

WHITEPAPER

How to realize a digitalized future Asset Performance Management strategy

Maximize efficiency across engineering, operations, and performance with APM 4.0

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Executive Summary:

Competitive organizations are always searching for the most optimized production processes. Industry 4.0 promises to transform industries worldwide, with digital processes at the forefront of that change. However, while they will be transformative, digital possibilities don't have to be complex. And not every company has to blaze a new and unique trail in order to benefit from digital technology adoption.

The objective of enterprise remains simple throughout even the most complicated digital changes: to achieve fully optimized and predictable asset performance. This paper outlines a pragmatic, effective approach to maximizing performance and predictability of assets across industrial operations.

The promise of Industry 4.0

By connecting machines, people and systems, Industry 4.0 promises to create intelligent networks across the manufacturing value chain that ultimately make operations fully predictable. By monitoring and measuring the performance of all equipment, future factories will generate the data that Operators need to iterate and improve processes, maximize production, and further improve efficiency.

Expectations for this transformation are high, and with good reason. The networked factory in the age of Industry 4.0 primarily runs itself, requiring only a few digitally augmented Engineers to monitor operations and troubleshoot failures. Moreover, the Industrial Internet of Things (IIoT) dissolves the boundaries between individual factories, connecting multiple production locations and streamlining operational management.

The broadest Industry 4.0 possibilities include self-sufficient machines that heal themselves, and each other, without human intervention. Peer-to-peer comparisons and systematic data analysis enhance the accuracy of reports on asset health at the system level and component level. Production assets can maintain a high degree of self-awareness and predictability in this environment, providing management teams not just with condition-monitoring or fault diagnosis, but with the actionable insights needed to improve predictability and sustainability.

The most reliable way to predict the future is to create it.

What others are saying about Industry 4.0

The improvements in asset maintenance, inventory optimization, interoperability, and worker and health safety that result from Industry 4.0 are not going unnoticed. McKinsey predicts that Industry 4.0 capabilities such as predictive alerts have the potential to reduce downtime between 30 to 50 percent. Meanwhile, automation capabilities can boost labor productivity by 40 to 50 percent.



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Successful digital transformation reaches beyond technology.

Nevertheless, while BCG notes that many manufacturers see Industry 4.0 as a priority in order to improve considerations like equipment maintenance or worker health and safety, few of them consider it an opportunity to identify new revenue streams. When it comes to digital transformation, the emphasis is typically on productivity optimization, while a comprehensive business strategy is often absent.



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Where should a comprehensive digital transformation strategy start?



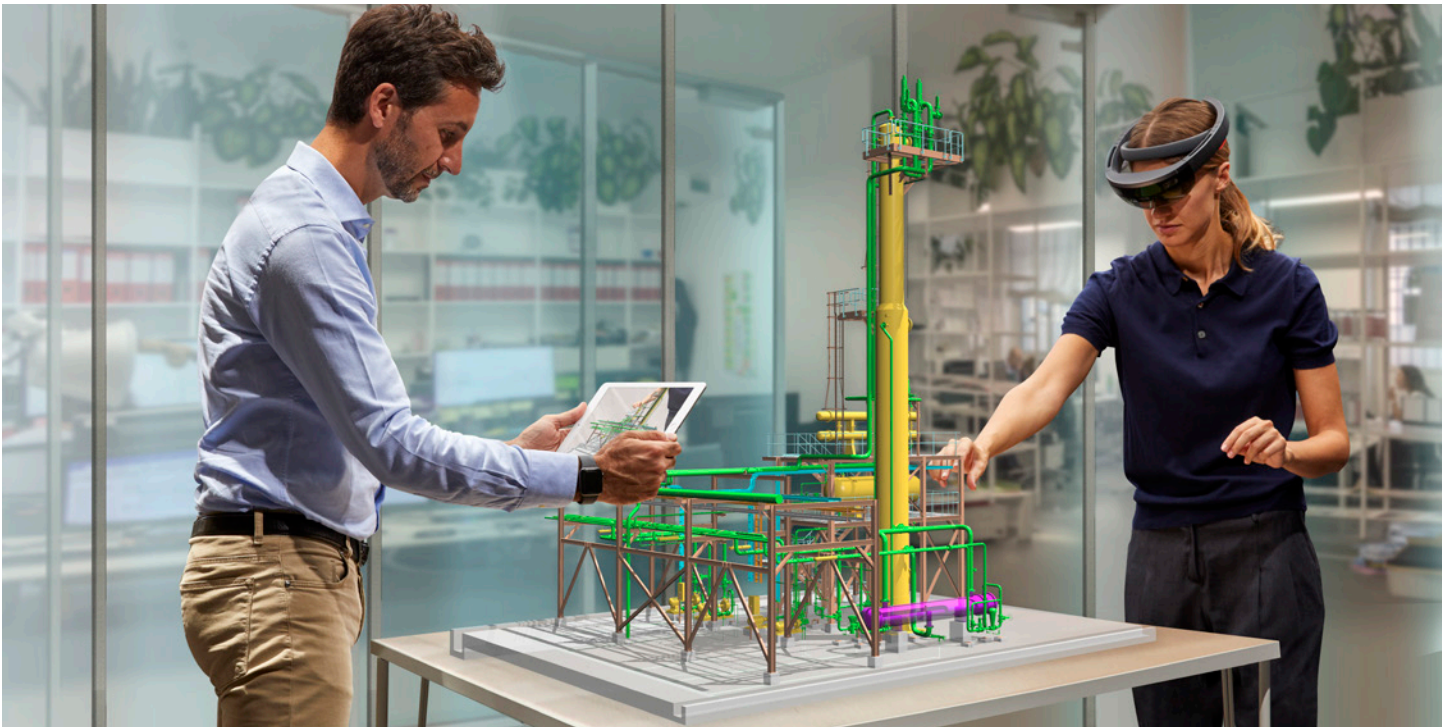
Shifting Software Investment from CAPEX to OPEX

