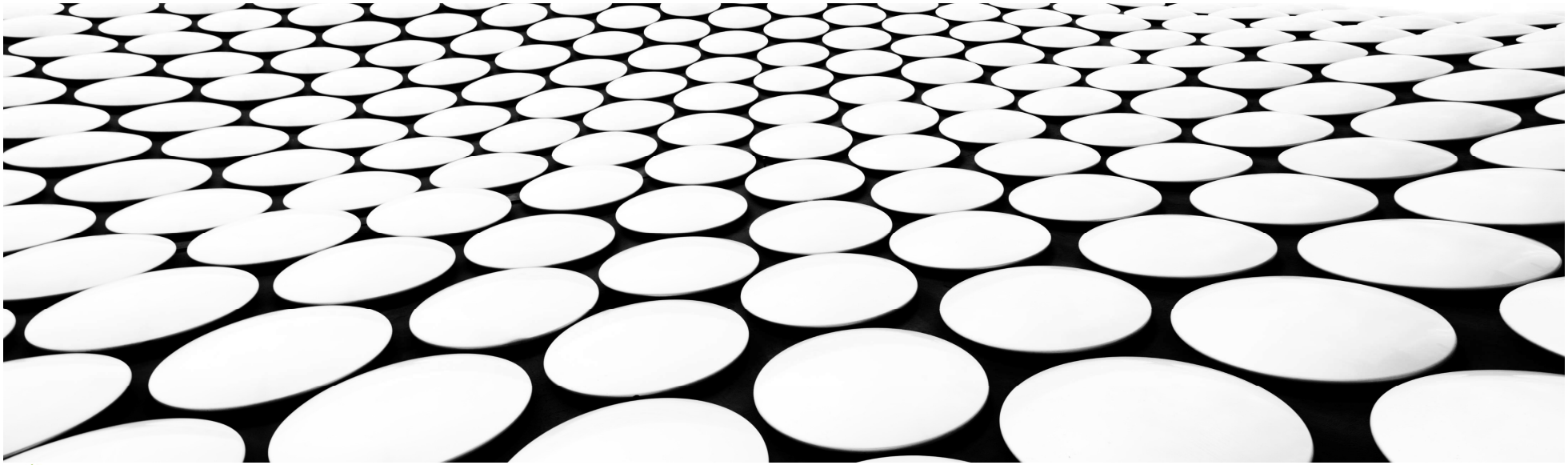
ASSET PERFORMANCE MANAGEMENT (APM)
- WHAT GOOD LOOKS LIKE
- HOW TO START



Global Asset Care

ASSET PERFORMANCE MGMT.

What is Asset Performance Management for any High Reliability Organization (HRO)

Asset Performance Management (APM) is a business capability focused on *optimizing operational assets* (such as plants, equipment and infrastructure) essential to the operation of an enterprise. It comprises a set of methods, processes, tools and technologies that aim to *reduce unplanned repair work, increase asset availability, minimize maintenance costs and reduce the risk of failure for critical assets.* APM can also improve an organization's ability to comply with regulations that prescribe how assets are inspected and maintained. APM uses data capture, integration, visualization and analytics to improve operations and maintenance timing, and to identify which maintenance and inspection activities to perform on mission-critical assets.

Source: Gartner

HIGH RELIABILITY ORGANIZATION (HRO)

Proactively identifying and mitigating potential threats & risks that can impact:

- Health & safety
- Equipment Reliability & availability
- Environment & reputation
- Production
- Etc.

The 80/20 Rule

"...Based on the famous Pareto principle, which states that 80 percent of the issues comes from 20 percent of the causes"

Bad Actors

Emerging Threats and Risks

Opportunities

Health & Safety, Regulatory

Programs and Foundational Activities

Process, asset, or program opportunities that can improve reliability, utilization and/or throughput while managing risk. For example;

- Extending routine Outage Shutdown Frequency

Programs improvement that results in better reliability of assets under that program. For example;

- Lubrication and contamination control programs
- Vibration monitoring programs
- Etc.

