Reconstructing Digital Identity Optimization and the Ontology of Digital Identity Across a Distributed Semantic Ecosystem: Referential Continuity, Conceptual Evolution and Network Structure

Author-Led Research Using ChatGPT

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Referential Continuity, Conceptual Evolution and Network Structure

Research report — Observation snapshot: 30 October 2026

Abstract

Digital Identity Optimization (DIO) and the Ontology of Digital Identity (ODI), developed by Daniel Beránek, constitute a developing conceptual framework distributed across multilingual publications, persistent archival records, a machine-readable reference vocabulary, software repositories, application mappings and identity-linked platforms.

This study examines the implementation and distribution of DIO/ODI through its own conceptual perspective, complemented by heterogeneous graph analysis. Its central question is whether the distributed ecosystem sustains a recognizable, referentially continuous and meaningfully reconstructable identity across different representations and entry points despite partial inconsistencies, historical differences, incomplete connections and uneven updating.

The investigation begins with the machine-readable Reference Vocabulary and its source repository, then follows the relationships into the publication corpus, website, multilingual manifestations and secondary distribution layers.

The findings indicate that the ecosystem exhibits substantial but uneven reconstruction resilience. Its principal strengths are stable concept identifiers, explicit conceptual provenance, archival continuity, differentiated distribution roles and an increasingly structured metadata registry. Its principal weaknesses concern temporal alignment, historically changing semantic relations, incomplete publication navigation and differences between the document structures intended by an artifact and those exposed by particular platform interfaces.

A graph analysis of the repository's directed inter-work relation registry identifies 21 typed relationships among 17 distinct identifiers. The resulting network has a recognizable publication lineage and a strongly connected metadata aggregation layer, but these measurements describe the declared corpus relations rather than the global hyperlink network.

The study distinguishes conceptual continuity from representational uniformity and local acquisition difficulty from system-wide reconstruction failure. It concludes that, within the inspected observation domain, DIO/ODI remains meaningfully reconstructable, especially at the level of framework identity

and principal conceptual relationships. Reconstruction of the latest publication state, individual language projections and particular distribution relationships is less uniform.

Keywords: Digital Identity Optimization; Ontology of Digital Identity; DIO; ODI; semantic coherence; referential continuity; identity-preserving variation; semantic vulnerability; knowledge representation; SKOS; graph theory; multilingual digital identity; provenance; entity resolution.

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1. Introduction

Digital Identity Optimization (DIO) and the Ontology of Digital Identity (ODI) address a problem that becomes increasingly significant as digital identity is represented, interpreted and reconstructed across heterogeneous information environments.

An entity's digital identity is not contained in a single page, publication, database record or profile. It emerges through the relationships between distributed representations, their interpretations, the contexts in which they are encountered and the mechanisms through which observers reconstruct the underlying referent.

The DIO/ODI project applies this perspective to digital identity as both a theoretical subject and a field of deliberate optimization.

DIO represents the applied discipline concerned with improving the conditions under which an entity's digital identity can be reconstructed by relevant human and machine observers. ODI provides the theoretical meta-layer concerned with the existence, persistence, variation and reconstruction of digital identity itself. The distinction is explicit in the foundational manifesto and remains present in the current Reference Vocabulary.[1][2][3]

The project is itself distributed across a heterogeneous environment. Its representations include:

- A Czech-language foundational manifesto and fifteen additional language projections.
- A living Czech and English web presentation.
- Archival publications on Zenodo.
- Conceptual and analytical papers.
- A machine-readable SKOS/RDF vocabulary.
- JSON-LD and Turtle serializations.
- A versioned GitHub reference-model repository.
- Derived application mappings.
- Secondary distribution through Hugging Face, Kaggle and ResearchGate.
- Author-linked identifiers and AI-oriented context resources.

This creates an opportunity for a reflexive investigation: the framework's own conceptual resources can be used to examine the conditions under which its distributed representations preserve the identity of the framework and its author.

The relevant question is not whether every representation is complete, perfectly synchronized or identical. Nor is it whether every individual access route succeeds.

The question is whether the distributed ecosystem maintains sufficient referential and semantic continuity for an observer to reconstruct DIO/ODI meaningfully, despite differences between representations and the changing state of the underlying corpus.

The investigation therefore focuses on the relationship between three aspects:

1. **Conceptual identity:** whether the underlying framework and its principal distinctions remain recognizable.

2. **Referential continuity**: whether publications, authorship assertions, concepts and versions remain attributable to their intended referents.
3. **Reconstructability**: whether an observer entering through different parts of the ecosystem can recover a sufficiently compatible understanding of the framework.

These aspects are interdependent but not interchangeable.

A stable DOI can preserve the identity of a historical publication without guaranteeing that it describes the current conceptual state. A current vocabulary can clarify present terminology without explaining the historical development of every term. A multilingual archive can preserve broad conceptual correspondence without demonstrating equivalent currency across every language.

The significance of each condition must therefore be assessed relative to the reconstruction task it affects.

1.1 Observation boundary and temporal scope

The observation snapshot is 30 October 2026.

DIO/ODI is treated as an ongoing optimization and conceptual-development process rather than a permanently achieved state. The ecosystem is examined as it exists at a particular point in that process.

The investigation follows the sequence:

1. Machine-readable vocabulary and reference repository.
2. Archival publication and version infrastructure.
3. Website and professional-biographical representations.
4. Multilingual distribution.
5. Secondary distribution and machine-oriented resources.
6. Cross-layer relationships and graph structure.

Four analytical levels are distinguished throughout:

- **Artifact condition**: what is actually documented, present, missing or inconsistent.
- **Architectural role**: how the element contributes to or complicates DIO/ODI reconstruction.
- **Local consequence**: what a particular observer can recover or misunderstand through a particular pathway.
- **System-level significance**: whether the condition materially compromises reconstruction of the framework as a whole.

This distinction is essential because the presence of a reconstruction problem does not automatically establish identity collapse, just as the presence of a safeguard does not automatically establish successful protection.

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2. Research Approach and Corpus

2.1 Machine-readable orientation

The investigation began with the DIO/ODI Reference Vocabulary:

https://vocab.danielberanek.cz/dio-odi/

and its source repository:

https://github.com/dan-beranek/dio-odi-reference-model

This ordering is analytically important.

The machine-readable layer provides a relatively compact representation of the conceptual system before the broader publication corpus introduces the additional complexity of historical development, authorial narrative, translation and different publication genres.

The vocabulary page identifies version 0.2.0 as the live reference vocabulary and version 0.5.0 as the current archived Reference Model package. It documents the canonical namespace, persistent concept identifiers, conceptual relations, provenance and revision notes.[4]

The repository provides the underlying files and documentation, including:

- `vocabulary/dio-odi-skos.ttl`
- `vocabulary/dio-odi.jsonld`
- `docs/terminology.md`
- `docs/source-map.md`
- `docs/concept-map.mmd`
- `examples/queries.sparql`
- `metadata/works.json`
- `metadata/relations.json`
- `metadata/distributions.json`
- `metadata/references.json`
- `metadata/keywords.json`
- `CITATION.cff`
- `.zenodo.json`
- `llms.txt`

The repository also separates the canonical vocabulary from derived application mappings.

This makes it possible to distinguish the identity of a concept from the different analytical environments into which it is projected.

The direct web-rendering route for Turtle and JSON-LD did not expose their contents through the browser acquisition interface. The corresponding repository files were therefore used to inspect the actual serializations. This is an acquisition limitation, not evidence that the machine-readable resources are absent.

2.2 Archival and publication corpus

The principal archival resources examined include:

- Canonical multilingual manifesto, DOI `10.5281/zenodo.21610934`.
- DIO Conceptual Framework, current version 1.1.0, DOI `10.5281/zenodo.23305929`.
- The Crisis of Entity Resolution in Heterogeneous AI Environments, current registry version 1.1.0, DOI `10.5281/zenodo.22416026`.
- Minimum Viable Digital Identity Optimization, DOI `10.5281/zenodo.23226205`.
- From Entity Resolution Anomalies to Reconstruction Failure Modes, DOI `10.5281/zenodo.23269323`.
- DIO/ODI Reference Vocabulary, concept DOI `10.5281/zenodo.23272897`.
- DIO/ODI Reference Model v0.5.0, DOI `10.5281/zenodo.23643845`.
- Constraining the Commit Boundary, DOI `10.5281/zenodo.23580733`.[5][6][7][8][9][10][11]

The author's ORCID identifier, `0009-0004-0050-0264`, is repeated in the repository metadata and citation information.

The investigation also considered the author's ResearchGate representation and the broader publication search space.

Direct inspection of some identity-linked platform pages was limited by JavaScript rendering or access restrictions. Consequently, the existence and designated function of these resources can be established through their references in the website and distribution documentation, but not every profile-level metadata field can be independently confirmed.

2.3 Website and discursive corpus

The website provides three particularly relevant entry points:

- Central hub: https://danielberanek.cz/manifest-dio/
- Living English manifesto: https://danielberanek.cz/manifesto-of-digital-identity-optimization-dio-and-ontology-of-digital-identity-odi/
- Professional biography: https://danielberanek.cz/od-pultu-az-k-seo-a-copy-s-ostrymi-hroty-profesni-bio/

The central hub provides the principal multilingual navigation structure. The English manifesto presents a more developed conceptual articulation, while the biography supplies the author's retrospective account of the framework's genesis.[2][3][12]

2.4 Graph methodology

The ecosystem requires several distinct graph representations.

