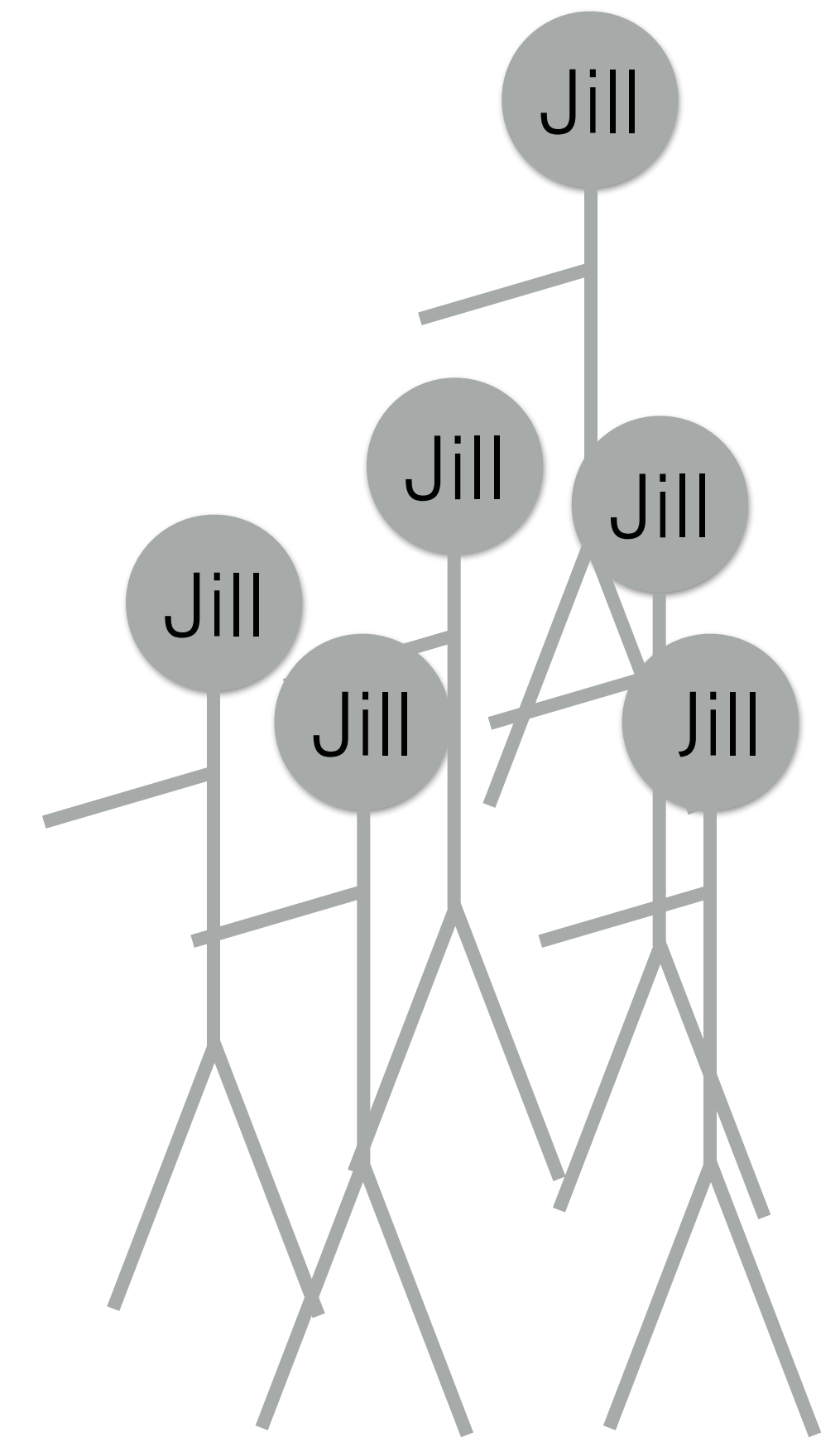
Gap Analysis Methodology



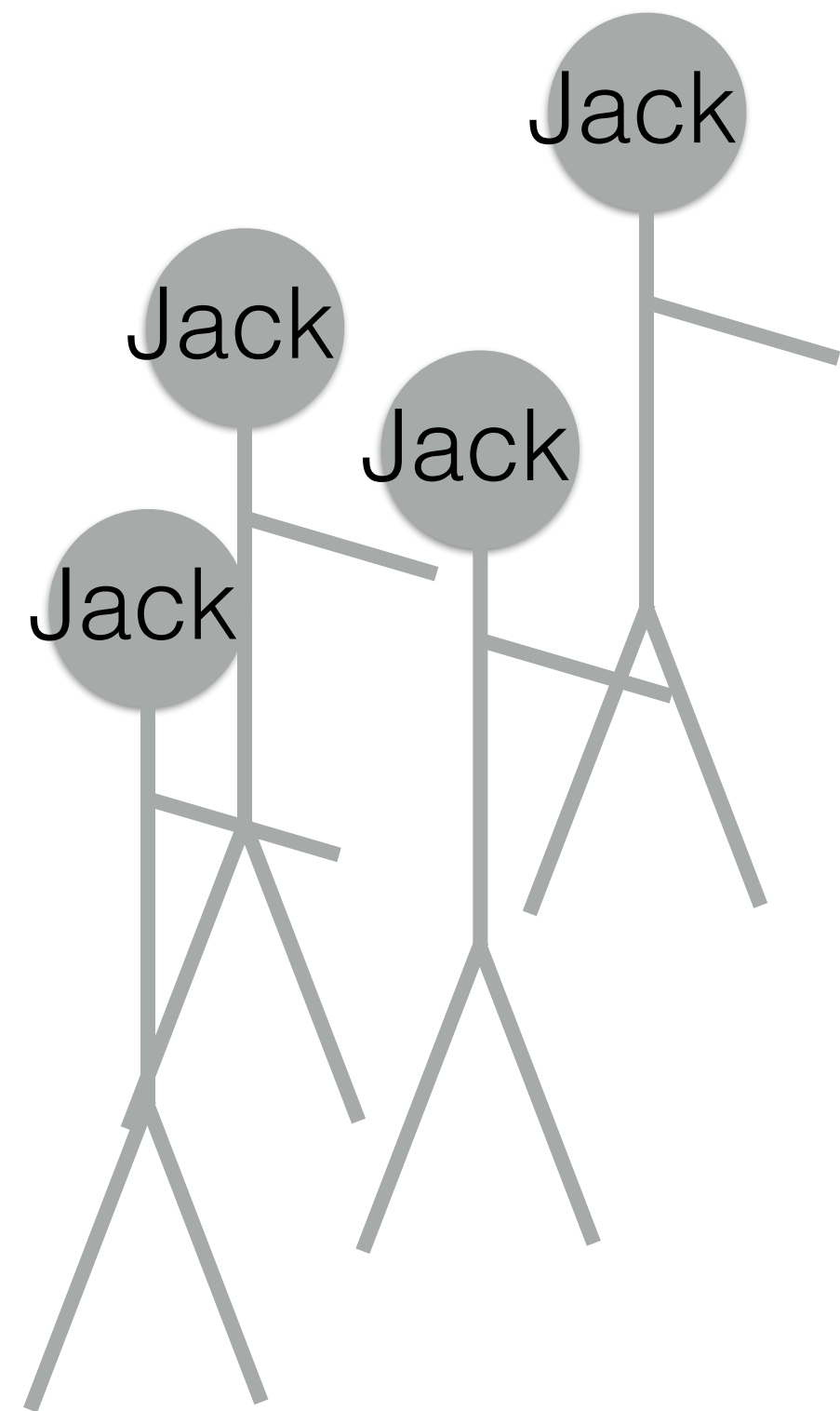
Governance/Science/Private



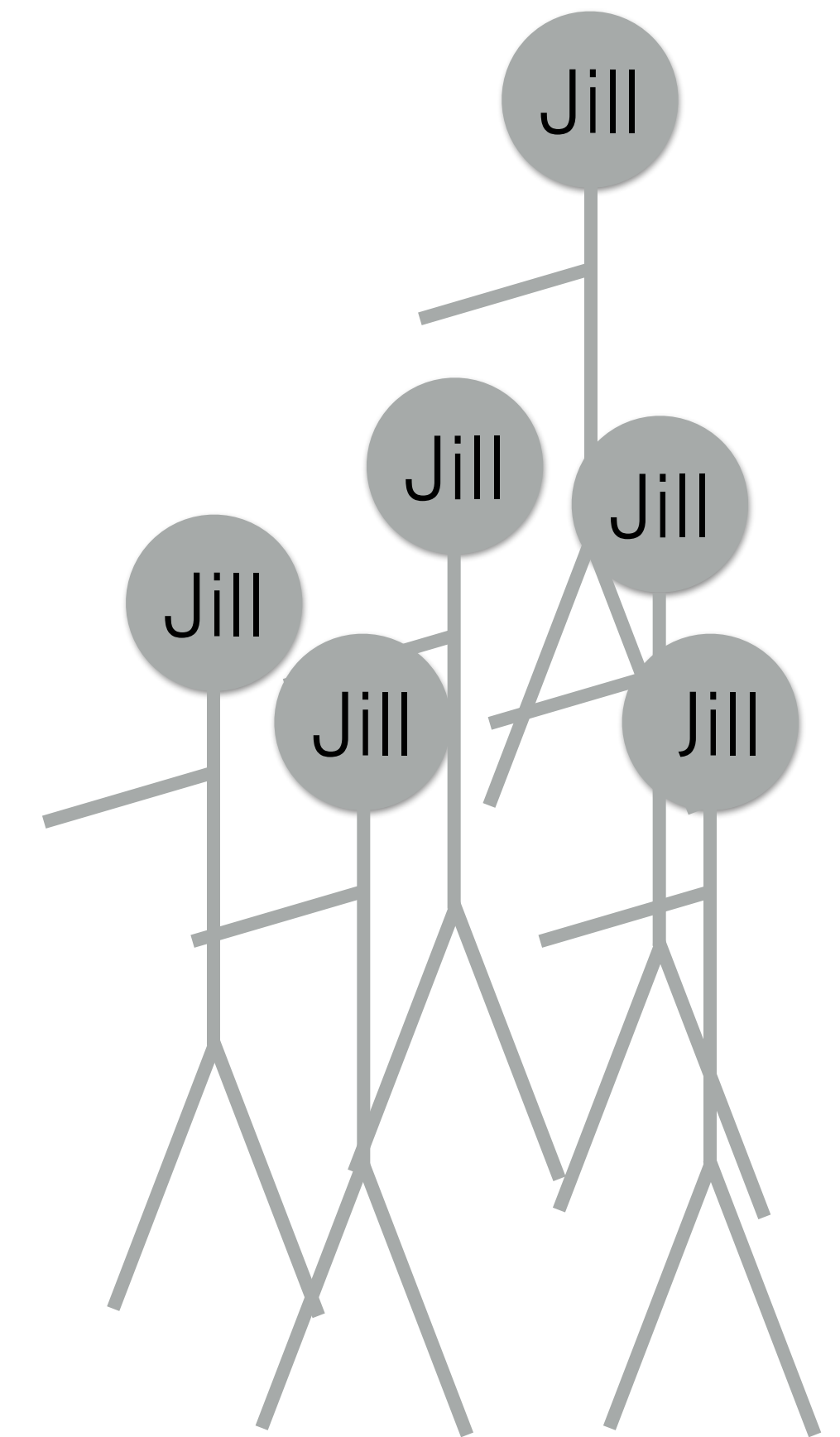
Earth Observation



Governance/Science/Private

