The Person that invented spell check should burn in *HELLO!*

MASTERINGSAP Connect

ROYAL PINES RESORT
GOLD COAST
11-12 NOVEMBER 2024

Deep Dive: Will AI Help the MRO Supply Chain Make Significant Gains in Reducing RISK and COST?

Drew Troyer, Norm Poynter, & Tim McLain

MASTERINGSAP
An SAPinsider Company

MASTERINGSAP
Connect

ROYAL PINES RESORT
GOLD COAST
11-12 NOVEMBER 2024

Tim McLain

Independent Thought Leader

Lexin Solutions & Asset Hive

Norm Poynter

Independent Thought Leader

(But no one really knows what Norm does!)

MASTERINGSAP
An SAPinsider Company

MASTERINGSAP
Connect

ROYAL PINES RESORT
GOLD COAST
11-12 NOVEMBER 2024

Drew Troyer

Global Head of Asset Management

Drew Troyer

Norm Poynter

Flashy Shirt Guy

MASTERINGSAP
An SAPinsider Company

Our 90 minute adventure...

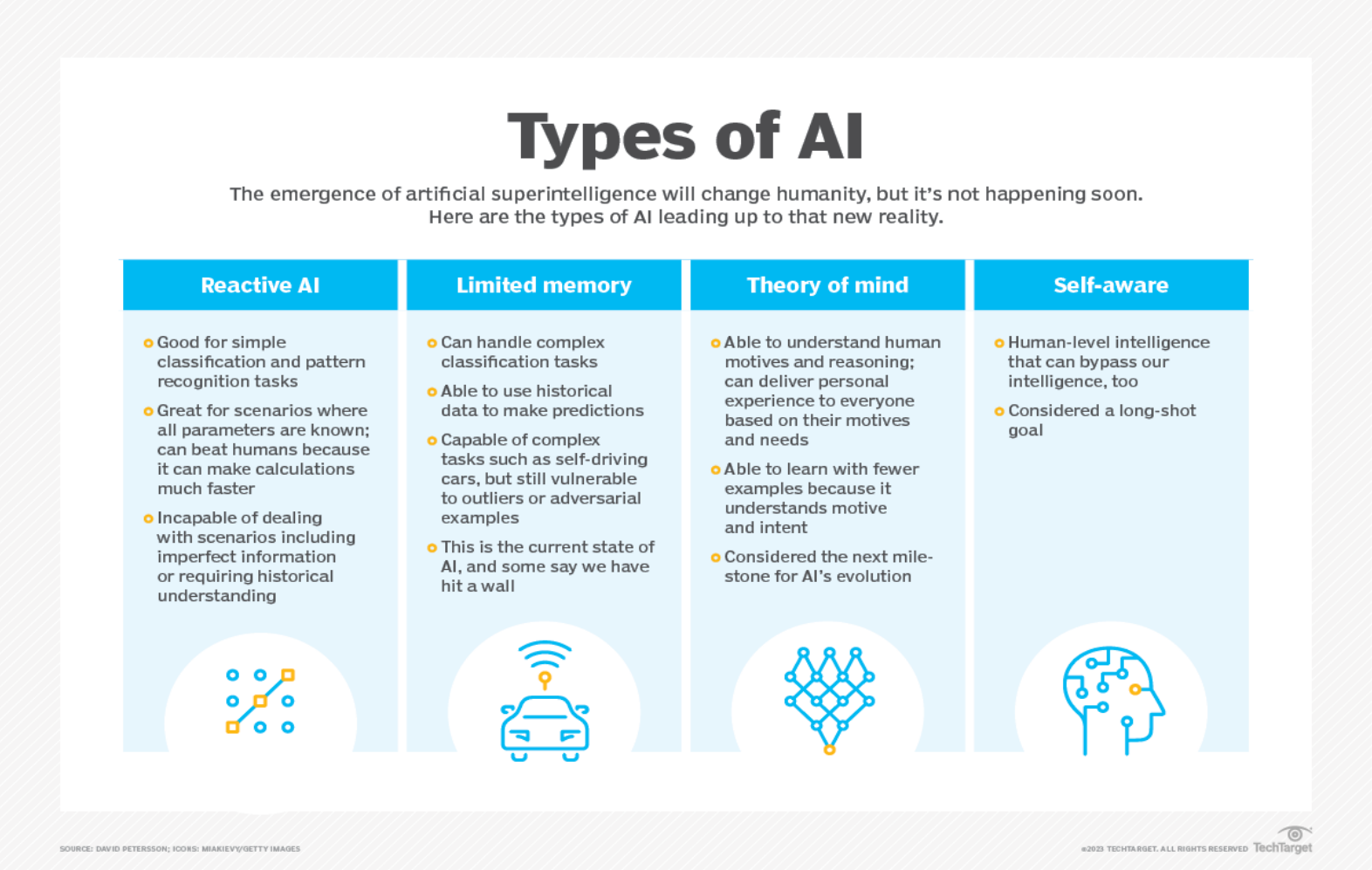
- Introductions
- Overview
- PM & EAM Thoughts & Discussion (that means you Audience!)
- MM & IM SCM Thoughts & Discussion (yep, still you!)
- Closing comments
- Lunch!

