

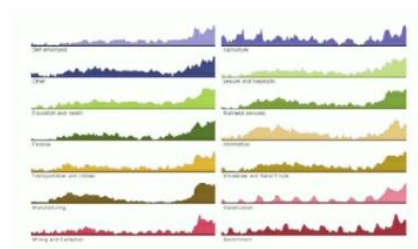
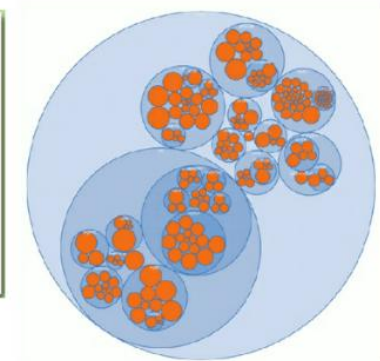
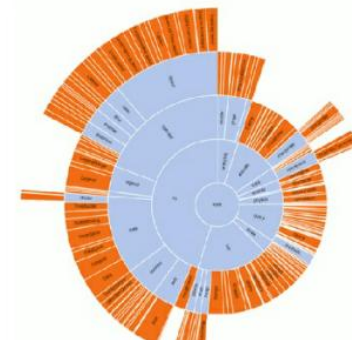
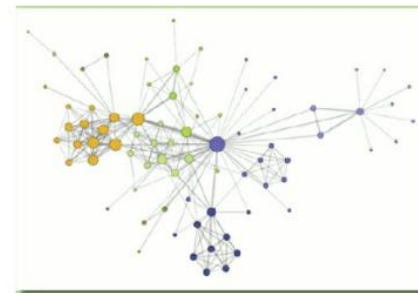
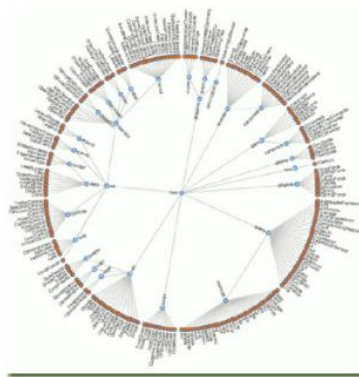
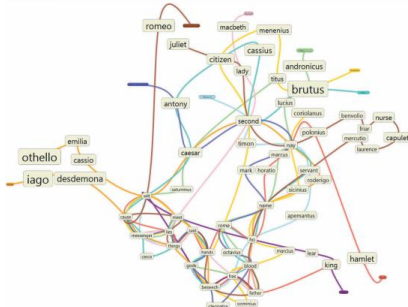
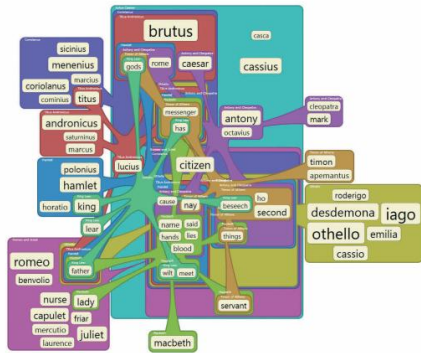


**Systemic Framework for
Enterprise Architecture & Transformation**

Visualization Challenges

Data Visualization Purposes

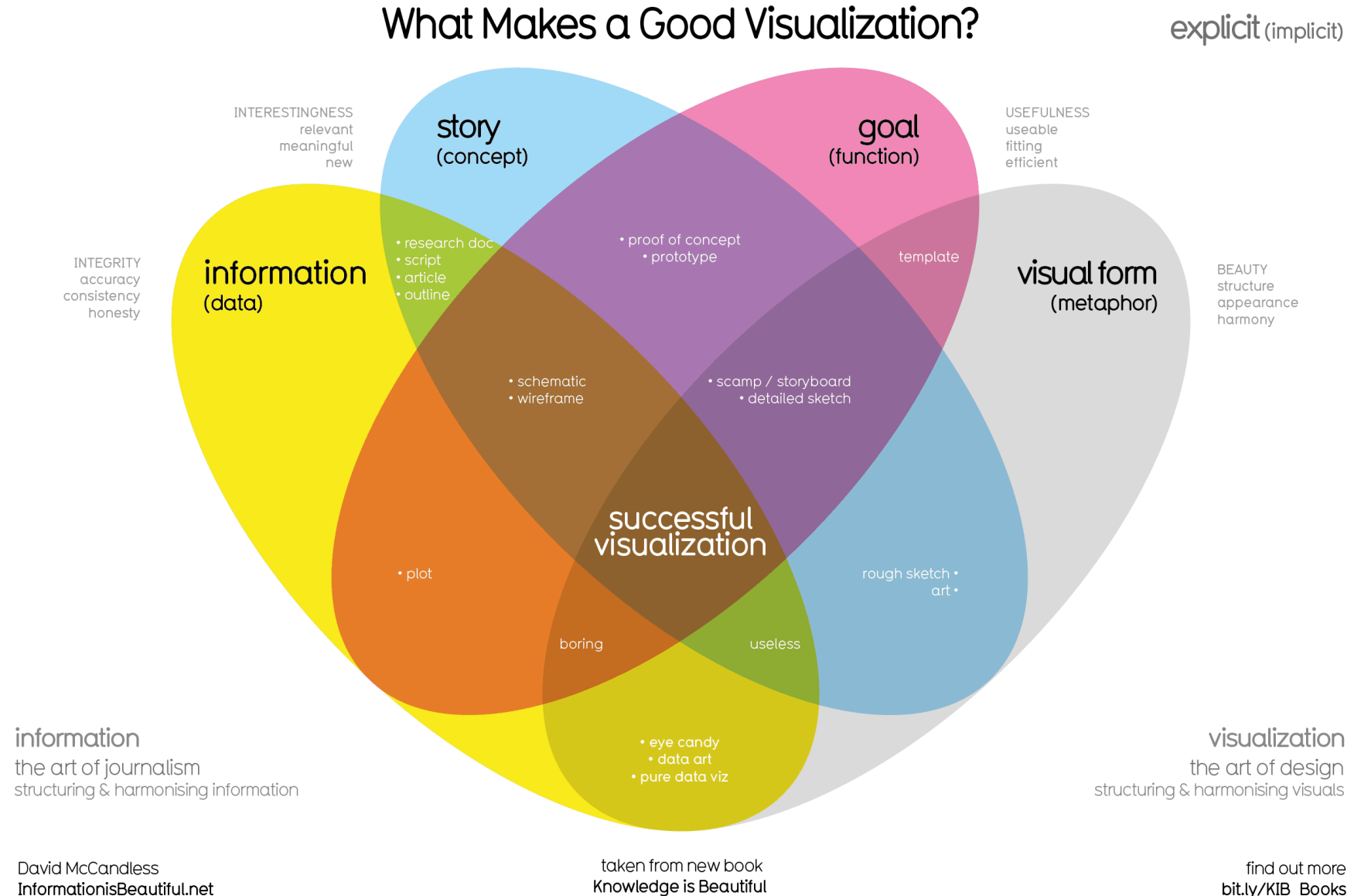
- The goal of visualization is to aid our understanding of data by leveraging the human visual system's highly tuned ability to see patterns, spot trends, and identify outliers.
- Well-designed visual representations can replace cognitive calculations with simple perceptual inferences and improve comprehension, memory, and decision making.



