Knowledge Organization Systems

THE BACKBONE OF HIGH-QUALITY, USABLE DATA

AI+IM GLOBAL SUMMIT

Welcome

Ashley Yurek, MLIS

Program Manager, Application Records Management, JPMorgan Chase

- 13+ years' experience in Records & Information Management and Data Governance, specializing in the development and implementation of Knowledge Organization Systems.
- Master's in Library & Information Science from Western University (Ontario, Canada).
- Columbus, Ohio.

Session Topic

In today's data-drive organizations, the ability to manage, retrieve, and leverage information efficiently is paramount. This session explores the foundational role of controlled vocabularies, thesauri, taxonomies, and ontologies in building high-quality, interoperable, and AI-ready data environments.

Disclaimer

The views and opinions expressed in this presentation are solely my own and do not reflect those of my current or former employers or any affiliated organizations.

Knowledge Organization Systems

Structures that manage, categorize, and provide access to information.

Controlled Lists

Taxonomies

Thesauri

Ontologies

Controlled List

A predefined, authorized set of values or terms used to ensure consistency and accuracy in data entry, classification, or decision-making.

Human Resources Example

- Full-Time
- Part-Time
- Contractor
- Intern
- Leave
- Terminated

Group Activity 1

In your groups, brainstorm 10-15 essential terms for your topic. Eliminate synonyms and decide on the "authorized" version of each word.

Group	Group 1	Group 2	Group 3	Group 4
Topic	Home Kitchen	Personal Wardrobe (Clothing)	Streaming Services (Entertainment)	Grocery Store

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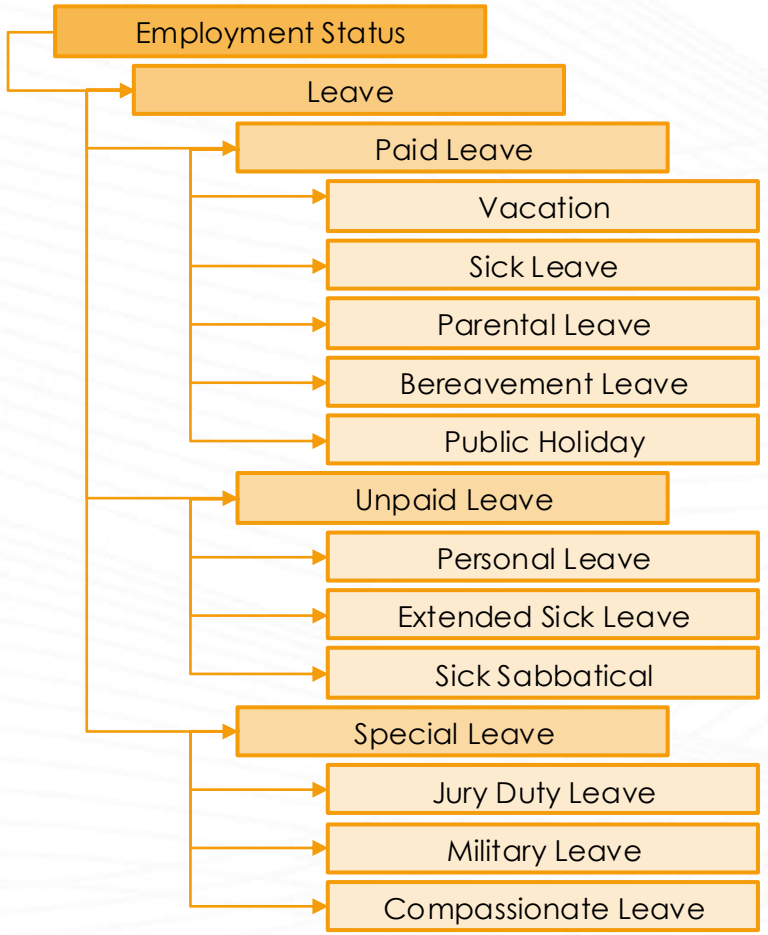
Taxonomy

A systematic way to organize information into categories or subcategories, making it easier to manage, analyze, and communicate complex data.