PM = Plant Maintenance
EAM = Enterprise Asset Management
MM = Materials Management
IM = Inventory Management

What is Aritifical Intelligence

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines, enabling them to perform tasks that typically require cognitive abilities such as learning, reasoning, problem-solving, and decision-making. At its core, AI consists of various technologies, including machine learning (ML), which allows machines to learn from data; deep learning, which models complex patterns using neural networks; and robotics, which enables the development of autonomous machines.

A Picture with more words on it...



Types of AI

The emergence of artificial superintelligence will change humanity, but it's not happening soon. Here are the types of AI leading up to that new reality.

Reactive AI	Limited memory	Theory of mind	Self-aware
Good for simple classification and pattern recognition tasks	Can handle complex classification tasks	Able to understand human motives and reasoning; can deliver personal experience to everyone based on their motives and needs	Human-level intelligence that can bypass our intelligence, too
Great for scenarios where all parameters are known; can beat humans because it can make calculations much faster	Able to use historical data to make predictions	Able to learn with fewer examples because it understands motive and intent	Considered a long-shot goal
Incapable of dealing with scenarios including imperfect information or requiring historical understanding	Capable of complex tasks such as self-driving cars, but still vulnerable to outliers or adversarial examples	Considered the next milestone for AI's evolution	
	This is the current state of AI, and some say we have hit a wall		

SOURCE: DAVID PETERSSON; ICONS: MIAKIEVY/GETTY IMAGES

Top 5 AI targets for EAM

MASTERINGSAP Connect

In the SAP Enterprise Asset Management (EAM) environment, AI is being integrated to improve asset performance, optimize maintenance workflows, and reduce operational costs. Here are the top 5 focus areas for AI in this domain:

1. Predictive Maintenance and Condition Monitoring

- Use AI and machine learning to analyze real-time sensor data (e.g., temperature, vibration, pressure) and predict asset failures before they occur.
- Leverage AI to improve maintenance schedules by identifying patterns that indicate impending issues, reducing unplanned downtime and extending asset lifecycles.

2. Asset Performance Optimization

- AI can analyze historical and real-time performance data to identify underperforming assets and suggest optimization strategies.
- Use AI algorithms to adjust operational parameters (e.g., speed, load) to optimize asset performance, improve energy efficiency, and reduce wear and tear.

3. Automated Work Order Creation and Scheduling

- AI-driven systems can automate the creation, prioritization, and scheduling of work orders based on real-time data, asset condition, and maintenance history.
- By streamlining work order processes, AI ensures that maintenance tasks are completed on time, and resources are allocated efficiently, reducing downtime and costs.

4. Root Cause Analysis (RCA) and Fault Detection

- AI-powered tools can analyze patterns in asset performance data to quickly identify the root cause of failures or malfunctions.
- Use AI to detect hidden issues and provide recommendations for corrective actions, enabling faster troubleshooting and reducing the risk of recurring failures.

5. Intelligent Spare Parts and Inventory Management

- Leverage AI for demand forecasting of spare parts based on asset usage patterns, historical maintenance data, and failure rates.
- Optimize inventory levels and automatically trigger replenishment orders for critical parts, ensuring that the right materials are available when needed while minimizing excess stock and associated costs.

