Fast Digital 4 Discrete Industries: Predictive Maintenance in a Box

Accelerating the Move to A Predictive Factory

Smart Machines Pave the Way for Manufacturing Longevity

The ability for machines to predict their own failures is transforming the way manufacturers approach factory efficiency and business longevity. In the race to stay competitive, savvy manufacturers know that smart, connected machines promise productivity gains and cost savings, and that maximizing equipment effectiveness through predictive maintenance is not just innovative, it's essential. But achieving that desired state of predictive is not a linear process; it's an iterative journey that takes time, effort and massive quantities of data.

For factories that still operate in reactive mode, or those that use a preventive approach, time is money. Machine downtime, whether it's due to failure, repairs, maintenance, or improvement, costs money and lost production. How can manufacturers make the right investments into machine maintenance that will quickly improve performance—without interfering with critical operations?

Capgemini Predictive Maintenance in a Box is a rapid project deployment solution that enables manufacturers to accelerate toward a state of predictive maintenance. With powerful insights-to-action capabilities, **Predictive Maintenance in a Box** captures and analyzes real-time information about root causes of equipment problems, enabling manufacturers to reduce unplanned downtime and defects, cut spare parts inventory and maintenance costs, improve the first visit fix rate ability, anticipate machine failure, and predict future maintenance needs.

Our ready-to-use solution leveraging pre-built algorithms is deployable to an industrial type of machine (i.e. stamping) in a few weeks—making it easy to scale to the entire factory. With smart technology like **Predictive Maintenance in a Box**, manufacturers will be able to make the leap from reactive to proactive operations and realize improved operations efficiency in weeks and not months.

Driving Faster Value for Clients

VALUE

Manufacturers are taking on their greatest organizational challenge yet as they come face to face with digital transformation. The need to cut down the time from cost to value has never been so urgent. The partnership between SAP and Capgemini brings together SAP's market-leading suite of digital solutions with Capgemini's global expertise in consulting, insights and digital manufacturing, creating a powerful innovation force, and reinventing machine maintenance to deliver faster ROI, and drive faster value.

Predictive modeling requires massive amounts of data, collected over time. The first step in the journey to predictive is to understand what's happening in the factory, and start creating machine history. By capturing, integrating and analyzing machine data with Predictive Maintenance in a Box, operators gain powerful visibility not just into machine performance today, but predictive capabilities into machine performance tomorrow. Reactive and preventive maintenance models only allow for monitoring, alerts and status updates when something goes wrong on a machine. The predictive maintenance model warns when a machine is out of normal running range, and estimates when that machine will fail, enabling manufacturers to proactively take corrective actions, avoid failures, and improve machine productivity and reliability.

