

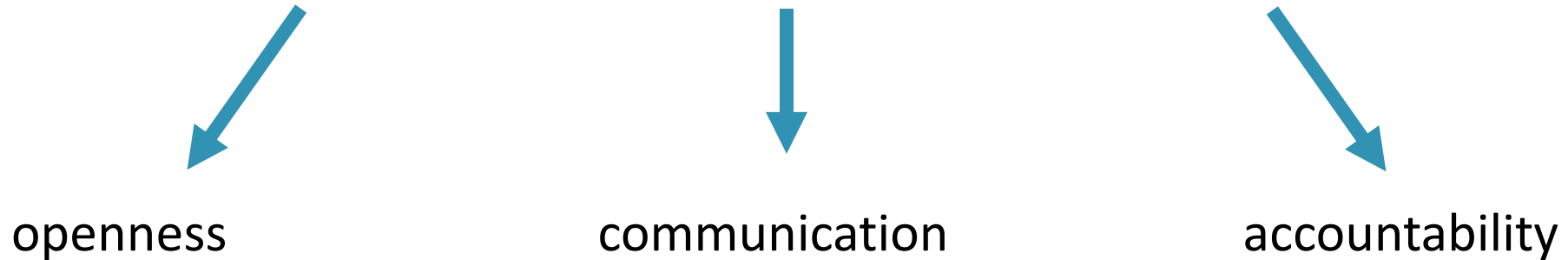
Data Transparency – Breaking Down Data Silos for Improved Insight

Dr Peter Tormay

Capish

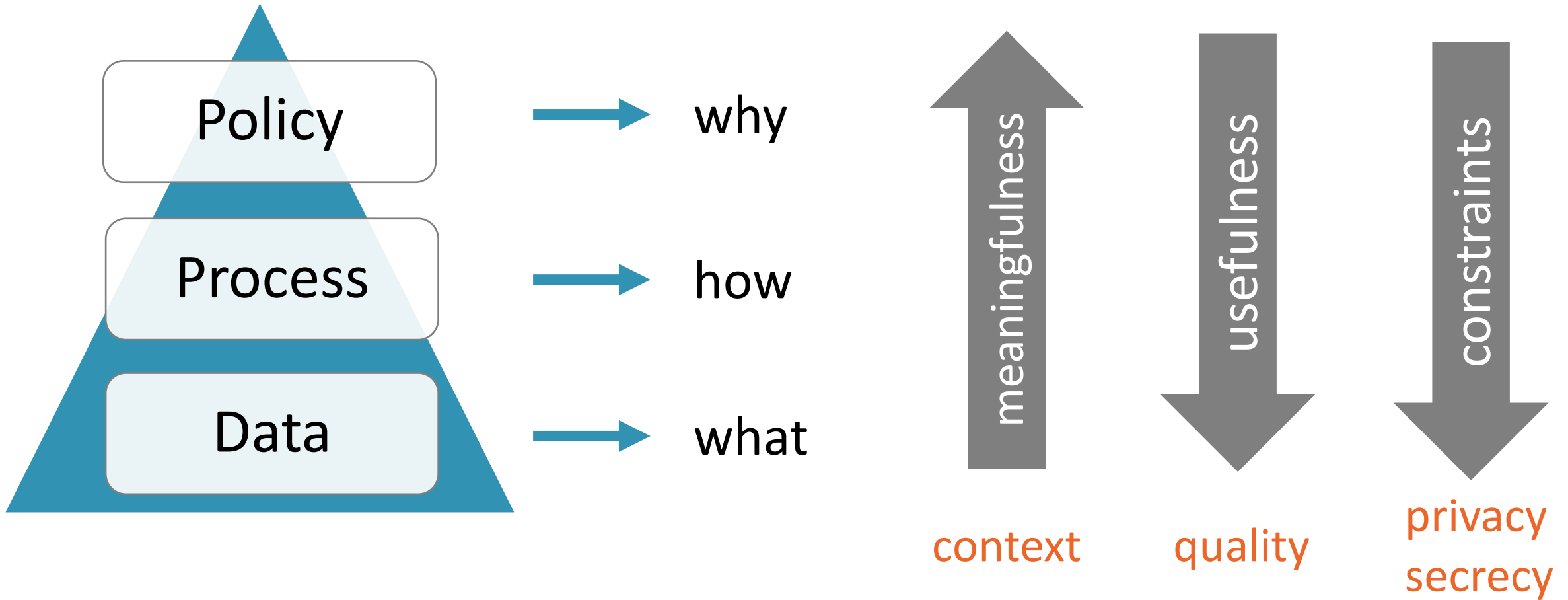
Transparency – An Organisational View

Transparency is all about the release of information by institutions or companies that is relevant for the evaluation of these institutions/companies



