



Gone are the days of pens and paper on the ramp, today it's hand-held digital pads that are seamlessly linked to a central MRO hub, saving time and money for those that have embraced the digital age.

Maintenance IT in demand and offering a digital dividend

Maintenance software is a dynamic market, with constant innovations even through one of the toughest periods ever for the aviation industry, as Bernie Baldwin reports.

The presence of IT applications in the maintenance hangar is not new, but the level of sophistication grows constantly, with advances and enhancements always being added by providers.

The COVID-19 pandemic, however, disrupted the whole of aviation. As the industry emerges from periods of lockdown and the financial downturn they caused, software providers – while pushing on with developments – have also been able to learn about the way the market views their products.

“At the beginning of the pandemic, we assumed that airlines and MROs would completely retrench their IT spending out of necessity. Yet after the immediate shock of travel being severely restricted and aircraft

grounded, the resilience in the industry slowly manifested itself, first in the cargo space and then among start-up airlines,” notes Maureen Coletta, Business Development Manager at TRAX. “At the same time, we found that many existing customers had the foresight to use this time to push forward their technological advancement plans for mobile maintenance.

“Airlines and MROs are still feeling the pain from the lockdowns, but understand the centrality of the aviation industry to transport and the worldwide economy,” she continues. “They, therefore, know that the long-term trajectory is upward. This explains the willingness of those in a position to do so to spend capital on projects that will drive efficiency and future earnings.

“Since the TRAX eMRO and eMobility products are cloud-based, mobile, and paperless, they have become a tool that can be wielded by our clients to achieve such efficiency and ROI,” Coletta observes. “In fact, one of our newest customers (a start-up) saw our products as a means to launch their airline as a fully mobile and paperless operation. It was a lesson to our business to see how essential technologically advanced software products are today. As a result, TRAX has been extremely busy, and we expect continued demand in the mid-term as the market slowly recovers.

RESILIENT IN A CRISIS

Julien Methot, Head of Consulting Services, Projects & Digital Solutions at Swiss AviationSoftware (Swiss-AS), has had a similar experience. “The impacts of the pandemic are felt at every layer of the aviation industry, but software solutions are seen as a smart investment during this time,” he remarks. “A modern integrated maintenance information system (MIS) is the backbone of any airline and MRO; therefore, many of them view this period as an opportunity to implement more efficient digital eco-systems.

“This is why we have not faced a substantial decrease of activities during the pandemic,” he continues. “No implementation project has been cancelled, though some were delayed. This reminds us how strategic our flagship product is for airlines.”

According to Methot, many customer projects have been initiated in two main areas. “The first is our mobility product, as it improves ground staff efficiency and their capacity while improving the turnaround time of the aircraft. The second is document management systems interfacing, because of the importance of record tracing for such high-value assets,” he reports.

The approach taken by many airlines also surprised Ramco Systems. Its Director of Aviation Consulting, Saravanan





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Rajarajan, admits: “As a technology provider, our assumption was that costly and lengthy digital programmes would be curtailed. In early Q2 2020, the focus was on cash preservation by cutting nonessential costs, later followed by cost consolidations through furlough and retrenchments,” he recalls. “We witnessed a spike of activities starting later in 2020. MROs took this downturn to reshape the business and plan for an eventual recovery. We are also witnessing MROs refocus on certain lines of business and a few of them getting into new lines of business, thereby bringing the digital landscape to the forefront.

“Digital initiatives are no longer side projects; they have become a central backbone to support the business strategy,” Rajarajan opines. “We have seen MROs constrained to digitise due to decades-old legacy systems. It has become quite clear that our customers want agility in the software to fit the evolving business strategy.”

According to CEO Eric Hansen, the lesson learned at Aviation InterTec Services (AIS) regarding its products is simple. “COVID-19 notwithstanding, RAAS [the company’s application for commercial operators] has been confirmed to be fundamental to our customers’ ongoing maintenance

operations and a key element in their overall business systems strategy,” he declares. “Implementation services and data management were of the highest demand during the downturn, perhaps surprisingly. In addition, spare time resulting from reduced operations allowed many new and existing customers to consult with us to investigate paperless options and the related operational implications.”

‘VIRTUALLY’ SUCCESSFUL

At Rusada, a further element came to the fore in the flexibility shown by individuals. “As a business, we were thrilled to see both our staff and customers adapt to, and embrace, the new ways of working forced by the pandemic,” explains David Purfurst, the company’s Global Pre-sales Manager. “On the development side, we continued to improve our ENVISION software and deliver new releases on time. On the client services side, we successfully transitioned to implementing our software virtually and even had one customer who purchased and went live on ENVISION without us ever meeting in person.