Top 5 AI targets for Plant Maintenance

MASTERINGSAP Connect

In the SAP Plant Maintenance (PM) environment, AI is being increasingly integrated to enhance maintenance processes, improve efficiency, and reduce costs. Here are the top 5 focus areas for AI in this domain:

1. Predictive Maintenance

- Use AI and machine learning to analyze equipment data (e.g., sensors, historical performance) and predict failures before they occur.
- Optimize maintenance schedules and minimize downtime by forecasting when assets are likely to need repairs or replacements.

2. Intelligent Asset Management

- Leverage AI to optimize the lifecycle management of assets, including condition-based monitoring and automated assessments of asset health.
- Enhance decision-making related to asset performance, replacement, and repair strategies based on data-driven insights.

3. Automated Work Order Management

- AI can automate the creation, prioritization, and scheduling of work orders based on real-time equipment data and historical trends.
- Reduce manual intervention, improve response times, and ensure that critical tasks are handled efficiently.

4. Root Cause Analysis (RCA) and Fault Detection

- Use AI to identify patterns and correlations in equipment behavior, which can help pinpoint the root causes of faults or failures faster.
- Enable quicker troubleshooting and resolution, reducing the impact of issues on operations.

5. Mobile and Augmented Reality (AR) Integration for Field Technicians

- Implement AI-driven AR applications to provide real-time, context-sensitive guidance to maintenance technicians in the field.
- Improve efficiency and reduce errors by enabling technicians to access remote support, view manuals, or visualize system performance data through wearable devices.

These focus areas aim to make plant maintenance processes smarter, more proactive, and more cost-effective by utilizing AI technologies within the SAP PM framework.

MASTERINGSAP
An SAPinsider Company

Top 5 AI targets for SCM

MASTERINGSAP Connect

In SAP Supply Chain Management (SCM) for Maintenance, Repair, and Overhaul (MRO) materials, AI can significantly enhance supply chain visibility, efficiency, and decision-making. Here are the top 5 focus areas for AI in this domain:

1. Predictive Demand Forecasting and Material Planning

- Use AI-driven models to analyze historical usage patterns, seasonality, and operational factors (e.g., maintenance schedules) to predict demand for MRO materials.
- Improve the accuracy of material planning by predicting future needs, enabling better procurement strategies and reducing stockouts or excess inventory.

2. Supplier Selection and Performance Optimization

- AI can evaluate supplier performance based on criteria like delivery times, pricing, quality, and reliability, and suggest the best suppliers for each MRO material need.
- AI-driven supplier risk management tools can proactively identify potential disruptions in the supply chain (e.g., delays, financial instability) and recommend alternative sourcing strategies.

3. Automated Purchase Order Management

- Leverage AI to automate the creation, approval, and tracking of purchase orders for MRO materials, based on real-time demand data and inventory levels.
- AI can also help prioritize purchase orders, ensuring timely delivery of critical materials while optimizing procurement costs.

4. Smart Inventory and Stock Optimization

- AI algorithms can optimize stock levels and order replenishments by analyzing usage rates, lead times, and consumption trends for MRO materials across multiple locations.
- Use AI to ensure inventory is properly balanced, minimizing the cost of carrying excess stock while ensuring that critical MRO materials are always available.

5. Supply Chain Visibility and Risk Management

- AI can provide end-to-end visibility across the supply chain, tracking the movement of MRO materials from suppliers to warehouses to maintenance sites.
- Implement AI-driven tools for real-time monitoring of supply chain performance, including identifying potential bottlenecks, delivery delays, or disruptions, and recommending mitigation strategies.

MASTERINGSAP
An SAPinsider Company

Top 5 AI targets for Materials Mngt

MASTERINGSAP Connect

In the SAP Indirect Materials Management (IMM) environment, AI is being leveraged to optimize procurement, inventory management, and supplier relations, with a focus on improving efficiency and reducing costs.

1. Automated Demand Forecasting

- Use AI to analyze historical consumption patterns, trends, and external factors (e.g., seasonal demand, production schedules) to predict future demand for indirect materials.
- Improve inventory management by aligning procurement with accurate, data-driven forecasts, reducing overstocking and stockouts.

