ONTO COMMONS | ONTOLOGY-DRIVEN DATA DOCUMENTATION FOR INDUSTRY COMMONS

ontocommons.eu

twitter.com/ontocommons

linkedin.com/company/ontocommons

Characterising tribological experiments through semantic technologies

Tekniker
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

Casla P.* | Fernandez I. | Quintana I. | Igartua A.

C/ Iñaki Goenaga, 5
20600 Eibar (Gipuzkoa) Spain
patricia.casla@tekniker.es

Introduction

Tribology aims to study friction, wear and lubrication of interacting surfaces. Tribological characterisation is key for developing new products and driving new materials into sustainable solutions. The use case scenario is based on **H2020 i-Tribomat.**

i-TRIBOMAT
Intelligent Open Test Bed for Materials Tribological Characterisation Services

Objective

The primary goal is to **shorten the time, number and size of experiments required to identify the behaviour of a material or combination of them** (e.g., metal, coating, lubricant) with respect to specific operation conditions by providing an ontology-based access to a materials' tribological information independently from the underlying data structures.

Challenges

Tribological experiments are necessary for understanding material behaviour. However, the experiments' results follow **heterogeneous formats and data models** due to a **lack of standards**.

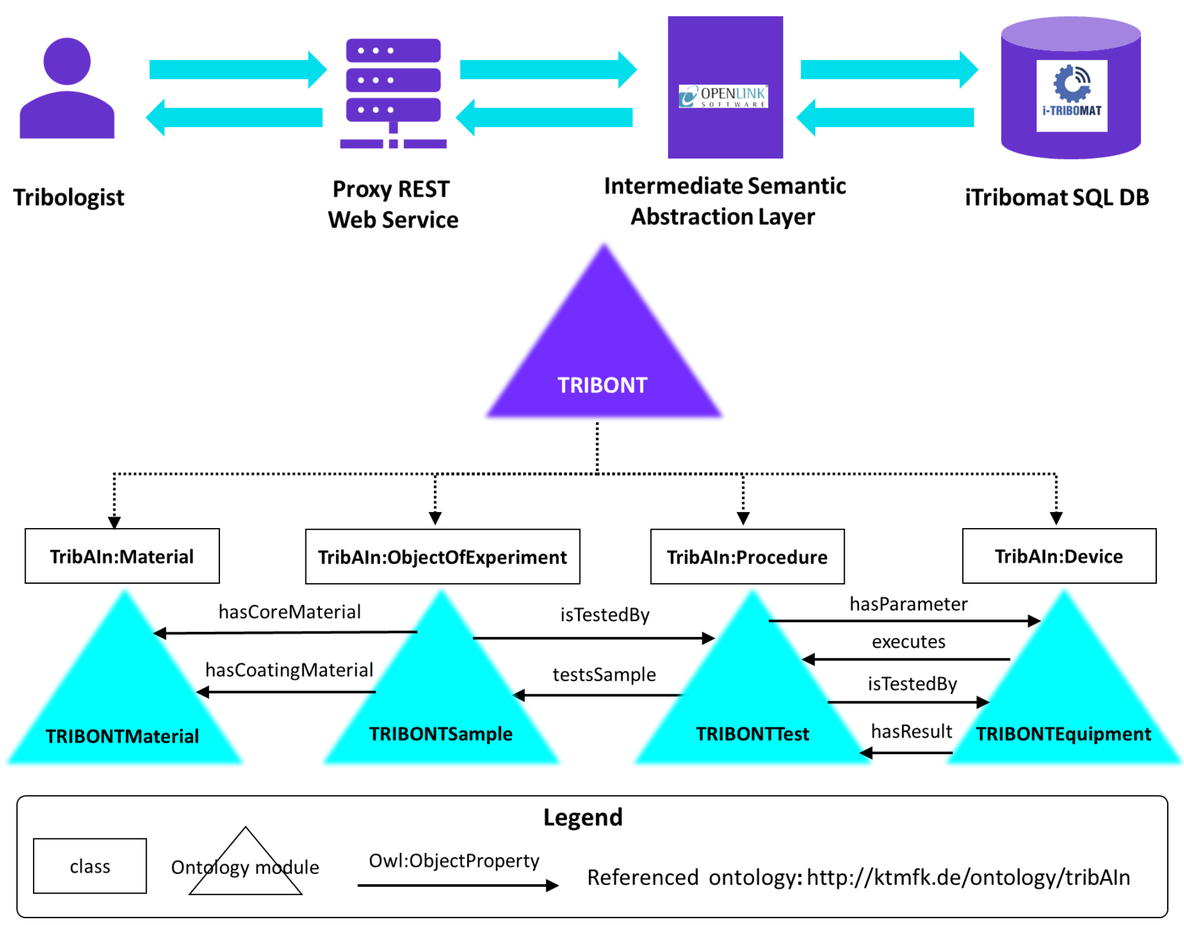
Approach

The proposed implementation approach provides formal and unambiguous data representation and homogeneous data access based on Semantic Technologies and Ontologies. Main components involve:

- **RESTful web services** for handling data to provide **security** and underneath **configuration abstraction**;
- **Ontology-Based Data Access** (OBDA) layer to **abstract** from underlying data structures
- **Common data model** for tribological experiments (**TRIBONT -Tribology Ontology**) , under construction.

TRIBONT follows a **modular approach** covering the key aspects involved in the tribological experiments (i.e., Test, Equipment, Sample and Material).

All the **modules are aligned with relevant existing ontologies** (e.g., TribAIn, EMMO etc.) to improve **interoperability**, ensure clarity in modelling and avoid errors that may have unintended reasoning implications



Expected benefits

- **Better representation** of materials' tribological experiments
- **Enrich existing data** with additional background knowledge
- **Ease data retrieval** and navigation through related resources
- Set the ground for developing **more application-independent solutions**

OntoCommons - Ontology-driven data documentation for Industry Commons, has received funding from the European Union's Horizon 2020 research and innovation programme under **Grant Agreement no. 958371**