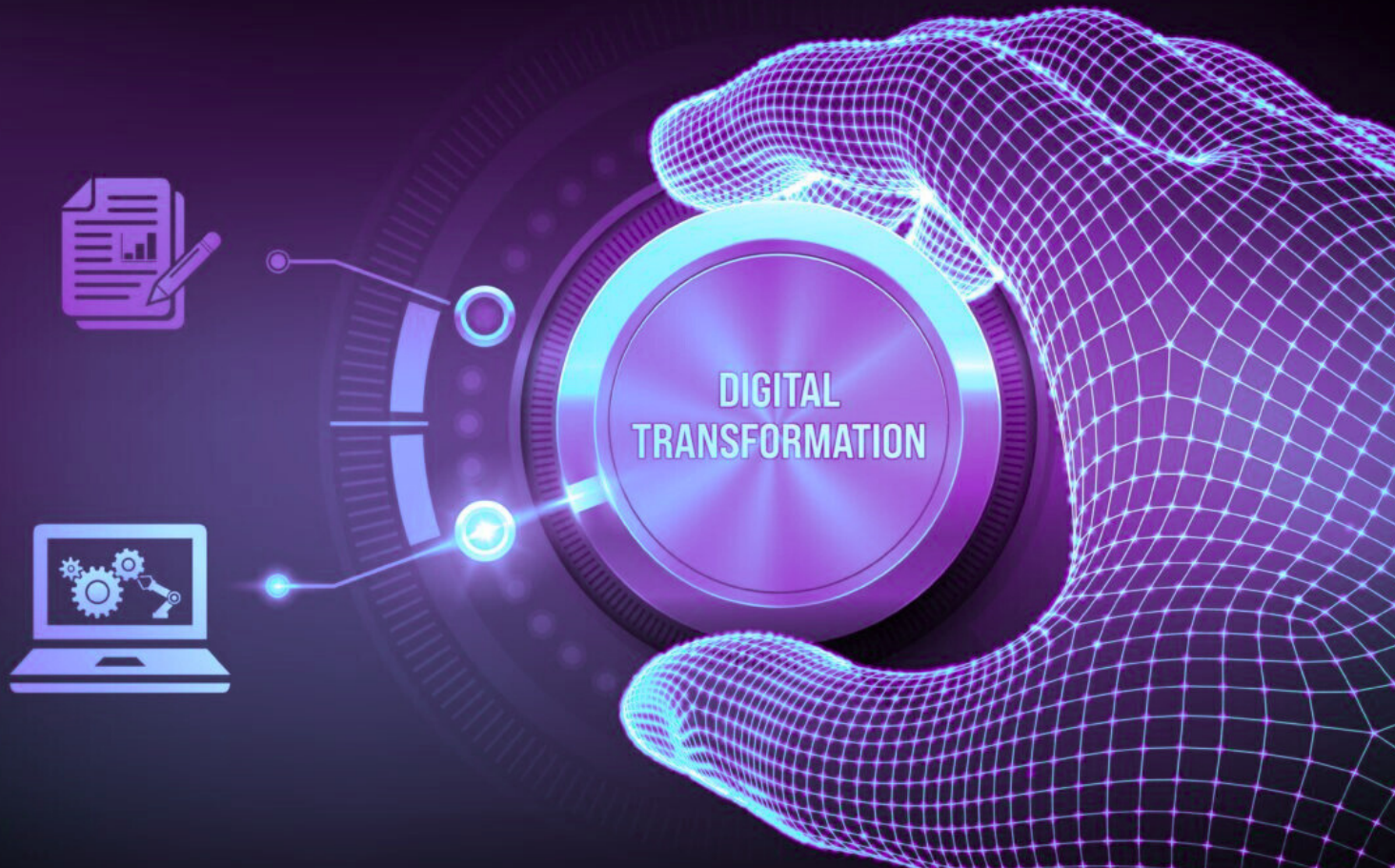




An ISO 9001:2015 Certified Company

X- Force Digitalization

Generative AI & Machine Learning

Supper Xgineer & X-Force PIP

Generative AI & Machine Learning Overview

X-Force PIP (Plant Information Platform) combines real-time industrial data with the power of Generative AI and Machine Learning (ML) to deliver actionable insights, automate tasks, and accelerate digital transformation in manufacturing, energy, oil & gas, steel, and utilities.

Key Capabilities

Generative AI

- **AI Assistant / Chatbot Integration:** Specialized assistants trained on plant-specific data help operators and engineers query alarms, performance, and incidents in natural language.
- **Automated Report Generation:** Use Generative AI to create daily shift reports, production summaries, and deviation analysis.
- **Knowledgebase Access:** Retrieve SOPs, technical manuals, and fault diagnosis steps conversationally.