When a site is in a firefighting mode, typically a short/medium term improvement plan is developed to stop the bleed. It typically consists of a combination of programs improvement, Bad Actor elimination, and Causal investigation

Once site is in a continuous improvement phase, other buckets of improvement can be added to the RIP

A dynamic list of improvement that is continuously updated, fostered, and steered by Reliability in an HRO

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CAPABILITIES : WHAT GOOD LOOKS LIKE FOR A WORLD CLASS APM

- Good quality data in EAM (Enterprise Asset Management e.g. SAP, Maximo etc.), alignment to ISO14224, 55000.
- Full integration between APM & EAM platforms
- Sufficient, secure, sustainable and relevant OT data. If gap exists invest in deploying sensors and process data management infrastructure.
- Right APM platform (fit for purpose)
- Alignment between vendor's product roadmap and a company's asset strategy roadmap
- Right infrastructure architecture.

Source : Gartner. (Please see appendix for details)

APM VALUES

Source: GE VERNOVA

BUSINESS CASE OPPORTUNITIES

LOV (put YOUR numbers here):

- High consequence Loss Opportunity Value (LOV) currently being tracked at YOUR organization (does not reflect the total opportunity)
- Enable deeper analysis to eliminate failures, not just mitigating consequences of failures after they occur.
- LOV $ xxxx (your numbers based on dashboards
- **OPPORTUNITY = xxxx % IMPROVEMENT = $ xxxx MILLION**

Solomon MEI or any industry benchmarking:

- Suggests we are doing more work than our peers for the same relative volume of production
- Opportunity to reduce the relative amount of work being executed by being more proactive, planful, safe and cost effective
- $ xxxx Million annual overspend
- **OPPORTUNITY = xxx% IMPROVEMENT = $xxx MILLION**

Standards & Guidelines assessment (

- Reliability practitioners have some competency challenges (theory and process)
- People/Process/Data/Technology not fully integrated & aligned
- Strategy development is seen by many as cumbersome & complex
- Reliability work prioritization is a challenge
- **OPPORTUNITY = MAKE THE RIGHT WAY THE EASY WAY**

Support Digital Transformation:

- Currently most equipment and asset strategies are paper based
- Multiple silos/systems for assets strategy program implementation
- ***OPPORTUNITY – DIGITALLY TRANSFORM EQUIPMENT STRATEGIES TO BE DATA-BASED using APM platform***

Removing Barriers to Improvement

- Reliability relevant data is not available or integrated
- Currently, reliability practitioners spend 2/3 of strategy management effort 'finding' data and documentation to support asset reliability programs
- Paper-based system makes updating and sharing strategies through the organization cumbersome
- ***OPPORTUNITY = REMOVE PERCEIVED COST BARRIER OF $xxx MILLION BY $xxx MILLION***

WHY AN ENTERPRISE APPROACH?

What can be done at center that sites cannot accomplish alone…

- **Economy of scale:**
  Cost of developing asset strategy library is not justifiable on a site-by-site basis

- **Consistency:**
  Each site has potentially developed their own strategy library, to drive consistency & unlock hidden value, use corporate library to drive centralized approach & challenge status quo

- **Objectivity:**
  Benchmarking is best enabled with the “center” driving it

- **Collaboration:**
  Promote collaboration from center to drive work being done across functions & networks such as COP’s

OTHER VALUE AREAS…

- **Enable promoting more proactive, strategy driven work**
  - Goal is to improve the ratio of proactive to reactive work from xxx% proactive to xxx% proactive.
  - Proactive and planned work is safer, cheaper and less invasive than reactive work (4:1 cost savings)

- **Make it easier to compare/share/benchmark across sites**
  - Current benchmarking sites is challenging & lot of time spent on “collecting and cleaning” data

