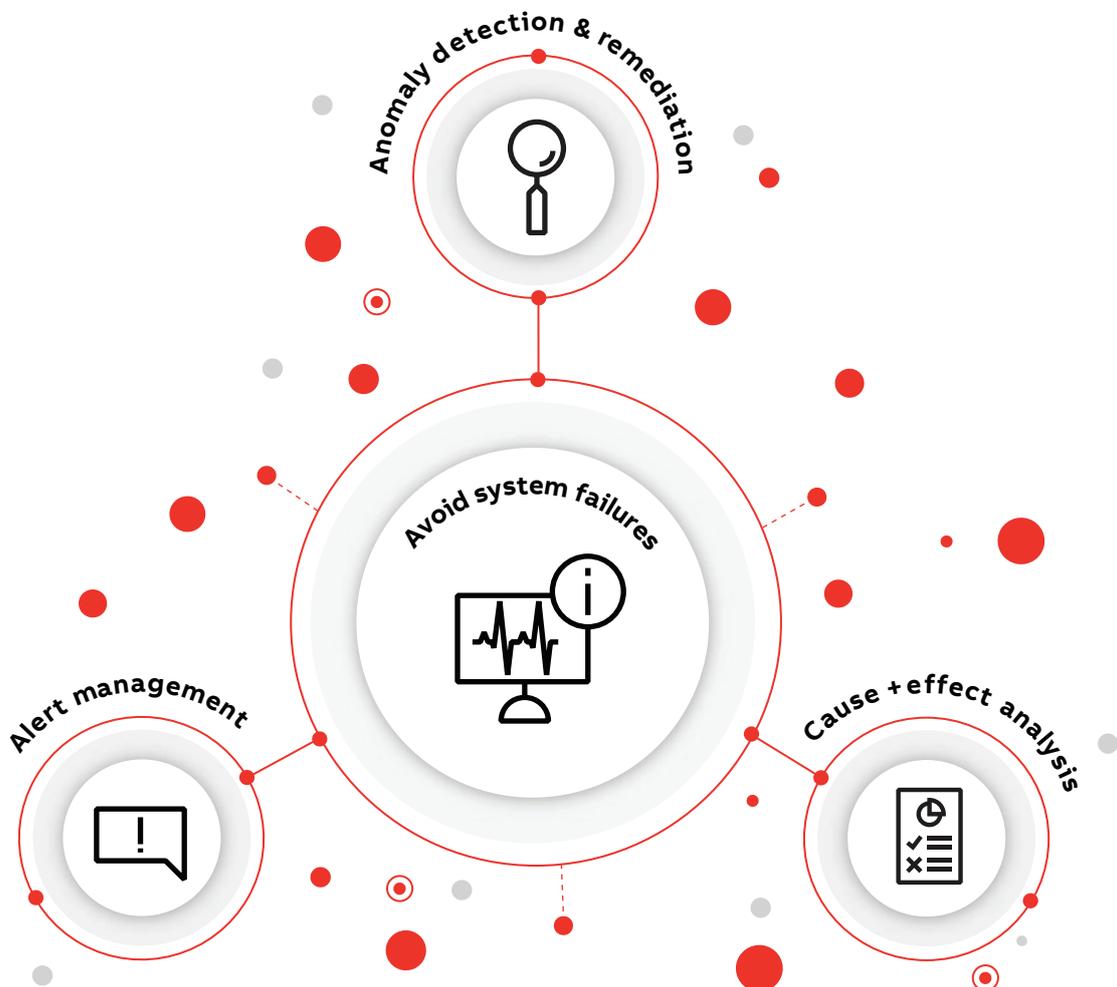


ABB ABILITY™ GENIX INDUSTRIAL ANALYTICS AND AI SUITE

# System Anomaly Detection Business Value Application

The power of industrial AI to address issues before they impact productivity



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## The modern business

**Globally, businesses are operating in highly competitive environments and seeking ways to stay ahead on the productivity curve at all times, relying on digital transformation and industrial AI to do so. The ability to react rapidly to existing and emerging sources of business competition is key to addressing the risk of losing customers and market share which can hamper revenue and profitability.**

# Customer challenges

A major issue today is **downtime** – for complex businesses today, downtime means much more than a simple inconvenience. The cost of unplanned interruptions, the impact of unforeseen failures, the effect of unexpected breakdowns can result in significant business losses. A Gartner study titled “The Cost of Downtime” suggests that a large company may lose as much as \$540,000 per hour from a preventable technical failure.

Studies also suggest that only 18% of assets have age-related failure pattern (or 82% of asset failures occur randomly). Additionally, most random failures of an asset are due to the impact of a related asset (ARC) and therefore analysis of a complete system of assets is essential.