Principles

Data Visualization Principles – What makes a good visualization

- A functional intent
- Data analysis
- Story telling
- Visual form
- Source:
- <https://informationisbeautiful.net/visualizations/what-makes-a-good-data-visualization/>



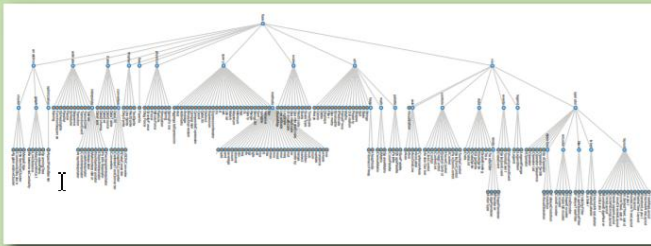
Data Visualization & Force-directed graph

- Force-directed graphs are meant to represent **networks of relationships** where arcs represent “forces” between nodes:
 - *Force-directed graph drawing is a class of graph layout algorithms that calculate the positions of each node by simulating an attractive force between each pair of linked nodes, as well as a repulsive force between the nodes. ... The sum of the forces acting on each node by all other nodes.*
- They are not meant to represent all kinds of relationships:
 - References: a tour through the Visualization Zoo.
 - <https://queue.acm.org/detail.cfm?id=1805128>
 - <https://meganleeusf.wordpress.com/2014/08/26/week-1-5-review-how-to-read-a-visualization-research-paper>

Data Visualization Taxonomy - 1

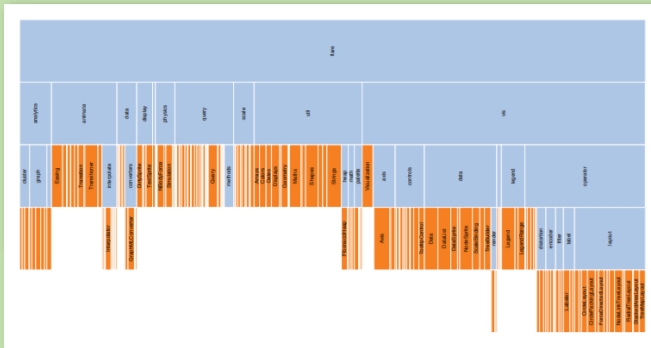
Visualization of Hierarchies

FIGURE 4A
Radial Node-link Diagram of the Flare Package Hierarchy



Source: Flare Visualization Toolkit (<http://flare.prefuse.org>)
<http://hci.stanford.edu/jheer/files/zoo/tx/hierarchies/tree.html>

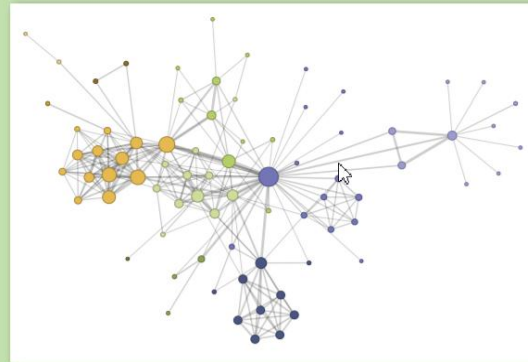
FIGURE 4D
Icicle Tree Layout of the Flare Package Hierarchy



Source: Flare Visualization Toolkit (<http://flare.prefuse.org>)
<http://hci.stanford.edu/jheer/files/zoo/tx/hierarchies/icicle.html>

