SMOOTHING THE SUPPLY CHAIN CHALLENGE

Ensuring that parts are acquired in the right timeframe at the right price is vital to keeping a fleet airworthy. Tailored IT systems help to streamline that operation. *Bernie Baldwin* reports on what these systems offer

There's a well-worn phrase that stipulates that a chain is only as strong as its weakest link. Although there are a few exceptions to that maxim, we can bypass those here because the supply chain in the airline industry aligns well with the sentiment in the phrase.

Having any weak links in the airline industry, particularly in the availability of parts and components, can cost considerable amounts of money. In addition to working with logistics specialists for the transportation of parts, airlines and their MRO providers use IT solutions to make sure that any required parts are where they are supposed to be at the right time.

Building on its MRO, ground handling and fuelling knowledge base, Sensus Aero, a subsidiary of Avia Solutions Group, has developed a unified enterprise resource planning (ERP) solution. Utilisation of this system aids in the streamlining of aviation ground support processes across a single platform, "seamlessly integrating with current IT infrastructure to provide enhanced efficiency and profitability to organisations worldwide". That, of course, includes controlling and monitoring the supply chain.

STREAMLINING INTERACTIONS

The company's chief executive, Renata Šumskaitė, explains how the supply chain/inventory management (SC/IM) module of the Sensus system interacts with other parts of the solution to ensure that airlines and MRO companies can keep their stock at the optimum level.

"Within our progressive system, the SC/IM module seamlessly integrates with other components to guarantee optimal stock levels," she begins. "Parts, material and stock replenishment requests automatically generate entries in the Demand Fulfilment module dashboard. This empowers procurement managers to handle requests efficiently, gain insights into available stock and request statuses, manage stock reservations, and create and oversee customer proposals.

"Digitalisation of the supply chain enables aviation MROs to be more agile and efficient"

"Furthermore, the integration extends to communication through the Sensus Customer Portal, allowing for streamlined interactions with customers, while also facilitating the management of vendor quotes and orders within the system," Šumskaitė adds. "Our interconnected approach ensures a synchronised and transparent supply chain experience, enhancing overall operational efficiency."

Canada-based WinAir says its system can "efficiently and effectively track and manage aircraft maintenance and inventory control". Jason Street, a member of the company's business development team, elaborates on the solution's capabilities with regard to stock levels.

"The WinAir Maintenance Planning system analyses aircraft utilisation to estimate due dates for all required maintenance tasks," Street explains. "Subsequently, it generates a comprehensive forecast report outlining the parts required for upcoming maintenance activities. This entails calculating the quantities on hand, those already reserved, available quantities, and potentially available quantities based on outstanding purchase orders and other pertinent variables."

Street continues: "Utilising this data, the system generates a forecasted list detailing the precise quantity of parts required by a specified date, along with the corresponding procurement needs. Leveraging historical usage data, the

Illustration by Phil Couzens

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system aids in determining optimal Min/Max/Economy levels to minimise production disruptions efficiently. Once these settings are established, the system automatically generates a list of required parts and quantities to fulfil the specified requirements.

“Furthermore, the system streamlines the purchasing and procurement process for required parts,” Street adds. “The Min/Max/Economy calculation is intricate and can be customised by users to include or exclude various variables such as existing reservations, soon-to-expire parts, parts in unacceptable condition, repairable conditions and existing part requests in any stage of the procurement process.

“When a part is requested through the Production system, the Inventory system offers multiple configuration options for actioning the request. It can automatically reserve the part if it’s in stock or initiate the purchase process if it’s not,” he confirms. “In more complex scenarios, the system intercepts part requests via the Logistics system, considering all permutations to fulfil the request. This includes evaluating existing stock, old quarantined stock, reserved stock, stock in other inventory locations, outstanding purchase orders/requests for quotes (RFQs), and available alternates or substitutes. Users requesting parts have immediate and detailed visibility, including estimated time of arrivals for their requests.”

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DIGITALISATION FOR INCREASED AGILITY AND EFFICIENCY

Saravanan Rajarajan, director – aviation solution consulting at Ramco Systems believes digitalisation of the supply chain enables aviation MROs to be more agile and efficient. He notes that Ramco Aviation Software’s SCM (supply chain management) module helps those organisations achieve this in more ways than one.

“The first is increased agility. The SCM module is capable of ad-hoc and real-time planning for changing demand and supply situations. Planning cycles are minimised and become a continuous process to reach dynamically varying demands and constraints,” Rajarajan elaborates. “For example, the Ramco Float Computation and Optimisation module leverages data and machine learning (ML) algorithms to forecast the float requirements and the best possible stock levels. The supply chain data and the part engineering and reliability data are processed together to arrive at the solutions, ranging from driving reliability, turnaround time (TAT), replenishment or purchase.

“Next is increased efficiency,” he continues. “Here, the automation of the supply chain process reduces the lead time, thereby reducing the float to be maintained. For example, the parts removed from aircraft are automatically screened with relevant data from sourcing, warranty, reliability and criticality. Based on all the parameters, the solution suggests the best possible disposition, whether to repair, to upgrade, make warranty claims or even put repairs on hold to conserve costs. Once deemed suitable for repair, based on the automation rules and supplier contract, the entire repair order process is automated in the software.”