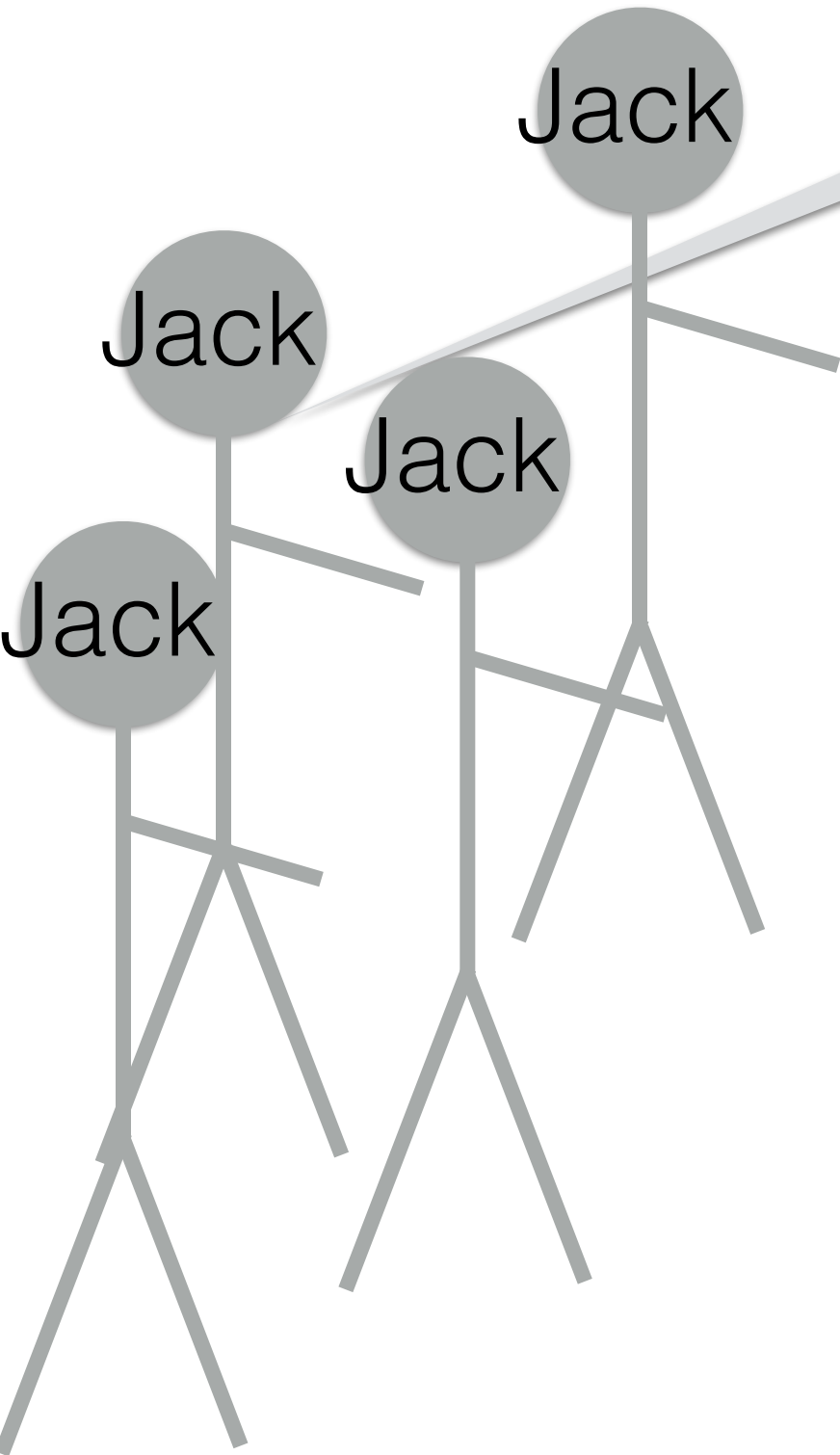


Earth Observation

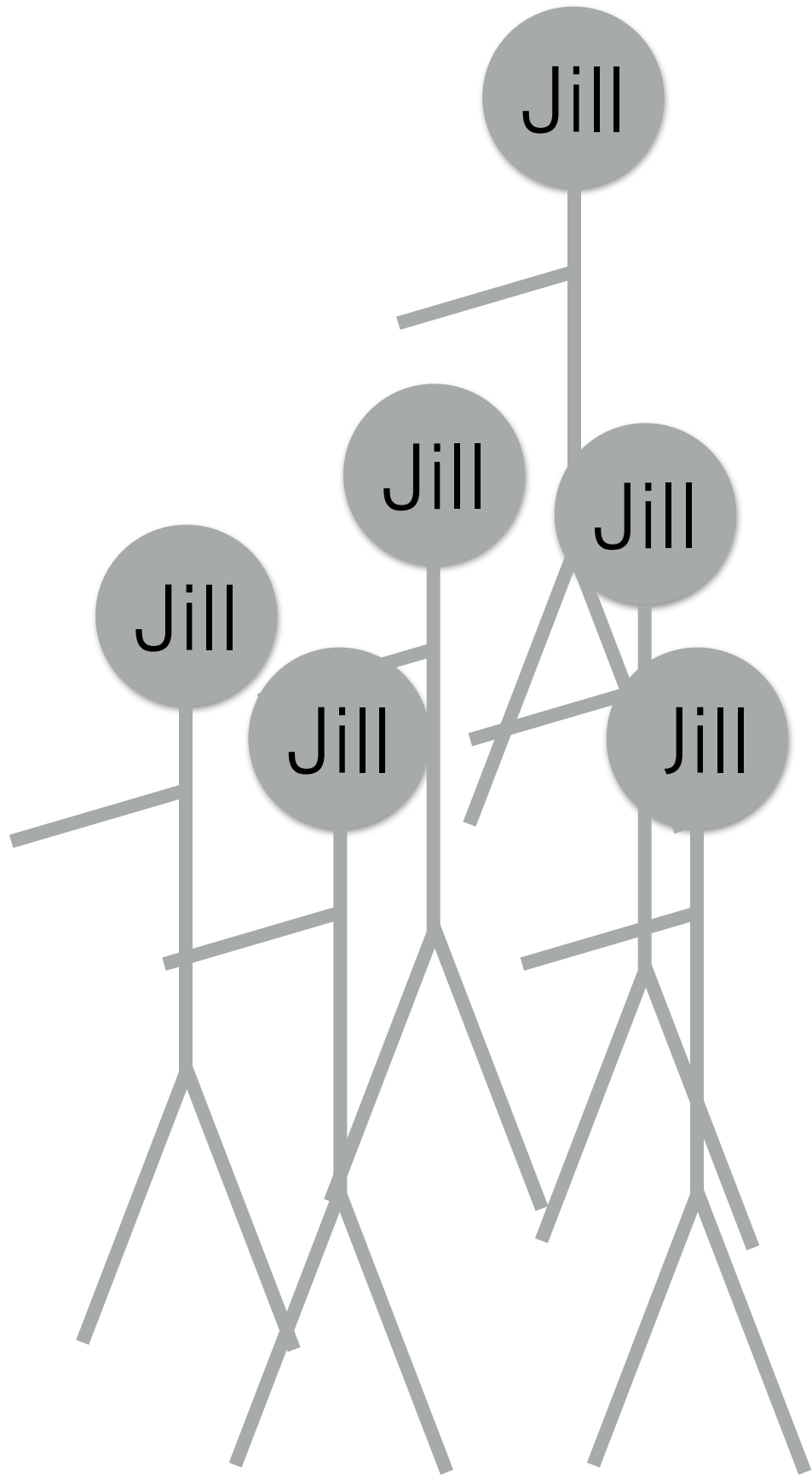


Governance/Science/Private

We have a complex/
wicked problem

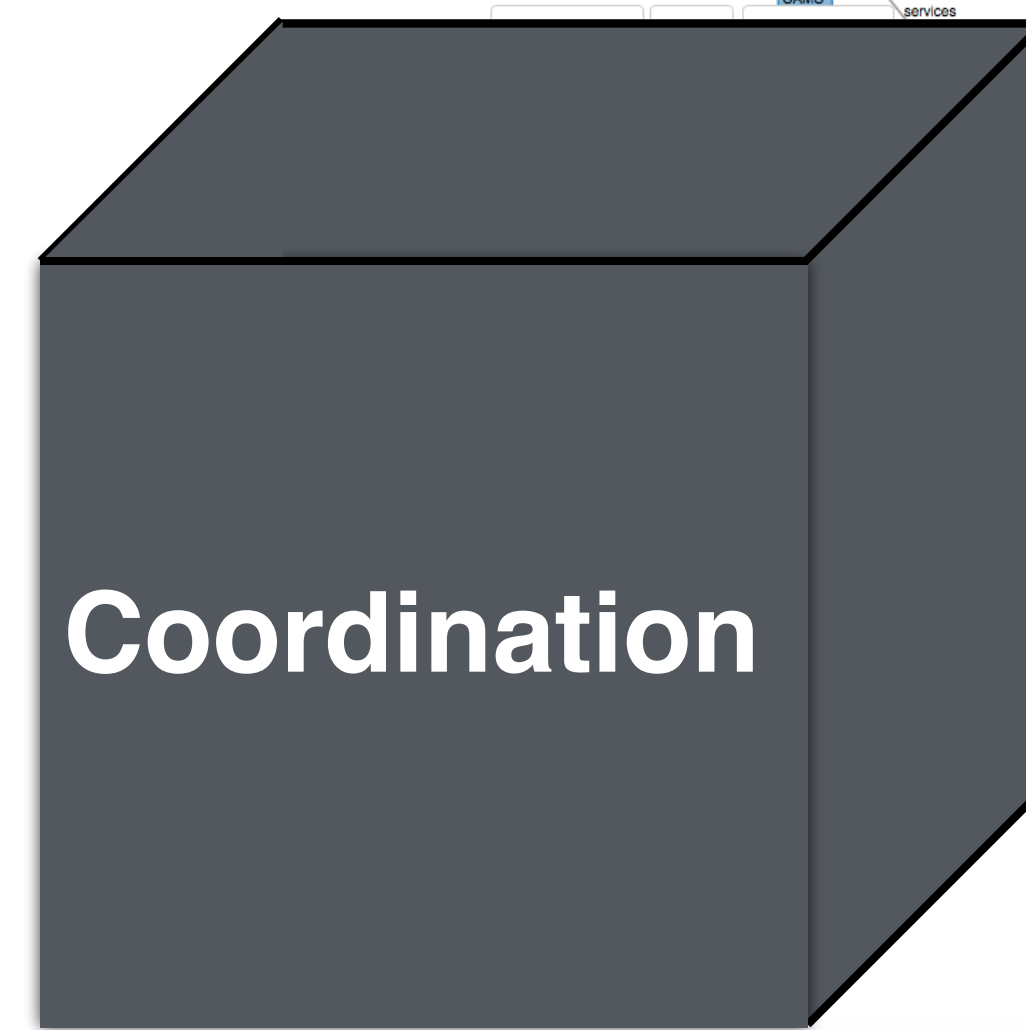
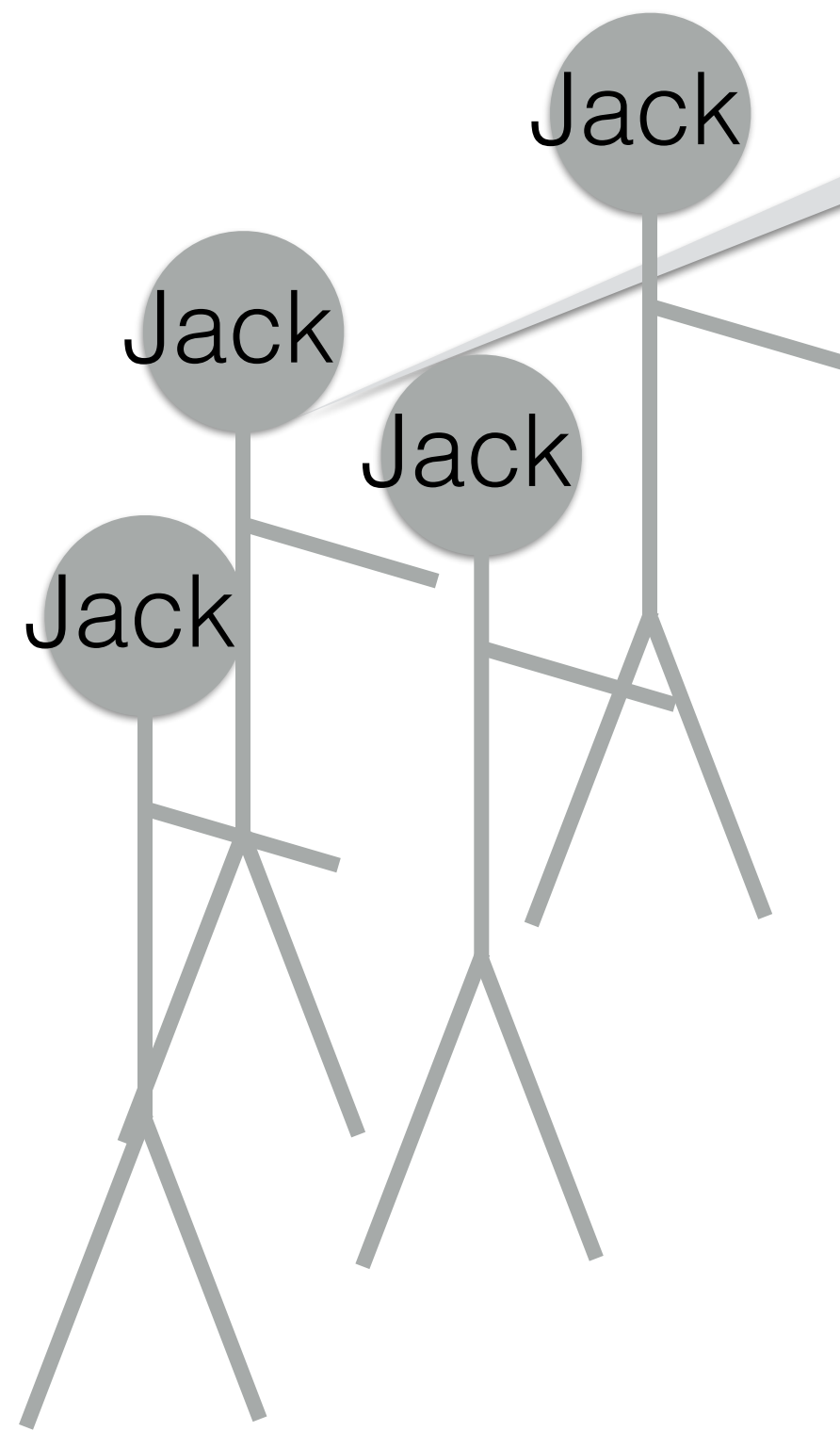


