



Systemic Framework for Enterprise Architecture & Transformation

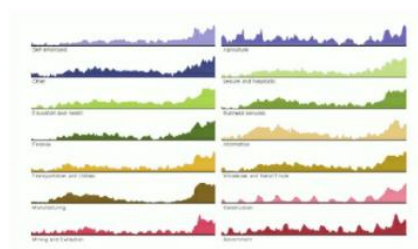
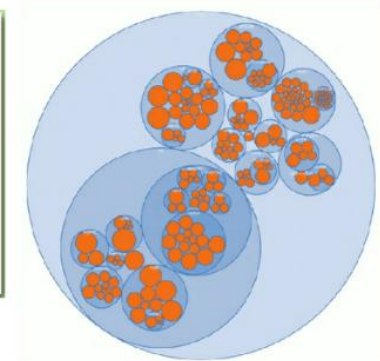
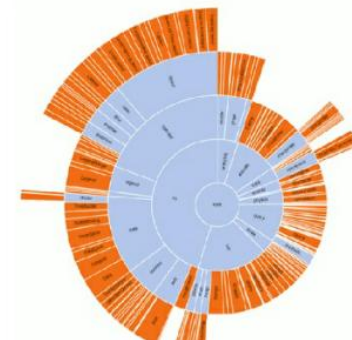
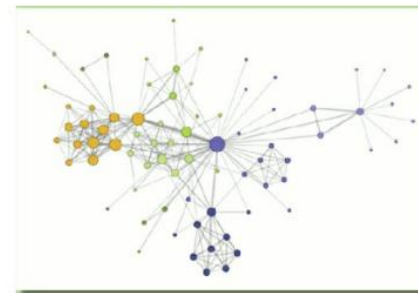
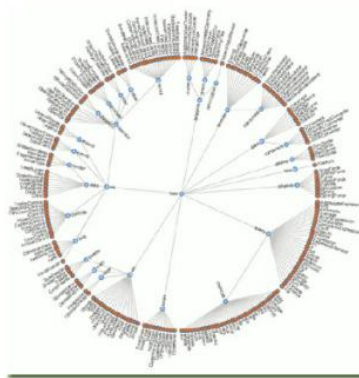
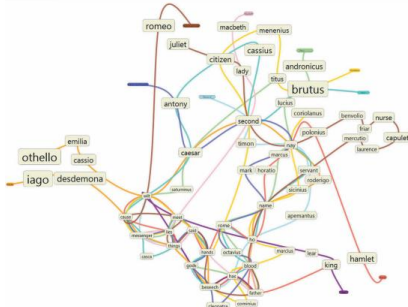
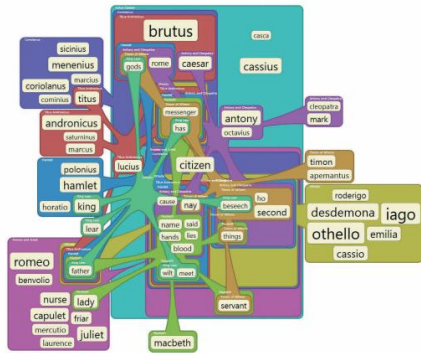
Visualization Challenges

Alfred North Whitehead:

By relieving the brain of all unnecessary work, a good notation sets it free to concentrate on more advanced problems, and in effect increases the mental power of the race.

Data Visualization Purposes

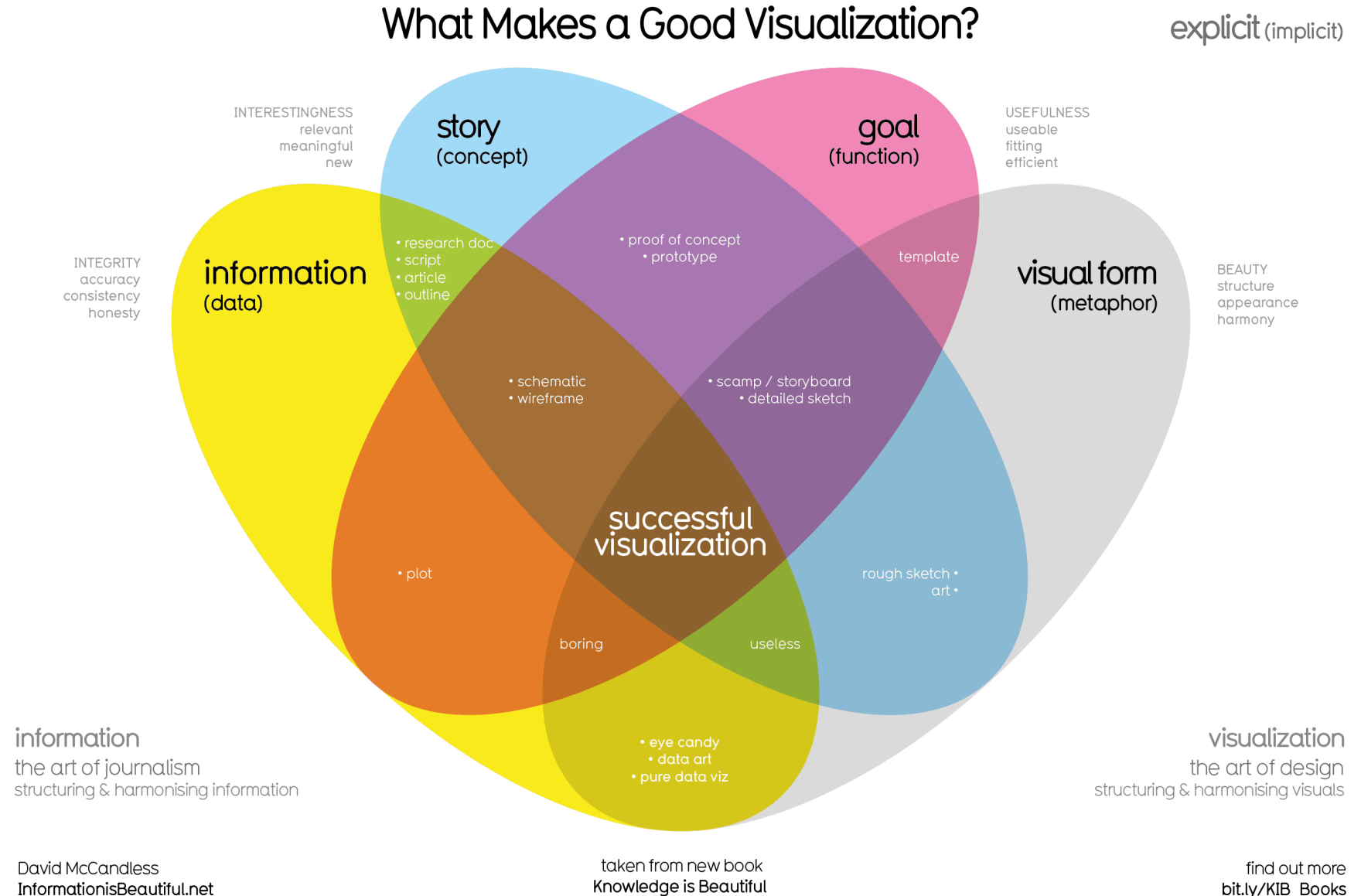
- The goal of visualization is to aid our understanding of data by leveraging the human visual system's highly tuned ability to see patterns, spot trends, and identify outliers.
- Well-designed visual representations can replace cognitive calculations with simple perceptual inferences and improve comprehension,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



