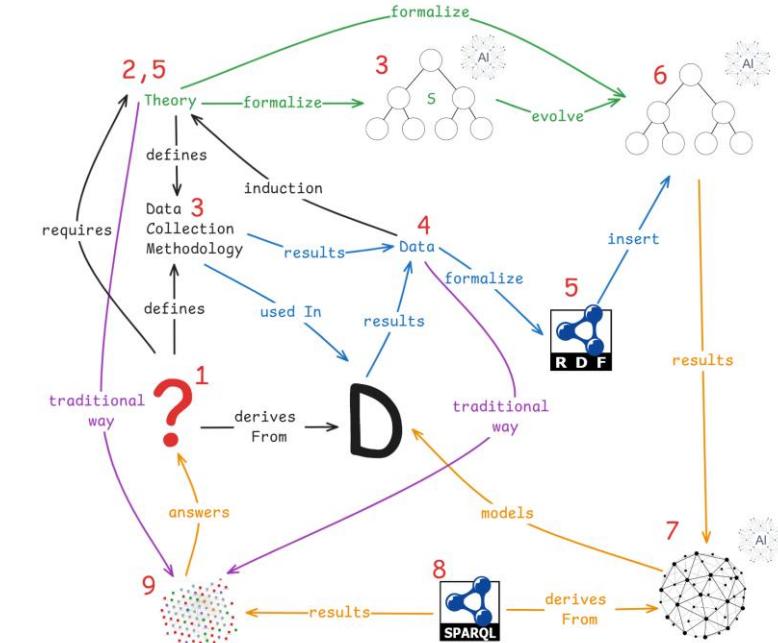


Blind-spots, Business Ecosystems, and Role of Semantics



Ontology Summit 2025
Track: “From Reality to Data”

Title: Beyond Blind Spots: How Semantic Strategies Reveal
Hidden Insights in the Business World

Ontolog Forum



ARISTOTLE
UNIVERSITY
OF THESSALONIKI



Christian Doppler
Forschungsgesellschaft

Josef Ressel Centre for
Data-Driven Business Model Innovation

Challenge



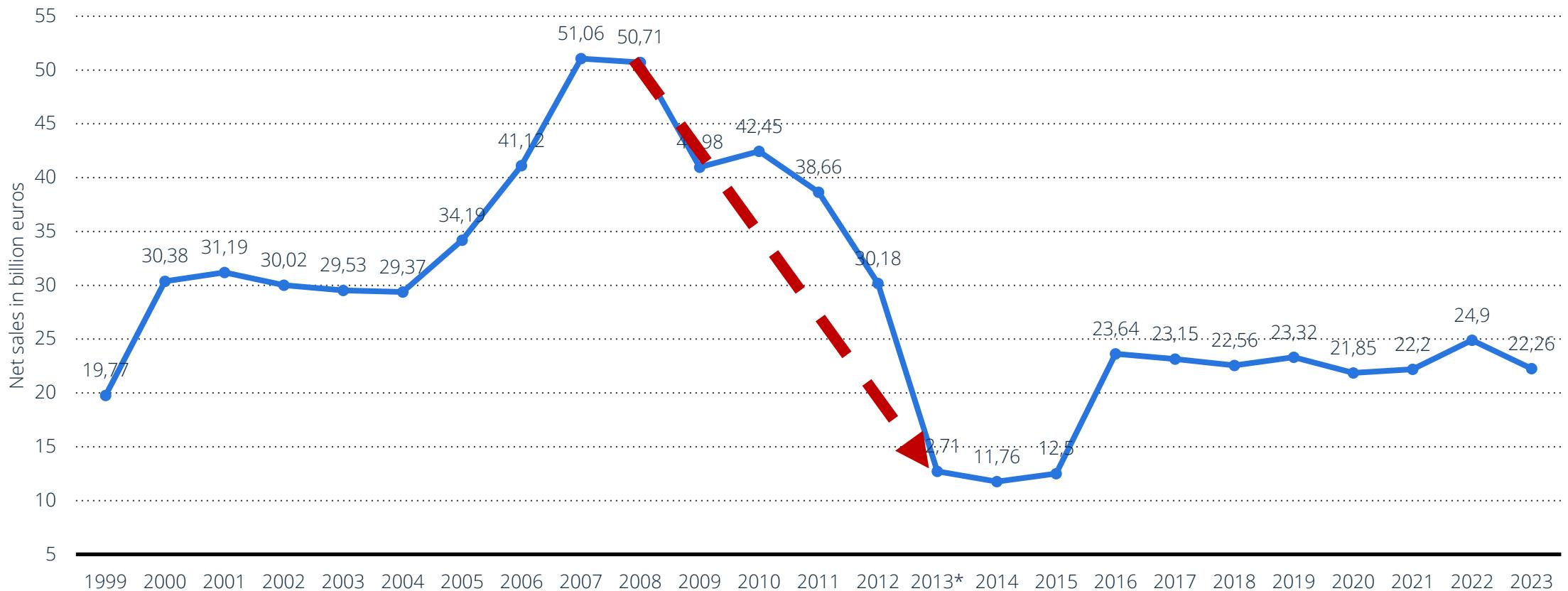






Nokia net sales worldwide from 1999 to 2023 (in billion euros)

Nokia net sales worldwide 1999-2023



Note(s): Worldwide; 1999 to 2023

Further information regarding this statistic can be found on [page 8](#).

Source(s): Nokia; ID 267819



symbian

vs

iOS

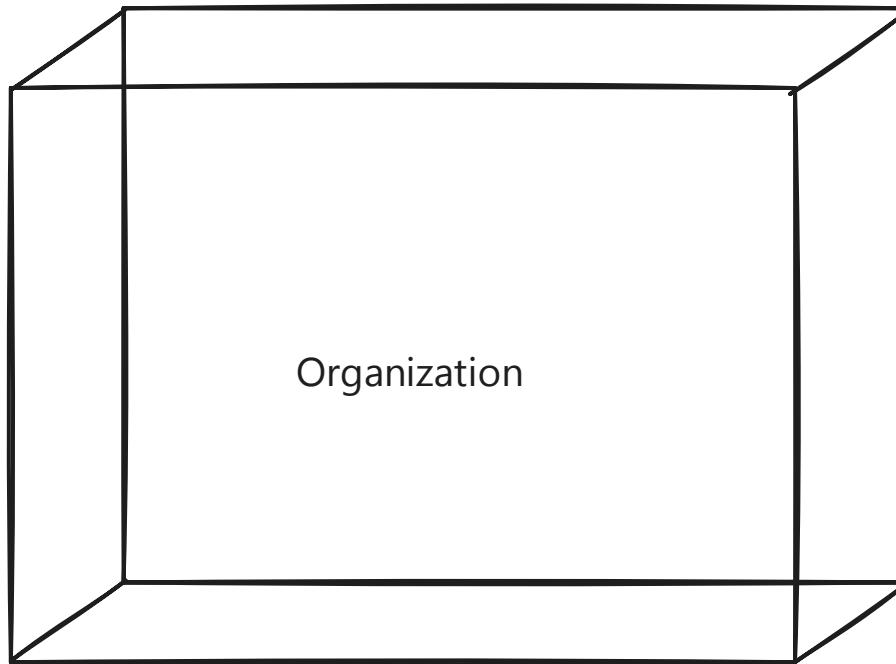


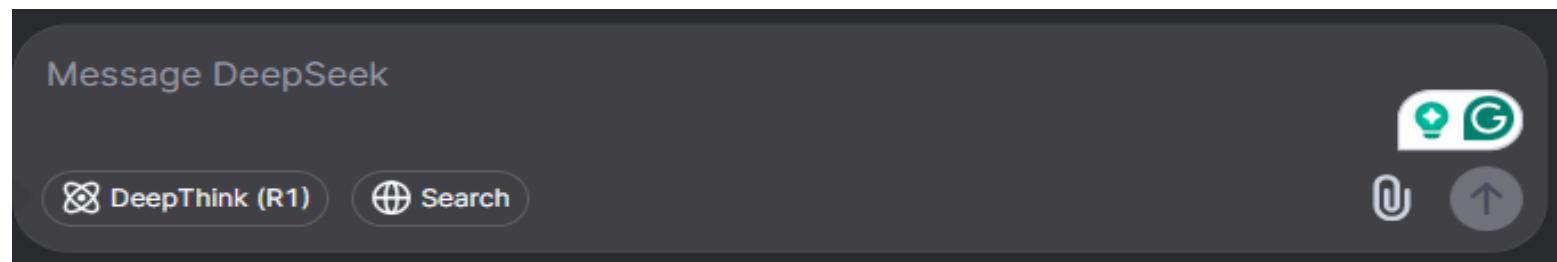
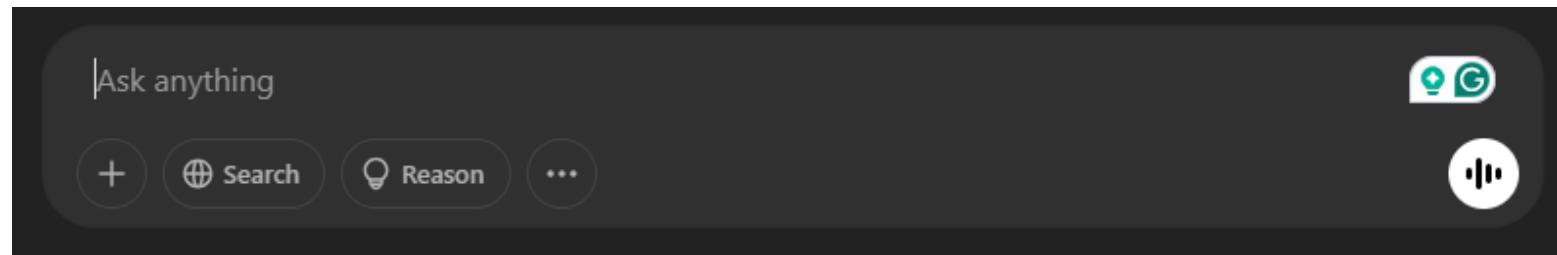
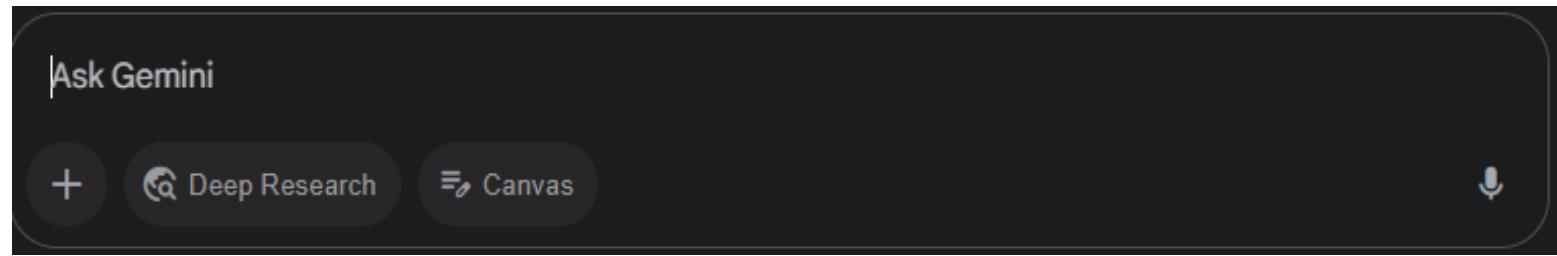
ANDROID



