# Knowledge Portals, Knowledge Hubs, and Taxonomies

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## **About the Speaker**



#### **Heather Hedden**

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- Leads the design and development of taxonomies and ontologies for varied use cases for diverse clients.
- Taxonomist for over 28 years in various corporate and consulting roles.
- Instructor of taxonomy design & creation workshops and courses.
- Author of the book, The Accidental Taxonomist, 3rd edition (Information Today, Inc., 2022).
- Blogs at <u>accidental-taxonomist.blogspot.com</u>

## **Outline**

- Introduction: Information
  Access Challenges
  - Defining and Comparing Knowledge Portals and Knowledge Hubs
  - Knowledge Portal/Hub Components and Knowledge Graphs
- Example Knowledge Portal: Enterprise Knowledge
  - Role of Taxonomies Example

### **Information Access Challenges**

Within an organization, information/content that should be shared, pooled, linked, and related, is often scattered in different applications and sources.

### **Application types:**

- multiple content management systems
- document management systems
- digital asset management systems
- employee experience platforms
- internal collaboration software
- external/partner collaboration spaces









### **Content/data/information types:**

- policies, procedures, guidelines
- product info/technical documentation
- customer information
- marketing content/collateral
- internal research information
- external/market research information
- people/expert resources



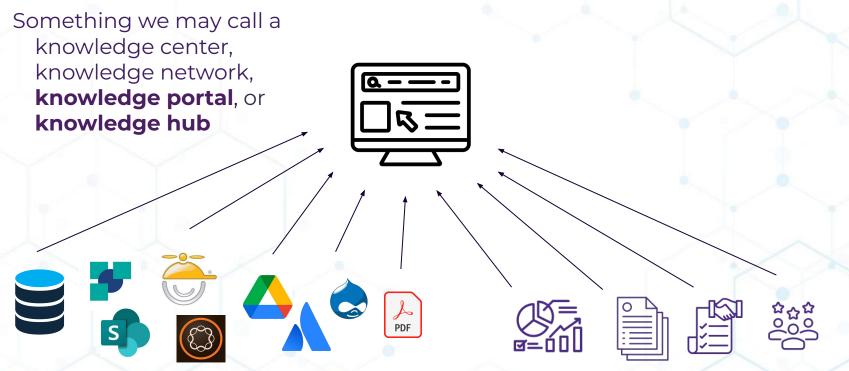






### Information Access Challenges & Solutions

- Users want to access disparate information together.
- Users prefer a single application, user interface and experience.



# Defining and Comparing Knowledge Portals and Knowledge Hubs

## **Defining Knowledge Portals**



### "Knowledge portals" were defined in the early 2000s.

- They tended to refer to a software platform.
- Often considered a kind of knowledge management software.
- Also defined by other vendors (CMS, knowledge base, etc.) as a solution built their tools.
- "Portal" refers to system designed to provide secure, customizable, personalizable, and integrated access to dynamic information from a variety of sources, a common interface that integrates the diverse functionality. – Detlor, B. 2004. Towards Knowledge Portals

## **Defining Knowledge Portals**

- Knowledge portal is type of portal that purposely supports and stimulates
  - knowledge transfer,
  - knowledge storage and retrieval,
  - knowledge creation,
  - knowledge integration,
  - knowledge application.

by providing access to relevant knowledge artifacts

- Highly integrative Knowledge Management Systems
  - that aim to synthesize widely dispersed knowledge,
  - to interconnect individuals,
  - to provide a "one-stop knowledge shop,"
  - and unify networking and repository KMS features.



"Knowledge Portals: Components, Functionalities, and Deployment Challenges," Claudia

Loebbecke and Kevin Crowston (2012)

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## **Defining Knowledge Portals**



### What we mean by "knowledge portal" today

- A web-based portal serving as a single entry point for gathered knowledge.
- A centralized online platform of various content sources that is designed to store, organize, and distribute knowledge within an organization.
- Not the "portal" of the early 2000s, which was often defined as a software program or Intranet.
  - Low success due to lack of effort to ensure content quality, governance, findability, and usability.
- Not a single technology solution, but rather an integrated suite.
  - As such, a knowledge portal is now more similar to a knowledge hub.