Earth Observation



Governance/Science/Private

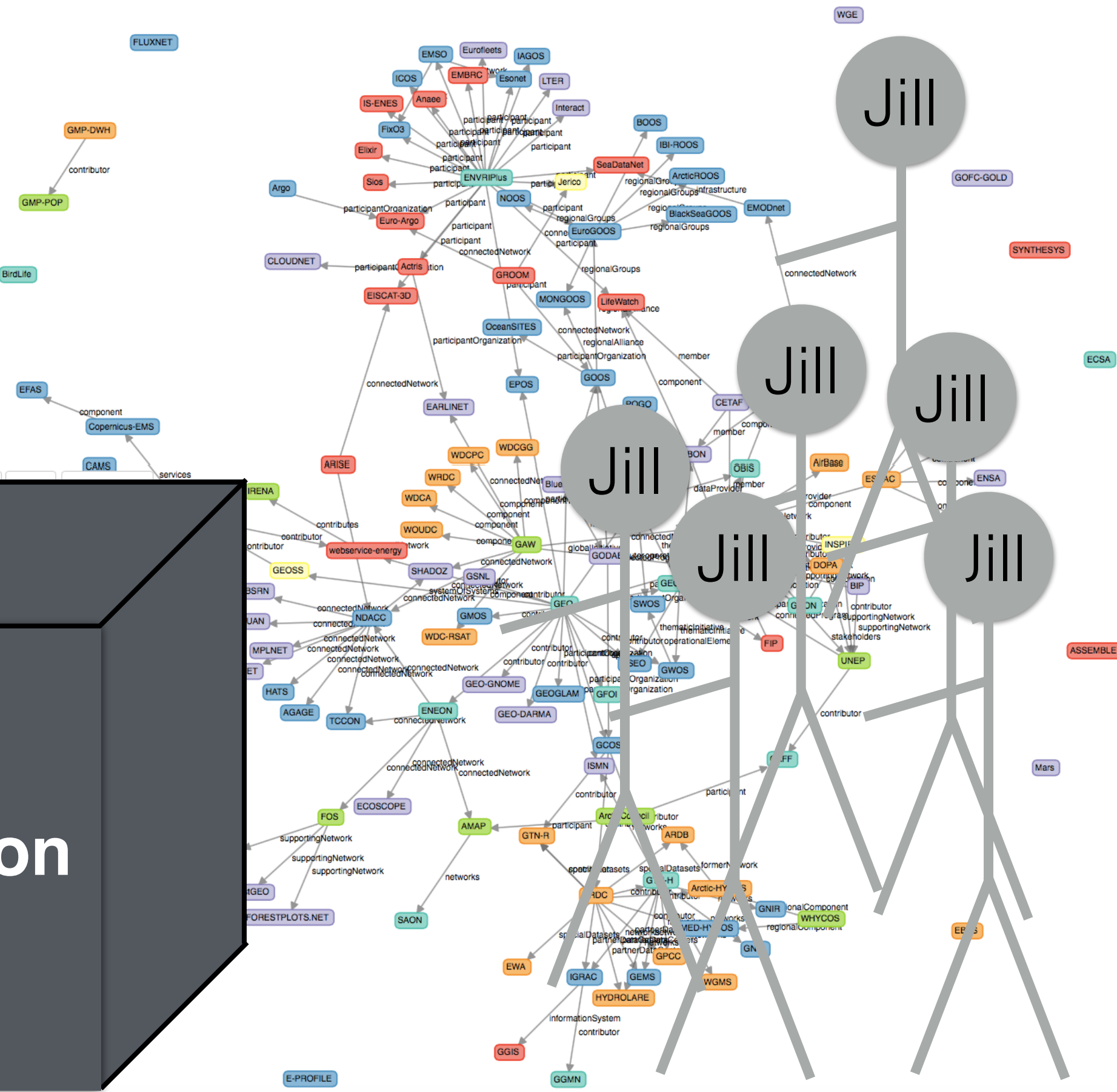
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Earth Observation

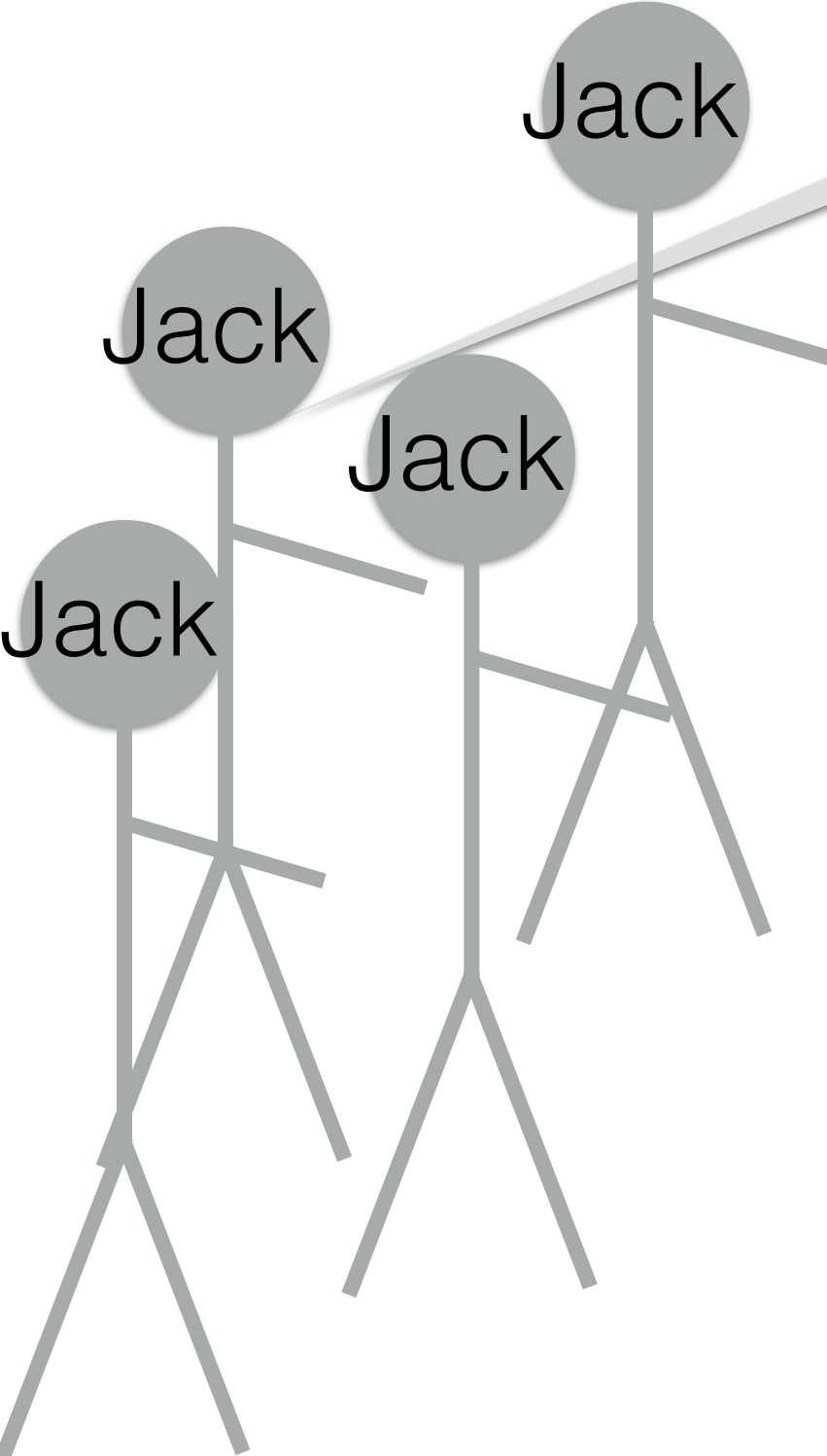
Complete list Table JSON & RDF

- NetworkOfNetworks
- SystemOfSystems
- Network
- Infrastructure
- ObservationSystem
- DataCenter
- Program



Governance/Science/Private

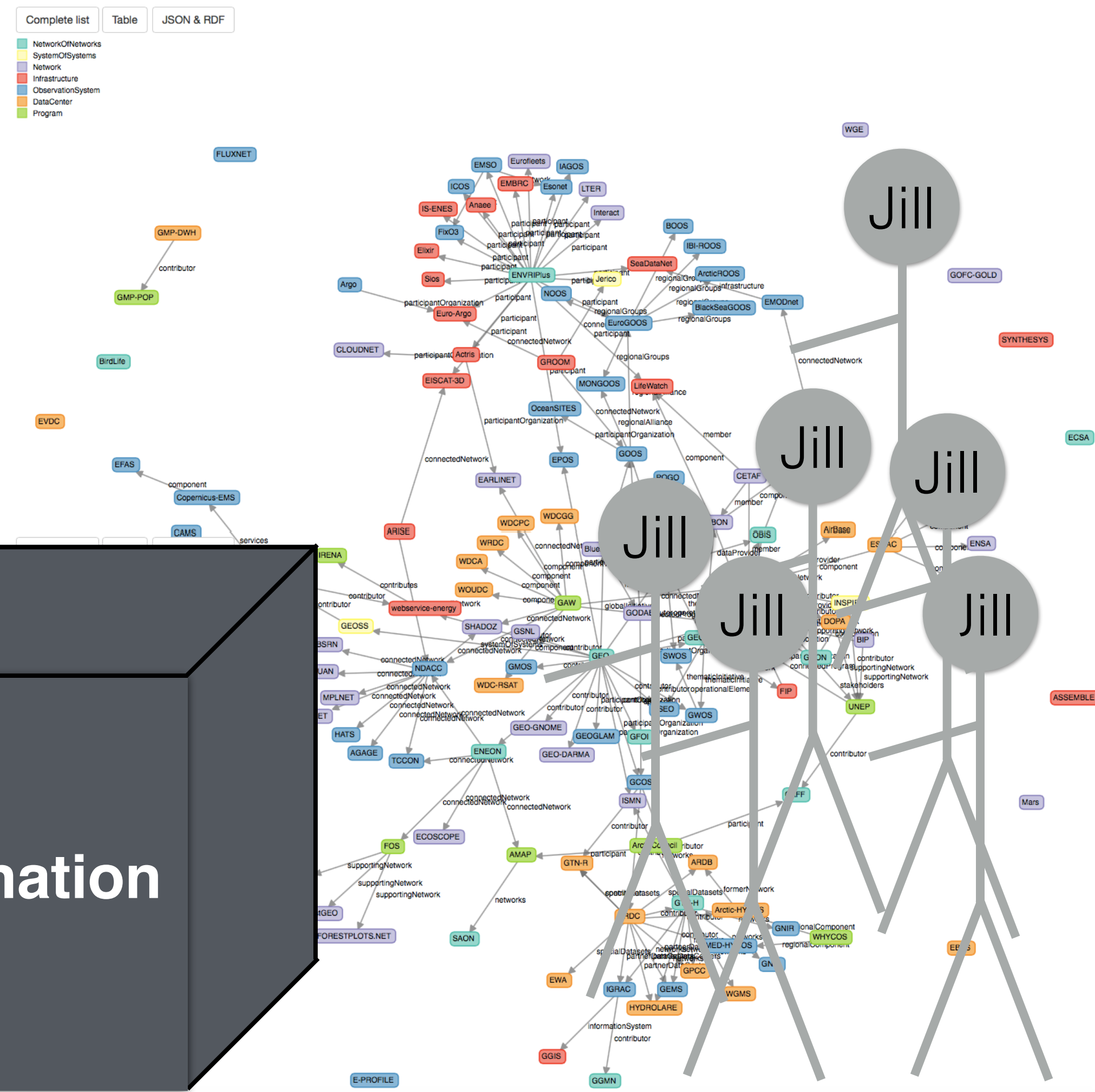
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Match Making

