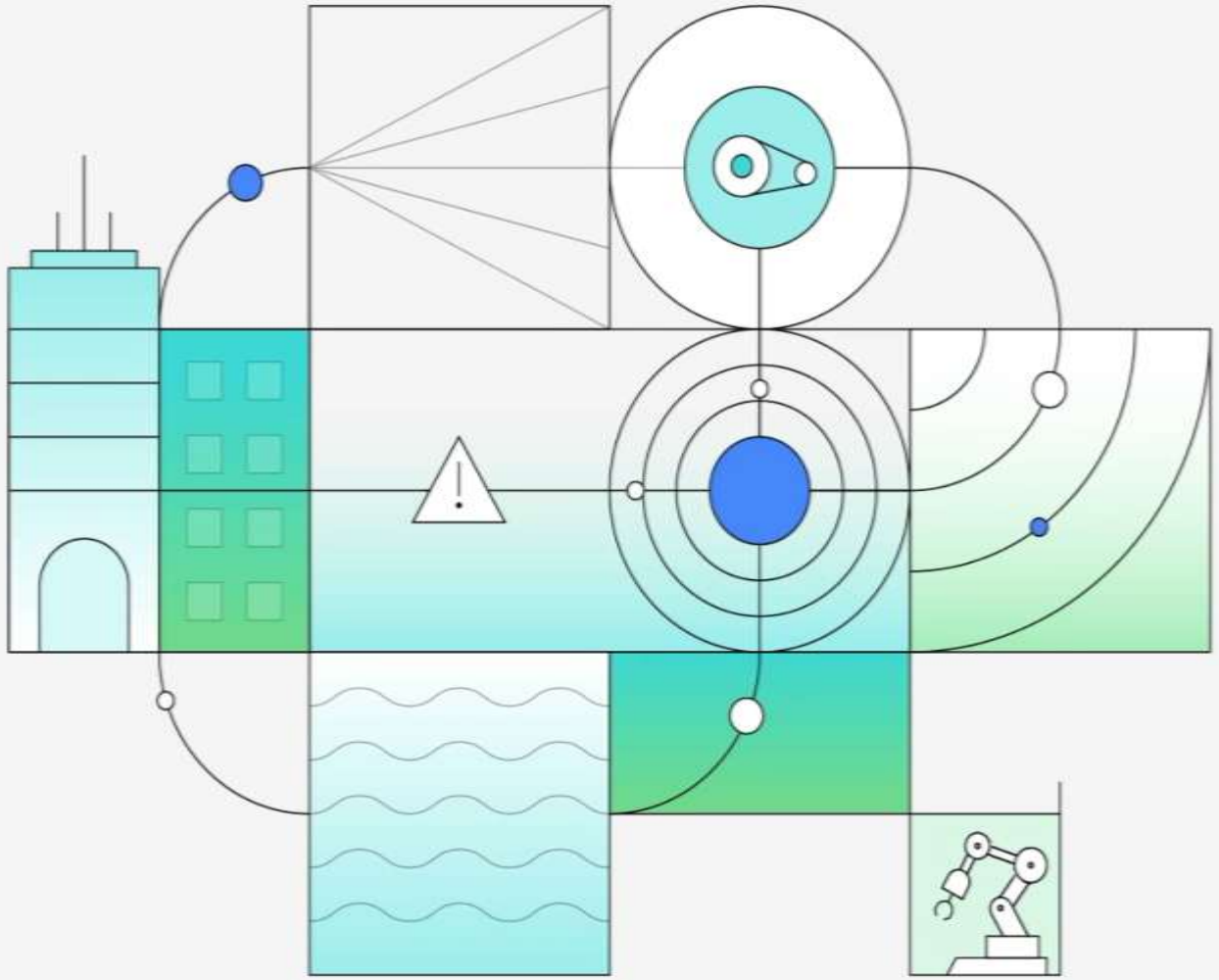
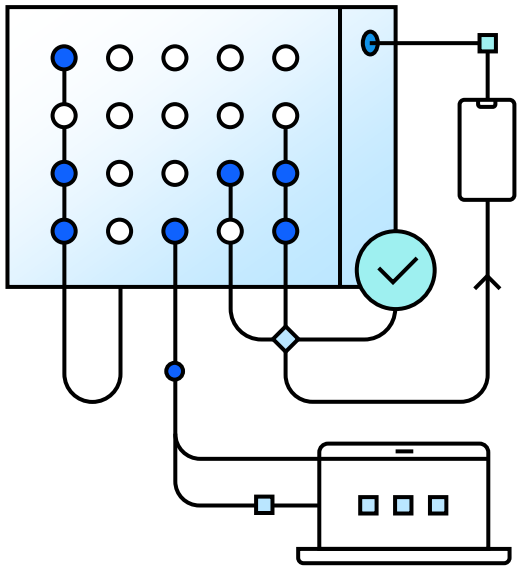
Intelligent, Agent-Driven for Zero Downtime Operations



Thipok Sriprasit
IBM Thailand – Automation

Chananop Wannatipyaporn
IBM Thailand – Data & AI

Maximo Application Suite Enables “Pursuit of Zero D”