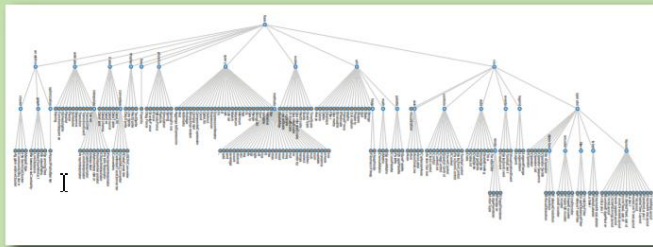
Data Visualization & Force-directed graph

- 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 – Two main kinds

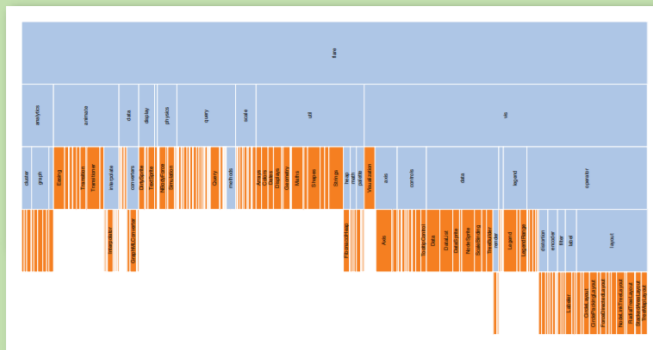
Visualization of Hierarchies

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>

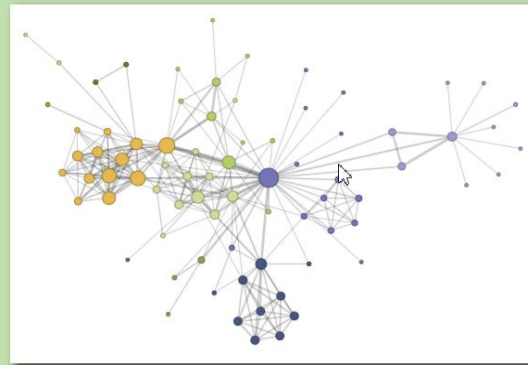
FIGURE 4D
Icicle Tree Layout of the Flare Package Hierarchy



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

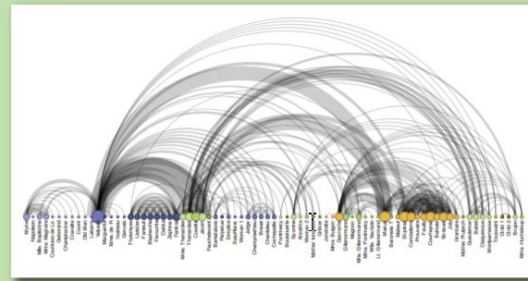
Visualization of Networks

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



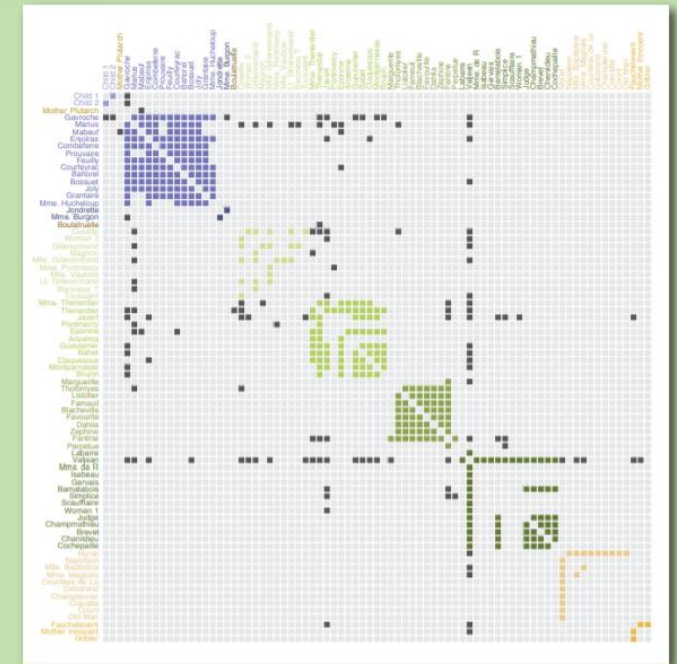
Source: Knuth, D. E. 1993. The Stanford GraphBase: A Platform for Combinatorial Computing. Addison-Wesley.
<http://hci.stanford.edu/jheer/files/zoo/tx/networks/force.html>

