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With assistance from a variety of MRO software providers, Bernie Baldwin reports on how their applications are helping airlines and MRO companies increase efficiency.

Software shifts to streamline support

Systems which manage all the operational tasks and backroom processes for airline maintenance departments and third-party MRO providers aim to streamline the business, make procedures more efficient and deliver reduced costs which can be passed on to the customer, be it an airline or the final end user, the passenger.

IT applications for MRO have certainly changed the way this vital part of the airline business works. With consumer electronics and applications being updated almost daily, the providers of MRO IT systems seek to utilise software they observe in the personal IT marketplace to their advantage. Which means that, as the halfway point of the decade is approached, there have been a vast number of major philosophical changes in the use of IT software for MRO purposes since 2010.

Ultramain Systems' vice-president product management, John Stone, says the three most prevalent shifts have been in mobility, paperless operations and visualisation. "The rapid adoption of low-cost tablet devices has created a demand for user-friendly access to enterprise systems from mobile devices. The main goal is to keep workers productive by delivering necessary information to the user, rather than the mobile worker having to use paper or return to a dedicated workstation," he explains.

"Mobility has made paperless operations viable on a large scale. For example, Ultramain Systems is delivering electronic tech logs (replacing the paper log book), fully integrated electronic task cards (replacing paper job cards), providing capabilities to raise electronic non-routines," Stone adds. "The net effect is accurate



As is the growing trend, Ultramain's system can operate across a range of devices.

real-time data entry at source by pilots and mechanics, and eliminating the thousands of paper records that are created on a daily basis. Paperless operations are also reducing much of the overhead that was associated with records verifications, duplicate reviews by back-office personnel, as well as the scanning and storage of paper. The cost advantage of paperless goes well beyond the cost of paper itself."

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"Because we are mobile and paperless, we have the ability to obtain real-time feedback on the status of our operations, aircraft, stock movements and maintenance activities. This enables better visualisation. In the paper world, managers often had to go into a production booth to understand the status of a heavy check. These paper reviews and white boards can be eliminated in favour of computer

screens that can be viewed anywhere in our network," Stone emphasises.

Virender Aggarwal, CEO of Ramco Systems, also identifies some key changes in the way hardware and software work in unison in the aviation industry. The first is the arrival of the 'Connected Aircraft' era. "Fifth-generation airliners such as the Boeing 787, the Airbus A380 and the A350 have prompted the entire global aviation ecosystem to relish IT instead of looking at it as a foreign element in the equation," he argues. "While doing so, lean processes and the data resulting from them have started to [help] achieve faster turnaround times.

"Tractability has always been key in solving the puzzle when things go wrong in the industry. Its paramount importance has been fortified by the yet-to-be-solved 2014 disasters we all witnessed," Aggarwal remarks. "Stringent regulations and mandates authored by the

authorities expect MROs and operators to have a paper trail for everything. This decade has witnessed paper trails for critical processes evolve into digital trails. IT has enabled us to pinpoint the root cause in a fraction of the time it took 10 years ago.

"Thanks to Facebook and Twitter, one of the key chords to strike when it comes to the human element is usability. There can be an abundance of functionalities in any IT solution and it still won't change a thing if they are not usable or reachable," Aggarwal avers.

Steve Russell, CEO, Conduce Group, cites the increasing business understanding – and now faith in the reliability and speed – of the cloud as a key development this decade. "There has also been the development and subsequent low-cost availability/desire for

mobile touch devices. Initially, this was for iPads, but Apple is now being supplanted by more secure, robust, stable and feature-rich Windows 8.1 tablets," he says.

■ ADAPT OR DIE

Moving on, Russell points to aviation's realisation that large ERP-type MRO systems have become "dinosaurs". "These entrenched and expensive systems are finding it difficult to evolve fast enough to address aviation MRO industry requirements. Some are struggling to thrive and, in the long term, may not survive," he predicts.

Lean, best-of-breed software that addresses specific requirements is another development this decade, avers Russell. "Then there's the recent comprehension of the apparent ease

with which modern apps can integrate with established back-end corporate databases, including the dinosaurs. Potentially, this gives a new lease of life for the established MRO ERP systems and can provide a friendly, flexible front end for those systems that are able to embrace mobile app technology."

Shane Ballman, founder and CEO of Synapse Software Systems, also picks out the embracing of new technologies since the start of the decade. "When you consider that the first iPad wasn't available until October 2010, it's easy to see just how far we've come in such a short time," he explains. "In MRO specifically, there are a lot of opportunities to address manual processes: paper-based work packages, optimisation of maintenance scheduling, adjustments due to aircraft availability and →

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so on. Along with the normal data integrity and workflow controls we expect from software, there are three areas where we feel MRO will gain a competitive edge with great software – intuitive software that doesn't require training, data relevance to the task at hand and alert notifications when problems are detected."

According to Alain Girard, director, new products and services at 2MoRO Solutions, the requirements regarding MRO software have followed three general trends over the past few years – collaboration, software as a service (SaaS) and cloud computing/portability.

"Considered as insecure by MRO and CAMO actors in the past, hosted solutions and electronic information exchanges are now required by a growing number of our customers," notes Girard. "During the same period, the community has been defining and adopting file exchange formats adapted to the whole lifecycle of aircraft and equipment. This is resulting in a growing demand for both SaaS solutions and data exchanges in extended IT infrastructures. As the amount of data gathered by different means is growing exponentially, a demand for cloud computing has arisen. In parallel, portable devices and wireless connections were identified by the MRO community as a way to improve ergonomics by portable and user-centric solutions."