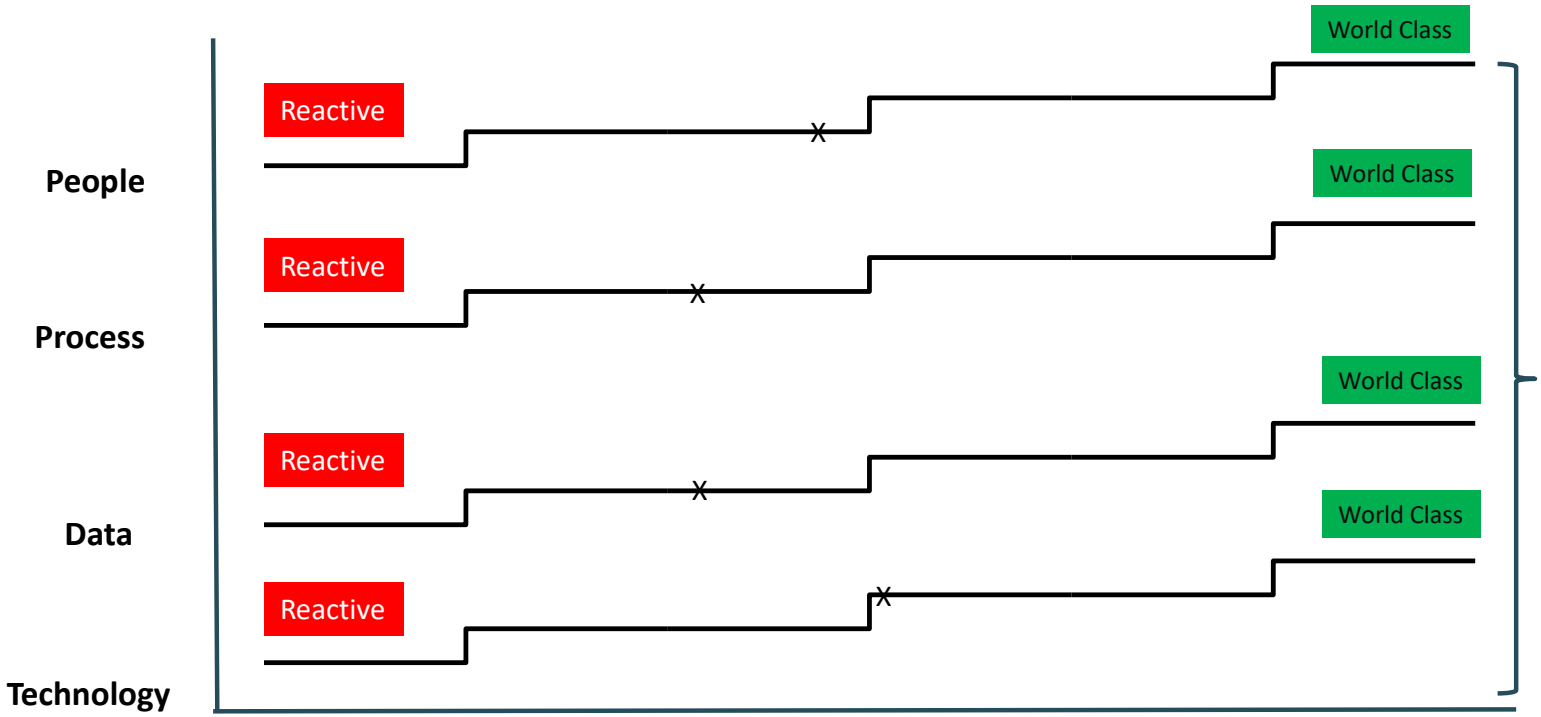
- **Shift from “Mitigating Consequence” to “Mitigating Failures”**
  - ➢ Good utilization despite lower availability typically shows we are very good at mitigating consequence
  - ➢ Mitigating consequences takes resources & money
  - ➢ To truly derive value & reduce costs, we need a failure elimination mindset

- **Visible vs. Hidden failure types**
  - ➢ Inspection management is designed to go after hidden failures
  - ➢ Consolidating Inspection management to one platform gives visibility to all failure types & damage mechanisms

MATURITY MATRIX (GARTNER VS. "X")

