# ASSET PERFORMANCE MANAGEMENT

Food & Beverage Industry

Today's Food & Beverage companies face a variety of challenges throughout their businesses–from managing the supply chain, prices and availability of incoming raw materials, to the execution of varied production processes and maintenance of disparate systems and equipment. At the same time, consumers are demanding product variety and a higher level of direct and nimble response to their market demands.

Asset Performance Management helps food and beverage manufacturers improve overall equipment effectiveness (OEE), empower the workforce, and deliver on time and in full with the information and tools to improve profitability and maximise return on capital across the asset and operations value chain.

Food & Beverage companies compete under the pressure of lower margins, increased regulatory obligations and capital expenditure constraints, all while trying to ensure their products are safe and delivered on time, with the highest quality and least waste level possible. Overall Equipment Effectiveness (OEE), Total Productive Maintenance (TPM) and Manufacturing Execution Systems (MES) are toolsets and KPIs to help food and beverage manufacturers deliver high quality products, with the best possible margins, to customers on time. Asset Performance Management (APM) can help digitally fuse these toolsets together to drive improved manufacturing performance.
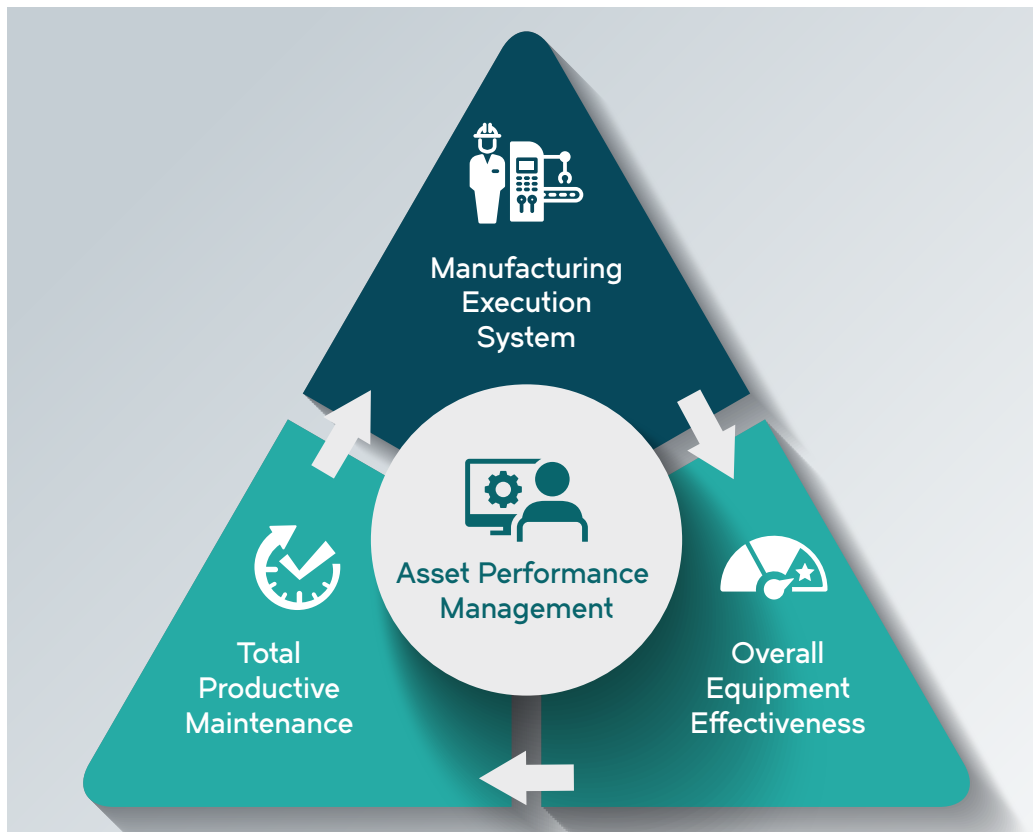
Overview

Operating with the highest level of efficiency, reliability and safety is a top priority in the food and beverage manufacturing industry. Technology triggers such as the the Industrial Internet of Things, big data analytics, mobility and workflow collaboration represent new opportunities for significant reliability, efficiency and safety improvements. Ensuring equipment reliability of operation and production translates to fewer unplanned machine starts stops and better adherence to schedule. This means that quality issues from stop/start cycles are minimised, and "on time, in full" deliveries, an important supply chain quality metric, are maintained.