## **Defining Knowledge Hubs**

### "Knowledge hub" is less well defined; various meanings

- Defined by vendors of KM software as a feature.
- Defined by libraries and institutions for specific purposes.
  - UN ESCWA definition: "The Knowledge Hub is intended to serve as the main knowledge platform for Convention stakeholders, providing easy access to information from multiple sources."
- Often for internal use, so can be called by an internal name.
- Might also be called a "knowledge base" or a "knowledge portal."
  - "Hub" is preferred over "base," since it is a place to explore other knowledge resources that reside elsewhere rather than just being a collection.
- Could refer to a physical, and not digital, knowledge gathering space.



### **Defining Knowledge Hubs**

### Definitions from knowledge managers

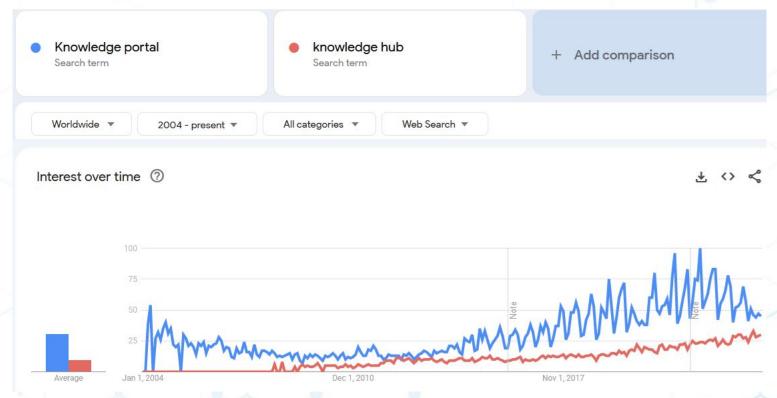
From this SIKM Leaders group in April 2023





- A "hub of organizing": a centralized place to connect people, work activities, and knowledge.
- A place where information is stored and waiting to be shared, whether by technology, physical location, or a group of knowledgeable people.
- As person(s)/groups/teams, is the person(s) who not only knows the answer you seek but can help/mentor/coach you through your situation.
- Digital workplace centers which pull together content and resources around high-level themes, resulting in multiple knowledge hubs dedicated to each research core.
- Internal or customer-facing repositories of content for a specific domain.

## Comparison of Knowledge Portals and Knowledge Hubs



## Comparison of Knowledge Portals and Knowledge Hubs

### Differences are not clear cut, but some tendencies are:

### **Knowledge Portals**



- Information often created by more people/ organizational units, which flows from many to many.
- Can be a KMS or be based on a CMS.
- For generic content of an organization.
- More often associated with intranets.

### Knowledge Hubs 1-9-1



- Information created and flows from a few people in leading units to the rest of the employees.
- A custom front-end to a knowledge graph.
- For specific type of content or resources.
- More often associated with knowledge bases.

"Knowledge portal" and "knowledge hub" are often used interchangeably.

Preference varies by organization and by geographic region.

"Knowledge portal" is more slightly dominant and more clear.

## **Defining Knowledge Portals/Hubs**

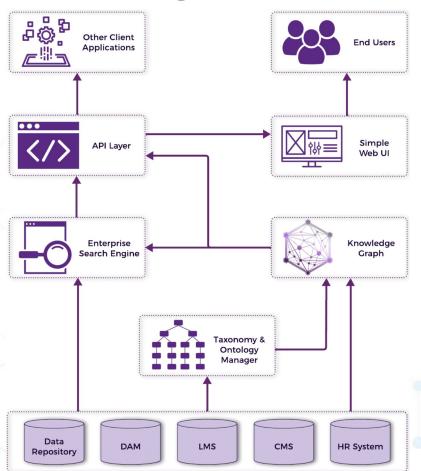
### **Preferred meanings**

- A single, central place/application for a set of users to find information and resources from different sources to do their work.
- Provides a knowledge service by bringing together information, content, data, and expert references.
- Includes semantics from metadata, taxonomies, and/or ontologies.
- A user-focused application based on a knowledge graph or a semantic layer.