GARTNER MATURITY				
L1 –RTF	Run to Failure	1	Reactive	Standards, process and controls do not exist.
L2 – POT	Preventive – Planned on Time	2	Stabilizing	Standards, process and controls created & sporadically used @ BU level
L2- POU	Preventive – Planned on Usage	2	Stabilizing	Standards, process and controls created & sporadically used @ BU level
L4 – CBM	Condition Based Maintenance	4	Plan For Improvement	Standards, process and control exist, and reviewed periodically.
L5 – PdM	Predictive Maintenance	5	Sustain for Improvement	Gaps within standards, process, and controls are identified and improvement plans are followed.
L6- RCM	Reliability Centred Maintenance	6	World Class	Every site standards, process controls are known, managed, and implemented at corporate level.
L7 - FIN	Financial Optimization	6	World Class	Every site standards, process controls are known, managed, and implemented at corporate level.

RELIABILITY ENABLEMENT FRAMEWORK & MATURITY



Where are we
(i) Comparing our peers in USA / Canada
(ii) World Class

Asset Criticality	Risk assess	Develop Asset Strategy	Implement Asset Strategy	Execute Asset Strategy	Review & Analyze Data	Reliability Improvement

Aligned to Standards and Asset Strategy Programs

YOUR MATURITY

People (xx Maturity)

- Focus on competency alone…
- High variability among the sites on the "How"

Process (xx Maturity)

- Focus on process alignment alone…
- M&R Standard currently emphasizing "Reactive Work": needs to be re-framed to promote "Proactive Work"

Technology (xx Maturity)

- Continue with 3.6 and/or move to SAP S4/HANA…
- 3.6 is limited in terms of assets it can handle and S4/HANA does not have the capability to manage an "Asset Strategy Library" nor the ability to analyze "risk"

Data (xx Maturity)

- Current metrics are highly dependent on individual site data configurations: this variability is a major barrier to benchmarking and sharing best practices through objective evaluations of effectiveness and efficiency

Summary:

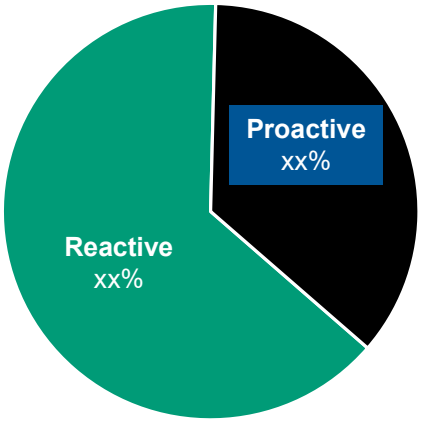
- Individual efforts to address gaps has not provided step-change improvements in the past
- Our maturity levels in each of these themes varies, and best practices suggest that we should bring the "lower maturity" up to the higher maturity themes (process and technology)
- In order to bring all to a higher level of maturity, while still moving forward in key areas of focus (Condition/Performance Monitoring and Inspection Management) we need to develop a coordinated plan

Reactive to Proactive approach

There is a significant opportunity to drive reliability, improve productivity and reduce maintenance costs with a shift from reactive to proactive maintenance

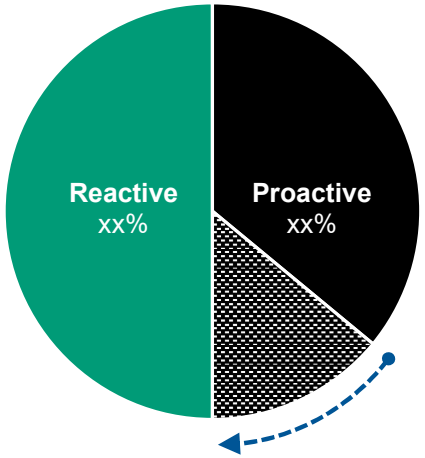
DID YOU KNOW?
Reactive maintenance takes 3-4x longer and is at least 2-3x more expensive than proactive maintenance.
A top quartile company has an 80% proactive 20% reactive maintenance spend ratio.

