Microsoft Services

Predictive maintenance

Manufacturing
The digital revolution has unlocked new opportunities for manufacturers to challenge the convention and re-think how products are developed, operations managed, and supply chains optimized.
In today’s competitive environment, manufacturers must have complete confidence in their operations—the foundation of their success.

To win in their markets, manufacturers must execute consistently and improve performance constantly.

Digital Transformation is shifting the balance to manufacturers who can ensure critical asset availability and deliver on customer promises.

Organizations can realize new levels of asset utilization by implementing predictive maintenance—intelligent systems and devices that implement sensors and cognitive systems and automate data collection to improve overall performance.

With predictive maintenance, manufacturers can lower costs, drive higher output and efficiency, and enhance product quality.
Improve maintenance efficiency

SMART SCHEDULING
Reduce overall maintenance budget and avoid loss of resources due to unplanned maintenance events

ASSET & INVENTORY OPTIMIZATION
Predict remaining useful life and optimum inventory levels of spare parts

ANOMALY DETECTION
Identify deviances from normal trends to predict potential failures

REDUCE DEFECTS
Improve internal quality, scrap, and rework rates
Unlock new opportunities at the intersection of business model innovation, differentiated experience and technology integration

MANUFACTURING AS A DIGITAL SERVICE

### DEMAND MANAGEMENT
- Sales orders
- Selected quotations & estimates
- Forecasting
- Replenishment of stock
- Product configurations

### MANUFACTURING MANAGEMENT
- Design & change control
- Material & labor cost monitoring
- Subcontract operations management
- Tracking & traceability
- Factory scheduling
- Project-based monitoring
- Supply chain management

### INVENTORY MANAGEMENT
- Multi-use warehousing
- Stock categorization
- Inventory optimization
- Warehouse management
- Real-time monitoring & reporting

### SALES MANAGEMENT
- Monitoring & management of margins
- Sales order management
- Repair & maintenance orders
- Payments & retentions
- Negotiation & monitoring of maintenance contracts

### MATERIAL ACQUISITION
- Supplier management
- Serial tracking
- Lot traceability
- Lead time management
- Material inspection

### CUSTOMER MANAGEMENT
- Customer contract management
- Service level agreements
- Installation services & assistance
- Recalls, claims & warranties
- Claims and reimbursements management
- Human resource management
- Remote monitoring
Imagine if you could stay one step ahead of your maintenance needs, scheduling maintenance process and times optimally ...
Enable intelligent manufacturing, automation servicing, and cost-effective production support

FROM REACTIVE

Our manufacturing floor is experiencing too much down time, often in the midst of busy production schedules.

I am facing continuous pressure to avoid breakdowns, eliminate extended downtime, AND reduce maintenance costs.

We have diverse equipment from multiple vendors linked together in a manufacturing line where each contains its own silo of operating data.

We do not have the information we need to respond quickly at optimal times to ensure quality and the continuous operation of the manufacturing lines.

It is difficult to coordinate our vendors for just-in-time response.

TO PREDICTIVE

The information and intelligence built into our manufacturing equipment and our machine-learning-based predictions provide the insight we need to anticipate and prevent many breakdowns.

We identify optimum times and processes for refreshing our equipment, which increases manufacturing uptime and drives down costs.

Our equipment vendors can remotely monitor, assess, diagnose, and tune our manufacturing equipment, and work closely with us to improve equipment performance and lifetime, schedule maintenance, and reduce downtime.

We have realized major savings in maintenance operations and are now more flexible, productive, lean, and effective in running our shop.
See through the eyes of your customers

**Inbound logistics**
- Optimize transportation
- Monitor supply chain
- Manage distributed orders (Purchasing)
- Manage capacity, inventory, loss
- Manage MRO and WIP inventories
- Manage maintenance of assets
- Manage shop floor orders
- Manage distributed inventory (FG)
- Outbound logistics

**Warehousing**
- Manage distributed inventory
- Manage capacity and consumption
- Monitor inventory lifecycle

**Manufacturing execution system**
- Manage MRO and WIP inventories
- Manage production and maintenance
- Monitor and control remotely

**Digital Hotspots**
- Inbound/Outbound logistics
  - Manage distributed orders
  - Optimize transportation and routing
  - Monitor supply chain performance
- Warehousing
  - Manage distributed inventory
  - Manage capacity and consumption
  - Monitor inventory lifecycle
- Manufacturing execution system
  - Manage MRO and WIP inventories
  - Manage production and maintenance
  - Monitor and control remotely
Move towards predictive maintenance

We can schedule our production efficiently because our equipment is monitored for signs that service is or will become necessary.

### Benefits

- Avoidance of production losses
- Reduction in inventory costs
- Reduction in expedited shipping costs
- Avoidance of catastrophic shutdown losses
- Reduction in supply chain management costs

### Gather Operational Data

Gather service-related data from sensors in equipment

### Analyze for Issues and Coordinate Service

Analyze sensor data for service issues, using predictive maintenance models

### Maintenance Planning

Reacting to maintenance needs
Restricting service personnel to physical static systems for sharing information
Investing in conventional insight engines

### Optimize Production

Efficiently provide service to accommodate production

### Maintain Crew

Gaining and analyzing captured data intelligently
Sharing and acting on insights innovatively
Sharing information with mobile staff seamlessly
Predicting and performing maintenance proactively

### Start

Top-line impact: We have made savings in maintenance operations and are now more flexible, productive, lean, and effective in running our shop.

### Stop

- Reacting to maintenance needs
- Restricting service personnel to physical static systems for sharing information
- Investing in conventional insight engines

### Continue

- Focusing on production efficiency
- Adopting new technologies
- Gathering and responding to real-time data
Innovate business models, services, and solutions that differentiate

Factory workers
- Remote monitoring & diagnostics
- Repair/Tune

Factory analysts
- Collaboration
- Root cause analysis
- Manufacturing insights

Field techs
- Remote repair/Tune walkthrough
- Collaboration/Analysis

Global operations
- Critical alerts
- Global manufacturing status dashboards

Collaboration/Analysis

Historical equipment data

Streaming equipment data

HDInsight
Power BI
App Service
Dat Factory
Azure SQL DB
Azure Storage
Azure Machine Learning
Event Hubs
Stream Analytics
HD Storm
Notification Hubs

Skype
Office 365
Improving the way people and cities move while reducing the average length of service calls by 4x

Twenty-four thousand elevator service technicians can now visualize and identify problems ahead of a job and have remote hands-free access to technical and expert information when onsite.

“Predicting problems enables us to have fewer service interventions, and this equipment helps us do our job faster”
— Andreas Schierenbeck, CEO of ThyssenKrupp Elevator
Deliver business outcomes through your digital transformation.

Engage your customers
Deliver personalized, rich, connected experiences to your customers, inspiring loyalty along every step of the customer journey.

Empower your employees
Enable your employees to keep up with your fast-moving customers, efficiently collaborating to quickly meet customer needs with agility.

Optimize your operations
Increase the flow of information across your entire business, synchronize your business processes, and improve your interaction with your partners and supply chain.

Transform your products
Gather information about the use of your products, design innovative features, and collaborate with your development team to improve products and develop new ones.
You are reinventing what it means to do manufacturing, and we’re committed to creating the right solutions for you.

Our solutions are disruptive and robust, delivering real results at speed.

Together, we can reimagine the art of the possible.
Microsoft Services empowers organizations to accelerate the value imagined and realized from their digital experiences.

Imagine.  
Realize.  
Experience.

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