“The message that we took away from the market was an encouraging one,” he adds. “Organisations understood that our software could be a key driver in making their business

more efficient at a time when every resource needs to be utilised to the fullest.

John Stone, Vice-President of Product Management at Ultramain, keeps the lessons learned simple. “The type of software we provide is critical to operators, and the market understands this. We’ve learned we can support customers remotely during the implementation process,” he emphasises.

While carrying out those remote implementations, new functions within the maintenance software were being added by Ultramain and the other providers. “ULTRAMAIN [the product] is intelligent M&E/MRO/ELB software that fully integrates maintenance (line, base, engine, shop) with materials, labour, documentation, ELB (electronic log-book) and procurement. And while not a new innovation per se, it’s worth mentioning that it is a fully paperless system that uses mobile devices to replace paper processes,” says Stone.

Innovations are continually flowing into ULTRAMAIN, though. “One recent innovation involves optimisation for labour scheduling, hangar planning, maintenance scheduling, check execution, and materials stocking and ordering. In each of these processes, ULTRAMAIN algorithms optimise the outcome based on user inputs. What-if modelling is used to allow outcome comparisons to help the user select the optimised outcome. Optimisation allows the user to know in advance what they should be doing and how to achieve it,” the VP notes.

Continuous improvement is the motto at AIS, says CEO Hansen. Consequently, there is a steady stream of new or enhanced functionality being developed. “The two main areas of focus are business intelligence and workflow automation,” he comments.

“Customisable dashboards and reports have been an option in RAAS for a long time, and we recently expanded our offering with a view to making the feature more accessible to all tiers of customers. Dashboards can be embedded in RAAS, distributed to management consoles external of RAAS, or even placed in





Mobile phones are now utilised to upload and receive MRO data, allowing mechanics access to schedules and status updates on parts availability.

variables, such as expected ground-time, type of work, staff qualifications, and staff availability. Optimisation of labour and aircraft ground-time is achieved by matching demand and capacity.”

Agopian adds that efficiency and automation have also been added to the supply chain and inventory processes. “Optimised material allocation and re-ordering algorithms help customers to reduce their spare parts and inventory costs. We have also enhanced our dedicated interfaces with major pool and repair providers as well as other logistics platforms,” he says.

Mobility is definitely a key enhancement across all providers. Ramco’s ‘Anywhere’ apps, for example, enable managers

dedicated digital signage status screens. Taking advantage of third-party reporting tools such as Microsoft Power BI or Tableau, and combining them with RAAS’s inherent ability to allow direct database access for data mining purposes, enables maintenance-related data analytics and intelligence to be distributed across the entire enterprise,” Hansen elaborates.

Kevoik Agopian, Team Leader – Business Consulting at Swiss-AS, points out that the AMOS Digital strategy is based on three pillars: mobility and paperless maintenance; seamless integration within the digital ecosystem; and automation of labour-intensive tasks.

“We’ve added more apps within the AMOSmobile suite, enabling the entire turnaround process to be performed directly at the aircraft,” he reports. “We have also improved our staff capacity planning solutions for line and base maintenance. Our system can now automatically make work packaging and assignments using rule-based logic using

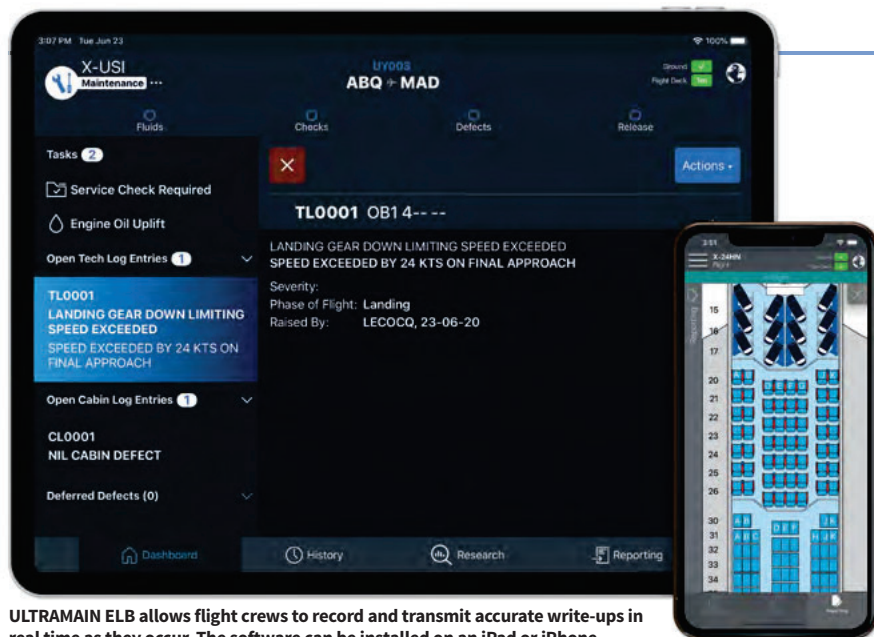
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ULTRAMAIN ELB allows flight crews to record and transmit accurate write-ups in real time as they occur. The software can be installed on an iPad or iPhone.