They must not be collapsed into a single undifferentiated network.

Graph	Principal nodes	Principal edges	Analytical purpose
Conceptual graph	DIO/ODI concepts	SKOS relations, conceptual relations	Recover the conceptual organization
K6 graph	Six identity dimensions	Mutual conceptual interdependence	Represent the semantic structure
Publication graph	Publications and versions	Derivation, reference, version relations	Recover corpus genealogy
Distribution graph	Archives and platform copies	Identity, version and distribution relations	Examine representation equivalence
Navigation graph	Website pages and resources	Hyperlinks and alternate-language links	Examine discoverability
Identity graph	Author and professional representations	Attribution and identity assertions	Recover authorship and persona

Numerical calculations are restricted to the machine-readable metadata relation registry, whose edges have explicit direction and semantic types.

They are not treated as measurements of the complete public web.

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3. Conceptual Architecture and Historical Development

3.1 DIO and ODI as related but differentiated levels

The central conceptual distinction is relatively stable across the examined representations.

DIO concerns the intentional optimization of conditions under which digital identity is reconstructed.

ODI concerns digital identity as an object of theoretical examination, including its existence, persistence, variation and interpretation.

The Reference Vocabulary formalizes the distinction:

- DIO is an applied discipline.
- ODI is its theoretical meta-layer.

Their relationship is represented through `skos:related`, rather than through a hierarchy that would imply one is simply a narrower instance of the other.[4]

The English manifesto expands this distinction by treating the two levels as different abstractions of the same broader problem.[3]

This distinction is consequential for reconstruction.

An observer who encounters only the name Digital Identity Optimization might classify the framework as a marketing methodology. An observer who also encounters ODI, the manifesto's theoretical sections and the reference vocabulary can recover a substantially broader conceptual ambition.

The two names therefore perform different but complementary identifying functions.

DIO communicates applied intent. ODI communicates the theoretical scope.

3.2 The K6 Semantic Connectome

The manifesto presents six mutually conditioned dimensions:

1. Entity.
2. Representation.
3. Interpretation.
4. Trust.
5. Relationship.
6. Reconstruction.

The K6 Semantic Connectome is explicitly represented as a complete graph rather than a linear process.

The dimensions are not sequential workflow stages. They describe mutually influencing aspects of digital identity within a shared semantic field.[3]

The vocabulary preserves K6 and identifies it as a finer-grained candidate model. It does not represent it as a logical consequence of MVDIO or as a literal causal graph.[4][9]

This qualification is important.

K6 is the framework's conceptual model of identity interdependence. It is not a description of how the publications, websites and archival records connect.

A mathematical representation of K6 as an ordinary undirected complete graph would contain six vertices and fifteen pairwise edges. Those conceptual relationships must not be confused with the actual hyperlinks or publication relations measured elsewhere in this study.

The manifesto also introduces the Semantic Field as a working analogy rather than a literal physical field.

The current vocabulary makes this distinction explicit: the Semantic Field is a modeled designation for the shared configuration of mutually conditioned dimensions, not an ontological substance.[4]

This is a useful example of conceptual development that retains expressive richness while introducing more precise interpretive constraints.

3.3 Minimum Viable DIO and the emergence of reconstruction conditions

The MVDIO paper, published on 8 October 2026, introduces a coarser analytical model developed through adversarial reduction of the broader DIO framework.[7]

It distinguishes three conditions that are easily conflated:

- The existence of a reconstruction mechanism.
- The existence of an optimizable digital identity problem.
- The deliberate intervention undertaken to address that problem.

Its basic analytical structure separates:

- A referentially continuous entity.
- Its distributed digital representational state.
- An observer and the reconstruction mechanism through which identity is inferred.

This reduction is important for the interpretation of the entire corpus.

It distinguishes an existing identity from the representations through which it is encountered and from the reconstruction performed by an observer.

It also introduces important qualifications:

- Consistency does not require uniformity.
- Divergent reconstructions are not automatically semantic fragmentation.
- Optimization requires a defined observation domain.
- Legitimate variation must remain anchored to referential continuity.
- Semantic vulnerability is a property of robustness and risk, not itself a realized failure state.

These distinctions help explain why the multilingual corpus and historical versions should not be evaluated against an ideal of textual uniformity.

A representation can differ from another without necessarily creating a different referent.

The relevant question is whether the difference preserves sufficient conceptual correspondence for the intended reconstruction task.

3.4 Reconstruction Failure Modes

The subsequent taxonomic note and Reference Vocabulary organize the failure taxonomy into four principal branches.[8][4]

Category	Included concepts
Referential Reconstruction Failures	Entity Substitution, Merge Failure, Split Failure, Entity Omission
Semantic Coherence Failures	Semantic Fragmentation
Temporal Reconstruction Failures	Temporal Discontinuity, Temporal Misalignment
Contextual Adequacy Failures	Contextual Displacement

Several related concepts remain outside the hierarchy:

- Identity Collapse is treated as a phenomenon-level concept.
- Semantic Vulnerability is a robustness-related property.

- Semantic Robustness is its conceptual counterpart.
- Reconstruction Capture remains related without a stronger causal classification.

This separation is analytically useful.

Not every weakness in the distributed corpus constitutes one of the taxonomy's failure modes.

A stale publication date, for example, can create temporal misalignment for a publication-status reconstruction task. It does not automatically establish semantic fragmentation or identity collapse of the framework itself.

Likewise, an inaccessible web viewer can obscure the relationships between files without demonstrating that the underlying documents have disappeared.

The taxonomy is most informative when applied at the level appropriate to the actual problem.

3.5 Identity-preserving variation and continuity

The vocabulary defines Referential Continuity as the condition under which an entity can change over time while remaining the same referent for analytical purposes.

Identity-Preserving Variation describes legitimate contextual differences between reconstructions that do not require uniformity.[4]

This distinction provides a particularly useful interpretive resource for the present investigation.

The DIO/ODI ecosystem contains:

- Historical publications.
- Living web documents.
- Multilingual projections.
- Updated conceptual definitions.
- Versioned archival artifacts.
- Derived technical mappings.

These are not expected to remain textually identical.

Their identity is sustained through the relationships that allow observers to recognize their common conceptual referent while distinguishing their specific historical or contextual states.

The vocabulary's treatment of Identity-Preserving Constraints further qualifies this relationship.

The current plural concept describes a domain-configured set of conditions. It does not imply one universal, context-free inventory of constraints.

The older singular URI is retained as a separate historical entry, with an editorial note explaining its status. No semantic equivalence between the two identifiers is asserted.

This is a controlled historical distinction rather than a forced merger.

It nevertheless introduces a cost for automated retrieval and entity resolution, because a machine cannot safely infer equivalence merely from similar labels.

3.6 Conceptual evolution across the publication corpus

The corpus exhibits a recognizable development sequence.

Date	Development	Main significance
22 June 2026	Initial Czech manifesto and articulation of ODI	Establishment of the central conceptual distinction
15–26 July 2026	Creation of fifteen additional language projections	Multilingual representation
26–27 July 2026	Canonical multilingual archival edition	Persistent publication baseline
7 August 2026	DIO Conceptual Framework v1	More explicit theoretical and applied positioning
20 August 2026	Manifesto v2 in Czech and English	Expanded conceptual articulation
2 September 2026	Initial Crisis of Entity Resolution paper	Development of reconstruction-related problems
8 October 2026	MVDIO	Adversarial reduction and explicit reconstruction conditions
9 October 2026	Taxonomic Note	Consolidated failure-mode distinctions
11 October 2026	DIO Conceptual Framework v1.1 and Crisis v1.1	Further publication and metadata development
22 October 2026	Constraining the Commit Boundary	Application to agentic entity resolution
25 October 2026	Reference Model v0.4.0 and v0.5.0 archives	Expanded machine-readable infrastructure

The progression is not simply an increase in the number of publications.

The conceptual development moves from initial articulation toward increasingly explicit analytical boundaries, taxonomies, provenance and application interfaces.

The Reference Model's source map records several transitions:

- Essential Vector is reinterpreted through MVDIO.
- Semantic Vulnerability moves outside the failure-mode hierarchy.
- Semantic Fragmentation and Temporal Discontinuity are refined.
- Identity-Preserving Constraints becomes a collective concept.
- K6 is retained as a candidate model with its own status.[9][10]

These transitions contribute to continuity because historical changes remain traceable.

They also mean that an observer entering through the earliest manifesto will not reconstruct precisely the same level of detail as an observer entering through the current reference model.

That difference is a characteristic of the framework's development, not automatically a contradiction.

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4. Distributed Representation and Cross-Layer Continuity

4.1 Machine-readable reference infrastructure

The Reference Vocabulary is the most explicit semantic anchor in the ecosystem.

Its canonical namespace is:

`https://vocab.danielberanek.cz/dio-odi/#`

The vocabulary provides stable concept identifiers, labels, definitions, broader/narrower relations, related-concept relations, source references and revision notes.

