factor™

Information Architecture at Scale

MIGRATING FROM HIERARCHIES TO A GRAPH: AN ENTERPRISE CASE STUDY

Data Summit
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The foundation for a faster enterprise

TERMINOLOGY

TMS: Taxonomy Management System

GUID: Globally Unique Identifier

URI: Uniform Resource Identifier

A sequence of characters that identify a name or a unique resource on the Internet.

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THE REASON

Why did our client migrate to a new system?

- Vendor was discontinuing support
- Client wanted more efficient content publishing:
  - Autotagging
  - Graph architecture for an AI foundation

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THE REASON

Why did our client migrate to a new system?

- Simplify data architecture and make sources of truth explicit.
- Reduced transformations and eliminated need for middleware (services syncing to services)

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What is a *graph*?

- Comes from graph theory
  - Field of mathematics
  - Models relations between objects
- Consists of *nodes* and *edges*



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Standard RDBS Structure: Rows and Columns

	Field 1	Field 2
Record 1		
Record 2		

Graph DB Structure: Triples

Class;
Relationship;
Class

Class;
Relationship;
Class

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Hierarchy vs Graph

Hierarchy

- Tree structure
- Default broader/narrower relationship

Graph

- Web-like structure
- Many different relationships

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BACKGROUND

The Client

- Fortune 500
- Manufacturing
- Factor developed taxonomy: started with Marketing

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BACKGROUND

The TMS

- RDB - based
- Allowed for direct SQL queries
- Scheduled syncs from Product Information Management (PIM) system of selected product terms
- API syncs available via transformation and microservice

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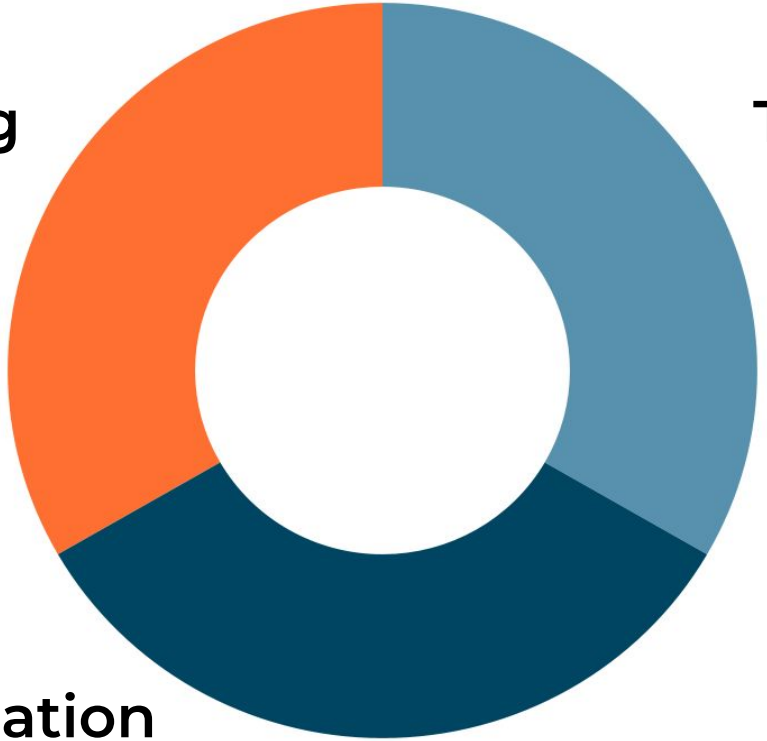
BACKGROUND

Downstream Systems

- Content Management System (CMS)
- Digital Asset Management (DAM)
- Customer Relationship Management (CRM)
- Campaign Management and Tracking
- Campaign Finance and Analytics

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Our Considerations



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Iterative, not sequential

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Modeling:

What will it *look* like?

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MODELING:

Identifiers

In the TMS:

- GUIDs
- System-created identifiers

In the Graph:

- URIs

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MODELING:

Identifiers

Represented by URIs:

- Classes
- Properties
- Relationships

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MODELING:

Identifiers

GUID Attribute and GUID in URI

GUID:
3bea25dd-ba00-4f56-a9ef-ee193c1dbe3d

URI:
graph-server/class/subclass/3bea25dd-ba00-4f56-a9ef-ee193c1dbe3d

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MODELING:

Attributes

In the TMS:

Attributes are not shared between taxonomies.