Anomaly detection is the answer – it helps identify data points, items, observations or events that do not conform to expected patterns of defined groups. Anomalies are also referred to as outliers, novelties, noise, deviations and exceptions. Early detection of anomalies often provides critical information which can help prevent potential system failures.

Avoiding a trip in the plant is one of the major objectives of operations and maintenance teams. Any process upset or plant trips imply inherent hazards along with loss of production. Most often, operations and maintenance teams, as part of root cause analysis post plant trip, notice changes in critical parameter pattern which caused the trip. Often, these go unnoticed due to limited resources and the massive amounts of data involved.

# System Anomaly Detection App

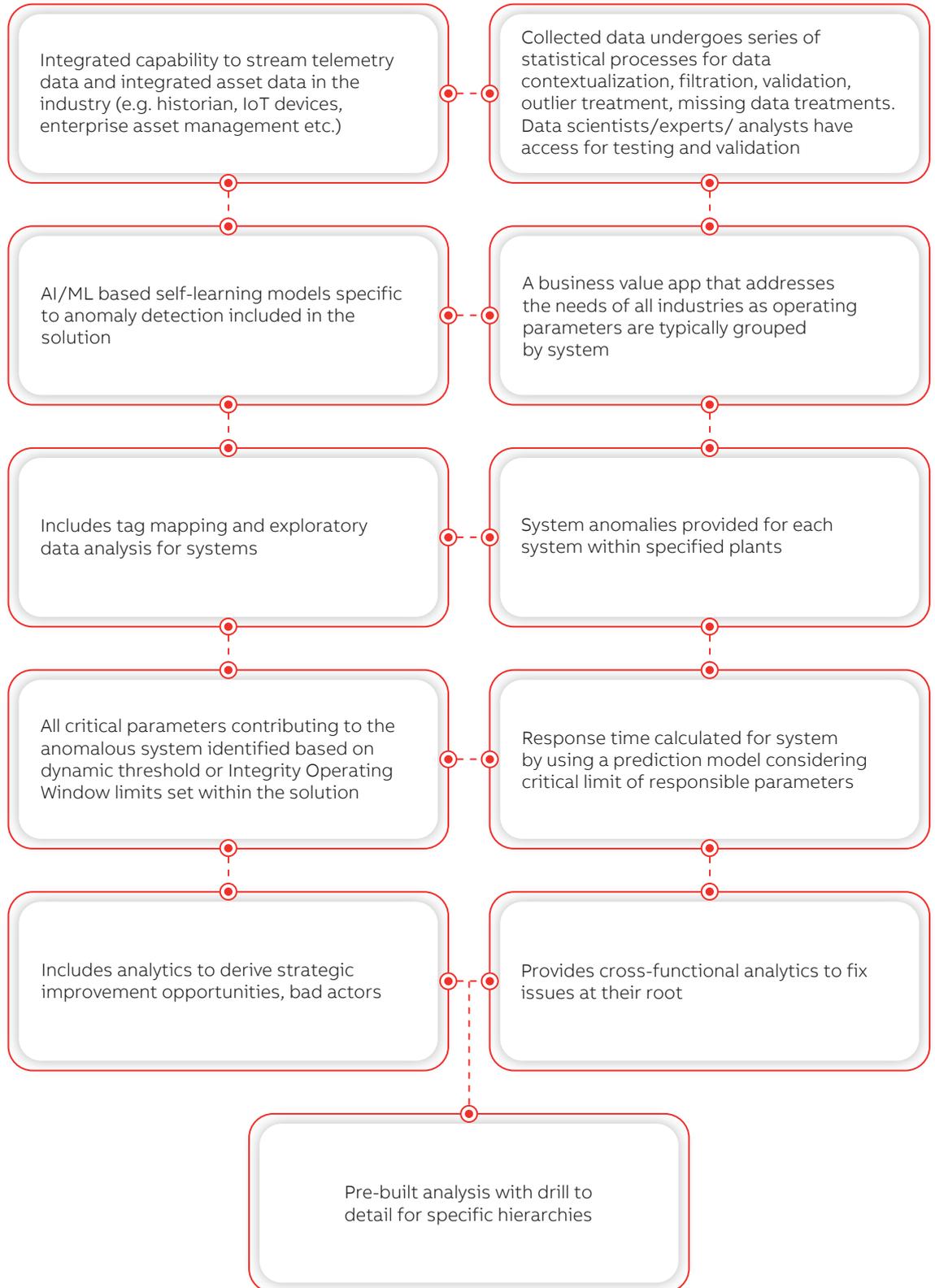
The System Anomaly Detection App, which is part of the ABB Ability™ Genix Industrial Analytics and AI Suite, is designed to detect unusual, anomalous behavior from process streaming time series data. It then uses Artificial Intelligence / Machine Learning (AI/ML) methods to support dynamic decision-making in all types of process driven industries (including oil & gas, refinery, petrochemicals, metals, cement and the like). It addresses the needs of industry to continuously monitor changes in pattern across IT and OT systems from high frequency near real-time data.

