



Smart solutions drive MRO evolution

Digitalisation of aircraft maintenance is a huge discussion topic within the commercial aviation sector, but it is dwarfed by the mind-boggling amounts of data that the industry must deal with – and then act upon – as efficiently as possible, reports Mark Thomas.

The pace of innovation within the software sector can mean that those working within Maintenance, Repair and Overhaul (MRO) sometimes find it difficult to keep up with the latest available solutions. This is not helped by the fact that large parts of the sector are at very different stages of implementation, with more than a few players still using maintenance systems that have their origins back in the 1970s.

Essentially this means aircraft designed in 2017 in some cases still being maintained by systems designed in 1970 – a situation that the MRO industry knows it needs to resolve.

According to consultancy Oliver Wyman's 17th annual 'Global Fleet & MRO Market Forecast', released in late April, the industry must evolve significantly over the next 10 years to meet changing demand driven by new technology, fleet mix trends, growth and geographic shifts. It spelt out some of the reasons why digital evolution is a must:

- The in-service commercial airline fleet is forecast to grow from nearly 25,000 aircraft as of early 2017 to more than 35,000 by 2027. Aircraft deliveries to

airlines will total about 20,000 over the period, with retirements of older-technology aircraft accelerating to approximately 10,000 during that time.

- The accelerated rate of new aircraft deliveries will result in a massive technology shift. By 2027, 58% of the fleet will be new-generation aircraft.
- Major net fleet growth will occur in Asia, especially China and India, which will become the largest region, nearly doubling in in-service fleet and related MRO demand.

A survey of MRO executives earlier this year by the company also revealed that many feel the promise of advanced analytics and game-changing technologies remains unfulfilled in the aftermarket, with only 20% of respondents saying they had seen a material impact on business operations from these technologies.

By game-changing, the consultancy is referring to technologies like drone-supported maintenance, paperless shops, predictive maintenance, smart sensors and virtual maintenance.

Revealingly, 62% of the survey participants described their industry as being constrained by old IT systems that lack functionality and flexibility, as well as too often not being compliant with changing regulations.

They also voiced significant concern over the anticipated shortfall in the number of adequately trained mechanics due to the expected retirement of experienced hires during a time when the global airline fleet is rapidly expanding and modernising. By 2027, for example, demand in the US for MRO technicians is forecast to outstrip supply by 9%.

Another session at MRO Americas, focusing on the value of Big Data for maintenance, underscored some increasingly familiar points. Essentially, engine makers are far ahead, airframe and component OEMs are catching up, and airlines are still struggling with choices.

Airbus' head of digital, Jaime Baringo-Ezquerro, revealed it has taken three years to move from alerts to truly predictive MRO with data. American Airlines' applications manager, Maureen Morgan, outlined challenges she had faced: the bewildering variety of data; how to govern data across many divisions; and limits on staff and money. "There are 49 applications in Tech Ops alone," she said.

Data remains something the industry cannot, however, do without. According to Nick Ward of digital services at Rolls-Royce,





New aircraft generate 50 times the data of their predecessors, says Dr Johannes Bussmann, chairman of the executive board at Lufthansa Technik, which has launched its Aviator real-time platform to integrate the supply chain digitally into airline and shop MRO.

He added that OASES has already replaced several other modern MRO IT systems, thanks to its emphasis on business value, with the customer base now covering over 120 aviation operations in more than 50 countries. “The forward sales pipeline is looking very strong for the rest of the year, with several contracts in detailed exchanges,” he said.

So how is Commssoft’s flagship OASES product evolving to meet current customer needs and demands? According to Godwin, OASES is firmly focused on delivering maximum business value through technical breadth and commercial flexibility, allied to ease of use. Many leading aviation software companies have forgotten the importance of value and ROI, he said.

The OASES system can optionally be accessed via Commssoft’s private cloud hosting service, something that Godwin says eliminates the need for on-site hardware, with access via the internet, and with minimal IT infrastructure. Extensive security controls and managed back-up services make this an easy option for start-ups, Continuing Airworthiness Management Organisations and regional airlines, he adds, offering high business value returns. “Roughly 55–70% of our new customers are opting for the private cloud option,” he pointed out.

OASES is a professional product but is much more flexible to business processes than many other systems and is supported empathetically, he continued. Commssoft has tried to cultivate a “family” atmosphere amongst its customer base, placing great emphasis on user group meetings, and Godwin said the company is enjoying “an exceptional rate of positive referrals in the market place from its customers”.

He also flagged up several notable updates and innovations coming along the development roadmap for Commssoft, including: Quotations Module (for MRO organisations managing future bids and quotations); Resource Planning Module (for optimising resources in the hangar and for

specific work scopes); and RFIDs [radio-frequency identification] Tooling Support (RFIDs contactless tool tracking for the hangar and shop floor environment). Others include a Maintenance Costs module with extensive costs analysis, reporting, budgeting and forecasting; enhanced purchasing order approval workflows; electronic techlog interfaces; and an extensive range of new mobile applications.

COMMUNITY

The community aspect is a key part of the MRO IT sector. According to Swiss AviationSoftware (Swiss-AS), its flagship AMOS MRO software solution is a community product with all the advantages this entails for its customers.

That customer list includes regional and low-cost airlines including Cebu Pacific, Canadian North, Portugália, Helvetic, Air Caraïbes, Widerøe, HOP, TUI, Eurowings, SpiceJet, Jet2, easyJet, Ryanair, Vueling, Pegasus, flydubai, Norwegian, AirAsia and IndiGo. Significantly, last year saw Swiss-AS achieve the 150 AMOS customer milestone.

