



P L E T K A

S E M A N T I C P A T T E R N S

CIDOC CRM SIG · Oxford, England · March 2026

The Challenge

Cultural Heritage Data Today

- Many ontologies, many repositories
- No common way to understand or apply them
- Data integration is fragmented and unsustainable

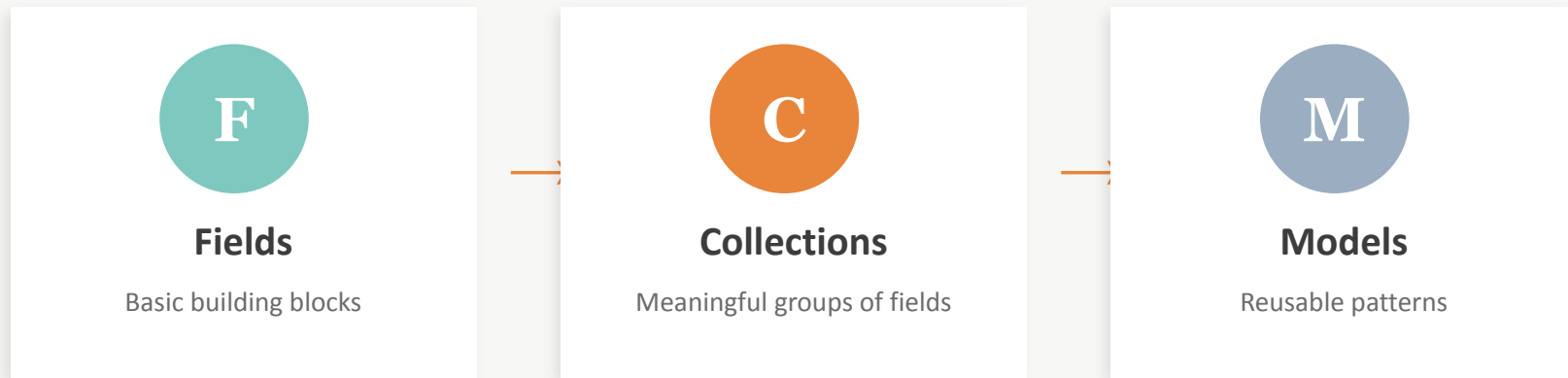
What We Need

A common means to document HOW to apply an ontology consistently and support a sustainable data integration process.

Pletka provides the answer: reusable semantic data patterns.

How Pletka Works

Semantic data pattern libraries built from reusable building blocks



The result? **A reusable pattern** — Understand it. Apply it. Reuse it.

Try it out at www.pletka.io — Join the Waitlist

A Brief History: From Zellij to Pletka

2020

Development begun to support SRDM 1.0 Modelling

Collab: SARI · Developer: Peter Harris Inc.

2021

Development widened by Takin.solutions

Getty semantic data strategy · Developer: Peter Harris Inc.

2023

ORDEA: Swiss Universities funding

Expanded functionality: generators · Collab: SARI · Developers: Advance

2025

DH-Infra: Fundamental backend and frontend rebuild

Collaboration with Delving as lead developer begins

2026

ARDEAH: Swiss Universities funding

Consolidate functionality, add new features · Collab: SARI · Developer: Delving

DH-Infra: The Latest Developments

A Comprehensive Data Curation Interface

- Register organizations and manage users
- Create and manage projects, models, collections, and fields
- Connect to shared pattern libraries
- Publish and version patterns for community sharing
- Link patterns across projects with version control
- Collaborative work

Technical Implications

- New UX
- New Backend
- User Rights Implementation
- Controlled Semantic Path Writer
- Ontology Family Manager
- Issues management
- Data Migration



Delving and a New Tech Stack

A new development approach and architecture

A Modern Foundation

Proven technologies chosen for reliability, flexibility, and independence

Core Technologies

- Go — fast, reliable server language used by major cloud platforms. Deploys as a single binary: simple to host, easy to maintain
- PostgreSQL — the world's most advanced open-source database. Battle-tested, no vendor lock-in
- Svelte — lightweight, responsive interfaces that feel instant. Domain experts work with the tool, not against it

Why It Matters

- No vendor lock-in — all components are open source and widely supported
- Schema-driven UI — new entity types and fields appear automatically, no custom development needed
- Self-hosted or shared — run on your own infrastructure or join a shared instance
- Long-term sustainability — proven stack with large community and ecosystem

Technology choices that protect your investment and your independence.

