Taxonomies, Ontologies, Knowledge Graphs, Oh My!

Sept. 26, 2019 11:30am EDT
Today’s Program

Taxonomies, Ontologies, Knowledge Graphs, Oh My!

- **INTRODUCTION**
  - Highlight examples of Taxonomies, Ontologies and Knowledge Graphs:
    - What are they? How are they different? How are they used?
    - Briefly discuss the technology behind them

- **QUICK SURVEY**

- **DEMO**

- **WRAP-UP**

- **Q & A**
FOUNDATION

- TopQuadrant was founded in 2001
- Strong commitment to standards-based approaches to data semantics

MISSION

- Empower people and drive results — by making enterprise information meaningful

FOCUS

- Provide comprehensive data governance solutions
Everyday Taxonomies
What is a Knowledge Graph?

Robert De Niro

1998

Natascha McElhone

E34 BMW M5

Peugeot 406

Prince Engine

Munich, Germany

Paris, France
Knowledge Graph Recipe

Ontology + Instance Data

Knowledge Graph

*Blueprint

*Actuals
But What About Taxonomy?

- Taxonomy in technology does not carry a definitive definition, it is **HOW THEY ARE USED** that matters.
- A major dimension of taxonomy is hierarchy.
- A taxonomy is more than just hierarchy.

- A Taxonomy, done right, is a Knowledge Graph.
The Blueprint for Taxonomy is SKOS

- Wikipedia: Taxonomy is the practice and science of classification of things or concepts, including the principles that underlie such classification.

- W3C SKOS Reference: The Simple Knowledge Organization System is a common data model for knowledge organization systems such as thesauri, classification schemes, subject heading systems and taxonomies.
  - SKOS distinguishes between two basic categories of semantic relation: hierarchical and associative.
    - A hierarchical link between two concepts indicates that one is in some way more general ("broader") than the other ("narrower").
    - An associative link between two concepts indicates that the two are inherently "related", but that one is not in any way more general than the other.
Adding Taxonomy to the Recipe

*broader
related
close match
etc

* A broader form of ‘Is-A’ is broader :)
Taxonomies in e-Commerce
Same Domain, Different Use

Luxury cars Ratings
Luxury cars offer a premium driving experience by combining pampering interior comfort and refined performance with proven advanced safety features.

Find Luxury cars Ratings

Ultra-luxury cars (7)
The top of the car hierarchy, ultra-luxury sedans stand out for their premium packaging, potent powertrains, and leading-edge technology. These are big sedans that command big prices, but they provide a rewarding experience for both driver and passengers.

Luxury entry-level SUVs (10)
A first step into the realm of prestige brands, these entry-level models tend to offer some premium touches but fall short of a true luxury experience. These can be derived from humble, rather basic vehicles. Well-equipped mainstream models can be smart alternatives.

Luxury compact SUVs (16)
These models feel like the essence of a premium brand, compressed into a small package. Performance, handling, and amenities can rise to true luxury levels, though often the price can grow just as precipitously. Cabin space and modest base-level amenities tend to be compromises.

Small, upscale, and dressed in prestige branding, these entry-level luxury cars often promise more than they deliver. These can be rebranded, upgraded versions of mainstream models that command a price premium.

This popular segment features truly sporty, luxurious models from prestige brands. Optional equipment can make the prices soar. Reliability varies widely.

Luxury midsized cars (17)
Truly polished cars, the best midsized models define luxury with space, power, and a pampering driving experience. Expect all the latest bells and whistles. AWD is widely available.

Luxury midsized SUVs (19)
Power, convenience, and comfort are hallmarks of luxury midsized vehicles. Expect high-tech features, premium packaging, and coddling comfort. Many models offer a third seating row. All-wheel drive and advanced safety features are a given.