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

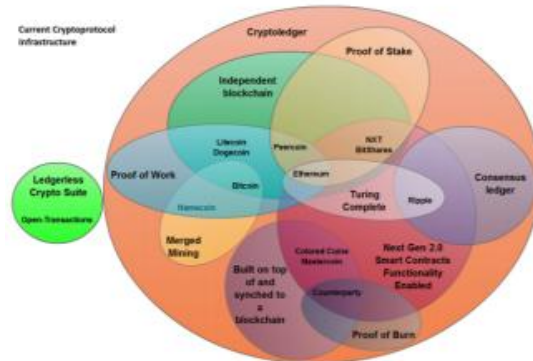
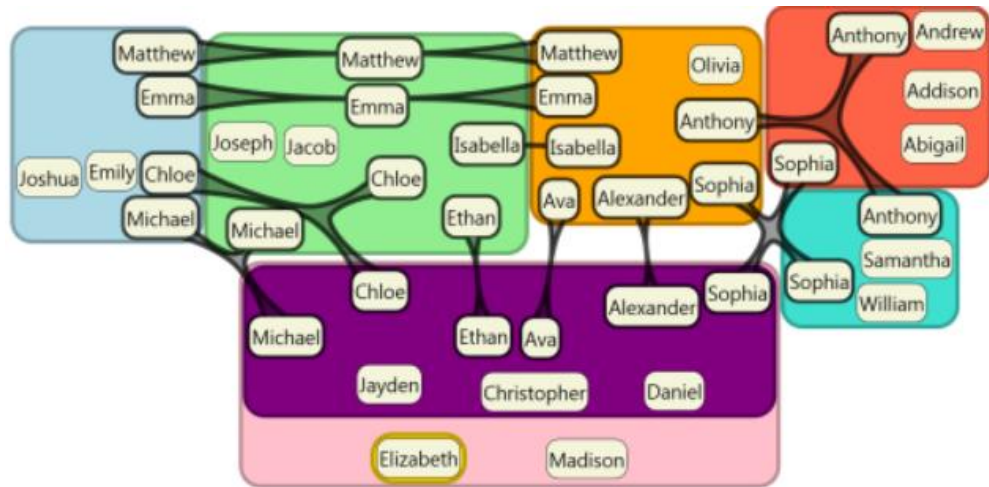


Source: Knuth, D. E. 1993. The Stanford GraphBase: A Platform for Combinatorial Computing. Addison-Wesley.
<http://hci.stanford.edu/jheer/files/zoo/tx/networks/matrix.html>