Machine Learning

- **Anomaly Detection:** Detect early signs of equipment failure or process deviations using ML algorithms.
- **Predictive Maintenance:** Schedule maintenance based on data-driven predictions instead of fixed cycles.
- **Process Optimization:** Identify energy-saving or yield-enhancing patterns across operations.

Technical Features

Feature	Description
Prebuilt ML Models	Use cases for anomaly detection, quality prediction, and forecasting.
Task Scheduling	Map input parameters and automate ML-based actions.
Model Configuration	Customize model parameters directly from the PIP interface.
Dashboards from AI Output	Visualize ML/AI insights as dynamic dashboards or trends.



Overview Xgineer & X-Force PIP



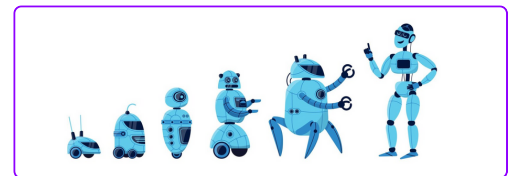
Xgineer and X-Force PIP form a unified, intelligent platform that integrates real-time data analytics, domain expertise, and artificial intelligence to enhance industrial operations, maintenance, and decision-making throughout the plant lifecycle. By embedding engineering knowledge and process context, this solution revolutionizes how teams engage with plant data, offering intelligent assistance, machine learning-powered predictions, and generative AI capabilities to drive smarter, faster, and more informed actions.

Feature Highlights

- **Industry & Site Specific Intelligence**
Built with domain awareness tailored to your plant's sector and operational characteristics.
- **Prebuilt Knowledge Library**
Embedded with theoretical and process knowledge for faster onboarding.
- **Guided Knowledge Acquisition**
Uses structured wizards to extract information intelligently instead of relying on unstructured document imports.
- **Veteran-Verified Knowledge**
AI's knowledge is reviewed and validated by seasoned industry professionals.
- **Reinforcement Learning**
Continuously improves by learning from operator interactions and feedback.

Knowledge Embedded in Super Xgineer

- **Engineering Fundamentals:**
Chemical, Mechanical, Electrical & Electronics domains.
- **Theoretical Process Knowledge:**
Embedded understanding of design specs and system behaviours.
- **Process-Specific Knowledge:**
 - Plant material flow and batch processing
 - Operating parameters and timing
 - Constraints, equipment sizing, and bottleneck identification



Historical Knowledge Integration

- CAPA Records
- Process/Project Change Documents
- Audit Reports & Action Plans
- Engineering Docs: Datasheets, SOPs, Troubleshooting Guides

What your Super Xgineer will Do?

- Understand process flow, timing, parameters, and constraints
- Analyse historical breakdowns and CAPA
- Monitor current plant status and send email-based analysis reports
- Deliver daily production reviews with improvement prescriptions



Access to Real-Time & Historical Data

- CMMS: Maintenance records, breakdown logs, corrective actions
- SCADA/MES/PIMS: Live and archived production data
- LIMS: Quality parameters and lab test records

Intelligent Industrial Automation Platform with LLM Integration and Multi-Source Data Orchestration



Large Language Model (LLM)

This intelligent industrial platform leverages a Large Language Model (LLM), available both on-premises and as a web service, to provide advanced natural language understanding and interaction.



Data Extractor for different files

It includes a powerful Data Extractor capable of processing various file formats such as PDF, Word, Excel, and CSV, enabling seamless ingestion of structured and unstructured data.



Data Fetching Tools

Additionally, a suite of Tools is available to dynamically fetch and interact with data from databases, MES, SCADA, or ERP systems on demand, ensuring real-time insights and operational efficiency across industrial environments.



Agents – Perform tasks

Intelligent Agents are embedded to automate tasks such as sending notifications, emails, generating dashboards, and compiling reports.



Vector Database – Chromadb, PGVector

The system utilizes vector databases like ChromaDB and PGVector for efficient semantic search and contextual data retrieval.

Summary

Super Xgineer is an AI-powered virtual engineer designed to replicate the expertise of a plant head with 30 years of experience. Tailored for industry-specific needs, it combines engineering fundamentals, process knowledge, equipment history, and real-time plant data to deliver actionable insights. From diagnosing breakdowns and analyzing production to recommending process improvements, Super Xgineer acts as a 24/7 intelligent assistant. With guided knowledge acquisition, integration with CMMS, SCADA, MES, and LIMS systems, and reinforcement learning, it evolves continuously to become smarter and more accurate—empowering teams to make faster, data-driven decisions.