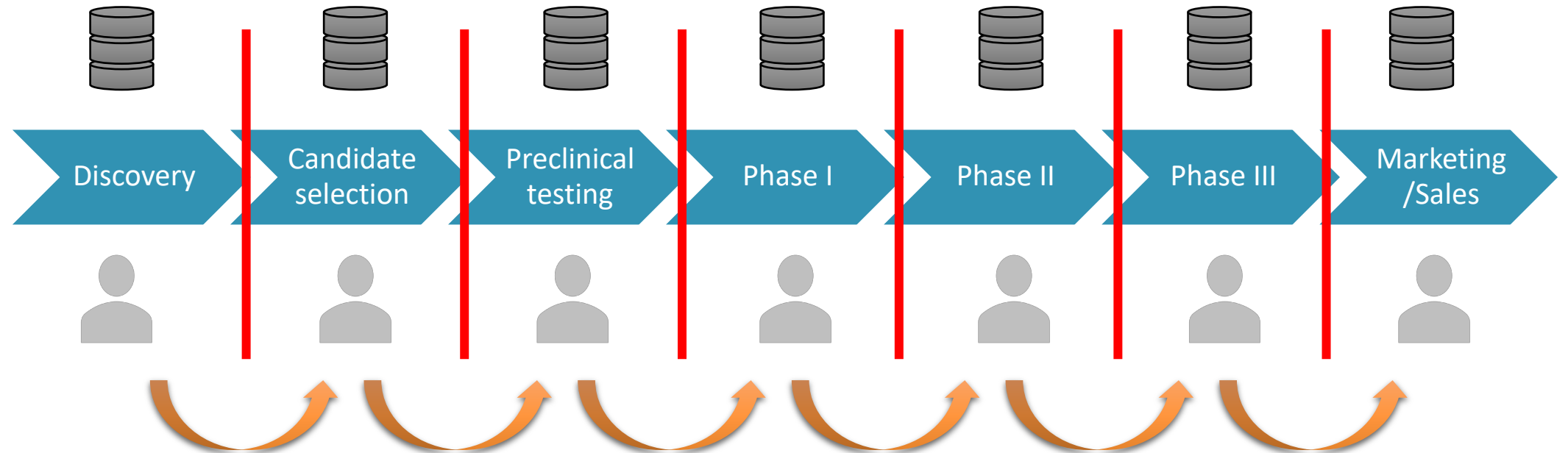
Trust & Reputation

Transparency Granularity

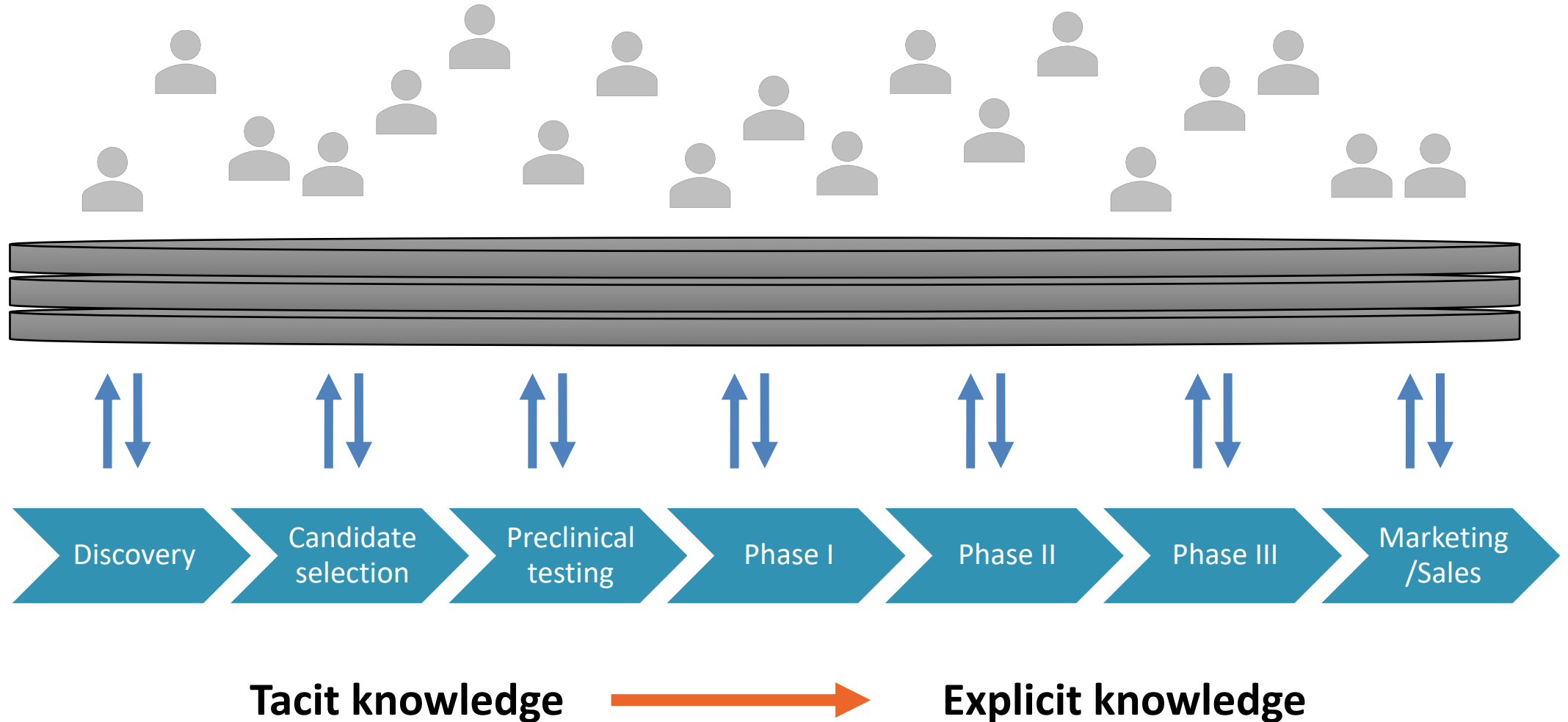


Transparency – a Data View

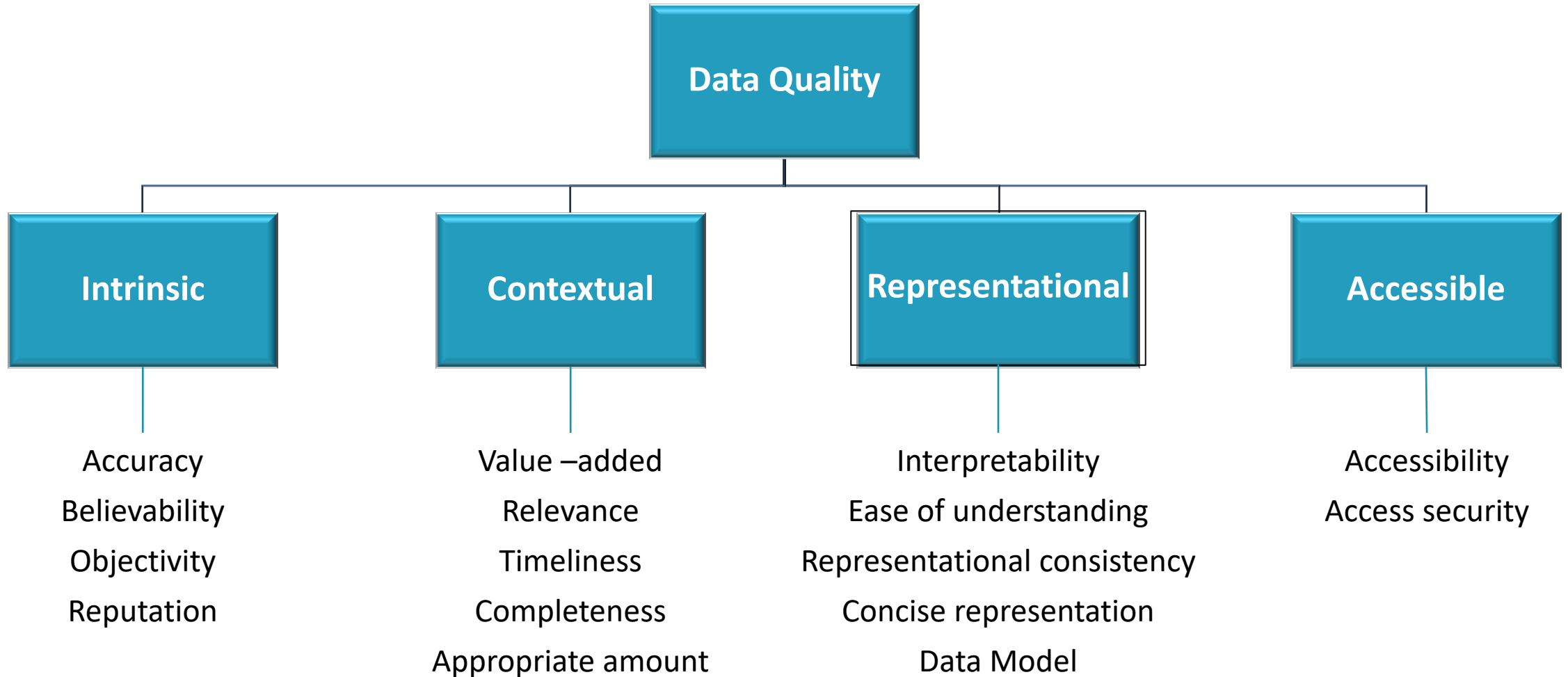
Transparency is all about the **free flow of information** between stakeholders for the purpose of **informed decision making**