Large capital expenditures like digital transformation efforts create inherent challenges when implementing new technology, including:

- The large amount of cash required to make the investment ties up and delays additional investment opportunities.
- Error-prone guesswork is involved in determining future capacity needs for software.
- Lengthy and arduous processes are required to get budget approval.
- Purchased technologies often stay with the company — despite technology advancements or changes in company growth.

For these reasons, CFOs are shifting away from capital expenditures and instead adopting operational spending models. This allows companies to:

- Pay only for the capacity they need now and scale as requirements change.
- Simplify and accelerate the approval process with fewer short-term spending requirements.
- Reduce large upfront expenditures, freeing up capital to make multiple investments across the business.
- Decrease the need to borrow or divert financing from other projects to pay for large, upfront technology costs by increasing funding through operations.
- Smooth out cash flows over time instead of requiring lumpy outlays that may impact financial reporting and market.
- Adapt to fast-paced advancements in Industry 4.0 technology.

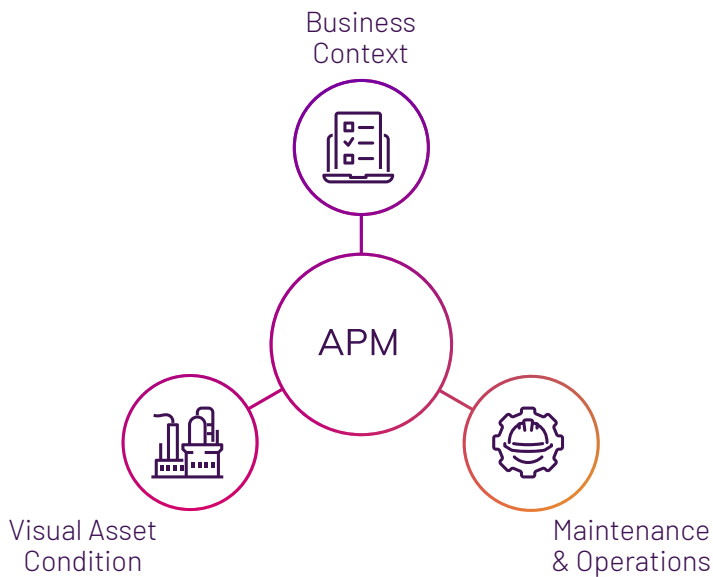


Overcoming the challenge of achieving digital transformation

A holistic approach to asset performance is paramount for meaningful and impactful digital transformation. Companies must shift their focus away from specific technologies and instead work on establishing a high degree of interconnectivity among assets, people, processes, and technology.