Versioning & Collaborative Workflows

Work like editors, not like database administrators

How It Works

- Branching — create a working copy, experiment freely, merge when ready. Like track changes for semantic structures
- Version history — every published version is preserved. Compare, roll back, or fork from any point
- Review workflows — propose changes, get feedback, approve together. Parallel work without conflicts

Future: Git Backend

- The same collaboration technology that powers modern software development, adapted for cultural heritage
- Full audit trail — who changed what, when, and why
- Distributed collaboration — work offline, synchronize when ready
- Institutional autonomy — each organization controls their own data while sharing patterns

Semantic patterns deserve the same collaboration tools as code.

Designed to Grow

A platform, not just a tool

Generators & Plugins

- Generators — produce documentation, RDF, XML, API specs, or validation reports from your models. Define once, generate many
- Plugins — extend with institution-specific logic without modifying the core. Connect to existing systems
- Standardized interfaces — any developer can build new generators or integrations

Open by Design

- Open standards — SKOS, RDF, JSON-LD, etc at the foundation. Your work is portable and interoperable
- REST API — every feature accessible programmatically for automation and integration
- Community-driven — shared pattern libraries grow through contribution, not duplication
- Future-proof — new output formats are just new generators, no core changes needed

Define your patterns once. Generate everything you need, now and in the future.

Ontology Families Manager

The screenshot displays the Ontology Families Manager web application. At the top, there is a navigation bar with the Pletka logo and links for Projects, Ontologies, Vision, and Community. A language dropdown is set to English, and the user is identified as George Bruseker. The main header features the 'Ontology Families' title and a subtitle 'Organized collections of related ontologies and their extensions'. On the right side of the header, there are buttons for 'View All Ontologies' and 'Import Ontology'. The main content area is divided into five panels, each representing an ontology family:

- CIDOC CRM Family:** CIDOC Conceptual Reference Model and its extensions for cultural heritage documentation. It shows 1 Base and 12 Extensions, with 261 classes and 825 properties. It has 2 child families. URL: <https://www.cidoc-crm.org/>.
- IFLA Library Models:** International Federation of Library Associations ontologies for bibliographic records. It shows 1 Base and 0 Extensions, with 16 classes and 72 properties. URL: <https://www.ifla.org/>.
- Metadata Standards:** Standard metadata vocabularies including Dublin Core and SKOS. It shows 0 Bases and 0 Extensions. URL: <https://www.w3.org/2004/02/skos/>.
- Project-Specific:** Domain-specific ontologies developed for particular research projects. It shows 0 Bases and 0 Extensions.
- Swiss Art Research (SARI):** Ontologies developed by the Swiss Art Research Infrastructure for art historical research. It shows 1 Base and 5 Extensions, with 102 classes and 321 properties. URL: <https://swissartresearch.net/>.

Project Create and Search

The screenshot displays the Pletka website's 'Projects' section. At the top, there is a navigation bar with the Pletka logo and links for 'Projects', 'Ontologies', 'Vision', and 'Community'. On the right, there is a language dropdown set to 'English' and a user profile for 'George Bruseker'. Below the navigation, the 'Projects' title is followed by a '+ New Project' button. A search bar is present with the placeholder text 'Search projects by name or description...'. To the right of the search bar are two dropdown menus: 'All Institutions' and 'Name (A-Z)'. Below these elements, it states 'Showing 1-36 of 36 projects'. The main content area features a grid of six project cards, each with a title, a brief description, and a set of statistics for Models, Collections, Fields, and Categories. The projects are: Amazigh Enslavement, Arches for Science Project, Art Information Commons-PMA, Census Project, CIDOC CRM Information Groups, and Database Machine Drawings.

Pletka Projects Ontologies Vision Community

English George Bruseker

Projects

Browse and manage semantic model projects

+ New Project

Search projects by name or description...

All Institutions Name (A-Z)

Showing 1-36 of 36 projects

Amazigh Enslavement

amazigh_enslavement

This project investigates the enslavement of Amazigh individuals in the Canary Islands before, during, and...