Current Maintenance Spend Ratio



Shifting towards higher proactive work, we could generate $xx M per year

Initial Target Maintenance Spend Ratio



Notes & Assumptions:
1) Current proactive work (xx%) is the average across all sites, based on 5 year WO history extract from SAP
2) Current maintenance spend ($xxM) is the annualized maintenance spend, based on 5 year WO history extract from SAP

WHY FOCUS ON RELIABILITY

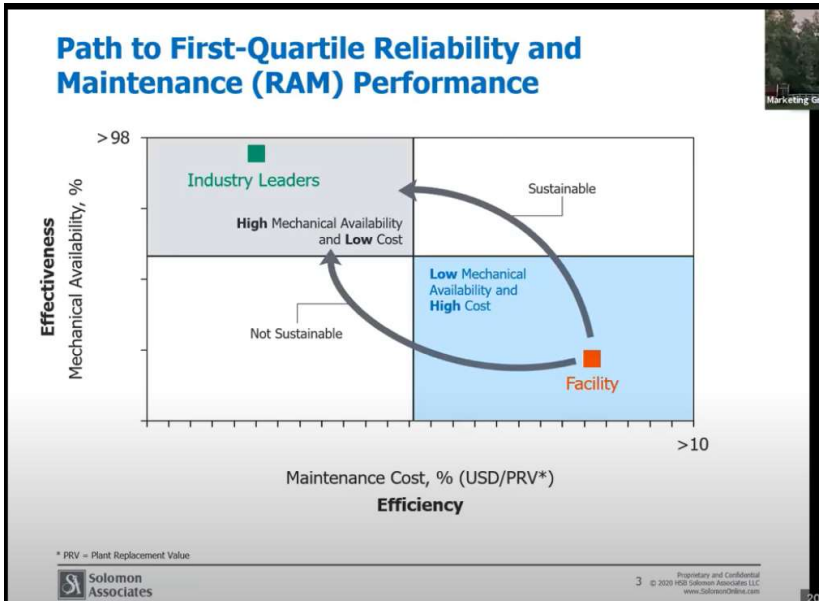
