



# **Supply Chain Management (SCM) in the Airline Industry**

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## **Topic Outline**

- **Introduction**
- **Key Elements of SCM in an Airline**
- **Challenges & Strategies / Solutions**
- **The Future of SCM**

# Introduction

Supply Chain Management (SCM) encompasses the planning and management of all activities involved in sourcing, procurement and logistics. It integrates supply and demand management within and across companies.

In an Airline, the focus is in managing an optimized inventory that provides high level of service in meeting demands, while complying with tough regulatory standards of international Civil Aviation Authorities. (e.g. EASA / FAA / Kuwait DGCA, etc.)

Airline inventory are capital-intensive. Since a lot of parts can be repaired, overhauled and re-used, they move globally between airlines, suppliers and repair facilities, where handling and storage are quite complex.

# Key Elements of SCM in an Airline

UNIT	RESPONSIBILITIES
<b>1. Material Planning</b>	Configuration control. Demand analysis, forecasting & allocation.
<b>2. Vendor Management</b>	Identify & maintain approved credible suppliers. Supplier audits and performance review.
<b>3. Order &amp; Warranty Administration</b>	Order processing & warranty claims. (purchase, repair, loan, exchange)
<b>4. Strategic Purchasing</b>	Cost reduction through contracts. High value projects.
<b>5. Stores &amp; Logistics Management</b>	Storage & movement of inventory. Meet customs & aviation regulations.

# Key Elements of SCM in an Airline

UNIT	RESPONSIBILITIES
<b>6. Aircraft on Ground (AOG) Support</b>	Acquire parts or services to put the aircraft back into service (own & customer aircraft).
<b>7. Component Control</b>	Traceability and life cycle management. Implementation of Scheduled Maintenance.
<b>8. Inventory Control &amp; Surplus Management</b>	Asset management. Recovery of investment through surplus sale.

# Challenges & Strategies / Solutions

## CHALLENGE

### High Aircraft Utilization & Short Ground Time

In an ideal business model, an Airline needs to produce more flights with a high passenger load factor to generate higher revenues.

This means that aircraft ground time or scheduled maintenance window is minimized whenever possible.

Therefore, parts & tools required for maintenance should be available & accessible at the shortest possible time.

➤ Communication between the maintenance team and SCM is vital to define the suitable Maintenance Work Package for each maintenance window in order to provision & position the parts / tools in advance.

# Challenges & Strategies / Solutions

## CHALLENGE

### Unscheduled Maintenance & Aircraft on Ground (AOG)

An Airline may be required to perform unscheduled maintenance from time to time, due to various reasons (e.g. defects, incidents, accidents, etc.).

Unless the required maintenance is performed satisfactorily, the aircraft cannot be released for flight. Hence, the term is known as “AOG”.

Such situations may happen at any time and any location.

➤ An Airline SCM coordinates with its maintenance team to define highly critical parts (based on reliability data & in-service experience) & position the same to specific outstations in advance, or establish pooling arrangements that are readily accessible in case of actual demand (e.g. wheels).

# Challenges & Strategies / Solutions

## CHALLENGE

## Unscheduled Maintenance & Aircraft on Ground (AOG)

- AOG Desk is manned 24/7 to facilitate sourcing & parts supply solutions to address the immediate need.
- Keep emergency contacts readily available for such situations.
- Perform post-event analysis in terms of parts availability and take suitable action (e.g. increase of spare level, stock allocation at outstation, subscribe to pooling arrangements, etc.) as deemed reasonable.



# Challenges & Strategies / Solutions

## CHALLENGE

### Long Delivery Lead Time & Turn Around Time

Some parts are having long delivery lead times. At times, suppliers fail to deliver on time.

Delays in delivery may lead to delay in defect rectification or in the performance of maintenance tasks, which may lead to “AOG” situations.

Some parts, which are customized to the Airline’s specifications are single-sourced & not available elsewhere.

- Identify critical parts with long lead times and order in advance.
- Monitor supplier’s performance & hold regular meetings. Implement the Supplier Product Support Agreements.

