Appendix: OntoPriv Evaluation Process

Gabriela Suntaxi, Kelvin Ojeda, Francisco Rodríguez

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In this appendix, you will find the rest of the quantitative and qualitative evaluation process applied to OntoPriv. Here you can see the results obtained when evaluating OntoPriv in its dimensions: Language, Tool, Methodology, Cost, and Design.

1 Quantitative evaluation process: Ontometrics

For the Ontology Design dimension, the formulas present in the study "Evaluating the Proposed Public Budget Ontological Model" were used, relying on what was presented in the tool created by the University of Rostock, and the following was obtained:

- **Number of classes:** 176 classes present on OntoPriv.
- **Attribute Richness (AR):** applying the formula, it was obtained that the richness of attributes in the developed ontology is 1,875.

$$AR = \frac{|330|}{|176|} = 1.875 \tag{1}$$

- **Inheritance Richness (IR):** applying the formula, it was obtained that the inheritance richness in the developed ontology is 0.994318.

$$IR = \frac{|175|}{|176|} = 0.994318 \tag{2}$$

- **Relationship Richness (RR):** applying the formula, it was obtained that the richness of relationships in the developed ontology is 0.435484.

$$RR = \frac{|135|}{|175| + |135|} = 0.435484 \tag{3}$$

2 Qualitative evaluation process: OntoMetric

The evaluation process of the remaining dimensions present in OntoMetric and that evaluate OntoPriv as a whole follow the same scoring method present in the main article and since they are qualitative dimensions, compliance or not with the aspects discussed in the different dimensions are subject to the developers' criteria.

2.1 Language Dimension

In this dimension, the language with which OntoPriv was developed is taken into consideration. That being the case, the language to evaluate is OWL. The result of the evaluation is presented below.

Table 1: Results obtained when evaluating OWL

Language Dimension			
Factor	**Characteristic**	**Sub - Characteristic**	**Score**
Domain Knowledge	**Concepts/ Instances/Facts/ Claims**	Allows Instances of Class	1
		Has Metaclasses	1
		Can Define Classes without Metaclasses	1
		Allows Facts	1
		Allows Claims	0
	Atributes	Can Define Class Attributes	1
		Can Define Instance Attributes	1
		Can Define Local Attributes	1
		Can Define Global Attributes	1
		Can Define Polymorph Attributes	1
		Can Define Exceptions In Attributes	1
	Facets	Has Default Attribute Values	0
		Has Attribute Types	1
		Can Define Cardinality of Attributes	1
		Allows Define Procedural Knowledge	0
		Allows New Facets	1
	Relations	Allows Definition of Functions	1
		Arbitrary N-ary Relations	0.5
		Allows Define Ad-hoc Relations (for this specific purpose)	0.5
		Can Constrain The Type In Relations (Type restriction)	1
		Can Constrain The Value in Relations	1
		Has Operational Definition	1
		Can Declare Properties in Relations	1
	Taxonomies	Contain-SubclassOf-Relation	1
		Contain-NotSubclassOf-Relation	1
		Can Define Exhaustive Decomposition	1
		Can Define Disjoint Decomposition	1
		Multiple-Subclass-of in Classes	1
		Multiple-Instance-of in Instances	1
	Axioms	Allows Axioms Embedded in Terms	1
		Allows Independent Axioms	1
		Allows Axioms in First Order Logic	1
		Allows Axioms in Second Order Logic	1
	Production Rules	Allows Disjuntives in PRs (Ownership restrictions)	0
		Allows Conjuntives in PRs	0
		Each Rule Has Defined a Chaining Mechanism	0
		Each Rule Has Defined a Priority	0
		Procedures in The Consequent in PRs	0
		Certainty Values in PR	0
Inference Mechanism	**Reasoning Potential**	Allows Multiple Inheritance	1
		Allows Monotonous Reasoning	1
		Allows Non Monotonous Reasoning	0
		Makes Exceptions in Inheritance	0
		Axioms Keep The Consistency	1
		Execute Procedures	0
		Inference Mechanism in PR	1
	Inference Engine	IE is Sound and Complete	1
		IE Performs Automatic Clasifications	1
		IE Deals Exceptions	1
		IE Deals Multiple Inherance	1
		Allows New Inference Engine	1
Total			**39/51**

2.2 Tool Dimension

In this dimension, the tool/program with which OntoPriv was developed is taken into consideration. That being the case, the tool/program to evaluate is Protégé. The result of the evaluation is presented below.