The Solomon webinar "Guidance in the time of Uncertainty – Staying True to your Reliability Journey" . Describes their perspective on reliability and reliability culture.

World's best:

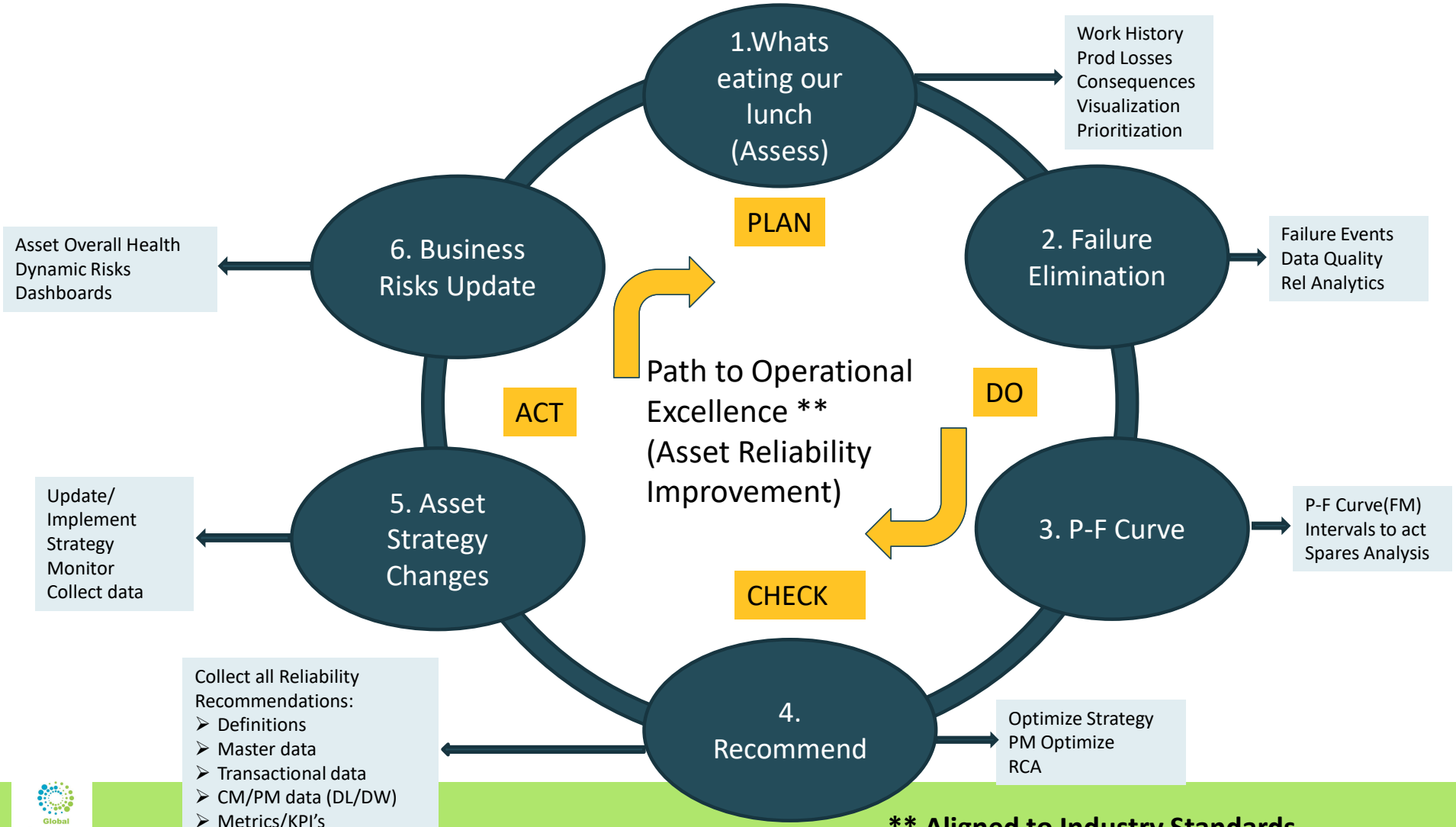
- "Operational availability is the primary driver to becoming the world's best. Without strong reliability you can never be the world's best. Operators with high reliability will have low maintenance costs. Maintenance planning is proactive and not reactive"