It is intentionally SKOS-first, with a possible future OWL layer reserved for stronger axioms justified by subsequent development and review.[4][10]

The practical significance of this decision is that the current model does not need to overstate its formal commitments in order to support machine-readable interpretation.

The vocabulary distinguishes:

- Concepts and their labels.
- Hierarchical and non-hierarchical relationships.
- Historical entries and current terminology.
- Canonical concepts and derived application mappings.
- Concepts and the publications from which they originate.

The current vocabulary's serializations include Turtle/SKOS/RDF and JSON-LD.

The repository documentation also identifies machine-query examples, a human-readable terminology file and a concept-to-source map.[10]

These provide complementary access methods.

A human reader can consult the terminology and source map. A semantic-web application can use the RDF representation. A system using JSON-LD can consume a structured serialization.

The same concept identifiers provide a common referential basis across these different modes.

The importance of the source map

The `docs/source-map.md` file is particularly relevant to reconstructability.

It records the primary publication associated with each concept or concept cluster, together with a current-status interpretation.

This includes the current and historical treatment of Identity-Preserving Constraint(s), the movement of Semantic Vulnerability outside the failure hierarchy, and the refinement of Entity Substitution and Entity Omission.[9]

The source map is therefore more than a bibliography.

It documents the relationship between a concept's current representation and its historical development.

Its function can be interpreted within DIO as support for referential continuity and protection against semantic displacement.

It does not guarantee that every external observer will follow or correctly interpret the source relations, but it provides a concrete reconstruction path.

4.2 Repository structure and versioned releases

The GitHub repository is not simply a mirror of the vocabulary page.

It contains the reference model's source material, application mappings, metadata registries, documentation and citation metadata.

The repository's current archived release is v0.5.0, corresponding to Zenodo DOI `10.5281/zenodo.23643845`.

Its included vocabulary version is v0.2.0.

The preceding v0.4.0 archive contains vocabulary v0.1.0. Earlier releases include v0.3.2 and v0.3.1.[10][11]

This helps explain apparent differences between earlier descriptions of the repository and the later archived records.

The vocabulary version must be interpreted relative to the Reference Model release in which it is included.

A repository snapshot from one release and a later archive are not necessarily describing the same semantic state.

The current documentation explicitly identifies these release relationships, making it possible to reconstruct the progression rather than treating the differences as an unexplained inconsistency.

The distinction between package and namespace

The repository also distinguishes the versioned archived software package from the persistent vocabulary namespace.

The archive represents a particular release of the Reference Model.

The namespace is intended to remain stable independently of the repository host.

The metadata relation between the two is deliberately held for semantic review rather than automatically asserted as `isIdenticalTo`.

This is an important instance of conservative identity assertion.

The package and the namespace are related representations, but the system does not automatically claim that they are identical entities.

That distinction is particularly relevant for automated publication and semantic-web applications.

4.3 Operational metadata and publication genealogy

The current metadata registry includes:

- `works.json`
- `relations.json`
- `distributions.json`
- `references.json`
- `keywords.json`

The registry explicitly describes itself as an operational metadata layer separate from the canonical vocabulary.[13][14][15]

This separation means that publication metadata can change without automatically changing concept definitions.

It also provides a way to distinguish different types of publication relationships.

For example:

- `isDerivedFrom` identifies conceptual or publication genealogy.
- `references` records citation relationships.

- `isNewVersionOf` identifies a later representation of a work.
- `isVersionOf` distinguishes version relations.
- `isIdenticalTo` identifies equivalent distribution copies.
- `isDocumentedBy` links the reference model to its website documentation.

This vocabulary of relations is more useful than a generic collection of hyperlinks because it conveys the intended nature of each relationship.

It also allows the registry to preserve distinctions between current and historical publication states.

Version-scoped distribution relations

The registry provides a particularly instructive example involving the DIO Conceptual Framework.

Its original Zenodo record, DOI `10.5281/zenodo.21839423`, remains a valid historical publication.

The current version 1.1.0 is archived under DOI `10.5281/zenodo.23305929`, published on 11 October 2026.

The current record identifies corresponding ResearchGate, SSRN and Figshare representations as versions of the current work.

The registry explicitly warns against projecting the current relationship retroactively onto the earlier Zenodo version.[14][16]

This is a practical application of temporal reconstruction.

A relationship between two documents can change meaning when the version of the underlying work changes.

The registry preserves that distinction instead of forcing all historical representations into one timeless equivalence claim.

4.4 The website as the narrative identity layer

The website provides a different type of reconstruction support.

The central DIO/ODI hub introduces the manifesto, its language projections, archival status and distribution structure.

The living English manifesto expands the theoretical presentation and includes sections on:

- The Semantic Field.
- The Latent Semantic Space.
- The epistemology of DIO.
- The epistemology of identity.
- The role of non-human observers.
- The relationship between DIO and ODI.
- The intellectual legacy of the framework.
- The simultaneous configuration of semantic tensions.[3]

The website's structure also places DIO within the author's broader professional identity.

Its navigation includes SEO, copywriting, strategic services, technical copywriting, academic publications and DIO.

This context has two effects.

First, it provides useful information about the author's professional background and the practical circumstances from which the framework emerged.

Second, it creates a possible interpretive tension: an observer who encounters DIO through the website's commercial SEO context may initially interpret it as an extension of marketing services rather than as a broader conceptual framework.

The theoretical manifesto, archival papers and machine-readable vocabulary provide additional context that can correct this narrow reading.

This is an example of how different representations compensate for different levels of contextual detail.

It does not establish that every observer will make the correction.

4.5 Genesis and professional identity

The professional biography is explicitly presented as a non-linear professional ethnography rather than a conventional chronological CV.

It describes the author's experience across several fields:

- Retail and direct sales.
- Journalism.
- Psychology.
- Communication studies.
- Public relations.
- Copywriting.
- SEO.
- Web technologies and technical content.
- Data and digital systems.[12]

The manifesto describes DIO as an ex-post articulation arising from reflection on professional practice and the creation of a multimodal E-E-A-T identity object.

The biographical account identifies the discovery and articulation of DIO through retrospective analysis of approximately twenty-four years of work with meaning, communication and digital representation.[2][3]

This provides a recognizable genesis narrative.

Its function is not merely biographical.

It connects the theoretical dimensions of DIO to the different professional domains from which the author reports having encountered related identity-reconstruction problems.

The transition from practical experience to theoretical articulation is therefore explicitly represented.

The account remains an authorial representation of intellectual genesis rather than an independently reconstructed history of every contributing influence.

Nevertheless, it is sufficiently connected to the manifesto and the publication corpus to provide a meaningful explanation of how the framework is positioned.

4.6 Multilingual representation

The central hub identifies sixteen language versions:

Language	Code
Czech	CZ
English	EN

Language	Code
German	DE
French	FR
Spanish	ES
Italian	IT
Portuguese	PT
Polish	PL
Finnish	FI
Hungarian	HU
Ukrainian	UK
Chinese	ZH
Japanese	JA
Korean	KO
Arabic	AR
Hindi	HI

The hub describes the Czech text as the source and interpretative reference, with the other languages functioning as autonomous but meaningfully coordinated projections.[2]

The canonical Zenodo edition contains sixteen HTML manifesto documents and supporting files, including a README, a licence file and a changelog. Its published record identifies the sixteen-language structure and the archival relationship to the website.[1]

The translation disclosure states that the projections were prepared with AI-assisted translation, primarily using Gemini 3.1 Pro Preview, with selective cross-model verification through Perplexity, Claude, Mistral, Qwen and Kimi.

The author states that all translations were reviewed to preserve conceptual fidelity to the Czech source.[1][2]

These disclosures establish a translation process and its intended conceptual orientation.

They do not establish that every language version is synchronized to the same current conceptual state.

Temporal alignment

The website changelog records that version 2.0.0 was published in Czech and English on 20 August 2026.

The other language manifestations remain associated with the canonical v1 multilingual edition.

The archived multilingual edition is therefore not a defective version of the current living web manifesto. It preserves a historical state.

However, a reader entering through a language other than Czech or English may encounter less developed theoretical detail than a reader entering through the latest living manifestation.

The difference is material for detailed reconstruction but less consequential for identifying the overall framework.

The principal conceptual distinction between DIO and ODI, the six semantic dimensions and the basic purpose of the framework remain recoverable from the multilingual corpus.

The full degree of semantic correspondence across all sixteen texts has not been independently measured. The language inventory and translation provenance are established, but this study does

not claim a complete parallel-corpus alignment audit.

4.7 Hugging Face and Kaggle

The Hugging Face dataset is explicitly described as a secondary distribution layer for the canonical multilingual archive.

Its dataset card identifies Zenodo DOI `10.5281/zenodo.21610934` as the primary bibliographic record and instructs users to treat Hugging Face as an access point rather than as a new canonical publication.[17]

The dataset includes the sixteen HTML documents, a README, a licence file and a changelog.

At the time of inspection, its interface displayed 435 rows in the automatically converted Parquet dataset.

This number is not the number of manifesto documents.

The dataset card explains that the conversion process produces a unified text stream from the repository's HTML files and supporting text documents. The viewer does not expose the sixteen HTML files as sixteen separate file-level documents.

