Introduction to Data Exploration

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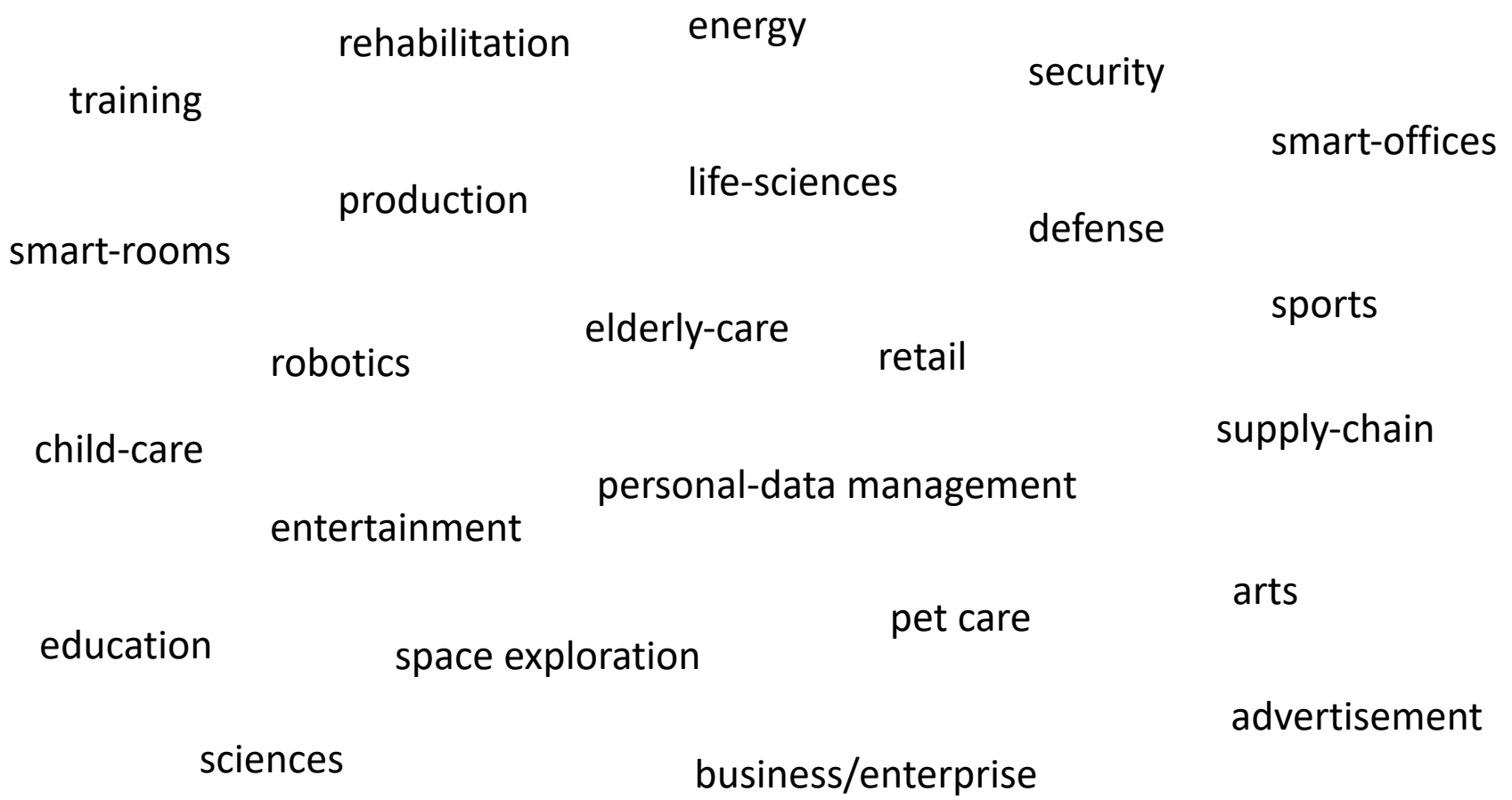
Objectives