Solomon's perspective,
Based on 25+ years of data, the only sustainable way to reduce cost is to first improve reliability.

Improve effectiveness to become efficient

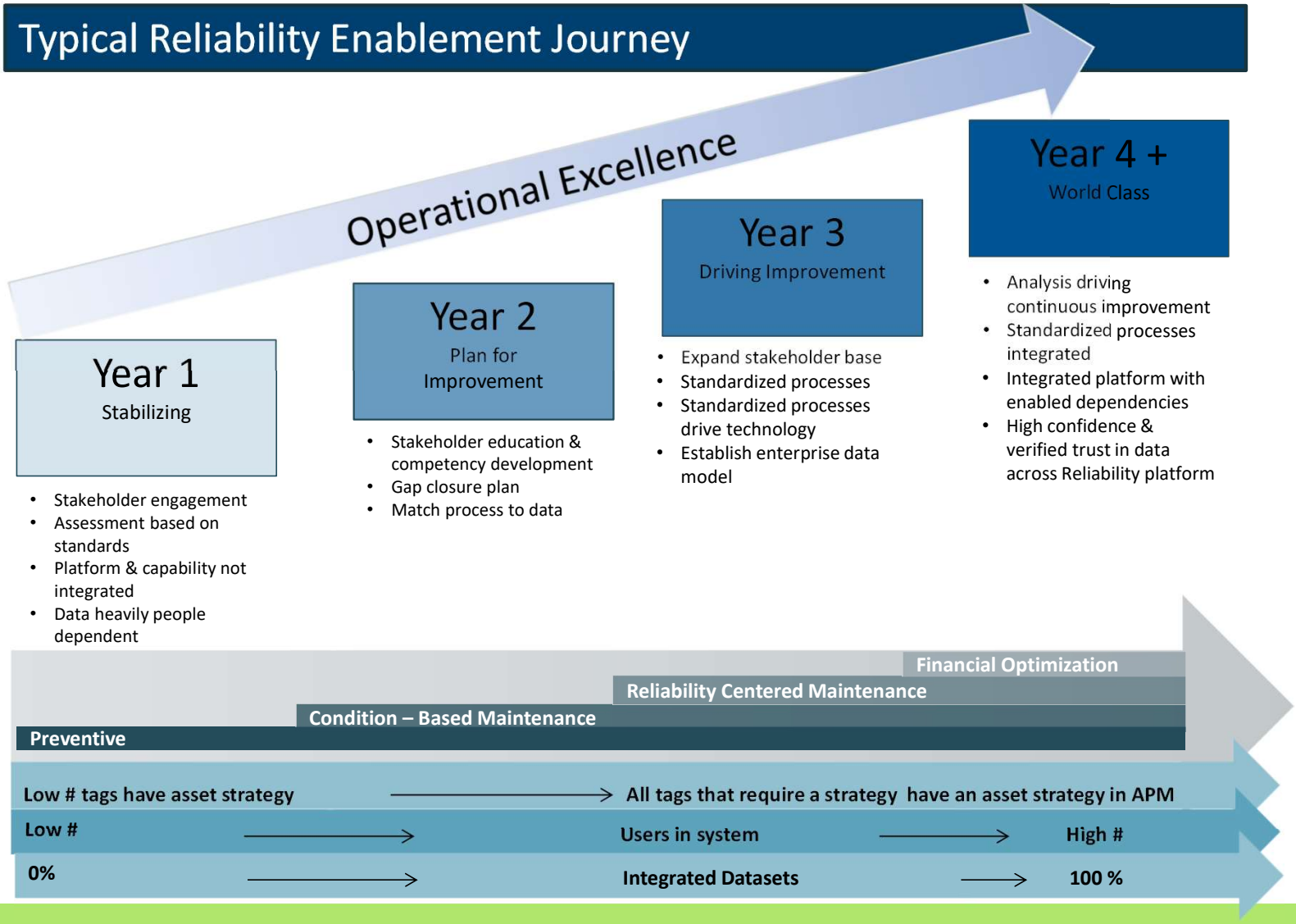


REACTIVE TO PROACTIVE APPROACH (DATA INFORMED & TECHNOLOGY ENABLED)