2. Smart Supplier Selection and Management

- AI algorithms can analyze supplier performance, pricing trends, delivery times, and other criteria to suggest the best suppliers for each procurement need.
- Enhance supplier relationship management by identifying potential risks (e.g., financial stability, delivery issues) and recommending actions for improvement.

3. Automated Procurement Process

- AI can automate repetitive tasks in the procurement process, such as order creation, purchase requisition approvals, and invoice matching.
- Streamline procurement workflows and reduce manual errors, improving efficiency and speeding up the order-to-payment cycle.

4. Contract Management and Compliance

- AI can be used to analyze contracts and monitor compliance with terms, including pricing, delivery conditions, and penalties for non-compliance.
- Automate the extraction of key clauses from contracts and detect anomalies or potential violations, ensuring better control and risk management.

5. Spend Analytics and Cost Optimization

- Use AI to analyze procurement spend data across departments, categories, and suppliers, identifying opportunities for cost reduction and better sourcing strategies.
- Leverage AI to recommend areas for consolidation of suppliers, bulk purchasing, or negotiation of better terms based on spending patterns and market conditions.

Top 5 AI targets for Inventory Mngt

MASTERINGSAP Connect

In the SAP Indirect Materials Inventory Management (IM) environment, AI technologies can significantly enhance inventory control, optimize stock levels, and improve overall efficiency.

1. Inventory Optimization and Stock Level Management

- AI-driven algorithms can predict optimal stock levels based on historical consumption, demand fluctuations, and lead times, minimizing overstocking or stockouts.
- Use AI to automatically adjust reorder points and safety stock levels in real-time, ensuring continuous supply without excess inventory.

2. Demand Forecasting and Consumption Prediction

- Leverage machine learning to forecast future demand for indirect materials by analyzing past usage patterns, seasonal trends, and other factors like production schedules or external market conditions.
- Improve accuracy in forecasting demand for non-production materials, ensuring timely replenishment and reducing unnecessary purchases.

3. Automated Stock Replenishment

- AI can trigger automated reordering of materials when inventory levels reach a pre-defined threshold, streamlining the procurement process and reducing manual intervention.
- Integrate AI with supplier systems to facilitate just-in-time deliveries based on real-time inventory data, reducing lead times and carrying costs.

4. Smart Inventory Tracking and Real-time Visibility

- AI-enabled sensors and RFID technologies can provide real-time tracking of materials, offering greater visibility into stock locations, usage rates, and inventory status.
- Use AI to analyze this data for discrepancies or inefficiencies in stock movement, helping to prevent loss, theft, or mismanagement of indirect materials.

5. Automated Material Categorization and Sorting

- AI can classify and categorize materials more efficiently, helping to optimize storage locations and improve stock organization.
- Machine learning algorithms can identify patterns in material usage and location preferences, automating the sorting of materials and streamlining warehouse operations.