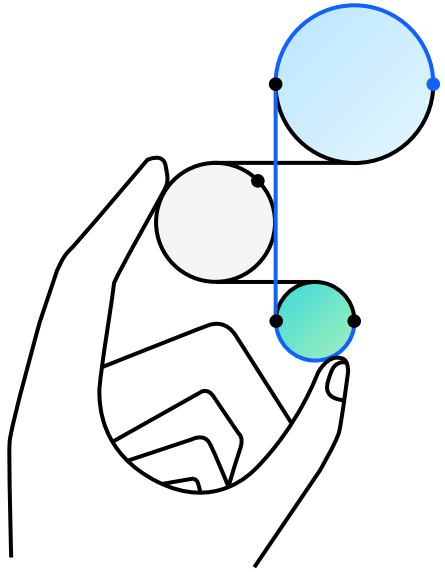


Zero Defects

Detect & Correct

AI Computer Vision Models catch defects before they become expensive rework

Fast, Easy, Accurate



Zero Downtime

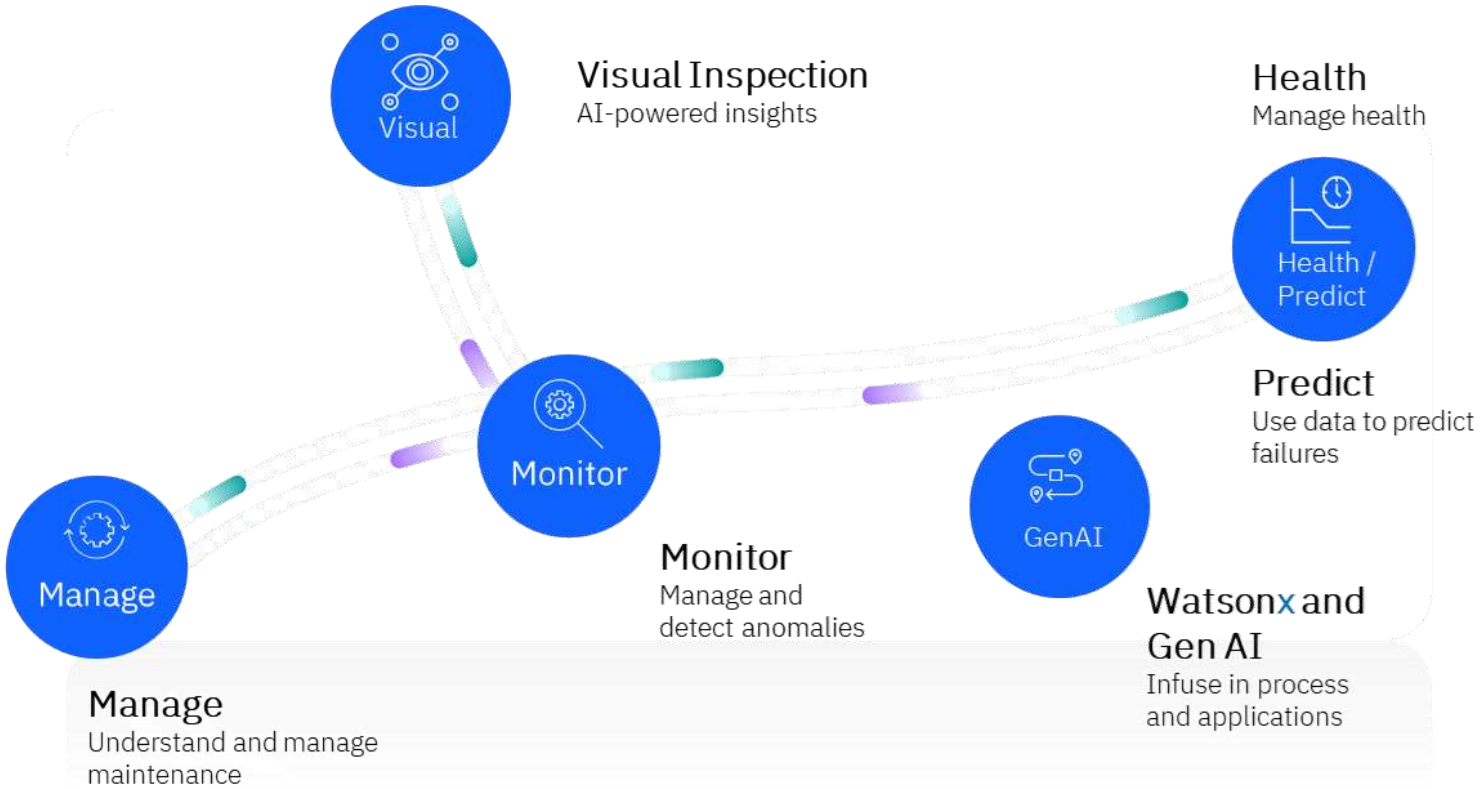
Predict and Correct

AI Machine Learning Models identify potential asset failures in the future, allowing for preventative maintenance, before an expensive breakdown

Enables Continuous Operations

Intelligent Asset Management

AI-powered Solar Farm Inspection



OT Data Pipeline

SCADA, Historian, PLC, ICS, Sensors, Devices, EMS, MES, BMS

Monitor

Connectivity at Scale
Pre-Configured Connectors, Data Unification, Asset Hierarchy, Asset Management

No-Code AI/Analytics
AI-based Anomaly Detection, Meta Model, Analytics Catalog

Customizable UI
Summary Dashboard, Pre-Built Widgets, Configurable Rules & Alerts