13	1	18	20
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

Arches for Science Project

arches_for_science

Getty Conservation Institute

15	2	10	20
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

Art Information Commons-PMA

pma

Philadelphia Museum of Art

10	14	63	20
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

Census Project

census

8	18	95	20
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

CIDOC CRM Information Groups

CRM_Information_Groups

Takin Solutions

10	4	11	22
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

Database Machine Drawings

dmd

Max Planck Institute for the History of Science

9	1	8	20
MODELS	COLLECTIONS	FIELDS	CATEGORIES

PUBLIC

Semantic Projects: Complete Documentation

Pletka Projects Ontologies Vision Community English George Bruseker

Projects > ORDEA SRDM 2.0 (en)

ORDEA SRDM 2.0 (en)

A continuation of SRDM 1.0. (en) Star Fork Watch

srdm_2.0 Swiss Art Research Infrastructure (en) Created Jun 12, 2024 Public

Models 15 **Collections** 65 **Fields** 644 (+ 98 Indirect) **Ontologies** 9 Linked (47 Classes • 163 Properties)

Overview **Models (15)** Collections (65) Fields (644) Activity Settings

Sort by Name Type: All Models Search models... + Add Model

- Archival Unit** SRDM.16 Archival_Unit 10/28/2025
The archival reference data model provides a list of standard fields that are typically present in the general description of bundled archival material in a cultural heritage dat...
E78 Curated Holding 81 Fields 11 Categories 20 Collections draft Local
- Artwork** SRDM.2 Artwork 10/28/2025
The artwork reference data model provides a list of standard fields that are typically present in the general description of an artwork in a cultural heritage data system. The ...
E22 Human-Made Object 53 Fields 12 Categories 15 Collections draft Local
- Bibliographic Item** SRDM.8 Bibliographic_Item 6/24/2025
The bibliographic item reference data model provides a list of standard fields that are often found present in the general description of a bibliographic item. The scope of thi...
E33 Linguistic Object 30 Fields 10 Categories 8 Collections draft Local

Easy to Read Semantics

Activity draft

Projects, Research Tasks, Experiments and similar activities.

LAM.1 [E7 Activity](#) 48 fields

[Patterns](#) 48 [Statistics](#) [Metadata](#) [Debug](#)

7 categories, 48 fields Compact Detailed

- Names and Identifiers** 3 coll - 12 fields
 - Name** [crm:P1_is_identified_by](#) > [crm:E33_E41_Linguistic_Appellation](#) 6
 - Name **String**

This field is used to record the string value of the name attributed to the documented entity.

Path: [crm:P190_has_symbolic_content](#) > [rdf:literal](#)

ID: LAF.6

Type: **String**
 - Name Type **Concept**
 - Name Language **Concept**
 - Source Reference Work for Name **Model** [LAM.13_Textual Work](#) [LAM.13_Textual Work](#)
 - Name Label **String**
 - Name Part **Collection** [LAC.1_name](#) [LAC.1_name](#)
 - Identifier** [crm:P1_is_identified_by](#) > [crm:E42_Identifier](#) 5
 - Identifier **String**
 - Identifier Type **Concept**

New Projects Build on Existing Modelling

The screenshot shows the Pletka web application interface. At the top, there is a navigation bar with the Pletka logo and links for Projects, Ontologies, Vision, and Community. On the right, there is a language dropdown set to 'English' and a user profile for 'George Bruseker'. Below the navigation bar, the breadcrumb trail reads 'Projects > Test (en) > Settings'. The main content area is titled 'Settings' and has a 'Description' sub-section. On the left side of the settings panel, there is a sidebar menu with options: General, Access, Repository, Ontology & Semantics (highlighted in green), Autocomplete, Validation, Social & Collaboration, and Categories. At the bottom of the sidebar, there is a 'Danger Zone' section with a warning icon. The main content area displays a list of projects under the 'Description' section. The first item, 'No parent project', is selected with a checkmark. The list includes various project names with their respective language codes in parentheses, such as HDTO (en), MEGA-J (en), STAGE (en), Rare Books (en), Historic Environment Records (en), Visualising of the Heavens (en), Database Machine Drawings (en), CIDOC CRM Information Groups (en), Greeks in Venice (en), GEMENE (en), Amazigh Enslavement (en), Ogee (en), Monte lato (en), Provolone (en), Linked.Art (en), Ordea SRDM 1.0 (en), LUX (en), Reference Collection Arches (en), Releven (en), Sem TEI (en), Ruscha Project (en), Art Information Commons-PMA (en), Arches for Science Project (en), SemCMD Project (en), Globalise_GLBM (en), DHI Slavery Project (en), Parks Canada (en), Census Project (en), Semafora (en), Life Watch Italy Modelling Project (en), GRP Zurich (en), SIA Common Ground (en), ORDEA SRDM 2.0 (en), Provenance Index Reindex Project (en), and Lingo RDM (en).

