

Semantic linked data and metadata storage made easy with LARAsuite.

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Abstract:

The LARAsuite (<https://gitlab.com/larasuite>) is modern scalable generic open source **Research-Data-Management (RDMS)** system, that combines features of a **Labor-Information-Management-System (LIMS)** system and an **Electronic Lab Notebook (ELN)** in a new fashion, intended to dramatically reduce the input of users and shielding a lot of the the complexity of linked data generation through automation.

Its is based on a dockerised microservice architecture that is easy deployable on a kubernetes cluster or docker compose environment. The LARA suite is designed to dynamically scale horizontally to capture changing demands of users. A very important feature of the LARA suites is its support for automated linked metadata annotation of all generated data and its extensive API, making it suitable for AI and Machine Learning applications that support automated model generation.

All metadata contain links to related domain ontologies (using concepts from EMMO as top-level ontology) and is captured in a triple/quadstore (OpenLink Virtuoso), forming an automatically generated knowledge graph. This Service exposes a SPARQL endpoint, which can be used for extensive (federated) queries and logic reasoning to derive implicit knowledge.

The LARAsuite is a generic framework that addresses most natural sciences, like physics, chemistry, biology and related disciplines. It is developed as a world-wide open source project of a small group of enthusiasts. The development is also interacting with NFDI4Cat (esp. for complex Biocatalysis tasks) and NFDI4Chem (reaction planning) – its power is the integration with SiLA based lab automation systems.

A short demonstration of some selected features is planned.

Keywords: Research-Datata-Management-Sytem, Electronic-Lab-Notebook (ELN), Labor-Information-Management-System (LIMS), Semantic Metadata, Lab Automation