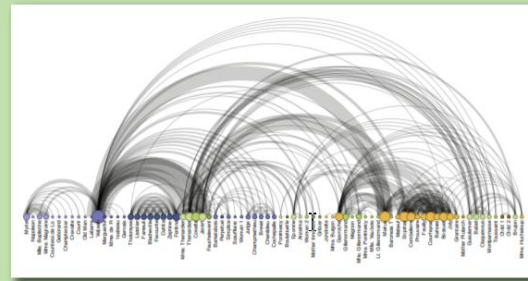
Visualization of Networks

FIGURE 5A
Force-directed Layout of *Les Misérables* Character Co-occurrences



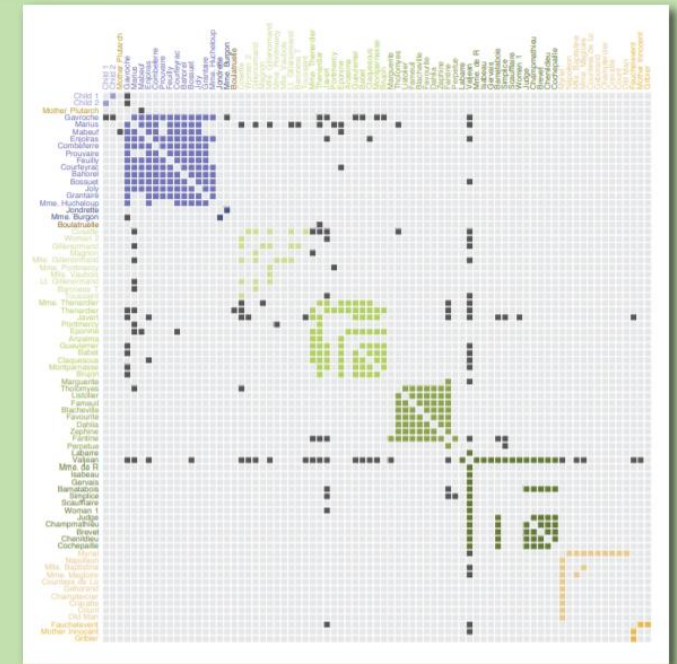
Source: Knuth, D. E. 1993. *The Stanford GraphBase: A Platform for Combinatorial Computing*. Addison-Wesley.
<http://hci.stanford.edu/jheer/files/zoo/tx/networks/force.html>

FIGURE 5B
Arc Diagram of *Les Misérables* Character Co-occurrences



Source: Knuth, D. E. 1993. *The Stanford GraphBase: A Platform for Combinatorial Computing*. Addison-Wesley.
<http://hci.stanford.edu/jheer/files/zoo/tx/networks/arc.html>

FIGURE 5C
Matrix View of *Les Misérables* Character Co-occurrences

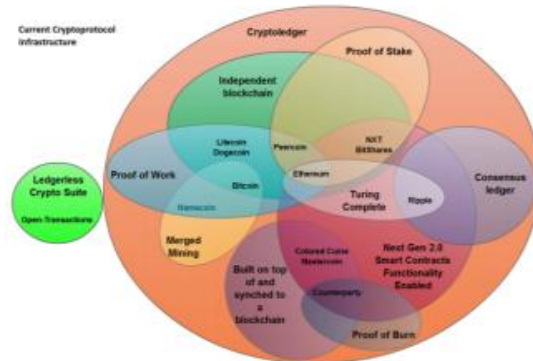
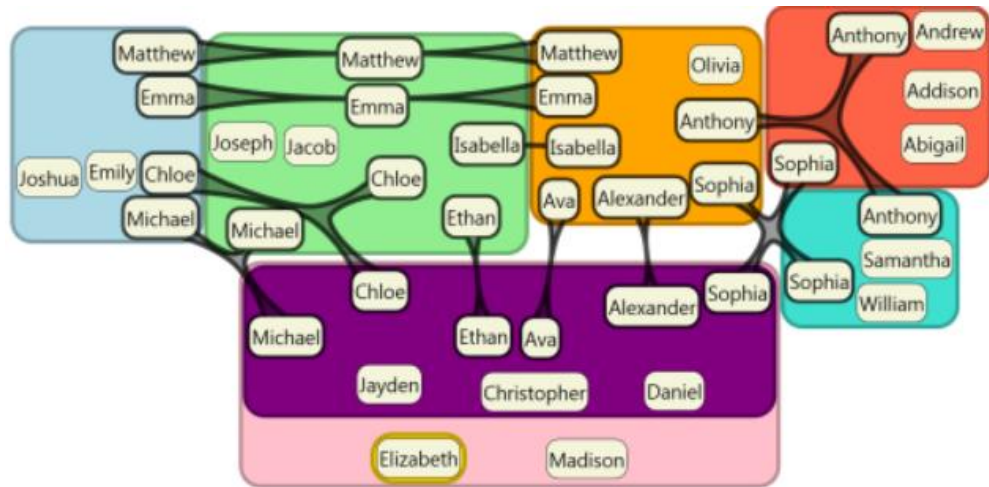


Source: Knuth, D. E. 1993. *The Stanford GraphBase: A Platform for Combinatorial Computing*. Addison-Wesley.
<http://hci.stanford.edu/jheer/files/zoo/tx/networks/matrix.html>

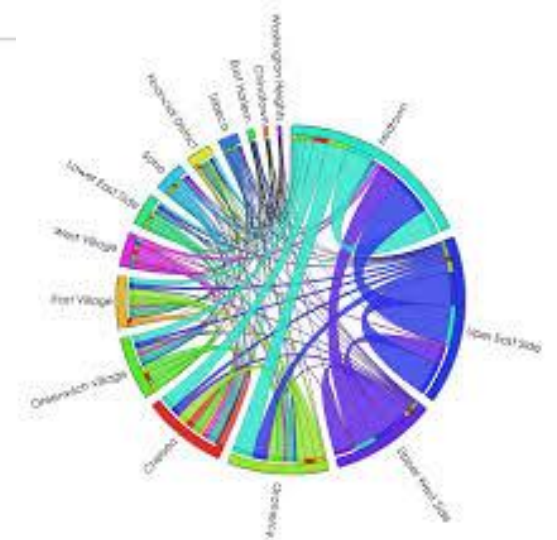
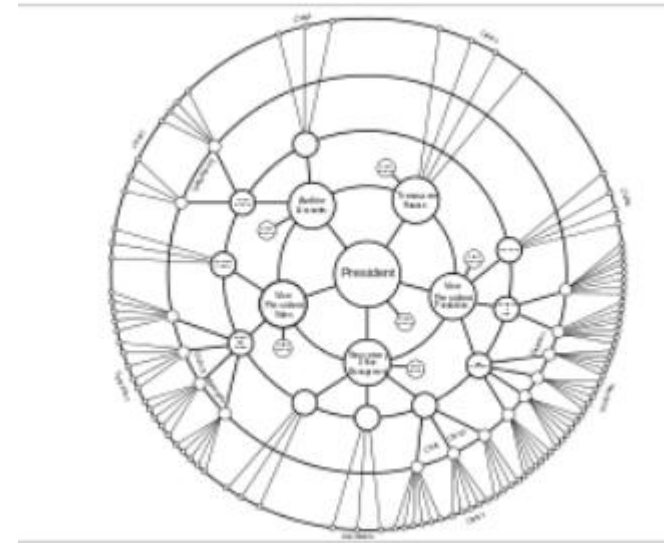
Data Visualization Taxonomy - 2

