QASAR: A quality assurance tool for semantic resources

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Abstract

Ontologies play a crucial role in enabling interoperability and data sharing in multiple fields of relevance. The ontology engineering community has dedicated significant efforts to develop quality assurance frameworks and methodologies, which address various quality aspects and propose different approaches when it comes to quality evaluation. However there remains a gap in providing integrated tools that combine these quality frameworks and methodologies into a unified, streamlined experience to assist ontology developers. We propose in this demo an ontology quality assurance tool designed to address this gap, through the integration multiple quality frameworks and methodologies developed by our team throughout the years, to provide a cohesive quality assurance workflow that assist ontology developers in the process of developing higher-quality ontologies.

App URL: https://semantics.inf.um.es/qasar

Keywords

Knowledge representation, ontologies, quality assurance

1. Introduction

Semantic resources have become key elements for enabling interoperability and data sharing in multiple domains. The assurance of the quality of those resources is a matter of increasing importance, but there is a lack of tools for supporting the developers of the ontologies in the quality assurance process. We present QASAR, a tool that aims to support the assurance of the quality of semantic resources.

2. QASAR

QASAR provides ontology qualitative and quantitative information that allows developers and researchers to evaluate their semantic resources, assessing their strengths and weaknesses through the usage of four ontology quality-related frameworks, namely, OQuaRE [1], OntoEnrich [2], HURON [3] and Evaluome [4]. OQuaRE provides the quality model, which is structured in quality characteristics, which are then subsequently divided into quality sub-characteristics, that are then measured through quality metrics, which are also offered by OQuaRE. OntoEnrich provides additional quality metrics based on the lexical regularities exhibited by the labels of the entities, as well as allowing users to perform lexical analyses over their resources. HURON provides quantitative metrics for assessing the human readability of ontologies and to evaluate the adherence to best practices. Finally, Evaluome provides corpus analysis capabilities through its clustering-based data analysis. The QASAR information is represented by using the Ontology QUality Ontology (OQUO)[1], which is a modular ontology that contains the semantic definitions needed to represent quality models based on metrics, characteristics

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[1]https://github.com/tecnomod-um/oquo

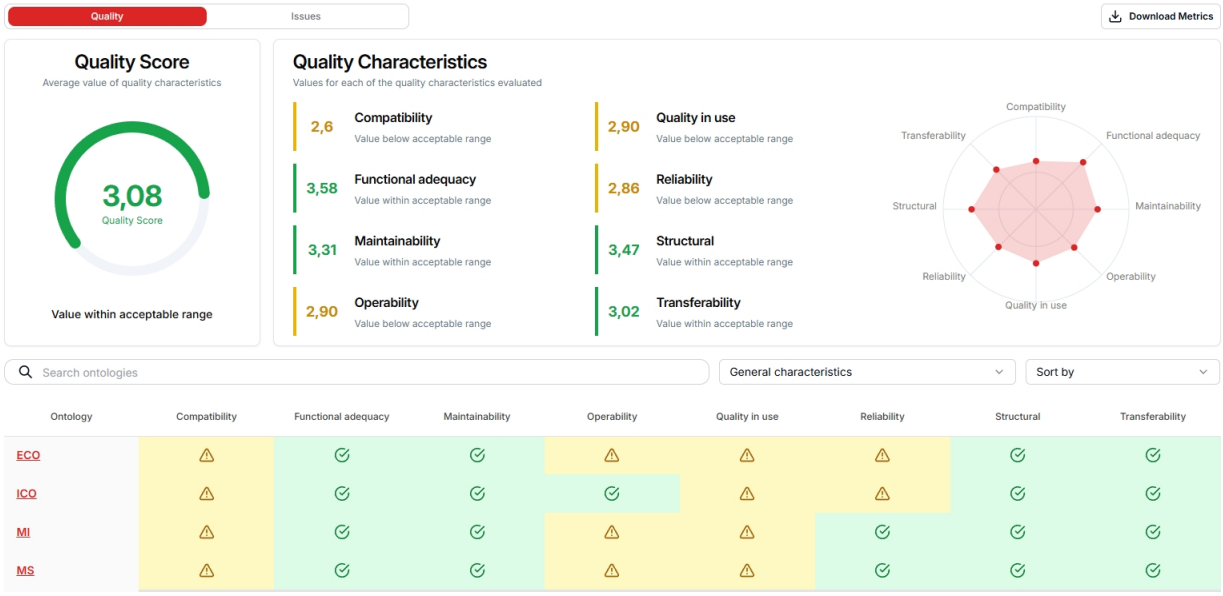

Figure 1: Quality summary provided for a project, displaying information about its ontologies

and subcharacteristics; in addition to the entities needed to represent ontology evaluations. QASAR generates a quality report of the ontology, which is organized in the following views: summary of the quality of the resource, detailed access to the results driven by the quality model and with flexible query options, information about the evolution of the metrics of the resource, issues found, and advanced analyses. Through the issues view, users will be faced with a list of different problems detected by the integrated quality frameworks. Each of the issues listed provide detailed information, such as the exact IRI of the entity associated with it, a detailed description together with a recommendation of steps to perform to properly address it, the list of associated entities, and a classification of the severity. Additionally, QASAR provides corpus analysis capabilities by allowing users to create projects, which are intended to group related ontologies. Users are able to access a quality summary report, which is displayed in Figure 1, and which includes a dashboard to quickly understand how each resource is performing; a quality issues report with all the different issues detected and lastly, the possibility of performing an analysis of the reliability and behavior of the quality metrics for analyzing the corpus.

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Declaration on Generative AI

The authors have not employed any Generative AI tools.

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