MASTERINGSAP
An SAPinsider Company

AI Impacts on EAM & SCM

Advantages of AI

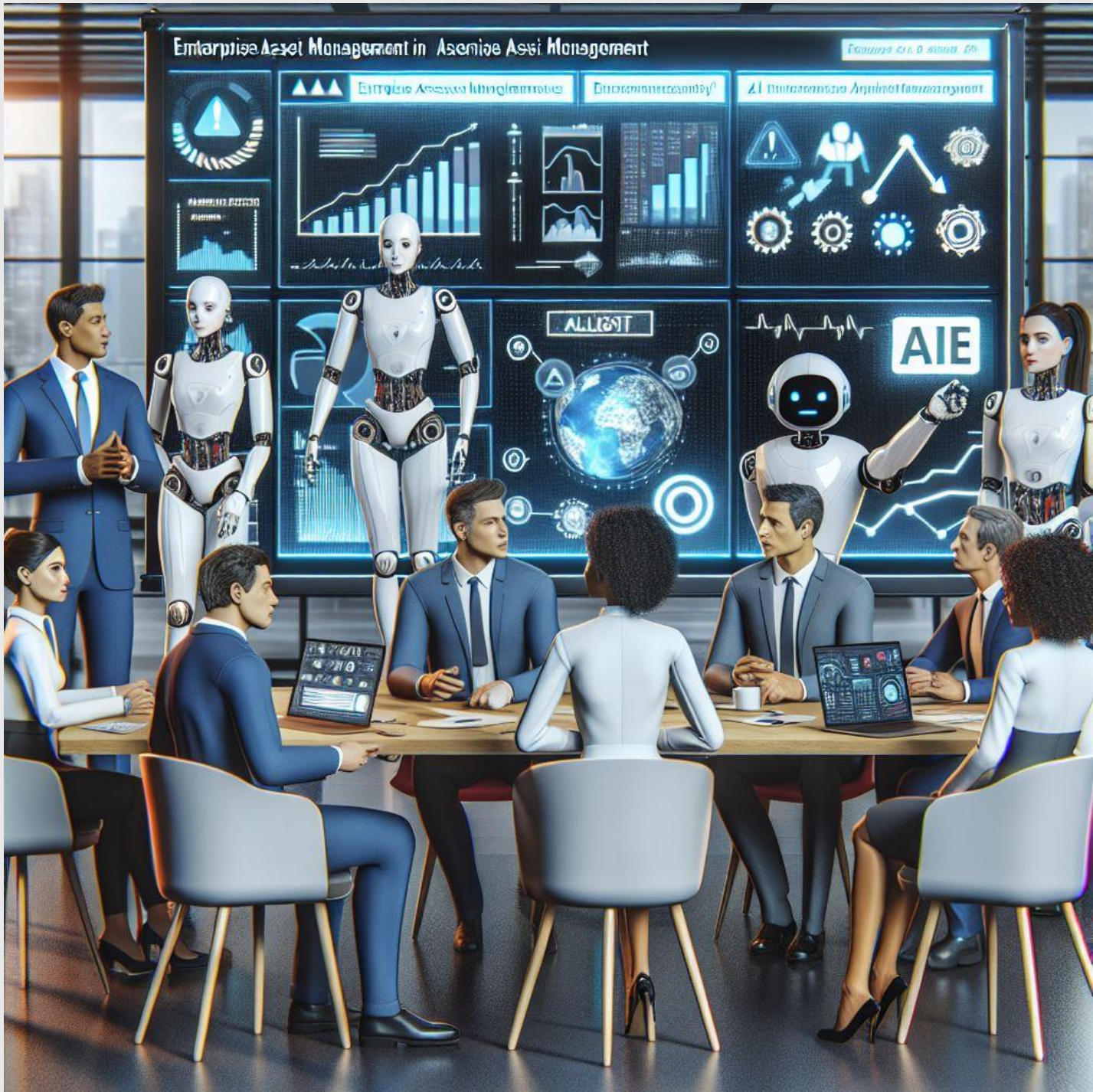
- Increased Efficiency and Productivity
- 24/7 Availability and Continuous Operations
- Reduction in Human Error
- Data Acquisition and Analysis
- Cost Reduction and Scalability
- Improved Safety and Risk Management
- Unbiased and Data-Driven Decision Making
- Continuous Learning and Improvement
- Personalization and Enhanced User Experience
- Innovation and New Possibilities

AI Impacts on EAM & SCM

Disadvantages of AI

- High Costs and Implementation Challenges
- Lack of Creativity and Emotion
- Job Displacement and Reduced Human Involvement
- Ethical and Privacy Concerns
- Bias in AI Algorithms
- Decreased Human Skill Development
- Lack of Accountability and Transparency
- Security Risks and Misuse of AI
- Energy Consumption and Environmental Impact

