TRAIL 5.2:

Excavation database (web-based geodata infrastructure for recording features and finds)

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Summary

The TRAIL meets the need for a unified excavation database design for use by universities, companies, municipal and district archaeology services and authorities. The excavation database will combine the parallel developments of iDAI.field and archaeoDox. N4O will develop and maintain it as a core service.

Description

In this TRAIL, a standardised client, based on iDAI.field, with a minimal, generic data schema is extended to include a document management system (DMS) based on the concepts of archaeoDox, and a multi-client capable backend with the ability to process SQL and JSON data structures as well as geodata. Interfaces with other systems and archives are provided in the form of XML, JSON, OGC-compliant protocols and import/export formats. Based on this client-server infrastructure, the backend is supplemented by a front end, that has online and offline modes and flexible synchronisation

options, for recording structured, primary archaeological attribute (descriptive) and spatial data, as well as essential metadata. The data schema will be standardised enough to allow the data to be collected and stored in a common backend and specific enough to allow the data to be used flexibly in research. An integrated DMS will be used to store, version and annotate the files generated during archaeological fieldwork, such as photos, scanned drawings and survey protocols, so that they can be archived.

Selected excavation data from the DAI, the NLD and the AMH form the basis for this TRAIL, as well as research data from the Kalkriese project. The (meta)data standards are METS/MODS for files in asset management, NORMA as a generic geodata and minimal attribute data schema (core concepts of archaeological fieldwork: survey data, excavation sections, etc.), archaeoDox for document management concepts and structures (general documents produced by fieldwork), and Open Geospatial Consortium (OGC) for geodata. These standards will be implemented or further developed in consultation with the community via TA7. Finally, the development is trialed as a core service (incl. requirements analysis, conception, implementation and tests). The result will be a service that enables small organisations and university research projects without their own infrastructure and RDM capabilities to store their primary data in an archivable form and make it available for reuse. Individual users can add their own asset management and extended attribute data schemas to the system as needed. On the basis of a prototype mobile app, after testing, mobile end devices will be connected via standardised interfaces to the backend.

Relevance

Due to the high diversity of excavation contexts, methods and research objectives, there is currently no digital documentation standard for excavations in Germany that is accepted outside of individual institutions. Likewise, no digital information system exists that meets all the requirements of any type of excavation (or related processes, such as building or topographic surveys). Instead, nonspecialist technologies (predominantly GIS and CAD) have been used over the decades. From a scientific point of view, GIS-based solutions have prevailed, which originate from the geoscience sector. However, the technological and conceptual complexity of a universally applicable "archaeological information system", combined with the scarce resources of the discipline, makes it unlikely that a more discipline-specific solution will ever materialise and (including the associated standards of data structures and information layers) be universally accepted. A more rational and realistic approach is therefore needed, which only becomes possible within an NFDI consortium: Minimal standards and consortium partners existing solutions have to be combined in an open platform. Conceptually, the current hybrid, analogue-digital system of recording and processing data in the field needs to be replaced with a completely digital system, which can be used to process primary data with standard file formats for archiving and interoperable data structures, while avoiding media discontinuities.

Deliverables

For the first time, a digital infrastructure will be available for cross-institutional collection and archiving of essential primary data, along with document and extended asset management. The structures of the NFDI enable a degree of standardisation that would otherwise be unthinkable. In this way, the project translates NFDI-specific potential into concrete technologies. The TRAIL provides a client application for primary data collection based on modern, operating-system-independent technologies in synergy with iDAI.field and archaeoDox; a backend for archiving based on OGC-compliant, established server technologies; a flexibly connectable external solution for extended and institution-specific asset management; demand-oriented and expandable interfaces to other NFDI core services such as N4O.collections, IANUS and DANTE.

The excavation database will be provided as a core service for excavation projects in universities, companies, municipal and district archaeology services and authorities. Excavation data is standardised and transferred to central specialised information systems. The core service serves as a test environment for the standards to be developed by TA1 and provides synergies in the area of technological developments in TA4. Therefore, the TRAIL will contribute to white and blue papers of other TAs.

Work plan & requested funding

Milestone	Description	Month
1	Conception of excavation module in data model	1–2
2	Publication specification of data model	2
3	System development of excavation module	3–5
4	Conception of documentation module in data model	6–7
5	Publication specification of data model	7
6	System development of document module	8–10
7	Conception of geodata module	11–12
8	System development of geodata module	13–15
9	Development and implementation of module interfaces	16–17
10	Test and release	18

FAIR[1]   F1:RDA-F1-01M / F1:RDA-F1-02M / F2:RDA-F2-01M / F3:RDA-F3-01M / A1: RDA-01-01M / A1:RDA-A1-02M / A1:RDA-A1-02D / A1:RDA-A1-03M / A1:RDA-A1-03D / A1:RDA-A1-04D / A1.2:RDA-A1.2-01D / A2: RDA-A2-01M / I1:RDA-I1-01M / I1:RDA-I1-02M / I2:RDA-I2-01M / I3-RDA-I301M / I3:RDA-I3-02M / I3:RDA-I3-04M / R1:RDA-R1-01M / R1.1: RDA1.1-01M / R1.1:RDA-R1-02M / R1.1:RDA-R1-03M / R1.2:RDA-R1.2-01M / R1.2:RDA-R1.2-02M / R1.3:RDA-R1.3-01M / R1.3:RDAR1.3-02M

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