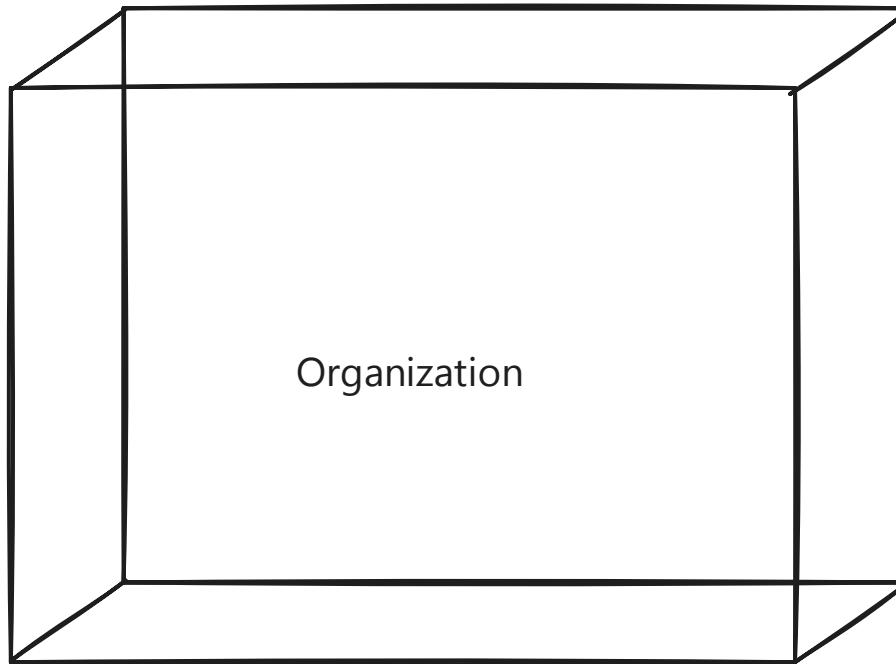
vs

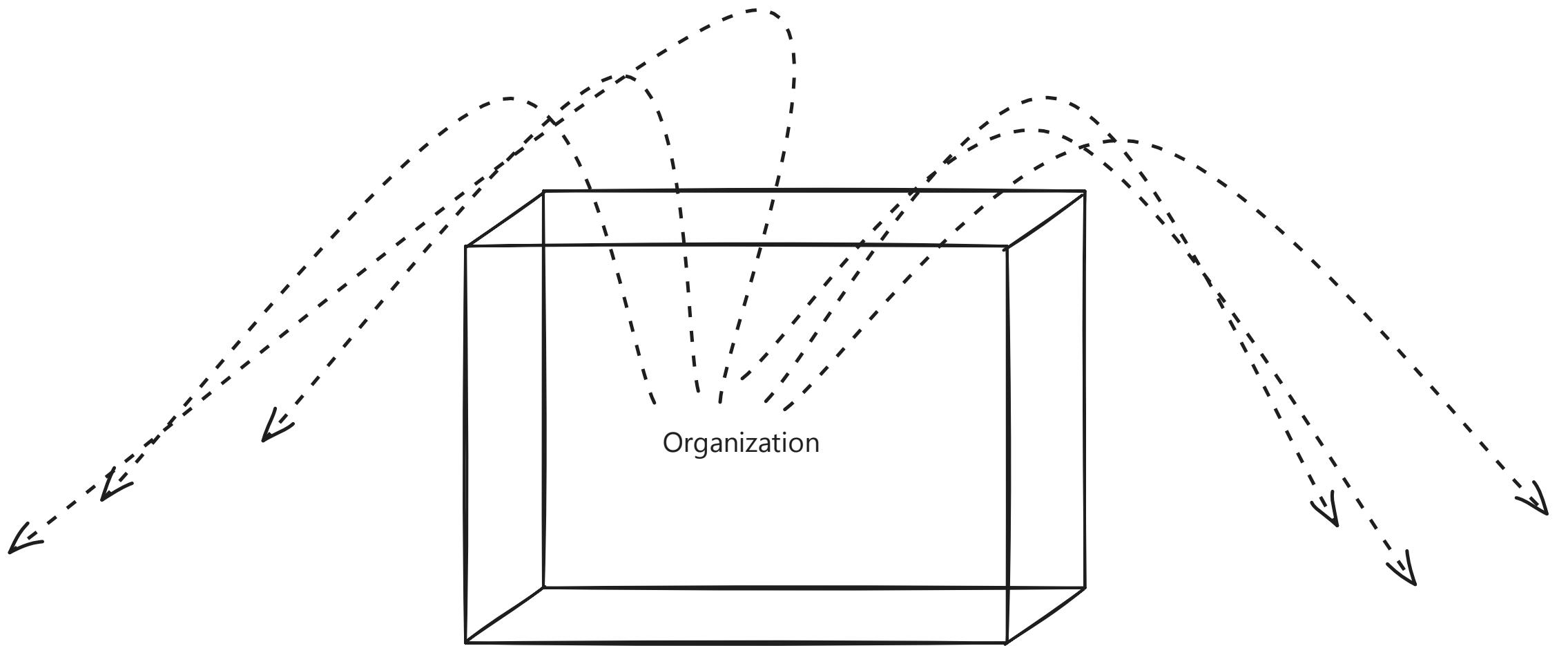
iOS





Strategy

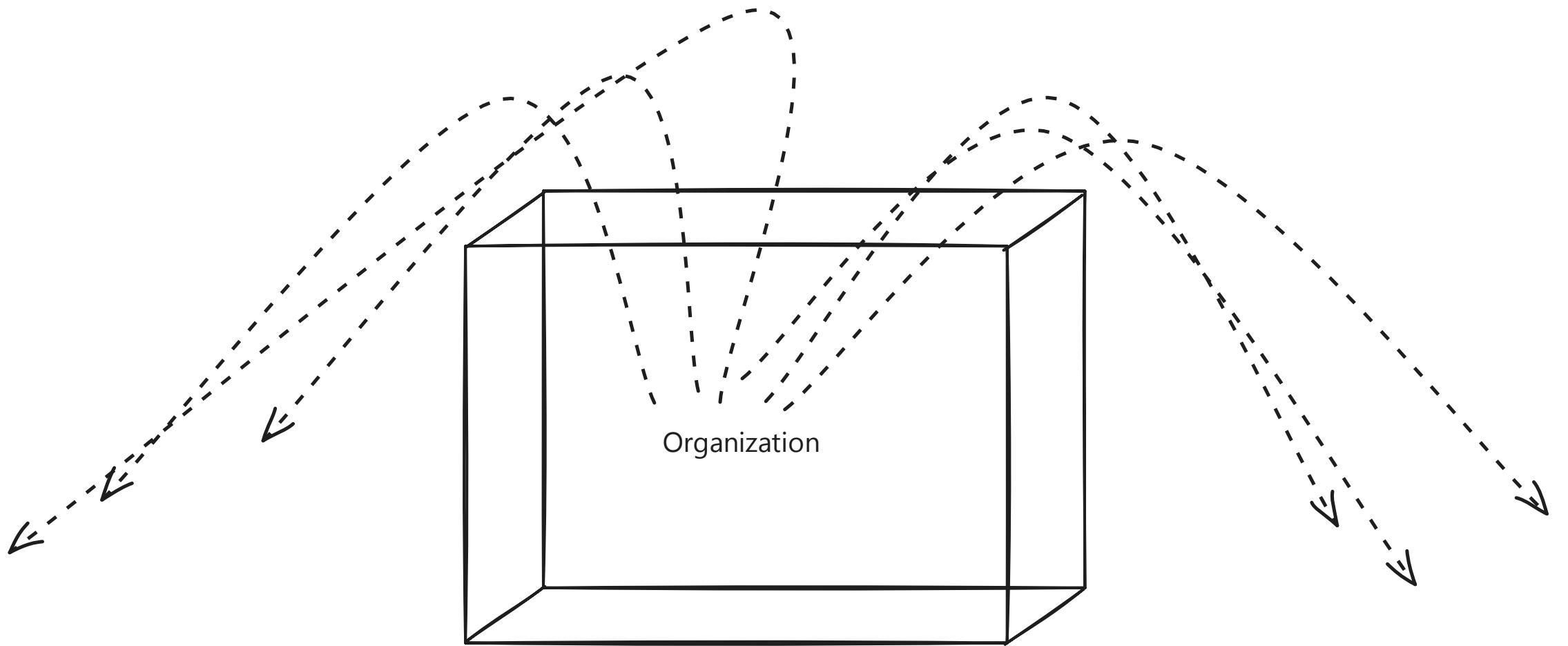


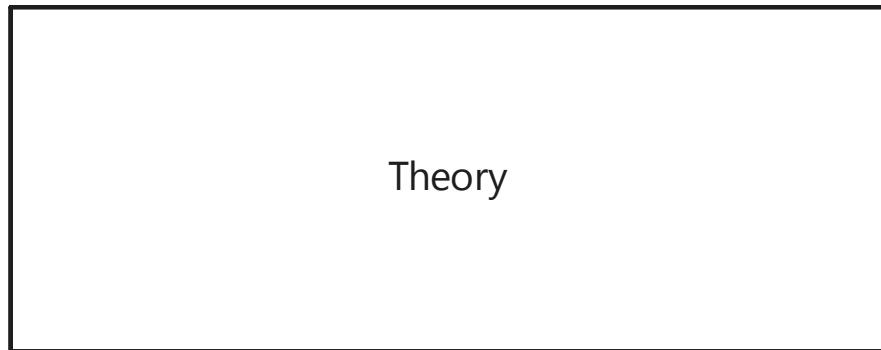




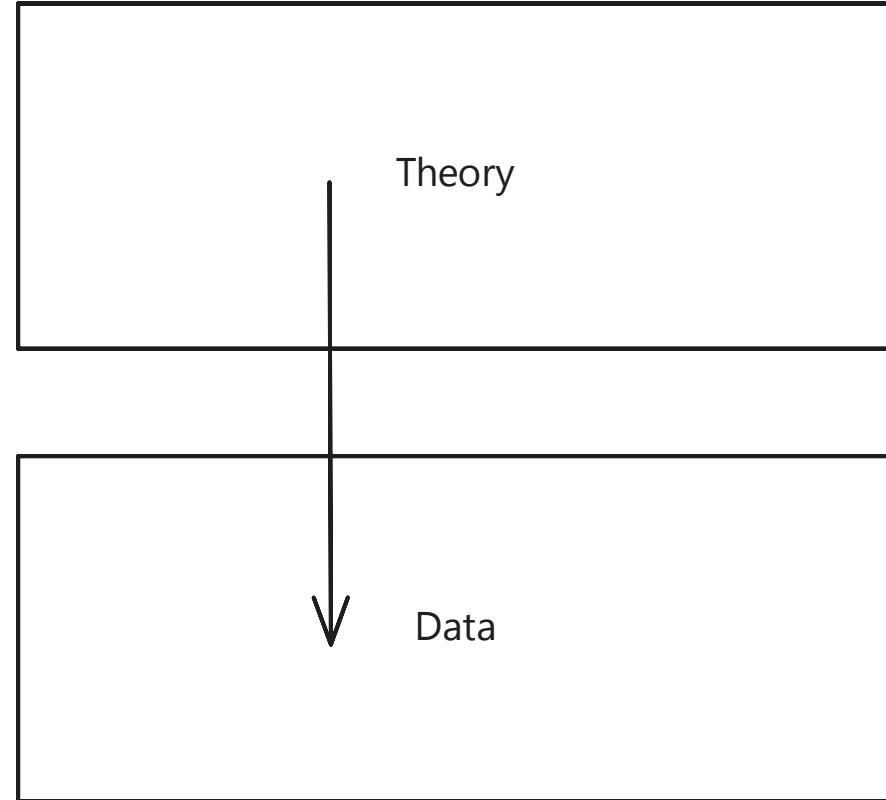


Challenge v2



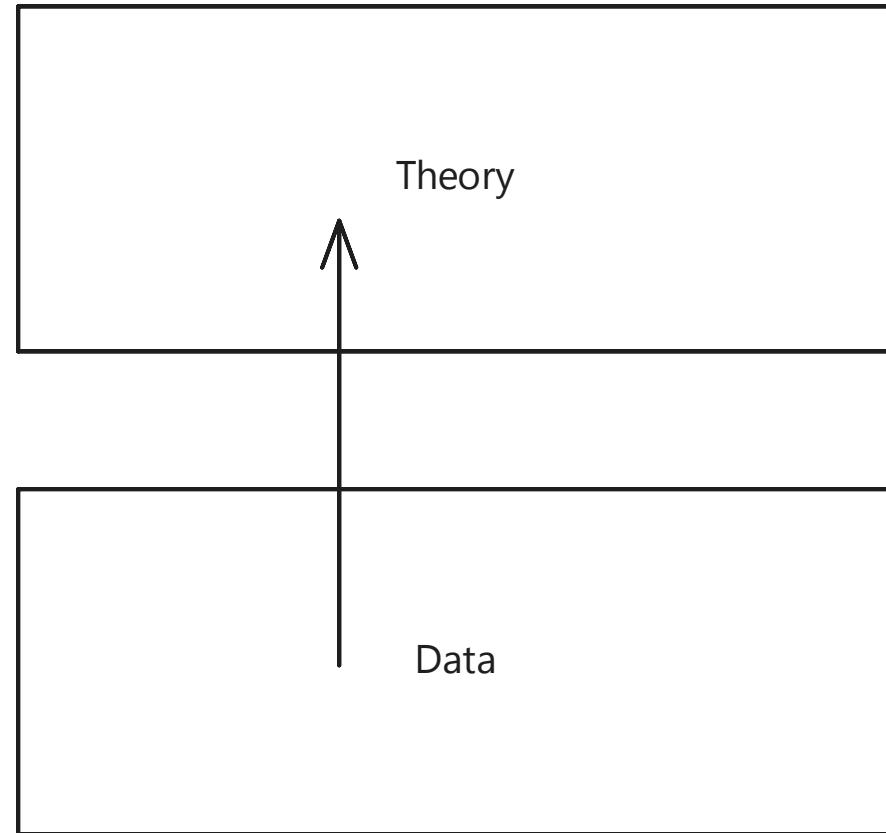
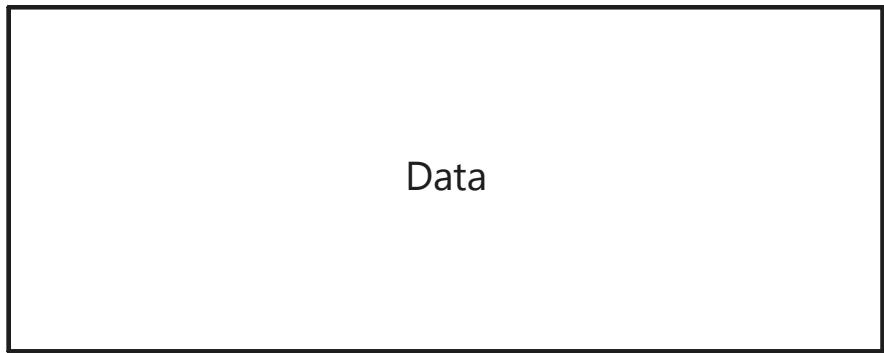