Visualization of Overlapping & Reuse

Untangling Euler diagram



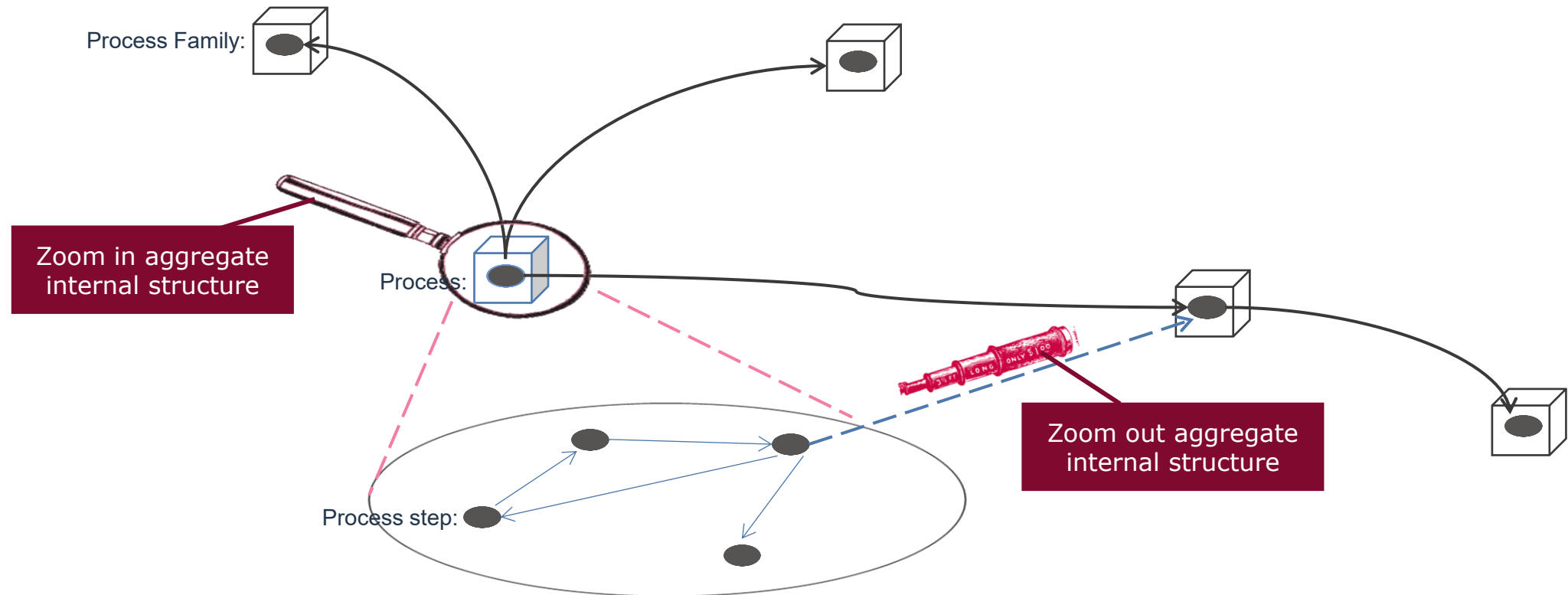
Visualization of Layered Neighborhood



Semantic Zooming

Layered graphs and navigation

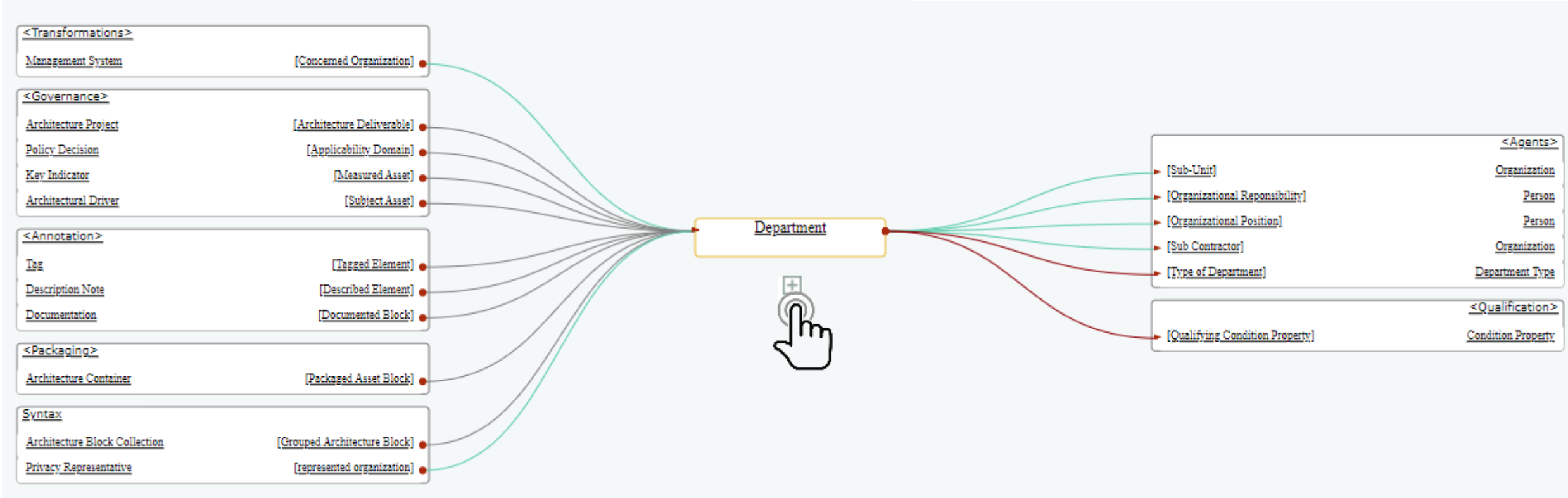
- Depending on the context of their work, users may prioritize either the external aspects of **aggregates** (Black box) or delve into their internal structure (White box) at different times. They need to access **details on demand**.
- **Semantic zooming** is a novel approach of graph navigation to address these needs.
 - It integrates zoom, fusion, or morphing to enable users to scrutinize aggregate details while maintaining visibility of higher-level aggregates and their interconnections.
 - It encompasses two pivotal functions: zoom-in, which delves into the internal structure of aggregates, and zoom-out, which ascends to reveal direct relationships between aggregates.



