Asset Performance Management
For Oil & Gas
Your Assets Speak Volumes

Are you listening?

You’ve invested in assets, processes, and systems on a massive scale to meet your business objectives and manage your risk around safety, financial, and environmental events. Hundreds of thousands of assets produce enormous amounts of data every day—all with their own specific purpose. Data from sensors, recommendations from people, and information from a multitude of systems produce a relentless stream of asset data that can either keep you informed to help make smarter decisions or leave you vulnerable to blind spots and risk.

You need the ability to know what all that data means in order to determine which information is key to the health of your assets. Then you need to decide which assets are most critical to your business. Most importantly, you need an asset strategy to manage it all for you, automatically.

Typical Value Drivers from APM Program Implementation:

• 5-10% reduction in reactive maintenance
• 5-25% reduction in IT total cost of ownership
• 2-6% increase in asset utilization
• Reduced safety and environmental incidents

INTRODUCTION
Predix Asset Performance Management (Predix APM) enables holistic and real-time views of how people, systems, and physical assets are performing and help to improve safety and performance, increase asset availability, and optimize costs—all while mitigating operational risk. Predix APM answers essential questions that spreadsheets, ERP systems, and historians cannot.

| 01 | How critical is this asset? |
| 02 | What is the history of this asset, and what is its current health? |
| 03 | In what ways could this asset fail, how could I mitigate risk of failure, and what would it cost? |
| 04 | What would be the consequences of this asset's failure on my business? |
| 05 | What action should be taken now, and what should be our overall strategy to optimize business objectives? |

By combining real-time data with human experience, operating parameters, analytics, and connectivity, an asset strategy continuously improves over time. It’s an automated loop of learning that can detect emerging threats for prevention and proper governance.
The Benefits

Predix Asset Performance Management provides end-to-end improvements.

- Inventory Cost Reduction: 5–10%
- Increased Availability: 2–6%
- Reduction in Reactive Maintenance: 10–40%
- EH&S Incident Reduction: 3–40%
- Gain in Employee Productivity: 5–25%
- Reduction in IT Total Cost of Ownership: 5–25%
It takes a mixture of unique and complex systems and work processes to keep facilities and plants running. How can you aggregate the data they produce to see the big picture?

Modern sensors ensure your physical assets produce a huge amount of data. Does that information help you or put you at greater risk?

Your people are a wealth of knowledge and experience. Can you leverage their collective knowledge to contextualize information from physical assets and systems?
Protect Your Tribal Knowledge
Your Team Has a Wealth of Knowledge That Shouldn’t Go to Waste

The way companies collect and manage information has evolved over time. Early on, observers in the field collected information on clipboards before entering it into historians. They relied upon experience to decide whether the data was worth recording. Today, we depend on technology and sensors to do most of that recording with a far greater degree of accuracy. However, a sensor cannot replace the critical thinking and judgment that only comes from an experienced employee. Unfortunately, due to an aging workforce and employee turnover, their knowledge and experience is often lost forever.

By using Predix APM, you can capture the expertise and perspectives of your team by recording human recommendations. Those recommendations contribute to an overall strategy that provides a better understanding of the big picture. Recommendations are continuously collected and balanced with operating parameters, analytics, data from systems, and data from physical assets. In this way, the information an employee contributes stays with the company long after separation, providing a seamless library of tribal knowledge and technical expertise that is passed along to the new generation.

• Only by using Predix APM can you safely and effectively reduce risk while optimizing costs
• Predix APM uses all asset related data to give you a clear picture of your organization’s overall asset health
Harness the Power of Your Asset Data
Healthy Assets Help Alleviate Business Issues

Your company has invested heavily in monitoring physical assets that produce millions of bits of data from various sources. Successful operations depend on a complex web of systems, people, processes, and data output. Predix APM bridges the gap between systems and transforms the information into valuable insight and perspective not possible with point solutions, giving you a true picture of your overall asset health while helping to reduce downtime and equipment failures.
Get More From Your Existing Systems

Find Out How ➔
Just because you have different systems doesn’t mean they can’t support a common purpose.

It takes a complex and sophisticated web of systems, software work processes, and IT expertise to keep a facility or plant running at full capacity. Although some of these systems work well together, each system is typically dedicated to performing a specific task. They could, however, work more productively and more efficiently. When multiple systems come together through Predix APM, the data can be combined with human experience and physical asset data to provide recommendations that continually improve over time. Plus, the insight gained can be used to optimize the very systems that are providing the data.

