

White Paper: Building an AI-Based Supply Chain Intelligence Platform (AISCIP)

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Executive Summary

In the complex landscape of the Oil & Gas industry, the primary bottleneck is often not physical logistics, but **informational velocity**. While companies generate massive amounts of data through systems like SCADA and SAP, there is a lack of a "neural link" to convert this information into **Active Coverage**. This white paper introduces the **AI-Based Supply Chain Intelligence Platform (AISCIP)**, a strategic framework designed to disrupt traditional, reactive procurement by bridging the gap between engineering telemetry and C-suite decision-making.

The Shift from Passive Procurement to Active Coverage

Traditional supply systems are often reactive, "buying things as we need them". AISCIP facilitates a move toward **Predictive Supply Chain Coverage Strategies**—comprehensive architectural plans that ensure a reliable, cost-effective, and continuous flow of goods and services to maintain operations without interruption.

The 8-Stream Active Coverage Architecture

The AISCIP platform optimizes coverage strategies by synthesizing eight distinct, real-time data streams:

1. **Predictive Telemetry (The Pulse):** Uses machine learning (ML) to monitor SCADA/IoT data from refineries and rigs, tracking Mean Time Between Failure (MTBF).
2. **Geological Alignment (The Horizon):** Links to subsurface reservoir models to predict equipment needs, such as HPHT alloys and tubulars, based on upcoming drilling strata.
3. **External Market Intelligence (The Market):** Scrapes global commodity indexes (e.g., steel, nickel) and monitors shipping lanes to enable "forward buying" and hedging.
4. **EHS & ESG Compliance (The License):** Integrates supplier carbon and safety performance data (TRIR) to ensure sourcing from compliant, high-performing vendors.
5. **Reliability-Based Coverage (The History):** Bridges to CMMS (SAP-PM/Maximo) to identify "bad actor" material numbers and exclude them from future strategies.
6. **Midstream & Geospatial Data (The Transit):** Uses real-time GPS and weather forecasting to dynamically reroute shipments during disruptions like port strikes or regional events.
7. **Downstream Demand-Sync (The Revenue):** Links to market demand for refined fuels and chemicals to sync raw material supply with actual revenue.
8. **Natural Language Interface (The UX):** An LLM-powered dashboard that allows users to query complex scenarios, such as the impact of a Tier-1 supplier production delay in a specific region.

Supercharging the SAP Material Master

AISCIP does not replace existing ERP systems like **SAP-MM**; instead, it "supercharges" them. By using the SAP Material Group (e.g., valves or pumps) as a primary key, the platform appends a **Dynamic Risk Score** to these groups based on live telemetry and market signals. For example, if consumption at a rig increases while a supplier strike is signaled, the platform automatically triggers a secondary coverage strategy for that specific material group.

Implementation Roadmap: From Concept to Pilot

AISCIP is designed for a rapid **90-day implementation**:

- **Phase 1: Discovery (Days 1–30):** Identifying high-criticality SAP material categories and

mapping API endpoints for data inventory.

- **Phase 2: Logic Pilot (Days 31–60):** Selecting a test category (e.g., upstream tubulars) and correlating telemetry with procurement triggers.
- **Phase 3: Integration (Days 61–90):** Building the LLM interface and launching the live dashboard with predictive alerts.

Phase	Timeline	Primary Objectives	Key Milestones
1: Discovery	Days 1–30	Identify "High-Criticality" SAP material categories. Map API endpoints.	Data Inventory Audit: Mapping of 8-stream availability.
2: Logic Pilot	Days 31–60	Select one test category (e.g., Upstream Tubulars). Sync drilling schedules with vendor capacity.	The "Neural Link": Correlation between telemetry and procurement triggers.
3: Integration	Days 61–90	Build the LLM interface for the pilot category. Define automated trigger responses.	AISCIP V1.0 Launch: Live dashboard providing predictive alerts.

Conclusion: Achieving Value Chain Synchronicity

The AISCIP framework represents a fundamental shift from reactive logistics to **predictive resilience**. By breaking down silos between Upstream, Midstream, and Downstream operations, organizations can transform the supply chain into a proactive engine of **structural value**.

About the Author Miguel Salcedo is a Senior Supply Chain Strategist with over 20 years of experience managing multi-billion dollar portfolios. Holding a degree in Computer Science, he specializes in bridging the gap between legacy industrial operations and modern AI-driven intelligence systems.