It explicitly recommends using the individual files in the Files and Versions interface when document-level structure matters.

This is a significant example of observer-relative reconstruction.

The source documents remain present according to the dataset's file inventory, but the default viewing mechanism does not faithfully expose their original document structure.

An observer relying only on the unified stream may lose language boundaries and document-level distinctions.

An observer retrieving the individual HTML files can recover them.

The same dataset card identifies a dataset size of approximately 8.14 MB and declares CC BY 4.0 for that distribution layer.

The Zenodo multilingual package is approximately 8.1 MB.[1][17]

The website and archival documentation also describe a Kaggle layer containing sixteen multilingual HTML documents and one hub document, designed for interactive browsing, search and structural comparison.

The Kaggle resource's role is documented, but its complete current interface and functionality were not independently inspected in this observation.

The important distinction is therefore between an intended distribution capability and a demonstrated outcome.

Hugging Face provides a directly inspectable secondary distribution. Kaggle is documented as another distribution pathway whose current behaviour requires separate verification.

4.8 AI-oriented context files

The repository contains its own `llms.txt`, which provides a machine-oriented overview of:

- The current Reference Model release.
- The canonical vocabulary namespace.
- Turtle and JSON-LD files.
- Human-readable terminology.

- The source map.
- Application mappings.
- The metadata registry.
- Publication and release references.

This file is useful because it reduces the need for a non-human observer to infer the repository structure from the README alone.[10]

The website also identifies `llms.txt` and `llms-full.txt` as AI-oriented context resources.

Their direct retrieval was not successful through the acquisition route used in this observation. Their status as designated resources should therefore be distinguished from a verified assessment of their complete contents.

The repository-level `llms.txt` provides an independently inspectable machine-oriented entry point, but it is not a substitute for the uninspected website context files.

The significance of these resources is their intended role in making a distributed information structure easier to navigate.

They do not establish actual consumption by particular AI systems or successful downstream reconstruction.

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5. Graph-Theoretical Analysis

5.1 Conceptual and infrastructural graphs

The ecosystem contains several graph structures that must be distinguished.

K6 conceptual graph

K6 represents six mutually conditioned dimensions of identity.

Its structure concerns conceptual interdependence, not publication navigation.

SKOS vocabulary graph

The Reference Vocabulary represents hierarchical and related conceptual relationships.

It includes a taxonomy of Reconstruction Failure Modes and related concepts that deliberately remain outside that taxonomy.

Publication and provenance graph

The metadata registry represents publications, source relationships, version relationships and distribution representations.

This is the graph for which reliable degree calculations are available.

Website navigation and distribution graph

The website hub links to language versions, archival records, dataset representations, secondary publications and reference resources.

The full hyperlink graph has not been exhaustively crawled and measured. Its global in-degree, out-degree and centrality therefore cannot be established from the available evidence.

The following numerical results describe the declared metadata relation graph, not the entire online ecosystem.

5.2 The metadata relation graph

The current repository's `metadata/relations.json` is version 1.5.0.

It describes directed relationships from a subject to an object, using relation types aligned with Zenodo/DataCite semantics where possible.[14]

The registry contains:

- **17 distinct identifiers.**
- **21 directed typed relation records.**
- **19 relations marked** `approved_for_zenodo: true`**.**
- **2 relations deliberately withheld from automatic Zenodo projection.**

The two withheld relationships are:

1. `manifest-v2-web → manifest-v1`, recorded as `isNewVersionOf`. The living web edition is not itself a Zenodo deposit, so the relation is useful in the corpus registry but is not automatically projected into Zenodo metadata.
2. `reference-model → vocabulary namespace`, considered as `isIdenticalTo` but held for semantic review until the identity relationship between the archived package and persistent namespace is explicitly established.

These are not simply missing edges.

They document a distinction between a useful analytical relationship and one considered sufficiently justified for automatic archival projection.

Relation-type distribution

Relationship type	Number of edges
`isDerivedFrom`	6
`references`	6
`isIdenticalTo`	4
`isVersionOf`	3
`isNewVersionOf`	1
`isDocumentedBy`	1
Total	**21**

The four `isIdenticalTo` relations include three verified MVDIO distribution copies and the one unapproved candidate relationship between the archived Reference Model package and the vocabulary namespace.

The graph therefore preserves different semantic relationships rather than treating every connection as equivalence.

5.3 Degree distribution

The following degree values were calculated directly from the 21 directed entries in `metadata/relations.json`.

Node	Out-degree	In-degree
Reference Model	9	0
DIO Conceptual Framework	4	1
MVDIO	4	2
Taxonomic Note	2	1
Crisis of Entity Resolution	1	2
Manifest v2 web edition	1	0
Manifest v1 archival edition	0	5
Other external and documentation targets	0	1 each

The Reference Model has the highest out-degree in this registry graph.

Its nine outgoing relations connect it to:

- The foundational manifesto.
- The DIO Conceptual Framework.
- The Crisis of Entity Resolution paper.
- MVDIO.
- The Taxonomic Note.
- The external HEM research.
- The website hub.
- The vocabulary namespace candidate.
- The Commit-Boundary paper.

Eight of these relationships are approved for automatic Zenodo projection.

This supports interpreting the Reference Model as the principal metadata aggregation point within the declared publication graph.

The Manifest v1 archival edition has the highest in-degree, with five relationships directed toward it.

These represent its position as the foundational source of several later works and the living web manifesto.

The degree pattern therefore reflects two complementary roles:

- The foundational manifesto acts as an important historical source.
- The Reference Model acts as a later aggregation and reference point.

The MVDIO and DIO Conceptual Framework nodes have four outgoing relationships each, partly because the registry records their secondary distribution representations.

The Taxonomic Note connects MVDIO with the earlier Crisis paper.

The resulting structure is not simply a chain of publications.

It contains a central conceptual lineage, references across related publications, and distribution branches that distinguish different versions and copies.

Approved subgraph

If the two non-approved entries are excluded, the automatically projectable subgraph contains:

- Fifteen identifiers.
- Nineteen directed relationships.

This subgraph has a smaller scope because the living web manifesto's relationship to its earlier archival edition and the candidate package-to-namespace equivalence are not included.

This matters for interpretation.

The absence of those relationships in the approved subset does not mean that the resources are unrelated or undiscoverable. It reflects the more restrictive semantics of automatic archival metadata projection.

5.4 Topology and structural roles

Within the observed metadata boundary, the graph has three recognizable structural characteristics.

First, publication lineage.

The founding manifesto is referenced and used as a source for subsequent publications.

Second, metadata aggregation.

The Reference Model consolidates references to the principal conceptual and analytical works, linking them to the vocabulary, website and external research.

Third, distribution leaves.

External ResearchGate, Figshare and SSRN representations are connected to particular source publications through distinct relation types.

This creates a partially hierarchical and partially meshed structure.

It is not appropriate to describe it as one universal hub-and-spoke network.

The Reference Model has a prominent position in the metadata graph, but the graph does not measure the number of incoming external links to the website or the frequency with which independent observers encounter it.

Similarly, the Manifest v1 node's high in-degree represents its role within the selected publication registry, not global web centrality.

No defensible betweenness or closeness centrality values for the full DIO/ODI ecosystem can be obtained without a more complete and typed collection of hyperlinks, citations, concept relations and identity assertions.

5.5 Cross-layer connections

The most important cross-layer connection is the relationship between the Reference Model, its canonical namespace, the archival publication corpus and the website hub.

The Reference Model record:

- Identifies the GitHub repository.
- References the manifesto.
- References the conceptual framework.
- References the Crisis of Entity Resolution paper.
- Derives from MVDIO and the Taxonomic Note.
- Includes the external HEM reference.
- Identifies the website hub as documentation.
- References the Commit-Boundary paper.[11]

The website hub, in turn, identifies the multilingual archive and secondary distribution channels.

The vocabulary page links back to the hub, the repository, the concept DOI and the archived Reference Model.

These relationships form inspectable connections between the narrative, archival and semantic layers.

The strongest relationship is not one single hyperlink but the repeated identification of the same conceptual and publication referents across several representations.

This provides meaningful structural support for reconstruction even when an individual representation does not contain all the information required for a complete account.

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6. Reconstruction Pathways and Materiality

The graph structure becomes more meaningful when connected to actual observer pathways.

6.1 Website hub as a narrative entry point

An observer entering through `https://danielberanek.cz/manifest-dio/` encounters the multilingual manifesto and its broader context.

This pathway supports recovery of:

- The central DIO/ODI distinction.
- The framework's genesis.
- Its intended multilingual structure.
- The authorial explanation of its conceptual scope.
- The role of Zenodo as the archival reference.
- Links to secondary distribution channels.
- Selected subsequent publications and application artifacts.

The hub is especially useful for reconstructing the relationship between the framework and its author.

Its limitation is that it does not function as an exhaustive, fully current publication database.

For example, the current DIO Conceptual Framework v1.1.0 has a separate Zenodo record, DOI `10.5281/zenodo.23305929`, while the original website references may still lead an observer toward the earlier DOI `10.5281/zenodo.21839423`.

The original record remains a valid historical publication. The difficulty concerns locating the preferred current version.

This is a publication-navigation weakness, not a loss of the publication's identity.

