From cultural heritage to interoperable data sets. Metadata standards as basis for digital object biographies

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Abstract:

In object-based research within the humanities, such as archaeology, art history, provenance research or conservation science, metadata describe not only digital files but also help to structure information about real-world cultural heritage objects. The term "metadata" here encompasses systematised object information on object designation, creation history, provenance and usage. Thus, "Creator" refers to the maker of the actual physical object, not the creator of the dataset or image file. Metadata elements such as "object material" describe, for example, the relationship between the chemical element "gold" and the documented artefact.

These various pieces of information together trace the object biography, i.e. the trajectory of the object from its creation or discovery to the present day. At each stage, from archaeological excavation through collection acquisition, conservation treatment and material-scientific analysis to further research activities, new information emerges. If this is not carefully defined or is lost, gaps in the knowledge about an object arise that are difficult to close.

Furthermore, the heterogeneity of metadata poses a central challenge. Different institutions and disciplines collect different data according to different standards. The consortium NFDI4Objects (N4O) addresses this problem through the development of collaborative metadata standards. The N4O Object Core Metadata Profile establishes a cross-disciplinary minimum metadata set with consensually defined data fields and controlled terminologies to secure data exchange within the wider NFDI. Building on this, for more specialised subject areas more specific standards are being developed, such as the metadata standard for conservation documentation (KuR-MDS). Through event-based data models like CIDOC CRM, these metadata can be linked, thereby enabling the digital representation of object biographies across institutions and research disciplines.

The contribution at HMC 2026 presents experiences from N4O on the development and linking of metadata standards and demonstrates how semantic interoperability sustainably strengthens interdisciplinary research.