Ontology Engineering Methods Survey

1. Survey Introduction

Thank you for considering participating in this survey, which aims to build understanding regarding common Ontology Engineering practices, problems, and possibilities.

The survey is divided into six screens. It is estimated to take around 15 minutes to complete.

After finishing the survey you will be presented with a screen where you may enter your email address. Doing so is entirely voluntary, but is required if you wish to participate in the sweepstake for 25 Euro Amazon gift cards. One winner will be drawn per every 50 participants in the survey. The winners will be drawn and announced when the number of respondents to the survey reaches 200, or in the first week of April 2015 (whichever comes first).

All individual responses to this survey will be kept confidential. Only aggregated summaries of the responses will be published, with the exception of the free text fields, which may (in the case of particularly enlightening answers) be used in future publications.

If you have any questions about this survey, please do not hesitate to contact me via email at karl@karlhammar.com, or via phone at +46 (0)36 101611.

Thank you!

Karl Hammar
Jönköping University / Linköping University

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2. Background Information

1. What is your gender?

- ( ) Male
- ( ) Female
- ( ) Other

2. What is your age?

3. What is your highest completed academic degree?

- ( ) High School
- ( ) Bachelor
- ( ) Master
- ( ) PhD

Other (please specify)

4. What is your current profession?

*** 5. Do you work in?**

- [ ] Academia
- [ ] Research institute
- [ ] Industry

Other (please specify)

6. What is your degree of knowledge and confidence regarding Ontology Engineering with Semantic Web ontologies (e.g., using RDF/RDFS/OWL)?

- ◯ Novice
- ◯ Some experience
- ◯ Confident
- ◯ Expert

*** 7. How many years have you worked with Semantic Web ontologies (e.g., using RDF/RDFS/OWL)?**

8. How many Ontology Engineering projects (e.g., projects where ontologies were developed, not just used) involving two or more people have you participated in?

9. How many projects involving non-academic participants (e.g., practitioners) performing Ontology Engineering-related tasks have you participated in?

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3. Industry Adoption Challenges

10. What is the most important show-stopper preventing industry uptake of ontology-based technologies today? Please try to respond with a single sentence.

*** 11. How important are each of the following factors in enabling industry adoption of semantic web ontology technology?**

	Not important	Somewhat important	Rather important	Very important	Critically important	Do not know / No opinion
Tooling quality	○	○	○	○	○	○
Documentation quality	○	○	○	○	○	○
Method support	○	○	○	○	○	○

Other (please specify)

12. If you have indicated that tooling, documentation, methods etc. above are important, please describe what is lacking today in these aspects, for improving industry adoption. Please try to respond with a single sentence per aspect you deem important.

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4. Ontology Design Patterns

*** 13. How familiar are you with Ontology Design Patterns (ODPs)?**

- ◯ Have not heard of ODPs
- ◯ Have heard of but not used ODPs
- ◯ Have used ODPs occasionally
- ◯ Have used ODPs extensively
- ◯ Work with ODPs on a daily basis

An Ontology Design Pattern (often abbreviated ODP) is a small and generic reusable ontology module that represents and possibly solves, a recurring modeling challenge. An ODP can/should be used to represent a best practice of modeling. When faced with a potentially difficult modeling problem (for instance, modeling the train routes of a subway network), an ontology engineer might find a suitable ODP for the general class of problem (in the aforementioned example, an ODP representing Paths might be relevant) that helps them understand and model this problem in a consistent and logical manner. This ODP can be imported into the ontology under development and there specialised to the specific modeling problem at hand.

*** 14. Do you believe that increased use of Ontology Design Patterns would be beneficial or harmful in supporting industry adoption of ontology-based technologies?**

- ◯ Highly beneficial
- ◯ Somewhat beneficial
- ◯ Neither beneficial nor harmful
- ◯ Somewhat harmful
- ◯ Highly harmful
- ◯ I have no opinion on this matter

15. What is the most important show-stopper preventing industry uptake of Ontology Design Pattern use today? Please try to respond with a single sentence.

*** 16. How important are each of the following factors in enabling Ontology Design Pattern usage today?**

	Not important	Somewhat important	Rather important	Very important	Critically important	Do not know
Tooling quality	○	○	○	○	○	○
Documentation quality	○	○	○	○	○	○
Method support	○	○	○	○	○	○

Other (please specify)

17. If you have indicated that tooling, documentation, methods etc. above are important, please describe what is lacking today in these aspects. Please try to respond with a single sentence per aspect you deem important.