Transparency – a Data View



Data Quality as a Key Driver in Data Transparency



Wang et al, J. Manage. Inf. Syst. 12, no. 4

Transparency – Benefits and Challenges

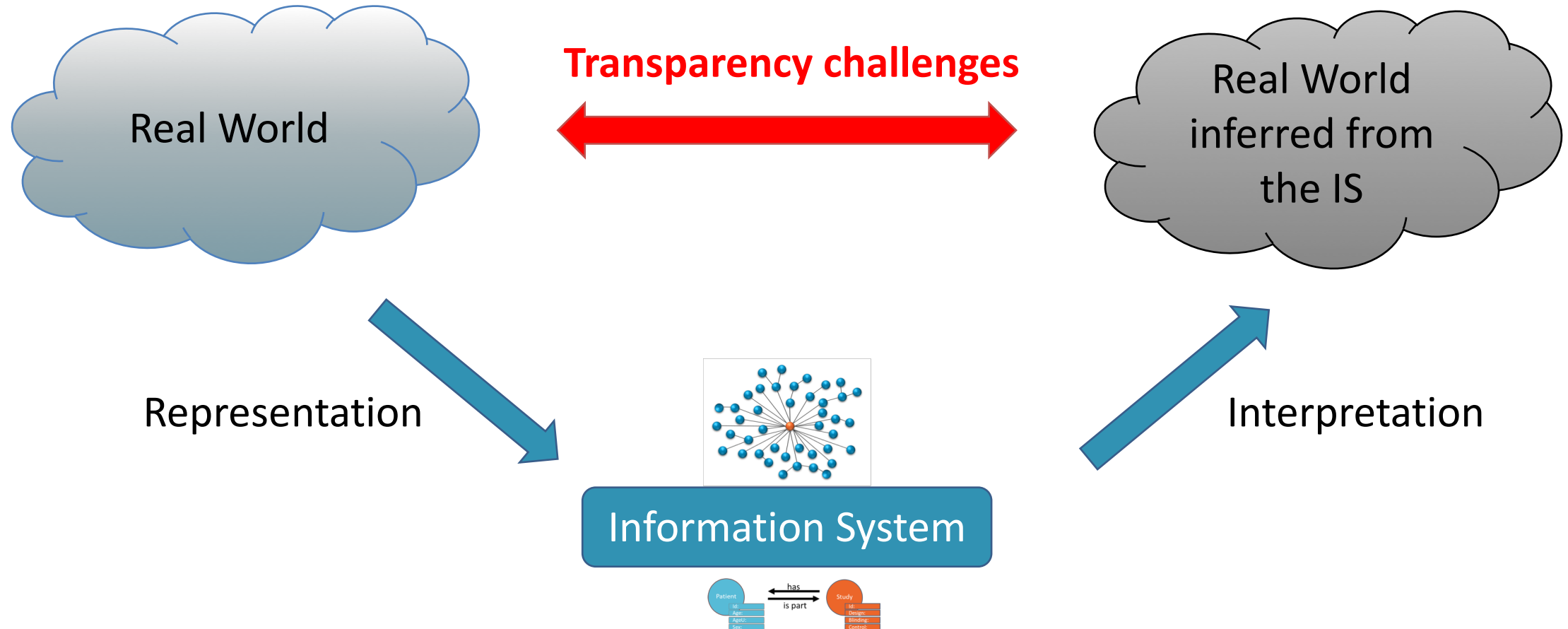
Benefits

- Autonomy
- Self Control and Motivation
- Accountability
- Feedback

Challenges

- Context
- Privacy
- Security
- Blame culture
- Not a guarantee the right decisions will be made

IT Systems as Real World Representation

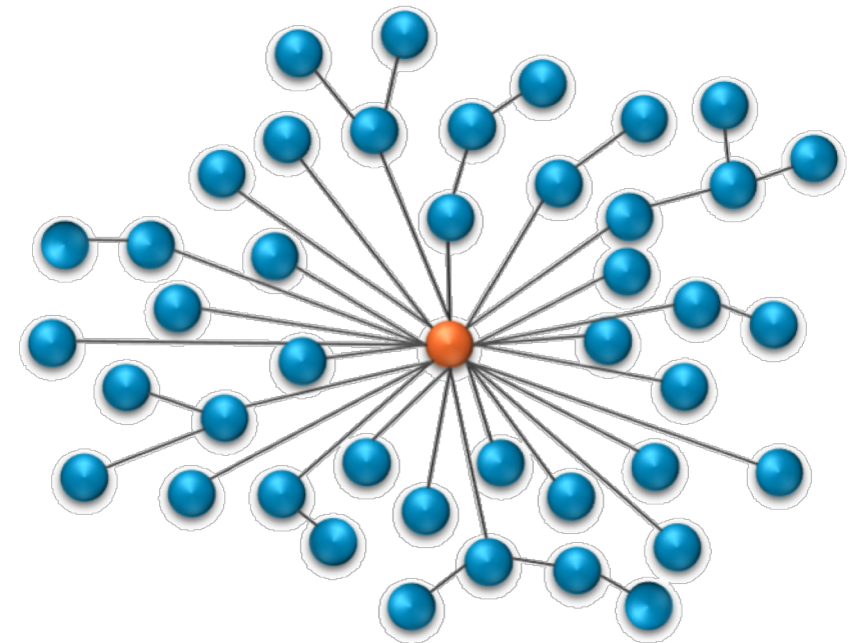


Ontological Data Model

Formal representation of a knowledge domain, describing its entities, events and processes and the relationships connecting these entities, events and processes