Table 2: Results obtained when evaluating Protégé

Tool Dimension		
Factor	**Characteristic**	**Score**
Capabilities	Local Use	1
	Network Use	1
	Internet-based Use	1
	Clarity of User Interface	0.5
	Response Time	0.5
	Reliability	1
Visualization	Browsers Shows Whole Information of Terms	0.5
	Browser Allows Selection of Detail Level	0.5
	Browser Shows Taxonomy	1
	Browser Shows Ad-hoc Relations	0
Edition	Tool Builds The Same of Language	1
	Tool Allows Edition in Any Time	1
	Tool Shows Taxonomy Graphically	1
	Tool Allows Definition of New Relations	1
Interaction	Tool Allows Independent Use	1
	Tool Supplies Access Interfaces	1
	Documentation Using Access Interfaces	1
	Access Interfaces are OpenSource	1
	Documentation Programming Access Interfaces	1
Methodological Aspects	Tool Supports Whole Life Cicle	1
	Tool Supports Important Development Activities	1
	Tool Supplies Documentation About Built Products	1
	Tool Checks Consistency	0.5
Cooperative Aspects	Tool Creates Work Groups	0
	Tool Allows Simultaneous Working	0
	Tool Looks Edited Ontologies	0
	Tool Looks Edited Terms	1
	Tool Notifies The Changes to Group	0
	Tool Identifies The User Changes	0.5
Translation	Tool Imports From Others Langs	0
	Tool Imports From Markup Langs	0.5
	Tool Exports to Langs	1
	Tool Exports to Markup Langs	1
	Translations Lose Minimun Semantic	1
	Translation is Supervised	0
Integration	Ease of Integration	1
	Difficulty of Refering New Terms	0.5
	Tool Allows Selection of Terms to Integration	0.5
	Tool Checks Consistency in Integration or Merge	1
	Assistance For Manual Merge	1
	Semi-automatic Merge	0.5
Total		**29/41**

2.3 Methodology Dimension

In this dimension, the methodology with which OntoPriv was developed is taken into consideration. That being the case, the methodology to be evaluated is Development Methodology 101 (MOD-101). The result of the evaluation is presented below.

Table 3: Results obtained when evaluating MOD-101

Methodology Dimension		
Factor	**Characteristic**	**Score**
Precision	Delimitation of Phases	1
	Specification of Activities by Phases	1
	Specification of Personnel by Phases	0
	Specification of Techiques by Phases	0.5
	Specification of Finished Products by Phases	0.5
Usability	Clarity of Activities and Techniques Description	0.5
	Quality of Manuals	0.5
	Manuals With Complete Examples	0.5
Maturity	Number of Developed Ontologies	1
	Number of Different Domains	1
	Importance of Developed Ontologies	1
Total		**7.5/11**

2.4 Costs Dimension

This dimension takes into consideration the costs involved in the development of OntoPriv. The result of the evaluation is presented below.

Table 4: Results obtained when evaluating OntoPriv costs

Costs Dimension	
Factor	**Score**
Use Licences of the Ontology	0
Estimated costs of hw and sw	0
Costs of access interfaces	0
Use Licences of the ontology tools	1
Total	**1/4**

2.5 Summary of Results

Finally, a summary table is observed where the results achieved in the qualitative evaluation process carried out on OntoPriv are placed.

Table 5: Results obtained in the evaluation process

Results of the Evaluation Process using OntoMetric	
Dimension	**Obtained score**
Content	22/23 points
Language	39/51 points
Tool	29/41 points
Methodology	7.5/11 points
Costs	1/4 points