Coordination

Earth Observation



Governance/Science/Private

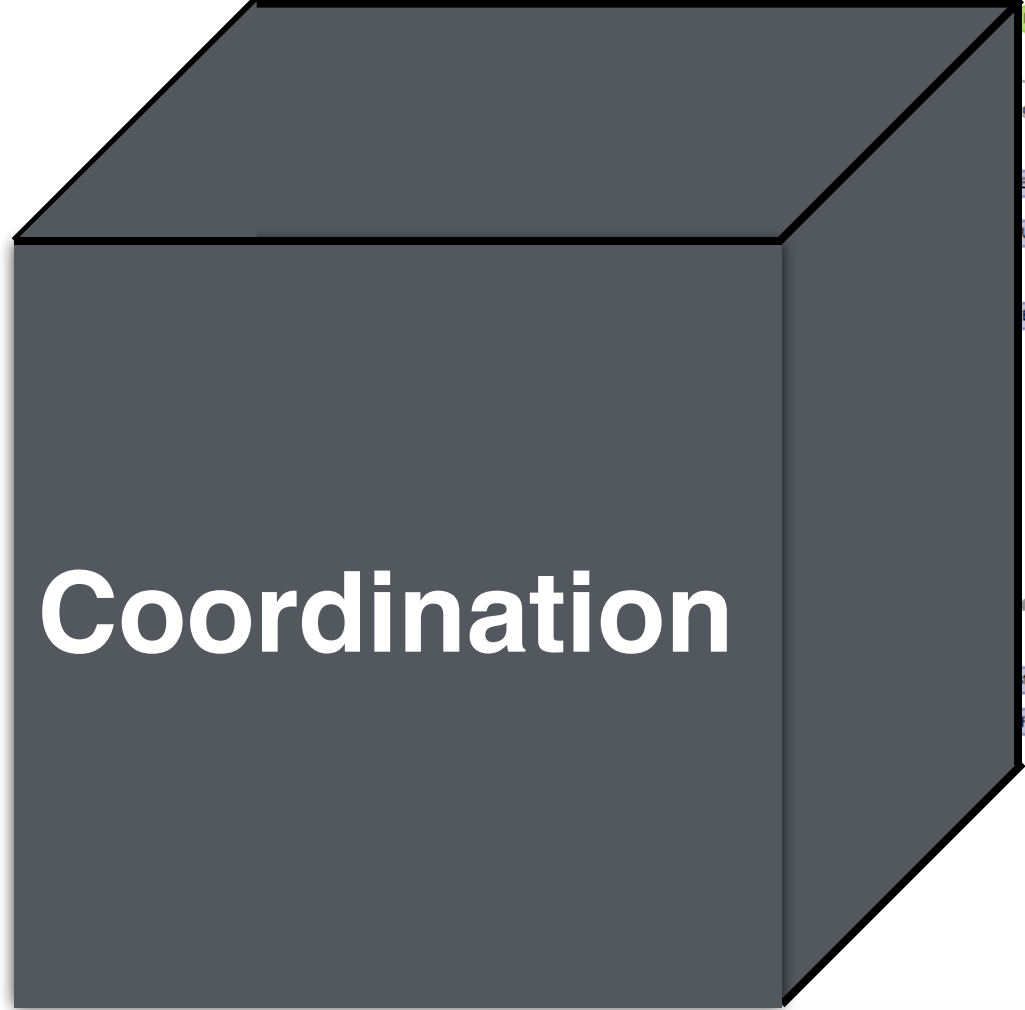
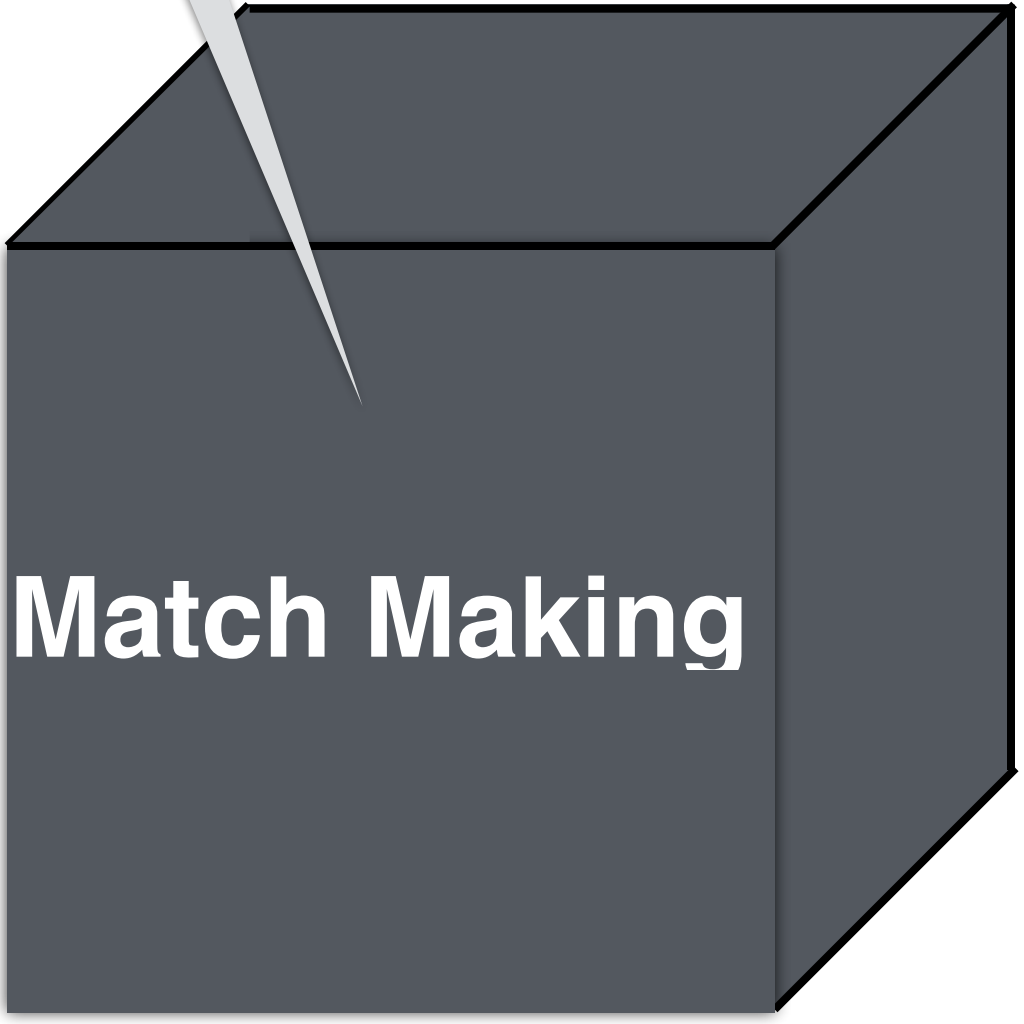
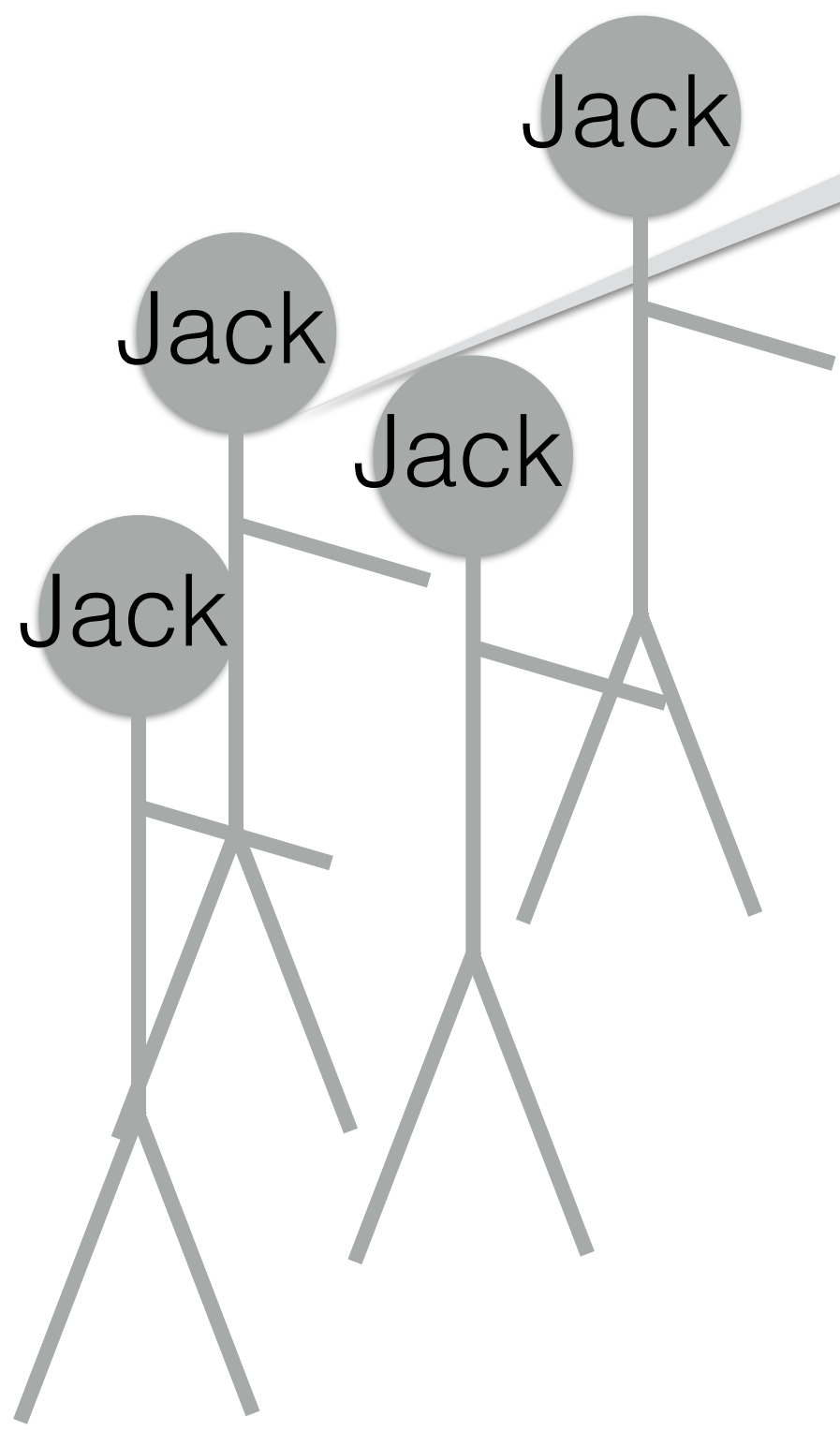
Earth Observation

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We will help you
find partners!