Benefits

- To share **common understanding** of the structure of information among people or software agents
- To enable **reuse** of domain knowledge
- To make domain assumptions **explicit**
- To **analyse** domain knowledge

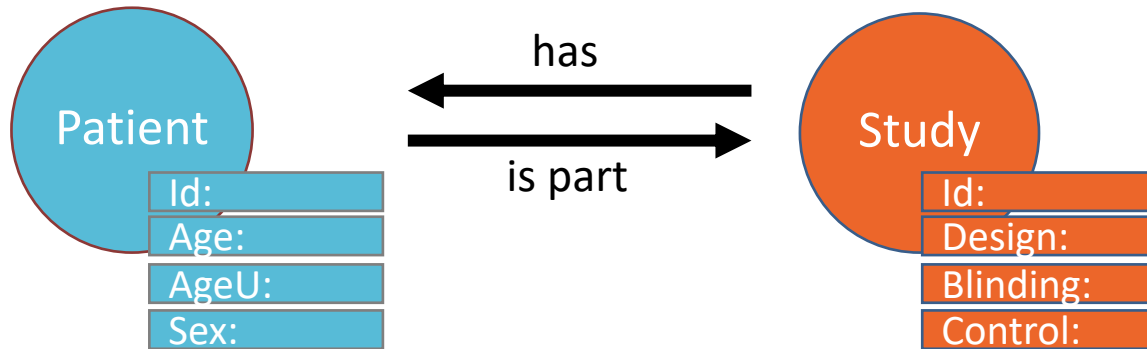


Ontologies in Life Sciences

- Snomed CT
 - ICD-09/10
 - MedDRA
- 
- The diagram shows a vertical list of three items: 'Snomed CT', 'ICD-09/10', and 'MedDRA'. To the right of this list is a large blue right-facing curly bracket. A horizontal blue line extends from the middle of the bracket to the left edge of the text 'Terminologies – Code lists', which is underlined.
- Terminologies – Code lists

Concerned with the meaning of labels rather than the entity the labels are describing

Holons



- A concept that can be interpreted by itself
- Classified according to content
- Contains information
 - Fields, groups and attributes
- Contains relations to other Holons
- Each relation has a specific meaning

Header

```
<o
  holonType= "Body Weight.Results"
  holonConcept="Body Weight"
  dimension="Data"
  domain="616.0754—dc23"
  ontology="(G5.24.1.0).ClinSci.ontology@capish.se"
  usage="Data"
>
<k>
<f>Body Weight.Results Key<v>BodyWeightKey...</v></f>
</k>
```

Message

```
<f>Date<v standard="ISO 8610" type="dateTime">2010-01-05</v></f>
<f>Body Weight<v unit="kg">68</v></f>
<f>Body Weight.Original<v unit="pounds">150</v></f>
```

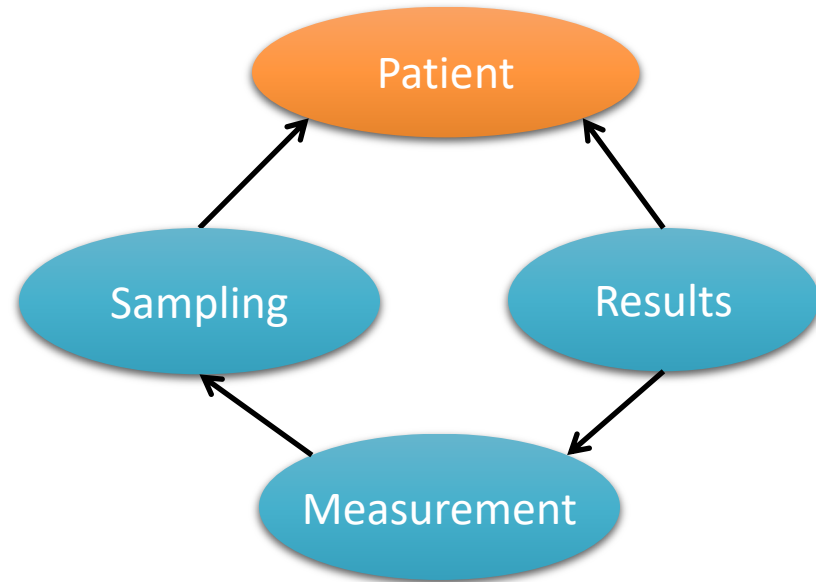
Relation

```
<r
  reverse="Has" dimension="Data" holonType="Patient">
Of
<f>Patient Key<v>PatientKey...</v></f>
<r/>

</o>
```

