Matt Midas Maven Asset Management *Driving Asset Management Forward*

West Mountain Maximo Users Group Salt Lake City, UT November 10, 2022



Our Background

Experience



- 14-years of providing Superior Maximo Services
- 100s+ of Years of Maximo Experience
- Commitment to Maximo Community

Credentials



- IBM Gold Partner
- Certified IBM Maximo consultants
- Awarded ISO
 9001:2015
 Certification



References



- High customer satisfaction
- Long-standing relationships based on trust
- Teaming partnerships with clients

Services



- Upgrades
- Tech Services
- Managed Services
- Training
- Data Management
- Mobile
- Process Realignment And more!



Goals of this presentation

- Understand what Condition Monitoring is
- Understand the difference between Condition Based Maintenance and Condition Monitoring
- Understand how Condition Monitoring started
- Understand the value and importance of Condition Monitoring
- Understand how Condition Monitoring is a part of a reliability program
- Think about how your organization can benefit from Condition Monitoring



- CM is the process of monitoring a parameter or condition in a piece of equipment in order to identify a significant change which is indicative of a developing fault.
- CM is a major component of an asset management program and a predictive maintenance program
- CM supports a reliability program.
- The use of condition monitoring allows maintenance to be scheduled, or other actions to be taken to prevent consequential damages and avoid its consequences.
- It identifies conditions that would shorten normal lifespan that can be addressed before they develop into a major failure.
- CM replaces time based intrusive PMs that can actually introduce a failure point



Early Examples

- In 1593, Galileo Galilei invented a rudimentary water thermoscope, which for the first time allowed temperature variations to be measured.
- The Italian, Santorio Santorio (1561-1636) is generally credited with having applied a scale to an air thermoscope at least as early as 1612 and thus is thought to be the inventor of the thermometer as a temperature measuring device. The more modern thermometer was invented in 1709 by Daniel Fahrenheit.
- In 1654 the first sealed glass tube was developed by Ferdinand II, the Grand Duke of Tuscany. It contained alcohol and had a numerical scale, but wasn't very accurate.
- In 1849, the French engineer Eugène Bourdon patented the pressure-measuring device commonly known today as the Bourdon tube.



Examples













Maintenance and Reliability

2020's and Beyond



Clean Working Environment



Where does Condition Monitoring Play



What is the difference between Condition Based Maintenance and Condition Based Monitoring?

Components Of Condition Monitoring

- Complete list of Assets
- Asset Criticality
- Asset Data
- Sensor Data
- Job Plans with tasks, labor and materials
- Meters set up in Maximo
- Conditions set against Meters
- Trending reports
- Data Analysis Plan

- Goals and Objectives
- Strategy
- Alignment





Common Methods for Condition Monitoring

- Vibration Analysis
- Oil Analysis
- Infrared thermography
- Ultrasound
- Acoustic emissions
- Electrical Monitoring
- Electromagnetic Measurement
- Laser Interferometry
- Motor Circuit Analysis

Some things to consider

- People have been using devices since the at least the 1600's to measure temperature and 1800's to measure pressure
- Do you have assets with meters or sensors associated with them?
- How are you collecting the data from meters/sensors?
- Do you have control systems that are collecting data
- Do you have a data historian SCADA
- How many of you do something with the information from the meter or sensor?
- Are meters set up in Maximo?
- Manually enter data into Maximo?
- Integration to feed meter readings
- Do you generate a work order with a Job Plan

MAVEN

Advances in technology have enabled us to vastly improve how me monitor our assets

- These improvements in how we monitor our assets will exponentially increase the amount of data we need to manage.
- Do you have a proper data strategy to manage your data?
- Maximo Monitor or other sensor dashboards?
- Are they connected to Maximo?
- Sensors are smaller, have multiple functions, extended battery life, easy to install
- Drones?
- Spot?
- Digital Plant?









Good

- Data is being captured
- Potential to do something with the data
- Improves with Mobile
- Can generate WO with JP

No So Good

- Someone records a value on paper
- May no get entered in a timely fashion
- Subject to errors





Good

- Improved data capture
- Not relying on re-keying data
- Integration or data load
- Trending to predict maintenance **Not so Good**
- Are we capturing the right data
- Do we have correct JPs in place
- May not cover all assets









Good

- Programable
- Routes
- Al to evaluate condition
- Data Analytics to predict failure
- Drones
- Spot

Not so Good

• Data intense – Are we ready



Automation



Digital Twin

- Digital representation of the asset
- Digital representation of the plant
- Full visibility of sensors/performance
- Data intensive

Drones

- Affordable way to perform Inspections
- Can improve
 efficiency



Spot

- Repeatable routes
- Highly flexible
- Highly configurable
- Multiple sensors and payloads

Sensor Capabilities





Sensors

- Vibration Triaxial
- Acoustic Emissions
- Temperature
- True RPM
- Humidity

IIoT Platform • Magnetic Flux

Multiple ways to mount Wi-Fi enabled Long lasting batteries Low cost of entry

IBM Maximo Monitor

Monitoring with AI-based Anomaly Detection at Enterprise-Scale



Solution

- Enterprise Scale Monitoring
- AI-based anomaly detection

Capabilities

- Ingest data through MQTT and SCADA connectors
- Easily Configurable dashboard: No-Code Widgets
- Enterprise-wide view of operation
- Shared Asset Hierarchy with Manage
- Feed Meters with Monitor data for Condition Based Maintenance
- Generation of Service Requests



Business Value

- Reduce unplanned downtime
- Shorten duration of outages
- Increase production output
- Decrease wasted time investigating false-positive alerts

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

OT Data

Pipeline

Monitor

Connectivity at Scale Omnio Connectors, 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

- Technology is increasing the amount of data we gather
- Edge computing can quickly analyze these large quantities of data
- Identify conditions that we need to know about
- Identify conditions that are problems and need to be addressed before they become catastrophic
- Have defined actions already identified to address actionable conditions

Benefits Of Condition Monitoring

- Reduced Unplanned Downtime
- Increased production output
- Maximizes Asset Life
- Optimizes Maintenance Budgets and Resources
- Offers insights, not just alerts
- More accurate data > better KPIs and Reports
- Allows more time to plan and schedule work
- Improves efficiency and effectives
- Improves safety
- Improves morale
- Improves Reliability

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Credits and Sources

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Thank You.

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