The market is shifting from a corporate top-down approach that has focused on managing the asset lifecycle through improved maintenance visibility and standardised practices to a holistic and operations-centric view where proactive and predictive maintenance opportunities empower personnel to act before costly failures occur.
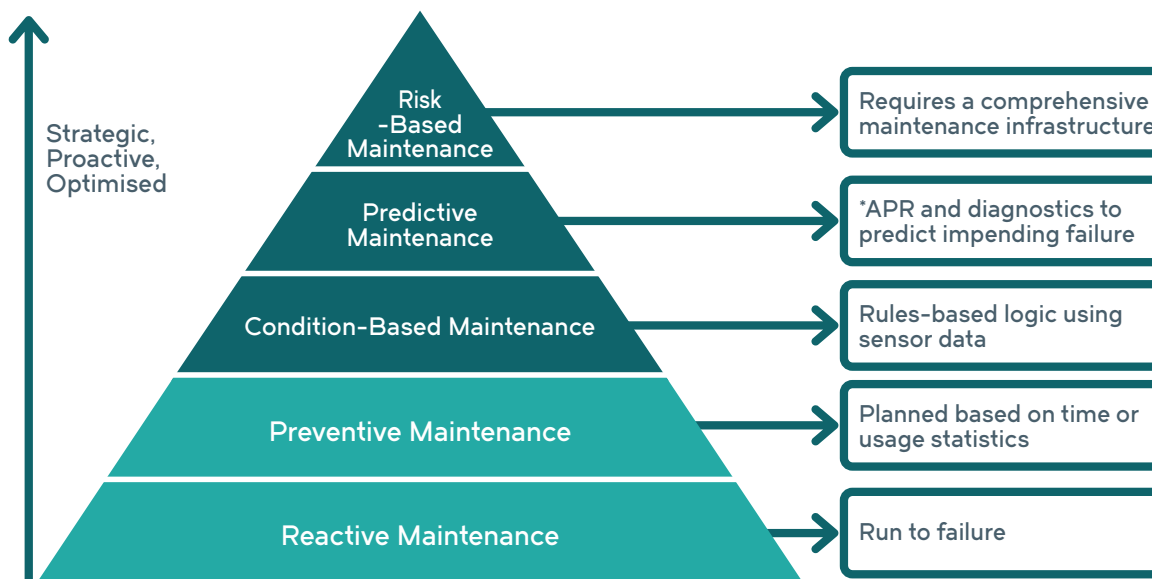
With Asset Performance Management (APM) solutions, personnel can exceed safety, reliability, and performance goals through analysis coupled with actions and optimisation for proactive and predictive maintenance execution. As a result, food and beverage manufacturers are able to improve profitability and maximise return on capital across the asset and operations value chain.

Maintenance Practices

APM solutions integrate all the various elements of a comprehensive maintenance program, making valuable information accessible and delivering context for smarter decisions. It requires a broad portfolio to collect data on assets, analyse it, determine the best course of action and use that action to further refine and optimise processes. This continuous improvement program is outlined with the Maintenance Maturity Pyramid.

The higher the enterprise moves up the Maintenance Maturity Pyramid, the more proactive the strategy becomes and the more advanced warning of equipment failure is required. This enables maintenance teams to better plan resources, order materials, and minimise unplanned events while allowing supervisory roles in the manufacturing process to efficiently distribute work orders and intelligently plan manufacturing capacity.

Strategic, Proactive, Optimised

Pyramid Level	Description
Risk-Based Maintenance	Requires a comprehensive maintenance infrastructure
Predictive Maintenance	*APR and diagnostics to predict impending failure
Condition-Based Maintenance	Rules-based logic using sensor data
Preventive Maintenance	Planned based on time or usage statistics
Reactive Maintenance	Run to failure

*APR-Advanced Pattern Recognition

Developing an APM Strategy

To combat the challenges faced in the Food & Beverage industry, a holistic strategy for APM must be developed that allows direct interfacing and collaboration between business, maintenance, and IT professionals within the enterprise with ancillary capabilities to improve the enterprise's Total Productive Maintenance (TPM) initiatives. Asset management information must be easily collected, analysed, viewed and acted upon to create a clear picture of processes and assets in terms of availability, reliability, costs and maintenance.

