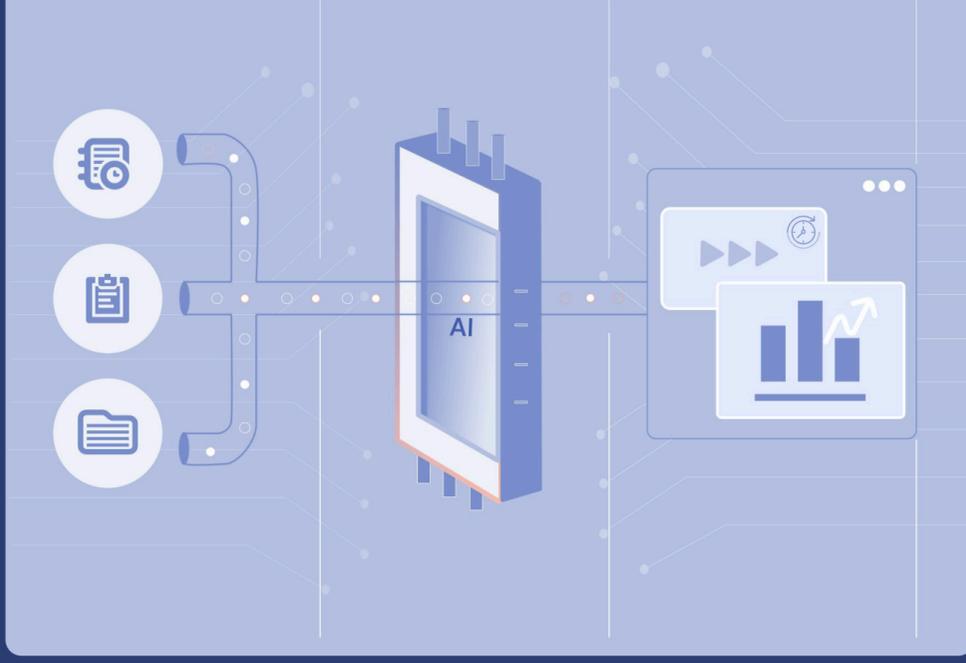


CASE STUDY

Scaling Asset Integrity Management with Agentic AI



Introduction

The energy sector is capital-intensive with asset health being the primary leading indicator of operational integrity. As the Oil & Gas industry sees a 53% surge in CAPEX, the volume and velocity of data have outpaced traditional human evaluation methods. Zemoso partnered with an oilfield services leader to realize their vision of bridging this "intelligence gap" by deploying an Agentic AI Layer that shifts the engineering paradigm from manual data retrieval to high-value strategic decision-making.

Industry challenge

The Paradox of Digitization

Modern upstream operations are drowning in data while remaining starved for insights.

- **Scale vs. Capacity:** An offshore rig generates between 1 to 10 TB of data daily across 40,000+ data tags, making manual oversight mathematically impossible.
- **The Burden of "Grunt Work":** Engineers spend the majority of their time on "data-related steps" and "endless retrieval and triage" rather than critical analysis.
- **Reactive Visibility:** Current health scoring often relies on triggered manual evaluations and quarterly checks, leaving operators blind to emerging risks between cycles.

Economic Friction: With 80% of OPEX dedicated to Integrity Management (AIM), inefficiencies in asset health scoring directly erode the bottom line.

Zemoso's partnership challenge

Zemoso set out to solve a specific, deeply entrenched process failure: the 500+ engineering hour requirement per customer for manual KPI scoring and reporting.

- **Bulky Workflows:** The current state involves a 250+ question questionnaire that customers often ignore due to its complexity.
- **Siloed Systems:** Engineers must manually validate data against fragmented sources including OEM portals, Excel logs, and legacy databases.
- **Lack of Standardization:** Without a unified layer, "mismatches" require engineers to manually decide which source to trust, leading to days of labor-intensive formatting and charting.

Impact created

Agentic AI layer compressed asset health evaluation cycles from **weeks to a few hours**.

How did we do this?

Multi-Agent Cognitive Orchestration

Zemoso engineered a "Human-in-the-lead" system powered by Amazon Bedrock, utilizing a fleet of specialized AI agents to automate the heavy lifting of Asset Integrity Management.

- **Autonomous Data Retrieval & Entity Resolution:** A dedicated Data Retrieval Agent navigates systems of record (Salesforce, IMS/MOS, etc.) to clean datasets and align assets using unique identifiers. This eliminates the manual "Locate" and "Prepare" phases of the traditional workflow.
- **Strategic Planning & Scoring Agents:** Planning Agent: Pre-processes prioritization for assets in the backlog and notifies engineers of "why-now" risks.
Scoring & Analysis Agent: Performs deterministic scoring and ML anomaly detection to flag risk areas instantly.
- **Insight Generation & Explainability:** An Insight Generation Agent drafts reports with sectioned insights and relevant plots. By providing "explainability" for every score, the system ensures the engineer remains the ultimate authority, reviewing AI-generated logic rather than building it from scratch.

Conclusion

Through this partnership, Zemoso demonstrated that the transition to Agentic AI is not about replacing human expertise, but about liberating it. By automating the data-intensive "backstage" tasks, we have enabled asset engineers to function as true strategists, ensuring the safety and longevity of critical energy infrastructure in an increasingly complex digital world.