The AMOS system is used by a large customer base that actively supports it with daily input. Swiss-AS uses this input and at the same time responds to fast-changing maintenance requirements and industry innovations at an early stage to satisfy the needs and expectations of its clientele, it states.

The developments and enhancements made include the know-how and expertise of the AMOS community members who are asked to contribute with their experience to new developments.

However, although it is a community product, the setting of hundreds of parameters that steer functions and processes in AMOS and allow individual workflow settings also gives individual customers the flexibility they need for their specific maintenance context, it adds.

Swiss-AS says this approach of allowing customers their own configuration “has entailed that more and more airlines

the company needs data to underwrite the risks it takes in providing total care support to airlines – “We’d be out of business without data.” Ward added that the two key metrics of data value are disruptions avoided and reduced maintenance cost. On the latter, he reported that Rolls-Royce had been able to cut highly expensive engine shop visits by half at some carriers by exploiting engine data.

VENDOR PERSPECTIVE

From the maintenance software vendor perspective, fast-emerging industry trends mean the need to update and enhance their offerings is constant.

According to Commssoft’s managing director, Nick Godwin: “There is a clear trend towards mobile applications, faster customisable reports for various stakeholders and towards greater predictive capabilities and economic optimisation of assets. Commssoft also sees significant demands to integrate our OASES (Open Aviation Strategic Engineering System) MRO IT system with others to reduce data errors and increase efficiencies. Commssoft actively embraces these trends in its business strategy and development plans.”

The current MRO IT market itself is looking more than robust at present. For Commssoft this has been a record year to date, with 11 contracts signed during the first four months of 2017, covering 14 aviation operations in 11 different countries.

The previous year had already been a record one for the company, said Godwin, but that performance “has already been matched in a third of the time”.





The rapidly expanding global airline fleet is facing a potential MRO labour shortfall due to the impending 'crew change' as experienced hires retire – by 2027, demand in the US for MRO technicians is forecast to outstrip supply by 9%.

can use AMOS without Swiss-AS having to provide any customer-specific software changes. Today AMOS is a functionally advanced software solution continuously subject to further development while being highly flexible and adjustable to the individual requirements of each community member”.

In terms of current development focus, the latest achievement is the launch of the AMOS MRO Edition, with many new functions developed in this context due to be released over the summer. The edition will support large pure-play MRO organisations with a set of highly specialised modules.

The initial scope of functions offered as part of this new solution has been developed in close co-operation with selected MRO organisations from within the AMOS community. This approach has not only reduced the time to market to a minimum but has also allowed Swiss-AS to bring in the valuable know-how and experience of market-leading MRO organisations to ensure that the new features fully meet the requirements of the target group.

Functions that are part of the new edition include graphical downtime management, production control and finance control dashboards, customer relationship management, quotation generator and facility/hangar planning.

MOBILE OPTION

In addition to the AMOS standard application – and representing another step along the road towards paperless maintenance – earlier this year Swiss-AS launched AMOSmobile, its touch-optimised mobile

package that compiles a suite of modules for use on mobile devices.

The package is fully integrated into AMOS, with the first module offered to the AMOS community being 'Maintenance Execution', covering functions such as dispatch, handling and e-signature of work orders, stock information and parts requests, fleet status, approval control and so on. Currently more than 50 apps cover the daily tasks of line and base mechanics – with more to come.

According to Swiss-AS, customer feedback is key to ensuring that software deliverables meet user expectations. “We have been closely co-operating throughout the development of AMOSmobile/EXEC with two launch customers [Pegasus and UTair]. The end product has been influenced by their active testing, validation and feedback throughout the agile development process. Together we performed live-testing sessions where the solution was implemented in the customer's test environment to simulate 'real-life' operation. These sessions were aimed at finalising procedures and gathering feedback from mechanics using AMOSmobile in live environments,” it stated.

Some of the benefits of AMOSmobile, it added, include full integration with AMOS (no interfaces necessary), time-saving due to raising and recording of all maintenance activities directly at the aircraft, faster access and transmission of data, and the fact it is intuitive and easy to use. It is also interactive with manuals, diagrams, 3D graphics and videos, and also has customisable dashboards.

Looking forward, Swiss-AS commented: “We are continuously looking at trends,

innovations, and new technologies, which are carefully assessed prior to being put in place or not. Only developments that are receptive with customers are of true value for the end-users.” The company added cryptically that it is currently working on a new project to be announced in June that will go “far beyond the boundaries of a standard MRO solution”.

AVIATAR

Digitalisation of maintenance was highlighted at MRO Americas by Dr Johannes Bussmann, chairman of the executive board at Lufthansa Technik (LHT).

New aircraft generate 50 times the data of their predecessors, more than half of an airline's operating costs are directly or indirectly affected by MRO services, and airlines will be dealing with both old and new models for some time, he said. “No industry generates more paper than aviation,” commented Dr Bussmann, who wants to get rid of paper and improve maintenance along the way.

One key is integrating the supply chain digitally into airline and shop MRO. That requires a digital platform that is open, neutral and modular for all suppliers and airlines to use.

No coincidence therefore that LHT has launched such a platform, Aviator, for integrating data in real time. Dr Bussmann said it would support a wide variety of airline goals, including condition monitoring, performance metrics, fault analytics and reliability improvement.

Three European customers have already joined the platform, which is the initial product of its recently created Digital Fleet Solutions division.

The platform applies analytical models to provide new insights, recommendations and notifications, enabling clients to make faster and better decisions. LHT says Aviator will reward its users through the optimisation of operating hours, reduced consequential costs, and safer as well as more reliable fleet operations. ■