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5. Finding Ontology Design Patterns

*** 18. How easy or difficult is it to find suitable Ontology Design Patterns for reuse in modelling?**

- ○ Very easy
- ○ Easy
- ○ Neither easy nor difficult
- ○ Difficult
- ○ Very difficult

*** 19. When using Ontology Design Patterns, how would you prefer to find the ODPs to reuse? Please respond according to your preference (i.e., not necessarily how you work today) and under the assumption that the technologies listed below exist and achieve a sufficient functionality to be used in accordance with your needs.**

- ☐ Web based search engine
- ☐ Search engine embedded in Ontology Engineering tool
- ☐ Web based ODP portal
- ☐ ODP catalogue embedded in Ontology Engineering tool

Other (please specify)

*** 20. What are the most important characteristics of an Ontology Design Pattern search engine?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Precision (i.e., that no unsuitable ODPs are returned for a given query)	○	○	○	○	○
Recall (i.e., that all suitable ODPs are returned for a given query)	○	○	○	○	○
Ability to filter results based on attributes/characteristics (e.g. size, profile adherence, etc)	○	○	○	○	○

Other (please specify)

*** 21. What are the most important characteristics of an Ontology Design Pattern web portal or catalogue?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Number of ODPs in catalogue	○	○	○	○	○
Domain coverage of catalogue	○	○	○	○	○
ODP categorisation structure	○	○	○	○	○
Selection of ODP metadata displayed	○	○	○	○	○

Other (please specify)

*** 22. In an ODP search engine or an ODP portal/catalogue, which fields or metadata about an ODP is most important when ascertaining the suitability of that ODP for reuse?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Title	○	○	○	○	○
Description	○	○	○	○	○
Graphical illustration	○	○	○	○	○
Competency questions	○	○	○	○	○
Example uses	○	○	○	○	○
Size in classes	○	○	○	○	○
Size in axioms	○	○	○	○	○
OWL 2 Profile adherence	○	○	○	○	○

Other (please specify)

*** 23. In an Ontology Design Pattern search engine, how many hits are acceptable to scroll through before finding the appropriate ODP to use?**

- ○ 1-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ 21+

6. Reuse in Ontology Engineering

*** 24. How easy or difficult is it to find suitable ontologies for reuse in modelling?**

- ○ Very easy
- ○ Easy
- ○ Neither easy nor difficult
- ○ Difficult
- ○ Very difficult

*** 25. When reusing ontologies in modeling, how would you prefer to find the ontologies to reuse? Please respond according to your preference (i.e., not necessarily how you work today) and under the assumption that the technologies listed below exist and achieve a sufficient functionality to be used in accordance with your needs.**

- ☐ Web based ontology search engine
- ☐ Search engine embedded in Ontology Engineering tool
- ☐ Web based ontology portal/index
- ☐ Ontology portal/index embedded in Ontology Engineering tool

Other (please specify)

*** 26. What are the most important characteristics of an ontology search engine?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Precision (i.e., that no unsuitable ontologies are returned for a given query)	○	○	○	○	○
Recall (i.e., that all suitable ontologies are returned for a given query)	○	○	○	○	○
Ability to filter results based on attributes/characteristics (e.g. size, profile adherence, etc)	○	○	○	○	○

Other (please specify)

*** 27. What are the most important characteristics of an ontology web portal or index?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Number of ontologies in portal	○	○	○	○	○
Domain coverage of portal	○	○	○	○	○
Ontology categorisation / grouping in portal	○	○	○	○	○
Selection of ontology metadata displayed	○	○	○	○	○

Other (please specify)

*** 28. In an ontology search engine or an ontology web portal/index, which fields or metadata about an ontology is most important when ascertaining the suitability of that ontology for reuse?**

	Not important	Somewhat important	Rather important	Very important	Critically important
Title	○	○	○	○	○
Description	○	○	○	○	○
Graphical illustration	○	○	○	○	○
Competency questions	○	○	○	○	○
Example uses	○	○	○	○	○
Size in classes	○	○	○	○	○
Size in axioms	○	○	○	○	○
OWL 2 Profile adherence	○	○	○	○	○

Other (please specify)