Maximo Applications

Maximo Manage

Maximo Health & Predict

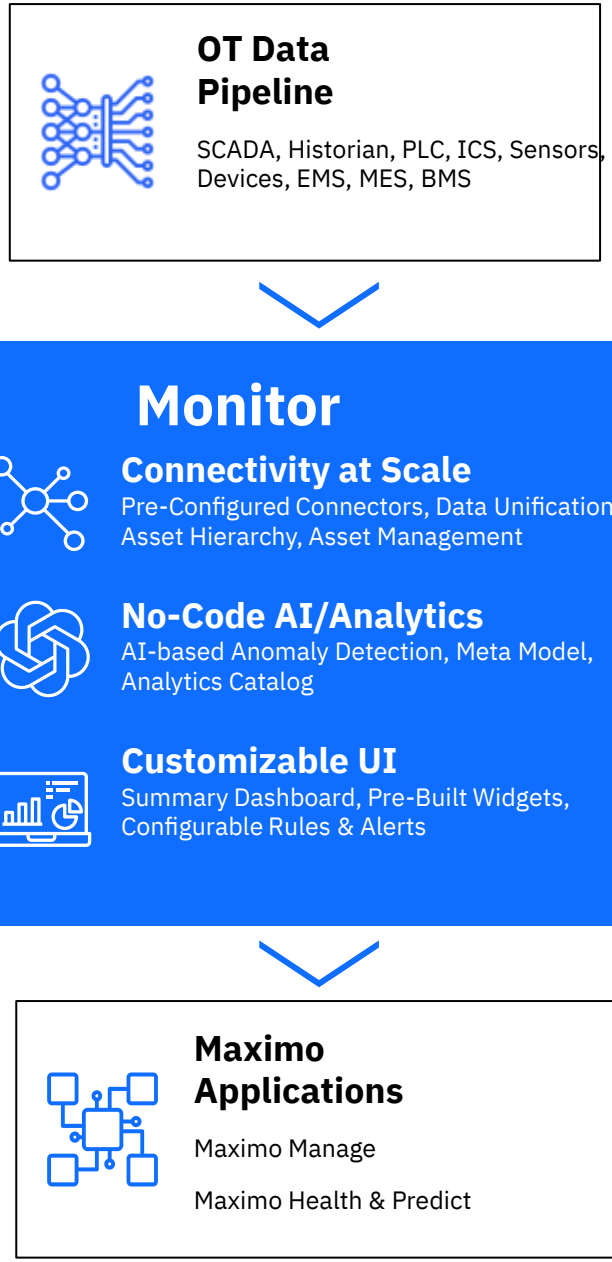
Flow of Insights

Intelligent Asset Management

AI-powered Solar Farm Inspection

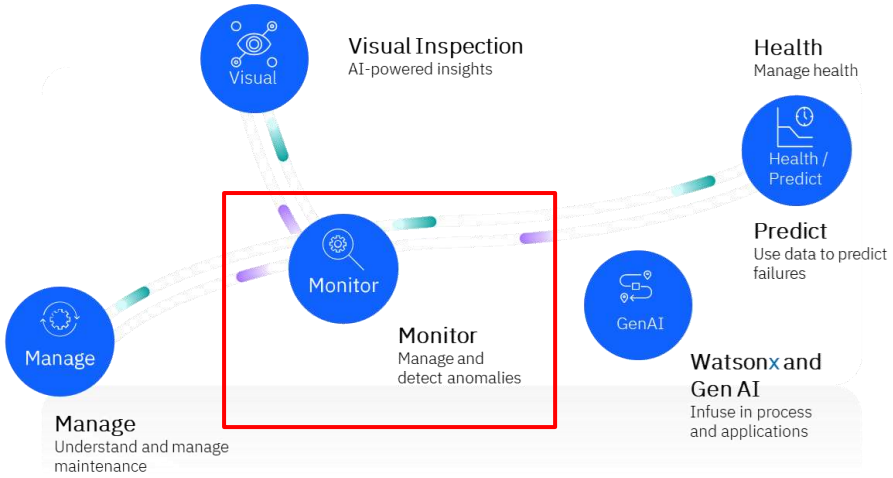
Overview:

- ❑ A solar farm energy production is continuously monitored.
- ❑ Power drops or anomalies generate alerts & trigger a drone visual inspection.
- ❑ Inspection results are analyzed and health scores for every panel are calculated, enabling real condition-based decisions.
- ❑ Fix work orders with clear fix instructions are provided to the technician.



Intelligent Asset Management

AI-powered Solar Farm Inspection



1 Energy Loss:

One solar panel is covered, resulting in a sudden power production drop of the farm.

That drop generates an alert then a service request to launch a drone inspection of the solar farm to identify defects.