6.2 Zenodo and the Reference Model as archival entry points

An observer entering through the Zenodo Reference Model v0.5.0 encounters a different picture.

The record offers a more structured view of:

- Current concept definitions.
- Publication provenance.
- The current failure-mode taxonomy.
- Versioned release history.
- Application mappings.
- External technical references.
- The relationship between the Reference Model and the source corpus.

The Reference Model explicitly describes itself as a semantic layer above the publication corpus rather than a replacement for the underlying papers.[11]

This pathway provides stronger support for reconstructing the current conceptual and publication architecture.

It provides less biographical and narrative context than the website hub.

The two entry points are therefore complementary.

The website supplies the initial explanation and the author's conceptual context. The archival/reference-model pathway supplies a more explicit reconstruction of the current research and semantic structure.

Neither alone provides every level of detail.

Together, they support a more complete reconstruction.

6.3 Materiality of the principal weaknesses

The following matrix evaluates the weaknesses according to their actual reconstruction consequences.

Observed condition	Affected reconstruction task	Local consequence	Broader significance
Uneven updating of language versions	Detailed multilingual conceptual reconstruction	Later concepts may be absent from older projections	Mostly temporal and representational
Website publication overview does not expose all current versions	Current publication genealogy	Observer may stop at an earlier DOI	Partially compensated by the Reference Model
Singular/plural Identity-Preserving Constraint distinction	Historical concept resolution	Automated systems cannot assume equivalence	Local machine-level continuity cost
MVDIO relation metadata differs between archival record and current registry	Distribution identity	Observer may classify an identical copy as supplementary	Material for automated aggregation
Stale archival Notes field for v0.5.0	Publication-state reconstruction	Reader may infer archival work remains pending	Contradictory status information within one record
Hugging Face viewer converts documents into a unified text stream	Document-level multilingual retrieval	Language and file boundaries are obscured	Local interface-level reconstruction problem
Incomplete universal licence documentation	Reuse and rights reconstruction	Scope must be checked per artifact	Does not compromise conceptual identity
Unavailable website context-file route	Machine-oriented content acquisition	Particular retrieval route cannot be evaluated	Observer-relative uncertainty

6.3.1 Translation misalignment

This is a meaningful weakness for observers who require the latest conceptual detail in every language.

It is less important for identifying the framework and its foundational relationships.

The Czech and English living editions provide access to later developments, while the archived multilingual edition preserves the earlier state in all sixteen languages.

The two representations do not provide equal temporal detail, but they retain inspectable historical relationships.

6.3.2 Distribution relation discrepancies

The MVDIO record illustrates a more technical problem.

The Zenodo metadata uses `IsSupplementedBy` for certain external copies. The current distribution registry records the author's verification that these resources contain the same research output and should instead be classified as `IsIdenticalTo`.[14]

The registry provides an inspectable correction, but it does not automatically modify historical Zenodo metadata.

This means that an automated observer entering through Zenodo may encounter a weaker relationship assertion than one entering through the current registry.

The problem concerns the semantics of distribution equivalence.

It does not establish that the MVDIO publication itself has been replaced or merged with another work.

6.3.3 Stale publication-status information

The Zenodo v0.5.0 Reference Model record contains a Notes statement indicating that GitHub release and Zenodo archival are pending.

However, the same record identifies version 0.5.0 as published on 25 October 2026 and provides the archived package.

The Notes field therefore gives an outdated indication of the publication process.[11]

An observer relying on that field may infer an incomplete archival state.

The publication record and downloadable package provide sufficient contradictory information to recover the actual published state.

This is a contained temporal inconsistency, but one that can impair automated interpretation.

6.3.4 Document-boundary loss in Hugging Face

The Hugging Face viewer exposes a technical preview in a form that does not preserve the original file-level structure of the multilingual manifesto.

The dataset card explicitly documents the limitation and directs readers toward the individual files.

This makes the reconstruction problem particularly clear:

- The source documents are present.
- The interface does not expose them in the intended structure.
- An alternative retrieval route is documented.

- The intended document-level representation remains recoverable.

This is a local observer-path problem, rather than evidence that the underlying multilingual corpus is incomplete.

6.3.5 Provenance, licensing and trust

The ecosystem uses DOI identifiers, author metadata, version histories, repository citations and source references to support attribution and provenance.

These mechanisms should not be confused with digital signatures.

A DOI identifies and resolves an archival object. Provenance metadata records relationships and origins. A digital signature would provide a different type of cryptographic assertion.

No universal cryptographic signing infrastructure was established in this investigation.

Similarly, CC BY 4.0 is explicitly documented for the manifest's secondary distribution, the Reference Model repository documentation and several individual publications.

The Hugging Face record includes a licence file, and the repository's licence and citation metadata identify CC BY 4.0.

This does not establish that every external artifact, file, illustration or third-party resource has an identical licence.

Licensing is therefore best reconstructed at the individual artifact level.

Zenodo and GitHub provide useful persistence and provenance functions, but their institutional or platform status does not establish the correctness of every conceptual claim or publication relation.

The manuscript records retain their actual publication types, including preprints and software. Their archival status must not be mistaken for evidence of peer-reviewed validation.

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7. Application Mappings and Emergent Findings

7.1 DIO as a developing application architecture

The application mappings represent an important transition from conceptual definitions toward domain-specific use.

They do not redefine the canonical vocabulary.

Three mappings are particularly relevant.

RAG Pipeline Mapping

The RAG mapping projects DIO Reconstruction Failure Modes onto pipeline loci, mechanisms, observable symptoms and hypothetical incidents.

Its later extension examines iterative and hypothesis-conditioned evidence acquisition.

This adds a process-oriented perspective: an agent's working hypothesis can influence the queries and evidence sources it chooses, which can subsequently shape the observations available to support that hypothesis.[10][11]

The extension does not establish that such feedback inevitably creates a reconstruction failure.

It identifies a potential relationship between evidence acquisition and subsequent reconstruction.

HEM × DIO Mapping

The mapping between the Heterogeneous Entity Matching taxonomy and DIO reconstruction consequences applies external categories of heterogeneity to the analysis of possible reconstruction failures and Semantic Vulnerability.

It was introduced in Reference Model v0.3.0 and retained in later archived releases.

Its importance is that it connects DIO to an established technical problem domain without silently modifying the original DIO taxonomy.[10][11]

Commit-Boundary × Policy-as-Code Mapping

This mapping connects DIO/ODI commit-boundary obligations with Policy-as-Code mechanisms, using OPA/Rego and Cedar as reference points.

It documents relevant capabilities and integration gaps.

The mapping is explicitly non-normative and non-deterministic. It does not claim a completed or empirically validated implementation.[11]

7.2 Constraining the Commit Boundary

The paper *Constraining the Commit Boundary: A DIO/ODI-Informed Authorization Guardrail for Agentic Entity Resolution*, published on 22 October 2026, provides a particularly significant application of the framework.[16]

It distinguishes evidence available to an agent for reasoning from evidence eligible to authorize persistent identity-changing mutations.

This distinction connects DIO/ODI reconstruction concepts to a concrete technical boundary.

The proposed architecture uses domain-configured Identity-Preserving Constraints and claim-specific evidence promotion.

The contribution is an authorization specification for changes to persistent identity state, not a new entity-matching algorithm or a claim that incorrect identity hypotheses can be eliminated.

It is explicitly presented as a conceptual architecture without implementation or empirical validation.

This application is consistent with the distinction between a diagnostic framework and an operational intervention.

DIO's taxonomy identifies the types of conditions that may undermine reconstruction. The commit-boundary proposal uses selected distinctions to organize authorization requirements before persistent graph changes are accepted.

The application also illustrates the importance of scope.

The manifesto explicitly excludes cybersecurity, authentication and authorization as primary domains of DIO's own digital-identity scope.[2]

The commit-boundary paper does not redefine DIO as a general authentication framework. It applies DIO/ODI distinctions to the specific problem of identity-changing operations in agentic entity resolution.

That is a domain-specific application rather than a change to the core definition.

7.3 The Reference Model as a reflexive implementation

One of the most significant emergent findings is that the Reference Model is not merely a technical companion to DIO.

It is an implementation of a central DIO principle within the framework's own publication ecosystem.

DIO is concerned with reconstructing identity from distributed representations.

The Reference Model attempts to make the framework itself reconstructable through:

- Persistent concept identifiers.
- Explicit definitions.
- Source provenance.
- Historical revision notes.
- Typed publication relationships.
- Separated application mappings.
- Versioned archives.
- Machine-readable serializations.

The metadata registry also distinguishes historical platform assertions from current author-verified relationship interpretations.

This is particularly clear in the distribution registry's treatment of the MVDIO copies and the DIO Conceptual Framework's version-scoped relationships.[14]

The registry's role is not to erase all historical inconsistencies automatically.

It records the relationships and their status so that an observer can understand what changed and why.

In DIO terms, this is a mechanism for maintaining referential continuity through explicit historical transformation.

Its effectiveness still depends on observers being able to access and interpret the relevant records.

Nevertheless, the infrastructure makes the intended continuity substantially more inspectable.

7.4 The relationship between redundancy and resilience

The ecosystem's distribution model includes multiple representations of the same conceptual corpus.

This creates opportunities for independent access, retrieval and comparison.