SAP

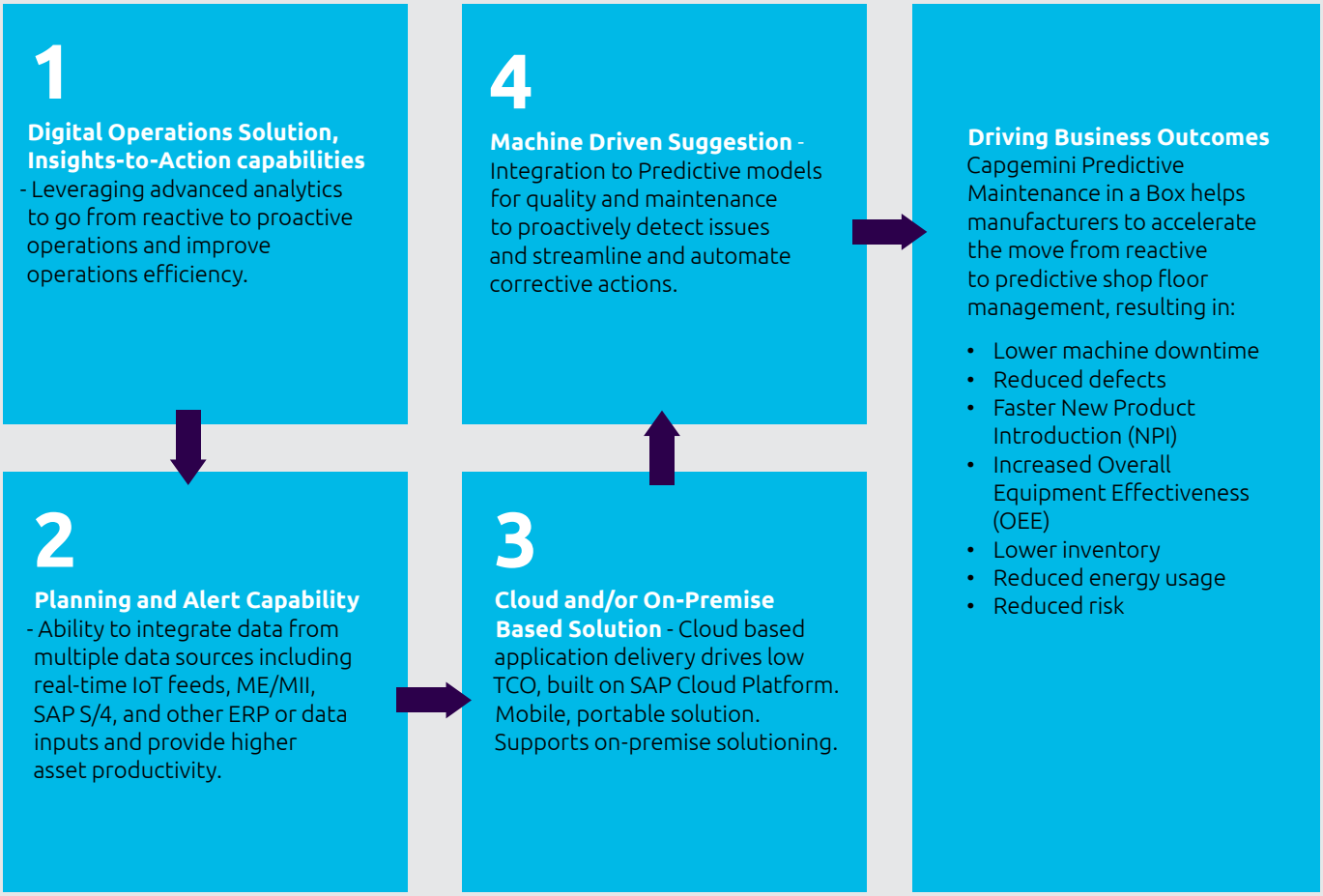
"By moving to an asset management mode driven by predictive maintenance, companies are increasing uptime, reducing maintenance costs, and ultimately, improving customer service. SAP collaboration with Capgemini on "Predictive Maintenance in a box" allows our clients to meet these expectations", said **Hans Thalbauer,** SVP Digital Supply Chain and Internet of Things at SAP.

Capgemini

"Asset Performance Management is where many companies start their Operational Intelligence journey. Getting more out of critical assets, first by avoiding unplanned maintenance and then maximizing throughput, generates tangible bottom line benefits while allowing organizations to experiment the power of data-driven operations. Capgemini and SAP joint initiative on Predictive Maintenance is a powerful accelerator of our joint clients' Operational Intelligence roadmap", said **Pascal Brosset,** CTO, Digital Manufacturing, Capgemini Group.