1. Energy Loss Detected

Intelligent Asset Management

AI-powered Solar Farm Inspection

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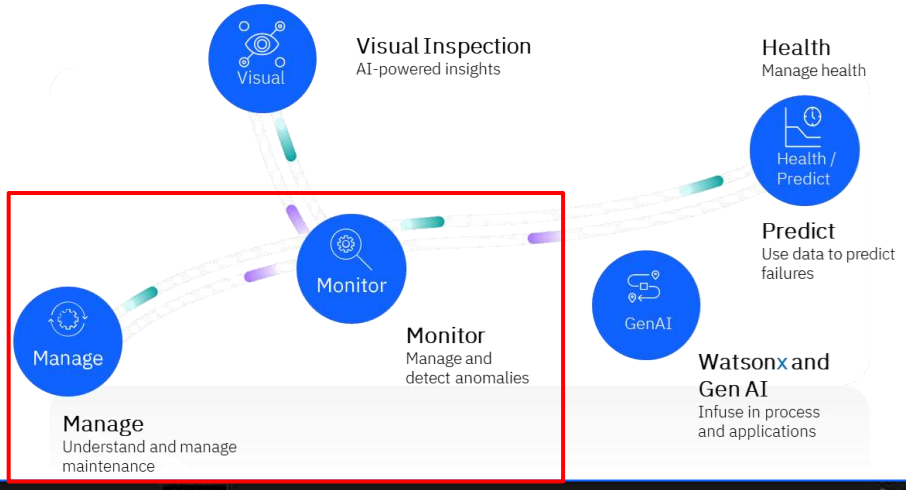
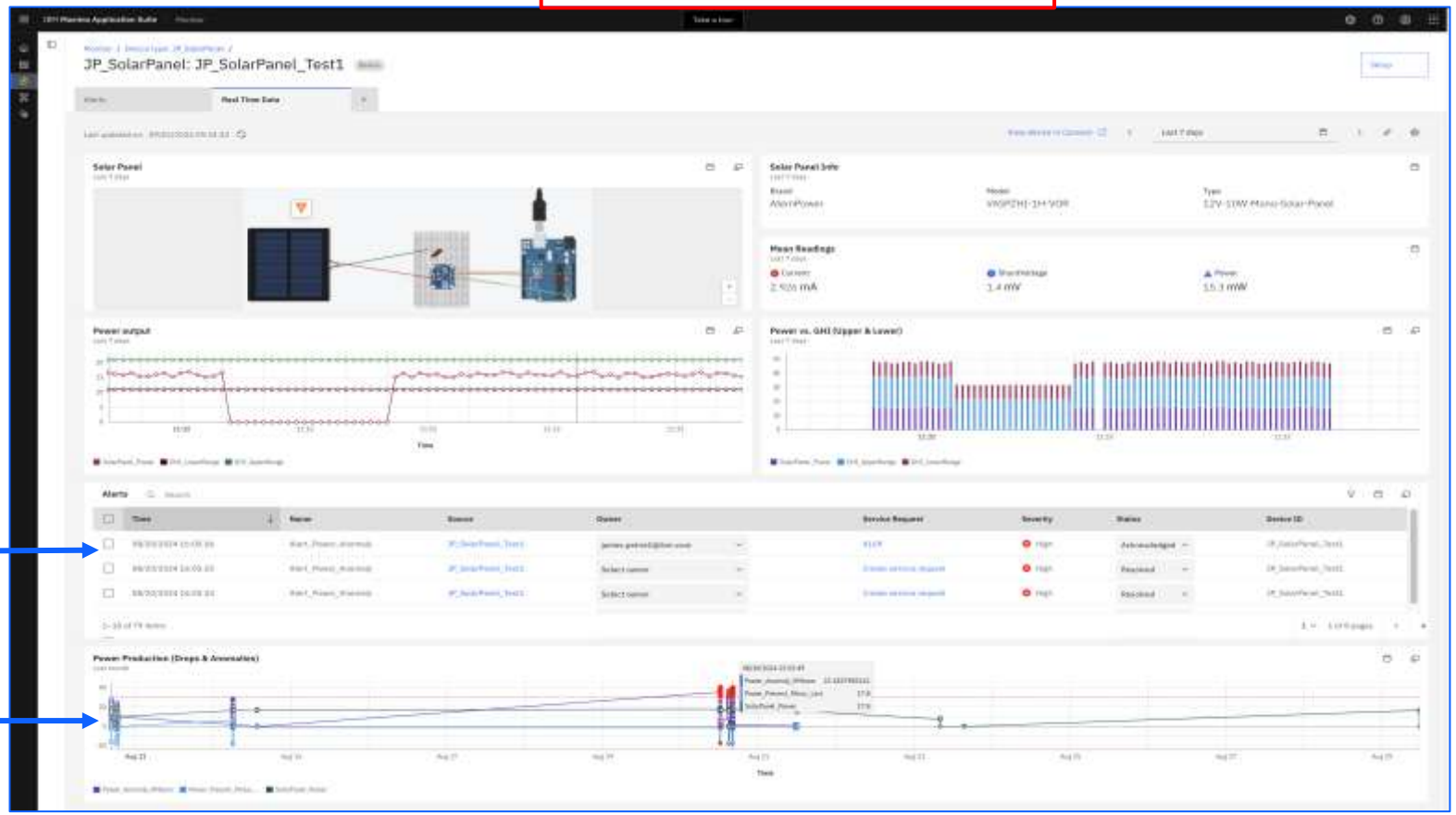




2. Service request sent automatically

3. Unsupervised anomaly detected

Intelligent Asset Management

AI-powered Solar Farm Inspection

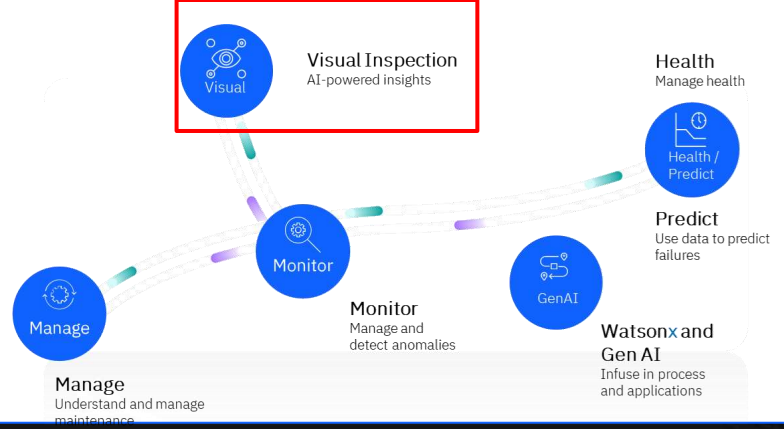
2 **Visual Inspection**:

The drone visual inspection automatically detects defects (like Lichen Growth or Bird Drops).