Semantic Zoom on specialization

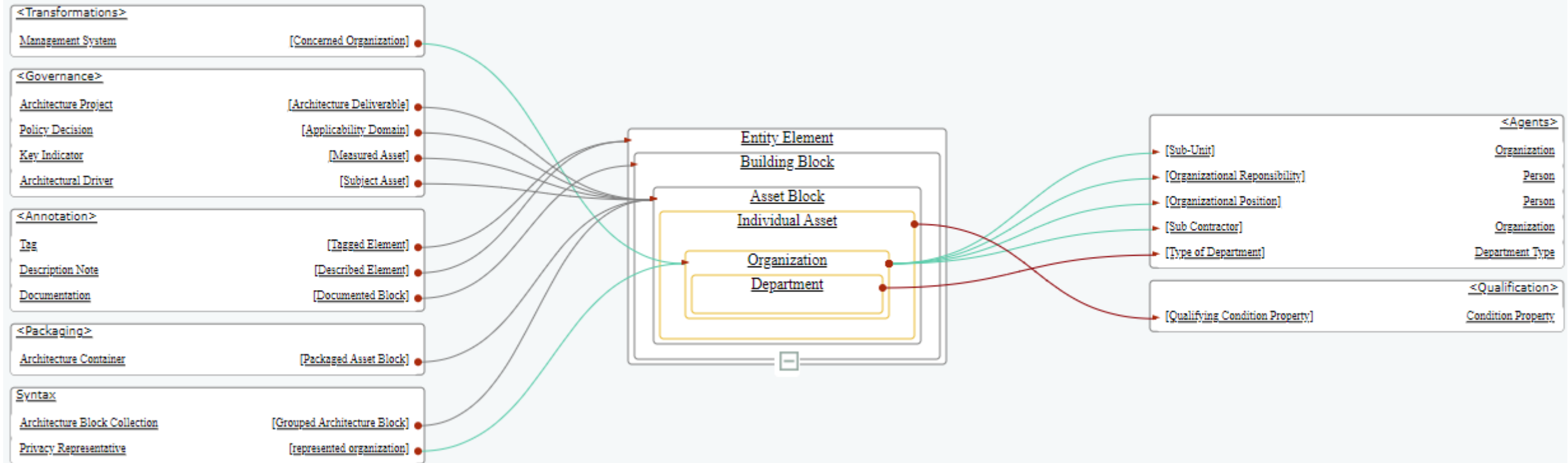
Semantic Zoom on specialization

Composition: → Classification: → Specialization: → Enumerated definition: → Syntax: →



Semantic Zoom on specialization

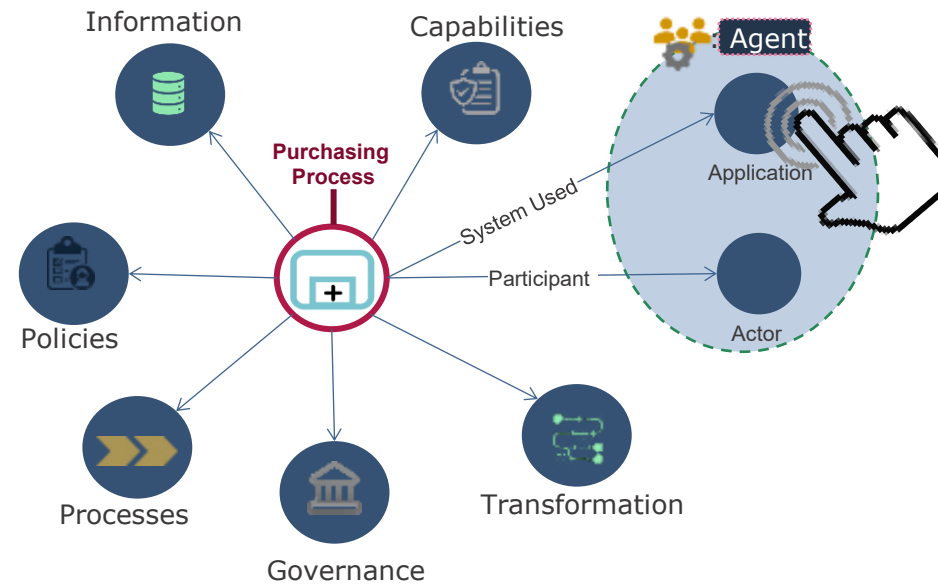
Composition: → Classification: → Specialization: → Enumerated definition: → Syntax: →