The critical first step in laying that interconnected foundation is building the right Asset Performance Management (APM) strategy — one based on a thorough understanding of an organization’s own level of maturity in order to best support business objectives and the overall business strategy. Done the right way, digital transformation acts as a business catalyst.

True digital transformation requires upgrading APM from an asset-oriented approach to a system that holistically connects Engineering, Operations and Performance. That’s APM 4.0.



APM insight in three dimensions

Effective APM systematically charts a diverse range of processes and demonstrates how well an organization aligns and adheres to them. It clarifies how reliable and complete operational data is, and it also considers the work culture and the efficiency of enterprise systems in supporting business processes and the workforce.

Essentially, APM organizes transparency across every single component, resource, system, and process in the organization. To accomplish this without getting overwhelmed by the sheer complexity of so many moving parts, APM must be viewed in terms of three high-level dimensions.

Business context: What targets do you have? Do you have a healthy balance between your financial conditions and performance parameters? What market challenges will you be facing? What sustainability & environmental factors should be considered? How are supply chain dynamics influencing your facility?

Maintenance and operations: What is the condition of your organization, processes and IT/OT systems? How do they interact? How are you organized?

Visual asset condition: What is the physical condition of assets, including their layout, automation architecture, and workflows within your plant?

Creating transparency in business context

Building proper business context entails utilizing approximately 10 cross-industry benchmarks. For example, the total maintenance costs/asset replacement value KPI determines the amount of money you need to keep your asset base in shape. But to determine the costs of maintaining any given asset and the value of replacing it outright, you need clear insight into multiple facets of that asset and your facility, such as the impact of the surrounding geography, demographics, and environmental conditions; the size, complexity, and age of the facility; the asset's place in the supply chain; and the health of the market that manufactures and services the asset.

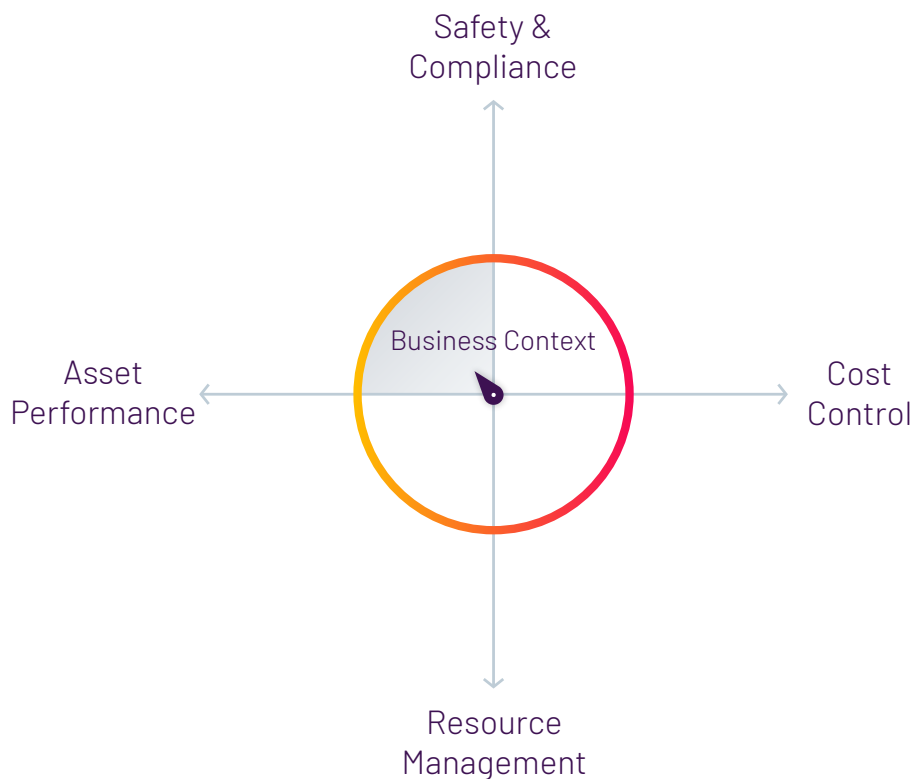
AVEVA's APM 4.0 framework (connecting Engineering, Operations, and Performance) puts all of these complex factors into their correct context and considers how each will determine the conditions for a successful digitalization journey. As a result, it will eventually also provide the ability to predict failures ahead of time, giving you the option to act in situations when proactive maintenance or repair is more cost beneficial.