Key Features

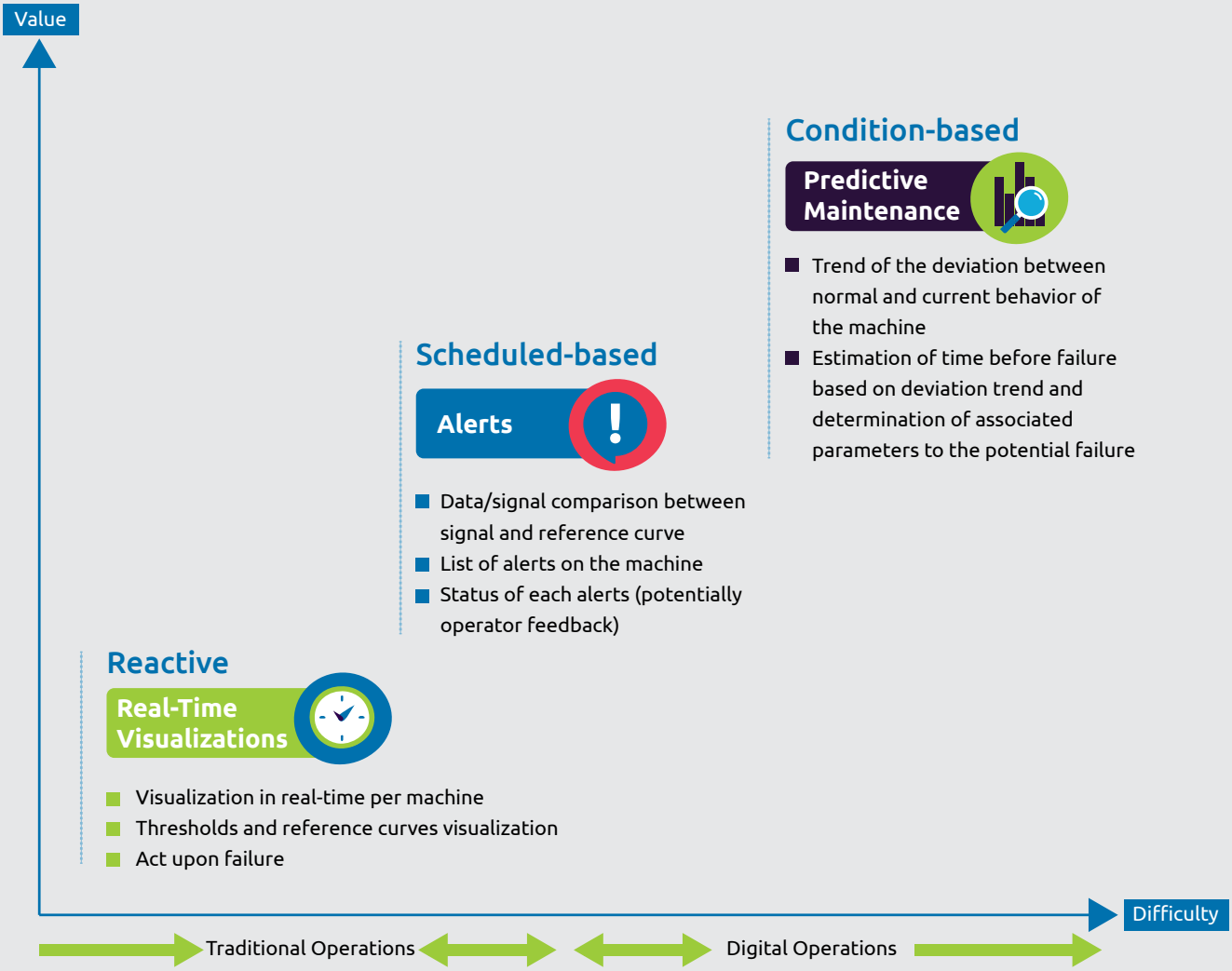
Combining the world's most powerful digital innovation platform, SAP Leonardo IoT, with Capgemini's Digital Transformation Framework, containing a vast library of pre-built algorithms, built on long-standing experience with many clients, Predictive Maintenance in a Box features tangible and reusable assets that accelerate digital transformation, including:

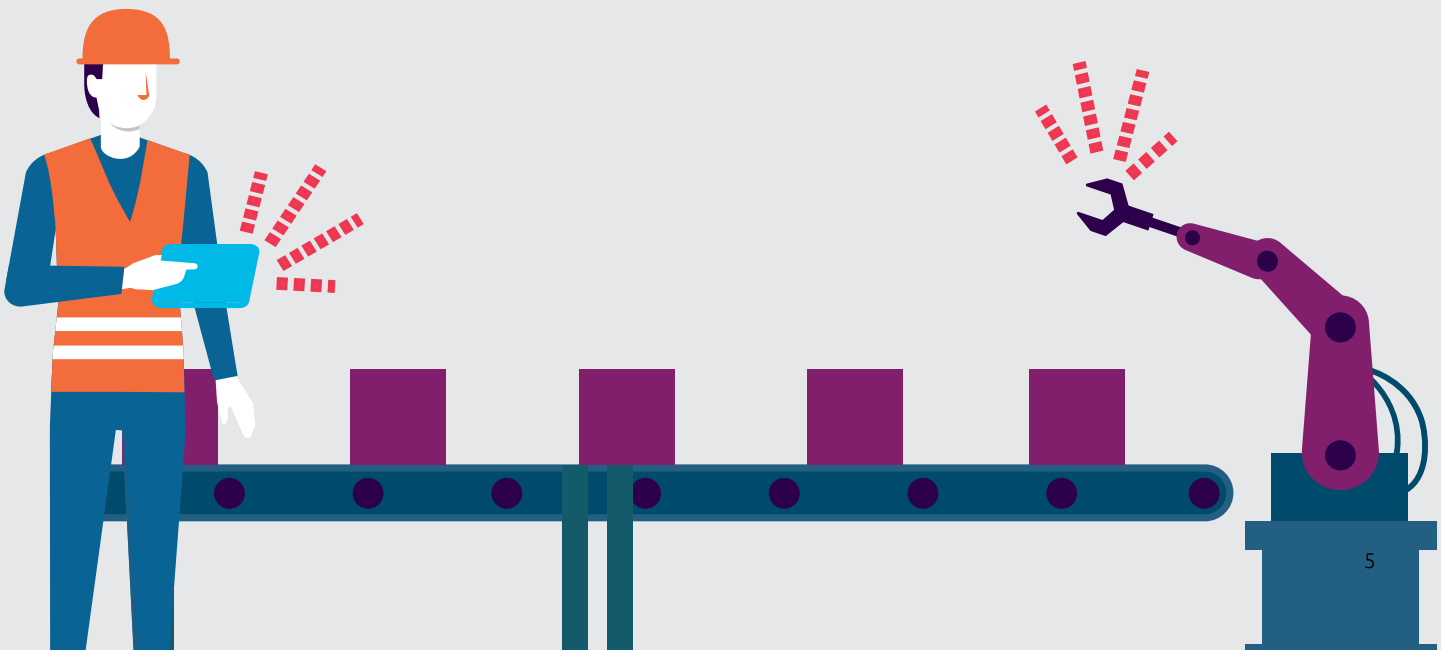


Capgemini **Predictive Maintenance in a Box** is just one of the foundational use-cases developed together with SAP as part of a joint strategic initiative called "Fast Digital 4 Discrete Industries by SAP and Capgemini." This initiative makes Digital Transformation a reality for discrete manufacturers through tangible and reusable assets, built on new and innovative SAP platforms. SAP and Capgemini are working together as part of this initiative to address the technological and organizational challenges of their clients going digital. Capgemini **Predictive Maintenance in a Box** leverages Capgemini's proven Digital Transformation Framework and global expertise in consulting, insights and data, cloud, and digital manufacturing with SAP Leonardo IoT as the digital transformation platform.

Key SAP applications used in the solution are SAP Predictive Maintenance and Service, SAP IoT Application Enablement and SAP Cloud Platform Internet of Things for device connectivity and Machine Learning.