Only Predix APM can bring different data from various systems together into a single context to identify and understand the risk, enabling you to quickly derive what should be done to prevent failures. You will ultimately mitigate risks, increase asset availability, and optimize costs.
Predix Asset Performance Management
The Elements of an Asset Strategy

Predix APM enables holistic and risk-based asset strategies to balance performance and cost by considering design, operational procedures, and maintenance plans for all assets. With APM, you get an enterprise-wide view of the impact of asset performance management activities to help you make the best decisions.

Physical assets, sensors, people, work streams, and systems all contribute data, readings, and recommendations in real-time through a predefined strategy based on business and program objectives.

The predefined asset strategy serves as a way to filter, evaluate, and categorize readings and recommendations. Recommendations that do not adhere to business and program objectives are filtered and set aside, providing continuous optimization.

An asset strategy uses sophisticated parameters and context to develop new recommendations and suggested actions that can be evaluated and deployed.

Once strategies are deployed to improve processes, systems, and overall APM, additional data feeds back into the same asset strategy to create a continuous loop of improvement.
ELEMENTS OF AN ASSET STRATEGY

Predix APM Continuous Improvement Framework

- Criticality
- Failure Modes
- Damage Mechanisms

- Strategy
  - Change Strategy (interval)
  - Drive Work (repair)
  - Optimize Plan

- Risk
  - Re-evaluate Risk

- Analytics + Action
  - Connect / Collect
    - Sensor Data / Alerts / Events
    - Inspection data / Alerts / History Events

- Operations & Maintenance
See The Big Picture
In a Whole New Way
Different Views of Asset Data
Provide a 360º View of Performance

Transaction View
Bring your EAM or ERP system to life. Predix APM takes advantage of enterprise asset management systems like SAP, IBM, and Oracle in new and sophisticated ways to strategically manage it all for you, automatically.

Strategy View
Only GE Digital offers a complete range of perspectives from its Predix APM system while combining data from other data sources.

Trend View
Condition monitoring and process historians systems, like our own GE Historian, can feed data into Predix APM that converts time series data into valuable insights and recommendations.
Control View
GE, Siemens, Rockwell, and many other control systems all integrate flawlessly with Predix APM and their data is leveraged to understand operating conditions that impact assets.

Picture View
Predix APM pulls key engineering data from 2D/3D CAD and GIS systems to display information of drawings and maps providing a unique visual perspective.

Regulation View
Global governmental regulations and standards bodies create requirements that dictate the way you conduct your business. Predix APM has the flexibility to configure your work processes to assure compliance with local regulations and global standards.
Different Views of Asset Data Mean You Are Always One Step Ahead

1. Align the APM program definitions with corporate business objectives.

APM initiatives typically drive core value levers for organizations looking to maximize production, optimize opex/capex spend, or minimize operational safety and environmental risks. The initial APM program definition will establish the business case, APM tactics to be implemented, and describe the measurement program. High ROI projects are identified in GE’s Digital Transformation Blueprint workshop.

2. Assess key business risks and determine which assets should be the primary focus.

Most of your business risk will reside within a subset of your total asset base. Quantifying the risk an asset presents to the business and focusing APM efforts accordingly allows you to ensure that assets with significant consequences for failure scenarios or those assets subject to legal and statutory requirements have a complete and optimized management strategy.

3. Define and implement asset strategies to ensure appropriate risk mitigation.

Asset strategies are targeted, holistic and optimized activities which mitigate potential risks of asset failure through predictive and preventative maintenance, inspection, monitoring, engineering and analytical methodologies. Integration with your broader asset management and operational systems, along with embedded optimization methods, ensure you are fully managing failure risk at an optimized cost profile.

1 month

1 month

6-12 months, based on scope and size

2-6 months, based on #2

Digital Transformation Blueprint

Begin value services between solution design and APM implementation

Predix APM Implementation

User Enablement & Process Transformation

Content Application or Development

Program Execution, Monitoring, and Sustainment

Payback can be achieved in less than 12 months
Different Views of Asset Data Mean You Are Always One Step Ahead

4 Execute APM program elements and establish dynamic monitoring to detect and actively mitigate emerging threats.

As asset strategies are executed, there are many emerging threats to an optimized strategy. Equipment ages, business and compliance requirements change, process conditions are altered, and asset health can deteriorate. The implementation of asset strategies can dynamically monitor threats and automatically adjust the strategy through managed recommendations to ensure risk is controlled.

5 Deploy APM governance activities to ensure program effectiveness and continuous improvement.

APM programs provide key metrics and indicators to measure the implementation and effectiveness of any value delivered through asset strategies. Boardroom to asset-level analytics and alerts provide clear visibility to strategy implementation, performance, and emerging threats across the enterprise.

Payback can be achieved in less than 12 months
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