Human Resources Example



Group Activity 2

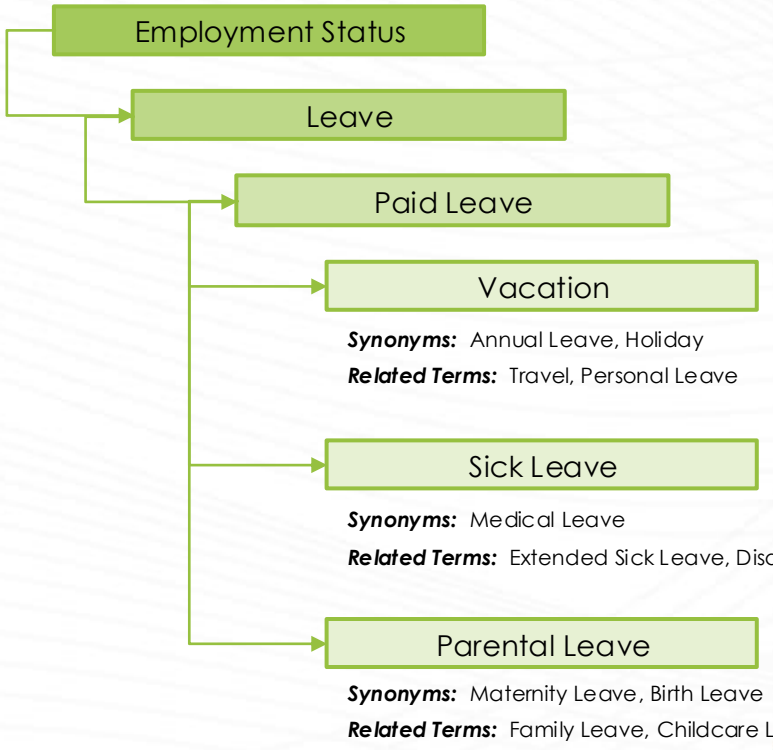
Take your flat list from Group Activity 1 and arrange it into a tree. Identify your "buckets".

Group	Group 1	Group 2	Group 3	Group 4
Topic	Home Kitchen	Personal Wardrobe (Clothing)	Streaming Services (Entertainment)	Grocery Store

Thesaurus

Organizes words or concepts by their meanings and relationship, supporting consistent communication, indexing, and retrieval.

Human Resources Example



Group Activity 3

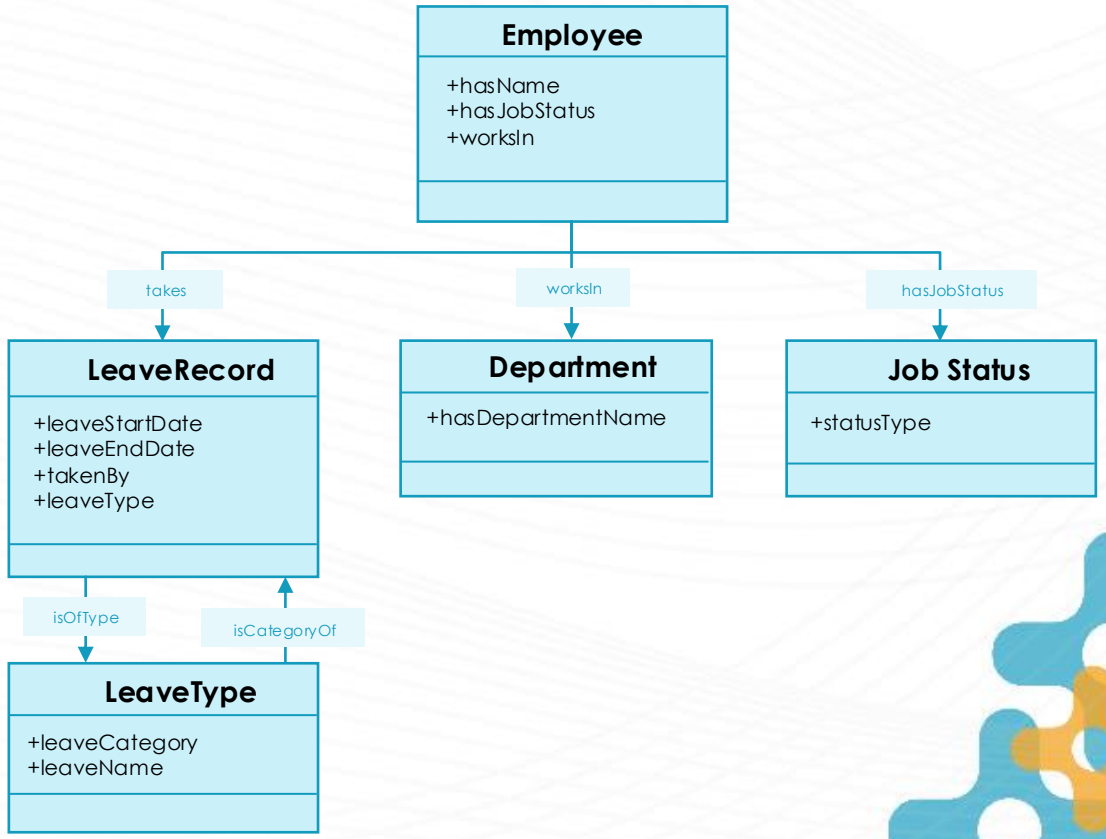
Look at your taxonomy. Capture synonyms and connect terms that are related but not hierarchical.