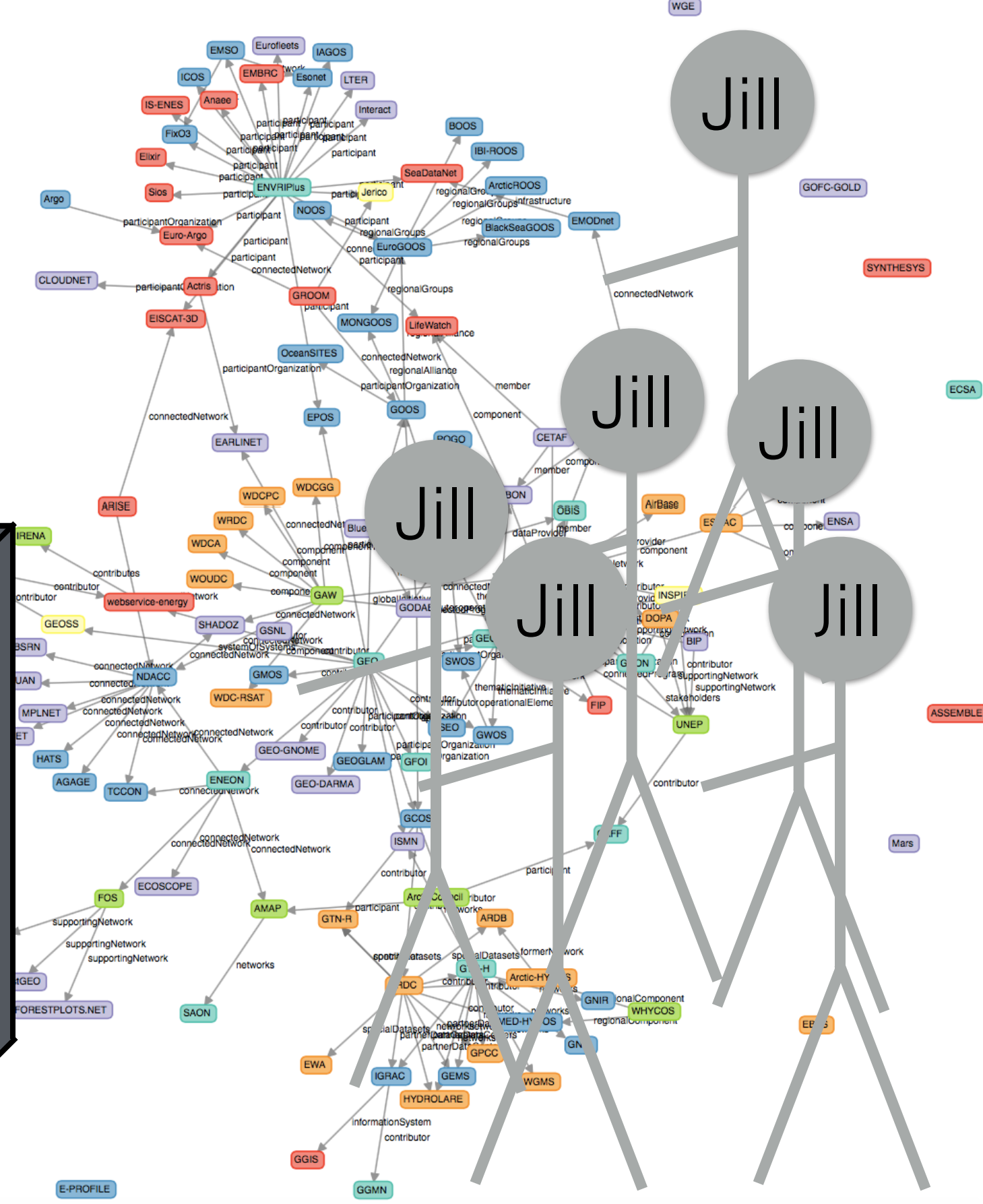
Match Making

Coordination



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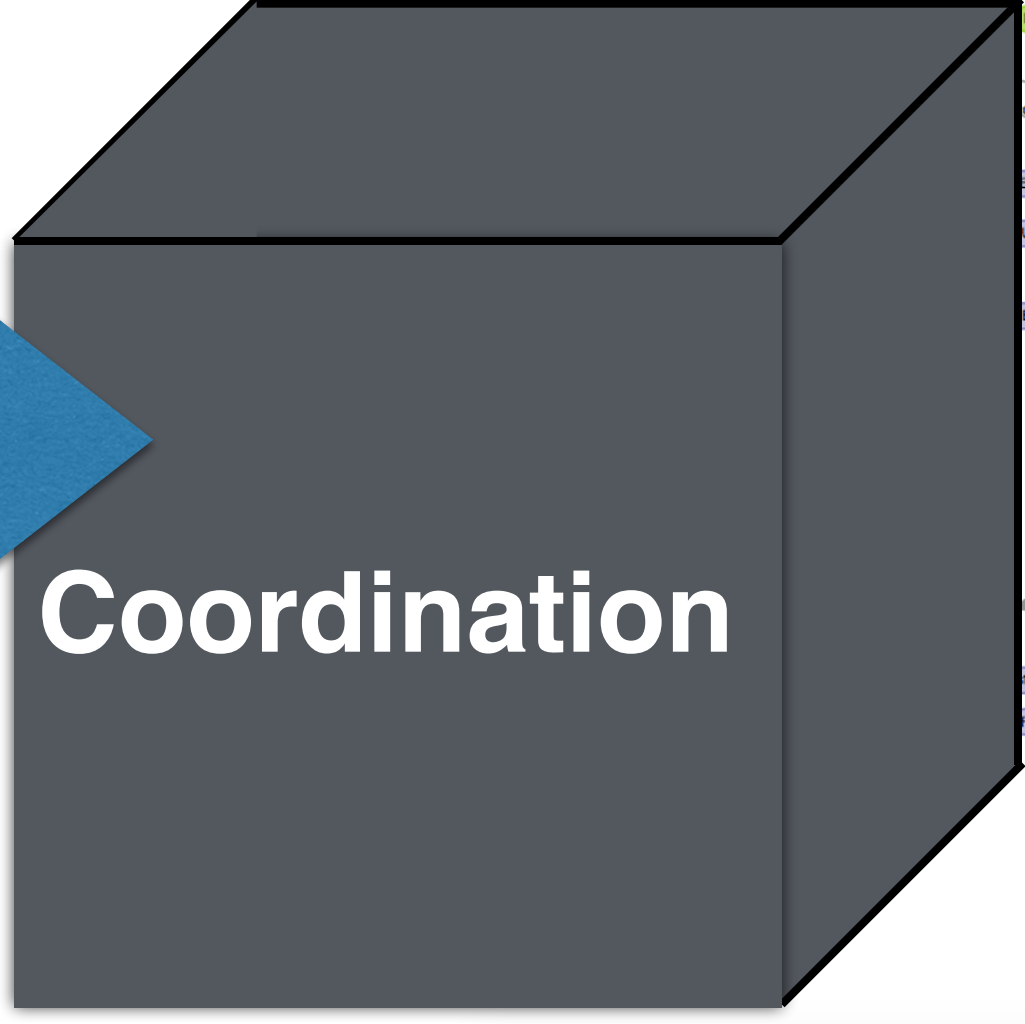
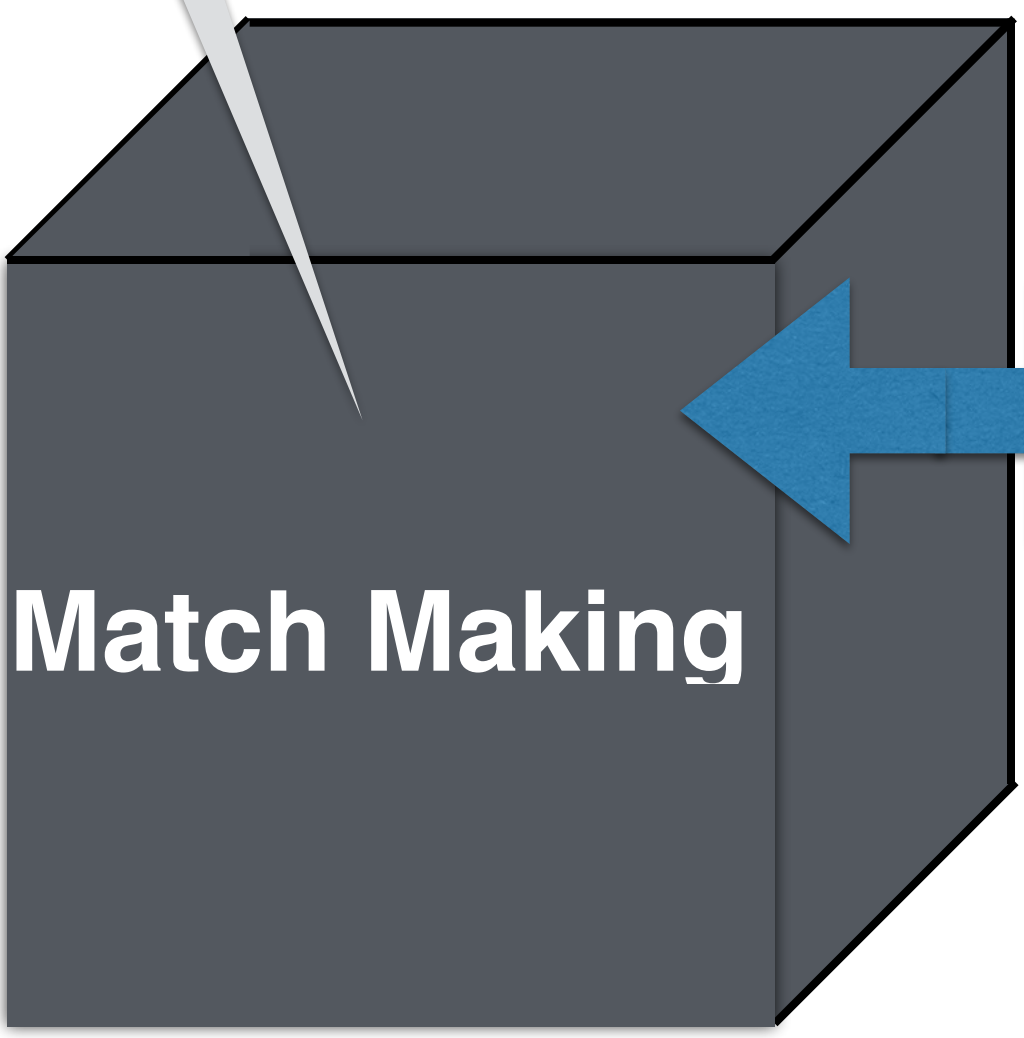
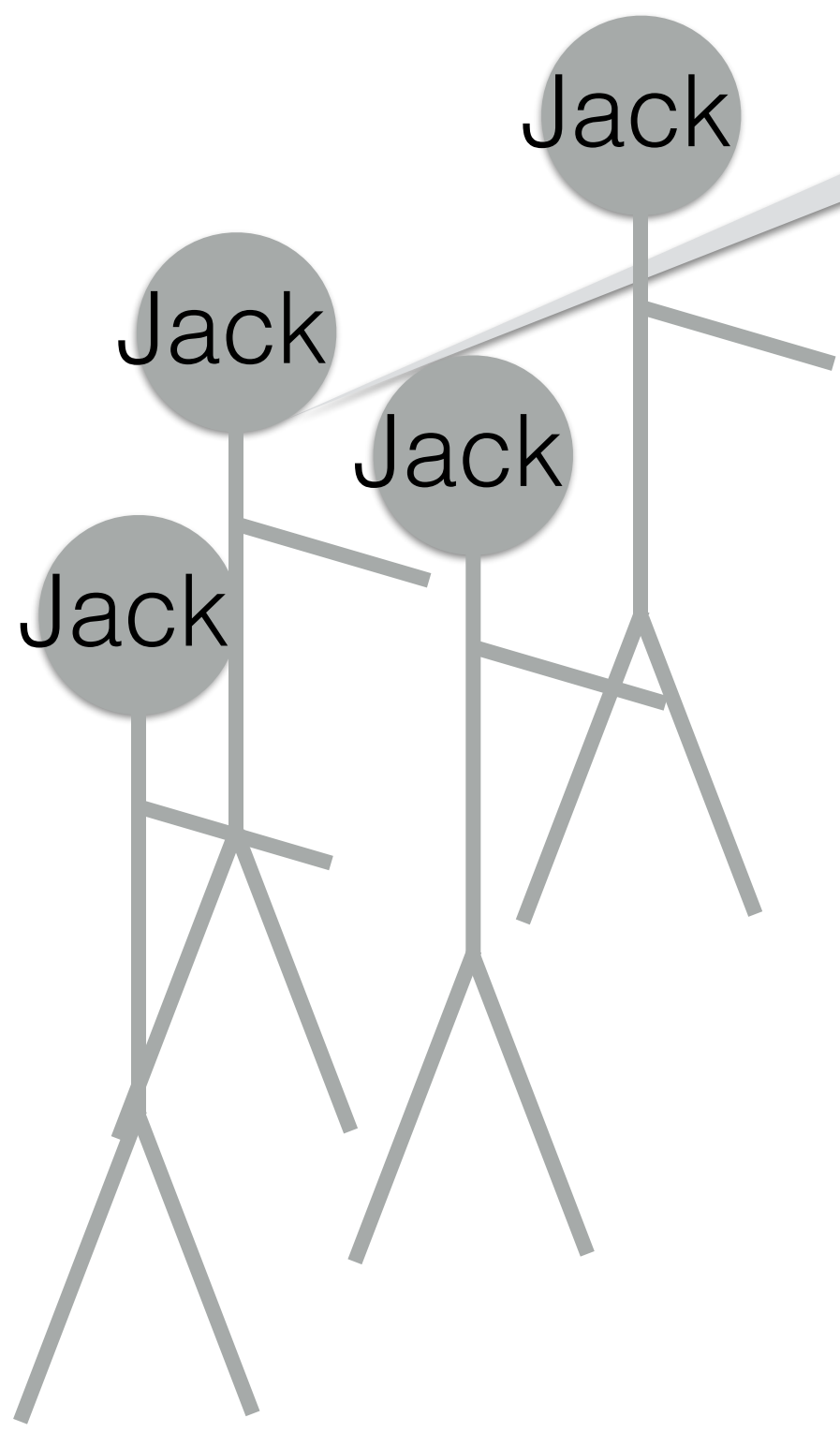