# **Knowledge Portal Components and Knowledge Graphs**

### **Knowledge Portal Components**



### Components of a knowledge portal

- Content management system and/or simple front-end web UI
- Enterprise search
- A knowledge graph
- APIs for connecting systems

### May also have:

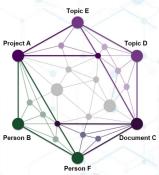
- Metadata hub (data catalogs, data lineage frameworks, or data quality systems)
- Taxonomy management system

"Knowledge portal" or "knowledge hub" may refer to the front-end application only.

## **Knowledge Graph for a Knowledge Portal**

### What is a knowledge graph?

- A model of a knowledge domain (taxonomy + ontology) combined with instance data stored in a graph database.
- Provides unified information across a domain/organization, enriched with semantics.
- Contains business objects and topics that are closely linked, classified, and connected to existing data and documents.
- A layer between the actual content and the querying layer.



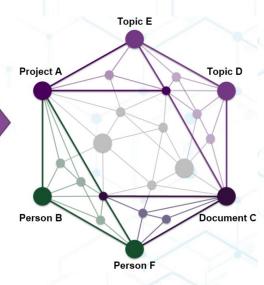
### **Knowledge Graph Components**

### **Graph Database**

Subject	Predicate	Object
Project A	hasTitle	Title A
Person B	isPMOn	Project A
Document C	isAbout	Topic D
Document C	isAbout	Topic F
Person B	IsExpertIn	Topic D







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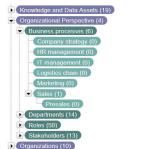






### **Business Taxonomy**

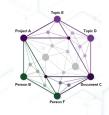
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**Enterprise Knowledge Graph** 

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## **Knowledge Graph Components**



### An enterprise knowledge graph comprises:

- 1. Extracted data stored or virtualized in a graph database, of either:
  - RDF-based triple store
  - b. Labeled property graph (LPG)





2. Which are tagged/classified/annotated with metadata:



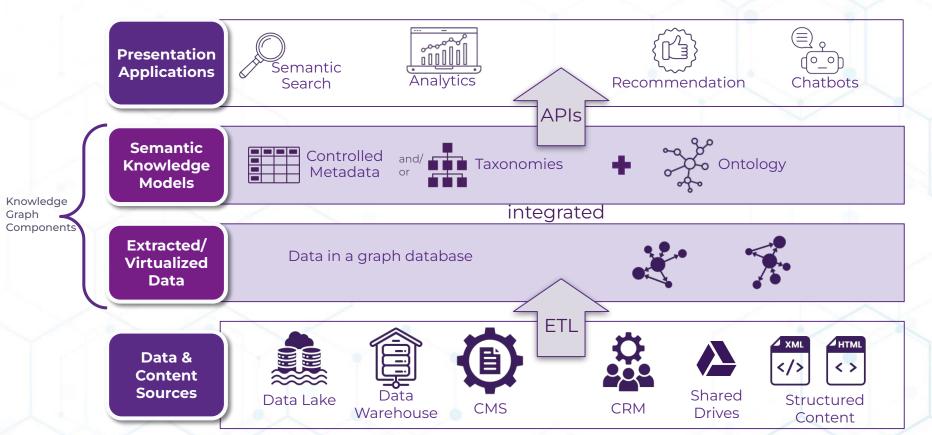
a. as concepts in controlled vocabularies (including taxonomies), to label and organize the data



- b. as attributes managed in an ontology to enrich the data
- 3. Which are semantically linked to each other with **ontology**-based semantic relationships, to represent conceptual relationships.



## **Knowledge Graph - As a Layer for a Portal/Hub**



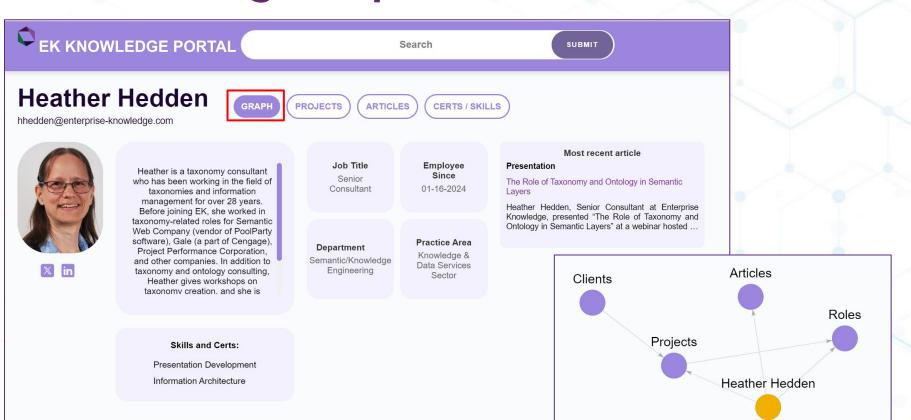
# Knowledge Portal with Knowledge Graph Example: Enterprise Knowledge

