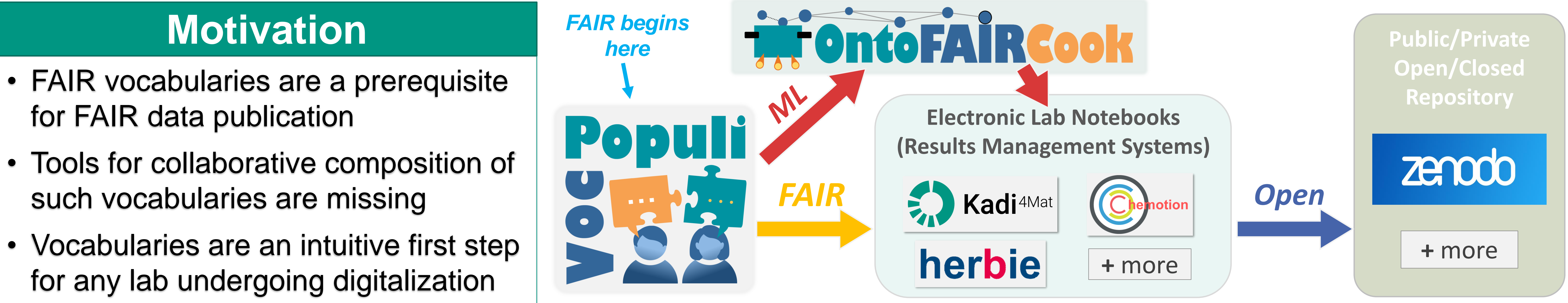
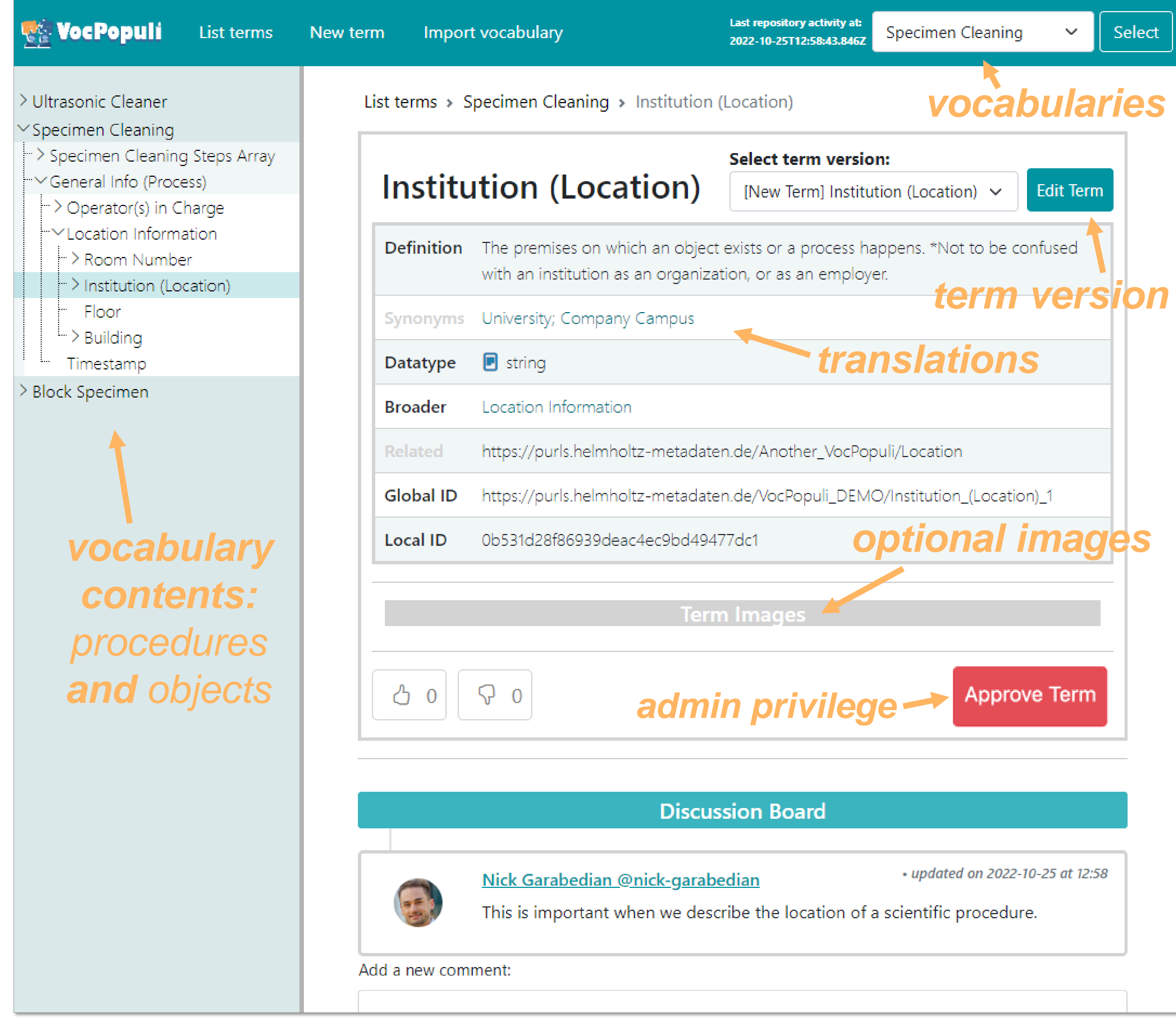


