



CUSTOMER CASE STUDY

PI Mapping Intelligence System

Our multi-agent system maps PI points to physical equipment across SCADA, maintenance, and operational databases, resolving inconsistent tag names and context gaps.

Solution: PI Mapping Intelligence System

Industry: Power Generation

Use Case Focus: PI-to-Equipment Mapping

GOALS

- Map PI points to physical equipment across multiple disparate databases.
- Resolve inconsistent tag names and operational context gaps.
- Establish a live knowledge graph to enhance system diagnostics.
- Automate the equipment-tag mapping process to eliminate manual workflows.

SOLUTIONS

- Deploy collaborative agent-to-agent reasoning with self-reflection capabilities.
- Utilize natural language processing and domain ontologies to extract tag descriptions.
- Integrate symbolic reasoning to map and resolve physical equipment identities.
- Establish continuous feedback loops for live, automatic mapping updates.

CHALLENGES

- Equipment appears under different aliases across disparate industrial databases.
- Mapping processes rely heavily on manual efforts and tribal knowledge.
- Fragmented systems lack semantic alignment, restricting analytics and automation.
- Operational systems experience data context gaps due to isolated silos.

RESULTS

- Unified equipment intelligence across SCADA, maintenance, and operational databases.
- Automated and evolving knowledge graphs of equipment-tag relationships.
- Scalable deployment capable of adapting to multi-system industrial environments.
- Improved diagnostic accuracy and operational visibility across the organization.

EXECUTIVE SUMMARY

BKOAI delivered a multi-agent system that maps PI points to physical equipment across SCADA, maintenance, and operational databases. By resolving inconsistent tag names and context gaps, the system builds a live knowledge graph of equipment-tag relationships. Agent-to-agent reasoning, NLP, ontology alignment, and continuous feedback loops improve mapping accuracy over time while strengthening diagnostics, visibility, and automation.

Resolving Inconsistent Industrial Tag Context

The same physical equipment can appear under different aliases across PI, SCADA, maintenance, and operational databases. Manual mapping depends heavily on tribal knowledge, while fragmented systems lack the semantic alignment needed for reliable analytics and automation.

Multi-Agent Reasoning and Ontology Alignment

BKOAI uses collaborative agent-to-agent reasoning with self-reflection to resolve ambiguous tag identities and context. Natural language processing extracts meaning from tag descriptions, while symbolic reasoning and domain ontologies map those tags to the correct physical equipment.

