Leveraging Technology To Optimize Scheduled Maintenance

Services by Airbus
Services by Airbus

- Creating value
- OEM expertise
- Long term partnership
- Flexible
- Innovative
Airbus Smarter Fleet

Leveraging Technology To Optimize Scheduled Maintenance

Smarter Fleet

An expanding offer of connected solutions
Maintenance Planning Document evolution

36 months escalation started for end 2018
When less costly means more granular maintenance program…

Blocks versus tasks
Forecast Maintenance events & slots
Adjust the airline/MRO manpower
Avoid hangar congestion

…to be shaped for unique drivers…

A/C utilization
Airline routes
Ground time for maintenance

Maintenance Program policy
A/C Age & Design

Define Work in-house & Subcontracted work
Out of Phase (OOP) tasks policy
Maintenance check organization & preparation
…trying to survive in daily operations!
Pain point analysis

- Granular maintenance programs make manual planning too complex
- Time buffers needed to avoid overrunning intervals
- Lack of data to support maintenance strategy
- Heterogeneous skills amongst planners
Example: 200 aircraft to be allocated in 6 maintenance bays
- $4 \times 10^{374}$ possibilities (4,000,000,000,000..... 374 zeros)

Brute force evaluation
- $10^9$ evaluations per second
- $\sim 10^{358}$ years needed (more than age of universe!!!)

« Greedy search »
- Allocation best slots first and then fill the gaps
- Quick computation, but not efficient in practice because rapidly destroyed by constraints leading to multiple swaps
Optimization technology: approaching optimum solutions in an acceptable timeframe
Optimization technology: finding optimum solutions at single task level

What-If Analysis

INPUTS
- Demand to be Met
- Resources Available
- Costs, Yields & Recipes
- Operational Constraints & Customer Preferences
- Business Goals

Fleet wide experience

Mathematical Model(s)
Using one or many

Optimization Engine(s)

Schedule or Plan with Metrics
- Minimized Costs
- Maximized Yields
- Best Possible Timing of Activities
- Specific Resource Assignments

Collaboration
Long Term Planning prototype

- Airbus and non-Airbus
- New planning in less than a minute
- Fail safe automated interface
- What-if scenarios
- KPIs and analytics
Expected savings

Savings computation example:
- 3% increased maintenance yield
- 2% savings over MRO visits
- About 1 USD saved per FH

=> Few months ROI
Scheduled Maintenance Optimizer:

- Real time KPIs and reports
- Quick answers
- What if scenarios
- Analytics
- Rules/objectives management
- Automated fail safe interface
- Planning optimizer
- Real time access to planning data

Maintenance tasks
- Work packages
- Rules & objectives

Stakeholders
- Managers
- Planning manager
- Planning team

Maintenance Information System
Summary of benefits

- Scale planners’ effectiveness to manage large fleets at single task level
- More precise planning allowing to better control maintenance yield
- Simulate new planning strategies in few minutes
- Assisted fail-safe planning interface within secured workflow
Scheduled Maintenance Optimizer:

End to end roadmap

Tasks embodiment

MRO or Production planning

Line Maintenance

Aircraft Swaps

WP routing

Planning and scheduling

Work Package Definition

Maintenance Program

Source data (MPD, ADs, SBs...), fleet experience

Smart Fleet

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