Theory



Theory

Data



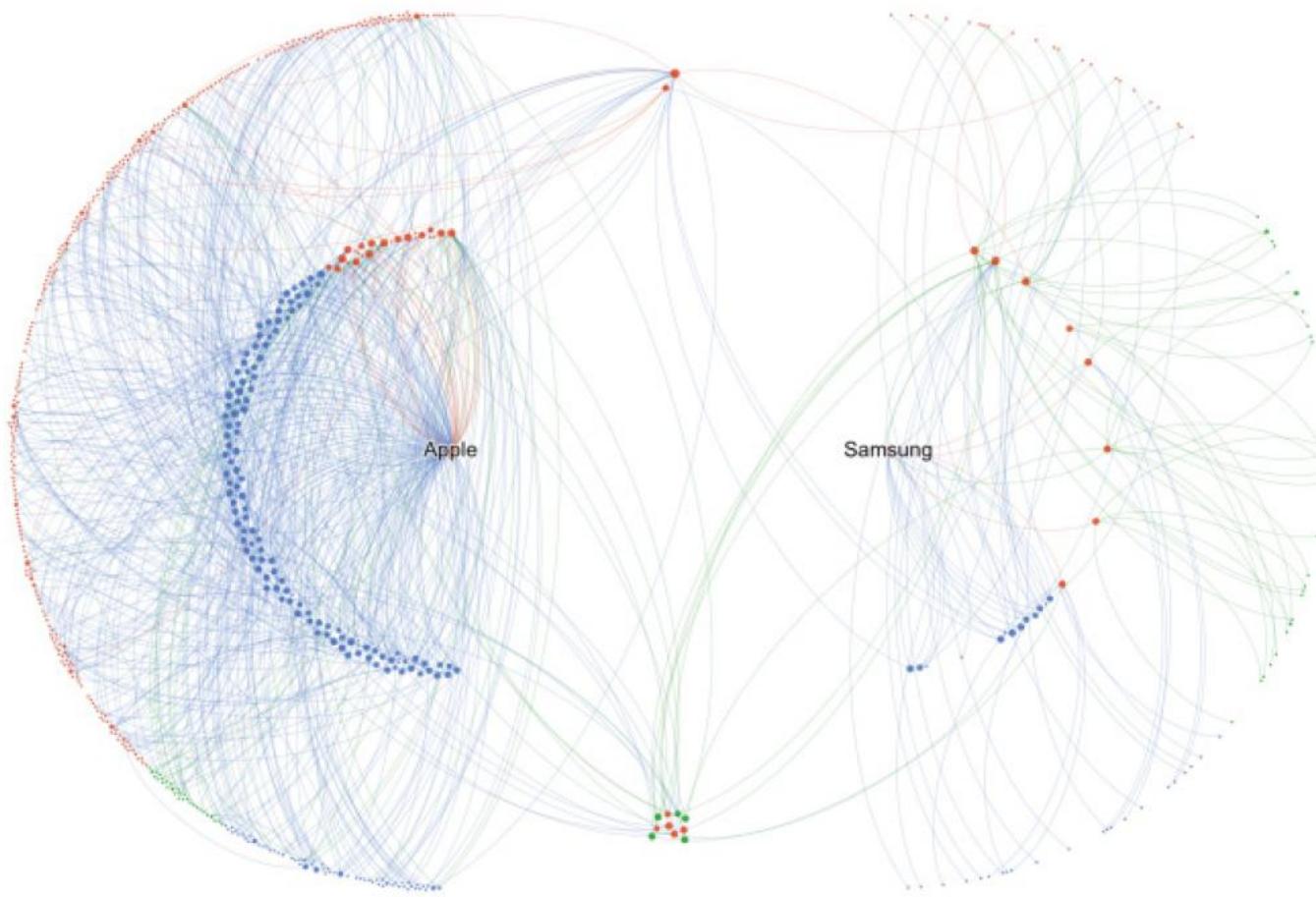
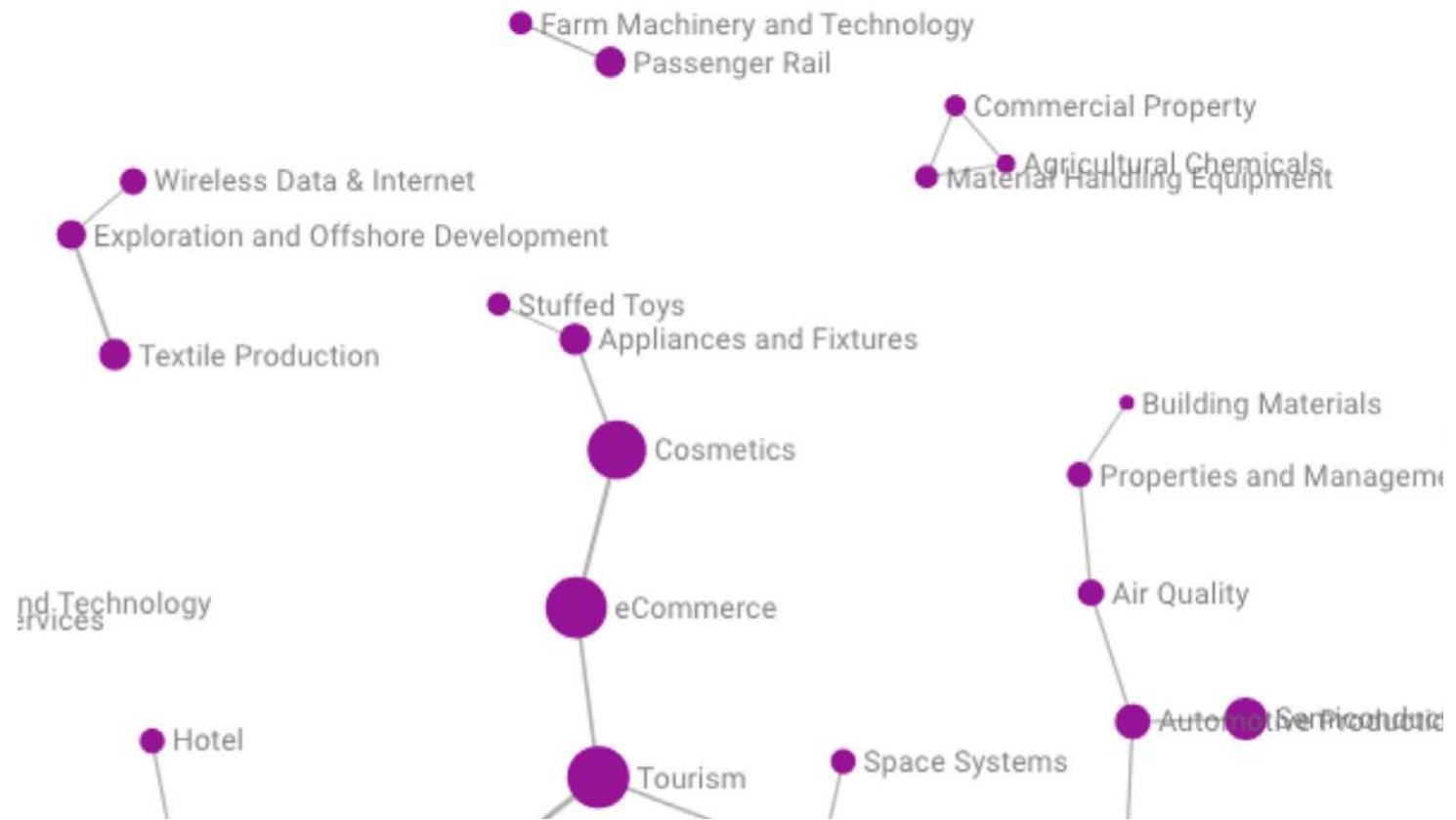
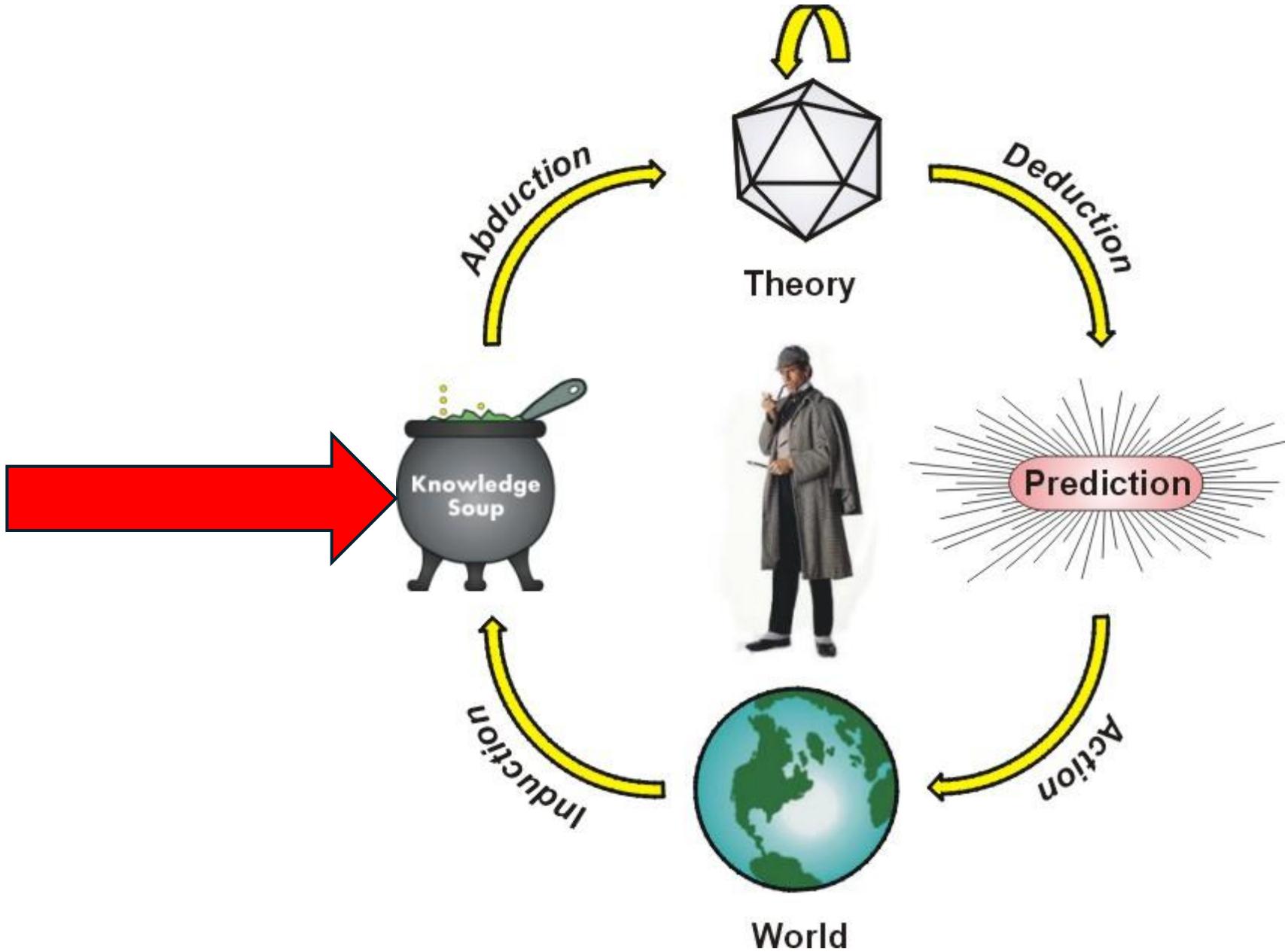
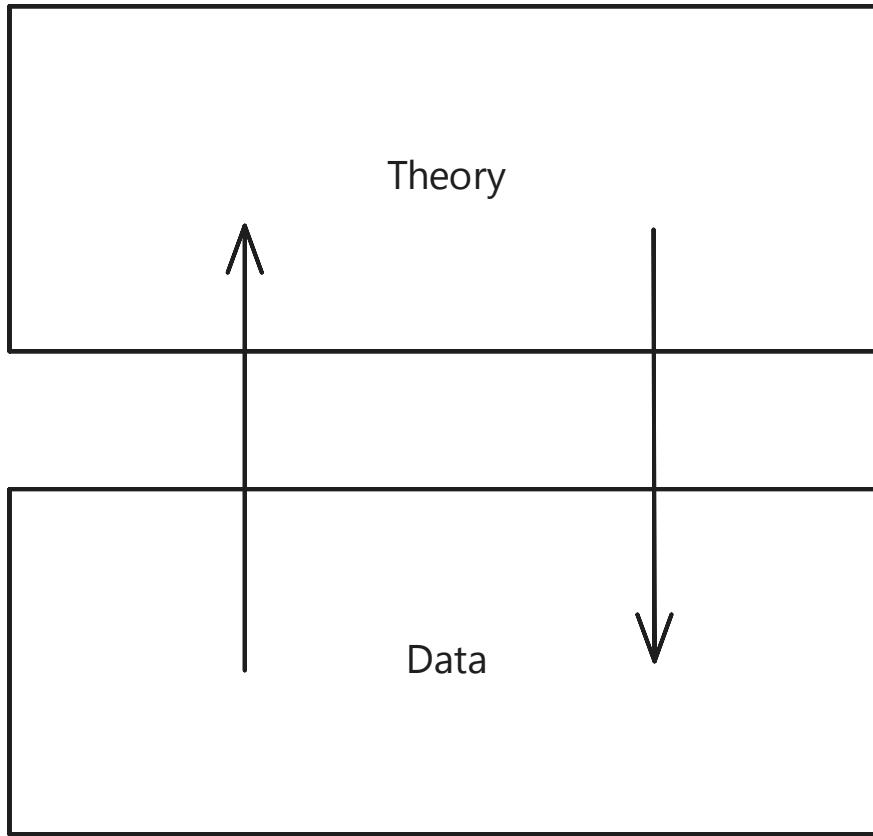


Fig. 7. Apple and Samsung bicentric EFR ecosystem.