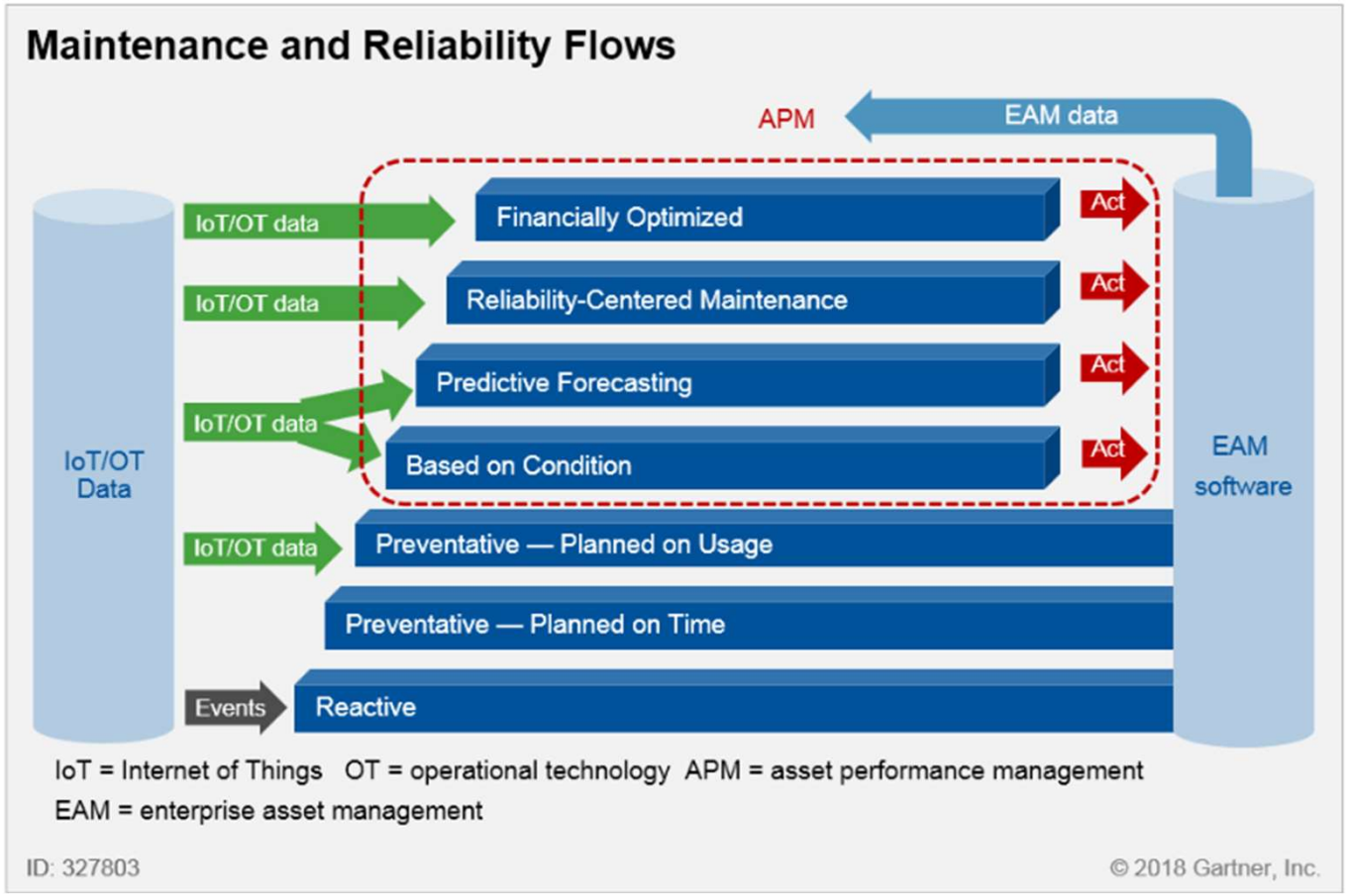
** Aligned to Industry Standards

Typical Reliability Enablement Journey



APPENDIX

RELIABILITY ENABLEMENT FRAMEWORK



RELIABILITY ENABLEMENT FRAMEWORK

Market Recommendations

While a comprehensive APM platform solution would deliver value for almost any organization, all the components of these types of solutions may not be needed for most organizations, and the value should be weighed against the investment and total cost of ownership. More specifically, when evaluating APM options, consider:

- The importance of good quality data in your EAM systems. Assess your data quality, and if there are deficiencies, then invest in upgrading your EAM systems and/or an asset data-cleansing project before investing in APM.
- The importance of integration with EAM. Ensure there is an interface to your EAM to be able to execute APM recommendations directly in the transactional EAM system.
- The importance of sufficient, secure, sustainable and relevant operational technology data. If the data doesn't exist or is not accessible, then invest in deploying sensors and process data management infrastructure before embarking on an APM project. Additionally, look at the underlying governance of the OT systems to ensure you have a documented, secure and stable basis for OT data architecture. If you are considering APM-as-a-service options, determine if outsourcing the core competency of data analysis is beneficial in your long-term plan, or, alternatively, if you should build competencies in-house.
- The APM vendor's experience with your specific use case. Does it have customers already using the product to manage the performance of similar assets? Most APM vendors serve a variety of industries and asset types, but some are quite specific and are developing "domain expertise" offerings. Pick a solution that fits your scope and budget.
- The alignment between the vendor's APM product roadmap and your own long-term equipment reliability strategy (assuming you have one). Not all APM vendors have an expansive product strategy. If your long-term plan includes expanding the scope of the solution to encompass different assets, and different approaches to managing their performance, then invest in an APM platform vendor solution. If your organization only needs to support specific analytical approaches or specific classes of assets, then an APM asset analysis vendor may be more suitable.
- The ability of the solution to support collaboration across the organization, as well as with external business partners, such as OEMs. Cloud technology is changing asset management collaboration dynamics and opening the door to new asset management business models. If you are considering a more collaborative asset management model, invest in APM solutions that support, or will support, the necessary collaboration.

Source: Gartner