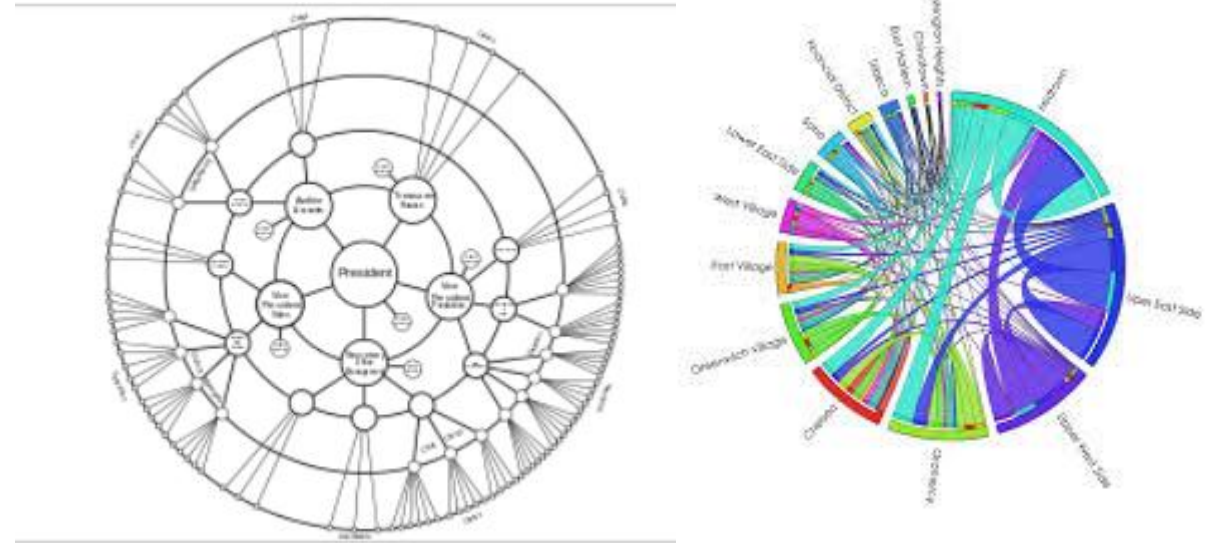
Data Visualization Taxonomy - 2

Visualization of Overlapping & Reuse

Untangling Euler diagram



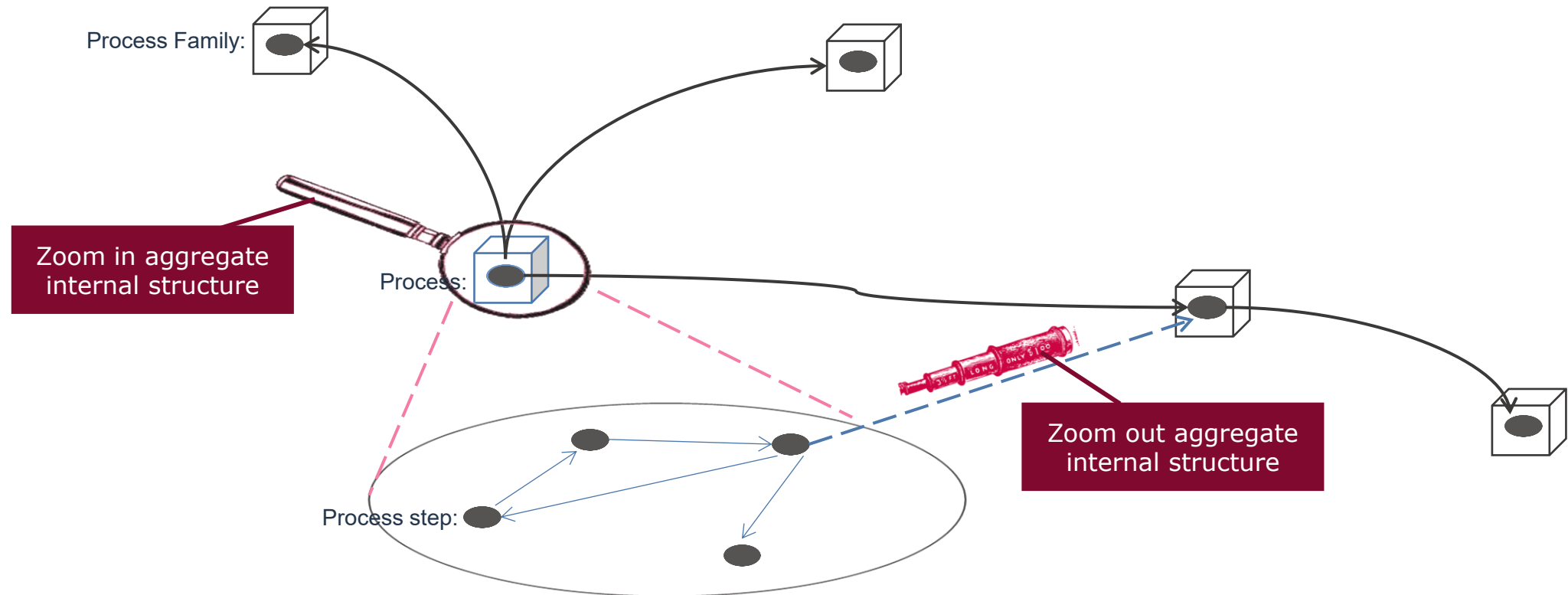
Visualization of Layered Neighborhood



Semantic Zooming

Layered graphs and navigation

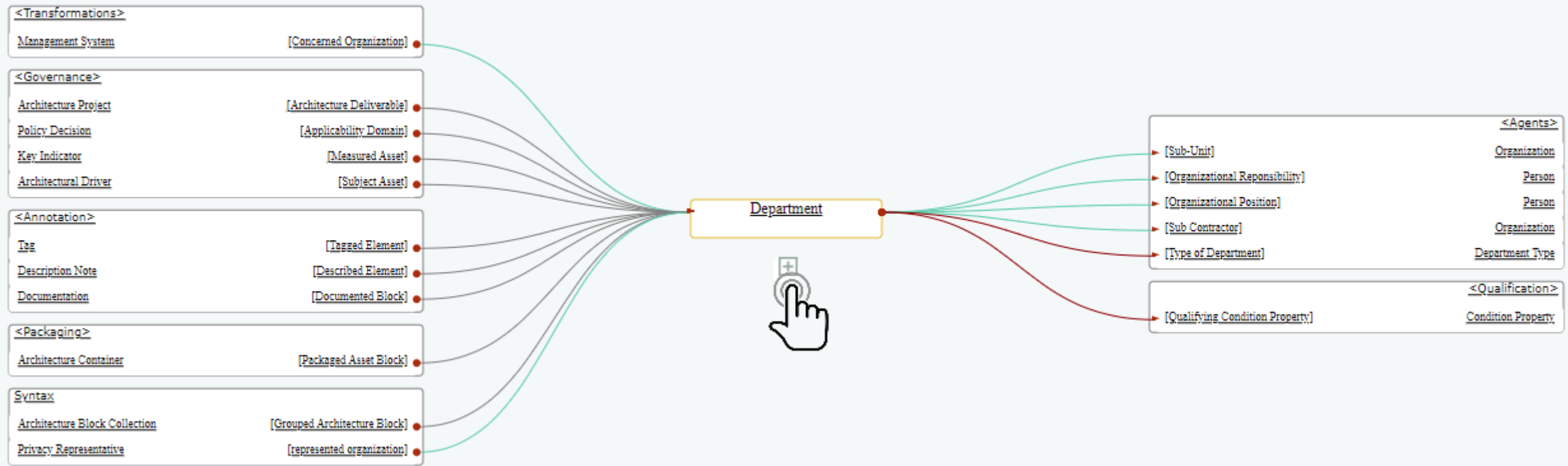
- Depending on the context of their work, users may prioritize either the external aspects of aggregates (Black box) or delve into their internal structure (White box) at different times. They need to access details on demand.
- Semantic zooming is a novel approach of graph navigation to address these 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