# Challenges & Strategies / Solutions

## CHALLENGE

## Price Escalations (Yearly & Occasional)

There is usually a yearly or occasional increase in the Supplier's catalog list prices (CLP).

Major suppliers do not fix the prices unless there is an exclusive contract in place, or if the turn-over (business transactions) is not significant.

Company regulations may also prevent an Airline from entering into exclusive contracts.

- Negotiate & establish contracts wherever possible to avoid price escalations and to obtain incentives, better pricing, terms & conditions.
- Forecast demand and procure in advance (prior to CLP revision). If found reasonable, stagger the delivery to avoid paying in advance.

# Challenges & Strategies / Solutions

## CHALLENGE

## Cash Flow & Credit Limits

There are times when the Airline's budget is limited & cash flow is controlled. Financial procedures may be lengthy and not synchronized.

An Airline's credit limit may not be enough to cover the magnitude of its ordering transactions, leading to payment in advance & delay in delivery.

Suppliers are unable to increase the credit limit nor extend the payment terms if payment by an Airline is delayed.

- An Airline's SCM needs to be fully aware of the financial infrastructure and policies in place, and to seek improvement if needed.
- Promote close coordination between SCM & Finance Department to ensure that payment terms are respected as much as possible.

# Challenges & Strategies / Solutions

## CHALLENGE

## Delivery Discrepancies

There are cases when parts are received on time, but held in Quarantine due to failure during Quality inspection.

Discrepancies include difference in part numbers, quantities, prices, defects in material, lack or incomplete certificates, etc.

Aside from the delay in usability of parts, payment terms (e.g. net 30 days) are being counted by suppliers starting from the date of invoice.

- Immediately report all discrepancies to the supplier for corrective action.
- Analyze the impact to supplier performance and communicate / meet with the supplier for clarification & implementation of preventive action.

# Challenges & Strategies / Solutions

## CHALLENGE

## SCM Legacy System

Aside from capability limitations of using a legacy (very old) SCM system, an Airline loses its potential to enhance its efficiency.

The knowledge base, user skills and maintenance support of the legacy system deteriorates & becomes rare, as its technology becomes obsolete.

At face value, migrating to a new SCM system appears to be a very expensive option as compared to existing legacy system.

- The SCM needs to adopt & keep in step with rapid technological advancement, to improve its efficiency and remain effective in the industry.
- When migrating to a new system, become fully trained & adopt best practices.

# The Future of SCM

## 1) Predictive Maintenance

Aircraft systems & parts are becoming smarter & more reliable as the technology evolves continuously.

“e-Enablement” solutions such as trend monitoring / airplane health management are being introduced, which provides real-time streaming of flight data to enable flight optimization analytics. Instead of waiting for the defect to happen, it provides advanced visibility of the health of the system.

The Airline SCM & maintenance team can then plan & position the parts / tools required ahead of time, which decreases the aircraft downtime significantly.

# **The Future of SCM**

## **2) Blockchain Technology**

A Blockchain is a decentralized, digital ledger that can be programmed to record nearly anything in a verifiable and permanent way by all participants. When new blocks of data are added, they become chains of chronological data that is traceable to the initial transaction. This technology is being utilized by crypto-currencies.

The shared database will make it easier to track the life cycle of components, its quality and compliance to regulations from manufacture to the latest configuration. It will create joint & transparent records, which will avoid bogus parts.

# **The Future of SCM**

## **3) Additive Layer Manufacturing (ALM)**

It is commonly known as “3D Printing”. There are still opposing perspectives on its use. One group believes that quality control might be a major obstacle for 3D Printing flight-critical parts, thus starting with non-critical ones would be reasonable. The other group believes that assessment of quality is not different to traditionally manufactured parts, and that the concerns about safety are unfounded in the usual fear of new technologies.

Aviation manufacturers such as GE has already acquired stakes in at least two leading European suppliers – Arcam AB & Concept Laser. Once accepted & regulated, this might lower the cost of parts and increase the Airline’s activity in local manufacture.



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***THANK YOU***

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