Therefore:

No such thing as a general query for any attribute.

Had to be done as multiple queries, each one to a separate taxonomy with the results joined together.

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MODELING:

Attributes

Questions:

Which attributes serve a functional purpose?

Are there attributes that are no longer necessary?

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MODELING:

Language Codes

In the TMS:

Modeled through language/country code relationships between English-language terms and their localized equivalents as separate terms.

Example:
“goodbye” - es/es - “adios”

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MODELING:

Language Codes

In the Graph:

Language codes are properties of the same term with the localized terms for the values.

Example:
goodbye

@en_us goodbye
@es_es adios

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MODELING:

Language Codes

Discovered During Testing

Language codes not to standards, hard coded on some systems.

Needed vendor support to change the appearance of default language coding.

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MODELING:

Future Thought

Implementing Graph Structure

We created a limited test set with relationships between two taxonomies, which could be used as a starting test bed for future graph work



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MODELING:

Future Thought

Implementing Graph Structure

Provided examples of what reporting/examples might look like, also used built-in visualization.

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Testing:

How does it work?

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Things to find out

1. Does the modeling work?
2. What other changes need to be made?
3. What does the output look like?
4. Do we have incorrect assumptions?

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What we did

- **STARTED EARLY**
- Communicated with business and technical partners and stakeholders what we believed the differences would be.
- Recorded feedback and concerns to make sure we addressed them during the process.

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What we did

- Put together next steps for testing.
- Got exports early
  - Is there enough here to run tests?
  - Are there comparisons or A/Bs that need to be tested?
- Recorded and tracked differences between systems

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What we did

- Communicated with technical partners and stakeholders as soon as possible
  - This is what it looks like in the old system
  - This is what it looks like in the new system
  - What changes do we need to make? What changes do system owners need to make?

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What we did

- Took their feedback and advised of the changes we were planning to make and when to expect the updates.
- Go back to testing with the updates.

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The Big Issue

Institutional Memory Loss
AKA
“Brain Drain”

Sync process between PMI and TMS

Utility/need for selected attributes

Missing vs. null data
(No field vs no values)

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Communication:

Who needs information?
Who has information?
When do we share it?

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What we need to know

1. Do we have correct and current information?
2. Does this idea meet stakeholder needs?
3. What limitations do stakeholders have?

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What we need to know

Do we have correct and current information?

Example:
Attributes - Do we understand which ones are required and what purpose(s) they serve?

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What we need to know

Does this idea meet stakeholder needs?

Example:
Attributes - For yes/no attributes, will the built-in true/false interface work, or does the attribute need to be recreated as it was in the TMS?

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What we need to know

What limitations do stakeholders have?

Example:
Will all systems be migrating to API service, or will we need to set up a way for taxonomy users to get export files for syncing?

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What stakeholders need to know

1. What changes are happening?

2. What is the change plan?
    a. Requirements
    b. Dates
    c. Contact people
    d. Feedback process

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What stakeholders need to know

What changes are happening?

1. What's NOT changing?
2. Are changes technical or user-facing?
3. Why are they happening?
4. How should stakeholders prepare?

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What stakeholders need to know

What is the change plan?

1. What is changing and when?
2. Who is responsible for managing changes?
3. What is the feedback process?

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Back to Why

What could the client do afterward that they were not able to do before?

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What could they do now?

Efficiency through simpler data flow

Stable platform for testing autoclassification and AI training

Cross-domain analytics

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Advice

Start Early
Is there work that can be done now which will benefit the current state?

Example: Attribute Audit

Start With What's Familiar
Provides security and consistency

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Advice

You Need Experimental Space

QA/Sandbox/Preprod environment

- Understand how the system instantiates the concepts
- Mitigate surprises
- Visualize possibilities

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Getting Started

1. Create a plan for the work
   a. Resources? Stakeholders? Time?

2. Determine what will be migrating

3. Start on the model, test as early as possible

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Information Architecture at Scale

Thank You!



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