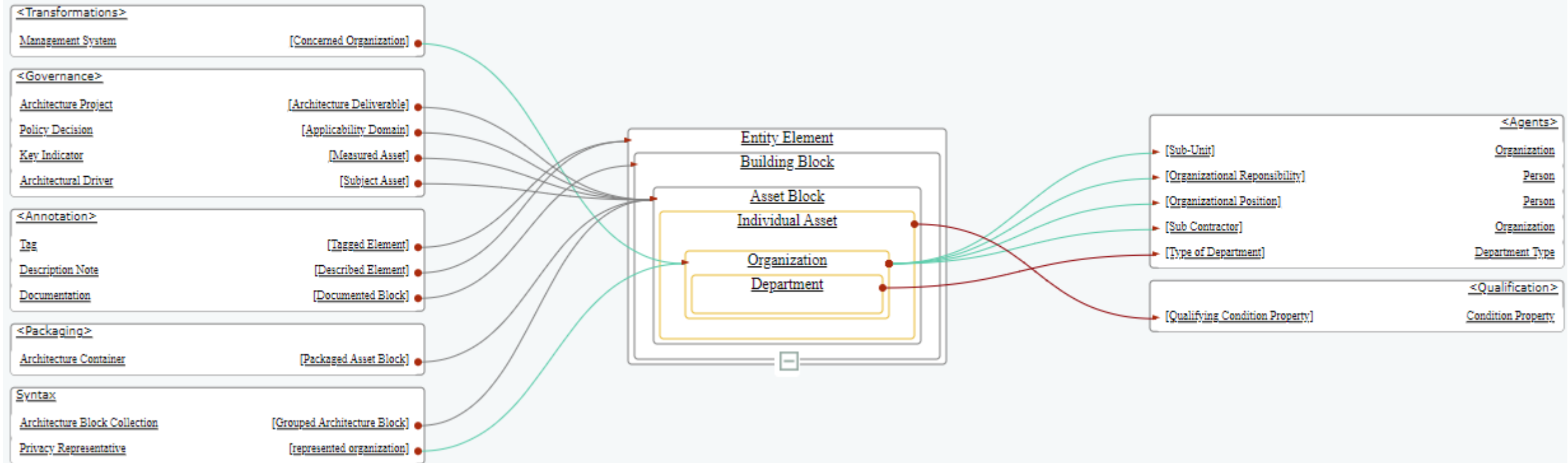
Semantic Zoom on specialization

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



Semantic Zoom on specialization

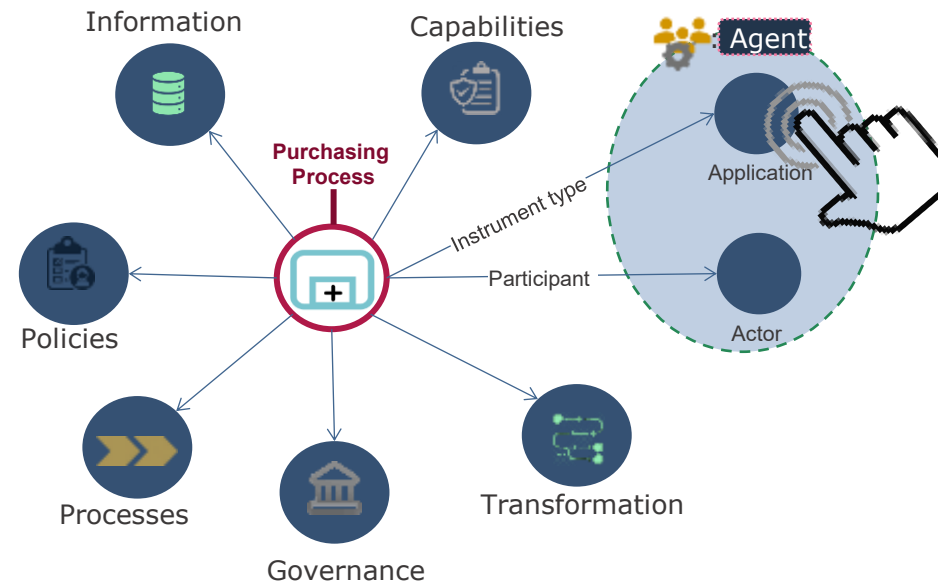
Composition: → Classification: → Specialization: → Enumerated definition: → Syntax: →