Settings

Description

- No parent project
- HDTO (en) (HDT)
- MEGA-J (en) (MEG)
- STAGE (en) (STA)
- Rare Books (en) (RAB)
- Historic Environment Records (en) (HER)
- Visualising of the Heavens (en) (VOH)
- Database Machine Drawings (en) (DED)
- CIDOC CRM Information Groups (en) (ING)
- Greeks in Venice (en) (GIV)
- GEMENE (en) (GEM)
- Amazigh Enslavement (en) (AME)
- Ogee (en) (OGEE)
- Monte lato (en) (MRD)
- Provolone (en) (PRO)
- Linked.Art (en) (LA)
- Ordea SRDM 1.0 (en) (SRD1)
- LUX (en) (LUX)
- Reference Collection Arches (en) (RC)
- Releven (en) (RLV)
- Sem TEI (en) (ST)
- Ruscha Project (en) (RUS)
- Art Information Commons-PMA (en) (PMA)
- Arches for Science Project (en) (AFS)
- SemCMD Project (en) (SEM)
- Globalise_GLBM (en) (GLB)
- DHI Slavery Project (en) (DHI)
- Parks Canada (en) (PC)
- Census Project (en) (CEN)
- Semafora (en) (SUR)
- Life Watch Italy Modelling Project (en) (LW)
- GRP Zurich (en) (GRP)
- SIA Common Ground (en) (SI)
- ORDEA SRDM 2.0 (en) (SRD)
- Provenance Index Reindex Project (en) (PIR)
- Lingo RDM (en) (RDM)

Roadmap 2026: Q2 – Q4

Generators Module

Plugin-based architecture with version support

Interoperability Hub

Connector feature for tool integration

Text API / LLM Integration

AI-assisted semantic mapping

CrossWalk Designer

Pattern library data alignment

Plugin-based Generators Module

with version support

Architecture

- Standardized template for generator development
- Bidirectional read/write between source and target systems
- Example: Arches plugin for bi-directional conversion
- Refactored existing generators for module compatibility
- Full version support across all generators

Existing Generators



New Possibilities



From Pattern to Action: X3ML Mapping

The screenshot shows the Pletka web interface for the 'Person' ontology class. The page title is 'Person draft'. Below the title, there is a description: 'An individual human person, alive or dead. This is used for artists or other creators, current staff and researchers, and anyone else.' There are two buttons: 'Diagram' and 'Edit'. Below the description, there are two tabs: 'LAM.9' and 'E21 Person', with '68 fields' indicated. A search bar is present with the text 'Search fields...'. The main content area shows a tree view of categories and fields. The 'Events' category is expanded, showing 'Birth Event' with sub-entries like 'Location of Birth Event', 'Birth Event Type', 'Source Reference Work for Birth Event', 'Birth Event Label', 'TimeSpan of Birth Event', 'Name for Birth Event', and 'Identifier for Birth Event'. Each sub-entry has associated ontology terms and their types (e.g., Model, Concept, String, Collection).



The screenshot shows the X3ML Mapping tool interface. The title bar indicates 'Mapping: [LAM.9] Person (Not-In-Model Edition No Generators) started 17/1/2024'. The interface has several tabs: 'Info', 'Matching Table', 'Generators', 'Analysis', 'Transformation', 'Configuration', and 'About'. The 'Matching Table' tab is active, showing a table with columns: '#', 'SOURCE', 'TARGET PATH NAME', 'TARGET', 'IF RULE', and 'COMMENTS'. The table contains 18 rows of mappings. An orange arrow from the left screenshot points to the first row of the table, which corresponds to the 'Location of Birth Event' field. The table also includes navigation controls like 'TOP', 'BOTTOM', 'VIEW MODE', and 'XML'.

#	SOURCE	TARGET PATH NAME	TARGET	IF RULE	COMMENTS
1	D	LAM.9_person	E21_Person		
1.1	P	LAP1_name	P1_is_identified_by		
1.2	R	LAP2_identifier	E33_E41_Linguistic_Appellation		
1.3	P	LAP16_contact_point	P1_is_identified_by		
1.4	R	LAF578_equivalent	E42_Identifier		
1.5	P	LAP3_type	equivalent		
1.6	R	PIRP45_gender	E1_CRM_Entity		
1.7	P	PIRP43_nationality	P2_has_type		
1.8	R	LAP60_ethnicity	E55_Type		

Interoperability Hub

Connector Feature

- Object transfers between Pletka and semantic data tools
- API communication with other tools for push/pull
- GitHub and Export Format as the Bridge

Technical Implications & Collaborations

- Module itself
- OntoMe
- Protege
- 3M
- SIP
- Arches
- ResearchSpace

Crosswalk Designer

Pattern Library Data Alignment

- Model-level pattern alignment interface
- Visual representation of cross-model relationships
- Code generation for mapping implementations
- Support for declarative mapping formats
- Integration with ETL and global search strategies

Technical Implications & Collaborations

- Module itself
- EDM
- NFDI4Culture
- LIDO

Cross Walk Editor: A Rough Mockup

Pletka Projects Ontologies Vision Community English George Bruseker

Projects > HDTO (en) > Models > Document (en) > Edit

Document draft

+ Add

A document is a recorded source of information, such as a report, publication, manuscript, or digital file that provides information about a heritage entity or related research.