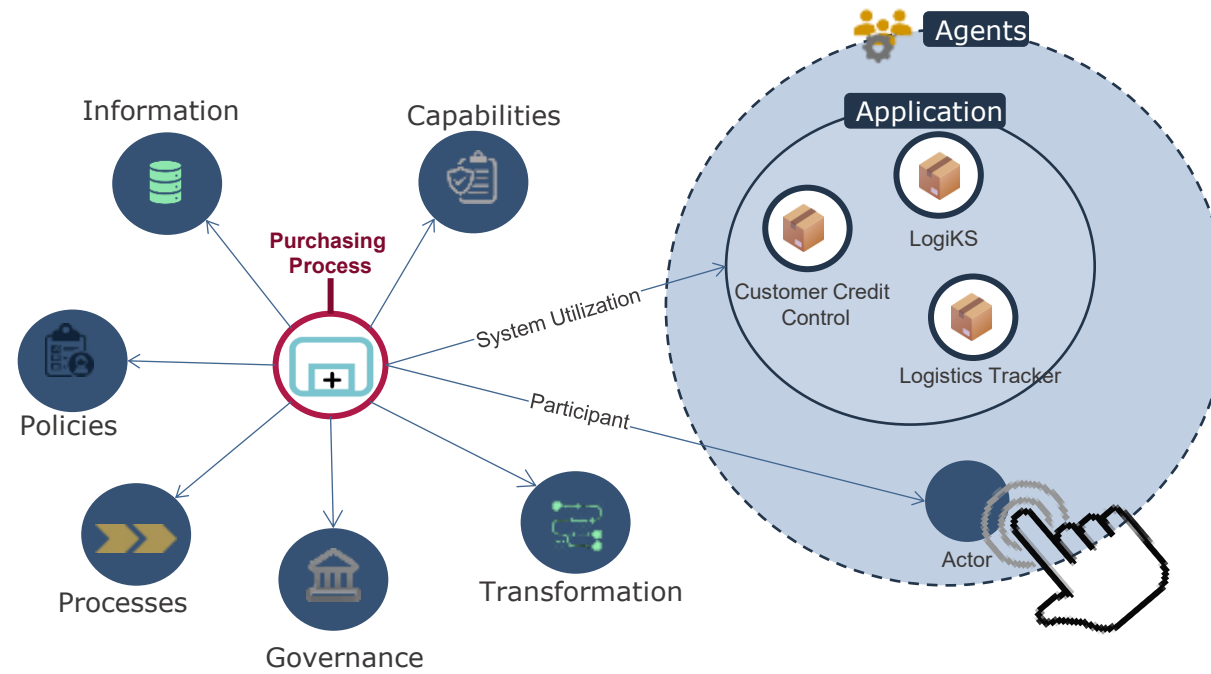
Semantic Zoom on composition

Aggregate Relationships

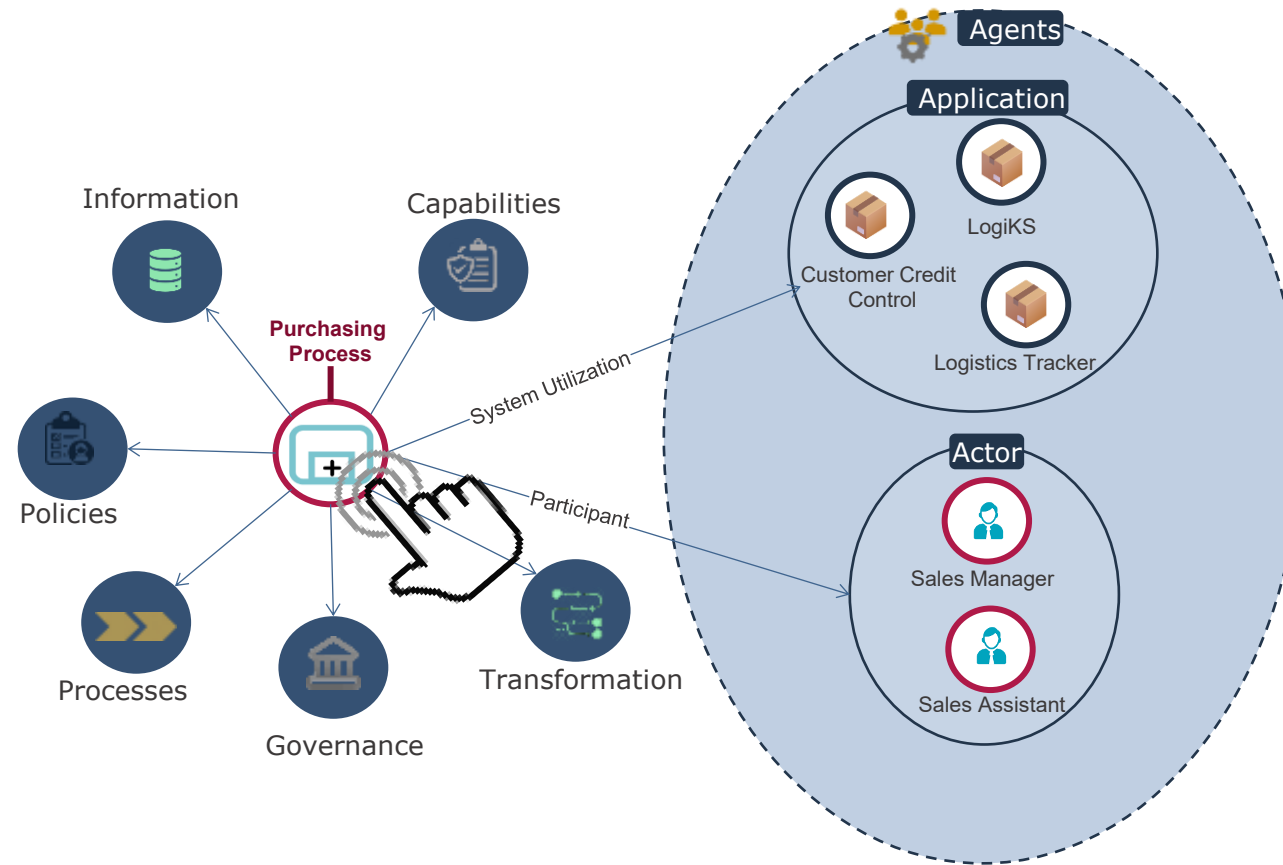
Semantic Zoom on composition – Aggregate Relationships (1)