Maximising Economic Return on Assets

The end goal of implementing a comprehensive maintenance program that moves to a more proactive and continuous improvement approach is to deliver the greatest economic return for all asset types. This is made possible by integrating various technologies and devices, and applying advanced analytics to determine where improvements should be made.

The right mix of equipment maintenance approach provides the most optimal results, taking into consideration cost of maintenance versus cost of an unexpected failure.

- A run-to-failure approach may meet production capacity target and adherence to plan in the short term, but may not be ideal where quality takes a hit with contamination from rusty equipment parts, excessive lubrication or even microbiological contamination. In the event of equipment downtime in such an approach, production capacity is often compromised for the duration of maintenance, resulting in a fall behind in schedule.

Asset Performance Management Delivers Measurable Results

100s of Millions Saved with Predictive Analytics	30% Reduction in Maintenance Costs	25% Improvement in Workforce Efficiency	25% Reduction in Unplanned Downtime

- Maintenance service may often be outsourced to Original Equipment Manufacturers (OEMs), and on a preventive approach where maintenance is planned on regular time or usage intervals. Such an approach works particularly well for manufacturing sites that run alternating production and packaging work orders because maintenance can be conducted on the other line that is not in operation. This approach carries a potential cost of losing equipment full capacity when the equipment could otherwise be operating as normal given status quo.

- Condition-based and predictive maintenance take on the approach of "when there is a need to". With the use of sensor data, Advanced Pattern Recognition is able to forecast an impending failure. This approach provides early warning and enables operators to reexamine plans according to current state, ensuring neither quality, capacity nor schedule is compromised. With such an approach, equipment reliability of operation and production is guaranteed at all times.

Collaboration through Mobile Workforce Enablement

Mobile workforce enablement allows operators and technicians to improve productivity while making faster and better informed decisions by reviewing, analysing and collaborating around specific processes or company data directly through mobile devices. In addition, Overall Equipment Effectiveness (OEE) KPIs can be monitored in real time no matter where the operator or technician is within the plant. Reporting through mobile devices provides a real time feedback loop to engineering and production managers. Overall, mobile workforce enablement increases production and process control situational awareness and enables short interval control strategies to provide closed loop continuous improvement.

With real time production data accessible to every stakeholder, maintenance processes become increasingly efficient.

A Global 500 beverage company improved asset utilisation, extended asset life, improved labor efficiency, reduced unexpected downtime, improved inventory productivity and cost avoidance, and reduced reactive maintenance with APM software.

APM Reduces Manufacturing Costs

As manufacturers confront the pressure of decreasing margins, it's important to drive as much cost out of the manufacturing and production process as possible. With the advent of the Industrial Internet of Things, sensor and other data capturing technology is enabling manufacturers to obtain a vast amount of data context around the condition of their food & beverage manufacturing and processing equipment.

By applying big data analytics and machine learning software tools to these new datasets, the organisation can better understand the condition of its assets allowing it to progress further up the maintenance maturity pyramid. Eventually organisations can begin to predict early asset or asset component failure long before it occurs. Thus allowing for optimal maintenance scheduling and spare part procurement.

Asset Performance Management and Digital Transformation

Using the comprehensive Asset Performance Management (APM) solution offered by AVEVA, organisations can monitor their assets to identify, diagnose and prioritise impending equipment problems — continuously and in real time. This enables companies to reduce unscheduled downtime, prevent equipment failures, reduce maintenance costs, increase asset utilisation, extend equipment life and identify underperforming assets.