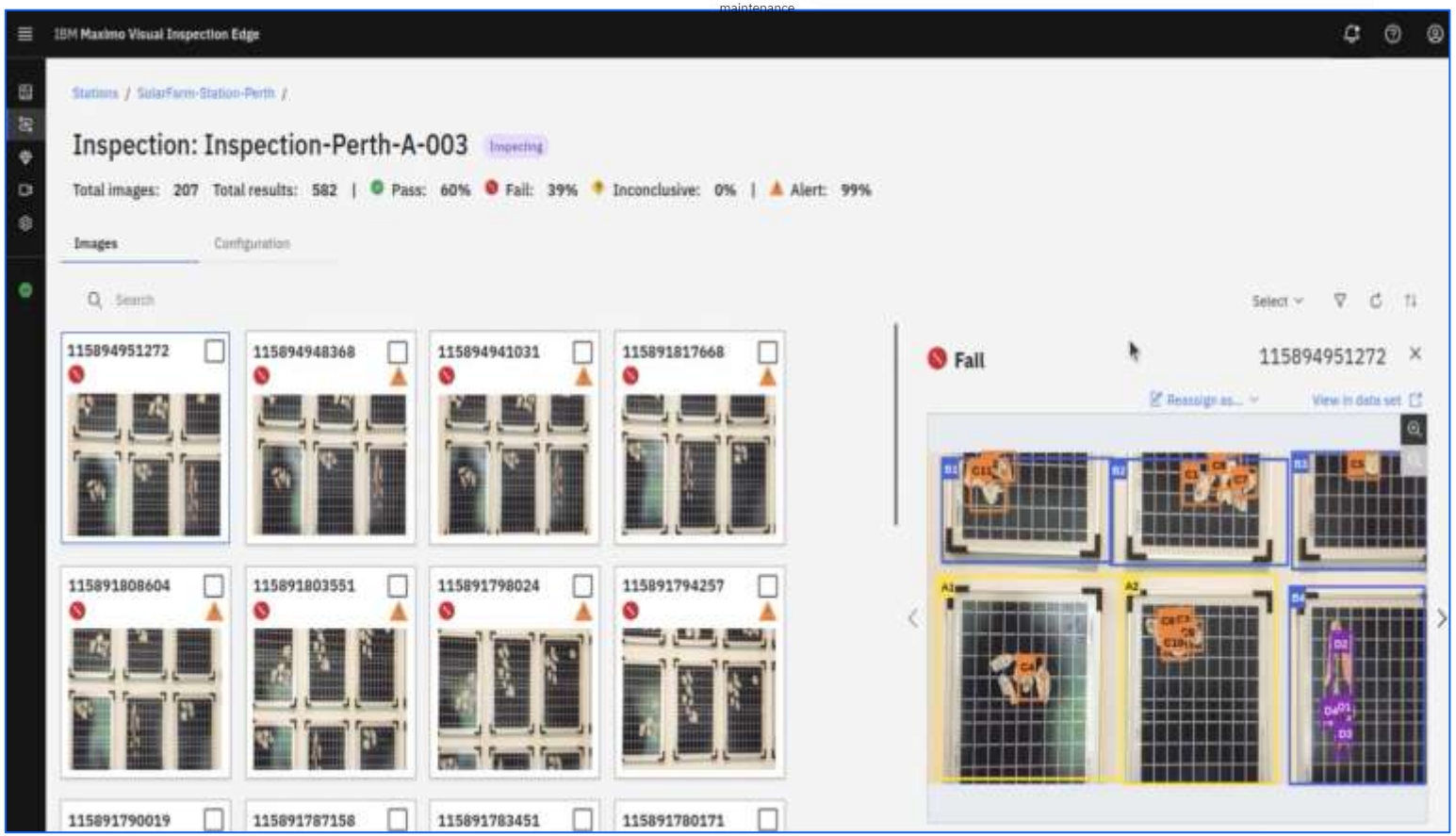
All inspection results are sent to Monitor where defect counts, trends, anomalies insights are provided via dashboards.

Overall Health score is calculated for each panel – mix of its power production, defects and number of past fix work orders.

Based on the real condition of every asset of the solar farm and other info like criticality, cost or age, decisions can be made on e.g. which panels to fix first.



1. Visual Inspection Results



Intelligent Asset Management

AI-powered Solar Farm Inspection

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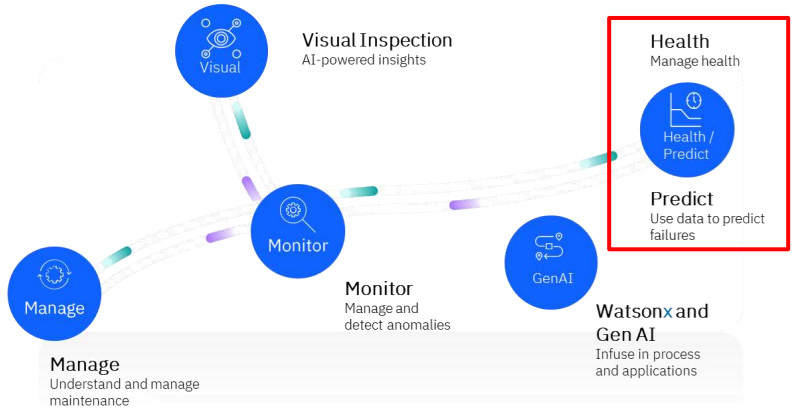
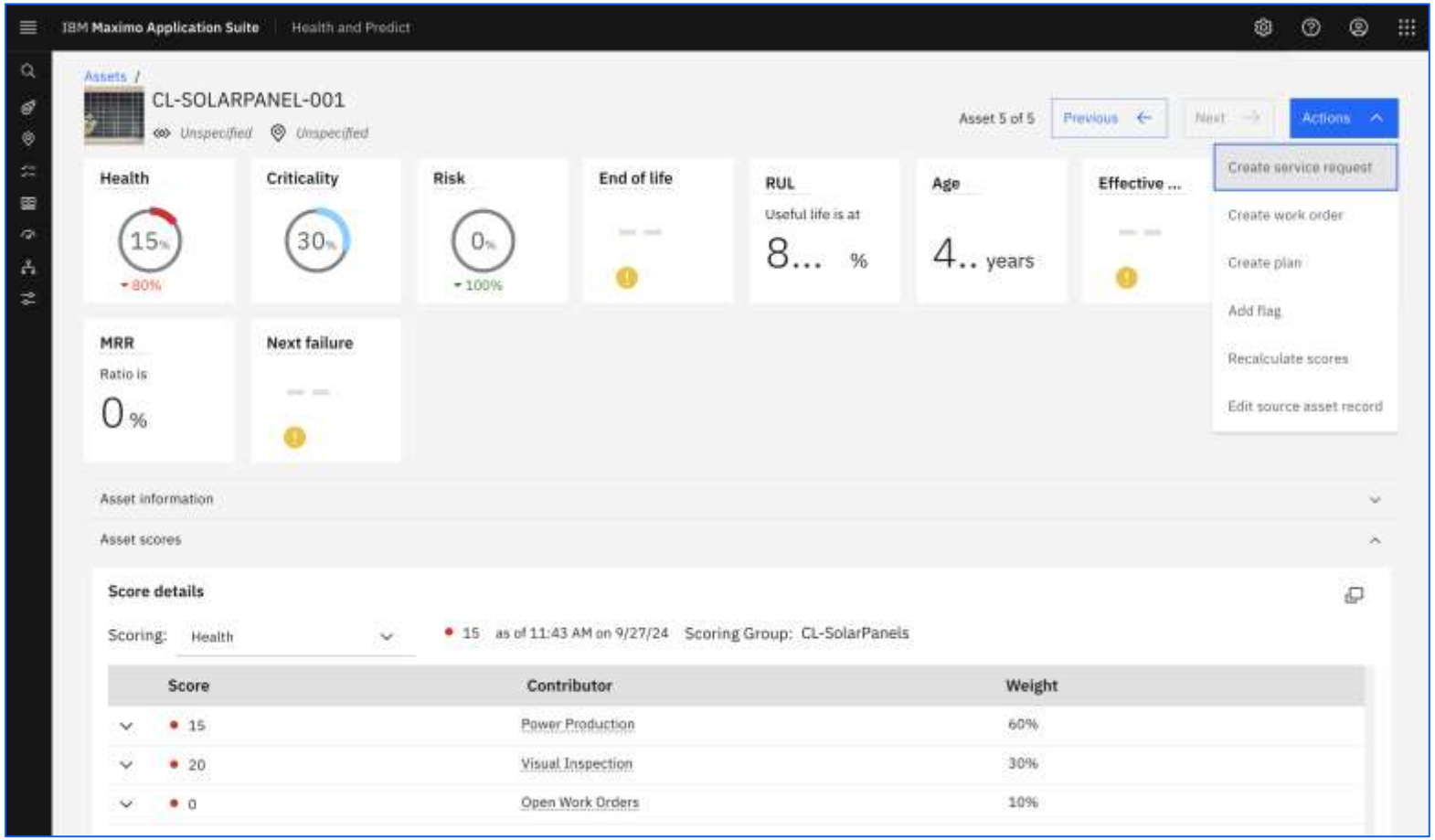