The APM 4.0 framework also balances four key value drivers within the Business Context dimension, helping you set course for the APM strategy with the best monetary value.

The way a business chooses to balance these four drivers over time will require re-tuning depending on how the business responds to the operations lifecycle and its effect on the asset lifecycle.

For instance this scenario is represented below:

- When market demand increases, the overall APM strategy needs to be focused on asset performance.
- When economic conditions enforce operational cost reduction, this focus might need to shift to a more cost-driven strategy.



These 4 value drivers work as a business compass and help you keep sight of your true north as they shift in response to the operational lifecycle.

The agility you need to re-tune your APM Strategy is determined by the overall condition and regulatory compliance of your assets, your asset management organization maturity, and their alignment with APM systems. In turn, those considerations depend on the lifecycle phase your assets are in.

Aside from helping you achieve the best ROI for improvement, this set of value drivers includes environmental and sustainability aspects that become key for a healthy business. From tighter regulations to an increased public outcry for corporate and industrial responsibility, businesses now have multiple incentives to maintain an accurate and up-to-date view of their assets at the highest level so that sustainability decisions can be made regarding material selection, dematerialization, energy consumption, proper end-of-life disposal, and so on. The value drivers defined here help you define, balance and prioritize these vital sustainability efforts.

Creating awareness of asset condition

When defining an asset's condition, it is easy to get lost in equipment details instead of evaluating the entire performance chain that is defined by the nature and condition of your current assets. Businesses need to know whether their asset base is in good condition in relation to factors like age, layout, overall health, and their match with current operating windows. The overall asset condition must also be considered to determine what is feasible in terms of predictable operations and delivery.

Creating efficiency in maintenance and operations

After taking the business context and overall asset condition into account, full insight into an organization's APM capabilities becomes crucial. These capabilities are the sum of all work processes, supporting systems, and data quality within a specific work culture. A company's effectiveness with APM is strongly related to the correlation of all these elements and the way the organization is shaped around them. After all, the best laid plans are only as effective as those responsible for putting them into action.

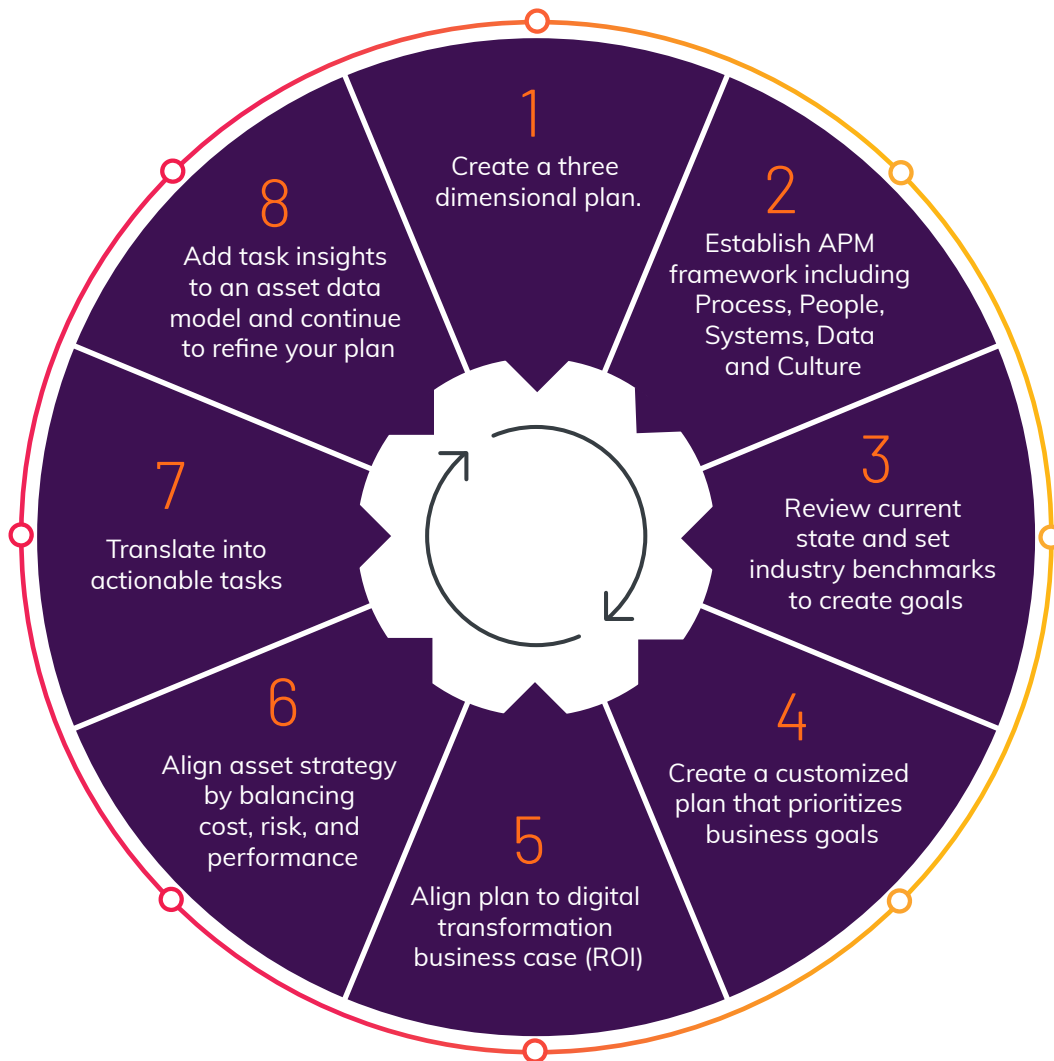
Shared insights into the current status of the business, organizational maturity, and asset condition ensure your success.



