

Evaluating an ontology with OntoClean

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Aim: To apply the OntoClean methodology to a subset of an ontology in the travel domain and assess the strengths and weaknesses of the methodology based on the resulting ontology.

Methods: The modelled concepts and relations in an ontology provides a common understanding of a domain for parties to agree or commit to. Thus ontologies can be used to facilitate interoperability between applications.

This OntoClean methodology can be used to verify an ontology for its correctness. Correctness refers to whether the modelled entities and properties in an ontology correctly represents entities in the world being modelled. This methodology examines the usage of the subsumption relation between classes in an ontology using formal notions (rigidity, unity, identity and dependance) to capture various characteristics of classes, and constraints upon those metaproperties [1]. We applied this to a subset of the Lonely Planet (LP)¹ ontology describing activities. LP uses the ontology to organise the structure and contents of documents for travel guides.

Results: We can observe an improvement from the original ontology after applying OntoClean outlined in the resulting ontology as shown in Figure 1 and 2 respectively. However, a limitation we found with this methodology is that the resulting ontology may not have the best structure. That is, it does not guide as to how it can be further structured. For example, the tour activity branch of the ontology can be further grouped into *Guide-oriented*, *Interest-oriented* and *Transport-oriented* categories.

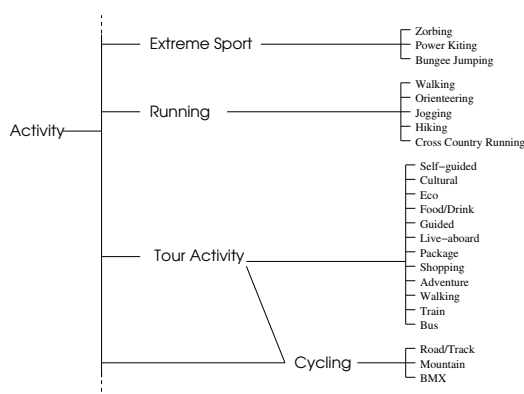


Figure 1. Sections of original LP activity ontology

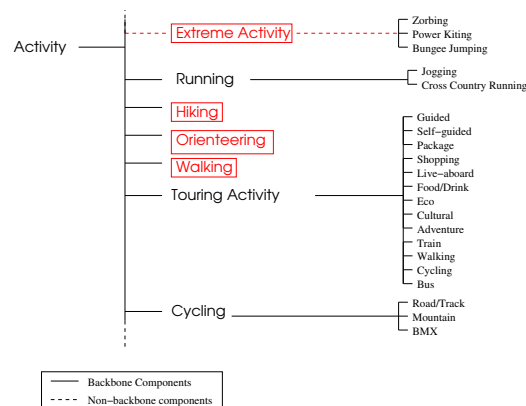


Figure 2. Sections of resulting LP activity ontology after OntoClean

Conclusions: We have considered the OntoClean methodology in this study and applied it to a subset of an ontology in the travel domain – the Lonely Planet activity ontology. Using the OntoClean metaproperties, it was found that modelling assumptions were clarified and inconsistencies were discovered. Thus we were able to correct these inconsistencies. However, it was noted that the resulting ontology could be further improved.

References

- [1] N. Guarino and C. Welty. Evaluating ontological decisions with ontoclean. *Communications of ACM*, Volume 45, Number 2, pages 61–65, 2002.

¹<http://www.lonelyplanet.com>