## Enterprise Knowledge LLC's Knowledge Portal

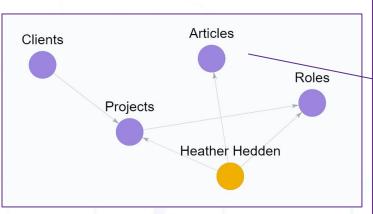
### **Features:**

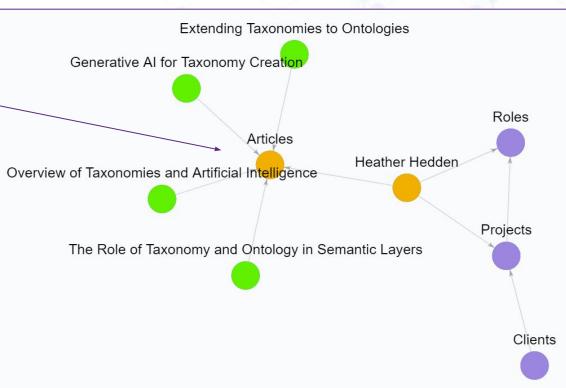
- Multiple content and data sources
- A complete ontology
- Some metadata values (although not yet a topical taxonomy)
- Graph visualization

## **EK Knowledge Graph**

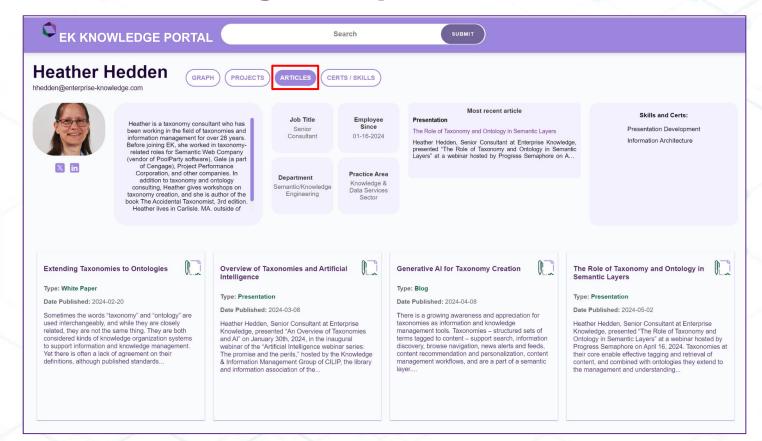


## **EK Knowledge Graph: Graph Visualization**

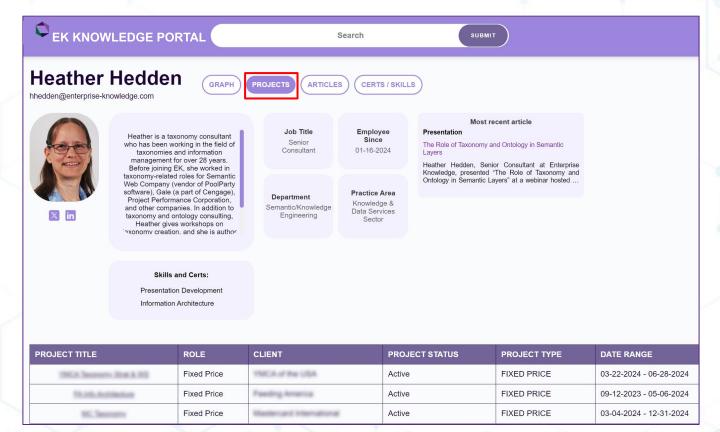




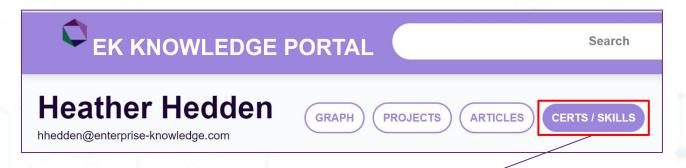
## **EK Knowledge Graph: Content Tile View**



