USE CASE

LISTEN TO YOUR MACHINES TO OPTIMISE ASSET HEALTH

ARE YOUR PREVENTIVE AND REACTIVE MAINTENANCE EFFORTS WRENCHING AWAY PRECIOUS RESOURCES?

If so, you're not alone. It is estimated that 45% of maintenance efforts are largely ineffective. For asset intensive organisations, this leads to company-wide inefficiencies and underperformance. Time to explore possible solutions.

UNDERSTANDING THE PROBLEM

For an asset-intensive organisation, machine maintenance is a crucial aspect of their day-to-day operations. However, while much effort goes into maximising uptime, the efficiency and effectiveness of many maintenance procedures leaves much to be desired, as industry insights show:

- 40% of preventive maintenance costs are spent on assets with negligible effect on uptime
- 30% of preventive maintenance activities are carried out too frequently
- 45% of all maintenance efforts are ineffective

These depressing statistics are largely a result of an out-dated traditional preventive maintenance approach that is based on time alone. Maintenance activities get scheduled based on a certain frequency without any regards to the actual state of the assets.

This approach consumes unnecessary resources by maintaining equipment more often than needed. Even worse, it could potentially cause failures by disrupting the equilibrium of stable assets.

Inefficiencies around maintenance are further impacted by the fact that 40% of organisations are not using any form of predictive maintenance and, of those who are using it, only a quarter are integrating their predictive algorithms with work order systems. That means data and information does not flow between systems and much of the deeper insights are lost.

In summary, most organisations simply don't know where to spend their maintenance time, resources and money to achieve the best outcomes – both for asset health and overall productivity of the business.

THE SOLUTION: LISTEN TO YOUR MACHINES

While most companies are aware that much of their preventive maintenance efforts are wasted, few know what to do about it. But the solution is surprisingly simple: to optimise their maintenance efforts, asset-intensive organisations need to listen to their machines - and thanks to innovative technology, that is becoming easier than ever.

Most machines and assets manufactured today have built-in sensors and provide real-time information to industrial control systems such as Supervisory Control and Data Acquisition (SCADA) systems, Building Management Systems (BMS) or Programmable Logic Controllers (PLCs). For older equipment, there are simple ways to retrofit sensors. This development is further enabled by the fact that communications networks that gather data from assets—in the form of cellular networks, Wi-Fi, Bluetooth and other technologies—have become more economical and ubiquitous even in sensitive plant environments.

As a result, operations teams can make use of streaming data from assets to monitor equipment performance, watch for early warning signs of failure and schedule maintenance accordingly. And asset management solutions have evolved accordingly:

- Out-of-the-box technologies are now available to collect, filter and map real-time data from equipment and make it available to reliability engineers and maintenance professionals for optimising preventive maintenance.
- Cloud technologies are providing a cost-effective way to aggregate, store and use advanced analytics against massive amounts of data coming from equipment, in combination with other sources.
- Analytics technologies are becoming more powerful in not only capturing tribal knowledge of engineers, but also for uncovering new, hidden patterns that can be used to predict failures. They are also becoming simpler to use, even by those without advanced statistical knowledge. Today's flexible analytic technologies work with data from multiple sources and in different formats. They even make sense of non-traditional, unstructured data formats such as video and audio.

All of these technologies enable organisations to schedule maintenance activities when they are needed and have the most impact – instead of when a certain amount of time has passed.

LISTEN TO YOUR MACHINE WITH IBM MAXIMO® APM – ASSET HEALTH INSIGHTS

Maximo® APM – Asset Health Insights (MAHI) enables organisations to understand the current health of their assets by leveraging data from the equipment, from Maximo, as well as weather data.

Tools are provided for the engineering team to define scoring methodologies using the knowledge and best practices based on their understanding of the equipment. It provides the following benefits for Maximo customers:

- Optimises maintenance – With visibility into asset health, maintenance costs can be reduced by eliminating unneeded preventive maintenance for healthy assets and identifying inefficient job plans.
- Improves reliability – By understanding the current health of assets through the Internet of Things (IoT), organisations can avoid potential asset failures and reduce expensive outages.
- Improves capital replacement planning – Leveraging asset health, organisations can identify assets in need of early replacement or refurbishment along with associated costs, and job plans needed to execute.

