

A Brief Overview of Ontology Evaluation

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- All ontologists agree that there are a good and bad ontologies.
- There is no universally accepted method of ontology evaluation.
- Research under the heading varies widely in goals, scope, and methods.
- Goal: Providing some categorization of evaluation efforts.

What is the motivation for the evaluation?

- developers: measure progress & quality during ontology development.
- ontology community: interested in availability of high-quality reference ontology
- 3rd party: looks for an ontology to use for a given purpose.

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What are the properties that are evaluated?

- Consistency/coherence
- Accuracy
- Conciseness
- Completeness
- Conformance to standards & best practices
- Clarity
- Adaptability
- Usage
- Intellectual property rights
- Capabilities (in applications)

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What aspect is evaluated?

- Vocabulary
- Syntax
- Semantics
- Context

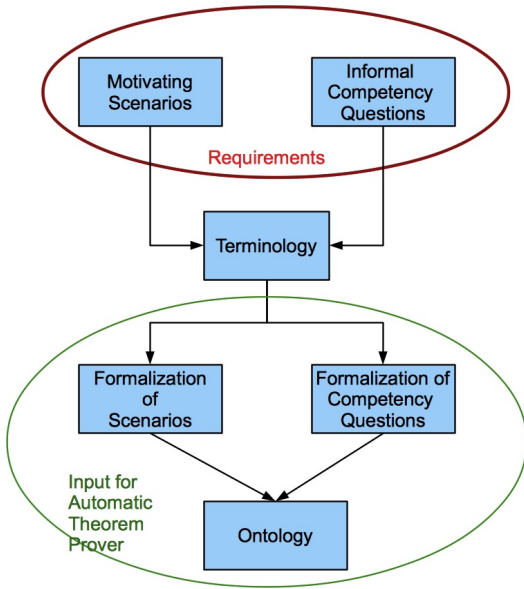
Who is doing the evaluation?

- human
- computer-aided
- automatic

What method of evaluation is used? (laundry list)

- Analysis using standards and best practices
- Comparison to “gold standard” entity (e.g., other ontology, Wordnet)
- Use of automatic theorem proving
- Population with data set
- Scenario-based evaluation
- Analysis of change of ontology over time
- Observation of users using ontology

Approach 1: Competency Question Driven Testing



Example: Searching of geneological data

Scenario

Adam is a parent of Bill.

Eve is a parent of Bill.

Bill is a parent of Katherine.

Adam is male.

Eve is female

Bill is male.

Adam was born in London.

Competency Questions

- Who are the parents of Bill?
- Who are the grandparents of Katherine?
- Who are the grandfathers of Katherine?
- Is a grandfather of Katherine born in the United Kingdoms?

- Motivation: ontology developers measure progress
- Property: completeness
- Aspects: vocabulary, semantics
- Who: automatic
- Methodologies: test-based, automatic theorem proving

Approach 2: Peer Review (Barry Smith)

- Motivation: community needs high-quality reference ontologies
- Properties: accuracy, conciseness, conformance to best practices, clarity
- Aspects: all (vocabulary, syntax, semantics, contexts)
- Who: human
- Methodology: analysis using best practices

Approach 3: Evolutionary Terminology Auditing (Werner Ceusters)

- Motivation: ontology developers measure progress
- Properties: accuracy, conciseness, completeness
- Aspects: vocabulary, semantics
- Who: computer-aided
- Methodology: analysis of change of ontologies, “gold-standard”

- Ontology Summit 2013: will focus on ontology evaluation and methodology
- Series of virtual events, starting January 17th
- Face to face: meeting in April

[1, 4, 3, 2]



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