*** 29. In an ontology search engine, how many hits are acceptable to scroll through before finding an ontology that may (with further evaluation) be found to be suitable for reuse?**

- ○ 1-5
- ○ 6-10
- ○ 11-15
- ○ 16-20
- ○ 21+

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7. Modeling Choices and Preferences

*** 30. For what purposes do you build ontologies?**

	Never	Rarely	Occasionally	Often	Always
AI / Reasoning style tasks	○	○	○	○	○
Documentation and guidance (i.e., human communication artefacts)	○	○	○	○	○
Vocabularies for publishing datasets	○	○	○	○	○
Integration across multiple data sources	○	○	○	○	○

Other (please specify)

*** 31. When studying an ontology, how important is the use of graphical illustration for understanding the meaning of the ontology?**

- ○ Not important
- ○ Somewhat important
- ○ Rather important
- ○ Very important
- ○ Critically important

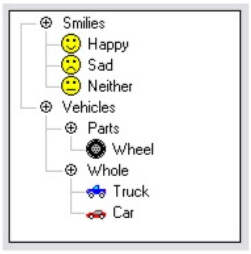
*** 32. When studying an ontology, which type of illustration format do you prefer? Example versions of each type are illustrated below the question. Note that the question does not concern these specific illustrations, but rather the type of illustration format that they represent!**

	Strongly dislike	Dislike	Neither dislike nor prefer	Prefer	Strongly prefer
Graph-oriented	○	○	○	○	○
Tree-oriented	○	○	○	○	○
Venn diagram-oriented	○	○	○	○	○

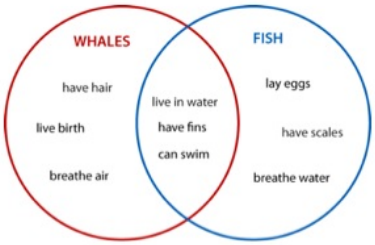
Other (please specify)

33. If you wish to leave a comment regarding your graphical illustration format preferences given above, please do so here.

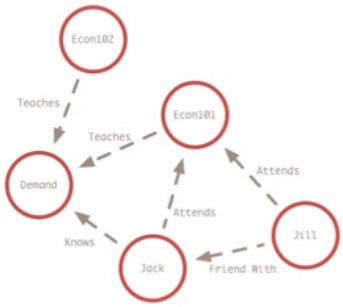
Illustration format examples



Tree



Venn diagram



Graph

*** 34. When studying an ontology, how important is the textual syntax used for understanding the meaning of the ontology?**

- ◯ Not important
- ◯ Somewhat important
- ◯ Rather important
- ◯ Very important
- ◯ Critically important

*** 35. When studying an ontology, which type of textual syntax do you prefer? Example versions of each syntax are illustrated below the question.**

	Strongly dislike	Dislike	Neither dislike nor prefer	Prefer	Strongly prefer
Triples	◯	◯	◯	◯	◯
Turtle	◯	◯	◯	◯	◯
Functional Syntax	◯	◯	◯	◯	◯
Manchester Syntax	◯	◯	◯	◯	◯

Other (please specify)

Syntax format examples

Functional syntax example

```
DisjointClasses( :Woman :Man )
ObjectPropertyAssertion( :hasWife :John :Mary )
DataPropertyAssertion( :hasAge :John "51"^^xsd:integer )
DataPropertyDomain( :hasAge :Person )
DataPropertyRange( :hasAge xsd:nonNegativeInteger )
```

Turtle example

```
<http://www.w3.org/People/EM/contact#me>
  rdf:type contact:Person;
  contact:fullName "Eric Miller";
  contact:mailbox <mailto:em@w3.org>;
  contact:personalTitle "Dr.".
```

Triples example

```
exstaff:85740      exterms:address    exaddressid:85740 .
exaddressid:85740  exterms:street     "1501 Grant Avenue" .
exaddressid:85740  exterms:city       "Bedford" .
exaddressid:85740  exterms:state      "Massachusetts" .
exaddressid:85740  exterms:postalCode "01730" .
```

Manchester syntax example

```
Class: Parent
  EquivalentTo: Mother or Father
Individual: John
  Facts: hasAge ”51"^^xsd:integer
DataProperty: hasAge
  Domain: Person
  Range:  xsd:nonNegativeInteger
```

8. Ontology Engineering Workflow

*** 36. How often are your ontology engineering projects performed by teams that are geographically distributed (e.g. not located in the same office)?**