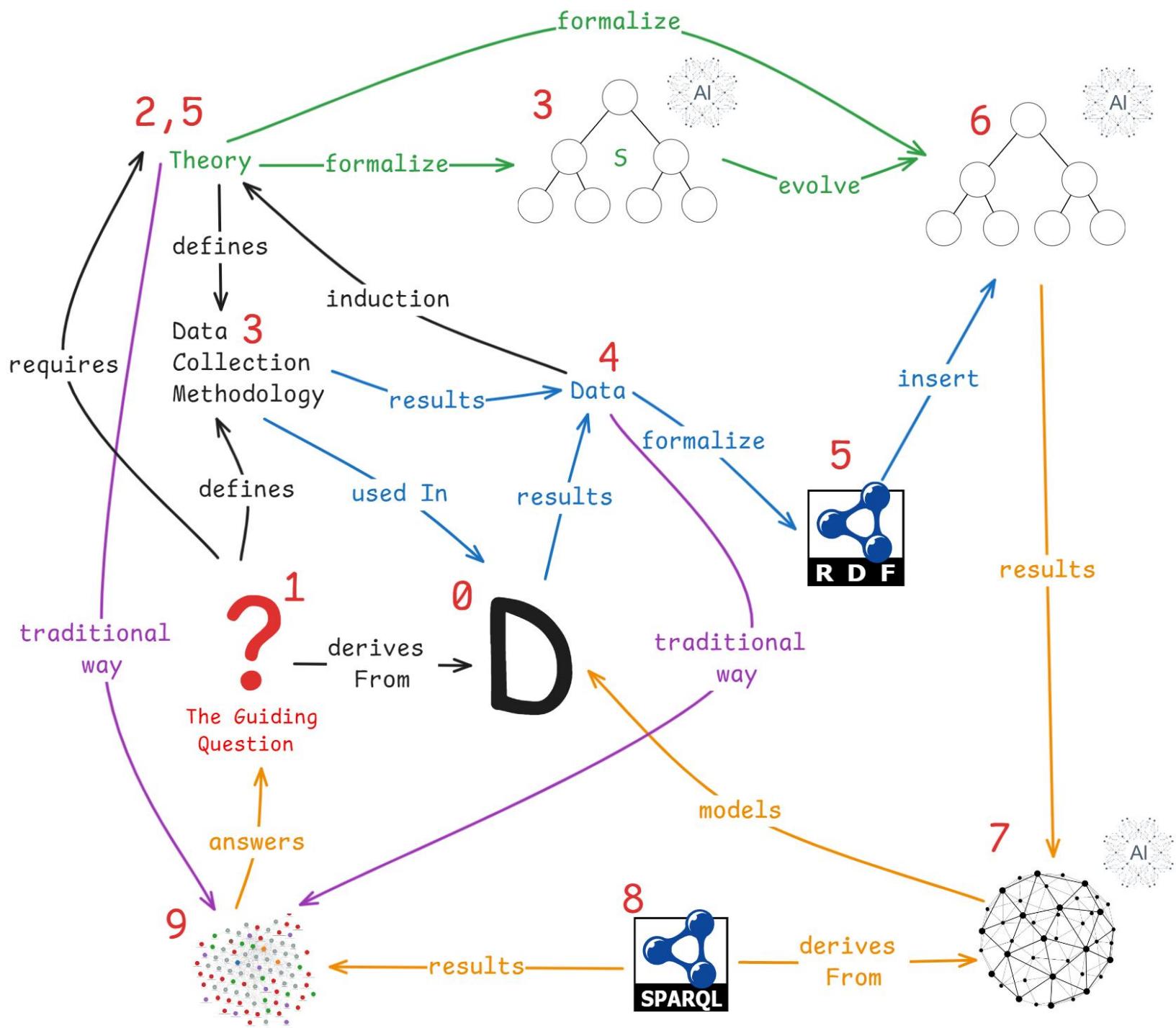
Challenge v3

Where to start?

Question

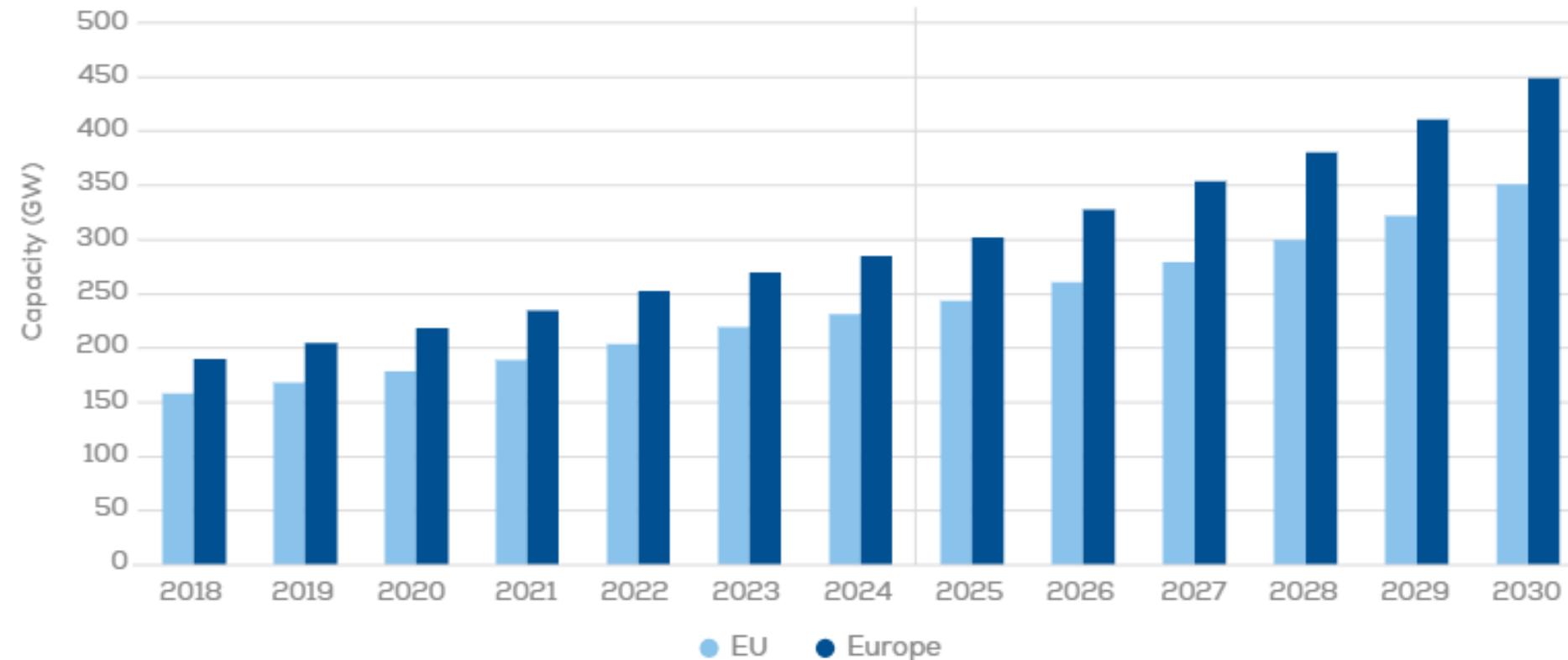
How can we extend the business ecosystem frameworks to effectively bridge **evidence and theory** to derive meaningful representations for strategic analysts in complex business ecosystems?

Business Ecosystem Analysis & Representation (BEAR) Framework



0. Domain of Interest

FIGURE C. 2025-30 new wind power capacity in Europe and the EU - WindEurope's Outlook



Source: WindEurope

1 . Guiding Question

How do specific companies establish their positions through product&service delivery interactions within the wind energy ecosystem?

2. Theory

How do specific companies establish their positions through product&service delivery interactions within the wind energy ecosystem?

How do **specific companies** establish their **positions** through **product&service delivery interactions** within the wind energy ecosystem?

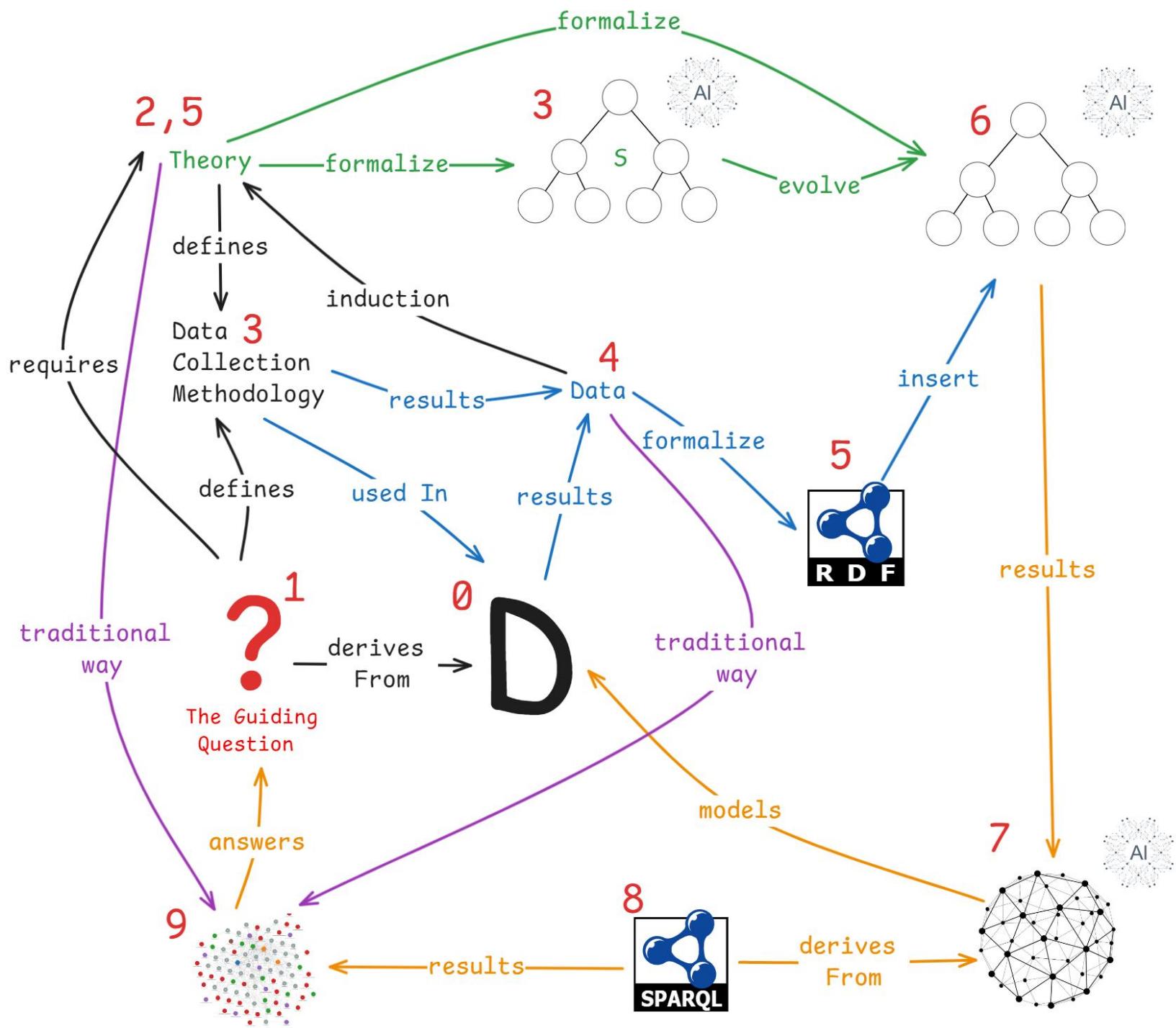
Organization Theory, Supply Chain Dynamics,
Business Ecosystem Theory, Business Strategy