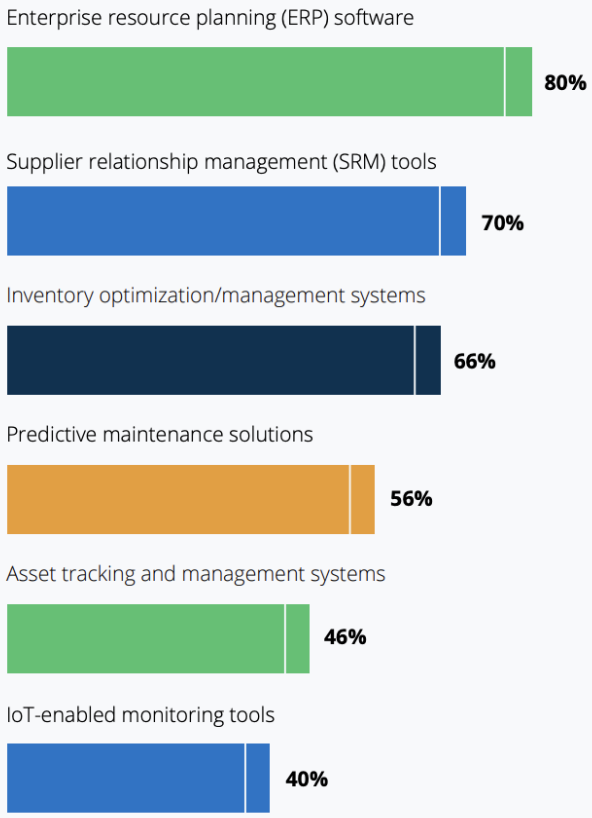
#MasteringSAP #MasteringSAPConnect2024



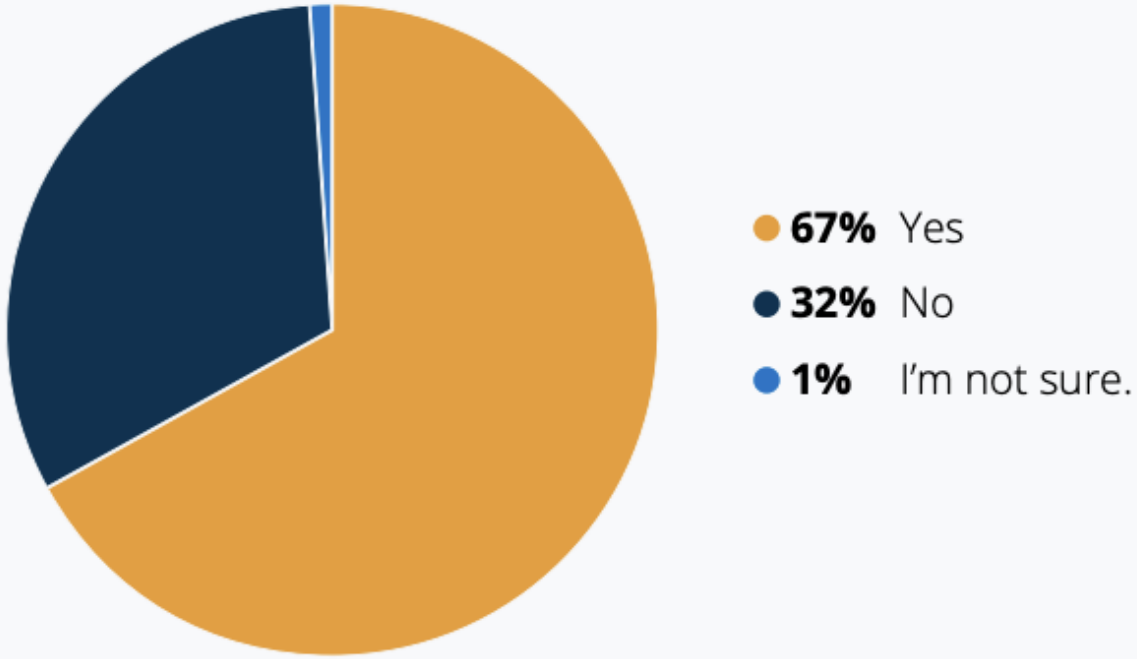
Technologies used to manage MRO

MASTERINGSAP Connect

Which of the following technologies does your organization currently use to manage its MRO practices?



Is there a centralized inventory management team in your organization that manages MRO inventory?



Centralised MRO or not...

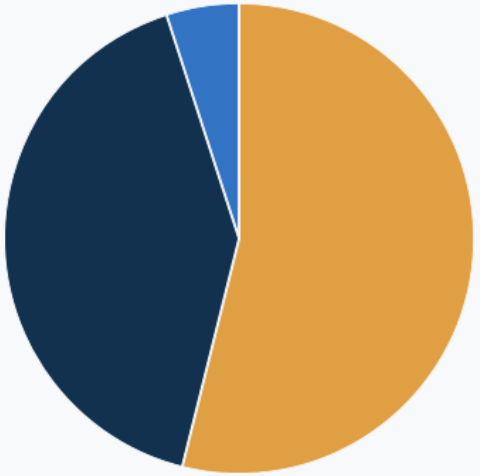
- Establishing a centralized inventory management team is often a crucial step toward optimizing MRO inventory and advancing organizational maturity in inventory practices.
- By centralizing inventory and procurement decisions under a dedicated central inventory management team, organizations can eliminate local optima decision-making, use coordination across their entire organization as leverage with their suppliers and significantly reduce waste.

