



EVOLVING THE MRO SUPPLY CHAIN

Abstract

How more contemporary and leading practices are emerging in the maintenance supply chain

Introduction

The maintenance-repair-operations (MRO) supply chain in key industries including Resources, Oil & Gas and Utilities has to date been the poor cousin to FMCG and Retail supply chains. Lagging in terms of capability, visibility, and profile within the organisation, MRO activity in general has been referred to 'as the last bastion of uncontrolled expense'. Historically considered immaterial against the backdrop of

significant capital investment projects or viewed as an unimportant back office function, the MRO supply chain has increasingly found itself on the executive agenda in the last three to five years. We now see - in some leading organisations - an 'awakening' as this function begins to mature and professionalise.

Supply Chain leaders in this field will increasingly look to leverage a combination of established cross-

industry practices and take advantage of emerging technologies to deliver cost, inventory and risk reduction outcomes into their organisations. This thought piece will critique the common issues in the MRO supply chain, explore what better practices are currently encountered and offer our perspective on emerging practices that will shape the direction and effort of improvement initiatives for the next five to ten years.



Recognising the MRO Supply Chain

Today, we see the MRO supply chain wherever there is a significant maintenance task, but there was not always recognition of this as a formal supply chain, often referred to as 'engineering stores' earlier. With an increasing profile and awareness emerging, we are finding the function referred to as:

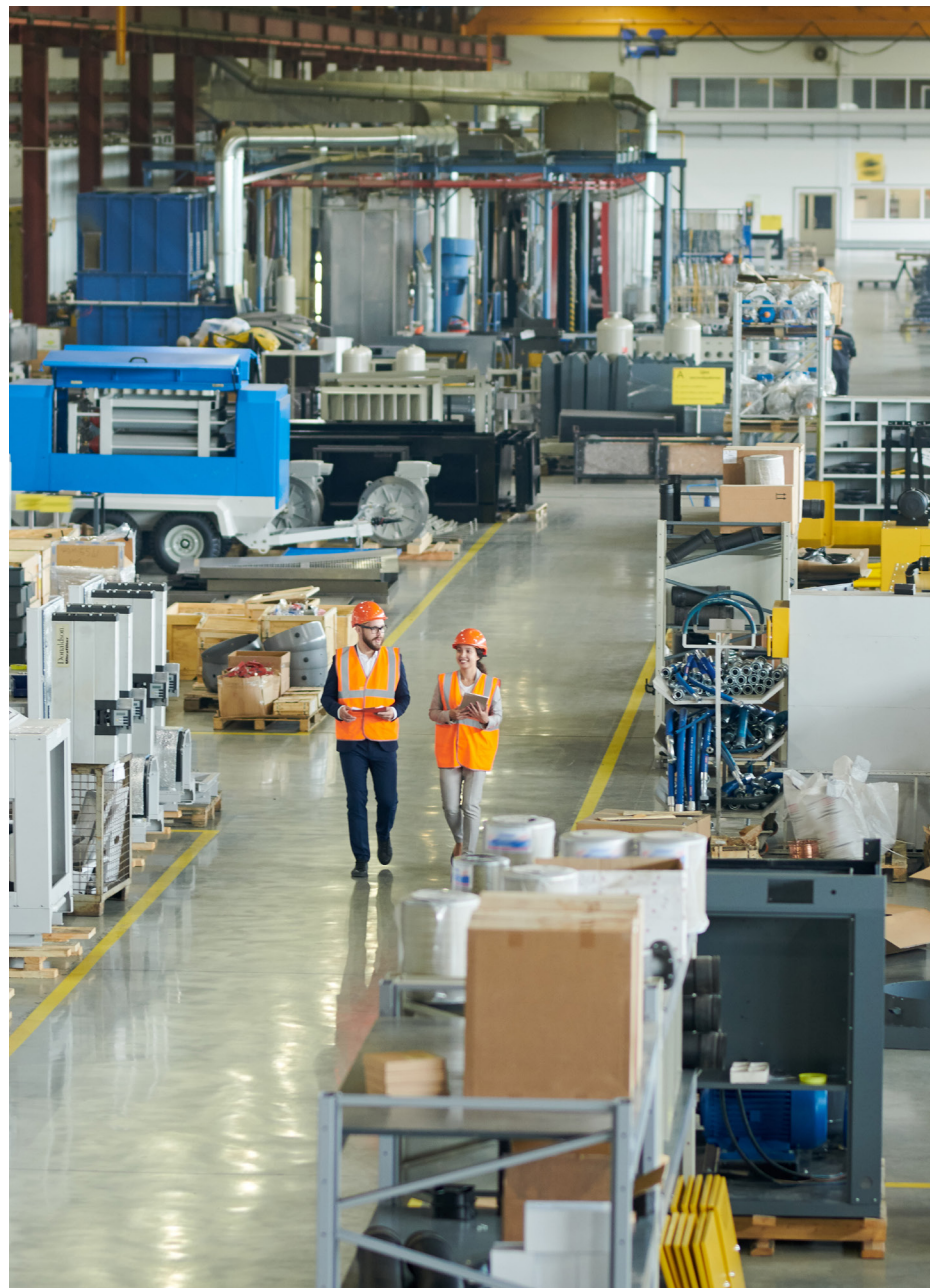
- MRO Supply Chain
- Inbound Supply
- Maintenance Demand Value Chain