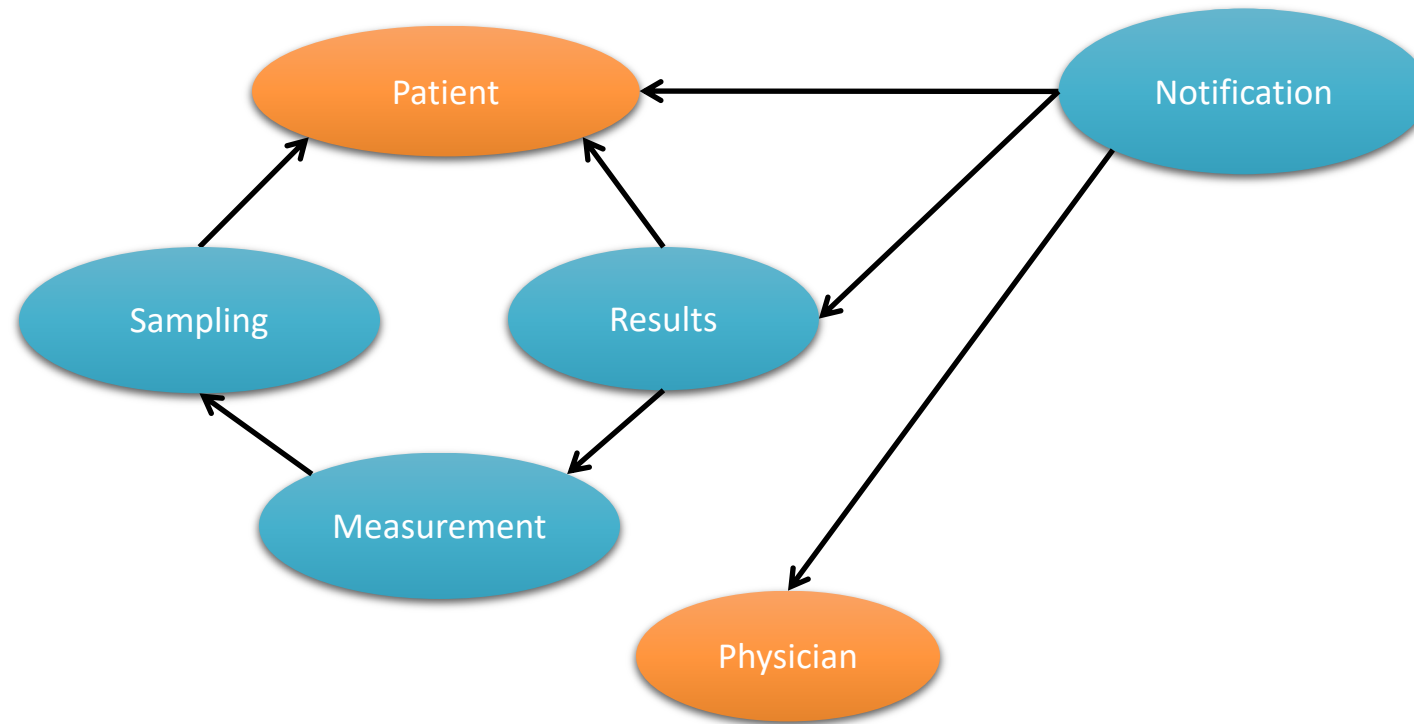
Real World Information Modelling

Holons in Action



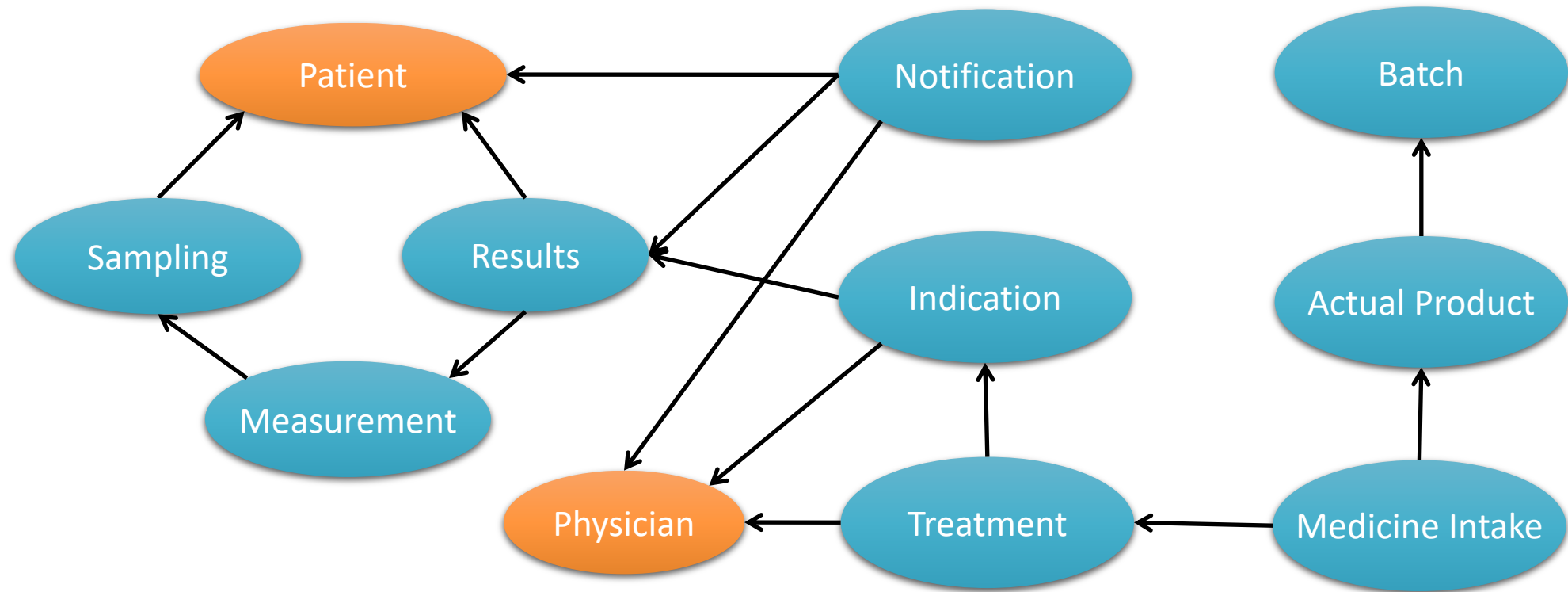
Real World Information Modelling

Holons in Action



Real World Information Modelling

