Predictive Maintenance (PdM) for Assets

One of the biggest Real world problem is asset failure in manufacturing industries which can cause downtime too. It can be solved using Machine learning algorithms and with Artificial Intelligence(AI).

Predictive Maintenance for industries is a method of preventing asset failure by analyzing production data to identify patterns and predict issues before they happen.

Until now, factory managers and machine operators carried out scheduled maintenance and regularly repaired machine parts to prevent downtime.

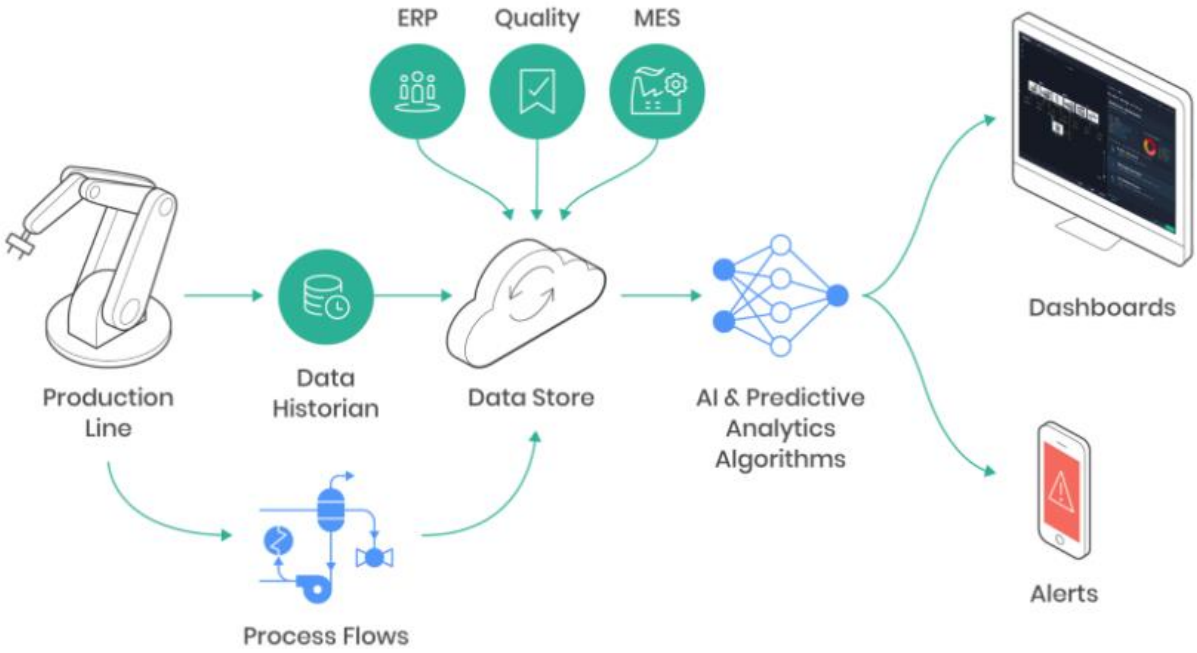
It is not a surprise therefore, that predictive maintenance has quickly emerged as a leading Industry use case for manufacturers and asset managers.

Implementing industrial technologies to monitor asset health optimize maintenance schedules, and gaining real-time alerts to operational risks allows manufacturers to lower service costs, maximize up-time, and improve production throughput.

Predictive Maintenance Using AI

Industrial artificial intelligence can be applied to predictive maintenance and many other use cases in the manufacturing industry.AI is perfectly suited to predictive maintenance. It offers a techniques to analyse the huge amounts of data collected from the manufacturing process, and deliver actionable insights to reach and sustain manufacturing excellence. These techniques are referred to as Machine Learning algorithms.

Critical features that help predict faults or failures are often buried in structured data, such as year of production, make, model, and warranty details, as well as unstructured data such as maintenance history and repair logs. However, emerging technologies such as the Big Data, analytics, and cloud data storage are enabling more equipment to share condition-based data with a centralized server, making fault detection easier, more practical, and more direct.



Predictive maintenance with machine learning looks at large sets of historical or test data, combined with tailored machine-learning (ML) algorithms, to run different scenarios and predict what will go wrong, and when.

Predictive Maintenance Using ML Algorithms

Advanced AI algorithms learn a machine's normal data behavior and use this as a baseline to identify and alert to deviations in real-time.

The algorithms required for machine learning must analyze input (historical or a training set of data) and output data (the desired result). A machine monitoring system includes input on a range of factors from temperature to pressure and engine speed. The output is the variable in question — a warning of a future system or part failure. The system will then be able to predict when a breakdown is likely to occur.

There are two main approaches to AI and machine learning for predictive analytics — supervised and unsupervised machine learning — each is relevant for a different scenario and depends on the availability of sufficient historical training data and the frequency of asset failure.

Predictive maintenance is achievable, affordable, and delivers measurable business benefits. The easiest way to get started is with an industrial platform centered on a rule-based model, which enables teams to quickly define, simulate and deploy a predictive maintenance solution for their products. Advanced analytics with predictive alerts and automated root cause analysis can be applied at a later phase — once sufficient historical data has been collected to accurately identify issues before they occur.