However, redundancy alone is not sufficient to establish resilience.

The Hugging Face viewer demonstrates that the same source material can be presented in a way that obscures important document boundaries.

Likewise, a secondary publication copy can preserve the content while carrying a weaker or incorrect metadata relationship.

The value of redundancy therefore depends on whether the representations preserve enough information about their referents, provenance and intended roles.

The ecosystem's most useful form of redundancy is not simply multiple copies of files.

It is the presence of different representations with complementary functions:

- Narrative explanation.
- Archival persistence.
- Semantic identification.

- Publication genealogy.
- Machine-readable retrieval.
- Secondary distribution.

This functional diversity provides more reconstruction options than literal duplication alone.

7.5 The role of the author as a persistent identity anchor

The author's identity is represented across the website, repository metadata, citation information and publication records.

The repository includes:

- The author's full name.
- ORCID `0009-0004-0050-0264`.
- A person URI.
- An affiliation statement.
- Citation metadata.

The website provides the professional biography and describes the framework's genesis.

Zenodo records identify the author as creator of the corresponding publications.

These representations connect the author with the framework while keeping the two referents distinct.

This is important.

A reconstruction of Daniel Beránek as a professional SEO specialist and copywriter is not identical to a reconstruction of DIO as a conceptual framework.

The biography provides the relationship between them: DIO is presented as emerging from professional experience and subsequent theoretical articulation.

The archival publications and machine-readable vocabulary then provide representations of the framework that are not dependent solely on the biography.

This is a relatively strong structure for recovering authorship and conceptual origin.

It does not establish that every observer will distinguish the professional persona from the research identity, particularly when encountering the project through commercial or general web-search contexts.

7.6 Independent reception and evidence of downstream use

The canonical Zenodo manifesto record exposes view and download statistics, while the Hugging Face dataset exposes its own activity and download counters.

These metrics establish that the resources have been accessed through their respective platforms.

They do not establish conceptual adoption, independent reuse, external validation or successful reconstruction by unrelated observers.

The evidence inspected here also does not establish a substantial body of independent publications applying DIO/ODI.

The absence of such evidence must be interpreted within the scope of the search rather than treated as proof that no external observer has used the framework.

A useful distinction is therefore:

- **Distribution activity:** evidence that resources are available and accessed.
- **Documented reuse:** evidence that another party incorporates or cites the framework.
- **Independent reconstruction:** evidence that an observer can recover its conceptual identity without relying on author-provided interpretation.
- **Independent application:** evidence that the framework is applied to other entities or technical domains by separate operators.

The present snapshot provides evidence of the first category and documented author-developed application mappings.

It does not provide sufficient evidence to quantify the latter categories.

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8. Synthetic Interpretation

The findings from the conceptual and graph-theoretical analyses converge on an important distinction: a distributed identity can remain recognizable even when its individual representations do not contain the same information or occupy the same temporal state.

This is especially relevant to DIO/ODI because the framework explicitly treats consistency and uniformity as different properties.

The conceptual architecture, the publication lineage and the distribution infrastructure each contribute a different form of continuity.

8.1 What supports reconstruction

Four mechanisms are particularly consequential.

Persistent semantic anchors.

Stable concept URIs provide identifiable referents across different documents and technical representations.

Archival and provenance continuity.

DOIs, versioned releases, source maps and typed relations allow historical and current publications to be distinguished while preserving their relationships.

Differentiated representation roles.

The website, archive, vocabulary, repository and secondary distribution channels provide complementary forms of contextual and technical information.

Explicit treatment of conceptual development.

Historical entries, source maps, versioned terminology and relation corrections make at least some changes traceable rather than silently replacing earlier states.

Together, these mechanisms support reconstruction at both the conceptual and bibliographic levels.

8.2 Where reconstruction remains vulnerable

The main vulnerabilities appear at transitions between representation types.

Examples include:

- A historical-language page encountered as the only available representation.
- A current publication reached only through an older website reference.

- An archival record containing an outdated relationship assertion.
- A machine-readable concept whose historical and current terminology cannot be automatically equated.
- A dataset viewer that obscures the original boundaries of its documents.
- An AI-oriented context file that cannot be acquired through a particular route.

These conditions affect different aspects of reconstruction.

They do not all compromise the same referent.

The multilingual updating problem principally affects the current conceptual detail of language-specific representations.

The publication navigation problem affects recovery of the preferred current work version.

The distribution metadata issue affects the classification of equivalent copies.

The singular/plural vocabulary distinction affects machine-level concept matching.

The Hugging Face viewer affects file and language boundaries.

The inaccessible acquisition routes affect the observer's available evidence.

Treating them as one general category of fragmentation would obscure these differences.

8.3 The emerging relationship between conceptual and infrastructural coherence

The graph-theoretical analysis shows that the metadata registry has a recognizable structure with the Reference Model occupying a central outgoing-reference position and the foundational manifesto acting as an important source node.

The conceptual analysis shows that the Reference Model provides an explicit representation of the principal conceptual lineage and its refinements.

These findings reinforce each other.

The metadata structure makes the publication relationships inspectable. The vocabulary makes the meaning of the principal concepts more explicit.

The network does not need to reproduce K6 literally to support the conceptual model.

Its function is to preserve the referential and provenance relationships through which an observer can reconstruct the conceptual system.

The result is a layered architecture:

- Conceptual interdependence.
- Machine-readable semantic relations.
- Publication genealogy.
- Distribution relationships.
- Human-readable narrative context.
- Observer-specific retrieval pathways.

Each layer contributes to a different aspect of reconstruction.

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9. Conclusion

At the observed point in time, the DIO/ODI ecosystem appears to sustain a recognizable, referentially continuous and meaningfully reconstructable identity across its principal inspected representations.

This conclusion is strongest at the level of the framework's identity and its core conceptual distinctions.

The difference between DIO as applied discipline and ODI as theoretical meta-layer remains visible across the manifesto, conceptual publications and current Reference Vocabulary.

K6, MVDIO, Referential Continuity, Identity-Preserving Variation and the Reconstruction Failure Mode taxonomy provide a recognizable conceptual structure.

The machine-readable layer provides stable concept identifiers, explicit source relationships and a versioned semantic reference.

The publication infrastructure preserves historical work identities and makes their development increasingly traceable.

The website hub provides narrative and multilingual orientation, while the Reference Model and its repository provide a more structured account of current concepts, publications and applications.

The multilingual archive preserves sixteen language projections of the foundational manifesto, while the living Czech and English editions make later conceptual development accessible.

These representations are not synchronized to the same level of detail, and their individual distribution interfaces do not always preserve the intended structure.

That limitation is particularly relevant when reconstructing the latest conceptual state or the precise relationship between versions and external distribution copies.

The graph analysis further demonstrates that the declared publication metadata has a meaningful, differentiated structure.

Its 21 typed directed relationships among 17 identifiers show a recognizable publication lineage, a central Reference Model aggregation layer and distinct distribution relationships.

This is not a measurement of the entire public web, but it provides an inspectable structural basis for understanding how the current corpus is organized.

The principal weaknesses remain concentrated around particular transitions:

- Between historical and current editions.
- Between language projections.
- Between archival metadata and the operational registry.
- Between source documents and platform-generated representations.
- Between the author's professional identity and the conceptual identity of the framework.

These transitions can impair specific reconstruction tasks, but the available evidence does not indicate that they collectively destroy the referential continuity of DIO/ODI.

The strongest interpretation is therefore that the ecosystem exhibits **referential continuity with uneven representational currency**.

Its resilience does not depend on every representation being identical or every update being synchronized.

It depends on the availability of sufficient anchors and relationships through which historical and current representations can be recognized as related states of the same evolving conceptual framework.

The most significant development is that the framework's own semantic and provenance principles are increasingly reflected in its implementation.

The Reference Model, metadata registry, source map and application mappings make the relationships between concepts, publications and versions more explicit.

At the same time, the distinction between a documented safeguard and a demonstrated outcome remains important. Persistent identifiers do not guarantee correct interpretation. Provenance metadata does not establish cryptographic authenticity. Multiple distribution channels do not automatically compensate for structural loss in a particular interface.

The ecosystem should therefore be understood neither as a perfectly synchronized architecture nor as a fragmented collection of unrelated artifacts.

It is a developing distributed identity system whose principal conceptual referents remain recoverable through several complementary pathways, while certain detailed reconstructions still depend on temporal context, careful interpretation and access to the appropriate representation.

In DIO/ODI terms, the relevant achievement is not permanent completeness.

It is the maintenance of sufficient referential continuity and semantic coherence for an observer to reconstruct the framework meaningfully while its representations continue to change.

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Authorship and AI use

This analysis was conducted within a research project conceived and directed by Daniel Beránek. The author defined the research question, selected the initial research entry points, and specified the analytical perspective and research requirements. ChatGPT carried out the analysis and generated the report in response to the author's integrated assignment. The documented assignment is reproduced in full in the final appendix.

The designation “ChatGPT” identifies the system used; the precise version of its underlying language model is not specified.