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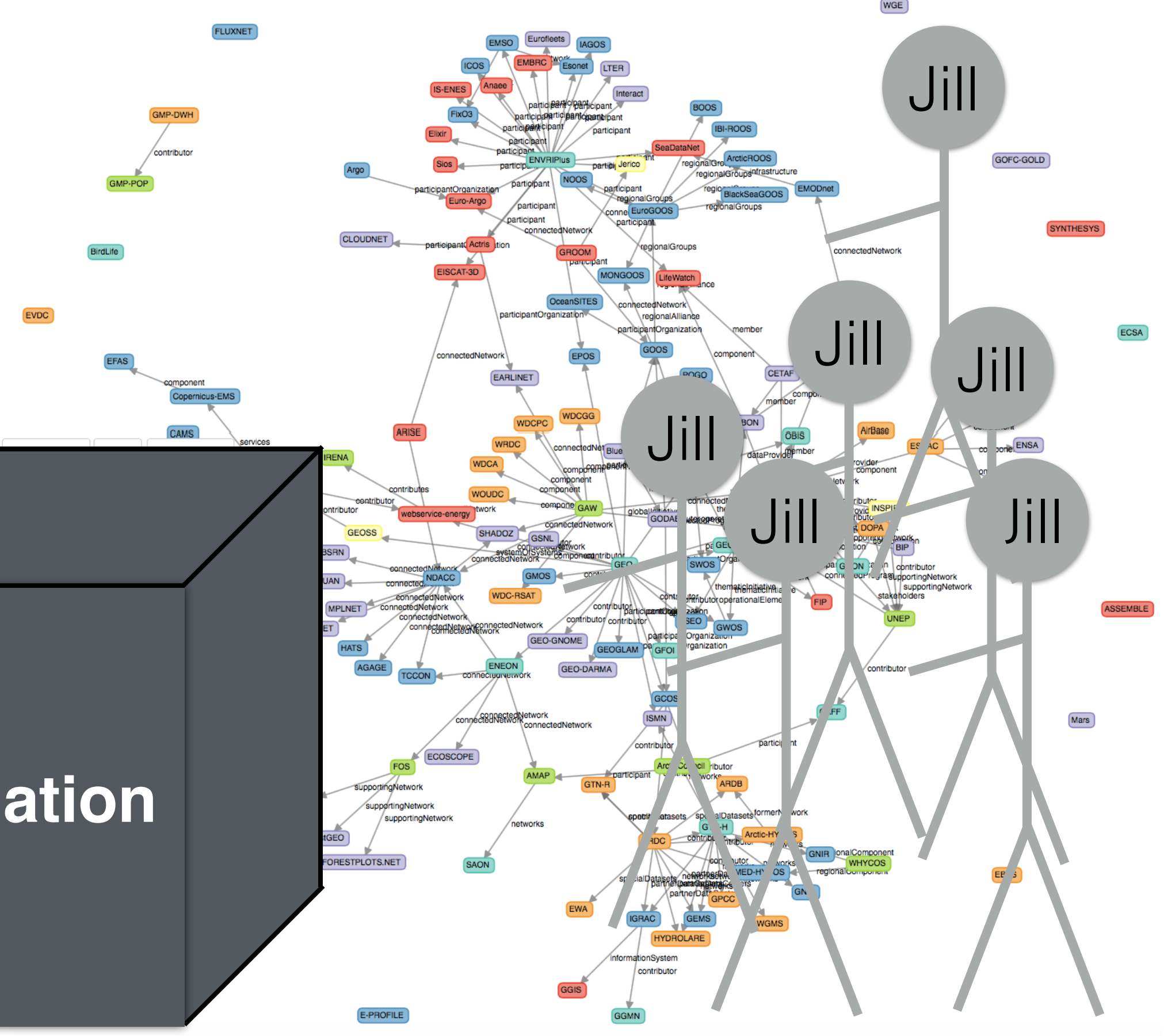
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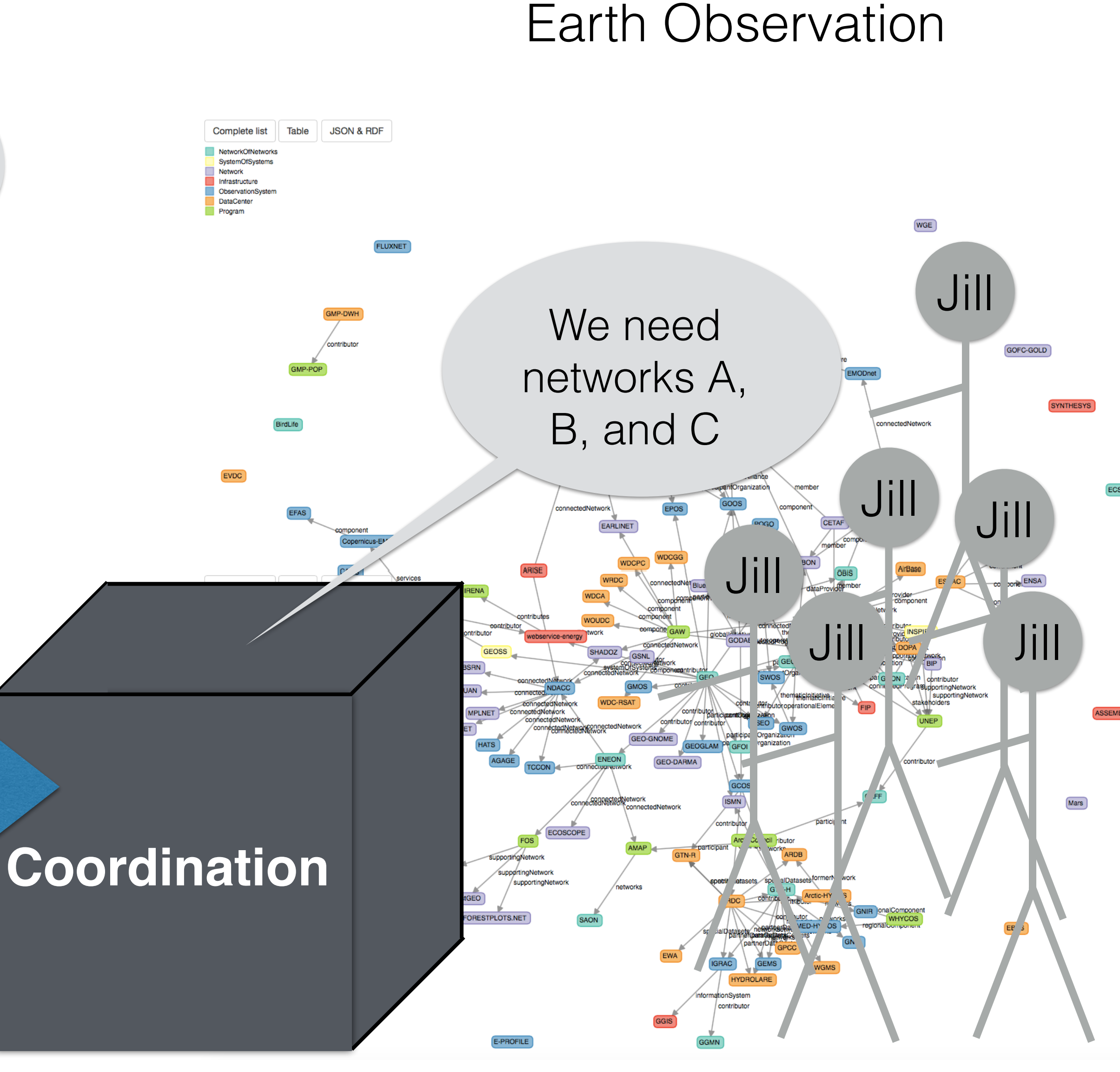
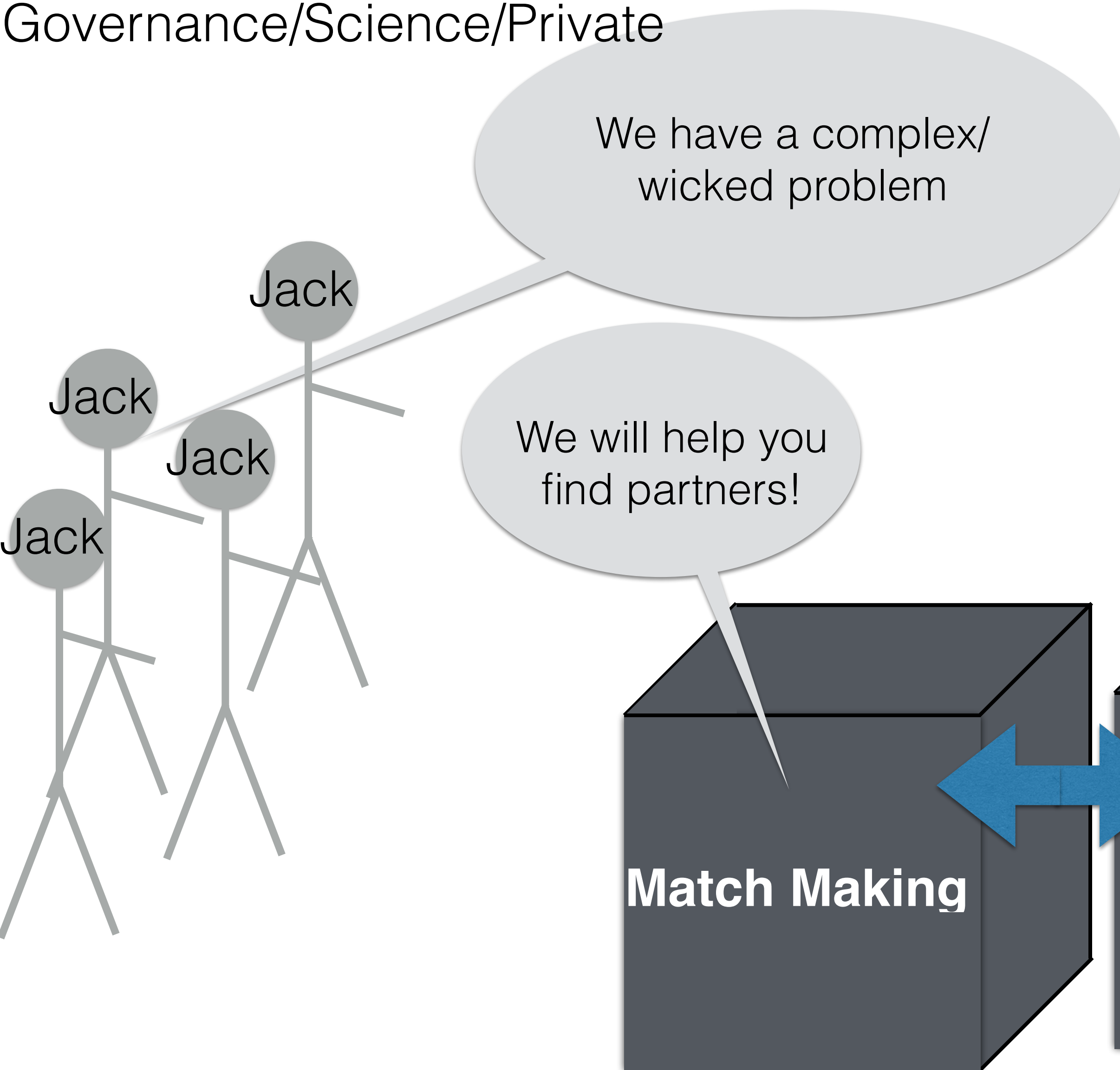