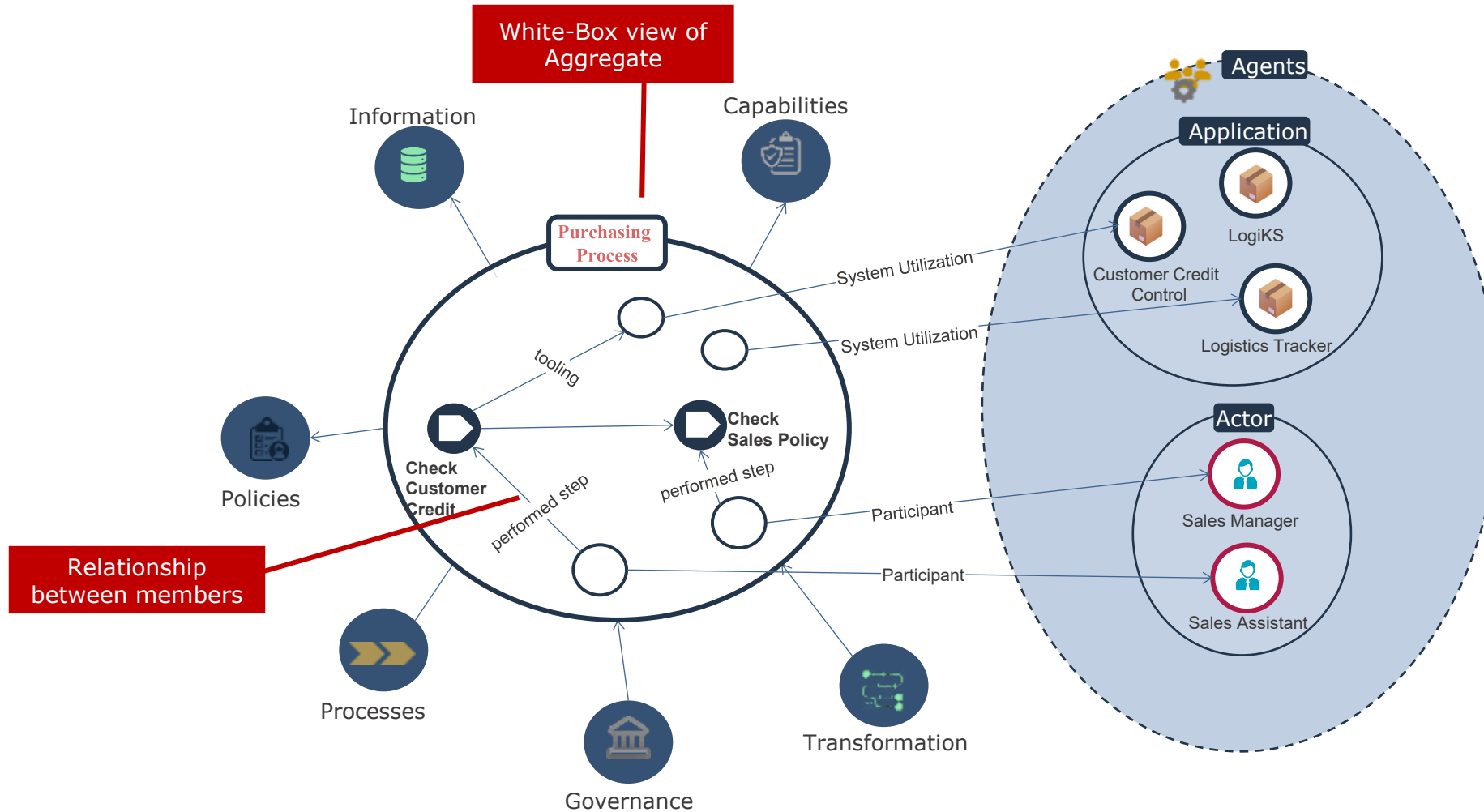
Semantic Zoom on composition – Aggregate Relationships (2)



Semantic Zoom on composition – Aggregate Relationships (3)



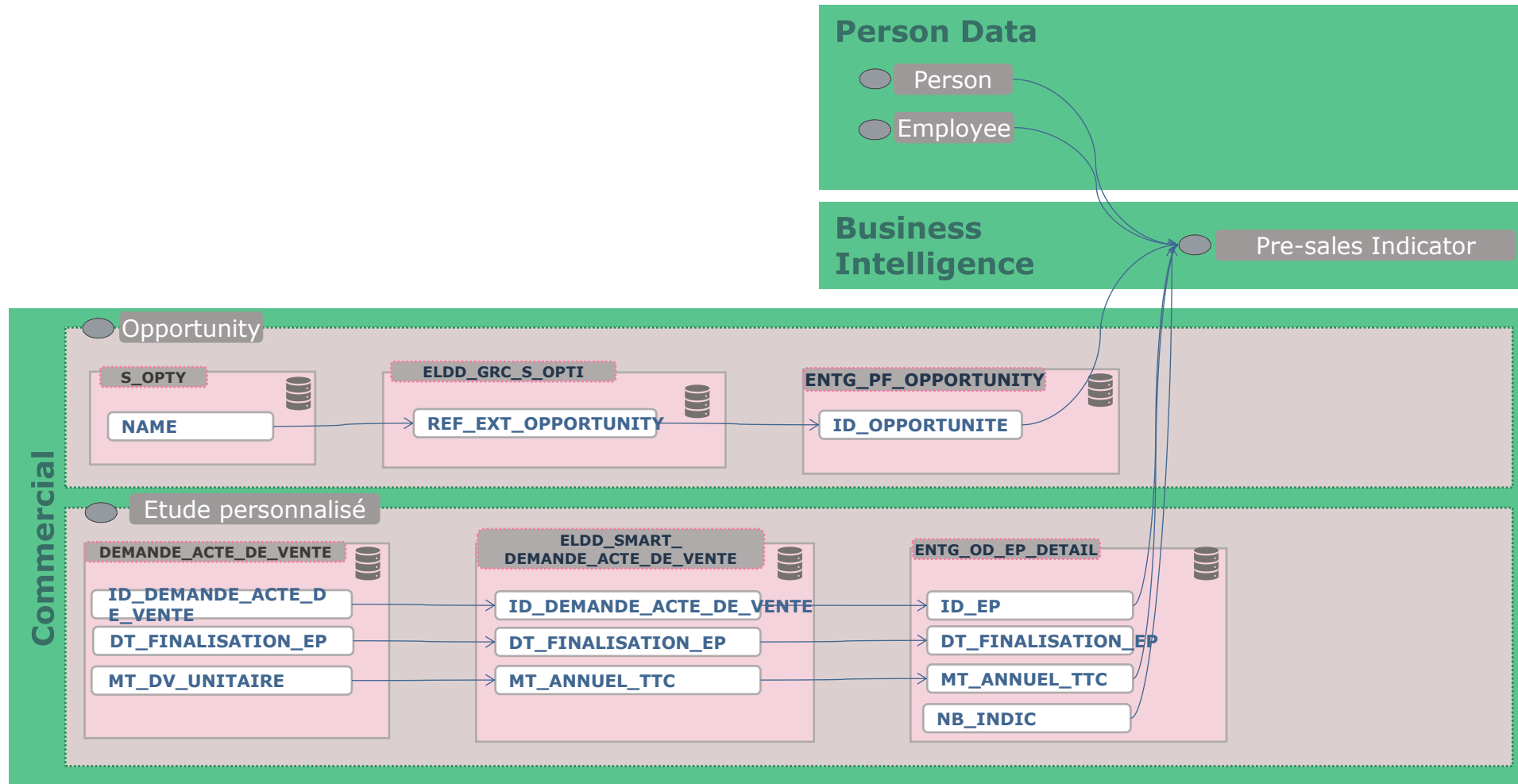
Semantic Zoom on composition – Aggregate Relationships (4)