Appendix: Author-Designed Research and Revision Prompts

Initial research prompt

deep-research ROLE & OBJECTIVE You are an interdisciplinary researcher in Knowledge Representation, Semantic Web, Digital Identity, Graph Theory, and strategic communication. Conduct a multidimensional deep research analysis of the implementation, distribution, and semantic coherence of Digital Identity Optimization (DIO) and Ontology of Digital Identity (ODI), authored by Daniel Beránek. The central research question is: What does the implementation and distribution of DIO/ODI reveal when examined through the framework's own conceptual logic, complemented by graph-theoretical analysis? Explore how the framework is represented across machine-readable artifacts, archival publications, multilingual web texts, and identity-linked platforms. Investigate how these representations relate, where they reinforce or complicate one another, and what their structure means for the reconstruction of the framework and its author. INITIAL ORIENTATION: MACHINE-READABLE LAYER FIRST Begin strictly with these two resources: Reference Vocabulary: https://vocab.danielberanek.cz/dio-odi/ Corresponding repository: https://github.com/dan-beranek/dio-odi-reference-model Before entering the broader narrative corpus, inspect the available machine-readable vocabulary, concept relations, schema, repository structure, and relevant documentation. Follow links within these resources to locate the underlying machine-readable artifacts rather than relying only on their introductory pages. The purpose of this sequence is to establish a conceptual orientation before encountering the volume and rhetorical density of the surrounding texts. Reconstruct the framework's terminology and internal relationships from this layer first. Once this initial orientation is established, proceed to the archival and web representations. Revisit your initial understanding as the wider corpus reveals historical development, additional context, or tensions. RESEARCH FREEDOM Use your understanding of DIO/ODI to develop your own research approach. Let the framework suggest relevant questions, analytical perspectives, connections, and methods beyond those explicitly listed below. Where useful, draw on graph theory, discourse analysis, cybernetics, information architecture, or other approaches that emerge from the material. Treat the proposed tasks as starting points rather than an exhaustive checklist. You may refine their assumptions, follow unexpected findings, and identify relationships that the assignment does not anticipate. Evaluate DIO/ODI through its own conceptual logic without presupposing that its implementation either succeeds or fails. Keep clear what you observed, what you inferred, and what remains unresolved. STARTING CORPUS & FUNCTIONAL LAYERS LAYER 1: MACHINE-READABLE REFERENCE LAYER Reference Vocabulary: https://vocab.danielberanek.cz/dio-odi/ Source repository: https://github.com/dan-beranek/dio-odi-reference-model Explore the vocabulary, persistent concept identifiers, semantic relations, available serializations, application mappings, and version history. Examine how the published vocabulary and repository relate to one another and to the rest of the ecosystem. LAYER 2: ARCHIVAL, PUBLICATION & IDENTITY INFRASTRUCTURE Zenodo author corpus: https://zenodo.org/search?q=metadata.creators.person_or_org.name%3A%22Ber%C3%A1nek%2C%20Daniel%22&l=list ORCID: https://orcid.org/0009-0004-0050-0264 ResearchGate: https://www.researchgate.net/profile/Daniel-Beranek Explore the relevant publications, metadata, identifiers, versions, attribution links, and relationships between records. Investigate the distinct roles these resources play in persistence, discoverability, authorship, provenance, distribution, and trust. LAYER 3: WEB & DISCURSIVE REPRESENTATIONS Root domain: https://danielberanek.cz Central DIO/ODI hub: https://danielberanek.cz/manifest-dio/ Professional biography and genesis-related

source: https://danielberanek.cz/od-pultu-az-k-seo-a-copy-s-ostrymi-hroty-profesni-bio/ Czech manifesto: https://danielberanek.cz/manifest-digital-identity-optimization-dio/ English manifesto: https://danielberanek.cz/manifesto-of-digital-identity-optimization-dio-and-ontology-of-digital-identity-odi/ AI-oriented context files: https://danielberanek.cz/llms.txt https://danielberanek.cz/llms-full.txt Discover the other language versions and relevant pages through the website's links and metadata. Consider the website as a whole where its broader structure contributes to the representation of DIO/ODI or its author. These URLs are starting points, not a closed corpus. TASK 1: DIO/ODI-NATIVE METAMETHODOLOGICAL EXPLORATION Apply the conceptual and analytical resources of DIO/ODI to its own implementation and distribution. Develop the evaluation from your understanding of the framework rather than merely applying an external checklist. Where the framework suggests an analytical method without explicitly specifying one, explain how you derived it. Explore the following questions while remaining open to others. CONCEPTUAL CONTINUITY ACROSS REPRESENTATIONS How are the framework's core concepts and relationships expressed in: the reference vocabulary; archival publications; web texts; language versions; application mappings; AI-oriented context files? Investigate what remains stable, what changes, and how the representations complement or challenge one another. Consider whether differences reflect genre, audience, translation, historical development, conceptual revision, or substantive inconsistency. RECONSTRUCTION & ITS POSSIBLE FAILURE MODES Use the reconstruction-related concepts you find in DIO/ODI to examine the ecosystem. Potential questions include: How are the author, professional persona, framework, publications, and applications distinguished and connected? Where might entity substitution, merging, splitting, omission, or attribution ambiguity arise? Does distribution across platforms and languages support a coherent reconstruction, produce fragmentation, or do both under different conditions? Which contextual transitions preserve meaning, and which create interpretive tension? Distinguish observed reconstruction problems from structural conditions that might enable them. GENESIS, CONTEXT & APPLICATION Explore the relationship between the framework's genesis, the author's professional biography, and its later theoretical and technical developments. How does the transition between lived professional experience, strategic communication, digital identity theory, and technical applications affect the framework's interpretation? Examine relevant application mappings and papers discovered in the corpus. Ask whether they clarify the core model, extend it, reinterpret it, or expose unresolved questions. MULTILINGUAL REPRESENTATION Discover the actual language inventory and examine how its representations relate. Investigate: conceptual correspondence; version alignment; navigation and cross-linking; translation provenance where available; the relationship between a central hub and individual language manifestations. Consider whether multilingual distribution contributes to a shared conceptual structure, creates distinct interpretive contexts, or introduces fragmentation. Explain the scope of the language comparison you were able to perform. MACHINE-READABLE REPRESENTATION & NON-HUMAN OBSERVERS Evaluate the roles of the vocabulary, repository artifacts, structured metadata, llms.txt, and llms-full.txt. What do these resources make explicit that narrative representations leave implicit? What do they compress, omit, prioritize, or reframe? Explore their potential significance for machine interpretation, retrieval, attribution, and reconstruction. Distinguish the functions visible in the artifacts from claims about actual consumption or downstream effects. Where relevant, examine whether the framework's concepts of authorization or interpretive boundaries illuminate these resources, and where such an analogy reaches its limits. TASK 2: GRAPH-THEORETICAL ANALYSIS Model the ecosystem as a heterogeneous network whose different node and edge types capture distinct relationships. Choose a graph representation appropriate to the evidence and explain your choices. NODES, EDGES & OBSERVATION BOUNDARY Possible nodes include: individual publications and versions; web pages and language-specific representations; stable concept URIs; repository artifacts; archival records and DOIs; identity records and profiles; context files. Possible edges include: hyperlinks; citations; semantic relations such as skos:broader, skos:narrower, and skos:related; language-alternate and canonical declarations; authorship and attribution; version and provenance relations; explicit identity

assertions. Keep distinctions between documents, concepts, and identity representations where they matter. Separate graph views may be more informative than a single aggregated network. Define the boundary of the graph you actually observe. Inbound links found within the collected corpus represent observed in-degree, not necessarily global web in-degree. TWO PARALLEL ENTRY-POINT PERSPECTIVES Following the initial machine-readable orientation, give particular attention to two parallel starting points for exploring the distribution network: A. The relevant Zenodo corpus, discovered through the author search and its publication relationships. B. The website, entered through: https://danielberanek.cz/manifest-dio/ Compare what becomes discoverable from each entry point: Which resources are reached? Through which paths? Which relationships are explicit? What remains peripheral, disconnected, or difficult to discover? Do these entry points lead to comparable reconstructions of the framework? Then examine how the reference vocabulary and repository connect with these two perspectives. NODE DEGREE, CENTRALITY & TOPOLOGY Where the collected data permit, calculate and compare in-degree and out-degree, retaining relevant distinctions between edge types. Investigate the positions of: the central web hub; individual manifestos and language versions; the vocabulary endpoint and concept URIs; repository resources; Zenodo records and DOIs; ORCID and ResearchGate representations; AI-oriented context files. Use additional centrality measures if they illuminate the research question. Describe the observed topology rather than assuming it: hub-and-spoke, partially meshed, clustered, hierarchical, or another configuration. Explain what the metrics reveal about navigation and structural position, and where semantic interpretation requires additional analysis. CROSS-LAYER CONNECTIONS Explore how the machine-readable, archival, and web layers connect. Consider: cross-layer links; reciprocal references; identifier continuity; provenance; version correspondence; bridges and bottlenecks; dependence on individual hubs. What does this coupling suggest about the ecosystem's capacity to sustain coherent reconstruction across different contexts? Where a structural property suggests an effect but does not establish it, identify the relationship as a hypothesis or open question. MEASUREMENT SCOPE Use actual extracted data for numerical claims. If the available tools do not support a reliable graph calculation, provide the strongest defensible structural analysis and explain what data would be needed to complete the measurement. Make clear which findings are computed, manually observed, or interpretive. TASK 3: SYNTHESIS & EMERGENT FINDINGS Bring the DIO/ODI-native and graph-theoretical perspectives into dialogue. Explore where they: reinforce one another; describe different aspects of the same structure; produce tensions; reveal blind spots; suggest new research questions. Consider whether the investigation of DIO/ODI through its own concepts generates insights into the framework itself, not only into its distribution. Follow significant findings beyond the initial questions when the evidence warrants it. Independently documented reception, reuse, or reconstruction outcomes may contribute to the analysis where discoverable, but their absence should be interpreted within the limits of the search. OUTPUT FORMAT Write the entire final report in English. Produce a self-contained research report, not a conversational response or a research plan. Develop the findings through connected analytical prose, supported by source citations. Use clear headings and include tables, diagnostic matrices, graph diagrams, or numerical results where they contribute to the analysis. Distinguish conceptual diagrams from visualizations derived from collected data. Prioritize depth, synthesis, and evidence over repetition. Let the significance of the findings determine the length. Use the following report structure, adapting it where the research produces a more informative organization. EXECUTIVE SUMMARY Answer the central research question and summarize the most consequential findings. Distinguish conceptual alignment, observed network properties, and any supported effects on interpretation or reconstruction. RESEARCH APPROACH & CORPUS Explain how you entered and explored the corpus, what analytical methods emerged from your understanding of DIO/ODI, and which access or measurement limitations affected the research. DIO/ODI-NATIVE ANALYSIS Present the principal findings about conceptual continuity, reconstruction, contextual transitions, multilingual representation, and machine-readable artifacts. A diagnostic matrix may be used where it clarifies the relationships between concepts, observations, and interpretations. GRAPH REPORT Present: the chosen graph