and mechanics to work on the go to gain operational efficiencies, says Rajarajan. “Our flagship mobile app, Mechanic Anywhere, continues to transform the shopfloors and helps them go paperless through remote access to maintenance documents, technical assistance, and digital signoffs, which is especially helpful with compliance and statutory-related functions. We have also added the capability of remote collaboration through real-time videos, photos and voice file feeds with the engineering teams for troubleshooting, thereby reducing the TAT and improving productivity,” he adds.

Additionally, Ramco has enabled customers to receive and manage digital content from their OEM in XML and SGML file formats. The company has also developed automated capabilities to process PDF-based OEM and customer documents. “These capabilities along with Mobility have made the digital transformation of shopfloor a reality,” Rajarajan emphasises.

David Purfurst is emphatic about Rusada’s current area of development. “Our main focus at the moment is mobility. We have identified key areas of maintenance operations that suffer from users having to go and log on to a PC or use paper to record information,” he remarks. “Our new suite of apps looks to enhance these processes by allowing them to be completed on the go and saving significant amounts of time by

utilising the hardware available in mobile devices – cameras for barcode scanning, fingerprint scanners for security and so on.

“For example, our recently released ENVISION Tasks app allows technicians and engineers to execute maintenance tasks using a tablet device. It also features an offline mode as it’s not always possible to maintain an internet connection in large hangars or remote locations. We will be releasing another two apps for ENVISION later this year,” Purfurst advises.

FLEET MANAGEMENT BOOST

Among the most recent enhancements to its system, TRAX took specific measures to help customers address the industry flux around the number of aircraft in a fleet that will be deployed based on the lifting of travel restrictions. “We adapted the software to manage planning for grounded aircraft – to enable customers to keep ‘automated’ control over these essential maintenance items,” Coletta explains. “We understand that other operators must use manual and time-consuming Excel Sheets to manage the grounded aircraft inspections that our enhanced software functionality has automated.

“Aircraft redelivery services are an integral part of fleet management, which is our speciality. There is a very fluid market situation now in the leasing sector with the return of even more aircraft, and in some

cases the selling of owned aircraft and leasing back,” she continues. “Our customers already have the required technical data residing in the TRAX eMRO system, but they needed help to up their game and reduce redelivery times. Enhanced digitisation via the new eContent Control app TRAX developed has greatly streamlined the process. One TRAX customer using the eContent Control app reported a 60% to 80% saving on the lease return process that represents US\$100,000 per aircraft return in savings.”

Among other TRAX developments is, unsurprisingly, mobile capability. “The TRAX eMobility apps are an example of how mobile add-ons to the MRO software system can assist in making the maintenance process more efficient,” Coletta remarks. “Using the apps, a pilot can raise a defect during a flight, which when connected through the aircraft onboard Wi-Fi system, streams down to the ground and presents a notification to a technician assigned at that location. The mechanic can prepare in advance by reviewing the OEM manuals, accessing the tools, and ordering potential replacement parts in advance. Each of the 13 apps that make up the eMobility suite brings productivity and profitability gains, as reported by our customer base.”

With all this constant development, it is understandable to wonder what is left within the MRO business, which could still be digitalised and incorporated into these systems and also deliver a solid return on investment. Ultramain’s John Stone asserts that as it pertains to ULTRAMAIN ELB, MRO and M&E software, all of the company’s system offers paperless operation. “Operators enjoy the benefits of up-to-date real-time data displayed in visualisations that make data immediately understandable,” he comments.

AIS’s Hansen sees things slightly differently. “From our perspective, digitisation of aircraft maintenance processes is only in its infancy. It will likely be another 10 years before true



end-to-end paperless is feasible across regulators, lessors, OEMs, MROs and operators,” he argues. “The road to full digitalisation and paperless processes requires integration of ever more systems, with ever more information being produced by each.”