Visibility of When, Where, and how MRO materials are being used.

MASTERINGSAP Connect

- There are potential challenges to understanding how MRO materials are being consumed and used. This has a significant impact on part-sharing programs and effectively assessing the criticality and stocking policies of certain materials.
- Organizations traditionally have implemented robust systems of inventory movement tracking to overcome these challenges effectively.

To what extent are you able to track and understand the consumption and utilization of your MRO materials, including which assets utilize them, the timing of maintenance activities and schedules, and who performs the maintenance?



- **54%** Completely—We have comprehensive visibility and data.
- **41%** Partially—We have some visibility and data, but it is not comprehensive.
- **5%** Not at all—We completely lack visibility and data.

Current Practise Pain Points

- The **absence of automated tracking systems** and their reliance on manual processes significantly hampers accuracy.
- **Inconsistent data governance practices** and the absence of clear data ownership guidelines lead to confusion over responsibilities and permissions, contributing to data duplication and inconsistency.
- **Regulatory compliance** requirements introduce additional complexity.
- The **lack of a centralized platform** for aggregating data from various MRO systems is a major impediment.
- **Lack of interoperable systems** and divergent processes across departments create information silos, making it challenging to achieve a unified view of MRO activities.
- This fragmentation is exacerbated by **legacy systems and outdated software**, which are often incompatible with newer tracking technologies, limiting the organization's adaptability and potential for improved visibility.

Future Trends

MASTERINGSAP Connect

Using Artificial Intelligence in EAM & MRO

- Predict maintenance needs, forecasting equipment failures, thereby reducing unplanned downtime.
- AI monitoring systems are anticipated to continuously track equipment health, allowing timely maintenance interventions to extend asset lifespan.
- Leverage AI for condition-based maintenance, moving away from traditional calendar-based approaches.
- dynamic scheduling, optimizing technician assignments, and ensuring timely interventions, including by pre-ordering parts and tools for maintenance
- Considerable opportunity has been identified in combining predictive maintenance, inventory optimization and dynamic scheduling tools powered by AI.
- AI will streamline the procurement process by automatically generating purchase orders based on predicted demand and inventory levels
- Integrating AI into supplier relationship management

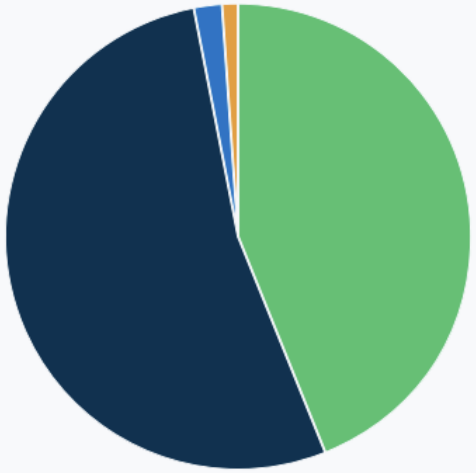
GAPS

MASTERINGSAP Connect

Regular Assessment of Criticality and Inventory Policies

- Understanding and regularly assessing criticality and inventory policies is crucial for ensuring operational efficiency and minimizing risks within an organization.
- By continuously evaluating the importance of various materials and their impact on operations, businesses can prioritize resources, prevent costly downtimes, and maintain smooth production processes.
- At 53%, a slight majority of the respondents say their procurement teams have a somewhat structured category management process for MRO.

Does your procurement team have a structured category management process for MRO? This involves the strategic grouping and managing of related products or services (e.g., market analysis, sourcing strategy definition, spend analysis).



- **44%** Yes—we have a structured process in place.
- **2%** No—we do not have a structured process in place.
- **53%** Somewhat—we use some aspects of category management, but it is not formally defined.
- **1%** I'm not sure / I don't understand the question.