### **EK Knowledge Graph: Data Table View**



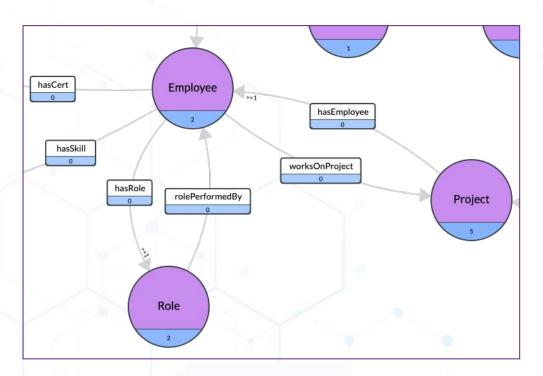
## **EK Knowledge Graph: Skills and Training**

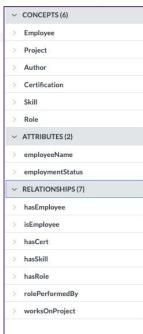


What Should I Learn Next?

- Certification in Semantic Technology or Ontology Development: Enhance your expertise in advanced topics related to information architecture.
- Data Science Skills: Learn data analysis and visualization to complement your taxonomy and information management skills.
- Certification in Knowledge Management: Further deepen your understanding of organizing, sharing, and leveraging knowledge within organizations.
- Advanced Presentation Skills Training: Up your presentation game with training
  that focuses on delivering impactful presentations for diverse audiences.

### **Ontology Overview**





Class/Concept:
Type of entity

Attribute:

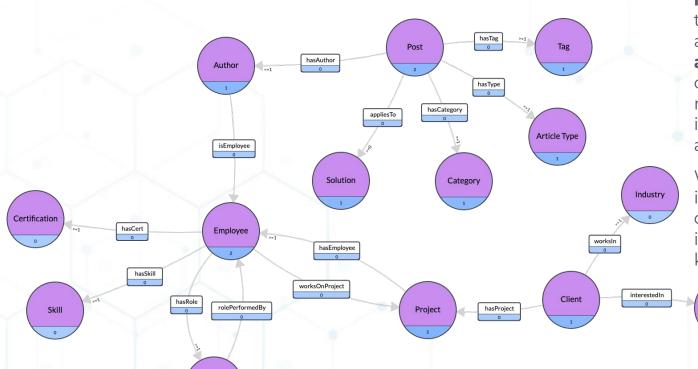
Data associated with an object in the ontology

Relationship:

Link between objects (classes/concepts and their entities) in the ontology

## **Ontology Overview**

Role



By identifying classes, defining the relationships between these classes, and associating the attributes between classes we can bring meaning to the information and data of an organization.

We can use this information to create compelling user interfaces, such as knowledge panels.



### **EK Knowledge Graph Data & Content Sources**

#### **Employee, Project, and Client Information** including: Time Project Name and Unique ID tracking Employee Name and Unique ID system Employee Role Name and ID Client Name and ID **Employee and Project Information** including: Intranet Project Practice Area and Service Area/s Project Client Name, Client Point of Contact **Employee Headshots EK Knowledge Base - Thought Leadership** including: Web CMS **Blog Articles** Presentations **Podcasts Employee Information, Skills and Certifications** including: **HR system Employee Name** Employee Job Title

Employee Skills, Certifications, etc.