Historically an Immature Supply Chain

Many studies have plotted and documented the evolution of supply chain from inception in military literature in the early 1800s into the 'modern' era with an array of concepts such as late postponement, Lean, third party logistics, and collaborative planning established in mainstream supply chain management over the 70s, 80s, and 90s. This story does largely not apply to the maintenance supply chain which - notwithstanding pockets of good practice - typically lags significantly in terms of sophistication. This has not been due to lack of care and attention of those working within the function but is more associated with several key structural reasons including:

- Supply chain operating and inventory costs were seen by maintenance as an immaterial in the scheme of capital works
- The largest MRO supply chains (in the resources sector especially) focused heavily on top line and operations growth during 'the boom years'
- The function was staffed from within and didn't have experienced supply chain leaders to 'call out' true performance
- Siloed structures and decision making remain across the capital acquisition, installation, operation and disposal life-cycle



Characteristics and Impacts of Low Maturity

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We frequently find that low MRO supply chain maturity can be characterised across a number of dimensions including process, organisation, physical footprint, inventory management, technology, and KPIs. Where these characteristics are found there will be a mix of visible and less obvious symptoms or business impacts.

Visible Impacts

The more visible impacts can be identified with minimal investigation and walking the end to end process. These include:

- Inventory write-offs
- High supply chain operating costs
- Stock outs impacting maintainer and asset utilisation
- Squirrel stores
- High value and number of free text purchase orders
- Manual processes with a transactional focus

Less Visible Impacts

The less obvious impacts may by definition require a little more work to identify but often have downstream impacts that can

really hurt the business, including:

- Inventory in excess above the appropriate or 'optimal' level
- Changes in maintenance schedule to cover up stock out
- Courier and expediting to cover up stock out
- Duplicate items catalogued
- Master data challenges with a poor or constantly changing BOMs (bills of materials)
- Continuity risk from over-reliance on uncodified knowledge held by a few individuals

Process



- High level of manual intervention in purchasing, warehousing and inventory planning processes
- Low process discipline (for example relating to criticality classification, freight coding, pricing, rotatables treatment, spot buys)
- Lack of inventory thinking in the early capital acquisition phases

Inventory Management



- Stocking strategy is either not understood, absent or inconsistent between sites
- Inventory levels determined arbitrarily without tools
- Lack of control and governance for 'directs' and/or 'capital projects' purchasing

Organisation



- No single point of accountability for the MRO supply chain
- No standardisation of organisation structure and roles across different sites
- Lack of contemporary supply chain skillsets and diversity of experience

Technology



- Low technology deployment or low adoption
- Process controls and enablers not configured in the organisations existing technology
- Manual interventions in activities that are often automated in other Environments