APM Solution

AVEVA offers an end-to-end solution that manages the collection of data from any number of sources, incorporates advanced analytics technology that combines machine learning with advanced pattern recognition and provides a complete asset management platform to manage asset lifecycle and maintenance processes. It also includes a variety of interactive visualisation capabilities for presenting this information in intuitive ways on mobile devices and platforms.
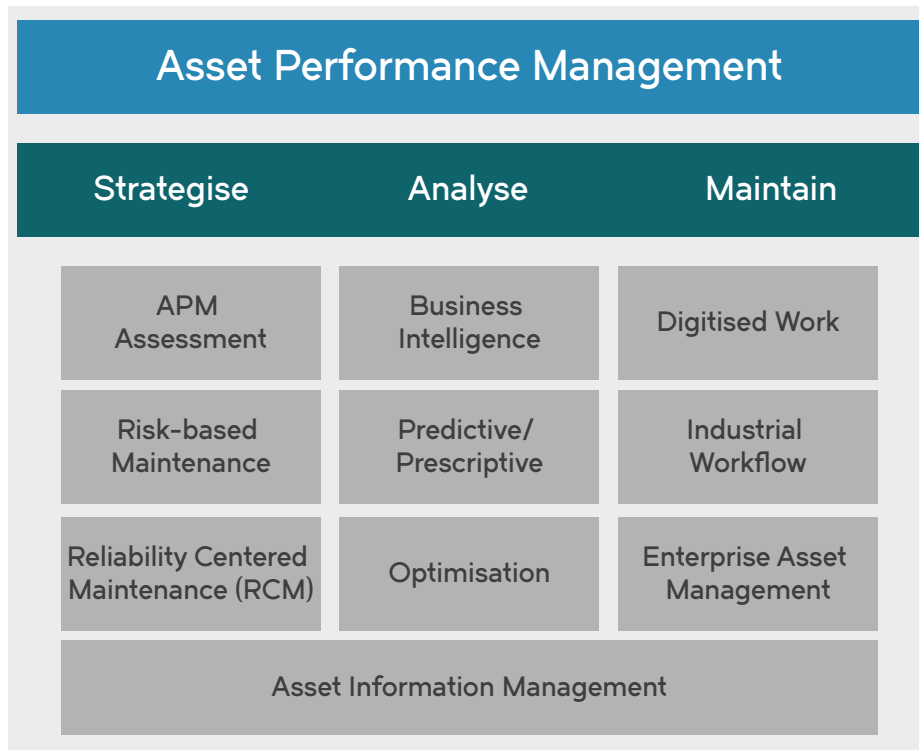
No matter what level of maturity your organisation has achieved on the Maintenance Maturity Pyramid, AVEVA software products can move you one step closer to asset performance excellence. The comprehensive offering is equipment and vendor agnostic for seamless integration with existing equipment and technologies, enabling you to maximise the value of previous investments through proactive asset health and performance monitoring.

"APM software provides better inventory control, better flow of purchase orders, and cost control in maintaining our assets." Improvements since implementing APM software:

- Improved regulation compliance visibility: 20-30%
- Reduced OT/contractor utilisation: 20-30%
- Reduced maintenance cost: 10-20%
- Improved labor utilisation: 5-10%
- Improved asset uptime/ availability: 10-20%

— **IT Manager, Medium Enterprise Food Company**

Asset Performance Management

Strategise	Analyse	Maintain
APM Assessment	Business Intelligence	Digitised Work
Risk-based Maintenance	Predictive/ Prescriptive	Industrial Workflow
Reliability Centered Maintenance (RCM)	Optimisation	Enterprise Asset Management
Asset Information Management		

Asset Performance Strategy

Developing an APM strategy enables companies to balance asset utilisation, cost control, and regulatory compliance, and shows how people, processes, and technology can drive optimal performance. We offer comprehensive APM Assessments, Consulting Services and Risk-based Maintenance to help our customers optimise their APM strategies.

Asset Information Management

Bridge the IT/OT information gap, improve data access throughout the enterprise and analyse that data to provide actionable insights with our rich information management portfolio and reporting tools available on premise or in the cloud.

Asset Analysis

Maximising return on capital investments, including ensuring assets are running as safely and reliably as possible, is key to improving profitability. Proactive and predictive maintenance empowers personnel to act before costly failures or downtime occurs. Our comprehensive analytics solutions enable customers to proactively plan maintenance and reduce costs.

Asset Maintenance

World class Enterprise Asset Management is the foundation of an APM strategy. We offer advanced solutions leveraging cloud, mobility, and augmented reality to transform and empower the mobile workforce, increase collaboration, provide comprehensive asset and materials management, and efficient maintenance execution to optimise the availability of all assets.

Further Information

For more information about AVEVA's APM portfolio, please visit: www.aveva.com/asset-performance

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