HDTM.17 E31 Document 39 fields

Patterns 39 Statistics Metadata </> Debug Search fields...

10 categories, 39 fields Compact Detailed

- Names and Identifiers (2 coll - 7 fields)
 - Name (crm:P1_is_identified_by > crm:E33_E41_Linguistic_Appellation) (EXTERNAL 4)
 - Name (String)
 - Name Type (Concept)
 - Name Language
 - Name Source (LAM.13_Textual Work LAM.13_Textual Work)
 - Identifier (crm:P1_is_identified_by > crm:E42_Identifier) (EXTERNAL 3)
 - Identifier (String)
 - Identifier Type (Concept)
 - Identifier Source (Model LAM.13_Textual Work LAM.13_Textual Work)

Pletka Projects Ontologies Vision Community English George Bruseker

Projects > Amazigh Enslavement (en) > Models > Document (en) > Edit

Document draft

+ Add

AMEM.36 E33 Linguistic Object 12 fields

Patterns 12 Statistics Metadata </> Debug Search fields...

5 categories, 12 fields Compact Detailed

- Names and Identifiers (1 coll - 2 fields)
 - Identifier (crm:P1_is_identified_by > crm:E42_Identifier) (EXTERNAL 2)
 - Identifier Content (String)
 - Identifier Type (Concept)
- Classification (1 coll - 2 fields)
- Events (2 coll - 5 fields)
- Parthood (1 coll - 1 fields)
- Description (1 coll - 2 fields)

Case Study: HDTO

Making a new ontology accessible to a broader public and scalable

The Approach

- Add ontology to Pletka
- Adopt existing good patterns for CIDOC CRM
- Build out data models
- Share and reuse

Outcome

16	Models
3	Collections
47	New Fields

A complete set of models for guiding practical HDTO implementation · dev.pletka.io/projects/HDT

Pletka in Action

From ontology definition to structured, reusable patterns

HC1 Heritage Entity

Subclass of: `crm:E70 Thing`
Superclass of: `HC3 Tangible Aspect`
`HC4 Intangible Aspect`

Scope Note:

This class comprises tangible and intangible entities of the real-world declared as valuable because of their contribution to society, knowledge and/or culture. The value that a heritage entity acquires is relative to the society and culture that assigns it each time. Instances of HC1 Heritage Entity may constitute real assets of any nature: physical, both movable and immovable, immaterial, or both digital. They may also constitute types or patterns of cultural events, traditions and practices, typical of the intangible heritage that should be documented with their features and their extent in space and time. Individual events are not considered instances of HC1 Heritage Entity. Rather, they can be related via their types or patterns to an instance of HC1 Heritage Entity. An instance of HC1 can be considered as the focal item for aggregating the content of its corresponding HC2 Digital Twin instance. Parts of an instance of HC1 Heritage Entity may or may not constitute Heritage Entities in their own right, such as a shop in a historical building.

Examples:

The Knossos Palace, part of the Knossos WH archaeological site
The "Palio di Siena"
The Florence Historical Centre, a WH Site
The Stonehenge Complex, a WH site
The Bauhaus style
The Dresden Elbe Valley

Properties:

HP1 has digital twin (is digital twin of): `HC2 Heritage Digital Twin`
HP2 has story (is story about): `nont:narrative`
HP15 is heritage of (has original heritage): `crm:E74 Group`

Ontology Definition



Pletka Platform

Scalability! Reusability! Reliability!

pletkaproject.org
dev.pletka.io

Development & Team

Idea, Design & Stewardship

Takin.solutions

Public Design & Stewardship Partner

Swiss Art Research Infrastructure

Development Lead

Delving

Funding

DH-Infra · Swiss Universities · Takin.solutions

Resources

pletkaproject.org

Project website

dev.pletka.io

Platform preview

GitHub — Coming Soon

Tech Stack

PostgreSQL

Go

Svelte



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SEMANTIC PATTERNS

Thank You!

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