



CUSTOMER CASE STUDY

Digitizing Engineering Intelligence: RDF-Powered Knowledge for Engineers

We turn P&ID data into smart knowledge graphs, so engineers get instant, context-rich insights for safer, faster decisions.

Solution: RDF-Powered Knowledge Graphs

Industry: Upstream

Use Case Focus: P&ID Data Digitization

GOALS

- Automate complex P&ID diagram data extraction.
- Establish standard-compliant semantic modeling.
- Turn P&ID process flows and equipment relationships into accessible digital engineering context.
- Make critical technical data easier for engineers to access and use.

SOLUTIONS

- Deploy AI-powered QA/QC workflows to automate data extraction.
- Utilize RDF and reasoning engines for compliant semantic modeling.
- Resolve and map entities dynamically across industrial ontologies.

CHALLENGES

- Manual extraction from P&ID diagrams is slow and error-prone.
- Aligning complex entities with custom industrial ontologies is difficult.
- Fragmented engineering workflows can delay safety-critical decisions such as isolation planning and equipment maintenance.
- The lack of standardized industrial ontologies makes alignment complex and limits a cohesive view of physical assets.

RESULTS

- Accelerated system insight access for rapid isolation planning.
- Created scalable, interoperable data structures for advanced analysis.
- Improved operational safety through standardized semantic context.

EXECUTIVE SUMMARY

BKOAI turns P&ID data into smart knowledge graphs so engineers can access context-rich engineering information faster. AI-powered QA/QC workflows automate diagram data extraction, while RDF semantic modeling, reasoning engines, and industrial ontologies map extracted entities into a standardized digital structure. The resulting knowledge layer improves access to system dependencies, supports isolation planning, and provides a scalable foundation for advanced engineering analysis.

Moving Beyond Manual P&ID Analysis

Piping and Instrumentation Diagrams contain critical process-flow and equipment-relationship information, but extracting and aligning that information is often manual and error-prone. Fragmented workflows can slow safety-critical decisions, while inconsistent ontology alignment makes it difficult to build a cohesive view of physical assets.

Building a Standardized Semantic Knowledge Layer

BKOAI combines AI-driven extraction and QA/QC with RDF-based semantic modeling. Reasoning engines and industrial ontologies resolve and map entities into a consistent structure, converting static engineering diagrams into interoperable digital knowledge that can be queried and reused.

Enabling Faster, Context-Rich Engineering Decisions

The resulting knowledge graph gives engineers faster access to system relationships and dependencies needed for activities such as isolation planning. Standardized semantic context improves interoperability and operational safety while creating a scalable foundation for broader engineering analysis.