OVERCOMING COMPLEXITIES

Users naturally want to be able put a range of parameters into their SC/IM module regarding the quality of parts, their age, whether they are used

1. Renata Šumskaitė, chief executive, Sensus Aero
2. Compute and Forecast Float using Machine Learning Models

serviceable material (USM), what substitutes are acceptable (including PMAs) or other desirable attributes.

Rajarajan points out that MRO providers grapple with a great deal of complexity when sourcing parts. "This is due to multiple factors surrounding the aviation parts and parties involved in the supply chain," he says. "Our SCM module captures multiple parameters as master definitions, which drive the downstream process flows and validations."

The range of parameters, according to Ramco, includes:

•Alternate parts and interchangeable (INC) based on the IPC/RSPL
• Applicable modification statuses and Version number
• Aircraft, EIPN, NHA effectivity
• Applicability of PMA, DER parts
• Requirements on specific units based on release certificate type and age
• Component remaining times, cycles and age condition of the parts – if they are factory new, overhauled or USM
• Units under warranty
• Ownership of items – owned, loaned, customer owner, PBH (power-by-the-hour) or leased.

In the same vein, Street confirms that WinAir meticulously maintains comprehensive historical and condition data for each part within its system.

"These records are comprised of various parameters such as age, counters, statuses, current and past conditions, usage history, modification status, attached documentation and maintenance requirement statuses," he remarks.

"Additionally, WinAir includes detailed substitute information capable of tracking both simple two-way and intricate one-way substitution needs, tailored to specific aircraft types. This integrated system seamlessly contributes to the Min/Max/Econ restocking and required parts forecast functionalities, ensuring optimised inventory management and proactive planning," Street adds.

Sensus Aero's Šumskaitė reports that the company's ERP boasts "an advanced Part Master module", which empowers users to define and control intricately vital data associated with aircraft parts. "This comprehensive system facilitates the creation of new parts and provides efficient tools for managing alternative parts seamlessly," she explains.

"Features of the module include hard-time and life-limited constraints, oversight of periodic checks, temperature/humidity control for optimal storage conditions, and robust management of airworthiness directive restrictions.

"This combination of features allows the Part Master to ensure regulatory compliance and effective inventory management across an organisation. This module is a testament to our commitment to providing a holistic solution for the nuanced demands of supply chain and inventory management throughout the aerospace industry," Šumskaitė emphasises.

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WinAir

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VALUE AND VISIBILITY

Having defined the attributes of required parts, the next challenge is the automation of putting in orders. So, how does a company’s SC/IM module interrogate the various parts suppliers – OEMs, official stockists, PMA manufacturers – to get the best value for right number of parts?

“Ramco Aviation Software enables the critical visibility of the parts and stocks in the supply chain. Organisational visibility is expanded outside the warehouses, which includes items in transit, under receiving, under quarantine, due from the supplier or due for repair,” Rajarajan comments. “Ramco has the global visibility of items separated between serviceable and unserviceable, considering the alternates for the part in demand.

“By enabling collaboration and data sharing in the ecosystems, the visibility of stocks is extended outside the organisations. Our Supply Chain Module has SPEC 2000 adapters for Procurement and Repairs with the availability of the parts from the registered suppliers. Data links can be extended to other partners like airlines, OEMs as well as the marketplace, to receive the stock availability, TAT and item certifications on demand or scheduled frequency. All the data are processed and displayed for the user in a screen showing the external part availability to support their decision making,” Rajarajan explains.

WinAir’s Street stresses that the company’s system has all the capabilities needed to get appropriate parts at the right price. “WinAir has the capability to efficiently import price listings from various suppliers, facilitating seamless integration with the Purchasing system to provide purchasers with clear visibility into part pricing and availability,” he declares. “Tailored integrations with the OEMs enable personalised part tracking and procurement for individual customers.”

Street adds: “The RFQ Management system offers the flexibility to send out requests for quotes in various quantities and conditions to multiple vendors, while also capturing and analysing vendor responses comprehensively. These responses are archived as detailed part pricing information, facilitating future transactions or RFQs with the same vendor.

“During the purchasing process, purchasers can effortlessly access and review detailed purchasing and RFQ history for specific parts, empowering them to make well-informed decisions regarding vendor selection and pricing,” he explains. “Furthermore, this pricing data seamlessly integrates into the Part Sales system, allowing for automatic consideration of historical part information and pricing when invoicing customers. This ensures accurate pricing for parts sold to customers, based on comprehensive historical data.”

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It’s clear that with the current sub-optimal state of the global supply chain, having such a range of options available in supply chain software can only help airlines and their MRO providers. As ever though, defining the requirements – asking the right questions – needs to be done carefully.

1. Global visibility of Stocks **2.** Aviation operation employees can easily keep up to date with WinAir’s Part Sales platform **3.** Saravanan Rajarajan, director – aviation solution consulting, Ramco Systems