Ontology Development on the PCA Platform

Iterative Refinement and Industrial Interoperability

Agenda

- Creating and extending ontologies
  - Foundational ontologies
  - API
  - Authoring
- Documentation
  - Github
  - mkDocs
  - Pages CMD
- Questions and answers

Questions and answers

The team is all in attendance and will try to answer any questions posed in the chat.

Q&A session after the presentation

Foundational Standards

- IDO (Industrial Data Ontology)
- ISO 15926-4
- CFIHOS v2.0+
- Information modelling Framework (IMF)

The Why: Bridging the Complexity Gap

Challenges

- Complex ontologies
- Static data silos

PCA Solutions

- Iterative refinement
- Real-time reference data

Architecture: Native URIs & the FAIR Path

Our .NET API serves all content at its native URI, fundamentally aligning the platform with FAIR Data Principles:

- **Findable & Accessible:** Resources are located at their identity address, reachable by any web-capable tool.
- **Interoperable:** Native URIs allow for direct semantic linking between disparate industrial datasets.
- **Reusable:** The API enables anyone to use the resource as reference data "from the get-go."

Simplified Concept Creation

Frontend Form Automation

Our collection of frontend forms abstracts the **nitty-gritty details** of complex engineering ontologies.

By automatically ensuring syntactic correctness, valid extension to existing concept and the user can focus on authoring new useful and concise definitions.

Structural Alignment

Concepts are automatically grounded in established top level ontologies.

- IDO
- ISO 15926-4
- CFIHOS v.2.0

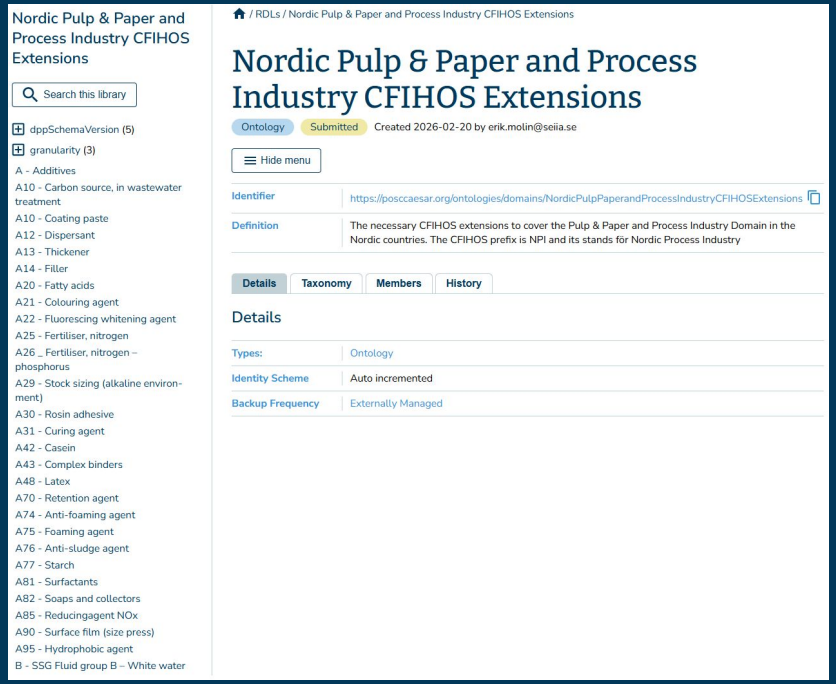
Resulting in definitions that are **interoperable** and **FAIR** by design.

Example: CFIHOS+ Domain Ontology

Iterative Refinement

Domain experts refine concepts through a **Work in Progress** state, ensuring technical accuracy before finalization.

- Drafting complex **CFIHOS** classes
- Real-time syntactic validation
- Collaborative feedback loop



🚀 **Live API Exposure:** All refinements are immediately accessible via native URIs for integration testing.

When the **Documentation** is the Product

Infrastructure for high-value information assets.

📘 **New Chapter:** Shifting focus toward the semantic value of the content itself.

The Docs-as-Code Pipeline

Source

GitHub Repository

Core content is authored as **Markdown (.md)** files. This ensures version control, peer review, and a single source of truth for all technical documentation.

Management Layer

Pages CMS

A user-friendly web UI allows non-technical domain experts to edit content directly. No Git commands or IDEs required to refine the documentation.

Deployment

Automated Rebuild

GitHub Actions triggers an automated build pipeline upon every save, validating syntax and deploying the updated site

⚡ **Automation:** The pipeline ensures that manual chores are eliminated, maintaining high technical accuracy at scale.

Composition: The Digital Director

The Blueprint (mkdocs.yml)

Acts as the "Director," managing site hierarchy, navigation, and global theme consistency across the entire documentation suite.

The Single Source of Truth

All "raw material" lives in the /docs folder, ensuring a centralized repository for all content assets.

Dynamic Composition: Using snippets and macros to pull in external code, keeping documentation modular and dry.