Objective

Explain what are the data challenges

We are living in a data-rich world…



How can we make SENSE from the REAL WORLD data

Data Challenges

INS

(**I**)mprecision
(**N**)oise
(**S**)parsity

3Vs

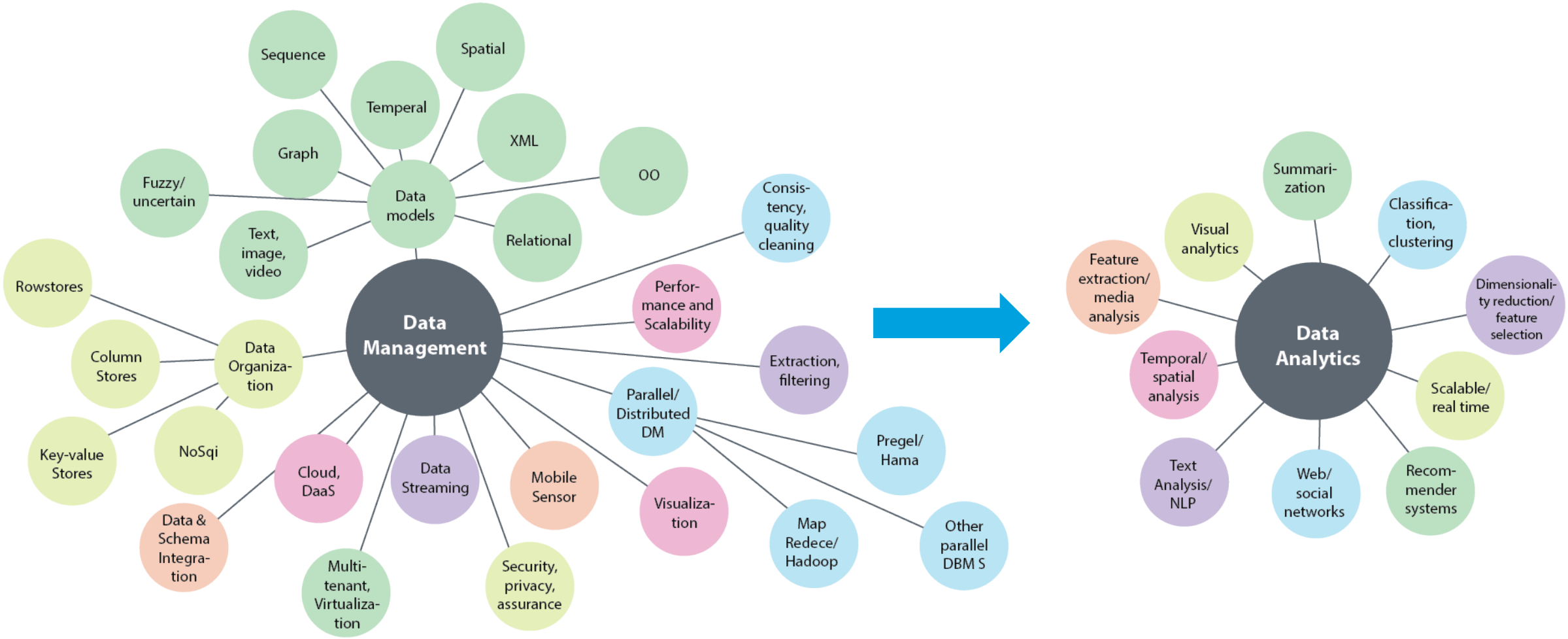
(**V**)olume
(**V**)Elocity
(**V**)ariety

HMLE

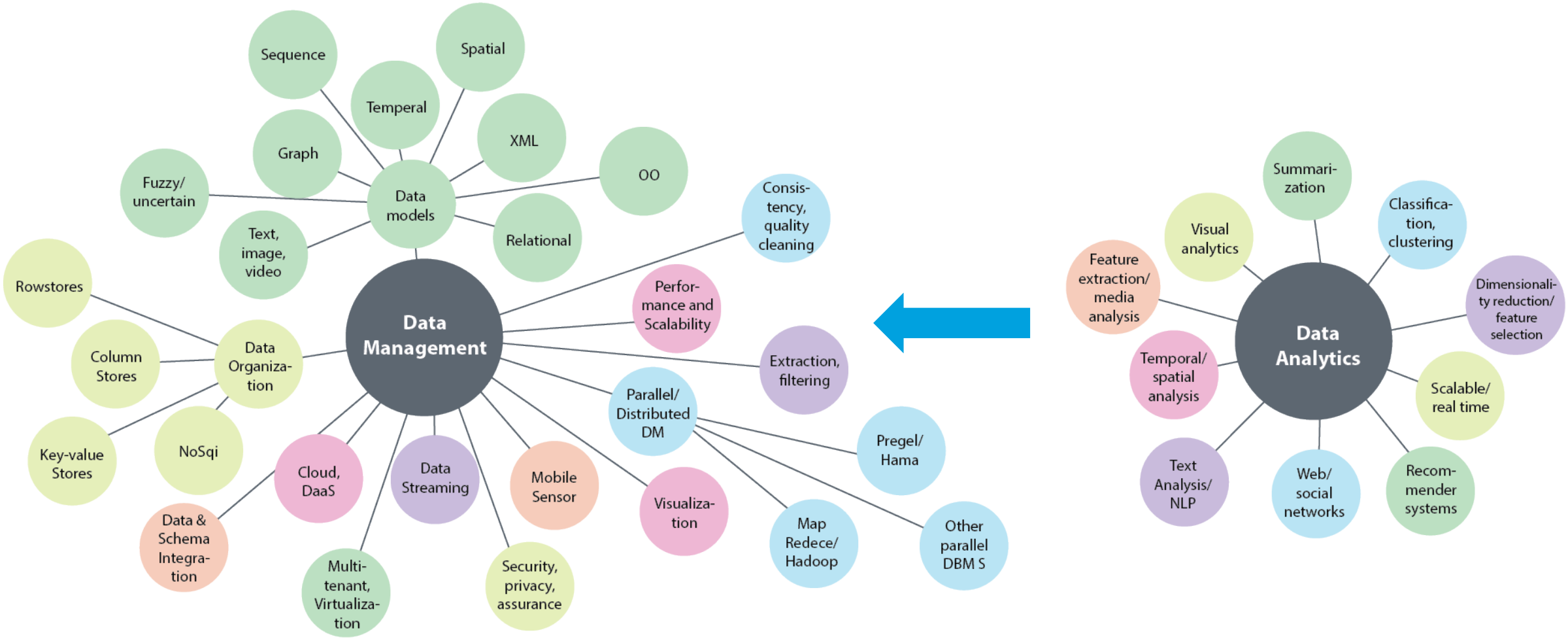
(**H**)igh-dimensional
(**M**)ulti-modal
Inter-(**L**)inked
(**E**)volving

Human Challenges: for many applications the final consumer is **HUMAN**

Data management/mining techniques for supporting scalable, real-time, analysis and exploration



Most data in the real world are imprecise, multi-modal, and subjective



Therefore, data exploration systems need to support both…

…effective data manipulation

- **Filtering**: Projection, selection
- **Integration**: Join, nearest neighbor joins
- **Set operations**: Union and Intersection

…effective data analysis/retrieval

- **Feature extraction**
- **Similarity search**
  (top-k, range, skyline, nearest-neighbor)
- **Clustering**, partitioning
- **Aggregation**, summarization
- **Classification**, latent analysis
- **Preference-driven** retrieval