Data is ingested from four different sources:

- 1. Time tracking system
- 2. Intranet
- 3. Web content management systems
- 4. HR payroll system

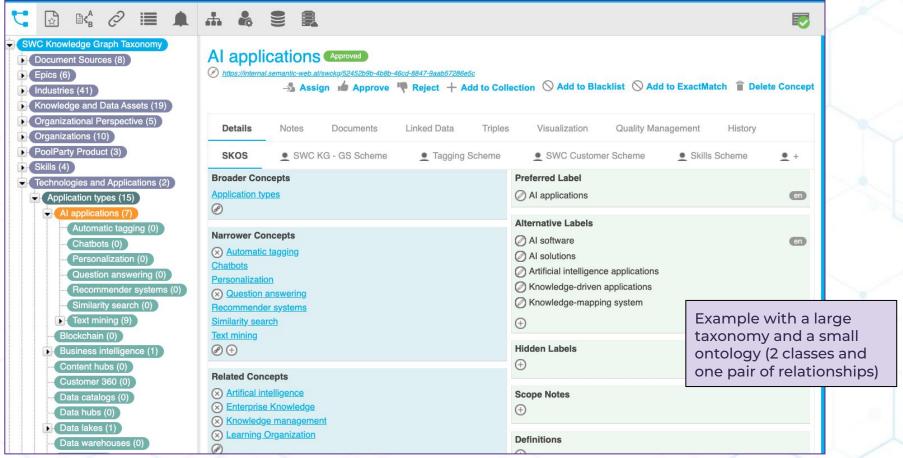
RDF and Python are used to ingest the data and generate the graph in order to visualize in GraphDB.

# The Role of Taxonomies in Knowledge Portals: Case Example

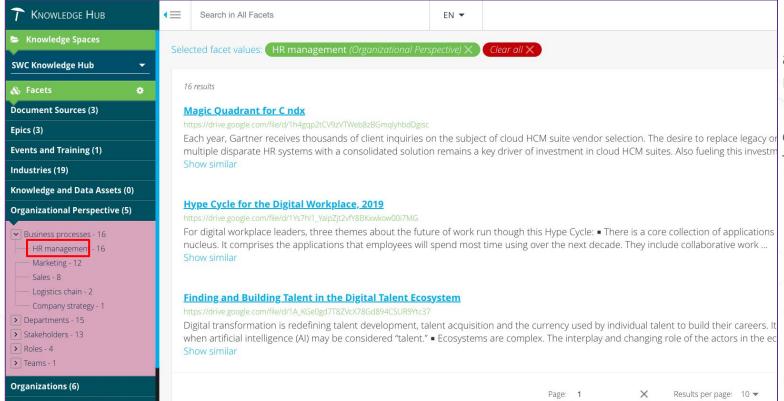
## **Taxonomy for a Knowledge Portal**

- Same taxonomy in different displays/usage: browse and search
- Challenge of accommodating different users: internal and external
- Challenge of different kinds of resources (content; people/experts)

## **Taxonomy for a Knowledge Portal**



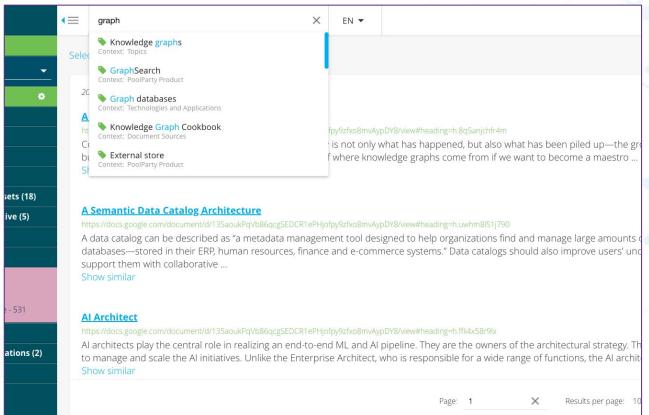
### **Taxonomy Support for Faceted Browse-Search**



Facets are used as search refinements.

Facet values are derived from the taxonomy.

### **Taxonomy Support for Search**



Search autocomplete is controlled by the underlying taxonomy.

Synonyms are considered.

Facet contexts are also displayed.

## Taxonomies for Content and for People Skills

Separate or a single taxonomy for subjects and people?