2. Health Score



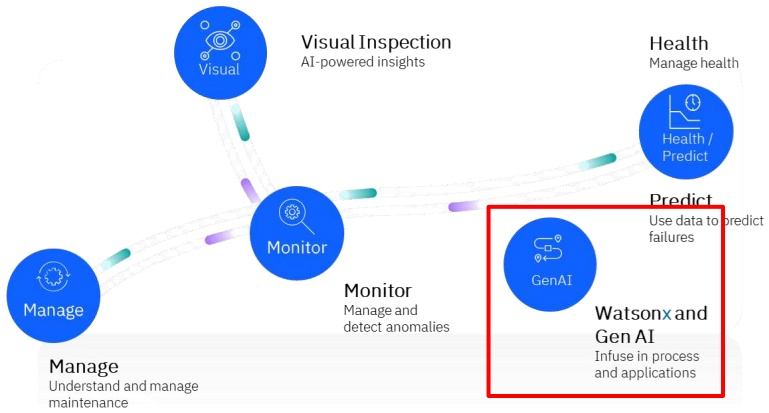
Intelligent Asset Management

AI-powered Solar Farm Inspection

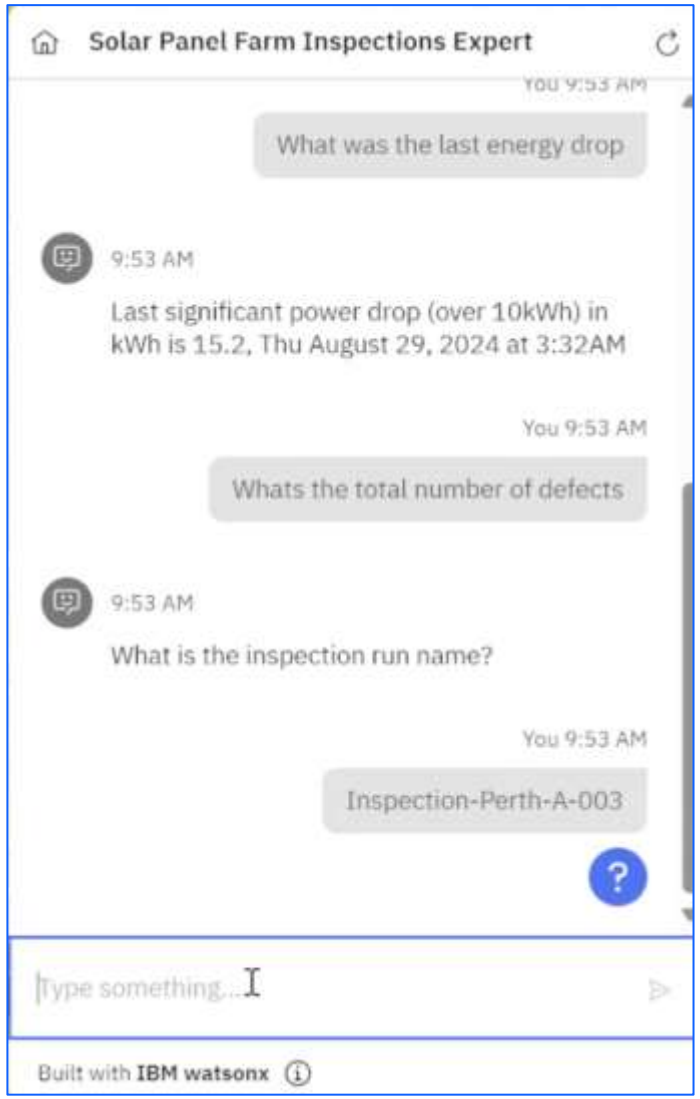
3 GenAI + Q&A:

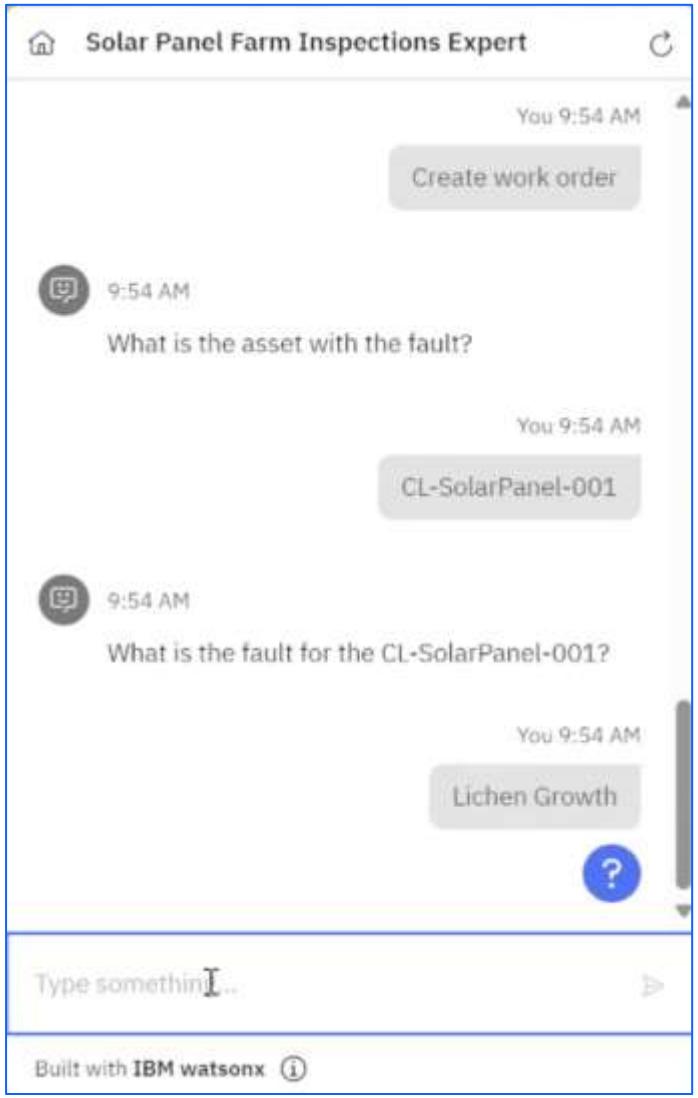
Ask questions like “*What was the recent farm energy production like ?*” or “*How many defects were found during last inspection ?*”, “*Generate a summary of last inspection*”

Finally, ask “*Create a Work Order*” and the system generates a work order with a long description providing clear fix instructions, materials required etc.



1. Natural language usage





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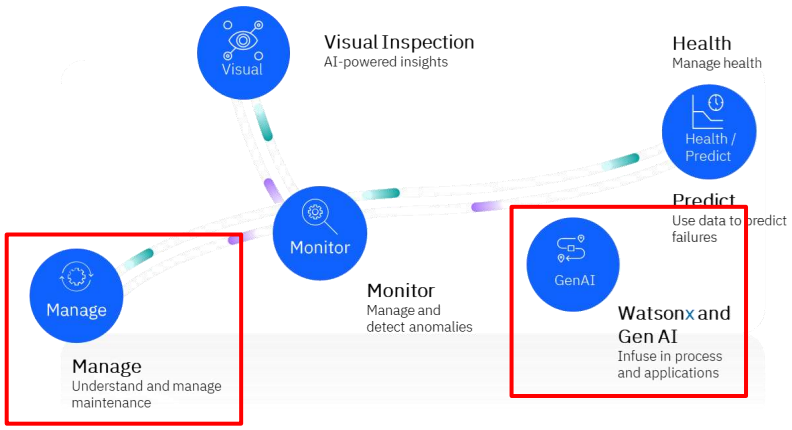
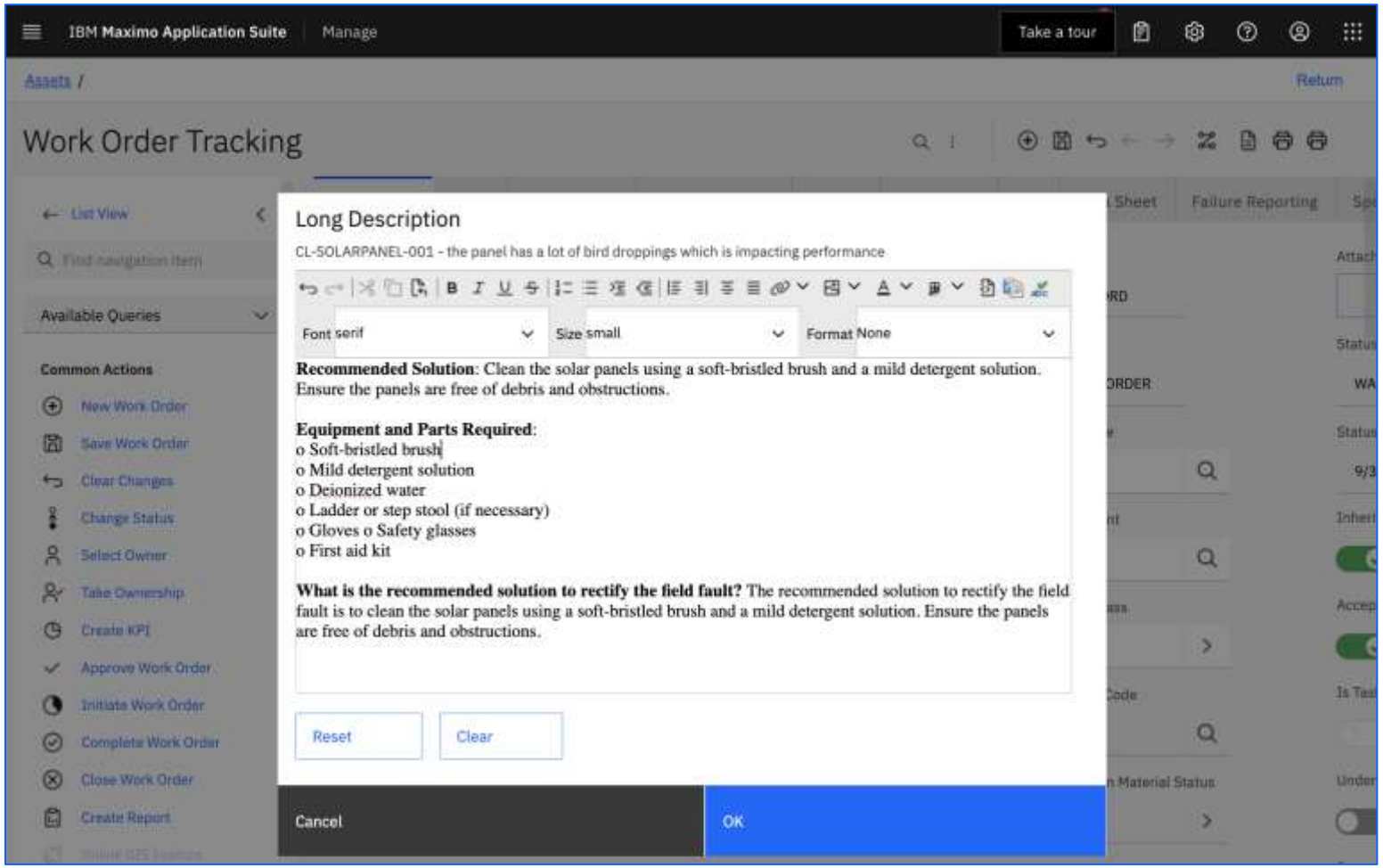