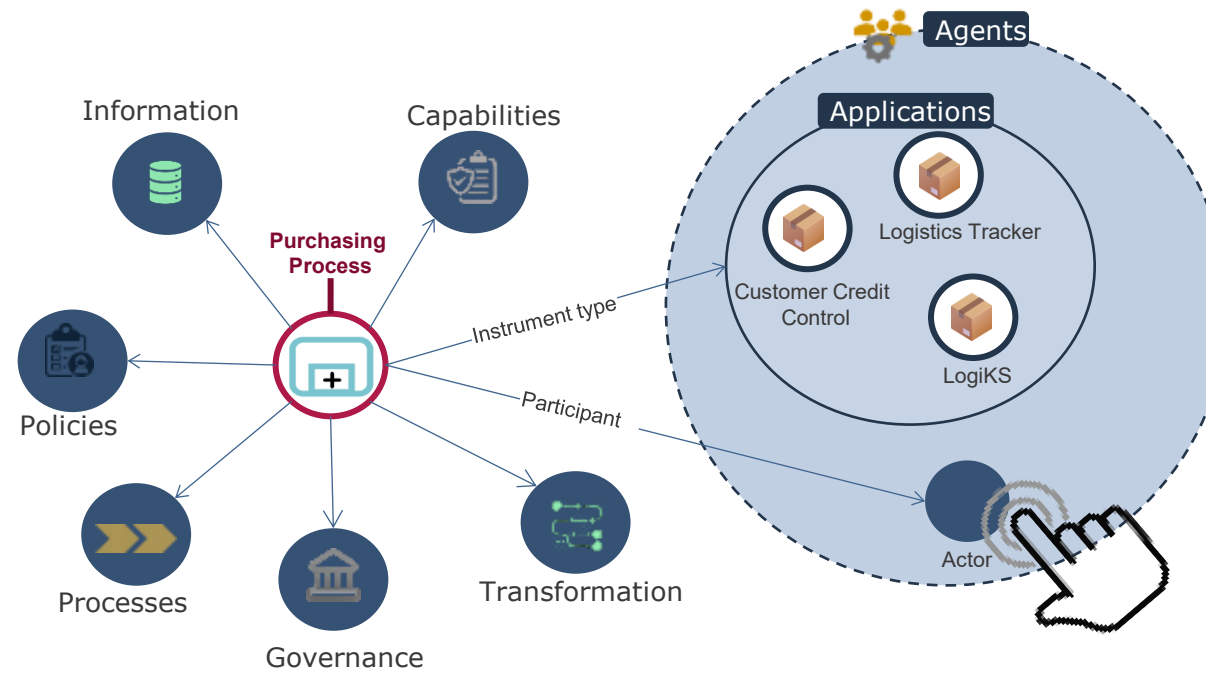
Semantic Zoom on compositionality

Aggregate Relationships

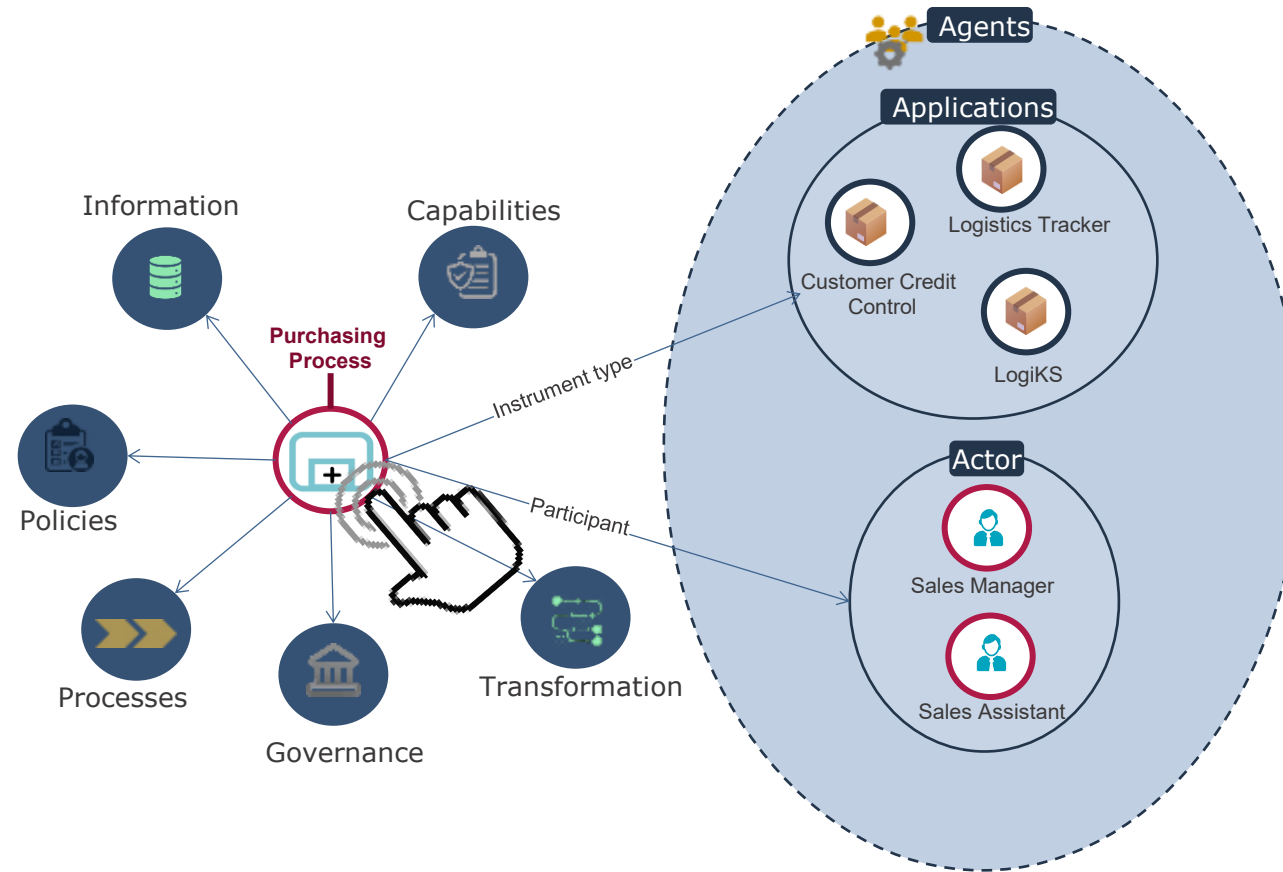
Semantic Zoom on compositionality – Aggregate Relationships (1)



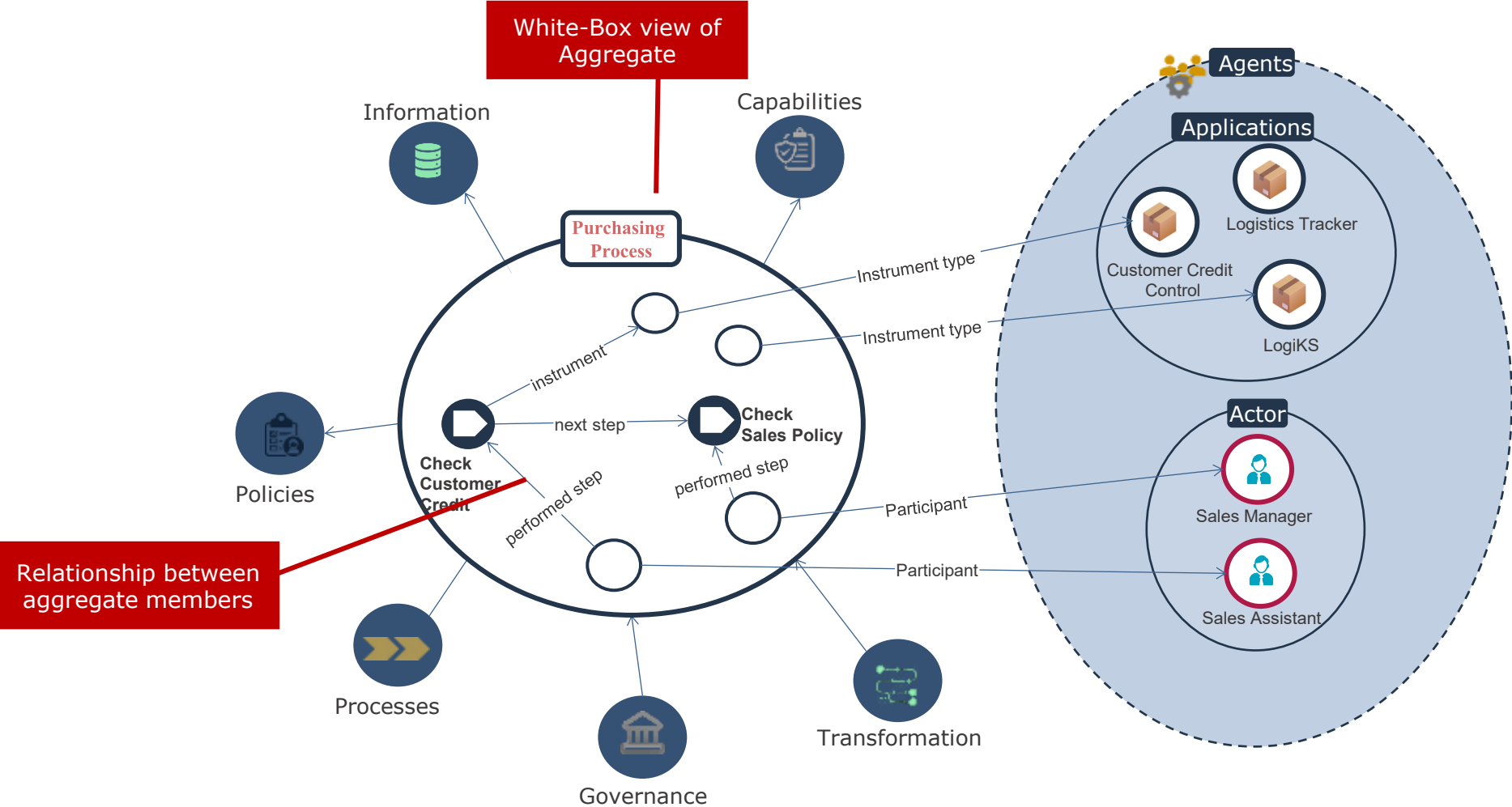
Semantic Zoom on compositionality – Aggregate Relationships (2)