Conclusion

Industry 4.0 comes with the promise of incredible new efficiencies for production and performance. For many organizations, however, the prospect of falling short in pursuit of those efficiencies may feel daunting, especially if it means an unsuccessful push to embrace Industry 4.0 could result in wasted money, time, and resources.

An effective APM 4.0 strategy connects engineering, operations, and maintenance. It lays the foundation for successful, streamlined digital transformation by establishing an easy-to-understand framework including best practices, integrated system solutions, and single truth data models. It provides an actionable, evidence-based roadmap that prioritizes improvement in tasks and investments while aligning business objectives.



AVEVA helps industrial businesses optimize the engineering, operation, and performance of critical assets. Our APM Roadmap gives clients the insight and perspective they need to identify top priorities and optimize operations, often in a matter of weeks.

Discover your current APM maturity with our brief assessment to help benchmark against competitors and guide your APM strategy development.



Watch the video

Strong APM strategies increase efficiency, decrease downtime, and drive actionable insights.

AVEVA's APM Assessment

AVEVA's APM consultants help organizations clearly identify their improvement potential. Our consultants typically need to do one to two weeks of on-site work to access the current state of the plant and the customer's ambitions, depending upon scale. During this period, the facility's staff will be trained to work with the APM Reference Framework, and the team will hand over the following to them:

- A compelling report with full insight into the plant's current status, versus its ambitions, across engineering, operations, performance, and all related departments.
- Recommendations and best practices for achieving goals and expectations
- A visual representation of the overall condition of the plant.
- A three-year roadmap toward achieving both quick wins and long-term business goals that includes digital transformation.

AVEVA customers who execute an APM Assessment realize significant cost savings while optimizing performance for the future.

About the Author



Wilco Hekkert is an Asset Performance Management expert with over 20 years of experience in the field of AssetManagement, Engineering & Operations. He started his career as an engineer in asset-intensive industries

and is seasoned in a variety of industrial sectors. He is now a Strategic Business Consultant, helping companies to connect the dots between people, processes and technology across all levels of the organization. His team is able to create a holistic, in-depth overview of a Maintenance Organization within business and operations.

Wilco has coordinated numerous APM assessments on a global level for a diversity of companies, connecting company objectives with organizational factors, and translating data and processes into day-to-day practice. Within AVEVA, his team helps customers gain insights and create a clear roadmap for digital transformation.

Refinery reliability starts with APM Assessment

Create clear lines of sight and actionable improvement plans

[Read the case study](#)



For more information on AVEVA's APM Assessment please visit:
sw.aveva.com/asset-performance/asset-strategy/apm-assessment