2. Easy Work Order



IBM Maximo Application Suite

Remote asset monitoring, maintenance and reliability applications in a single platform

Manage - Intelligent asset management

Work Management
- Job plans for recurring tasks
- Predictive maintenance
- Manage labor, skills, qualifications

Asset management
- Location/Function, work, and cost history
- Roll-up costs
- Asset modeling
- Improved asset safety

Analytics
- Descriptive, predictive and prescriptive analytics
- Built on industry-leading Cognos business intelligence software
- Available & customizable by user type

Planning and scheduling
- Ensures assignment of the right person, with the right skills
- Drag-and-drop team assignments accelerates schedule optimization.

Health - 360-degree view of assets

- Dashboard with cards, map view, spreadsheet view
- Fleet-wide view and health drilldown
- Health based notifications and actions
- Flexible health scoring by asset type or groups
- Sensor data integration
- Job plan efficacy analysis
- Refurbish / replace prioritization

Monitor - Monitor and detect anomalies

- Easily Configurable dashboard: No-Code Widgets
- Enterprise-wide view of operation
- Workflow to drive ownership of issues
- Auto-generation of work orders
- Rapid data integration
- Hierarchical data filtering and management

Predict - Predictive failures

- Templates provided to build common predictive models
- Score predictive models using Watson ML
- View pre-built visualizations for the common models
- Use model scores to assess asset health with Maximo APM - Health

Mobile - Technician work execution

- Templates provided to build common predictive models
- Score predictive models using Watson ML
- View pre-built visualizations for the common models
- Use model scores to assess asset health with Maximo APM - Health

Scheduler - Schedule work and resources

- Preventive maintenance forecasting and costing
- Drag and drop scheduling of work orders, visualize dependencies, understand resource impacts
- Critical path analysis and scheduling for complex projects
- Dynamically assign/dispatch technicians to work orders
- Track schedule compliance KPIs

Visual Inspection - AI-Powered Insights

- Simple, rapid deployment of custom computer vision models
- Classification, Object Detection, Action Detection models to support a variety of organizational requirements

Maintenance Transformation Agent

1.5t Fortune Global 500 companies loss an estimated trillion USD annually due to unplanned downtime

260k The average cost per hour of downtime in USD for manufacturing

As Is Maintenance Approach (Industry norm)

Human-Driven Monitoring Model:
Entire monitoring process depends on operators manually checking machine status.

Lack of Real-Time Visibility:
Data from machines is delayed or siloed, preventing early detection of issues.

Scalability Limitations:
More machines equals more workload for operators which leads to lack of the ability to scale without increasing manpower.

Reactive Maintenance Workflow:
Maintenance only happens after the machine shows problems or fails.

High Dependency on Manual Logs:
Operators must input or inspect data manually prone to human error.

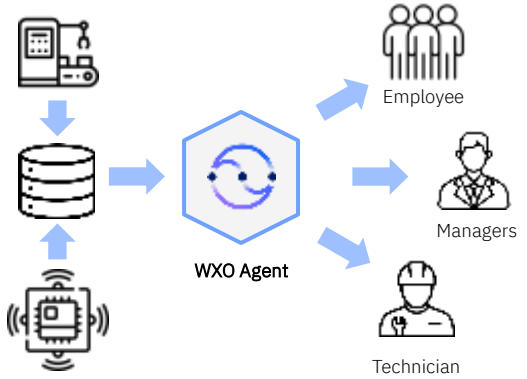
Ref1, Ref2

To Be Maintenance Approach (AI Transformation)

To continuously monitor machine conditions, detect anomalies, and trigger preventive actions automatically.

By capturing real-time operational data; temperature, vibration, motor load, cycle count. The AI model identifies abnormal patterns early, predicts possible failures, and recommends or triggers maintenance. The Agentic AI then coordinates with technicians, updates systems, and ensures actions are followed through.

WxO Maintenance Transformation agent



Operational Efficiency :
Automates real-time machine health monitoring. Reduces unplanned downtime and improves OEE (Overall Equipment Effectiveness).

Predictive Maintenance:
Detects abnormal vibration, temperature spikes, or degradation trend.
Predicts component failure before it impacts production.

Cost Optimization :
Reduces emergency repairs, scrap, and production interruptions. Enables optimized maintenance cycles (condition-based instead of schedule-based).

Employee Empowerment :
Operators focus on higher-value tasks instead of constant manual checking.
Technicians receive clearer, AI-generated instructions and prioritization.

Faster Decision Making:
Agentic AI automates alerting, escalation, and root-cause explanation.
Suggests recommended actions based on historical patterns.

Data & Insights:
Continuous data collection for performance trend analysis.
Enables digital twin simulation, capacity planning, and production forecasting.

Predictive

Proactive


Reactive