3 . Seed Ontology

Table 1

Mapping of Natural Language to OWL2 Formalization

Natural Language	OWL2 Formalization
Company	<pre><owl:Class rdf:about="https://purl.org/beo#Company"> <rdfs:subClassOf rdf:resource="https://purl.org/beo# #Organization"/> </owl:Class></pre>
Delivers to	<pre><owl:ObjectProperty rdf:about="https://purl.org/beo# deliversTo"> <rdfs:subPropertyOf rdf:resource="http://www.w3.org /2002/07/owl#topObjectProperty"/> <owl:inverseOf rdf:resource="https://purl.org/beo# receivesFrom"/> </owl:ObjectProperty></pre>



3 , 4 . Data & Data Collection Methodology

 UNIVERSITY OF APPLIED SCIENCES
OBERÖSTERREICH

Dipl. Ing.
Alican Tüzün BSc
 Ph.D. Kandidat
 Josef Ressel Zentrum für datentreibene Geschäftsmodellinnovation

Fakultät für Wirtschaft und Management
 FH OÖ Forschungs & Entwicklung GmbH
 Josef-Ressel-Gasse 1-3 | 4040 Steyr/Austria
 Tel.: +43 5 064 33813
 alican.tuzun@fh-ooe.at | www.fh-ooe.at

[15]

Wind Energy Ecosystem Survey

Consent to Data Usage for Additional Purposes

If you agree with the following purposes of use, please check the corresponding boxes. If you do not wish to give consent, please leave the fields blank.

I consent to the data collected in the context of this questionnaire being evaluated as part of a research project and published in anonymized form.

I consent to being contacted via email for a follow-up study.

I would like to receive the scientific publication by email after its release.

Hamburg, 24-27.09.2024

[Signature]

Ecosystem Relationships

As a */Company Type/*, we are offering our products and services to */Specific Main Task/* within the wind energy ecosystem.

[Company Type]: OEM

[Specific Main Task]: Manufacturing of Wind Turbines

To achieve that My Company...

1. delivers (Service&Product) to operators / planners
2. receives (Service&Product) from other OEM / subcontractors
3. is paid for (Service&Product) by _____
4. pays for (Service&Product) to _____
5. shares data of (Service&Product) with planners / surveyors
6. receives (Service&Product) data from survey companies / the customer
7. shares (Service&Product) information with the customer
8. receives (Service&Product) information from 1+2
9. collaborates for (Service&Product) with other manufacturers
10. has conflicts for (Service&Product) reasons with -
11. competes for (Service&Product) with competitors / other OEMs

Please proceed to the next page to complete the survey.

Wind Energy Ecosystem Survey: Impact of Data

Rate the importance or challenge for each question

1 = Not Important/No Challenge,
 2 = Slightly Important / Slight Challenge,
 3 = Moderately Important / Moderate Challenge,
 4 = Important / Significant Challenge,
 5 = Extremely Important/Extreme Challenge

Importance of Operational Data

1. How important is the use of operational data (e.g., machine data, production data) in your company's decision-making processes? 4
2. How important is real-time access to operational data for maintaining competitiveness in your industry? 5
3. How critical is the ability to share operational data with ecosystem partners (e.g., suppliers, manufacturers) for collaborative decision-making? 3

Challenges in Data Utilization

1. How challenging is the integration of different types of operational data (e.g., machine data, logistics data, customer data) within your company? 3
2. How significant are the challenges related to data security and privacy when managing and utilizing operational data in your ecosystem? 3
3. How difficult is it for your company to extract actionable insights from the vast amounts of operational data it collects? 2

Data Tools and Infrastructure

1. How important is having the right tools and infrastructure (e.g., data analytics platforms, IoT systems) for effectively utilizing operational data? 5
2. How challenging is it to integrate new data tools and technologies (e.g., AI, machine learning, cloud-based solutions) into your existing operational systems? 2

Future of Operational Data

1. How important is it for your company to invest in advanced data analytics capabilities to handle the growing volume of operational data? 3
2. How likely is your company to adopt emerging technologies (e.g., predictive analytics, digital twins) for better utilization of operational data? 4

2



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UPPER AUSTRIA

Dipl. Ing.
Alican Tüzün BSc

Ph.D. Kandidat
Josef Pešl Zentrum für datengetriebene Geschäftsmodellinnovation

Fakultät für Wirtschaft und Management
FH OÖ Forschungs & Entwicklungs GmbH
Wehrberggasse 1-3 | 4400 Steyr/Austria
Tel.: +43 5 0804 33813
alican.tuzun@fh-steyr.at | www.fh-oeo.at

15

Energy Ecosystem Survey

Consent to Data Usage for Additional Purposes

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Hamburg, 24-27.09.2024

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[Company Type]: OEM

[Specific Main Task]: Manufacturing of Wind Turbines

To achieve that My Company...



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2. receives (Service&Product) from other OEM / subcontractors

3. is paid for (Service&Product) by _____

4. pays for (Service&Product) to _____

5. shares data of (Service&Product) with planners / surveyors

6. receives (Service&Product) data from survey companies / the customer

7. shares (Service&Product) information with the customer /

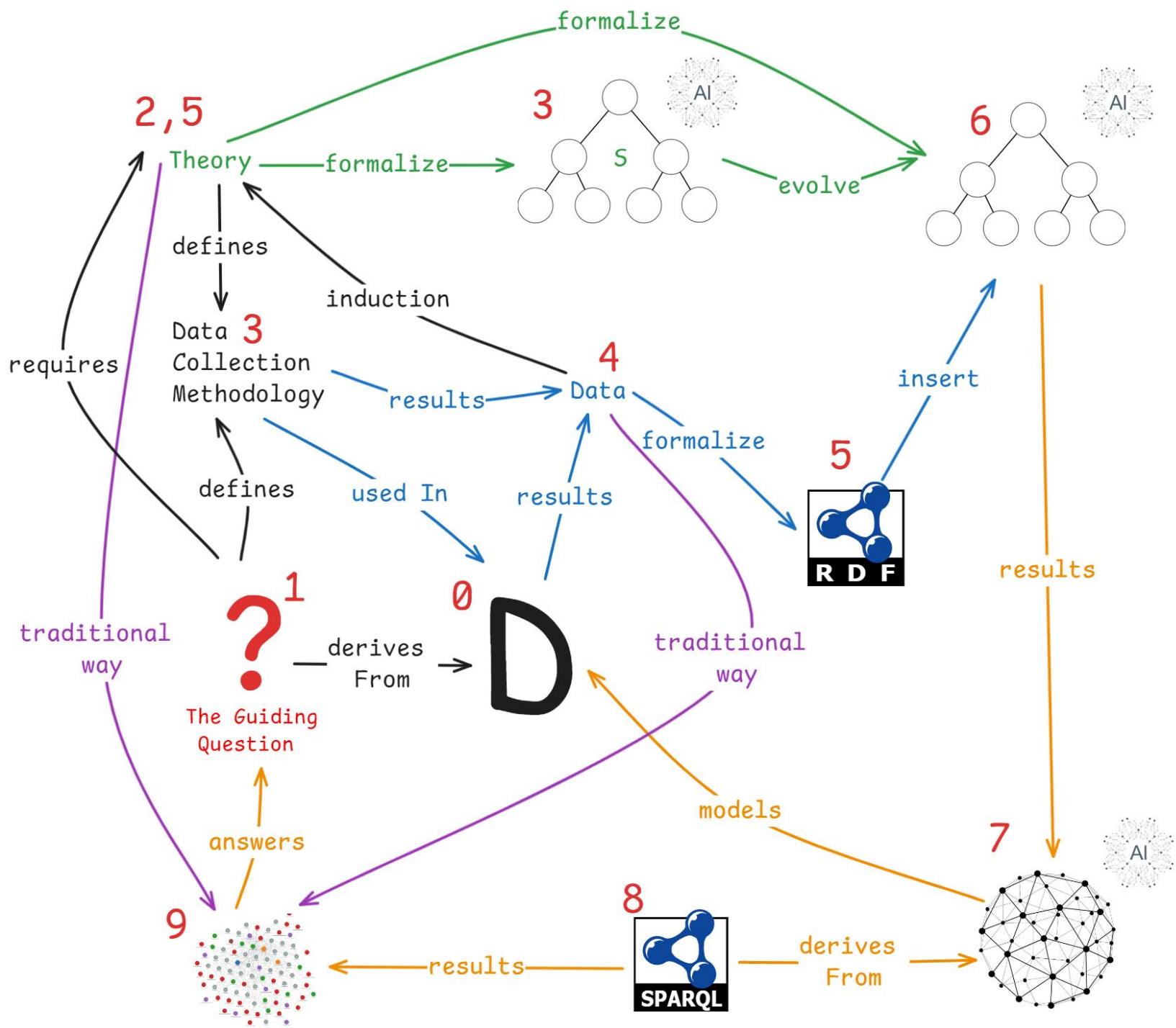
8. receives (Service&Product) information from 1+2

9. collaborates for (Service&Product) with other component manufacturers

10. has conflicts for (Service&Product) reasons with -

11. competes for (Service&Product) with competitors / other OEMs

Please proceed to the next page to complete the survey.

