



IT SOLUTIONS • AI STRATEGY

Predictive Maintenance for Manufacturing Assets, Reducing Downtime and Repair Costs

Objective

Reduce unplanned downtime and maintenance costs by leveraging AI-driven predictive maintenance to monitor, diagnose, and forecast equipment failures before they occur, optimizing asset life and operational efficiency.

Actors

- Maintenance and reliability engineers
- Production managers
- Asset/plant managers
- Condition monitoring analysts
- ERP, EAM, and MES users (e.g., IBM Maximo, Siemens MindSphere, PTC ThingWorx, GE Digital, Oracle)

Business Problem

Reactive and time-based maintenance methods are often inefficient—reactive repairs cause costly production stoppages while preventive schedules lead to unnecessary maintenance actions. Both increase operational costs, risk safety violations, and reduce equipment lifetime, especially in complex manufacturing environments.

Solution

AI and machine learning models continuously analyze sensor data, maintenance logs, and equipment history to detect anomalies, predict failure timing (Remaining Useful Life/RUL), and recommend optimal intervention windows. These insights trigger timely, targeted maintenance that maximizes uptime and minimizes costs, feeding into asset management systems for full operational integration.

Key Functions

- Real-time data ingestion from IoT sensors, SCADA, and maintenance logs
- Anomaly detection, RUL prediction, and root-cause analysis using ML models
- Prescriptive recommendations: optimal repair windows, parts ordering, and labor scheduling
- Automated alerting and work order creation in EAM/CMMS systems
- Predictive dashboards for visibility, compliance, and ongoing optimization
- Integration with ERP, MES, and supply chain for coordinated asset management

Business Flow

- Machine asset data is collected and analyzed in real time by the predictive maintenance platform (e.g., Siemens MindSphere, IBM Maximo, GE Digital, PTC, Oracle).
- Data science models score asset health, predict failures, and prescribe the most cost-effective interventions, which are automatically scheduled in EAM/MES.
- Maintenance teams receive alerts, while plant managers leverage predictive dashboards for operational decision support.
- All outcomes feed back into the model, ensuring continuous learning and program improvement.

Business Value

- **Up to 50% reduction in unplanned downtime and 30% maintenance cost savings**
- Improved asset longevity, reliability, and safety
- Enhanced productivity and throughput by eliminating surprise outages
- Actionable data and automation drive faster, more accurate maintenance decisions

Product Mapping (Best of Breed Options)

Siemens MindSphere — Industrial IoT and predictive AI for manufacturing assets

IBM Maximo Application Suite — AI-powered asset health, anomaly detection, and work order automation

GE Digital Predix — Industrial AI analytics, RUL prediction, real-time alerting

PTC ThingWorx — IoT data analysis, predictive maintenance, and prescriptive recommendations

F7i Prescriptive Maintenance — Optimization and automated repair recommendation engine for fleets and industrial plants

Oracle Product Mapping

Oracle Fusion SCM & Maintenance Cloud — AI-driven predictive maintenance, root-cause analysis, and work order management integrated with ERP and supply chain

Oracle AI Data Platform — Unified IoT ingestion, asset health modeling, and agentic automation for manufacturing operations