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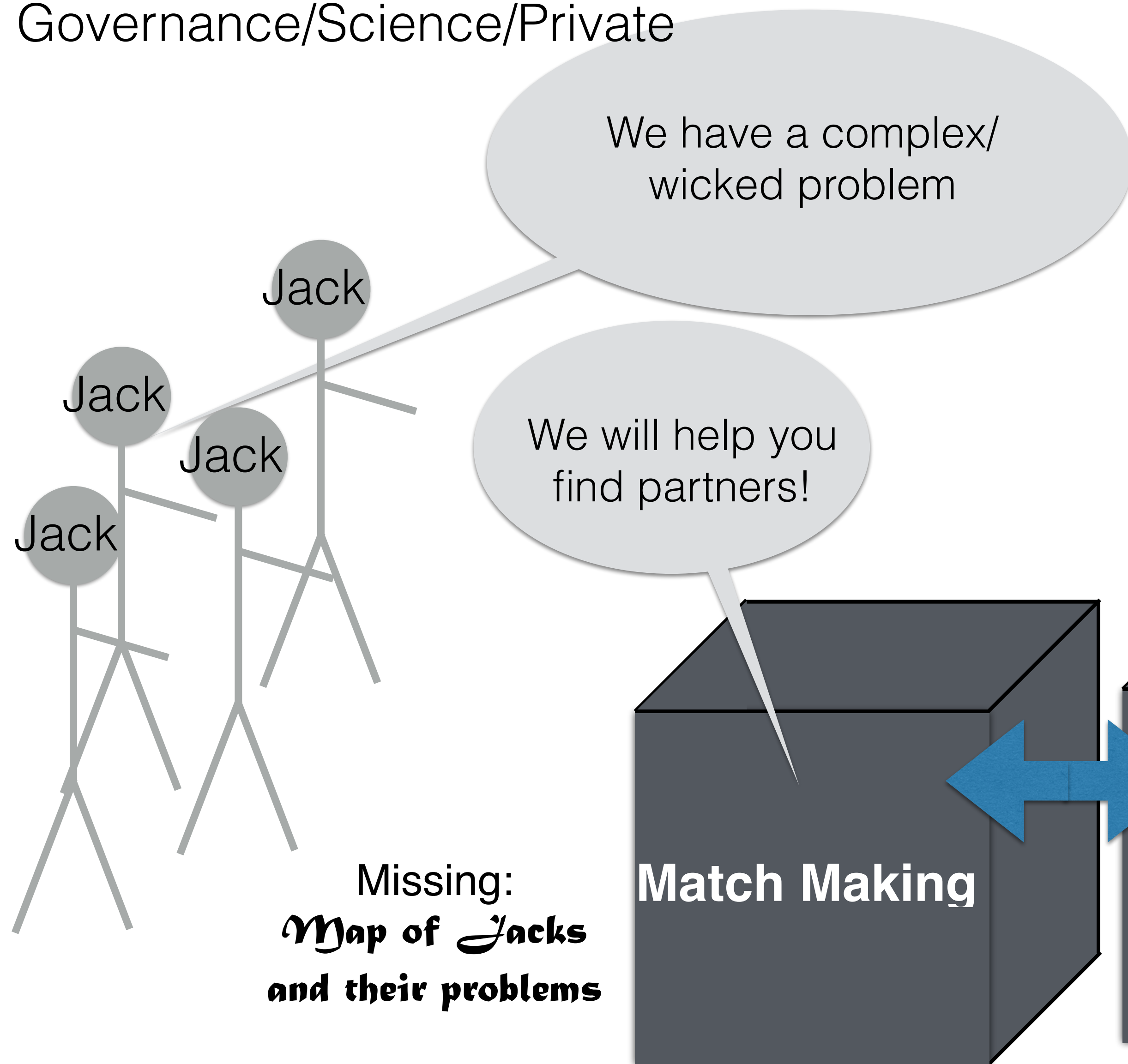
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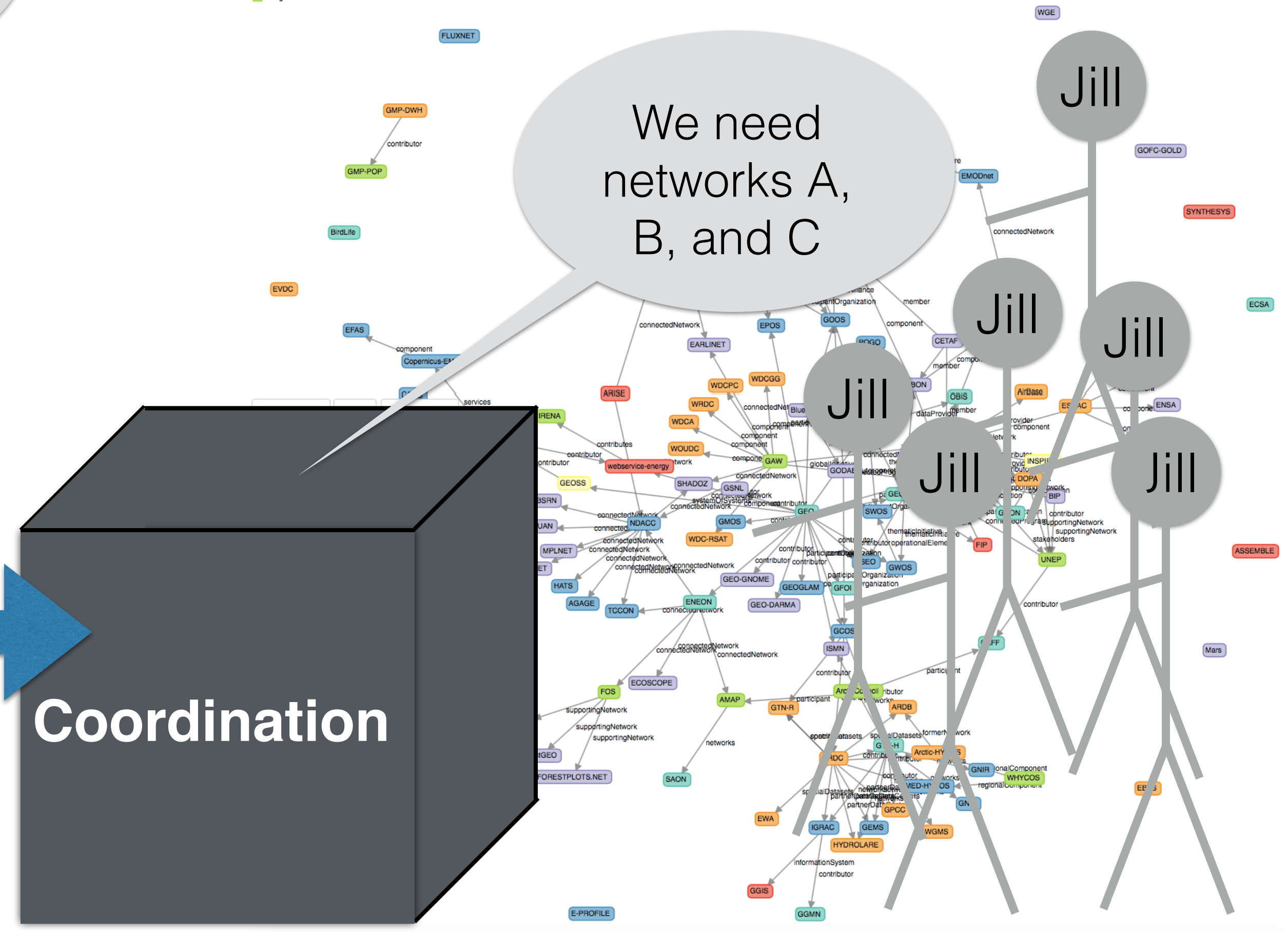
Governance/Science/Private

Earth Observation



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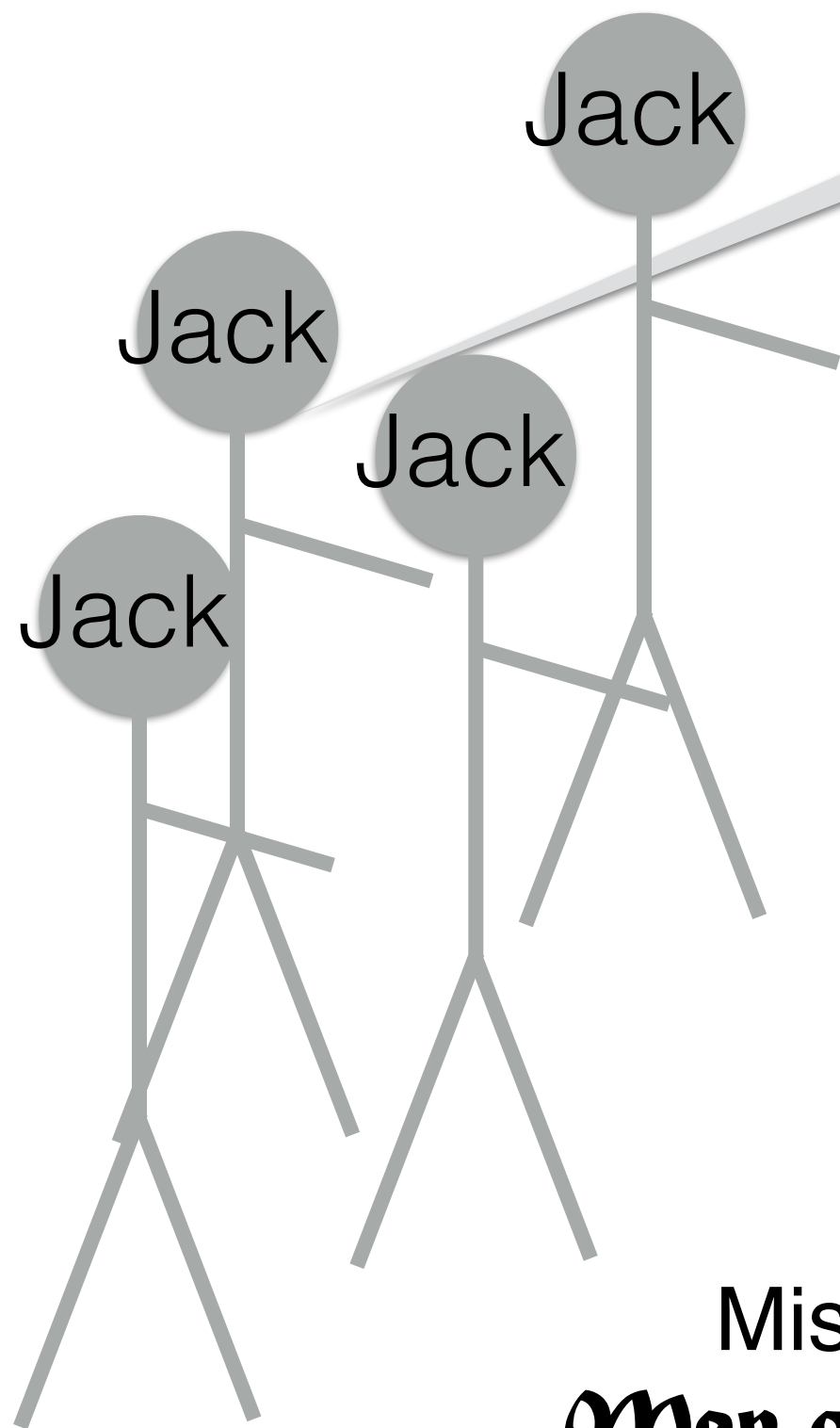
Earth Observation

We have a complex/
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Develop Use Cases
that require Matching
and Coordination

We need
networks A,
B, and C

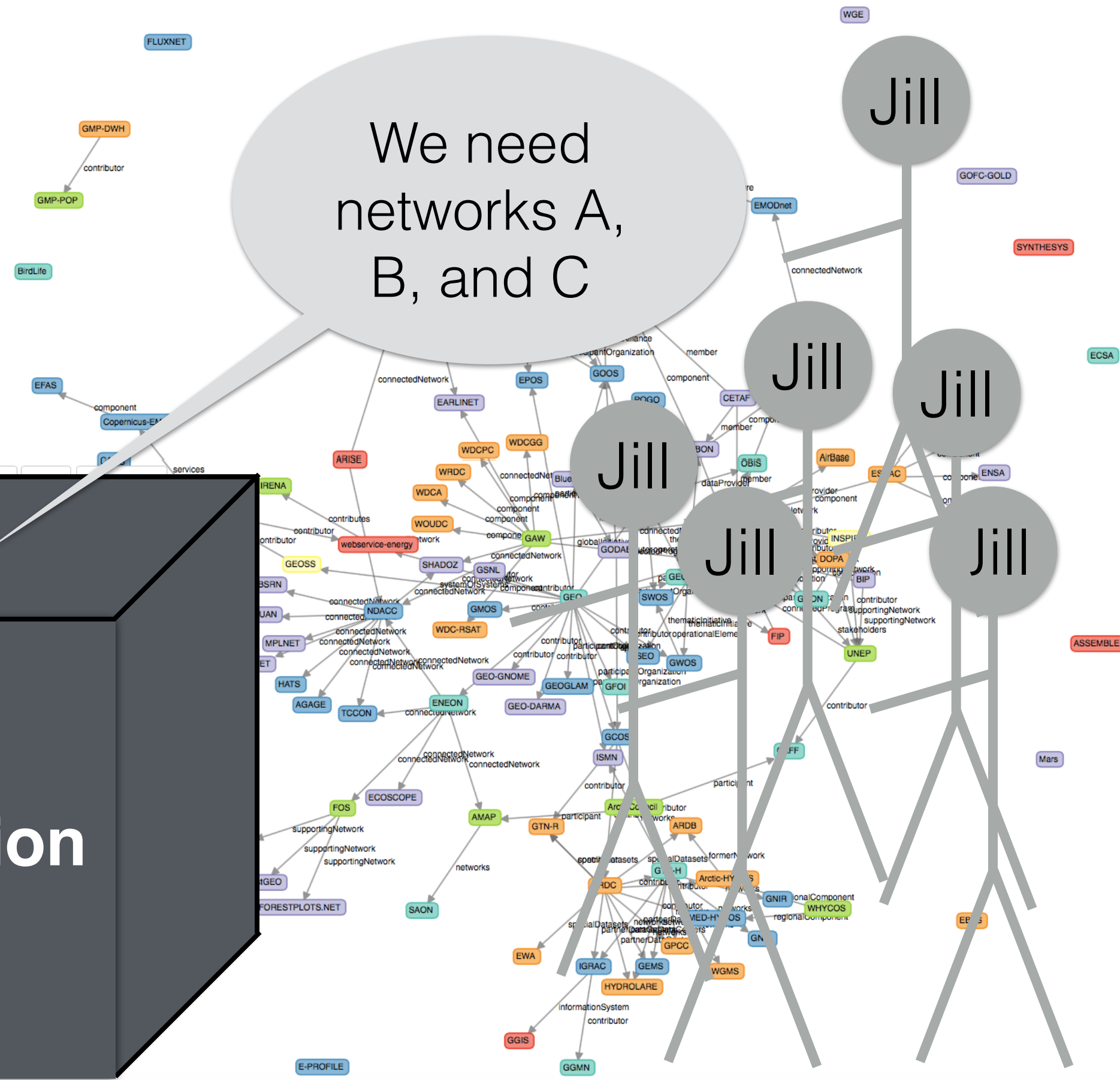


Missing:
*Map of Jacks
and their problems*

Match Making

Coordination

- Complete list
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Governance/Science/Private

