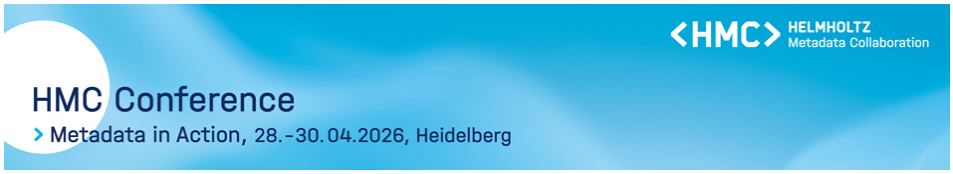

Beitrag ID: **67** Typ: **Talk**

FDO-Ops Prototype for machine-actionable FDOs

This talk presents the FDO-Ops model as a prototype framework that makes FAIR Digital Objects (FDOs) machine-actionable by discovering, assessing, and executing operations across heterogeneous data resources in an interoperable way.

The prototype builds on a DOIP/HTTP client interface where every management function and every Operation FDO is invoked with a uniform request pattern, providing a stable, client-agnostic interaction layer independent of underlying systems. It integrates an identifier and FDO type system supporting base infrastructure, i.e., the Handle Registry, a Data Type Registry, and a Typed PID Maker (TPM) instance. An extended service component called TPM Adapter is used that (1) supports Elasticsearch-based full-text search over information records; (2) ingests associated FDO–Operation and FDO–FDO relationships into a Neo4j graph for efficient traversal and rule-enforced consistency; (3) uses a mapping component that translates technology-dependent execution protocols of operations into a JSON-based execution map, run by an Executor module (e.g., for Web API calls or script executions).
Conceptually, FDO-Ops advances several interoperability layers defined in different interoperability models, in particular the technical and syntactic layers, by:

- treating operations themselves as reusable Operation FDOs
- separating workflows into phases (discovery, typed metadata assessment, and bit-sequence processing)
- integrating existing standards (e.g., APIs, SKOS/RDF) without requirinig changes to established (meta)data systems.

Applicability is exemplified with cross-domain use cases: discovering relevant FDOs, listing associated operations, interpreting SKOS vocabularies via a SPARQL-based endpoint, and executing data-level preprocessing/validation for Numpy and SKOS RDF/XML files.
Overall, this work shows how latest advances in research on machine-actionable FDOs, turning them from passive containers into reusable computational instruments, pave the way towards truly interoperable data ecosystems.

ONLY WORKSHOPS - Proposed interaction format

Alternative Track

1. From Harmonisation to Action(ability)

ONLY WORKSHOPS - Tentative audience

ONLY WORKSHOPS - Maximum number of participants

ONLY WORKSHOPS - Special technical requirements

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Track Klassifizierung: HMC Conference 2026 Track Topics: 2. Software Interoperability for (Meta)data Acquisition