Large, do-it-all vehicles, large luxury SUVs typically provide three seating rows, generous cabin space, and communicate cargo capacity. Expect the very latest in comfort and convenience tech. Some models are better suited to towing and off-roading.
Different Ways to Organize Car Models
Each Site has a Purpose

- Cars.com lists cars for sale
- Consumer Reports provides information about cars
  - Its taxonomy may have 2019, 2018, etc. BMW 2 Series
  - But may not have BMW 228 model
  - Information it would need to capture for BMW 2 Series is also different
Demonstration

- Quick survey
- What you’ll see
  - Common use cases (ex. better search)
  - Navigating many Taxonomies
  - Editing Taxonomies and Ontologies
  - Crosswalking Taxonomies
  - Quality
  - GraphQL
Enterprise Capabilities Across Knowledge Graphs

- **Collaboration:** Event notifications, tasks and comments.
- **Governance:** Configurable workflows with virtual work-in-progress copies of changes for controlled review and approval. Custom defined subject areas, governance roles, configurable dashboards with metrics.
- **Editing with Access Control and Audit Trail:** Different editor applications for different asset collection types, multi-lingual, cloning, merging, rich text support, batch edit operations for selected groups of assets, full audit history.
- **Importing:** From RDBMs, spreadsheets, XML, DDL, RSS feeds, SPARQL endpoints and other formats.
- **Discovery and Enrichment:** Auto-mapping of crosswalks, automated tagging of content, and data rules for validation and reasoning.
- **Search, Reporting and Visualization:** Parametric and faceted search. Built-in reporting. Visual navigation.
- **Systems Integration:** Integrate with enterprise systems via Web Services and APIs.
Conclusion

- Taxonomies are everywhere
- Ontology as blueprints for Taxonomies and Knowledge Graphs
- Hierarchical relationships and associative relationships are equally important and SKOS gives us a foundation
- We saw TopBraid EDG in action, creating and connecting Knowledge Graphs

- You may have noticed a new UI/UX...
... Questions?
TopBraid EDG 6.3 Provides Market Leading Support for Taxonomies and Ontologies

- **Taxonomy Editing and Management:**
  - TopBraid EDG makes it easy to create taxonomies and to use them to power search, document classification, content navigation and other applications
  - See: *Taxonomy Editing and Management in TopBraid EDG 6.3.pdf*

- **Ontology Editing and Management:**
  - Ontologies and ontology modeling are central to TopBraid EDG since ontologies define schemas for all other types of asset collections, including taxonomies (knowledge graphs)
  - See: *Ontology Editing and Management in TopBraid EDG 6.3.pdf*

* These overview slide presentations will be made available with the other webinar resources including the recording, slides used in the webinar, and Q & A
To Learn More about TopBraid EDG’s Support for Taxonomy, Ontology and Knowledge Graph Management

EDG Product Info:

Contact us: at info@topquadrant.com to:
- Discuss vocabulary management solutions (glossaries, taxonomies, ontologies)
- Request a more targeted demo of TopBraid EDG – Vocabulary Management
- Ask for a free EDG evaluation account
More Resources ...

**More Webinar Recordings, Slides, Q&A:**

**Short Videos:**
- TopBraid EDG “Quick Grok” Videos
- TopBraid EDG Animated Video

**Blog:**
- [https://www.topquadrant.com/the-semantic-ecosystems-journal/](https://www.topquadrant.com/the-semantic-ecosystems-journal/)

**Data Governance White Papers**
Benefits of a Knowledge Graph based Platform for Data Governance 2.0

TopBraid Enterprise Data Governance (EDG):
- Is flexible and extensible, based on standards
- Integrates reasoning and machine learning
- Enables people (UI) and software (APIs/web services) to view, follow and query
- Bridges data and metadata “silos” for a seamless data governance
- Delivers Knowledge-driven data governance

As an enterprise knowledge graph infrastructure, TopBraid EDG supports
Data Governance 2.0 and applications of AI / ML
When Does Taxonomy Stop and other (Master, Operational) Data Start?

The category, model, design, etc of a car. VS

The individual car with a VIN#.
AutoClassifier uses machine learning to populate maintainable Tag Sets (relationships between ‘Content’ and ‘Concepts’).

Text, Tags, and other relevant characteristics of Assets are indexed for optimized search and discovery.

Semantic models and business rules can be used to further post process and extend results.

Vocabularies and curation feedback are leveraged by AutoClassifier to extract information from unstructured content inside Asset Collections.

SMEs of all sorts develop/integrate vocabularies. As needed, they also review and curate auto-classification results providing input that improves results accuracy over time.

Content is retrieved/received over many connectors.

Search user submits a request and the interface sends the request on to the query engine.

The query is interpreted and semantic search is executed. Results include relevant metadata for customized user experience.

Similar to the search user, applications submit requests to an EDG interface. Determined by the interface (Web Service, Saved Search, SPARQL endpoint), results are prepared and sent in appropriate format.