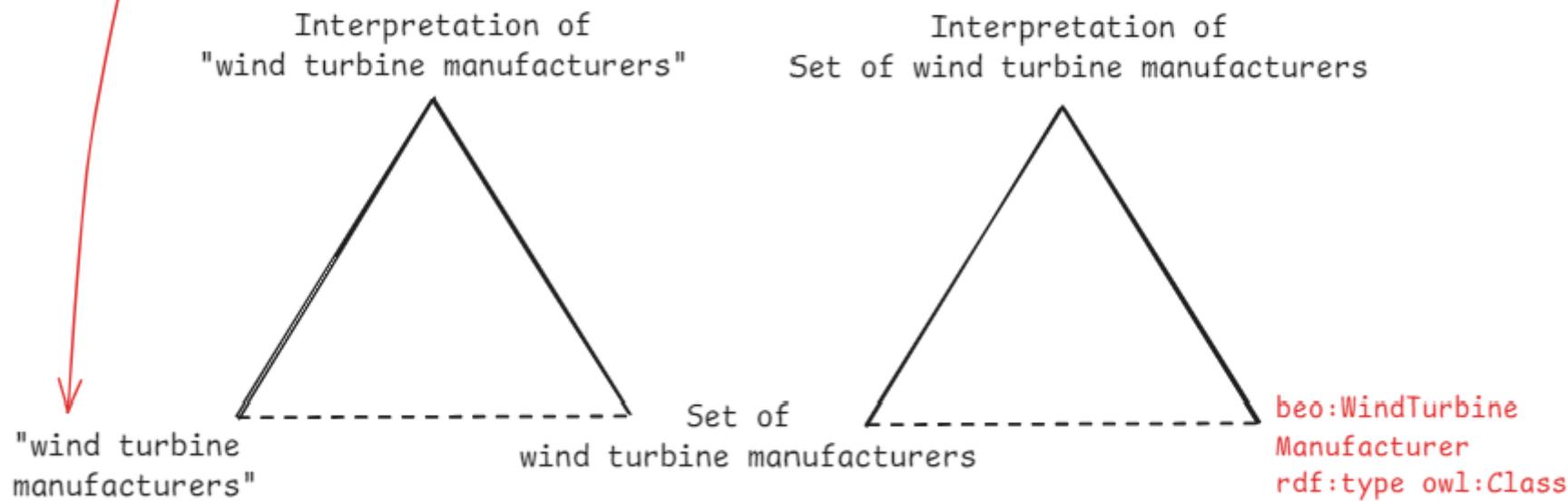


5, 6. Formalization of Data & Induction

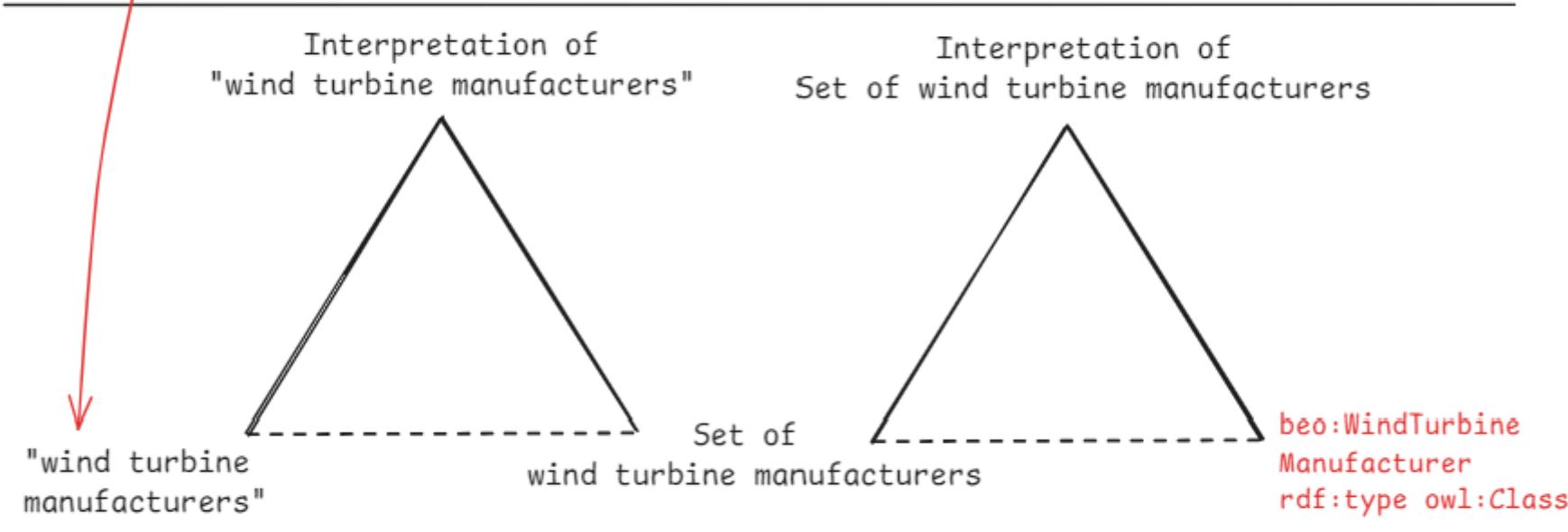
Organization 0 is an engineering consultant company and spare part provider. It delivers its products and services to service companies, wind turbine owners and wind turbine manufacturers. Receives products and services from spare part manufacturers.

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It delivers its products and services to service companies, wind turbine owners
and wind turbine manufacturers. Receives products and services from
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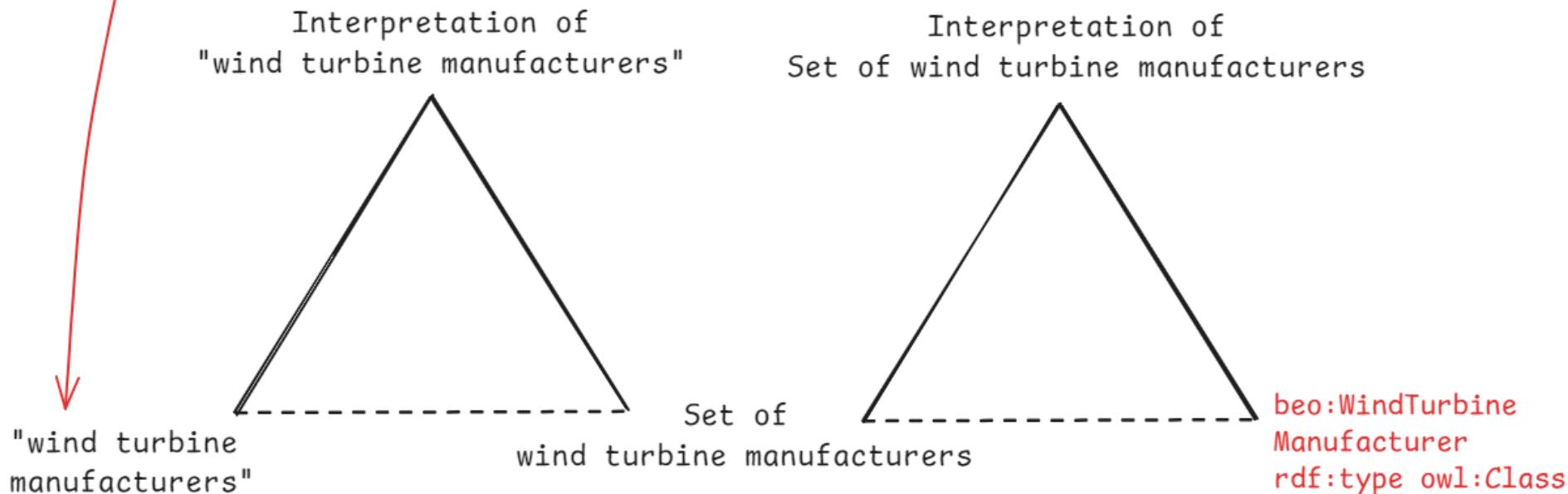


beo:EngineeringConsultantCompany
beo:SparePartProvider
beo:WindTurbineManufacturer

beo:WindTurbineOwner
beo:ServiceCompany
beo:SparePartManufacturer

beo:deliversTo
beo:receivesFrom
beo:Organization0

Organization 0 is an engineering consultant company and spare part provider.
It delivers its products and services to service companies, wind turbine owners
and wind turbine manufacturers. Receives products and services from
spare part manufacturers.



`beo:EngineeringConsultantCompany`
`beo:SparePartProvider`
`beo:WindTurbineManufacturer`

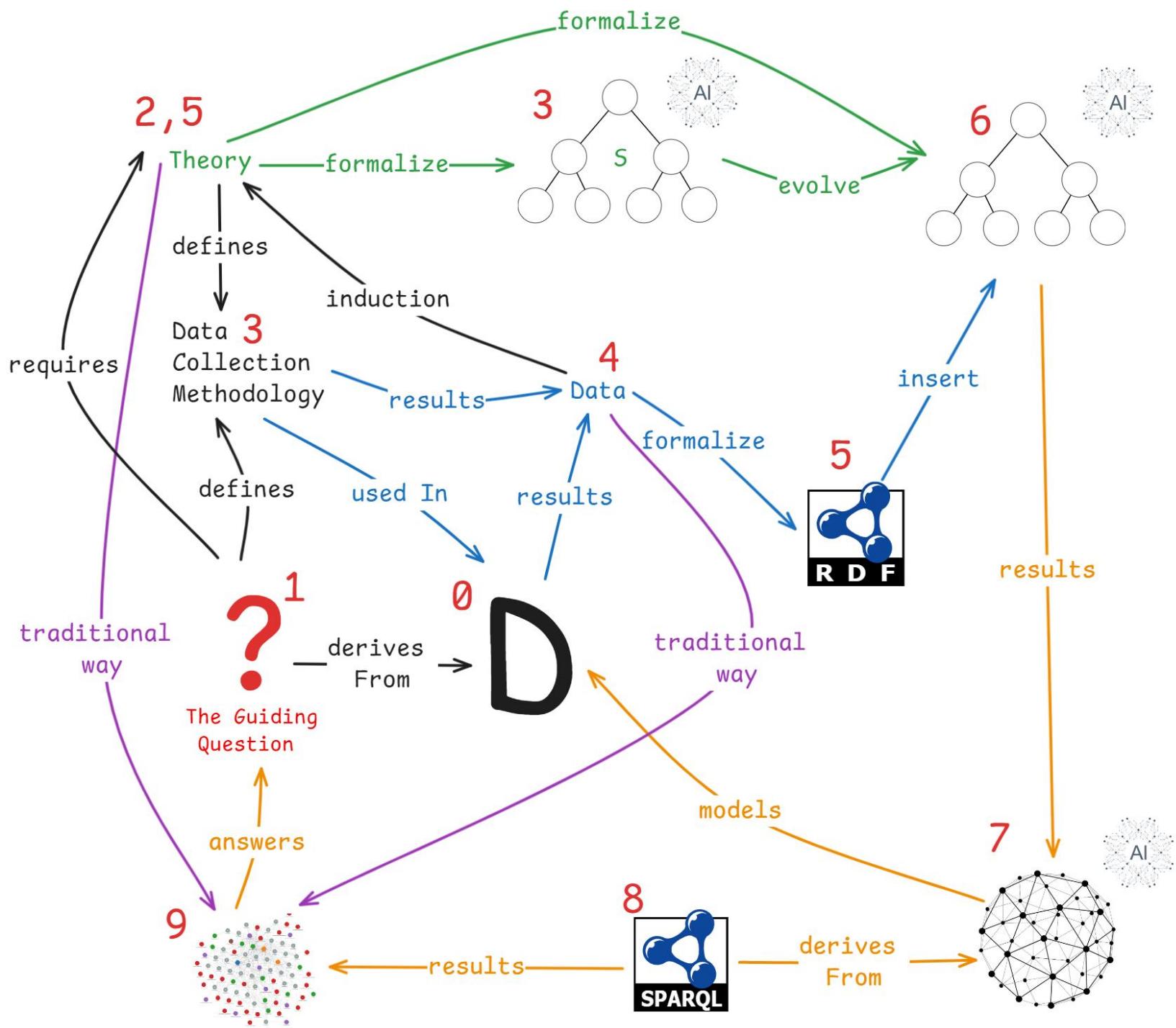
`beo:WindTurbineOwner`
`beo:ServiceCompany`
`beo:SparePartManufacturer`

`beo:deliversTo`
`beo:receivesFrom`
`beo:Organization0`

`beo:Organization0` `beo:deliversTo` `beo:ServiceCompany`
`beo:SparePartManufacturer` `beo:deliversTo` `beo:Organization0`

Punning
Deductive Inference

7 . Knowledge Graph



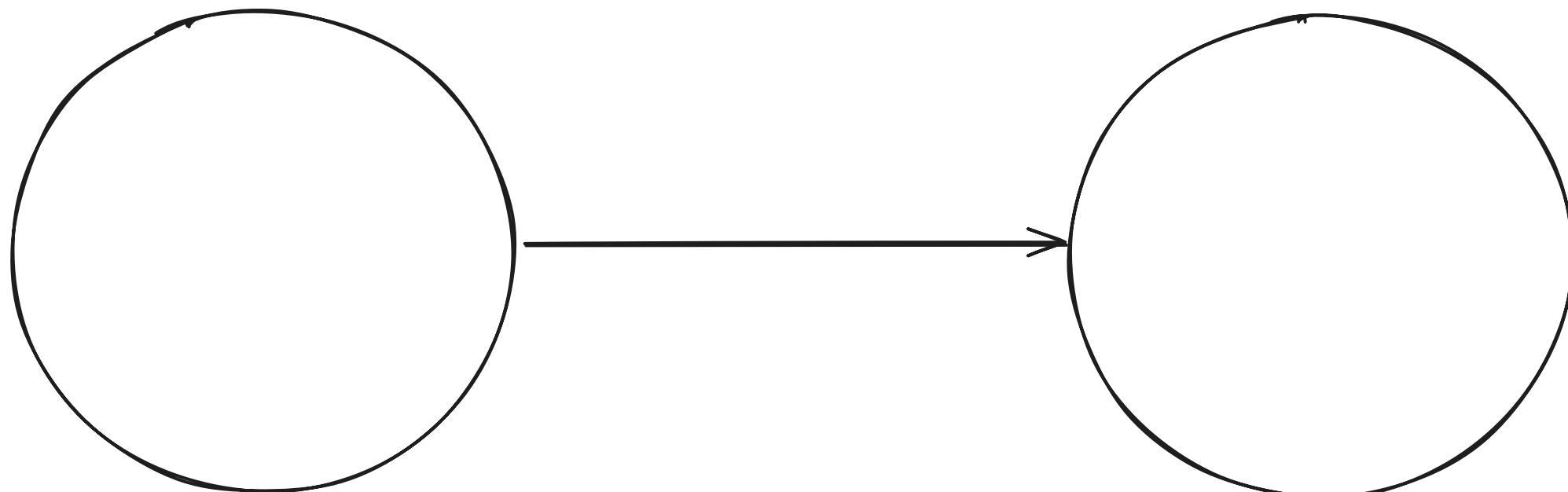
The knowledge graph is an emergent system
that emerges through data and theory
amalgamating.

