ALIGNMENT OF THE SUPPLY CHAIN TO MEET THE AVIATION MRO CHALLENGES

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The role of the MRO Supply Chain

Addressing TODAY’S challenges

The MRO supply chain has to work to meet the aircraft maintenance and airline business needs of today …

Strategic supply chain challenges:

- Planning & synchronization?
- Control and reporting?
- Systems and processes?
- Storage and inventory levels?
- Physical design & locations?
- Technology usage?
- Cost impact (Capital, Operational & Strategic)?

…but there can be legacy and inefficiency built within today’s solutions.
The changing world of aviation MRO today has significant impacts on the design and performance of the supply chain ...

- Decoupling the complexity
- Managing the E2E supply chain
- Outsourcing to core competency partners

- Responsive solution/multiple locations
- Extended supply chain issues

- “JIC” moving to “JIT”
- Visibility, tracking, control needed

- Lack of logistics infrastructure
- Customs; Resource shortages

- Arrival of OEMs into MRO
- “Total care” / “FHS” packages
- Changing Responsibilities

- Composite materials
- New niche OEM partners
- AHM data/opportunity

- Interiors becoming more complex
- MRO customer centricity – Switching costs of failures

- Growth implications on MRO capacity
- Extra fleet to cover MRO processes
- MRO growth $62bn to $90bn by 2024

... Today’s supply chain solutions could probably not fully support tomorrow’s needs
The role of the MRO Supply Chain
Assessing the FUTURE challenges

The MRO sector is rapidly changing and under increasing competitive and financial pressure …

<table>
<thead>
<tr>
<th>Element</th>
<th>Characteristic</th>
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| Systems            | • Integrated Supply Chain Systems  
                      • Collaboration in SC on data/consumption  
                      • Engaged new technology |
| Planning           | • Integrated planning & synchronisation |
| Visibility         | • Total parts visibility – Location & status  
                      • Focus equally on Rotables/repairable |
| Assets & Production| • Focus on core capability  
                      • SC focus on A/c TRT as No1 |
| Compliance         | • Supplier conformity; SLAs on rotables  
                      • Quarantine process managed |
| Inventory          | • JIC to JIT inventory  
                      • Agility; allocation rules |
| Operations         | • Operations Excellence  
                      • Global management of SC – Outstations etc.  
                      • Flexibility in operations; agility in design |

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<tr>
<th>Unknown impact …</th>
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<tbody>
<tr>
<td>Big Data – Predictive maint supply chain</td>
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<td>New fleets – Less maint; diff maint</td>
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<td>Airline alliances – Global reach</td>
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<td>Customer centricity of MRO – Link to profit</td>
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<td>Business model changes in owner/decision maker</td>
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<td>Growth – Absolute, but also by characteristic</td>
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<td>Regulations and trade flow barriers</td>
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<td>How to win – Labour &amp; resource shortages</td>
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… the supply chain therefore has to adapt and change to meet the business needs
Aviation MRO supply chains are typically complex and diverse in nature, and no two organizations have the same set up – So DHL adopts a standard process that is tailored to each specific customer situation.

**Understand**
- What are the business objectives? ...
- What happens today? ...
- What is the required scope? ...
- What resource is used? ...
- What are the issues? ...
- The future impacts/changes? ...
- Culture and ways of engagement ...

**Solution Design**
- Physical infrastructure
- Process flows
- Systems support
- Technology inputs
- Reporting & control
- People & resources
- Communications

**Implementation & Realisation**
- Phases of change
- Objectives and resources
- Enablers & barriers
- Measuring success
- Feedback loops
- Legacy disposal
- Communication
Building the MRO Supply Chain Enablers to success

There are several significant enablers to a successful engagement:

1. A **defined** business need to engage for change (by the customer)
   A clear view that a **value solution** can be proposed (by DHL)

2. **Openness, honesty, respect** by all parties

3. Clarity on the physical **engagement approach** (Overt or Covert)

4. **Realistic** timescales – That match desired response **quality**

5. **Be prepared** – For the unexpected and be **flexible** to work around the challenges

6. **Passionate** about the engagement … … **And celebrate success**!

And hopefully – **A positive outcome!**
The MRO supply chain of tomorrow will be established from current solutions ...

Current Solutions

Known changes

Known uncertainties

TOMORROW

Supply Chain Characteristics:
- Agile ... Flexible ... Responsive
- Controlled ... Connected ...
- Visible ... Collaborative
- Proactive ... Global

Technology Impact

Customer Centric:
- MRO aligned to passenger retention

But will be significantly different to meet the changing business requirements and trends that are happening ...
Building the efficient MRO Supply Chain
The role of technology

Technology is playing a core part in designing and operating efficient supply chain solutions …

*Trends*

… Innovation …

… Capability

**Digitalisation & Technology**

- Physically acting objects
  - Unmanned aerial vehicles (UAV) & drones
  - Warehouse robotics
  - Autonomous & automated guided vehicles
  - 3D printing

- Data-driven analysis, planning & forecasting
  - Supply Chain visibility
  - IoT & wearables
  - Augmented & virtual reality
  - Solution-centric supply chain
  - Blockchain

- Enabling Technologies
  - Mobile technology
  - Analytics/business intelligence
  - Machine learning
  - Robotics process automation
  - Digital infrastructure
  - Physical infrastructure
  - Digital security

… driving in efficiency and enhancing capability to ensure constant business value.
Building the efficient MRO Supply Chain
The role of technology

The technology enabled supply chain … … Delivering value and maintaining the competitive edge …
THANK YOU

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