Group	Group 1	Group 2	Group 3	Group 4
Topic	Home Kitchen	Personal Wardrobe (Clothing)	Streaming Services (Entertainment)	Grocery Store

Ontology

A formal, detailed model of concepts and their relationships in a domain, supporting advanced data management, integration, and reasoning for both humans and machines.

Human Resources Example



Group Activity 4

Turn your relationships into logic. Use verbs to link your terms.

Group	Group 1	Group 2	Group 3	Group 4
Topic	Home Kitchen	Personal Wardrobe (Clothing)	Streaming Services (Entertainment)	Grocery Store

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Group Activity 5

The Stress Test. Imagine an AI agent is tasked with answering a complex question based on your work.

1. **Map the Path:** Trace how the query would fail using *only* your Phase 1 Controlled List.
2. **The Logic Jump:** Identify one specific relationship you created in your Ontology (Group Activity 4) that allows the AI to "understand" the context of that query in a way the simple Taxonomy (Group Activity 2) could not.
3. **Presentation:** One representative from each group will stand up and share their "Logic Jump" – the moment their data became "intelligent".

Summary

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	Controlled Lists	Taxonomy	Thesauri	Ontologies
Description	A predefined, authorized set of values or terms used to ensure consistency and accuracy in data entry, classification, or decision-making.	A systematic way to organize information into categories or subcategories, making it easier to manage, analyze, and communicate complex data.	Organizes words or concepts by their meanings and relationship, supporting consistent communication, indexing, and retrieval.	A formal, detailed model of concepts and their relationships in a domain, supporting advanced data management, integration, and reasoning for both humans and machines.
Primary Goal	Had Data Integrity and Normalization	Classification and Feature Aggregation	Semantic Recall and Linguistic Mapping	Complex Reasoning and Business rules
AI Action	"Is this data valid and standardized?"	"Where does this concept belong in the hierarchy?"	"What other terms mean the same thing?"	"What does this interaction imply logically?"
Mechanism	Dropdowns, SQL Constraints, Permanent URIs	"Is-A" Hierarchies and Parent-Child Inheritance	Synonym Rings (USE/UF) and Associative Relationships (Related Terms)	OWL (Web Ontology Language), Multi-relational verbs, and formal logic
Error Handling	Hard Rejection – rejects "Bad Data" at the gate.	Graceful Degradation – Rolls up to the parent category rather than failing.	Soft Resolution – Instead of failing on a typo or synonym, the system "heals" the input by mapping it to the authorized term.	Logical Consistency Checking – Identifies "impossible" data and flags it as a logical contradiction before it can pollute the model.
The Win	80% reduction in data cleaning time. Models move from "Noisy" to "Precise".	Solves Data Sparsity. AI can "roll up" rare specific items into broader categories to find significant patterns.	Radical increase in Recall. The AU understands intent, ensuring it doesn't miss data due to synonyms or jargon.	The system moves from guessing patterns to proving outcomes based on defined world rules.
Implementation Effort / Cost	Low	Low-Medium	Medium	High
Best Fit Use Cases	Early-stage standardization; Simple classifiers; Dashboards with flat categories	Multi-level products/regions/docs; Hierarchical modeling and reporting; Faceted portal search.	Enterprise search, NLP tagging with many synonyms / aliases / abbreviations.	Entity-centric analytics, fraud graphs, personalization, semantic RAG, cross-system harmonization.

THANK YOU!

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