Typical predictive maintenance solutions focus on asset health check. The app however, focuses on integrated assets (or system) based on the function it performs. System anomaly detection is done using dynamic thresholds. The value proposition of performing anomaly detection is based on dynamic thresholds to ensure detection of an anomalous condition before alarm limits. Re-calibration of dynamic thresholds for critical tags happen at shorter intervals, thereby mitigating the risk of false positives.

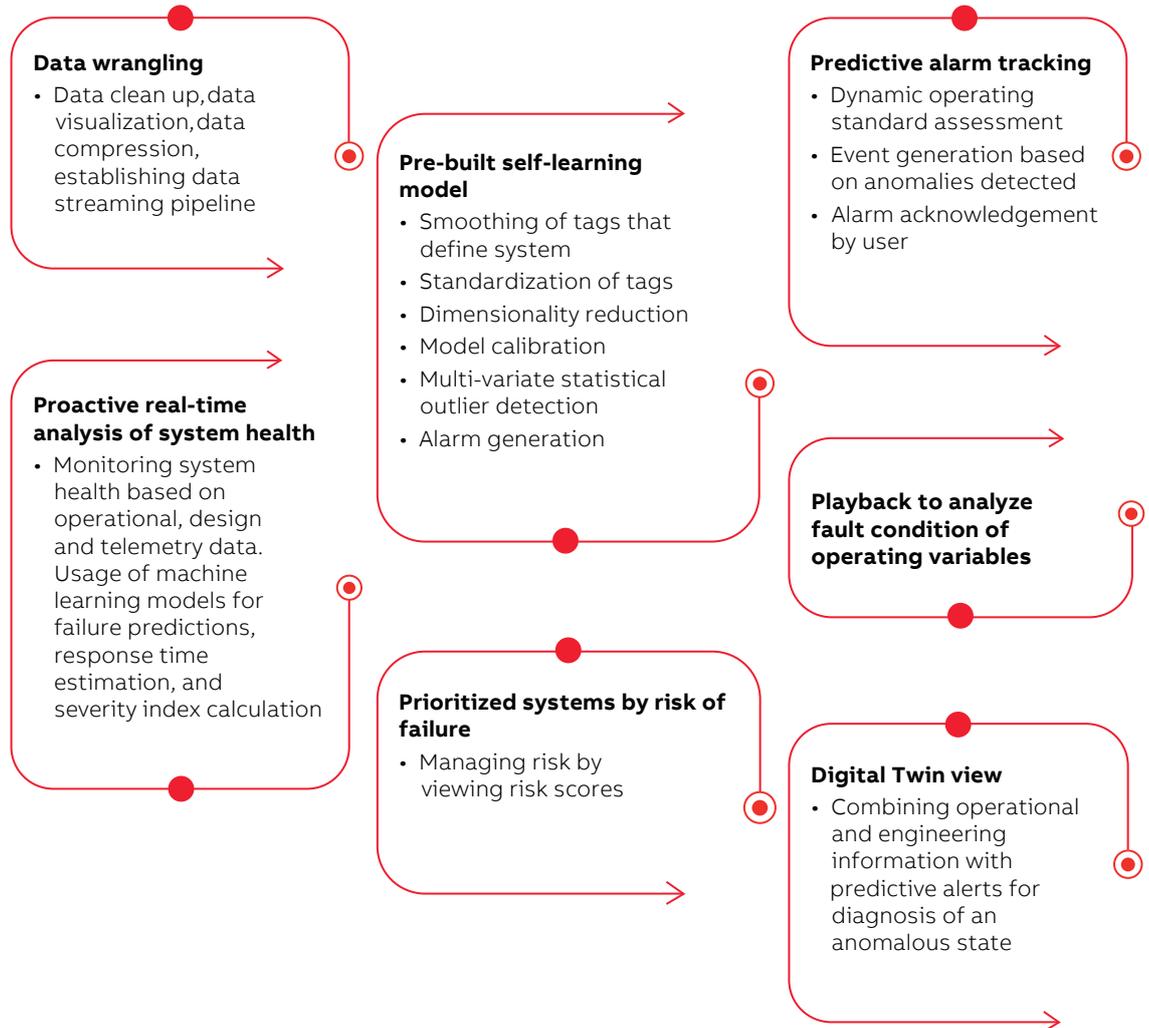
Potential system anomalies are highlighted using AI/ML for plant operator review, enhancing response time for process upsets.