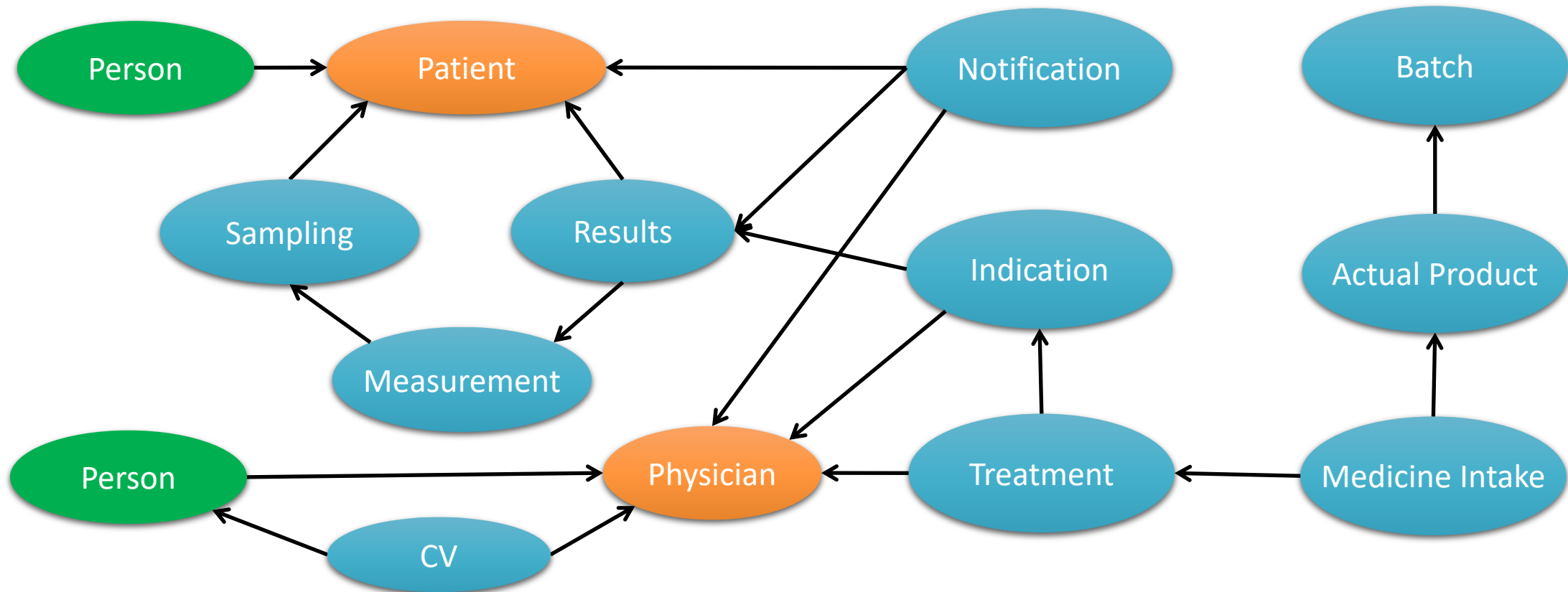
Holons in Action



Real World Information Modelling

Holons in Action

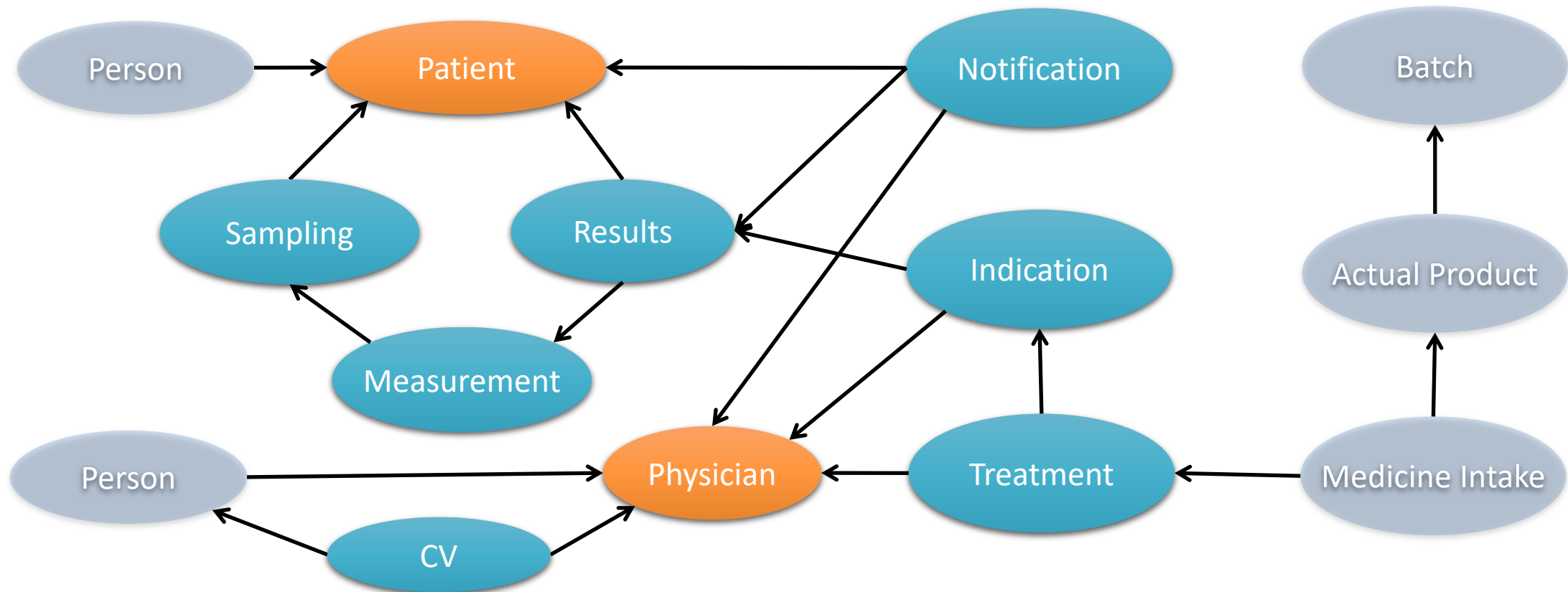
Building a Conceptual “Mind Map” of Related Holons



