

Crowdsourcing Linked Data EXPERT VALIDATION

User-driven Quality Evaluation of Dbpedia

*A. Zaveri, D. Kontokostas, M. A. Sherif, L. Buhmann, M. Morsey, S.
Auer, and J. Lehmann.*

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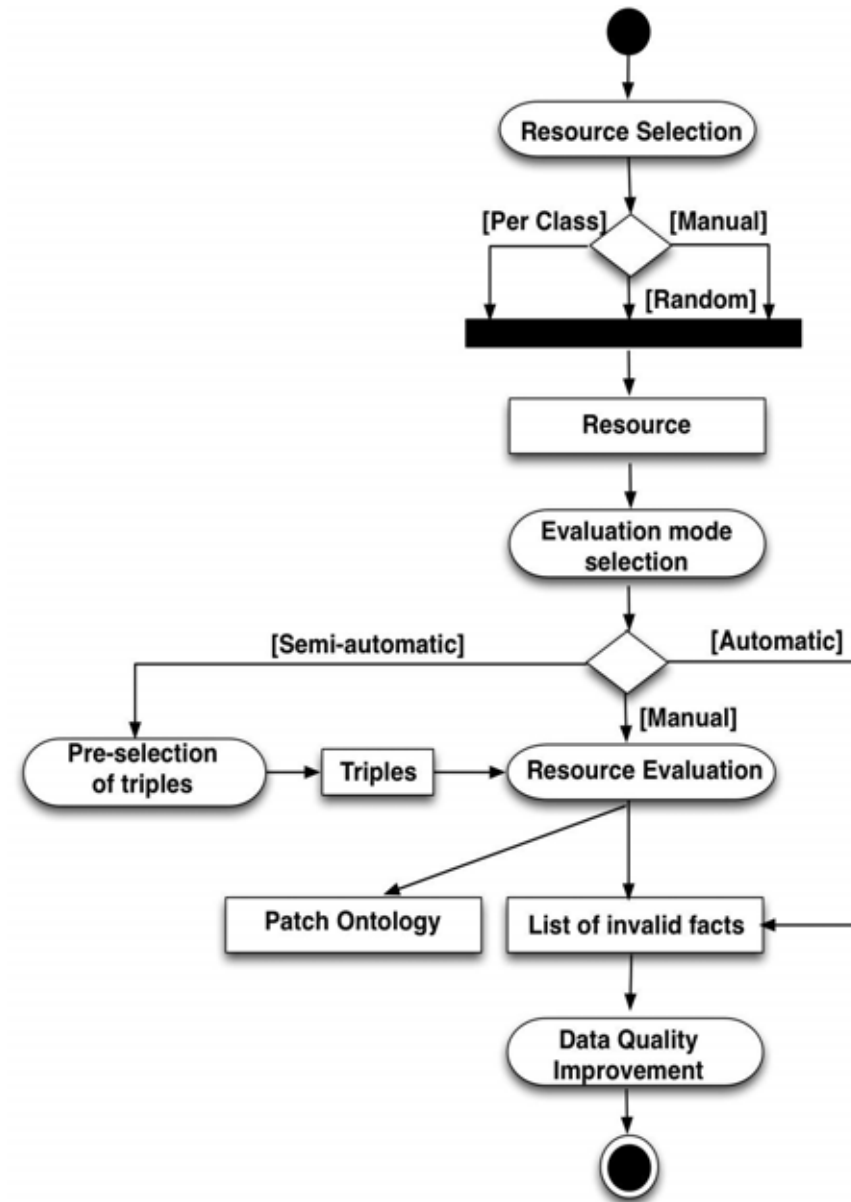
Outline

- Data Quality Assessment Methodology
- Quality Problem Taxonomy
- Crowdsourcing DQ Assessment Tool (TripleCheckMate)
- Evaluating Quality of DBpedia
 - Manual
 - Semi-Automatic
- Results

Methodology

4 Step Methodology:

- **Step 1: Resource selection**
 - Per Class
 - Completely random
 - Manual
- **Step 2: Evaluation mode selection**
 - Manual
 - Semi-automatic
 - Automatic
- **Step 3: Resource evaluation**
- **Step 4: DQ improvement**
 - Direct
 - Indirect



