



NFDI4Objects

Research Data Infrastructure
for the Material Remains of
Human History

TRAIL 4.4:

Dating partial objects: the model case of historical building research

Partner **Lead:** Landesamt für Denkmalpflege Baden-Württemberg

Participants: RWTH Aachen University, Technische Universität Berlin, Institute of Urban and Regional Planning, FIZ Karlsruhe, University of Bamberg, Institute for Archaeology, Heritage Conservation and Art History, Museum für Naturkunde (MfN) Berlin

External members: Alexander Stenzer (MonArch), Claudia Mohn (Datenbank Bauforschung/Restaurierung (Baden-Württemberg))

Contact Prof. Dr.-Ing. Anke Naujokat (RWTH Aachen) / naujokat@ages.rwth-aachen.de,

Felix Martin M.Sc. (RWTH Aachen) / martin@ages.rwth-aachen.de,

Prof. Dr.-Ing. Hermann Schlimme (Technische Universität Berlin) / h.schlimme@tu-berlin.de,

Matthias Razum (FIZ Karlsruhe) / matthias.razum@fiz-karlsruhe.de

Summary

Dating subsets of complex objects is a key challenge for N4O. The TRAIL will address this by improving the interoperability of existing research data ontologies, based on specific cases. As an object-oriented research discipline, historical building research is ideal for modelling ontologies of complex objects. In the first phase, the partial object dating of an example building in two different databases will be compared and transferred into a common format. The results will then be tested for their interdisciplinary potential with participants from other disciplines of the N4O consortium. Finally, the subject-specific and interdisciplinary findings of the TRAIL will be documented in a white and a blue paper.

Description

The aim of the TRAIL is to link different databases via a common exchange format for a narrowly defined range of metadata, using historical building research as an example. Currently, there are no subject-specific technical or conceptual solutions, so the TRAIL uses a model dataset from different database entries on the Le Corbusier house in the Weißenhof estate, Stuttgart, to create an exchange format. This constitutes an important step towards semantic linking of existing databases – the Datenbank Bauforschung/Restaurierung (building research/restoration database), and MonArch both contain entries on the Le Corbusier house. Using these datasets provided by two external partners, we will develop a semantically modelled core dataset for dating the house and its building and component parts. For this purpose, we will analyse the existing mapping of the building's construction phases in the participating databases to then develop a proposal for mapping the dating of a building and its parts. Subsequently, we will examine this interoperable ontology for its interdisciplinary potentials. In cooperation with the Museum für Naturkunde (Berlin), we will map structures for modelling natural-historical complex objects into the partial ontology developed for the Le Corbusier house.

The following standards will be used in the TRAIL: Bamberg Vocabulary for Historic Architecture, Cidoc CRMba and Core Data Index to Historic Buildings. In addition, the metadata schemas of the following databases will be developed: Metadata schemes of MonArch, Datenbank für Bauforschung/Restaurierung and baureka.online.

Relevance

The intended outcomes will ease the discover, preserve, integrate and describe sections of the research data lifecycle. In the future, university research in architectural history, heritage management, historical buildings and art history (which already has data stored with MonArch for some research projects) will benefit from the links to data available at heritage management offices. Curators of emerging and developing research data repositories will benefit from the unified storage of a specific range of metadata established by this TRAIL.

In order to link previously isolated projects in practice, the workflow created in the TRAIL will be described in a white paper and can be reused by other disciplines in N4O. This applies particularly to institutions that hold datasets with different partial object dating (e.g. collection holdings or excavation sites). The structure of the ontology for partial object dating, revised in collaboration with the Museum für Naturkunde, will be documented in a blue paper. Stakeholders involved in modelling the research data of complex objects will benefit from the blue paper. Especially in TA2 (M2.2), semantic (knowledge) modelling plays a major role: TRAIL 2.2 evaluates approaches to fuzziness and wobbliness; TRAIL 2.3 makes data on archaeological and natural history objects interoperable. In the first phase of the TRAIL, other datasets, databases and competence centres could be included, e.g.: TOPORAZ (NFDI4Culture), Denkmalatlas des Landesamts für Denkmalpflege Niedersachsen (NFDI4Ing) and Data for History (NFDI4Memory).

All of the mentioned databases can only be linked meaningfully if the data is accessible to everyone in the community. The metadata required for linking makes the data both more findable and more interoperable at the semantic level. The white and blue papers can be reused in other disciplines and as a reference in future projects that model partial object dating or merge different ontologies for complex objects.

Deliverables

Best practice experience with merging different ontologies will be documented in a white paper. Within the TRAIL, an interface for dating parts of a building will be defined and described in a blue paper. The results of the TRAIL, including best practices, will be documented for use by other disciplines in a white paper, while the technical results on partial object dating in generic object-oriented metadata schemas will be documented in a blue paper.

Commons: white paper, blue paper

Work plan

For the TRAIL, 0.75 FTE is available for one year. If the term is extended, additional metadata segments may be processed. Contributions are made by: RWTH Aachen University, Technische Universität Berlin, Institute of Urban and Regional Planning, FIZ Karlsruhe, University of Bamberg, Institute for Archaeology, Heritage Conservation and Art History and Museum für Naturkunde (MfN) Berlin.

- Milestone 1 (after 2 months):
 - Analysis of (partial object) dating completed, using the example of the Le Corbusier house in the Datenbank für Bauforschung/Restaurierung and MonArch.
- Milestone 2 (after 6 months):
 - Proposal for the semantic and interoperable description of partial object dating based on existing metadata schemas (Datenbank für Bauforschung/Restaurierung, MonArch, baureka.online, etc.) and vocabularies (Bamberg vocabulary for historical architecture) completed.
 - White paper on the workflow for merging different, subject-specific ontologies completed.
- Milestone 3 (after 9 months):
 - Analysis of the interdisciplinary potentials of the proposal for partial object dating completed.
- Milestone 4 (after 12 months):
 - Proposed ontology completed with consideration of complex objects from other disciplines.

*FAIR*¹ *F4:RDA-F4-01M; A1.1:RDA-A1.1-01D; I1:RDA-I1-01D; R1.3:RDA-R1.3-02D*

TRAILS related with TRAIL 2.3

¹ Nach Tabelle 1 von Bahim, C., Casorrán-Amilburu, C., Dekkers, M., Herczog, E., Loozen, N., Repanas, K., ... Stall, S. (2020). The FAIR Data Maturity Model: An Approach to Harmonise FAIR Assessments. *Data Science Journal*, 19(1), 41. DOI: <http://doi.org/10.5334/dsj-2020-041> [cc by 4.0](#)