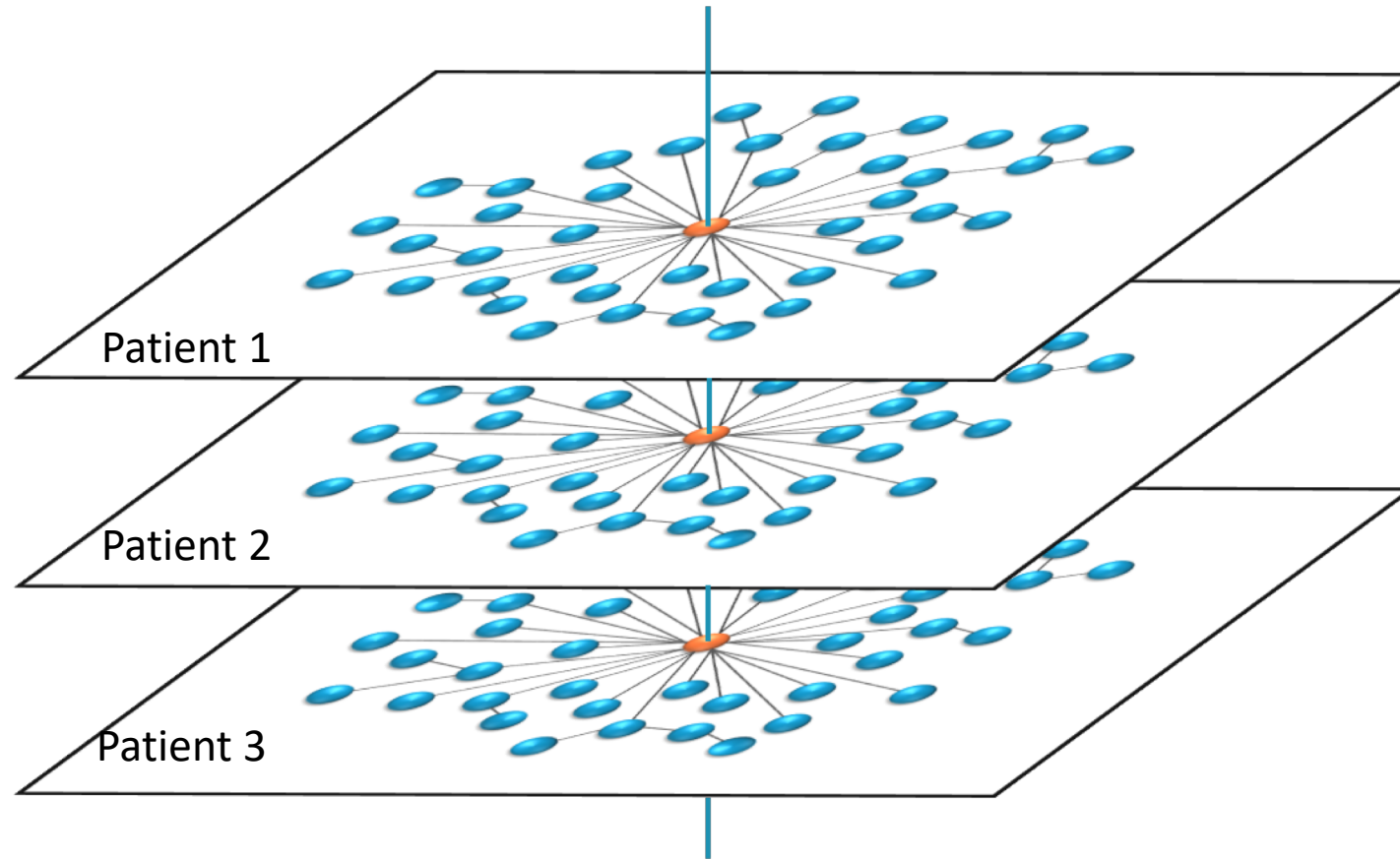
Real World Information Modelling

Holons in Action

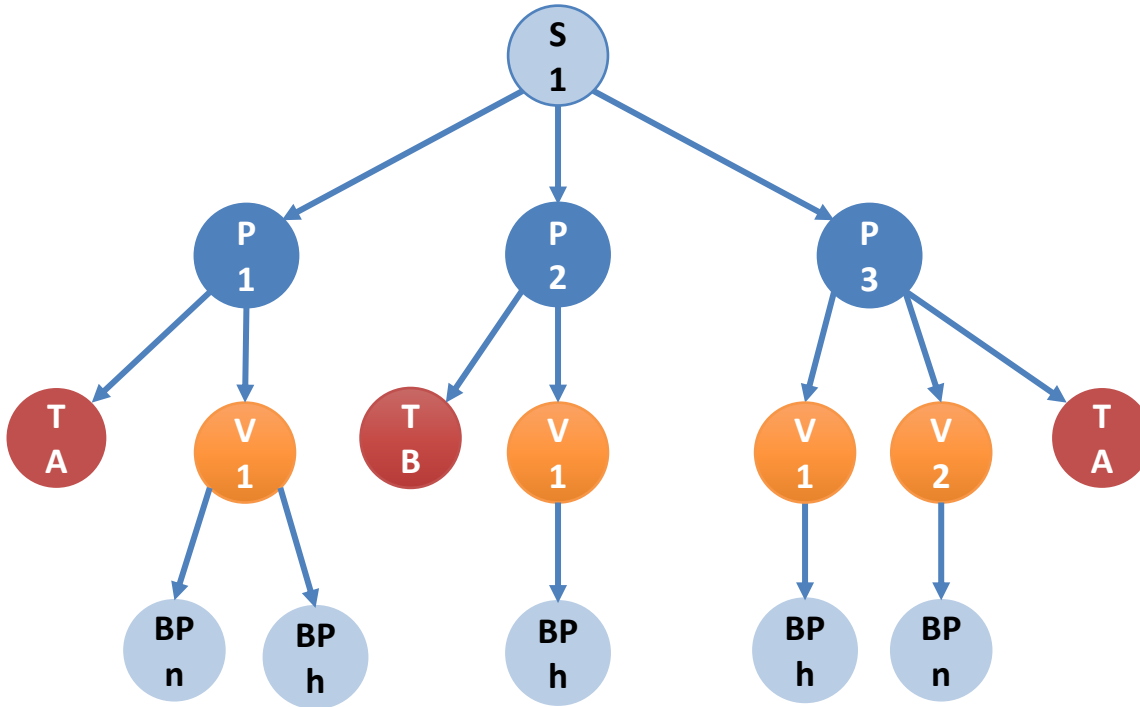
Building a Conceptual “Mind Map” of Related Holons