In essence, functionalities in the app are focused on reducing unscheduled trip, increasing plant availability, avoiding process upset condition and increasing operator response ability.

# Highlights

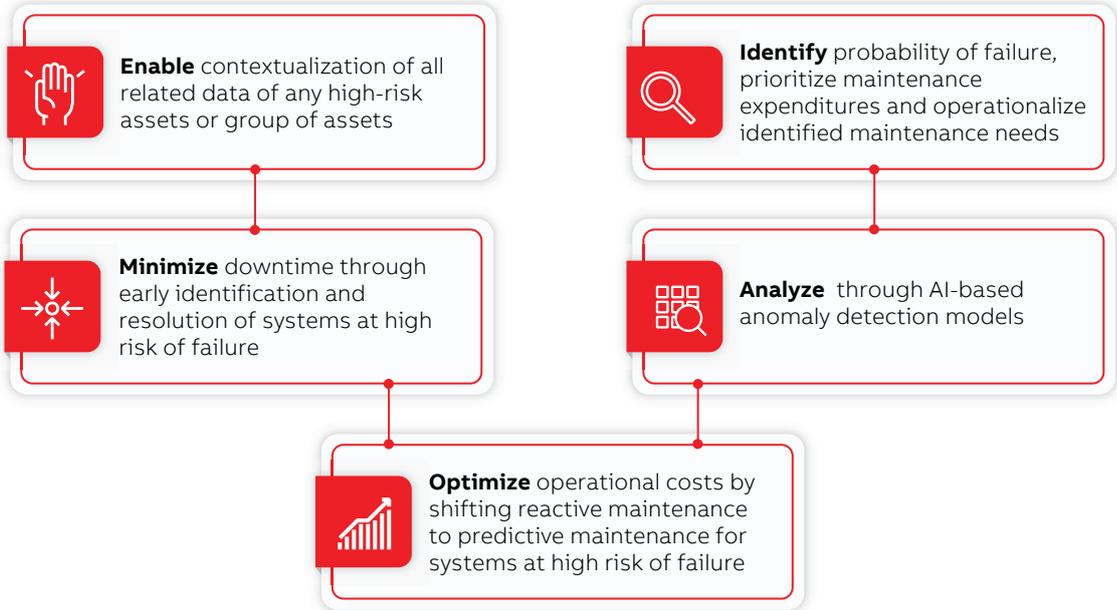


# Application analytics features



The app can connect to all source systems such as SCADA, historian, CMMS, DCS and IoT devices to provide data on operating and design parameters, failure events and failure modes.

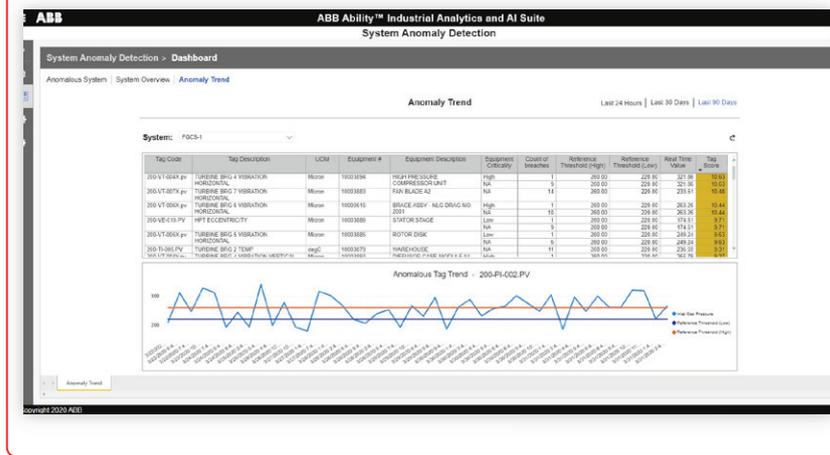
# Value proposition



## Anomalous system analysis



## Playback of anomalous operating variable



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## Business benefits

The system anomaly detection app is essentially used to identify an unusual pattern / behavior that can have a high impact on business processes especially in manufacturing and process industries. It automatically sets up healthy baseline models of user-defined systems and triggers alerts on observation of anomalous behavioral patterns.

The application helps reduce manual efforts needed to correct and rectify faults, in addition to providing more effective and efficient results. It also has the capability to identify factors that are responsible for the anomalous state of the system, allowing for immediate action and problem resolution before it affects the business process.

The system anomaly detection solution can reduce unscheduled trips by up to 50%.



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