



**NFDI4Objects**

Research Data Infrastructure  
for the Material Remains of  
Human History

## TRAIL 2.1:

# Exploring the RDM landscape in museums and collections

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## Summary

Sustainable management and exchange of data from object collections in museums, universities, cultural heritage authorities and research institutions according to the FAIR and CARE principles is challenged by the multitude of discipline-specific approaches to metadata, authority data, ontologies, interfaces and services. These range from local, very individual, partly commercial and highly specialised solutions to very generic, internationally recognised standards.

These approaches address different phases of the data lifecycle, from recording and inventorying objects and resources in collections (collect, describe), via creating and preserving digital representations (preserve) to forms of providing and linking interoperable metadata and digitised material for different reuse scenarios (e.g. research, online portals, apps, exhibitions, creative art works, citizen science, long-term preservation) (discover, integrate, publish).

Some data formats for indexing and providing object data (e.g. EDM, LIDO, EAD, MAB, Darwin Core) have become established in recent years, not least due to their mandatory use for ingestion in national and international portals. These formats meet subject- and material-specific requirements in different ways and to different degrees. To provide a solid foundation for the measures in TA2 on the standardisation, networking, interoperability and publication of research data from collection contexts, existing approaches will be recorded, structured and catalogued in this TRAIL through a systematic environment analysis.

One outcome of the TRAIL, in terms of content and strategy, will be to specify technical, scientific and organisational best practices and deficits and to summarise them in a white paper. This information on approaches will be semantically and technically processed in such a way that it will be searchable in various online catalogues.

## Description

The variety of national and international approaches to object collections in museums, universities, cultural heritage authorities and research institutions constitutes a challenge for TA2 and for this TRAIL. These are metadata standards (e.g. CDWA Lite, Darwin Core, LIDO), authority files (e.g. GND, ULAN), community-driven vocabularies, thesauri and classifications (e.g. AAT, TGN, iDAI.vocab, Iconclass) as well as ontologies for data modelling (e.g. CIDOC CRM, Spectrum, CCO) and influence especially the (primary) recording and description of objects in collections.

Since the curators of heterogeneous research collections do not have uniform workflows and systems, these approaches are taken very differently and are not always supported by suitable, interoperable interfaces, e.g. to integrate overarching services such as DANTE, BARTOC, Wikidata or GND. Large, internationally accepted standards exist, but often do not sufficiently reflect subject-specific granularity, so they are not implemented across the board and consistently by all actors. Many smaller and specific solutions, however, may only be used for certain types of objects and materials or in individual institutions, but are nevertheless of high professional interest and value (e.g. Nomisma). This makes it all the more important to agree on common technical interfaces, semantically referenceable terms and aligned data models as a key prerequisite for implementing the FAIR and CARE principles for object-related resources from collections.

The task of this TRAIL is to record, structure and catalogue metadata standards, authority files, community-driven vocabularies, data models, ontologies, interfaces and data services presently used within the community to manage object collections and to

research material, provenance and presentation issues. The following specific work formats are planned

- systematic research online and in publications,
- evaluation of comparable surveys by the Deutscher Museumsbund, the Institute for Museum Research, the Coordination Centre for Scientific University Collections in Germany and the Association for Anthropology
- qualitative individual interviews with representatives of the collection community,
- a quantitative online survey to address a broad range of stakeholders,
- open meetings for a range of participants to exchange experiences, discuss the findings openly and make joint decisions.

The key questions for these formats are as follows:

- How widespread, accepted and technically implemented in detail are the different approaches?
- What are the reasons for or against implementing an existing approach?
- To what extent do these approaches meet the requirements of FAIR, CARE and good scientific practice?
- What are the specific deficits and needs that should be addressed by future measures in TA2?
- Where are thematic overlaps with the other NFDI consortia related to managing and recording objects in collections?

## Relevance

Although the existing approaches under consideration have particular relevance to gathering and capturing data in research collections, they also affect the other phases of the data lifecycle, as they provide the technical and semantic prerequisites for downstream discoverability, searchability, usability and interoperability of the data.

First of all, everyone involved in the research and development of collections – from curators to scientists and IT specialists to decision-makers – will benefit from the results of the environment analysis. It will provide a needed resource for strategic planning related to specific tasks of data management in the respective institutions. The TRAIL is also highly relevant for infrastructure providers who aggregate metadata and digitised collection objects and make them available to a wide audience. The white paper will provide detailed selection criteria for suitable interfaces and technical exchange formats.

This becomes relevant for other communities within NFDI4Objects when object data goes beyond the collection-related tasks of acquisition, preservation, research, presentation and mediation, for example regarding information on find and provenance context (TA1: Documentation) and on restoration measures (TA4: Protecting). On an infrastructural level, the TRAIL lays the technical foundations for the discovery and archival services in TA5. The results of the TRAIL and the consequences for subject-specific and generic semantic knowledge modelling will be discussed in close cooperation with TA6.

Linkages with other NFDI consortia in the humanities are primarily with NFDI4Culture (TA1: Data capture and enrichment of digital cultural assets; TA2: Standards, data quality and curation) and NFDI4Memory (TA2: Data connectivity) as well as the entire community of stakeholders with research collections.

The TRAIL is primarily a meta-study of the status quo of the FAIRification process in object-related collections. It will systematically and comprehensively record and examine everyday practice regarding metadata standards, authority files, ontologies, interfaces and services. It lays a foundation for community-driven discussion, definition and decision-making on exchange formats, their documentation and semantic specification, so that individual actors can provide their data in their institutions in a more qualitative way and make it interlinkable. The TRAIL thus makes a significant contribution to the interoperability and reusability of (meta)data on objects in collection contexts.

For the NFDI as a whole, environment analysis can be a particularly beneficial methodological approach and provide conceptual support for other communities.

### Deliverables

- **White paper** on the results and consequences of the environment analysis as preparation for later blue papers and used to specify and prioritise the subsequent TA2 measures.
- Structured meta-recording of metadata standards, authority files, community-driven vocabularies, thesauri and classifications, ontologies, (data) services and tools for reference in the online catalogues (**IntS**) developed by TA6 for the N4O Commons as well as in other (inter)national data, tool and network catalogues (e.g. BARTOC, open-archaeo, linked open vocabularies).
- **N4O Commons:** White paper

### Work plan

- Year 1, Month 6: Conception and implementation of environment analysis
- Year 1, Month 9: Discussion and evaluation of the results in the expert community
- Year 1, Month 12: Publication of online catalogues and white papers

*FAIR*<sup>1</sup> F2:RDA-F2-01M; A1.1:RDA-A1.1-01M; I3:RDA-I3-03M; R1.3:RDA-R1.3-02M

*TRAILS* comprises TRAILS 2.2, 2.3 and 2.4; basis for TRAILS 2.7 and 2.5

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<sup>1</sup> 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](https://creativecommons.org/licenses/by/4.0/)