Ontology vs Instances



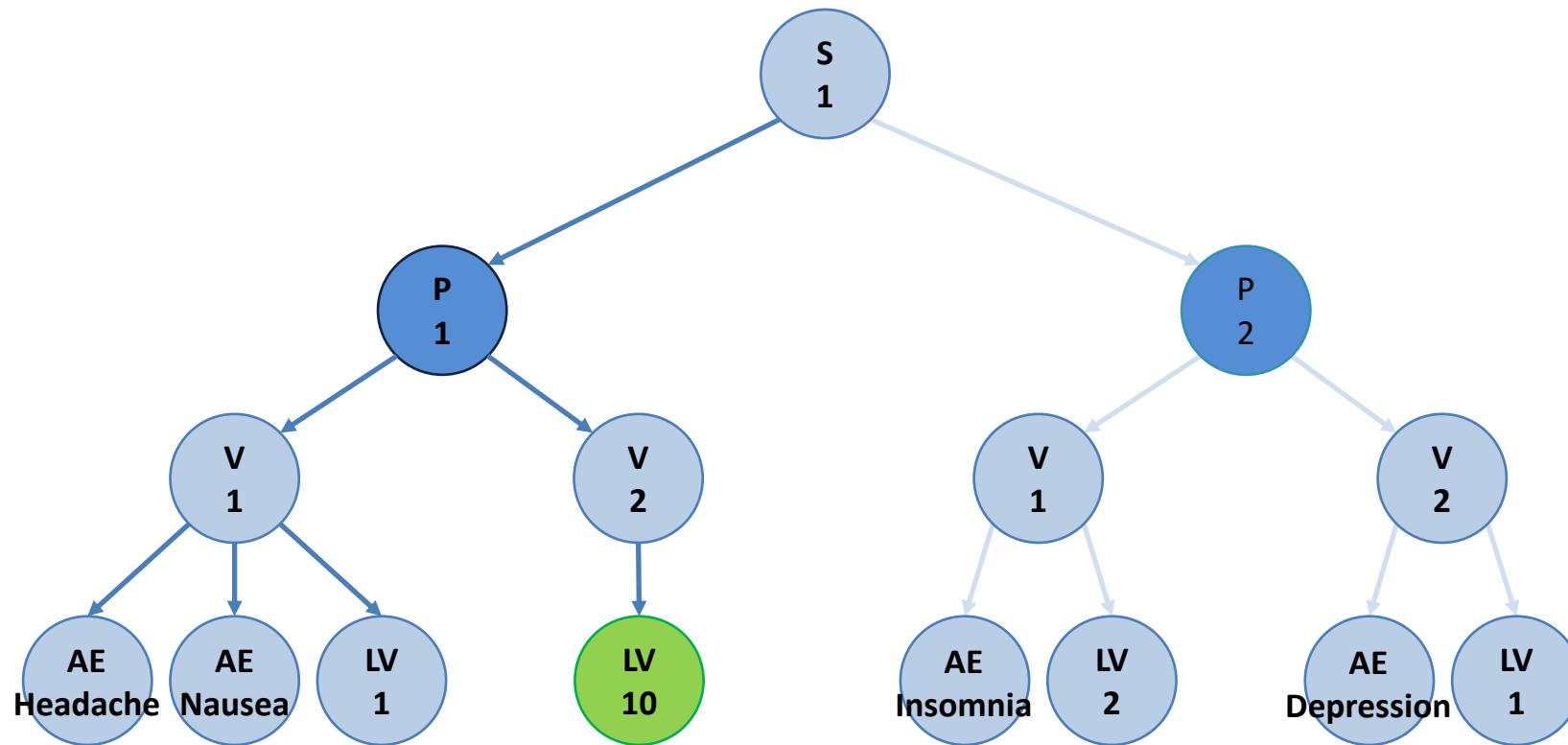
Graph Database Implementation



- individual nodes (identity index)
- node types (node type identity index)
- property values (property index)
- existence of indirect relationships (relation index)

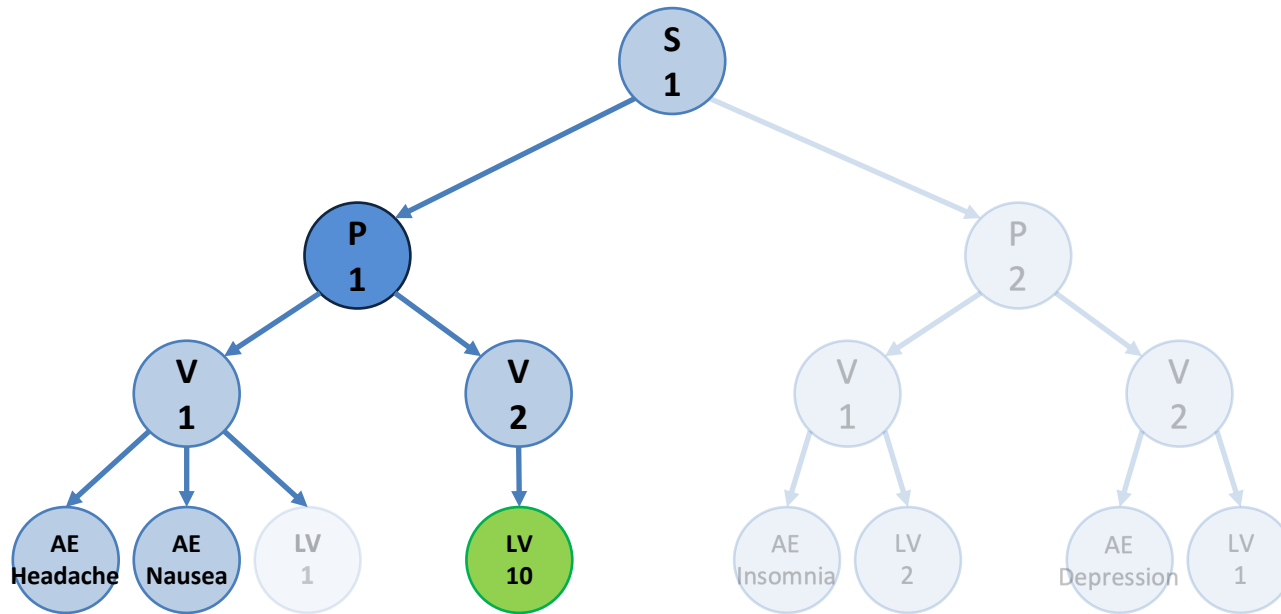
Graph Database Query

What adverse events have been reported for patients with elevated liver values



Graph database query

What adverse events have been reported for patients with elevated liver values



Select data:

Type of Node: "Patient"

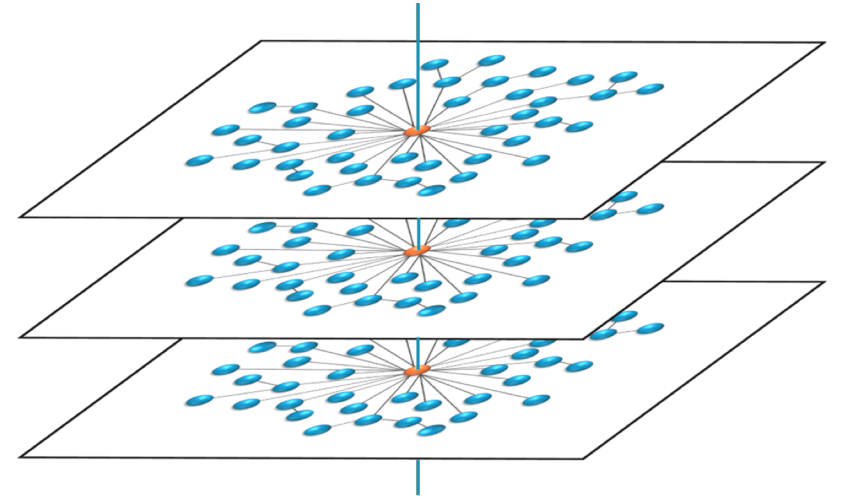
With (Type of Node: "Liver Value", Property: "Value > 5")

Fetch:

Type of Node: "Adverse Event", property: "Name"

Conclusions

- Data transparency is not just externally but also internally focused
- It enables autonomy, self motivation as well as accountability
- It makes domain knowledge explicitly available across the company
- New technology such as graph databases are data transparency enablers
- Ontology based information models with focus on nodes enable better data structures and search capabilities





Thank you

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