Storage Footprint



- Footprint developed in a 'site led' fashion resulting in duplicate infrastructure
- Poor warehouse productivity and controls
- Inappropriate storage conditions with degradation of expensive stock items

KPIs and Governance



- No meaningful metrics to measure true performance of the supply chain (including maintenance inputs)
- Lack of management reporting and visibility
- Misalignment of metrics with roles and accountabilities

The Fundamental MRO Supply Chain Opportunity

The first step to unlocking value is to formally recognise all the elements of the end-to-end supply chain including:

- Warehouse network
- Inventory management
- Inbound transport planning
- The procure-to-pay process

- Master data
- Touch points with key influencing functions such as maintenance planning and capital procurement

Benefits

We see organisations that have driven

improvements in the MRO supply chain deliver meaningful benefits that include:

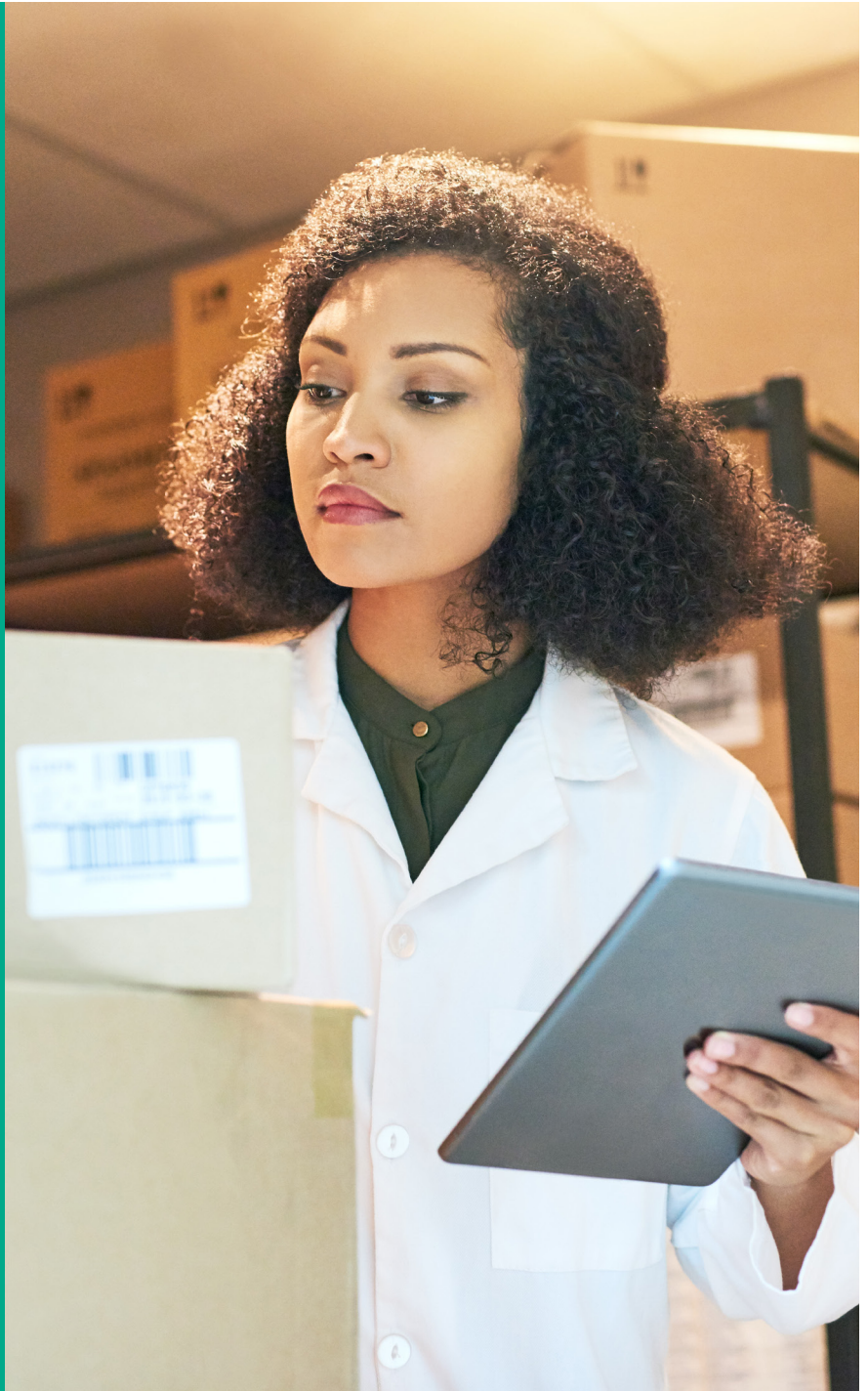
- Inventory reduction
- Operating cost reductions
- Visibility, control and performance delivered to internal customers
- Reduction in supply