The IBM Maximo Asset Health Insights solution comprehensively manages asset health for an organisation's entire asset portfolio. The process begins by gathering data streaming from sensors using the Watson IoT Platform to illustrate real-time condition data. Data from intelligent sensors can feed directly to the platform or by connecting to an existing control system (SCADA, PLC or BMS) through gateways such as SCHAD's Automatic Meter Reading product.

This data is then combined with historical data in IBM Maximo, where engineers can define baseline health for each asset or for a class of assets across their operations. The streaming asset health data is used to monitor the health of assets against the pre-defined rules. It is then scored and visualised to easily understand potential problem areas and accelerate preventive maintenance. Asset condition ratings are not new and are already used by many organisations – often using a simple 1-5 scale and this existing system can be easily integrated into MAHI.

Additionally, MAHI enables you to get more sophisticated: you can augment that condition with an unlimited number of other factors that, when combined, present a more meaningful interpretation of the asset's health.

Scoring your assets' health becomes a fully automated function, reliably and consistently applied to both static and dynamic data, to measure the asset's performance and detect, even predict, degradation.

In MAHI, the asset health is measured as a percentage score (0-100), which is consolidated from a hierarchy of drivers and factors that proportionately contribute to the score. Each score is calculated from a number of key drivers (e.g. condition, age, costs, risk) and each driver can, in turn, be calculated from an amalgamation of multiple factors. Drivers and factors are derived from data through a comprehensive calculation feature, with each value then weighted to reflect the level of influence each factor has in determining the health.

Dashboards display assets and their health in intuitive ways such as on a map, list, or hierarchical view. Operators can explore the health of individual assets for further analysis or information, such as sensor or meter data history or current operating condition. External data, such as weather conditions relevant to an asset or the type of operation it is performing, can also be brought into the system and visualised to help improve maintenance decisions. For high-risk assets, service request or work order notifications can be sent automatically based on a change in health status.

Because of data, operations teams can plan preventive or corrective maintenance based on a deep understanding of asset performance patterns. If issues should arise, IBM Maximo offers complete tools across the asset maintenance lifecycle, including mobile solutions, to help field operations mitigate issues quickly and effectively. Furthermore, the insights also support the strategic capital planning process, augmenting the "repair or replace" decisions.

OUTCOMES AND BENEFITS

GET FULL VISIBILITY INTO ASSET STATUS

Real-time sensor data, alerts from SCADA systems, historical trends, maintenance and failure history combine with environmental data to give you a complete picture of asset health, so you can make smarter decisions about repairing and replacing assets.

OPTIMISE MAINTENANCE SCHEDULES

Performing maintenance while the asset is working can reduce disruptions to operations. Optimising your preventive maintenance workload can reduce total preventive maintenance hours by 50% to 70%.

REDUCE MAINTENANCE COSTS

Monitoring and analysing asset health data—both historical and real time—can help you reduce maintenance cost by up to 25%. Maximo Asset Health Insights lets businesses plan asset maintenance based on actual condition rather than manufacturer recommendations, reducing the waste and the costs associated with ineffective maintenance practices.

AVOID UNPLANNED DOWNTIME

Prevent problems before they occur by alerting when conditions degrade and initiating appropriate responses to avoid failure. Instead of simply reacting to catastrophic failure, Asset Health Insights can let businesses schedule more of their maintenance activities, reducing overtime costs and the need for expensive spare parts on short notice.

FOR EXAMPLE

Maximo Asset Health Insights can help organisations from a wide variety of industries to perform better by optimising maintenance based on asset health. The exact impact of this will be different for each industry and business. Here are just three examples:

WIND ENERGY

Get to know your wind turbine assets better and maximise dispatch time, asset life and wholesale margins.

PLANT OPERATIONS

Get to know your conveyer system assets better and improve throughput productivity.

TRANSPORTATION

Understand the key drivers for performance across a range of asset types and maximise productivity, quality and output.