

# Applying Interoperable Metadata Standards (AIMS)



TECHNISCHE  
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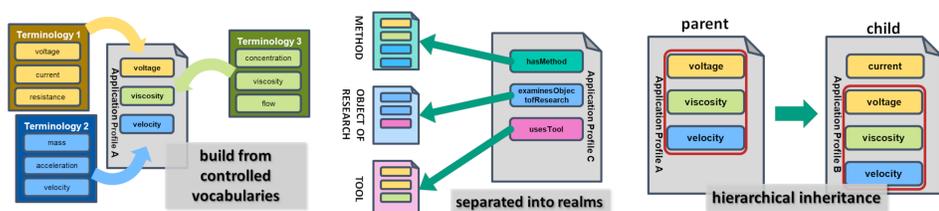
A Platform for Creating and Sharing Metadata Standards and their Integration into Scientific Workflows in Mechanical Engineering and Related Disciplines. Our vision is to **create an environment for metadata standards to grow**. To achieve this with *AIMS* we combine:

- a theoretical **metadata model**
- an **infrastructure** approach
- two use-cases as **application** of our idea
- multiple **partners** to disseminate our platform

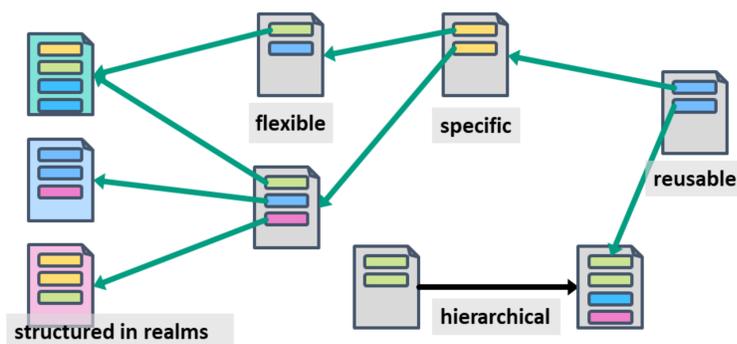
## Summary

Management of research data requires precise documentation of their content and creation via metadata. In order to enable the highest possible degree of interpretability and (re-)usability as demanded by the FAIR principles, metadata must be readable by machines as well as by humans. Standards defining the format as well as the required and permitted content are a necessary prerequisite for this. At present, however, suitable metadata standards are only available for a very limited number of scientific disciplines and types of research data, which constitutes a major obstacle to efficient research data management. Since establishing metadata standards is a complex and collaborative process, it should be supported by an infrastructure enabling the efficient creation, sharing and reuse of metadata standards. To this end, we intend to create a tool for the easy generation and adaptation of metadata standards linked to a platform collecting and indexing the created standards to make them accessible to the scientific community. The metadata standards will be assembled from controlled vocabularies and comply with application profiles as current state-of-the-art for interoperable metadata. In addition, it is necessary to ensure that the creation of metadata compliant to the defined standards does not disrupt research. Another essential part of the project will therefore be to establish workflows in which the metadata are generated with minimum extra effort and beneficial synergy effects like use in electronic lab notes or as index for data archives and backup strategies are exploited. In order to keep the scope of the project manageable and to capitalize on RWTH Aachen University's and TU Darmstadt's expertise in that subject area, the focus will be on mechanical engineering as a prime candidate for a discipline that could greatly benefit from suitable metadata standards and strategies for efficient documentation of research data with metadata.

## the metadata model



*AIMS* relies on the concept of „**application profiles**“: metadata schemata build in a modular fashion from **controlled vocabularies**. The resulting application profiles are **hierarchical**, **specific** and **re-useable**. They are separated into realms but build a flexible reference network and support versioning.



curious? get in touch with us!

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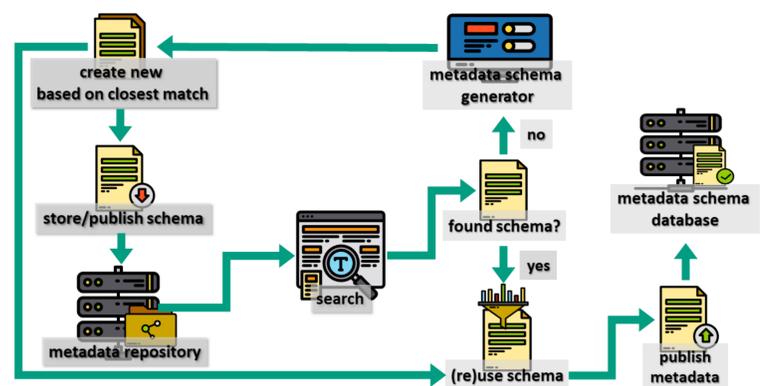
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## the infrastructure



*AIMS* provides infrastructure in form of three central components: a generator and repository for metadata schemas, accessible via web UI, and a repository for research metadata.

## the application

Integration into scientific workflows is an essential part of *AIMS*. To achieve this the project includes two use-cases from two different fields of engineering each providing multiple and divers test beds, both implement *AIMS* into research software.



Investigation of fluid behaviour on test bed with modular components at FST from Technical University of Darmstadt composed of multiple pumps, valves, sensors each with unique profiles.

Virtual Metrology Frame at Laboratory for Machine Tools and Production Engineering WZL of RWTH Aachen University



## the partners

The platform shall not only serve the project participants but explicitly aims for the broader scientific community. With concepts like modularity and reference deeply rooted inside, the resulting metadata schemata and interfaces stay interoperable and applicable to address all researchers way beyond engineering and related disciplines as well.