Approaching Ontology Challenges Posed by LINCS

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A Requirements-Based Approach

Competency Questions can be used to determine the scope of an ontology:

- These are questions that the ontology should answer.
- Aid ontology designers in determining the level of detail needed for the ontology.

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Example Competency Question for Genealogy Information

"Did anyone by the name of 'Sam' live in Guelph in the 1820s?"

- Time ontology (1820s)
- Geospatial ontology (Guelph the city a.k.a. "The Royal City", not the district)
- Residence ontology (which areas were inhabited during this time?)
- Names ontology (Sam, Samuel, Samantha, Samson, etc.)

Using Existing vs. Creating New Ontologies

	Advantages	Disadvantages
Using Existing Ontologies	• Many to choose from (‘plug and play’) • Removes burden of creating	• Evaluate each for best fit • Extend or modify depending on needs • Manual mappings if semantic mismatch
Creating New Ontologies	• Better control over content • Helps identify semantic requirements	• Manual process to create • Ensure conformity across datasets • Create n number depending on n datasets (same with mappings)

Strategies to Integrate and Coordinate Mid-Level and Domain-Specific Ontologies

Ontology Grounding

- Use the data to ground the ontology
- Determine the semantic requirements of the ontology
- Determine the required data in the information extraction process

Ontology Data-Based Access (OBDA)

- Bridges an ontology to access and query multiple datasets
- Provides a framework for mapping across different datasets

Implementation of Heterogenous Linked Datasets