⚙️ **MkDocs Architecture:** Transforming raw Markdown files into a structured industrial knowledge base.

Value: Stability Meets Accessibility

Accessibility

Content experts write in a "low-code" CMS environment without technical friction, democratizing documentation authorship.

Full Audit Trail

Every edit is tracked via GitHub version control, ensuring a transparent history of changes and robust regulatory compliance.

Automated Consistency

The MkDocs composer ensures a unified look and feel, regardless of who contributes, maintaining professional brand integrity.

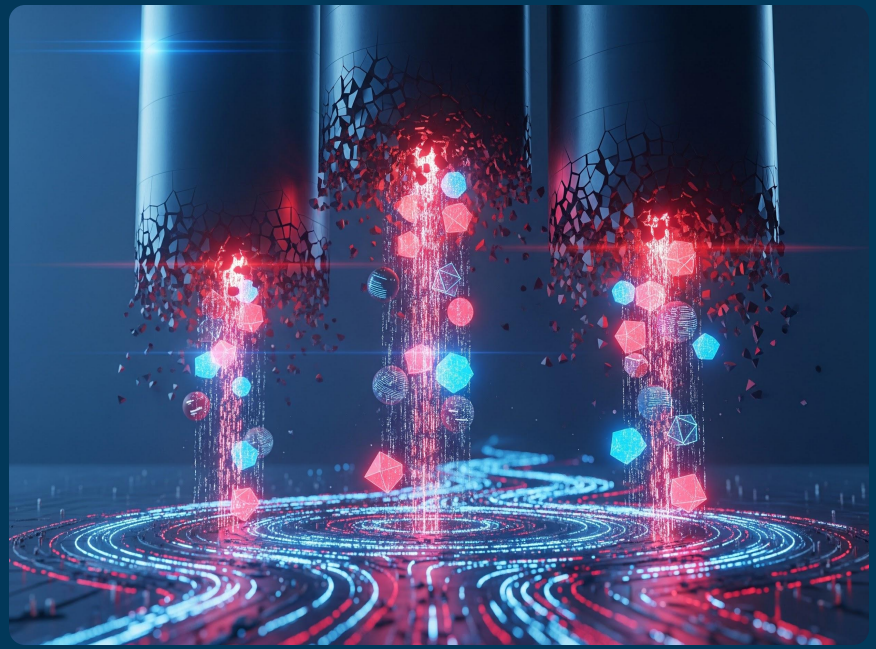
🛡️ **Strategic Reliability:** Balancing user-friendly input with industrial-grade technical governance.

From Silos to Semantics

A Service-Led Future

We've taken the manual chores out of Standardization enabling you to focus on engineering challenges.

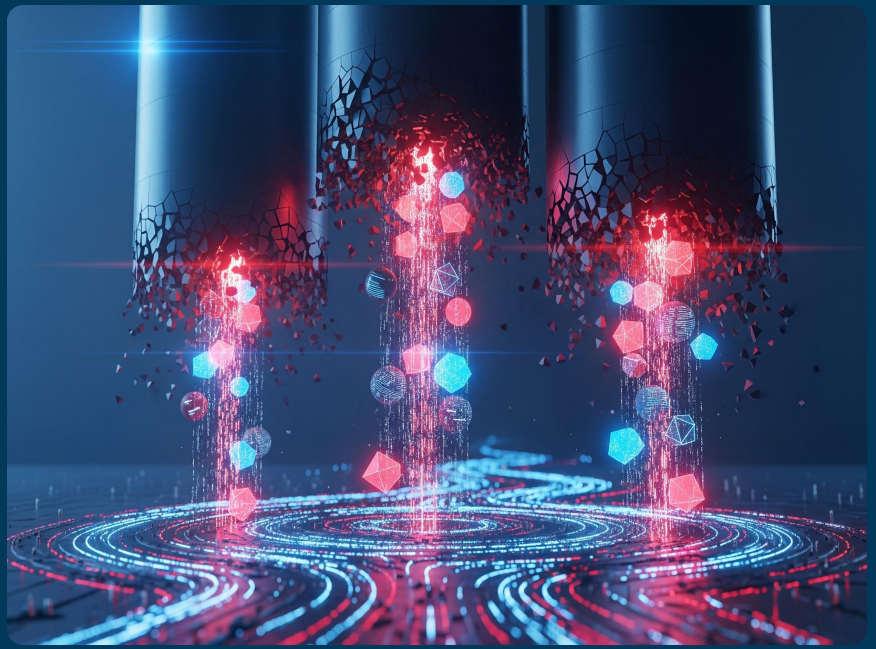
Combining agile practices with ISO rigour, the PCA platform ensures your data is ready for the AI-driven future of engineering.



🚀 **Call to Action: Browse the API, submit a concept, and start linking your industrial data today.**

Resources

- https://docs.posccaesar.org/
- https://draft.posccaesar.org/libraries/pcardl



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Thank you for your time

Contact us on **info@posccaesar.org**