■ CHANGES FOR THE BETTER

The trends since 2010 have obviously manifested themselves in each company's products, aimed at delivering reduced costs or increasing safety or, better still, both.

"Since the beginning, 2MoRO has been proposing web solutions and investing in heterogeneous systems interconnection. As an example, the SIMID collaborative project, led by Airbus, helped us obtain a significant breakthrough," reports Girard.

"2MoRO has always provided full web applications, on site or hosted by 2MoRO, which is a satisfying answer for small companies which have little investment capability," he adds. "And in 2015, we will propose a new software suite which has been fully designed to be used on tablets and smartphones. All the data managed



The "Defect Details" screen from Conduce Group's system on a Panasonic Toughpad.

by our software can be imported and exported through XML files.

Ramco's Aggarwal elaborates on how his company has incorporated the IT trends into its products. "Part of our integrated M&E MRO solution is LSAP (Loadable Software Airplane Parts), a point solution that upgrades all necessary software on board fifth-generation airliners at the click of a button.

"MOSP (Maintenance Optimization and Shift Planning) converts the shift planner's two to three days' work of complex planning (boards/Gantt charts) and optimises it in a matter of minutes," he continues. "Also, we offer the power of hands-free operations to the end user line mechanic with wearable devices. Clever software put to use on gadgets helps cut down the dependency of a laptop or a workstation, adding valuable 'spanner time' to the end user operating on the aircraft.

"The ability of Ramco's M&E MRO solution or its sub-modules to co-exist with any IT system or solution an operator or MRO is currently using is a boon in disguise. Operators and MROs can pick and choose specific modules of the solution to fill up the void in their existing aviation ERP and then seamlessly integrate with their parent system," Aggarwal states.

At Ultramain, there is a range of integrated applications that bring forward a strategy known as Ultramain ePaper. "Ultramain Mobile Mechanic, efbTechLogs, eCabin, Mobile Inventory and Mobile Executive are a series of mobile products that work in conjunction with the Ultramain M&E/MRO suite, as well as other maintenance systems," Stone reports. "Each of these solutions is simple to use, and thereby reduces training requirements and the normal problems associated with data entry by large workforces. And because they are well integrated within [the suite], they provide built-in auditing and validations that would typically be performed by humans. Users are guided to problem areas rather than having to discover them manually."

Emphasising Conduce's efforts in the new touch app environment, Russell reports that the company's work has introduced a number of benefits. "Software houses can now write fast, reliable mobile touch applications that deliver real-time MRO data capture, validation and onward distribution. These intelligent, friendly apps enable low-cost improvements to MRO operational efficiency and safety, especially as the touch environment facilitates intuitive software that 'you already know how to use'," he elucidates.

■ EASY IMPLEMENTATION

"Also, new-generation touch apps do not require extensive help documentation or employee training. As a result, simple, modern airline/MRO apps can address specific and often changing business needs, and be introduced with minimal user training time at an affordable cost," Russell stresses.

Discussing his company's adoption of the decade's top developments, Ballman says SynapseMX is built for users and allows technical operations teams to manage maintenance in minutes from any device with an internet connection. He also believes MRO software can "be delightfully enjoyable to use".

"Apps for mobile devices don't make you go to a training class to learn them, and MRO software can work the same way. SynapseMX is intuitive so that anyone can be productive within five minutes," he claims. "We don't make you hunt for critical information – if it's important, we show it in a simple, easy-to-read view. If it's not important, it's not cluttering your screen.

"Also, SynapseMX is designed [so users] don't sit at a desk all day; that's why we support tablet and mobile devices. We've specifically built simple screens that do exactly what you need them to do on smaller screens."

Additionally, SynapseMX automatically keeps track of what's going on for staff, so teammates can be updated automatically. "Everyone stays connected, effortlessly," Ballman declares. Even after going home, "the system will push an alert to you when it happens. You can even configure SMS or email notifications if you prefer".

While all these maintenance operations elements are being implemented, the applications must also keep up to date the human elements of maintenance such as staff licence currency and required training, especially when dealing with a range of national authorities.

John Stone believes the risks and challenges are really quite low with his company's system. "Ultramain ePaper creates a user experience that, in many cases, resembles the paper look and feel. There is little to no additional workload on the user, and they see many of the same forms in the same way, only digital," he reports.

"The difference is that the forms are smart. Licensing and certifications can be enforced at sign-off. From the training perspective, we often put our mobile devices in the hands of users who have never seen Ultramain, and they pick it

up and just start using it. The applications just do what they think they should do. This is attractive to both users and regulators, since it reduces the opportunities for errors while enforcing critical business rules," he emphasises.

■ RISING TO THE CHALLENGE

Virender Aggarwal confirms that employee skills, training, licences and certifications are critical in ensuring the quality and regulatory compliance aspects of maintenance. "With the multiplicity of regulatory agencies, OEMs, aircraft models, maintenance procedures and skill needs, managing this can become extremely complex and challenging.

"One way we have tackled this problem is by providing a framework to manage employee skills and certifications, and also providing a

high level of configurability in terms of how the framework can be set up," he continues. "This approach allows the application to be configured to satisfy multiple regulatory needs and usage scenarios."

Qualifications management is a key element in 2MoRO software, according to Girard. "Our solutions have a dedicated human resources management module. The qualifications of the individuals are recorded and compared to the required qualifications in the maintenance tasks. When the qualification of an individual is about to expire, human resources managers are warned by alerts."

With such drive to cover every eventuality, airlines can be confident that somewhere among the throng of suppliers is one whose system truly fits their requirements. ■

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"Swiss-AS was highly committed to this implementation project and did its utmost to make this project a success", says Finnair.

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