The Service and Risk Misconceptions

We consistently witness individuals seeking to drive improvements in the MRO supply chain who face a significant challenge to influence and educate various stakeholders in the operations and maintenance domains of the business. A common narrative is that these stakeholders do not believe that supply chain cost or inventory can be reduced without impacting the supply chain performance or inventory risk to operations. Their challenge is flawed in two ways:

1. Commonly their concern is grounded in anecdote only since supply chain performance and risk are rarely measured and reported effectively and so the current state is not actually understood.
2. There is a lack of understanding in these environments that the classic supply chain trade-offs – such as inventory level versus availability – only hold true where processes are mature. In immature supply chains you can both improve service to the end customer and reduce cost or inventory.

Organisations that are able to successfully influence and educate key stakeholders in this regard are able to build a critical mass of support and deliver meaningful improvements.



An Awakening – Emerging Practices

We are observing an increasing number of organisations with an awareness and desire to improve the MRO supply chain. Initially, many focus on improving the basics but a smaller leading group are increasingly implementing borrowed best practice from other industries and leveraging new technologies to push the boundaries of what excellence looks like.

Getting The Basics Right

With the desire to first work on those factors most directly controlled by the supply chain function, the initial focus of improvement programmes is often on improving the basics.

This tends to include reviewing old and obsolete stocks, establishing basic KPI reporting and improving fundamental 'within the walls' warehousing processes. Further steps to cementing a threshold

level of capability might include establishing increased segmentation of inventory policy and improving master data relating to items, bills of materials and lead times.

Selective Borrowing from FMCG & Retail

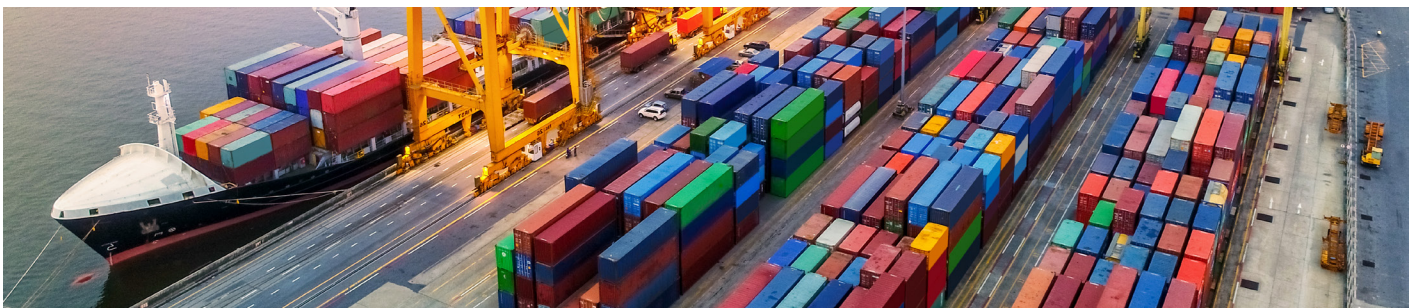
Whilst long acknowledged as different to FMCG and Retail, the MRO supply chain did not historically ask with sufficient curiosity what it could selectively leverage from these industries. We are seeing a small subset of organisations benefit from considering this more deeply and implement tailored versions of practices such as:

- Single point of accountability for end to end supply chain
- Statistical forecasting and inventory

planning for relevant items

- Centralised inventory planning and expediting based on exception management
- Taking control of inbound transportation
- Collaboration with both suppliers and maintenance planning on the forward plan (an MRO adaption of S&OP)
- Vendor managed inventory (VMI), consignment stock and 'pay per use' type models

We anticipate that these practices will become more widespread - as key individuals migrate between organisations - and more embedded as procedures and tools become the norm. In five years time we will consider these as not as 'better' but as common practice.