The focus at Swiss-AS is to deliver solutions that will improve aircraft turnaround times. “Over the next couple of years, we will develop a fully integrated ELB solution, which will allow pilots and cabin crew to report defects anytime,” states Julien Methot. “The pandemic has also left many customers with reduced fleets or in bankruptcy. This has led to a market flooded with spare parts and aircraft. Clearly, this is a great opportunity to purchase such assets

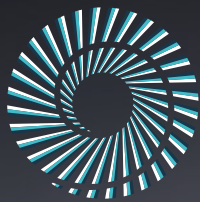
at a very advantageous price for our customers or for new airline start-ups.”

Rusada’s Purfurst believes there are many areas that could still benefit from digitalisation but notes that often it isn’t technology holding things back but established behaviours in the market from which people are hesitant to move away.

“For instance, if aircraft parts suppliers were able to standardise their responses to RFQs [requests for quotes] and use digital means, this would help streamline the process,” he points out. “Often, suppliers still require RFQs in ‘written emails’, through an online request store, or via telephone. This can slow down the process and incur more costs. Standardised RFQ formats would be a positive benefit for all parties involved.

“Another example is operators still requiring copies of task cards to be provided in their own company format when using third-party MROs. This often duplicates work as ever more MROs use systems such as ENVISION for digital task cards with electronic sign-off. This also makes the use of modern technology pointless when legacy formats are also still required,” Purfurst stresses.

Rajarajan foresees greater utilisation of ‘disruptive technologies’ in the hangar, with Ramco among those leading the incorporation into its applications. “As 5G, IOT [Internet of Things], AR/VR [augmented reality/virtual reality] and AI/ML [artificial intelligence/machine learning] technologies gain traction in the coming years, MRO



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David Purfurst, Global Pre-sales Manager, Rusada

software will evolve to work with new data structures like audio, photos and videos received from IOT, AR/VR, drones, and so on,” he predicts. “As organisations accumulate this wealth of data, AI/ML technologies will mine deep insights and be trained to make intelligent decisions. We expect the intersection of these technologies to unlock some interesting capabilities in the MRO space, thereby delivering better value to aviation organisations.”

Rajarajan has an ally in this area in TRAX’s Coletta. “Technology has advanced to the point where AI is no longer out of reach. We can expect to see more AI options integrated into MRO software systems such as AR, ML, intelligent voice recognition, predictive analytics and more,” she confirms. “TRAX has these options in its development roadmap. AR is already being used in the industry, with remote virtual inspections becoming a necessity during the pandemic.

“Data integration via upload functions and standard or custom APIs is already somewhat prevalent in the MRO industry, and TRAX products have the functionality to automate data ingestion and exchange. But the lack of standardisation for digital data exchange in the aviation industry is a great challenge. If this can be overcome, and combined with efforts to introduce blockchain records, it could be a game-changer for the industry,” Coletta declares in conclusion. ■

EmpowerMX delivers you from deviation

EmpowerMX’s cloud-based, mobile-first software-as-a-service (SaaS) solutions are used by the world’s leading airlines, MROs, and OEMs to more efficiently plan, execute, and optimise heavy maintenance, line maintenance, materials management, shops activities and component overhaul. Its software drives ROI and delivers efficiency gains by shortening maintenance turn-around times (TAT), increasing aircraft availability, and lowering cost per available seat mile (CASM) by improving workforce utilisation, eliminating unproductive workflows, providing real-time visibility into task completion, and digitising paper-based processes and documentation.

EmpowerMX software allows the service to be executed in accordance with a digital plan so that every time you start deviating from the plan, the system will tell you about it. The variations could be in the number of task cards getting closed, the availability of materials, the rate of manpower being

applied to the service and others. The system tells you early enough about these deviations so you can come up with an action plan to compensate for them and get the work package back on track. EmpowerMX target checks efficiency in multiple ways, like assisting technical personnel through their daily tasks so they can maximise the time they spend on value adding activities. EmpowerMX manages this without neglecting other areas of similar importance like collaboration and communications. Processes are streamlined for quick reaction to production bottlenecks and avoiding duplicate work. Streamlining reduces waste and results in better resource allocation. Its customers are also using the data provided by the system to continuously look for ways to optimise the way they do business.

The COVID-19 pandemic has acted as a catalyst and accelerant for MRO processes to transform and embrace long overdue digitisation initiatives. The re-opening and



EmpowerMX assists technical personnel in daily tasks so they can spend more time on value adding activities.

new protocols around no-touch information exchange, real-time confirmation, and data visibility all require new ways of thinking about traditionally manual and paper-based operations, and solutions to support the new environment.

The key word here is change – EmpowerMX believes the industry is well on its way to recovery and that’s no longer an issue. It foresees a gigantic digital transformation across the industry that changes how the airlines and all the OEMs and aftermarket service providers operate.