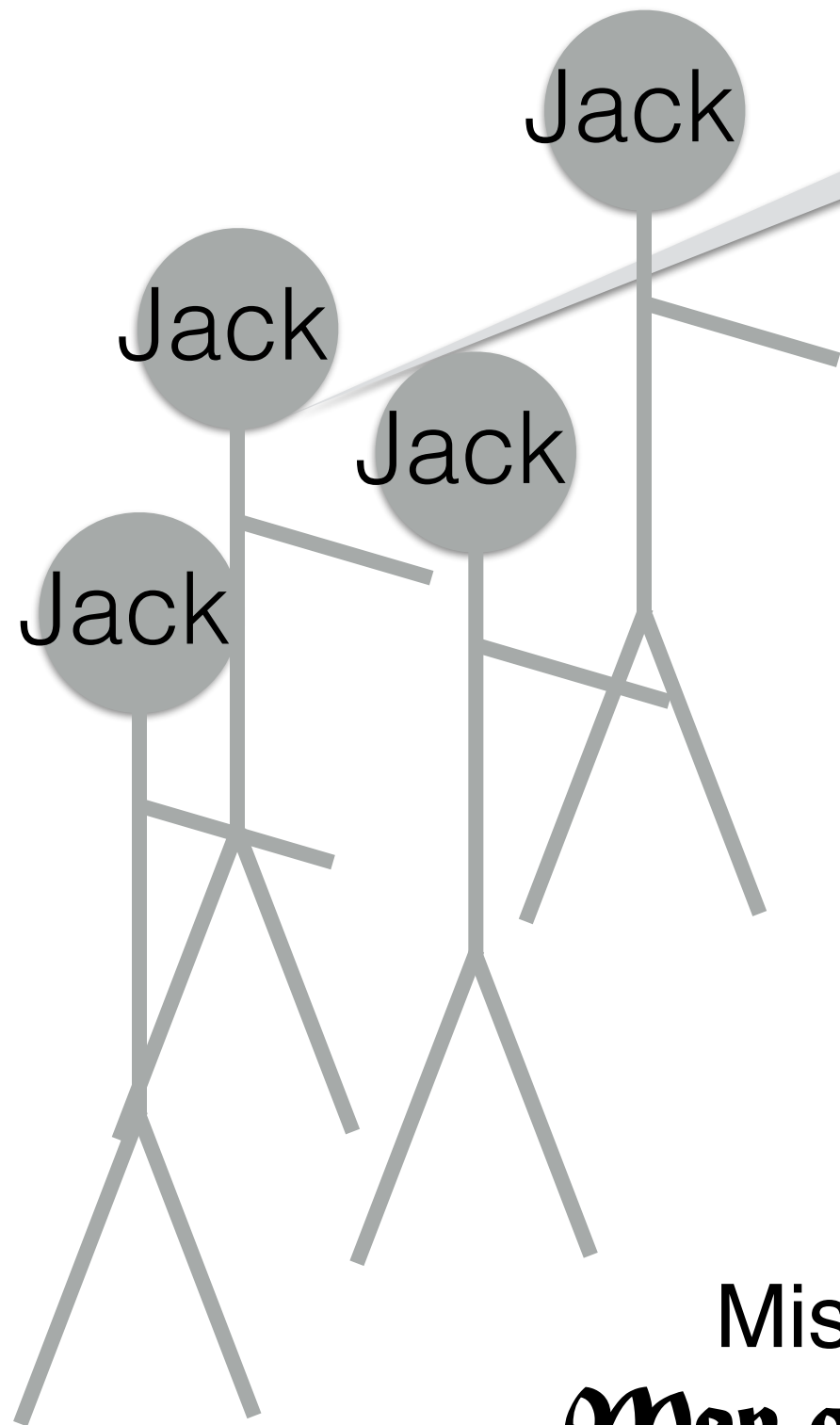
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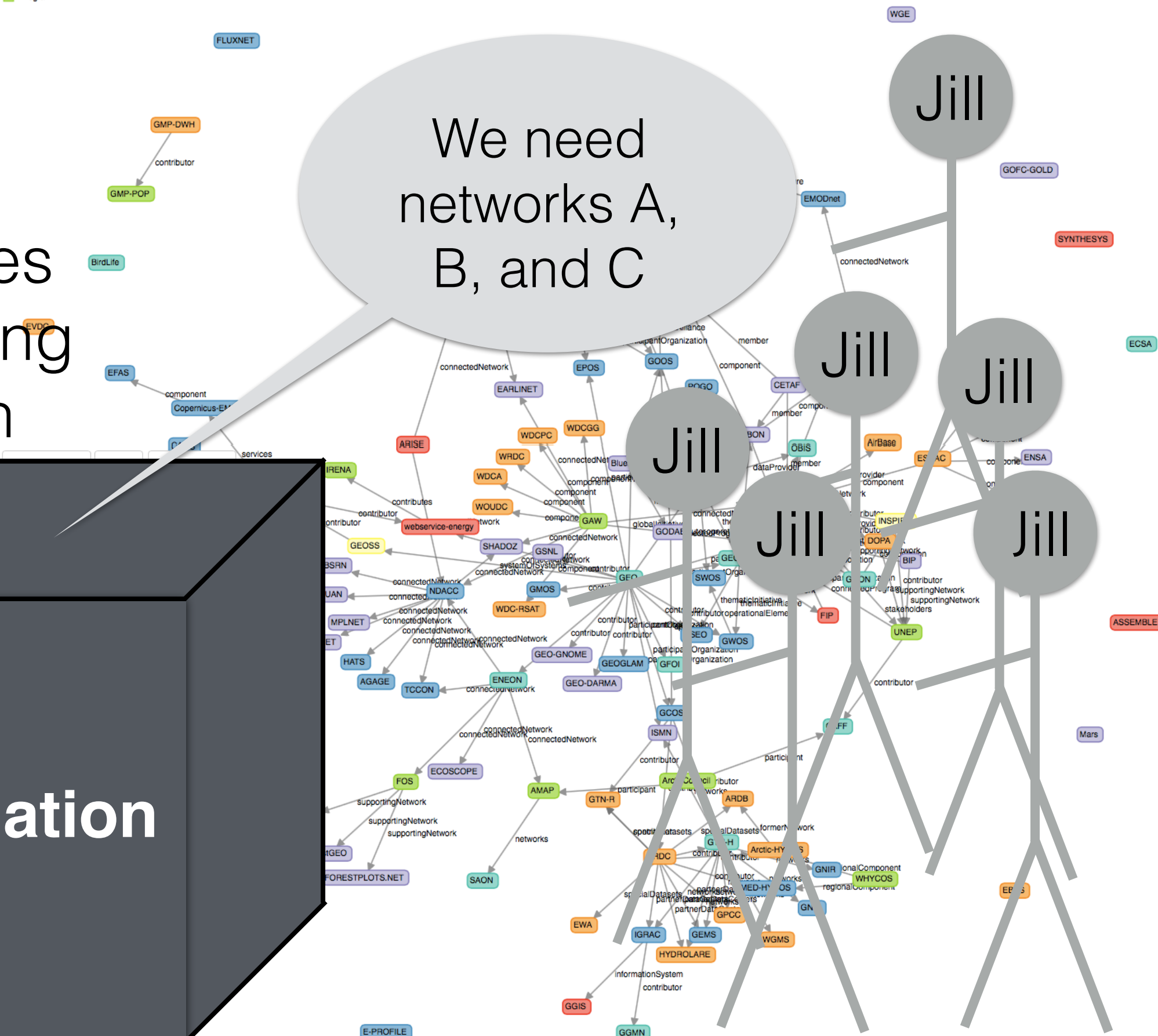
Missing:
*Map of Jacks
and their problems*
SEE-IN KB

Match Making

Coordination

Complete list Table JSON & RDF

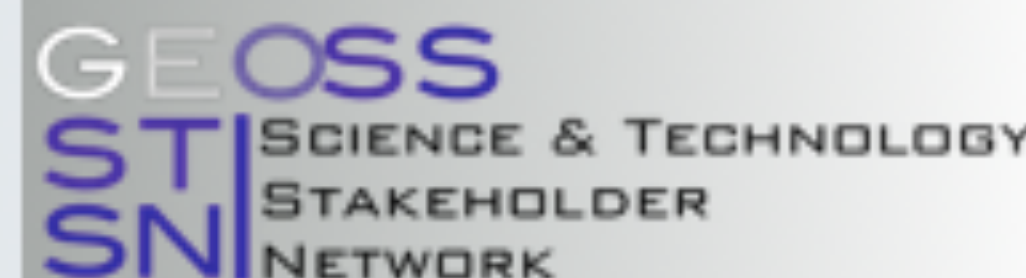
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5th GEOSS Science and Technology Stakeholder Workshop

*Linking the Sustainable Development Goals to
Earth Observations, Models and Capacity Building*

December 9-10, 2016, Berkeley, California, USA



Supporting the Implementation of the Transformative and Urgent 2030 Agenda for Sustainable Development:

Understanding the information and knowledge needs of those implementing the 2030 Agenda for Sustainable Development is prerequisite and a challenge for making the abundant knowledge derived from Earth observation and science usable. The urgency in the 2030 Agenda requires working at unprecedented pace and the organizations supporting the Agenda have to be responsive and agile. The transformative 2030 Agenda requires a new mindset. New ways of thinking and working for the achievement of the Sustainable Development Goals (SDGs) will lead to experimentation, innovation, and capacity building. Processes and tools need to be created for simplifying and translating the abundantly available knowledge into forms that are relevant, timely and actionable for the implementation of the 2030 Agenda.

Scope and Objectives of the Workshop:

The workshop aims to facilitate the development of a collaborative platform where providers, scientists, and policy makers can work together in support of the 2030 Agenda for Sustainable Development. The workshop will focus on specific examples, in particular those SDGs scheduled for reviewing by the High-Level Political Forum 2017. The workshop will provide a forum to review the knowledge needs associated with the monitoring and implementation of the SDGs. Science communities can help to generate the required knowledge and translate it into actionable forms. Decision and policy makers engaged in the monitoring and implementation of the SDGs benefit from having improved access to applicable knowledge and knowledge-creating tools. A platform incorporating this knowledge and tool set would support building new capacity in using this knowledge for policy making and the planning of action to implement the SDGs.

The development of evidence-based policy options that consider the SDG interactions must have a high priority. The scoping of a collaborative platform that would support the development of policy options accounting for SDG interactions, allow for gap analyses, and provide access to knowledge, including the documentation of use case and stories, will be the theme linking the different parts of the workshop. Importantly, the relationship of such a platform to other effort needs to be considered.

Developing a Collaborative Platform in Support of the Implementation and Monitoring of the Sustainable Development Goals:

Achieving the sustainable development targeted by 2030 Agenda depends on information and knowledge derived from Earth observations and models. GEO has the convening power to bring together those who can generate the knowledge and those who use the knowledge in developing and implementing policies for SDG implementation and monitoring.

Program Committee:

Richard L. Bernknopf
Douglas Cripe
Phil Dickerson
Lawrence Friedl
Shelley Jules-Plag
Argyro Kavvada
Rick Lawford
Norman Miller
Joan Maso
Stefano Nativi
Jay Pearlman
Hans-Peter Plag
Giovanni Rum
Michel Schouppé
Andy Stevens
James Syvitski
Juli Trtanj

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Berkeley
UNIVERSITY OF CALIFORNIA

GEOSS
SCIENCE & TECHNOLOGY
STSN | STAKEHOLDER
NETWORK

The objectives of the workshop are to:

- Explore approaches to linking the Earth observation communities engaged in GEO to those communities monitoring the progress towards SDG targets;
- Better understand the needs to support through observations and models the policy development for SDG target implementation;
- Discuss gaps in observation, modeling support, and capacity for SDG monitoring and implementation and means to address these gaps;
- Scope a collaborative platform, which supports the co-creation of and access to the knowledge required for the implementation and monitoring of SDGs, including initial considerations of the institutional framework the platform is meant to support.

Workshop Sessions:

Session 1: Societal Knowledge Needs for Sustainable Development

Session 2: Interconnection and Interaction of SDGs

Session 3: Monitoring Progress Towards Goals: The Information Needs and Gaps

Session 4: Evidence-Based Policy Options for Implementing Goals: Knowledge Needs and Gaps

Session 5: Adding Models to Earth Observations

Session 6: Building Capacity for Evidence-Based Policies for Sustainable Development

Session 7: Developing a Collaborative Platform: The role of the GEOSS Knowledge Base

Workshop Announcement: http://www.gstss.org/2016_Berkeley

Contact: dcripe@geosec.org, grum@geosec.org, hpplag@odu.edu

The Workshop will focus on specific examples of selected SDGs.