An Awakening – Emerging Practices

Leveraging New Technologies to Drive Excellence

Much is presently written and discussed on the topic of how the digital and automation revolution is impacting organisations. Whilst the nature and timing are hotly debated, there is little doubt that most supply chains will be impacted. In the MRO context there are emerging practices in organisations who will not 'wait and see' but actively seek to leverage new technology to drive excellence. There is no one technology that is the driving force here, more a range of different themes that includes:

- Adoption of low cost cloud based software-as-a-service solutions for

specific tasks such as inventory planning or transport planning

- Automation tools in the back office of supply chain to reduce manual effort in tasks such as invoice checking or transport booking
- Leveraging big data platforms to improve visibility

It is on this last point that we anticipate the biggest opportunity for step change. Leading organisations are seeking to leverage these platforms to establish a version of the 'control tower' concept for MRO supply chains by collating large data sets from the material vendor, maintenance plan, inventory positions and transport partners.

Once established, refreshing this view frequently allows for an unprecedented level of visibility and significant improvement in the velocity of decision making. In one such example, the organisation was able to significantly increase its visibility of the end to end supply chain and drive planning of the maintenance and supply chain tasks to a completely new level of collaboration. When we discussed this with them, the benefits that had been delivered were attributed to trust. Greater collaboration requires trust to be built with both vendors and the maintenance function, and technology was seen not just as a toolset but as the key enabler of building this trust.

The Third Paradigm – The Predictive Supply Chain

We have so far outlined two distinct views of the MRO supply chain.

In the first, the supply chain is immature and there is little understanding of exactly how well it responds to the needs of internal customers.

In the second there is an 'awakening' to the idea of a more contemporary and professionalised MRO supply chain with a focus on both better responding to the needs of internal customers and delivering cost and inventory value. For many organisations there is still much work to do in this evolution.

Looking toward to where the MRO supply chain will evolve in the longer term, our anticipation is that the combination of enhanced condition monitoring tools and big data processing will lead to a third paradigm where the supply chain is expected to predict – not respond to – maintenance requirements. Is it worth noting that typically the majority of demand placed on MRO supply chains is already predictable, just not easily visible. Whilst there are some lead indicators and examples in microcosm we are yet to see how this will impact the configuration of the supply chain function. It is likely that its role will be less about managing physical locations and inventories and become increasingly about translating predictive maintenance requirements into supply chain activities, facilitating the required flow of materials and personnel in synchronization with maintenance events.



Authors

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Meet our Practitioners



Simon Coates – *Director, Infosys Portland*

Simon Coates leads the Supply Chain practice for Infosys Portland for APAC, based out of Melbourne.

Simon has had a successful supply chain career in industry in the UK and Australia including “C” level Supply Chain roles before transitioning into consulting in 2007. During this time Simon was a director of EAN Australia (now GS1) and sat on the Grocery Industry Steering Committee, working with retailers and grocery suppliers to improve collaboration across the supply chain. In consulting, Simon’s blend of operational, planning and consulting experience has helped ensure successful delivery of over 150 projects for leading organisations in Australia, NZ, Asia and the Middle east across most industry verticals. Simon’s key strengths lie in developing and delivering strategy across large, complex supply chains.



Iestyn Williams – *Engagement Manager, Infosys Portland*

Iestyn Williams has been delivering supply chain improvements in both Europe and APAC for the last fourteen years and presently oversees delivery of Infosys Portland supply chain projects in QLD and NSW. Iestyn has a broad supply chain skillset having led programmes spanning supply chain strategy, supply chain planning, inventory optimisation, network design, transport operations, master data management and cost-to-serve. Iestyn has a particular passion for delivering change in the MRO supply chain and led such programmes in various settings including tier one mining, utilities and postal infrastructure.

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