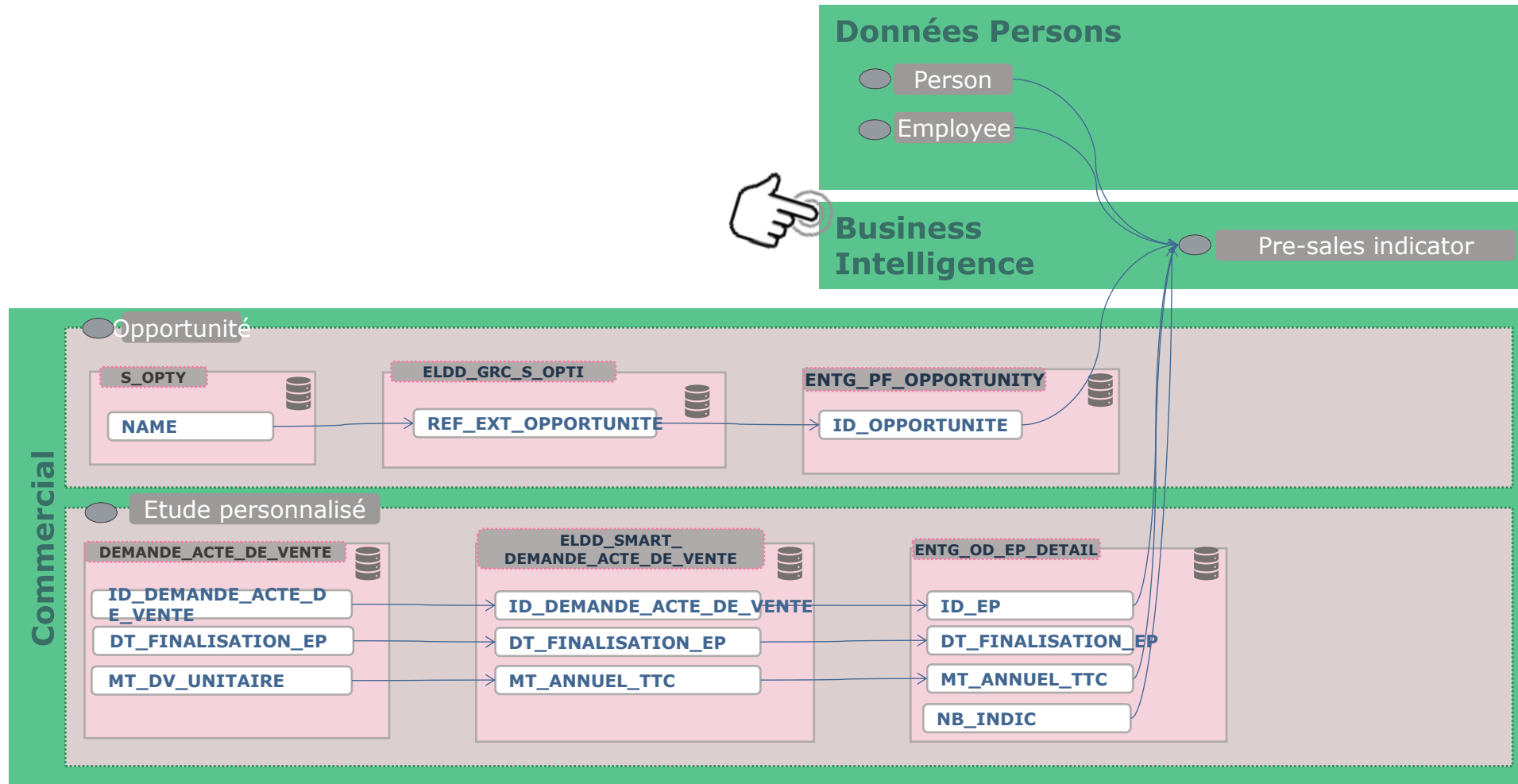
Semantic Zoom on composition

Sequences

Semantic Zoom on composition – Sequence (1)



Semantic Zoom on composition – Sequence (2)



Semantic Zoom on composition – Sequence (3)

