

TechNova Industries partnered with GMIndia to implement an **AI-enabled predictive maintenance solution** that leveraged IoT sensors and machine learning models. The objective was to eliminate unplanned equipment failures, optimize maintenance efforts, and increase production uptime. Predictive maintenance systems like this use real-time sensor data and analytics to forecast issues before they cause breakdowns, enabling proactive intervention.

Business Challenge

TechNova's manufacturing operations faced frequent equipment failures that disrupted production schedules and drove up maintenance costs. Traditional reactive and scheduled approaches did not provide early warning of impending faults, leading to unplanned downtime, reduced throughput, and higher operational risk — challenges typical in industrial maintenance environments.

Solution Overview

GMIndia designed and deployed a solution combining:

- **Industrial IoT Sensors:** Installed vibration, temperature, and performance sensors on critical assets.
- **Data Pipeline & Connectivity:** Real-time telemetry streamed securely to analytics systems.
- **Machine Learning Models:** AI analyzed patterns in live data to detect early signs of failure.
- **Operations Dashboard & Alerts:** Maintenance teams received condition-based alerts and actionable insights for targeted intervention.

This proactive, data-driven approach replaced time-based schedules with intelligent predictions.



Implementation Timeline

Phase	Key Activities
Assessment & Planning	Identified critical machinery and failure modes
Sensor Deployment	Connected equipment to IIoT sensors
AI Model Training	Built machine learning models on historical + real-time data
Pilot Testing	Validated alerts and analytics on a subset of assets
Full Rollout	Scaled predictive maintenance across production lines

Note: Implementation typically involves condition monitoring integration and algorithm refinement to maximize predictive accuracy.



Measurable Results & Impact

Operational outcomes achieved within the first 6–12 months:

- **Up to 45% Reduction in Unplanned Downtime**
- **10–40% Lower Maintenance Costs** by prioritizing interventions only when necessary
- **Extended Asset Reliability and Life** through early issue detection

These performance improvements align with broader industry findings showing predictive maintenance can cut downtime nearly in half and significantly reduce repair expenses.

Technologies Used

Technology	Purpose
IoT Sensors	Continuous machine health monitoring
Cloud/Edge Analytics	Data processing and real-time analysis
Machine Learning Models	Predict future equipment conditions
Visualization Dashboard	Alerts and performance insights
Integration APIs	Connected analytics with maintenance systems