- Never
- Rarely
- Occasionally
- Often
- Always

*** 37. In the case that you work with a distributed Ontology Engineering team, how easy or difficult do you find communications about modeling choices?**

- Very easy
- Rather easy
- Neither easy nor difficult
- Rather difficult
- Very difficult
- I do not work with distributed teams

*** 38. In communicating about modeling choices within an ontology engineering project, which communications methods do you most often use?**

	Never	Rarely	Occasionally	Often	Always
Face to face conversation	○	○	○	○	○
Drawings (on paper, whiteboard, etc)	○	○	○	○	○
Phone conversation	○	○	○	○	○
Chat conversation	○	○	○	○	○
Video conference	○	○	○	○	○
Screen sharing	○	○	○	○	○
Joint ontology development workspace (e.g., a shared triple store, WebProtégé, or similar)	○	○	○	○	○
Email correspondence	○	○	○	○	○
Issue tracker / discussion forum	○	○	○	○	○
Version management system commit messages	○	○	○	○	○

Other (please specify)

*** 39. In communicating about modeling choices within an ontology engineering project, which communications methods would you prefer to use?**

- ☐ Face to face conversation
- ☐ Drawings (on paper, whiteboard, etc)
- ☐ Phone conversation
- ☐ Chat conversation
- ☐ Video conference
- ☐ Screen sharing
- ☐ Joint ontology development workspace (e.g., a shared triple store, WebProtégé, or similar)
- ☐ Email correspondence
- ☐ Issue tracker / discussion forum
- ☐ Version management system commit messages

Other (please specify)

*** 40. When developing new ontologies (i.e., from scratch) with a team, do you prefer to construct modular ontologies (consisting of several different namespaces joined via the use of the OWL:imports keyword) or monolithic ontologies (consisting of a single joint namespace)?**

- ◯ Strongly prefer modular ontologies
- ◯ Prefer modular ontologies
- ◯ Have no preference for either
- ◯ Prefer monolithic ontologies
- ◯ Strongly prefer monolithic ontologies

41. Is your answer to the above question primarily motivated by:

- ☐ Tool design enforcing or supporting one or the other
- ☐ Adhering to development method recommendations
- ☐ Communications simplicity
- ☐ Development performance efficiency/speed
- ☐ Quality of resulting ontology
- ☐ Need for project oversight/accountability
- ☐ Requirements engineering / testability

Other (please specify)

*** 42. In the case that you develop modular ontologies, which party is normally responsible for the merger of the resulting modules into a complete ontology?**

- ◯ Module developer
- ◯ Specially designated developer
- ◯ It varies (no specially defined role)
- ◯ I do not develop modular ontologies

Other (please specify)

*** 43. Based on your experience, do you believe that the use of a shared ontology development workspace (e.g., WebProtégé or a shared triple store) would be beneficial or harmful when working on an ontology together with novice ontology engineers?**

- ◯ Highly beneficial
- ◯ Somewhat beneficial
- ◯ Neither beneficial nor harmful
- ◯ Somewhat harmful
- ◯ Highly harmful
- ◯ I have no opinion on this matter

*** 44. When aligning or merging two existing ontologies, which of the following approaches do you apply?**

- ☐ Link existing classes and/or properties from the involved ontologies using equivalency mappings (owl:equivalentClass, owl:equivalentProperty)
- ☐ Link existing classes and/or properties from the involved ontologies using subsumption mappings (rdfs:subClassOf, rdfs:subPropertyOf)
- ☐ Create new classes and/or properties, linking to existing classes and/or properties using equivalency mappings (owl:equivalentClass, owl:equivalentProperty)
- ☐ Create new classes and/or properties, linking to existing classes and/or properties using subsumption mappings (rdfs:subClassOf, rdfs:subPropertyOf)

Other (please specify)

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9. Survey Conclusion

Thank you for participating in this survey!

In the below field you may enter your email address. Doing so is entirely voluntary, but is required if you wish to participate in the sweepstake for two 25 euro Amazon gift cards. Winners will be drawn and announced when the number of respondents to the survey reaches 200, or in the first week of April 2015 (whichever comes first).

If you have any questions about this survey, please do not hesitate to contact me via email at karl@karlhammar.com.

Karl Hammar

45. Enter your email address if you wish to participate in the sweepstakes.