Predictive Maintenance In a Box: Traditional to Digital

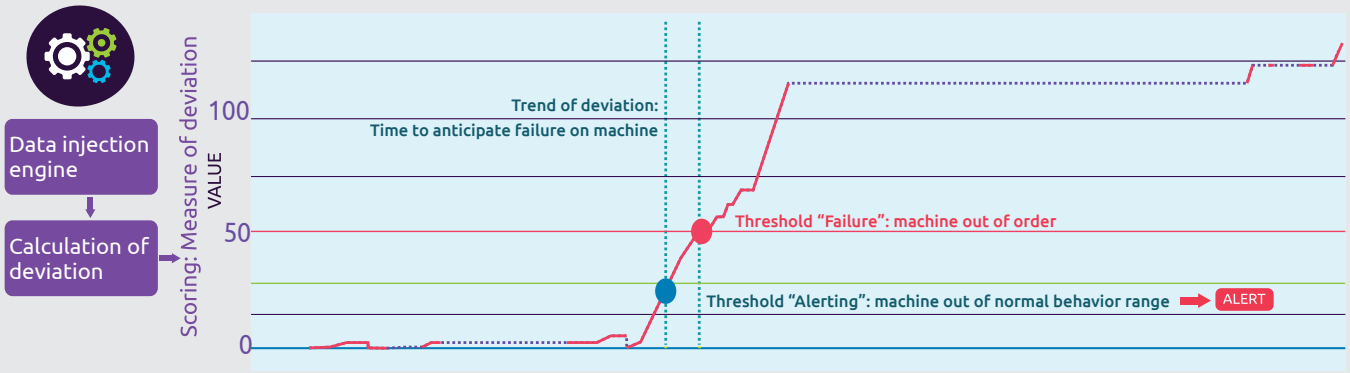




Predictive Maintenance in a Box - What is in the 'Box'

Process	Stamping	Machines	2 machines 2 tools per machines	Data	1 week data Frequency: 10 ms

Scenario	Specifics algorithm calculate deviation (or distance) between normal behavior and current behavior of the machine. If this deviation is over “Alerting Threshold”, we estimate from the trend of the deviation when the “Failure Threshold” will be reached, and Alert is sent to operator with expected time before failure and associated parameters to the failure.

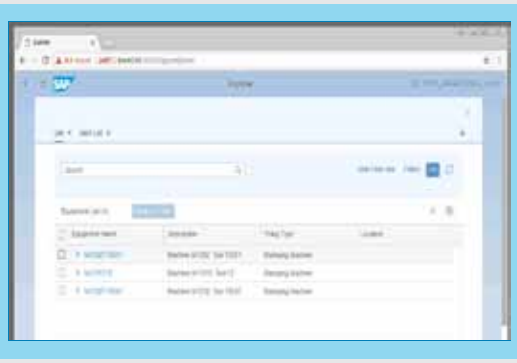


Process Flow

1

Equipment Overview

Users can see the equipment list that shows every monitored asset at one glance. Selecting a specific asset displays the all the alerts associated with that asset.



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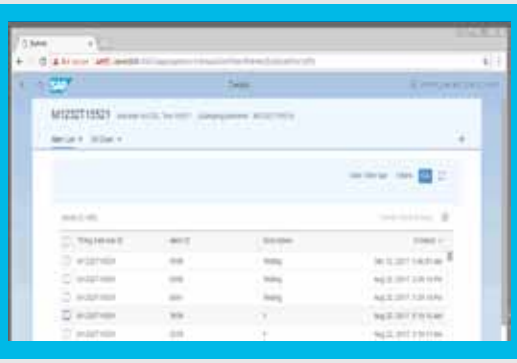
Alert Details

Behind the alerts, is a Score Value, an output of the algorithm, used to estimate the gap between the baseline and the current data set. The greater the score value, greater the chance for machine failure.



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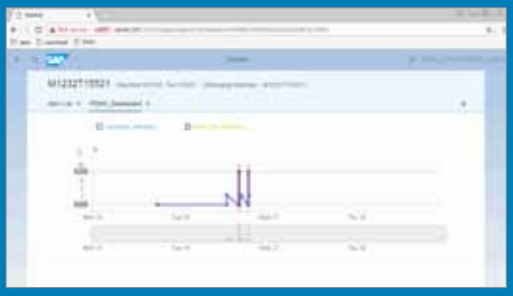
Alert List

The list of alerts raised by the algorithms indicate key parameters that can lead lead to machine failure.



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Machine Data Overview

To further investigate, the Machine Data Overview provides more depth and context into the alert raised. This helps the user to be proactive and take the next course of action thereby preventing machine failure.

About Capgemini

A global leader in consulting, technology services and digital transformation, Capgemini is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 200,000 team members in over 40 countries. The Group reported 2017 global revenues of EUR 12.8 billion.

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About SAP

As the market leader in enterprise application software, SAP is at the center of today's business and technology revolution. SAP helps you streamline your processes, giving you the ability to use live data to predict customer trends – live and in the moment. Across your entire business. When you run live, you run simple with SAP.

For more information, visit **www.sap.com**

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