Observed Limitation of OWL2 DL

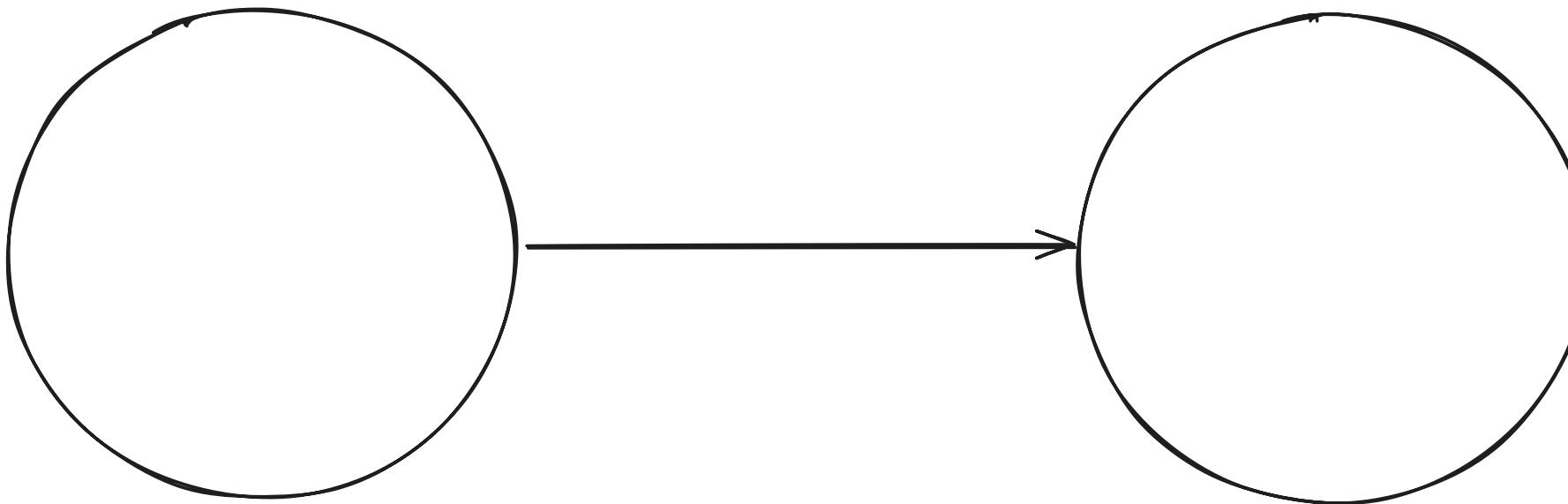
Gearbox manufacturer X is delivering to wind
turbine manufacturer.

GearboxManufacturerAG

WindTurbineManufacturer

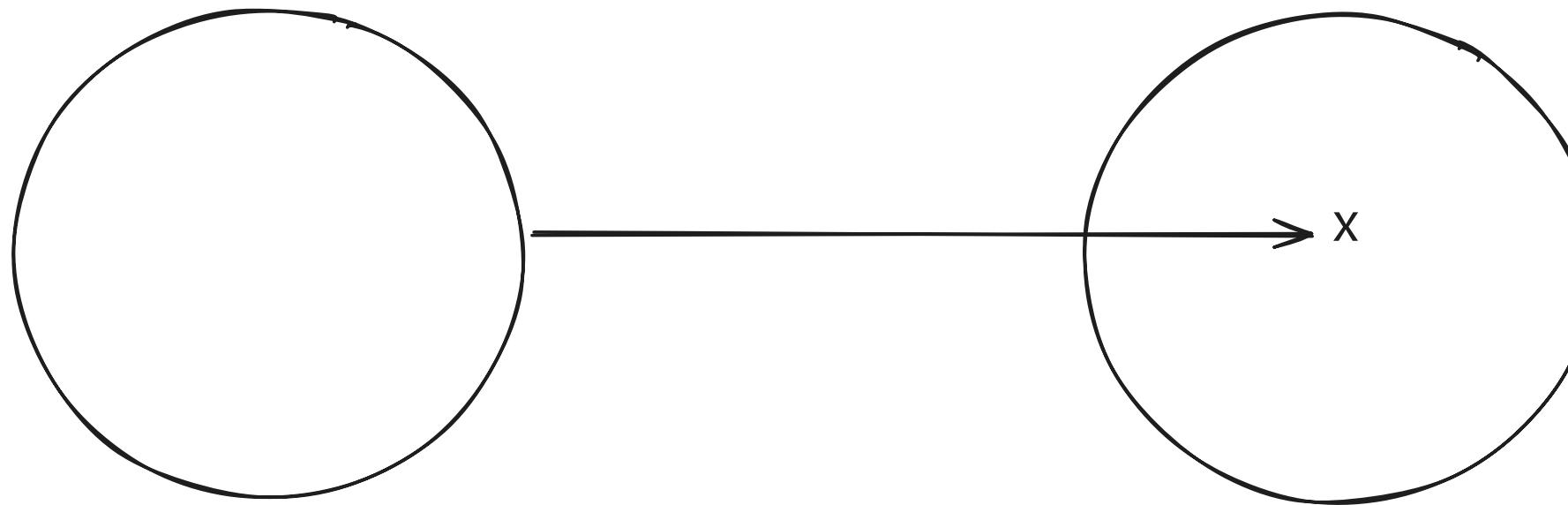


GearboxManufacturerAG



WindTurbineManufacturer

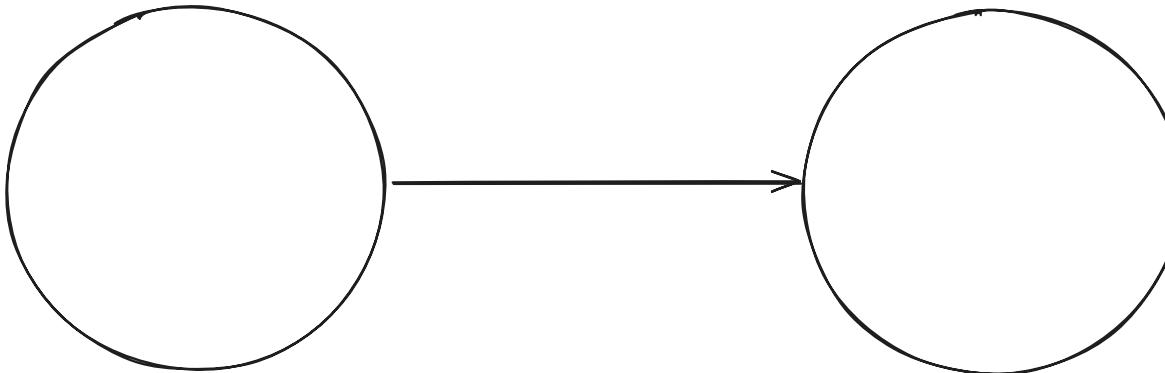
GearboxManufacturerAG



WindTurbineManufacturer
X

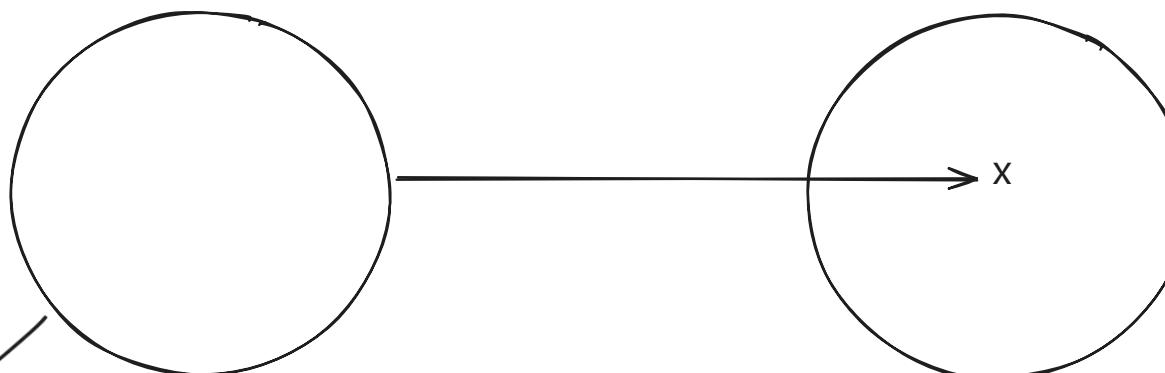
GearboxManufacturerAG

WindTurbineManufacturer



GearboxManufacturerAG

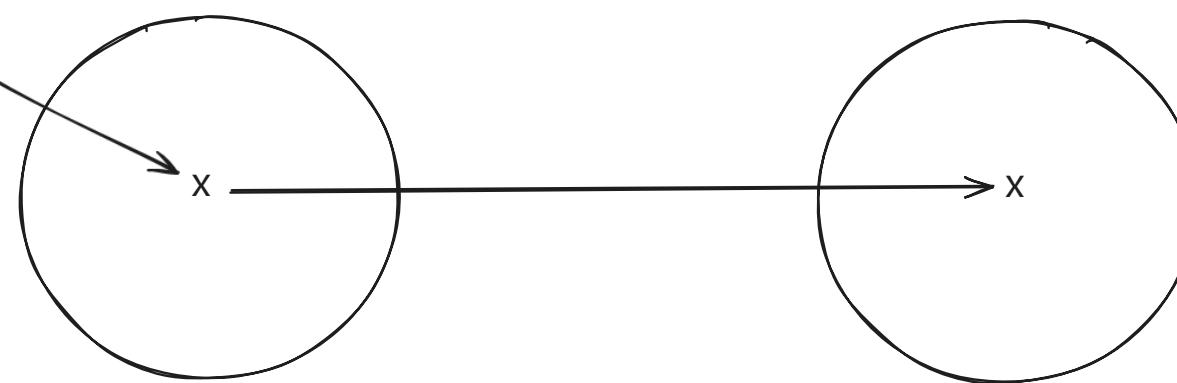
WindTurbineManufacturer



represent

GearboxManufacturer

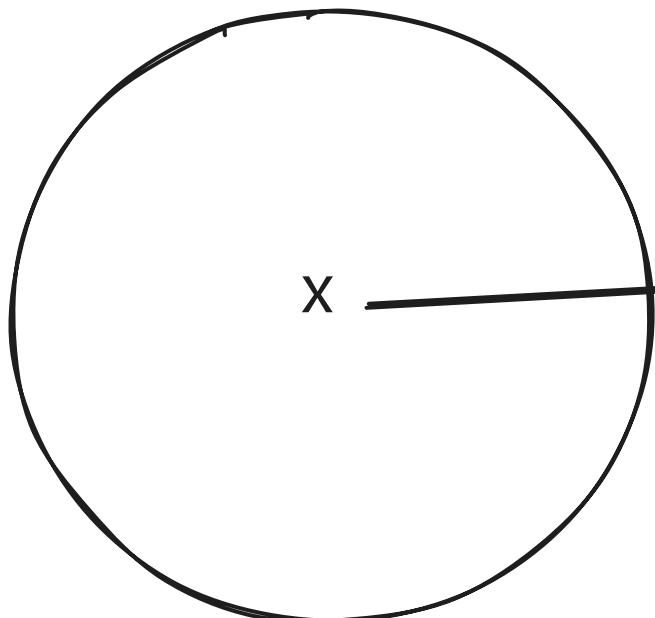
WindTurbineManufacturer



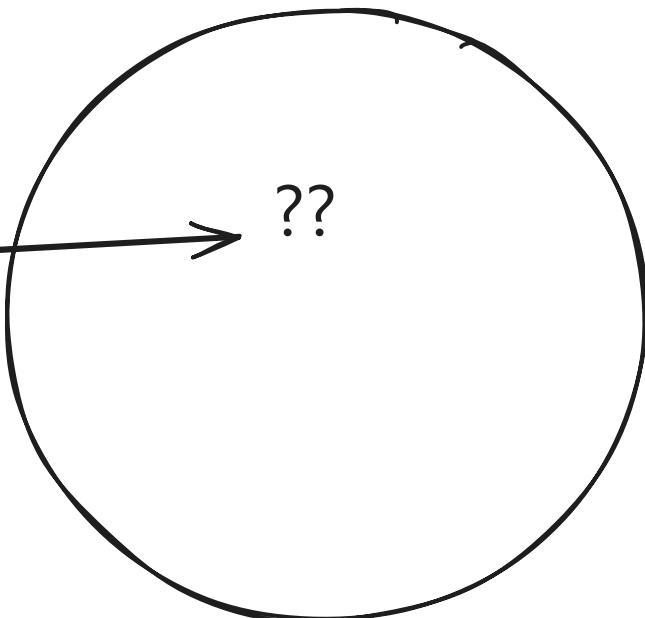
Gearbox manufacturer X is delivering to wind
turbine manufacturer.

There exists a Gearbox manufacturer X which
delivers to some wind turbine manufacturer.

