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PROCUREMENT TRANSFORMATION & DIGITALIZATION

Challenge 3.1: Practices for Transforming Procurement at HPCL

Background & Context

In the dynamic and increasingly complex landscape of the oil & gas industry, the procurement function plays a critical role in cost optimization, risk mitigation, sustainability, and digital transformation. HPCL needs to modernize its procurement practices to stay aligned with global best practices. This includes adopting advanced technologies like AI, ML, blockchain, and analytics; integrating sustainability and ESG principles to reduce carbon footprint; improving vendor evaluation and performance tracking; and moving towards e-procurement and automated workflows.

➢ **Constraints:**

- Must comply with PSU procurement norms, CVC guidelines, and GoI regulations.
- Adoption of advanced tools must align with existing ERP/SAP systems.
- Supplier ecosystems vary in digital maturity, limiting immediate adoption of advanced solutions.

Challenge Statement

Propose innovative strategies and tools to modernize HPCL's procurement processes, making them more digital, sustainable, and effective while ensuring compliance with regulatory and operational contexts.

Expected Outcomes

- **Digital Transformation:** Practical recommendations for AI/ML-based process automation, predictive analytics, and blockchain-enabled transparency.
- **Sustainability Alignment:** Frameworks that embed ESG goals into supplier selection, evaluation, and risk management.
- **Vendor Management Enhancements:** Tools for better vendor profiling, evaluation, and performance monitoring.
- **Global Benchmarking:** Plans for adopting best practices and KPIs to measure procurement maturity against international standards.

Challenge 3.2: Smart Procurement- Fast, Transparent, and Fully Automated

Background & Context

HPCL's procurement process spans multiple steps, from purchase requisitions and tendering to bid evaluations, approvals, and purchase order release. While some digital tools are in place, extensive manual interventions, inter-departmental coordination, and repetitive documentation still cause delays, inefficiencies, and compliance risks.

The need is to reimagine procurement as a fully automated, intelligent, end-to-end workflow that reduces turnaround times, eliminates redundancies, and ensures transparency without compromising compliance.

> ➢ **Constraints:**

- Must comply with PSU and CVC procurement regulations.
- Integration with external platforms (GeM, CPPP) and internal SAP/ERP systems is essential.
- Automation must allow for exception handling in high-value or policy-sensitive cases.

Challenge Statement

Design a fully automated, adaptive procurement workflow for HPCL that minimizes manual intervention, reduces processing time, and eliminates redundant steps while ensuring compliance, transparency, and scalability.

Expected Outcomes

- **Process Redesign:** Simplified procurement workflows applying lean principles and smart automation.
- **System Integration:** Seamless connectors with government platforms (GeM, CPPP) and SAP/ERP.
- **Smart Evaluation:** Decision-support tools (AI/ML scoring, automated bid analysis) to speed up approvals.
- **Exception Handling:** Adaptive workflows that accommodate policy-compliant deviations.
- **Transparency & Auditability:** Built-in digital footprints to preserve traceability and compliance.

Challenge 3.3: Creating Intelligent Cost Database

Background & Context

HPCL's Central Procurement Organisation (CPO) has placed thousands of Purchase orders (POs) for various items and services over past few years. This data contains information of prices of various items. However, the Cost Estimation Cell (CEC), who is responsible for estimating costs for future purchases using the past price data, is unable to benefit from the repository since the items in the past POs do not have any unique Item code, but have been described in text only. Hence, the same item may be recorded in different POs with slightly different descriptions (e.g., *"Supply of Carbon Steel Pipe of 100 mm diameter"* vs *"CS Pipe 100 mm size"*). This lack of unique identifier for an item prevents effective retrieval of price data from past POs and hinders efficient estimation.

An intelligent solution is required to recognize same items described by text in the past POs, assign a unique item code, then use the information intelligently to build a reliable cost database. The solution should include tools to analyse the database to generate useful statistics on costs, variance across regions and departments, time-trends, and in other useful ways. The tools should create a dashboard for presenting the data in a useful to view way.

> **Constraints:**

- Data confidentiality: external data sharing must be restricted.
- Historical records vary in accuracy and quality, requiring robust data cleaning.
- Solution must integrate with HPCL's procurement systems and scale for future data growth.

Challenge Statement

Devise an intelligent solution that transforms HPCL's procurement data into a standardized and actionable cost database, enabling reliable cost estimation, price trend analysis, and interactive exploration.

Expected Outcomes

- **AI/NLP-based Standardization:** Techniques to identify and unify diverse item descriptions across purchase orders.
- **Analytical Insights:** Models to identify price trends, cost patterns, and predictive estimations.
- **Interactive Dashboards:** User-friendly visualizations for cost analysis and data exploration.
- **Data Quality Framework:** Mechanisms for cleaning, anomaly