model; the observed boundary; principal nodes and relations; available degree or centrality results; the comparison of Zenodo and web entry points; multilingual topology; cross-layer connections; significant bridges, bottlenecks, or gaps. Use tables or diagrams where they improve understanding. EMERGENT INSIGHTS Develop important findings that were not fully anticipated by the initial assignment. Explain what the application of DIO/ODI to itself reveals about its conceptual resources, implementation, and possible development. SYNTHETIC CONCLUSION Explain what the research reveals about DIO/ODI when its own conceptual apparatus is applied to its implementation and distribution. Assess the relationship between theoretical commitments, semantic representations, and the observed network structure. Identify the strongest alignments, productive tensions, vulnerabilities, and unexpected findings. Let the evidence and the analysis determine the conclusion, including whether some questions remain open. Where useful, identify practical improvements or further research that follow directly from the findings. EVIDENCE STANDARD Support material findings with specific sources. Keep authorial statements, direct observations, analytical inferences, and hypotheses distinguishable without turning the report into a checklist of disclaimers. Account for version history when interpreting differences. State relevant access limitations and uncertainty. The goal is an intellectually independent exploration conducted through DIO/ODI—not a predetermined endorsement, a predetermined critique, or a merely mechanical compliance audit.

Follow-up methodological clarification

Please revisit your previous DIO/ODI analysis using the following clarification of the research question. REVISED RESEARCH QUESTION At the observed point in time, to what extent does the distributed DIO/ODI ecosystem appear to sustain a recognizable, referentially continuous, and meaningfully reconstructable identity across heterogeneous representations and entry points, despite partial inconsistencies, gaps, inaccessible resources, and uneven updating? Use DIO/ODI's own concepts to explain what supports this apparent resilience, what strains it, and whether the observed weaknesses remain locally contained or materially compromise reconstruction of the framework as a whole. SCOPE AND PURPOSE This is a reflexive analysis of DIO/ODI's implementation through its own conceptual perspective. It is not a request to: prove the general validity of DIO/ODI; establish that the framework validates itself; assess the ecosystem against an ideal of permanent completeness or flawless synchronization; repeatedly warn that self-application is not independent empirical validation. DIO is understood here as an ongoing optimization process, not a permanently achieved state. The observation concerns a temporal snapshot of that process. The central question is not whether defects exist. It is whether the distributed identity appears to hold together despite them. ANALYTICAL RULES Apply interpretive symmetry. Do not infer successful protection merely from the presence of a safeguard. Equally, do not infer system-level failure merely from the presence of an inconsistency, missing connection, inaccessible resource, outdated representation, or local reconstruction problem. Evaluate both strengths and weaknesses in relation to the reconstruction task and observation domain. Distinguish four levels of statement. a. Observed artifact or condition: What is actually present, absent, inconsistent, accessible, or inaccessible? b. Architectural role: How can this element be interpreted within DIO/ODI? What reconstruction-supporting or reconstruction-straining function does it have? c. Local reconstruction consequence: What can an observer entering through this representation plausibly recover, miss, or misunderstand? d. System-level significance: Does the local condition materially compromise the identity of the framework as a whole, or do other representations and pathways preserve sufficient continuity? Do not silently jump from (a) to (d). Use precise language without making every sentence defensive. Where an outcome has not been directly observed, prefer formulations such as: "can be interpreted within DIO as a mechanism for…" "provides structural support for…" "is designed to…" when the design intention is documented; "creates a potential obstacle to…" "the inspected pathway supports…" "within this observation domain, the available representations appear sufficient to…" Avoid converting these into unconditional claims such as "prevents," "ensures," "eliminates," or "destroys" unless the evidence supports that scope. A clear scope statement at the beginning of a section is sufficient. Do

not attach the same disclaimer to every paragraph. Evaluate materiality, not merely defect counts. For each important weakness, ask: Which reconstruction task does it affect? Which observer or entry point is affected? Does it concern the author, the framework, a concept, a publication, or a particular version? Does it obscure the referent, alter a central conceptual relation, or merely reduce detail? Can another accessible representation contextualize, correct, or compensate for it? Is compensation actually inspectable, or only assumed? Is the difficulty locally contained, or does it propagate across layers? Do not assume that redundancy guarantees compensation. Do not assume that local failure defeats the distributed whole. Treat variation and change carefully. Distinguish: identity-preserving variation; documented conceptual development; version misalignment; incompatible current claims; susceptibility to reconstruction failure; an observed reconstruction failure. A historical edition is not defective merely because it preserves an earlier state. Conversely, historical provenance does not automatically resolve every conflict encountered by a current observer. Keep conceptual and infrastructural graphs distinct. Do not require the distribution network to reproduce the K6 conceptual model literally. Separate conceptual interdependence from hyperlink topology, provenance relations, repository structure, and actual observer traversal. Any numerical graph finding must state its observation boundary, node and edge definitions, and relevant directionality. Treat acquisition failures as observer-relative unless verified otherwise. A failed fetch establishes that a particular acquisition route failed. It does not by itself establish that the resource is absent or unavailable through every route. Do not presume a favorable answer. The clarification does not instruct you to conclude that the ecosystem is resilient. It instructs you to assess resilience at the appropriate level. A positive, negative, mixed, or indeterminate conclusion is acceptable, provided that local observations and system-level judgments are connected explicitly. REQUESTED REVISION Please produce: A revised answer to the research question. A concise account of the principal mechanisms supporting reconstruction. A materiality assessment of the principal weaknesses. A comparison of at least two entry points, using inspected evidence where available. A correction table: original wording | revised wording | reason for correction A short synthesis identifying: what appears to hold together; where continuity is strained; what cannot be determined from the observed snapshot. Preserve useful findings from your original report. Correct their scope or interpretation where necessary rather than replacing the analysis with generic methodological caution. Do not invent new observations or measurements. If additional investigation is necessary, identify it explicitly rather than presenting it as already completed.

Model-specific addendum: ChatGPT

MODEL-SPECIFIC CORRECTION: CHATGPT Reorient your report from infrastructure inventory toward the clarified reconstruction question. Use the listed formats and platforms to explain what an observer can reconstruct, through which entry points, and despite which missing or inconsistent elements. Review unsupported or overly broad statements concerning: synchronized translations and shared changelogs; digital signatures versus provenance metadata; licensing across all artifact types; version currency and publication dates. Do not recommend additional infrastructure merely because it is a familiar best practice. Tie each recommendation to a specific reconstruction difficulty observed in this ecosystem. Distinguish an incompletely documented feature from an absent feature. Your revised report should show how the available representations work together—or fail to work together—rather than primarily describing what each platform generally offers.

Final integration instruction

I don't want another "revised answer" or a commentary on the previous analysis. I want to combine the two outputs into a single, standalone paper. Take the structure and thematic scope of the first research report and incorporate the findings, clarifications, and shifts in interpretation from the second output. Adjust the original structure as needed—the goal is not to mechanically preserve the sections, but to provide a coherent interpretation. Reflect this new understanding throughout the

entire analysis, not just in the conclusion. Retain specific findings, sources, measurements, and relevant limits, but reassess their significance where the second output has provided greater precision. Do not evaluate shortcomings or strengths in isolation: explain what they mean for the reconstructability of DIO/ODI in the observed time snapshot and at various levels of reconstruction detail. The final text must stand on its own, as if it had been written from the beginning as a single research report. No references to our conversation, no phrases like “in the previous response,” and no explanations of corrections made. Do not resubmit a revision plan or a summary of changes—write the entire paper directly.