Evaluating Quality of DBpedia

Evaluation Methodology - Manual

- **Phase 1:** Creation of quality problem taxonomy
- **Phase 2:** Crowdsourcing quality assessment
 - Contest-based
 - Participants: LD experts
 - Task: Detect and classify LD quality issues
 - Time: 1 month
 - Reward: 300 EU prize
 - Tool: TripleCheckMate

Quality Problem Taxonomy

Dimension	Category	Sub-category	D	F	DBpedia specific
Accuracy	Triple incorrectly extracted	Object value is incompletely extracted	-	E	-
		Object value is incompletely extracted	-	E	-
		Special template not properly recognised	✓	E	✓
	Datatype problems	Datatype incorrectly extracted	✓	E	-
	Implicit relationship between attributes	One fact encoded in several attributes	-	M	✓
		Several facts encoded in one attribute	-	E	-
Attribute value computed from another attribute value		-	E + M	✓	
Relevancy	Irrelevant information extracted	Extraction of attributes containing layout information	✓	E	✓
		Redundant attribute values	✓	-	-
		Image related information	✓	E	✓
		Other irrelevant information	✓	E	-
Representational-Consistency	Representation of number values	Inconsistency in representation of number values	✓	W	-
Interlinking	External links	External websites	✓	W	-
	Interlinks with other datasets	Links to Wikimedia	✓	E	-
		Links to Freebase	✓	E	-
		Links to Geospecies	✓	E	-
		Links generated via Flickr wrapper	✓	E	-

Crowdsourcing DQ Assessment tool

The screenshot displays the DBpedia Evaluation Campaign interface. At the top, there is a navigation bar with the DBpedia logo, the text "DBpedia Evaluation Campaign", and an "Evaluate" button. On the right, there is an "AKSW" logo. Below the navigation bar, the user's name "Amrapali Z" and submission statistics "Submitted 0, Skipped 1" are shown.

The main task area shows a resource URL: "About: http://dbpedia.org/resource/Megan_Terry". Below this, there are radio buttons for "is Correct", "has Errors", and "has Missing Information". A "Comments" field with "Save" and "Skip" buttons is also present.

The central part of the interface is a table with columns for "Predicate" and "Object". The table lists various properties of the resource, such as "dbp-owl:abstract", "dbp-owl:birthDate", "dbp-owl:birthName", "dbp-owl:birthPlace", "dbp-owl:birthYear", "dbp-owl:occupation", "dbp-prop:alternativeNames", "dbp-prop:birthDate", and "dbp-prop:birthName".

A modal window is open, showing details for a specific triple: "Subject: dbpedia:Megan_Terry", "Predicate: dbp-prop:dateOfBirth", and "Object: '7' (@type = http://www.w3.org/2001/XMLSchema#integer)". The modal is divided into sections for "Accuracy", "Description", and "Interlinking - Coherency". Under "Accuracy", there are several sub-sections: "Datatype problems", "Implicit relationship between attributes", and "Triple incorrectly extracted". The "Triple incorrectly extracted" section is highlighted with a red box, and it contains the text "Object value is incompletely extracted".

On the right side of the modal, there is a "Description" section with a text area and a "Description" label. Below this, there are "Example N3" and "Example URI" sections. At the bottom of the modal, there is a "Comments" field.

At the bottom of the interface, there are two URLs: <http://tinyurl.com/TCM-Demo> and <http://tinyurl.com/TCM-Screencast>.

Results – Manual Methodology

Total no. of users	58
Total no. of distinct resources evaluated	521
Total no. of resources evaluated	792
Total no. of distinct resources without problems	86
Total no. of distinct resources with problems	435
Total no. of distinct incorrect triples	2928
Total no. of distinct incorrect triples in the <i>dbprop</i> namespace	1745
Total no. of inter-evaluations	268
No. of resources with evaluators having different opinions	89
Resource-based inter-rater agreement (Cohen's Kappa)	0.34
Triple-based inter-rater agreement (Cohen's Kappa)	0.38
No. of triples evaluated for correctness	700
No. of triples evaluated to be correct	567
No. of triples evaluated incorrectly	133
% of triples correctly evaluated	81
Average no. of problems per resource	5.69
Average no. of problems per resource in the <i>dbprop</i> namespace	3.45
Average no. of triples per resource	47.19
% of triples affected	11.93
% of triples affected in the <i>dbprop</i> namespace	7.11