### Reason for separate taxonomies

They have different content, queries, use cases

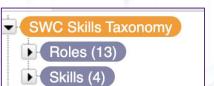
### Reasons for a single taxonomy

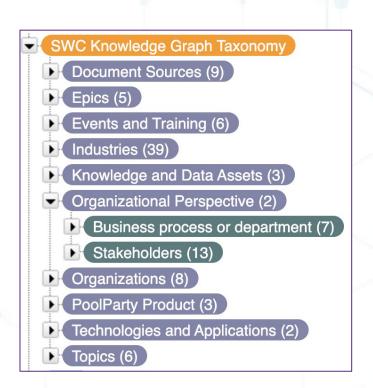
- They have a lot of overlap in concepts
- They can be combined in the same frontend, as a recommendation of people related to a subject

### **Taxonomies for Content and for People Skills**

Started as two separate taxonomies: (1) general and (2) skills

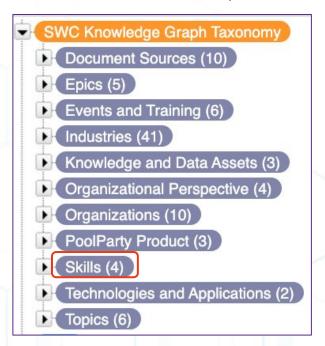






## Taxonomies for Content and for People Skills

Merged into a single taxonomy. But the narrower concept "Roles" moved.





### Taxonomy for Internal and External Users

### Different user groups and content

- Internal, for all Knowledge Hub content (including product help documentation)
- External, for product help documentation

**Challenge:** Supporting internal and external users with external users using only part of the taxonomy – one or two taxonomies?

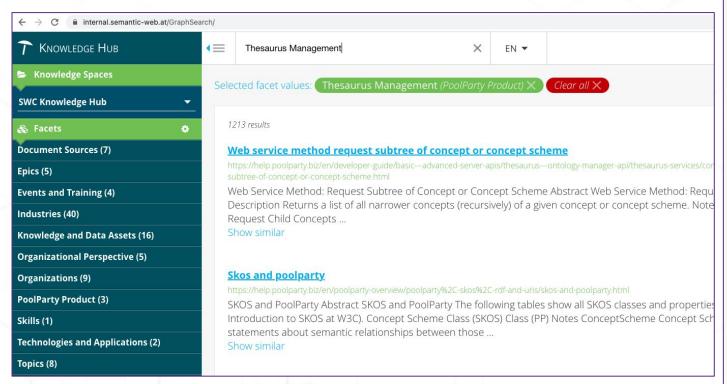
### Separate taxonomies benefits:

- They have different users
- They have different context

### Single taxonomy benefits:

- They have the same set of concepts for a large knowledge scope: the software product
- Easier to maintain

## Taxonomy for Internal and External Users



Frontend for internal users, accessed via the employee Intranet

Frontend for external users, accessed via public help documentation website

#### Refine search ■ START NEW SEARCH **Document Sources** PoolParty FAOs (10)User Guide for Knowledge Engineers (10)Administrator Guide (5) PoolParty Overview (4)PoolParty Release Notes (1) **PoolParty Product** ☑ Thesaurus Management (30)Corpus Management (6) Extractor (5)PoolParty APIs (5)GraphSearch (3) Semantic Middleware Configurator (3) Blacklist (2)Concept scheme details (2)Custom schemes (2)Data Validator LOAD MORE **Topics** Taxonomies (11)

SKOS

## Conclusions



## Taxonomies and Ontologies in Knowledge Portals

A knowledge portal requires semantics, but it does not need it all at first, and can scale up later.

- A knowledge portal can have an ontology without a topical taxonomy initially (Enterprise Knowledge example)
  - It is still useful to connect entities (people, projects, clients).
  - Metadata covers other types of information (roles, skills)
  - A topical taxonomy can be added later.
- A knowledge portal can have a taxonomy without a complete ontology
  - Classes and relations can be established initially between the two types where it make most business sense (e.g. skills and employees).
  - The ontology can be expanded with more classes and relations later.

### **Resources on Knowledge Portals**

- "Improving Customer Experience in a Personalized Customer Resource Portal,"
   February 6, 2024
- "Expert Analysis: Top 5 Considerations When Building a Modern Knowledge Portal,"
   January 30, 2024
- "Breaking it down: What is a Knowledge Portal?," December 5, 2023
- "Knowledge Portal Architecture Explained," November 9, 2023
- "<u>Five Lessons in Developing and Deploying a Modern Knowledge Portal</u>,"
   September 5, 2023
- "Knowledge Portal for a Global Investment Firm," April 4, 2023
- "Knowledge Portals Revisited," December 9, 2022

Q&A

Thank you for listening. Questions?

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