Semantic Zoom on compositionality – Aggregate Relationships (3)



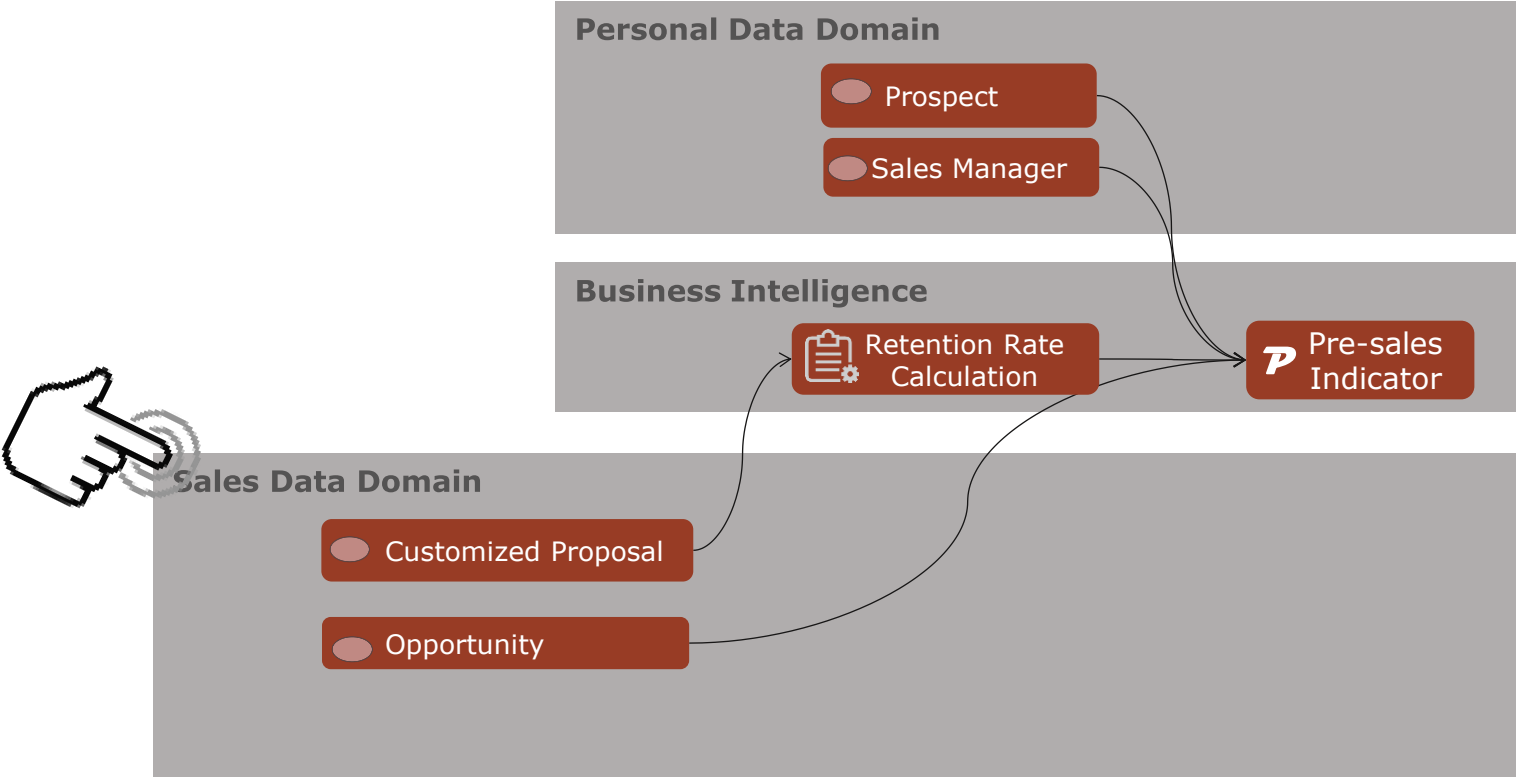
Semantic Zoom on compositionality – Aggregate Relationships (4)