Collaborative Metadata Definition using Controlled Vocabularies, and Ontologies

Nick Garabedian, Ilia Bagov, Christian Greiner
Karlsruhe Institute of Technology, Institute for Applied Materials, Germany



VocPopuli



The screenshot shows the VocPopuli web interface. On the left, there's a sidebar with a tree view of terms: Ultrasonic Cleaner, Specimen Cleaning, Specimen Cleaning Steps Array, General Info (Process), Operator(s) in Charge, Location Information, Room Number, Institution (Location), Floor, Building, Timestamp, and Block Specimen. The main area shows a list of terms, with 'Specimen Cleaning' selected. Below this, there's a detailed view of the 'Institution (Location)' term. This view includes a definition, synonyms, datatype, broader term, related terms, global ID, and local ID. There are also fields for 'Term Images' and an 'Approve Term' button. A discussion board is visible at the bottom.

- Ease of use by non-experts is first priority
- Any resource can be digitalized:** Lab Procedure; Lab Specimen, ELN, ELN Export, Data Analysis
- GitLab login is used to associate user contributions with term versions and vocabularies
- Each term receives a git branch for editing
- GitLab Issues are used to collect comments
- Terms are voted on and approved or not approved
- PROV and SKOS are optional exports

Vocabulary IDs

Global ID: set at birth and never changes

Local ID: a hash of the terms' Local IDs

Version ID: a hash of all terms' Version IDs; changes when a term is modified

IRI (PURL): if published

Term IDs

Global ID: set at birth, never changes; it represents a self-contained concept

Local ID: denotes an approved version of the term


Version ID: changes for every unapproved version

IRI (PURL): if published

OntoFAIRCook

- FAIR vocabularies are a stepping stone towards FAIR ontologies
- In this ML-based app vocabularies are converted semi-automatically into FAIR data ontologies
- The conversion is actively improved as the ontologies grow
- Ontologies allow for scalable data-driven machine learning

Electronic Lab Notebooks (Results Management Systems)



The diagram shows four FAIR-Save Apps: FS-DigitalBook, FS-Validator, FS-Analysis, and FS-Instrument. These apps interact with vocabularies and ELNs. The FS-Analysis app is shown with a Python logo and a 'MATLAB + more' button. The FS-Instrument app is shown with a 'LabVIEW + any other' button.

- FAIR-Save Apps interact with vocabularies and ELNs
- Terms used within ELNs are linked to the IDs in the related vocabulary and ontology for an unambiguous definition
- An export of the defined schemes can be used to automatically create structured forms in the ELNs
- The output from the developed tools will be exemplarily first integrated into the ELNs Herbie and Kadi4Mat

Contact and Acknowledgements

This project is a close collaboration with our partners: Frederic Bock, Benjamin Klusemann, Catriona Eschke, Florian Wieland, and Martin Held at Helmholtz-Zentrum Hereon; and Karlheinz Weber, Nuoyao Ye, Floriane Bresser, Benedikt Stoll, Malte Flachmann, Jakob Biesinger at the KIT. It was funded by the Initiative and Networking Fund of the Helmholtz Association in the framework of the Helmholtz Metadata Collaboration project call.