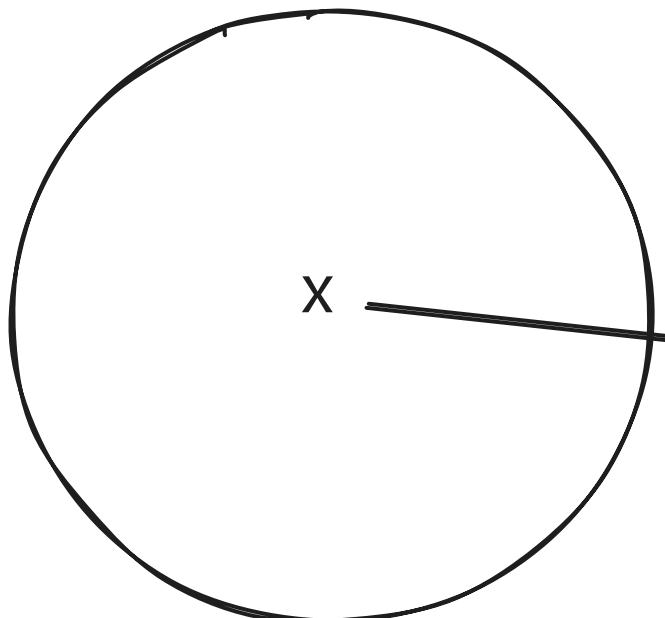
GearboxManufacturer



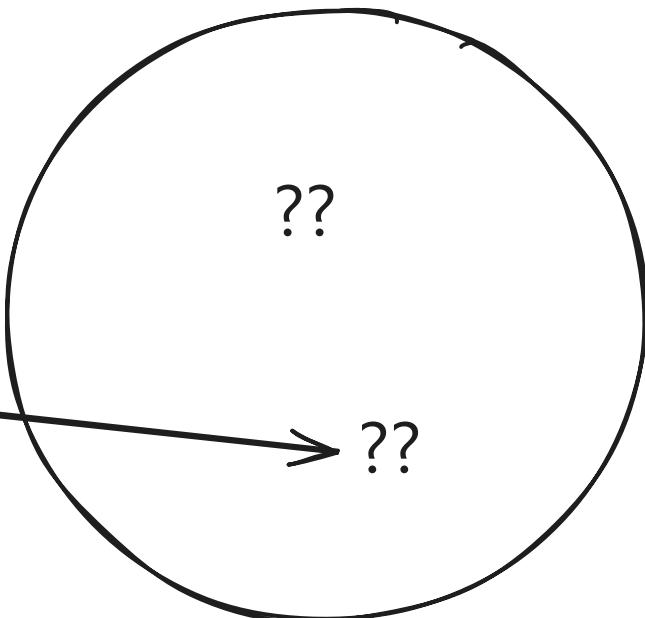
WindTurbineManufacturer

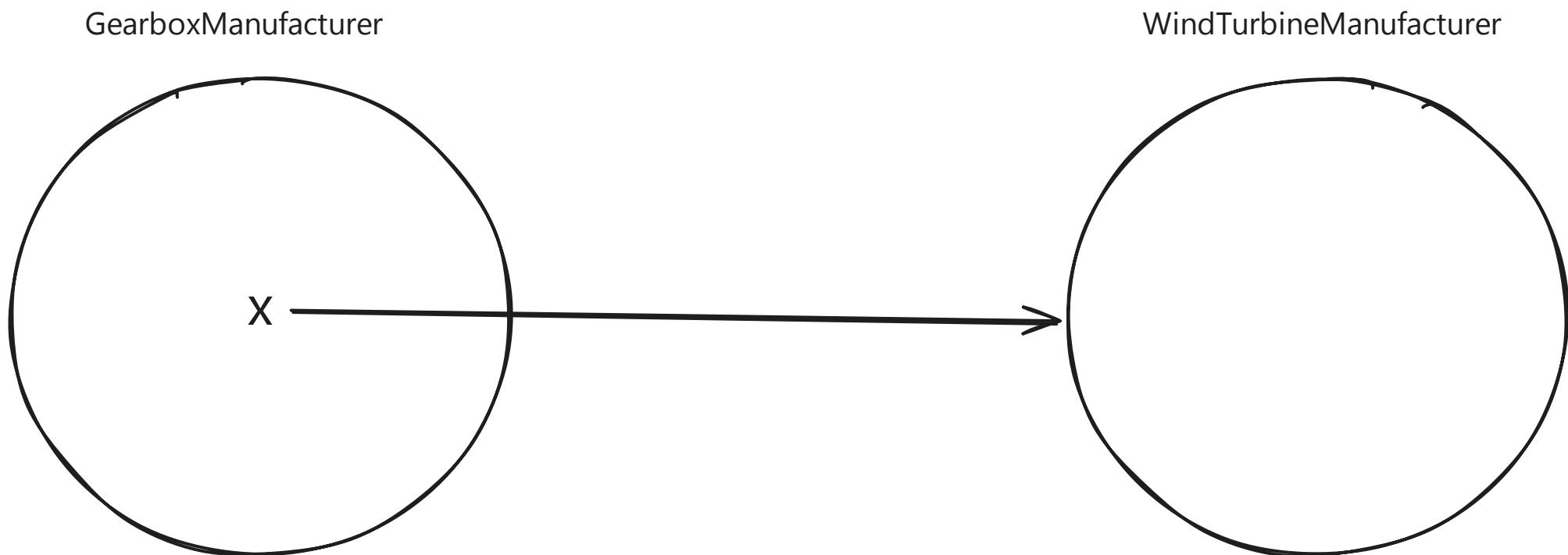


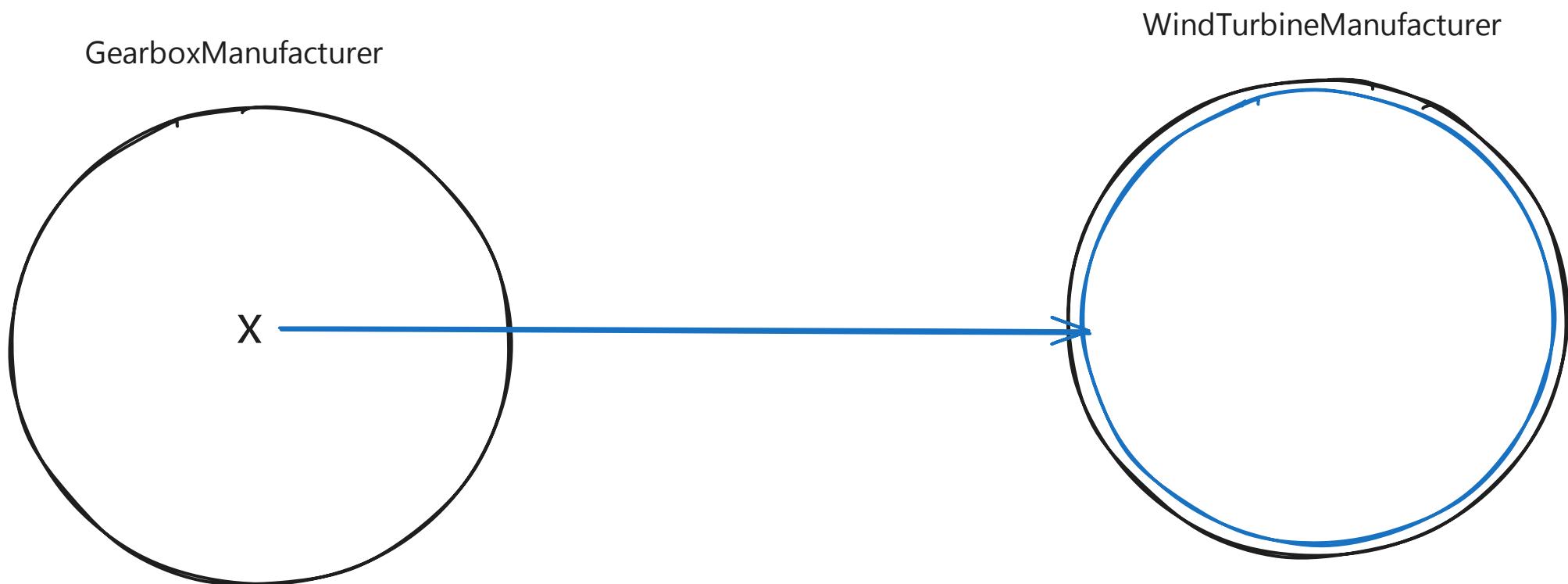
GearboxManufacturer

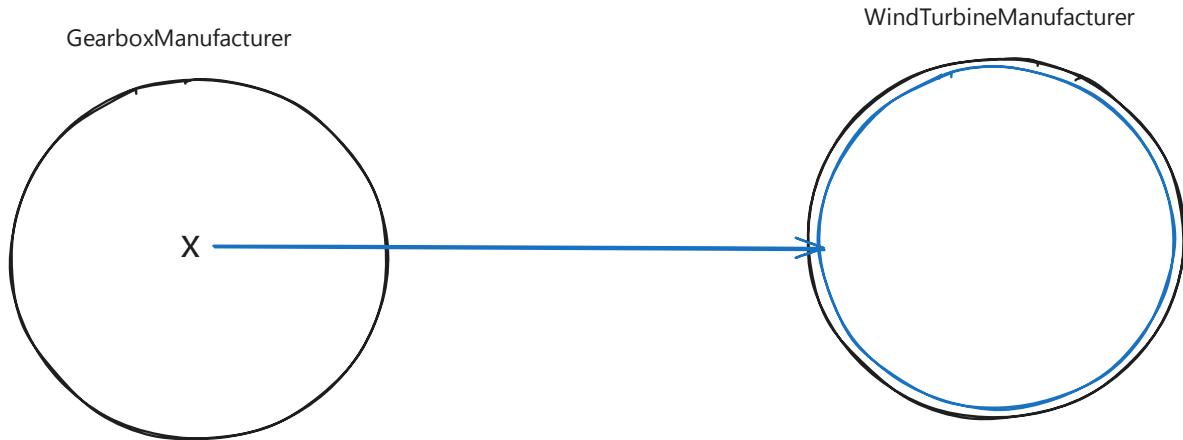


WindTurbineManufacturer



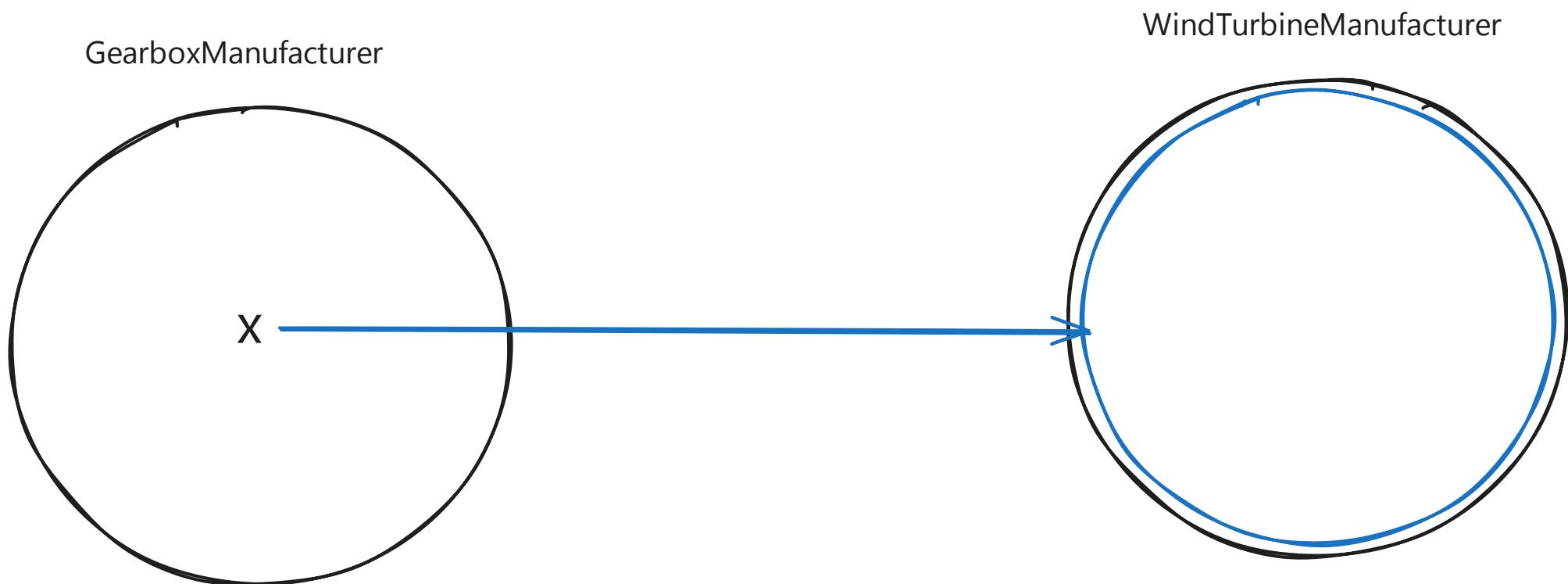






There exists a Gearbox manufacturer X which
delivers to some wind turbine manufacturer."

Limitation



Manufacturer

GearboxManufacturer

WindTurbineManufacturer

x



There exists a Gearbox manufacturer X which
delivers to some manufacturer."

ServiceProvider

Manufacturer

CloudServiceProvider

WindTurbineManufacturer

x



Short Demo

Future

Improvements of BEV

Integrating validation to the framework: Iterative validation with DE

Changing the language

Integrating induction techniques: Inference to the Best Explanation

Integrating Semi-Automation (LLM-NLP)

Integrating Complexity Metrics & Calculations: Structural Complexity

Semi-Automated Knowledge Discovery: Graph Theory, LLM

...

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Ontology Summit 2025
Track: “From Reality to Data”

Alican Tüzün

Ontolog Forum



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