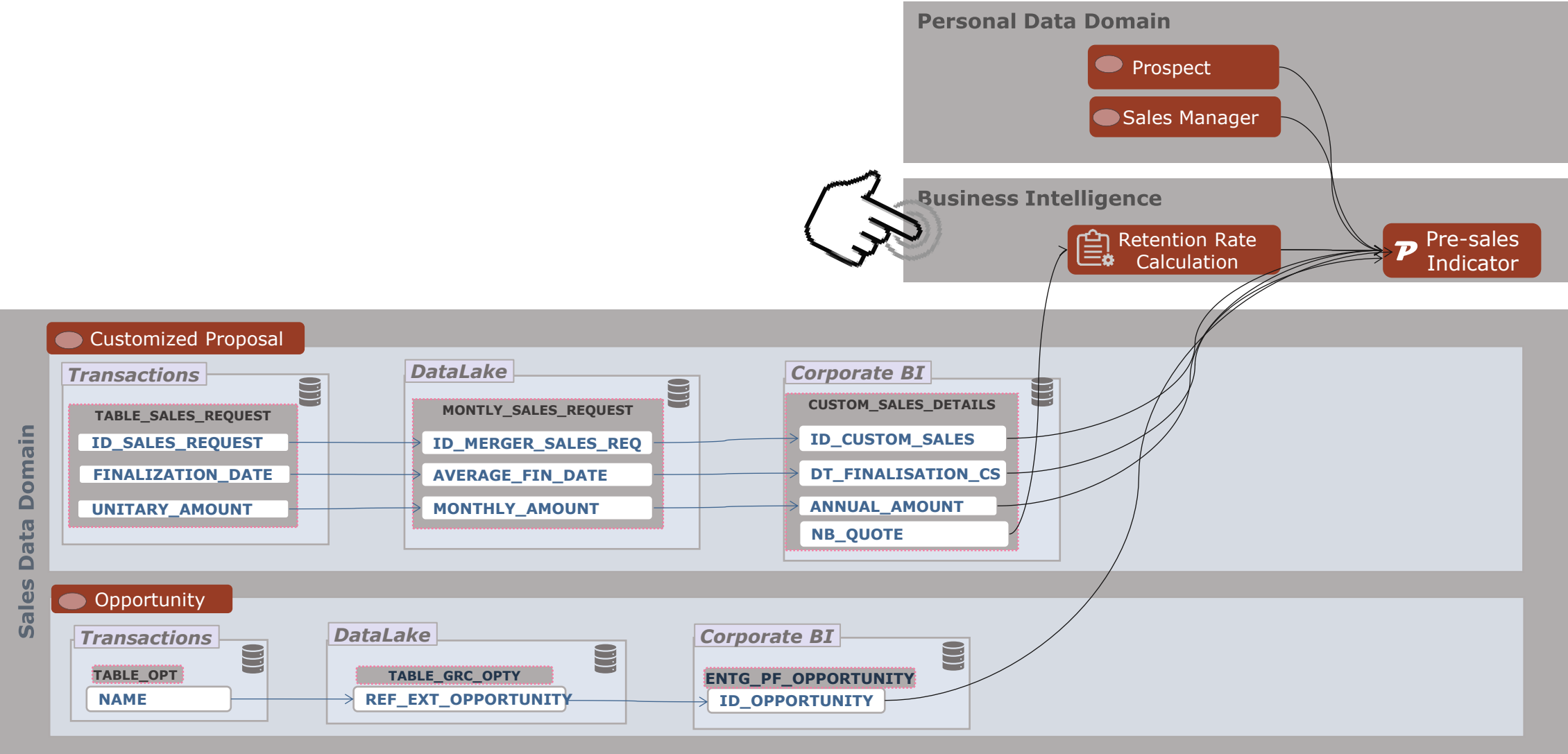
Semantic Zoom on realizations

Data Lineage Mapping

Semantic Zoom on Data Lineage – Ontology Lineage (1)

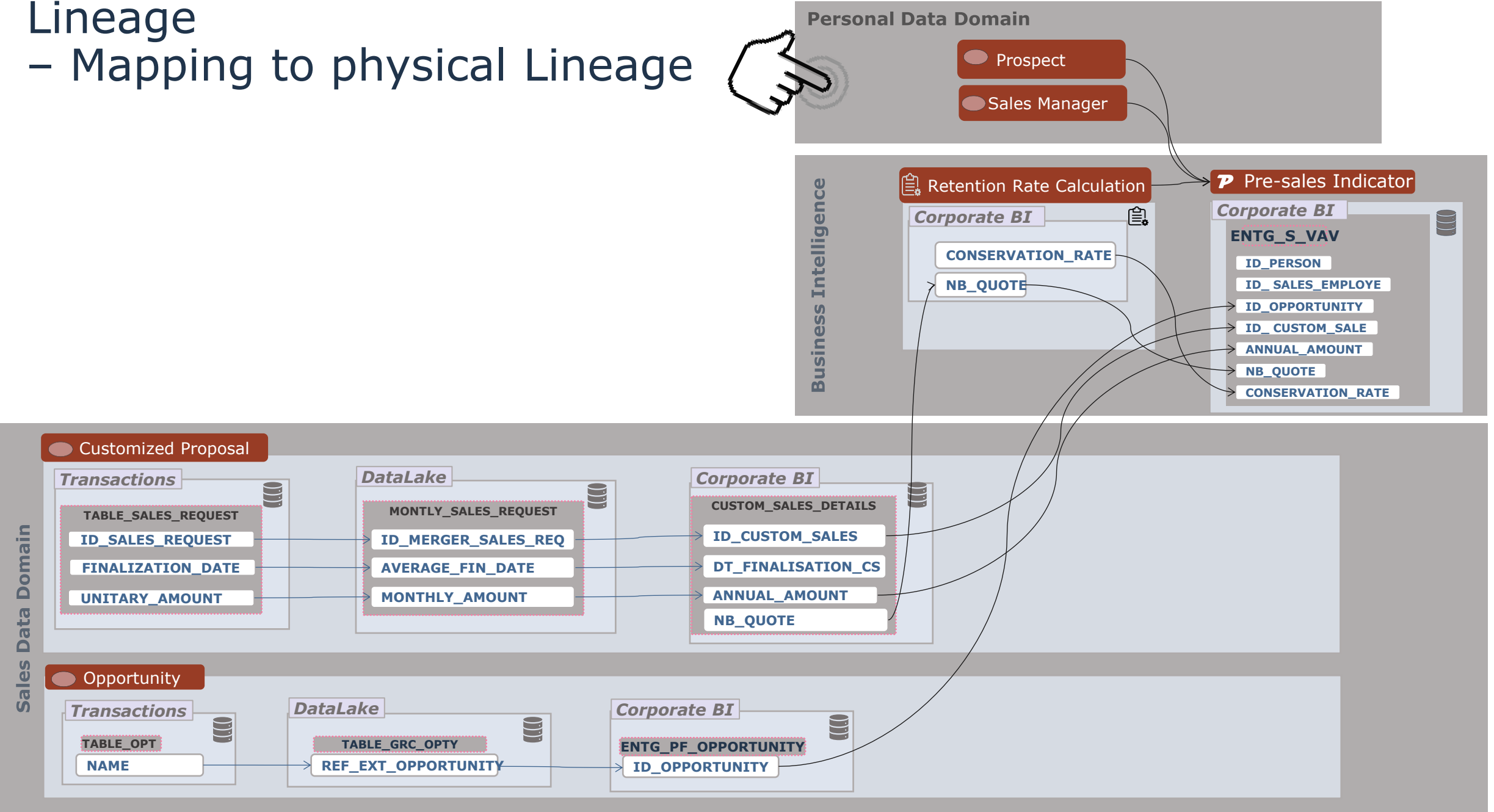
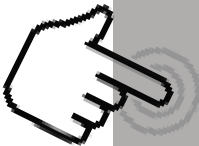


Semantic Zoom on Data Lineage – Mapping to physical Lineage



Semantic Zoom on Data Lineage

- Mapping to physical Lineage



Semantic Zoom on Data Lineage

– Mapping to physical Lineage