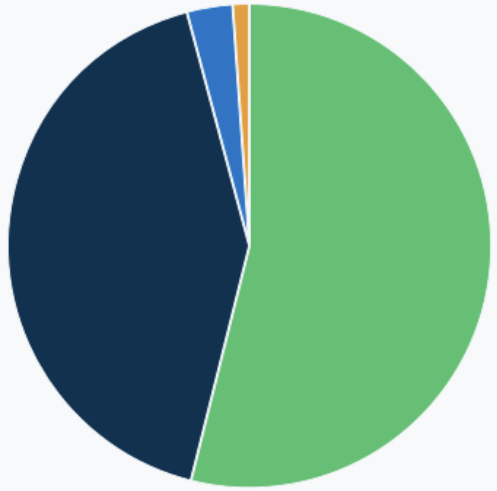
More GAPS

MASTERINGSAP Connect

Regular Assessment of Criticality, Inventory Policies, and Category Management

- Only 54% have a structured approach to defining and regularly reassessing the criticality and stocking policies of MRO material.
- Many companies fail to reassess criticality and service levels due to resource constraints, complexity of processes, and resistance to change, compounded by data management issues and lack of advanced tools.
- Category management in procurement is crucial for achieving cost savings, strategic sourcing, and supplier collaboration, while also improving efficiency and risk management. It enables procurement to leverage market insights and drive value creation, aligning sourcing decisions with the organization's overall strategic goals.

Does your team currently have a process in place to define and regularly reassess the criticality and stocking policies of its MRO materials?



- **54%** Yes—we regularly assess both criticality and stocking policies
- **42%** Partial Yes—We only regularly assess stocking policies
- **3%** No—and we are not currently developing a process.
- **1%** I'm not sure.

More Learnings

MASTERINGSAP Connect

How would you evaluate the relationship between procurement and operations in your organization?

The relationship between procurement and operations is reactive with no proactive integration.

2%

There is occasional sharing of maintenance plans and initiatives between procurement and operations, but it is not systematic.

9%

We have a formal plan and process in place that ensures regular coordination between the two departments.

65%

Procurement and operations share joint ownership of outcomes, with overlapping KPIs and a deep mutual understanding.

24%

Which of the following accurately describes your organization's level of collaboration with its MRO suppliers?

Data sharing

80%

Strategic sourcing agreements

63%

Vendor-managed inventory

60%

Routine delivery schedules

54%

Joint planning

43%

Long-term partnership contracts

37%

No Collaboration

7%

Which of the following options best describes the state of your MRO material Data (including descriptions, manufacturer part numbers, spec sheets, and data uniformity)?

Full Data Uniformity Across All Materials

39%

Partial Data Uniformity for Critical Materials

57%

Informal Data Understanding Without Standardization

3%

Limited Data Understanding and No Standardization

1%

Conclusion: The MRO Practice in Five to Ten Years

MASTERINGSAP Connect

- Procurement and operations leaders envision a significant transformation in their company's MRO practices, driven by advancements in technology and an evolving regulatory landscape. The most prominent expectation is the **shift towards predictive maintenance**.
- Another common theme is the **increasing incorporation of digital AI technologies** into MRO practices. Digital platforms for inventory management, asset tracking, and maintenance scheduling will streamline processes and improve decision-making.
- **Data will play an essential role**, providing insights into asset performance and maintenance trends, and allowing for data-driven optimization of maintenance schedules and decision-making.
- There will be an emphasis on **upskilling the workforce**, particularly in digital literacy and data analytics, to empower employees to effectively leverage emerging technologies and extract actionable insights.
- **In summary, the next decade will see MRO practices becoming more predictive, digital, sustainable, collaborative, and compliant, aligning closely with broader business strategies to drive efficiency and innovation.**

A Picture with more words on it...

MASTERINGSAP Connect

12 important benefits of AI for business

1. Better decisions
2. Efficiency and productivity gains
3. Improved speed of business
4. New capabilities and business model expansion
5. Personalized customer services and experiences
6. Improved services

7. Improved monitoring
8. Better quality and reduction of human error
9. Better talent management
10. More innovation
11. Increased profitability
12. Industry-specific improvements

ILLUSTRATION: AURIELAKI/ADOBE STOCK

How to Connect with Me

E: Tim@lexinsolutions.com

M: +61 0467 734 084

Li: linkedin.com/in/tim-mclain/

Web: lexinsolutions.com