Building **technologies** that
support MRO training programmes

There is a growing momentum to adopt new technologies in training processes in the MRO sector and perhaps, the incoming innovations will also help overcome the supply chain and labour challenges the industry faces.

By Keith Mwanalushi

There is no denying that technology is making an impact on the aviation industry. Training programmes within MRO service companies are being improved to enhance their efficiency, effectiveness, and accessibility.

At SetnaiO and their growing MRO business, Setnix, they place great importance on leveraging cutting-edge technologies to enhance the quality of the products and services they are providing to customers around the world. Chief Operating Officer, Michael Coughlin says his primary focus involves exploring diverse applications of these technologies to propel the businesses forward.

"It's an exciting time in the MRO industry with the advent of numerous advanced technologies and tools," states Coughlin. "I feel like a kid in a candy store with so much at my fingertips and seeing more emerging each day.

By effectively harnessing these resources, we can maximise the value we deliver to our customers, which remains our top priority."

The growth of e-learning and online platforms, data analytics, and machine learning has transformed the delivery of MRO training programmes and the likes of AJW are embracing this.

"We're using innovative ways to operate and have built a tablet application for technicians in our MRO facility in Montreal," declares Craig Macpherson, the CIO at AJW Group. He says this application involves the technicians' workflow allowing them to maximise component touch time. "We aim to optimise and change the way

Michael Coughlin, Chief Operating Officer at SetnaiO

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>
> *Michael Coughlin, SetnaiO*

we work, to create more opportunities for employment in digital development and management, for technicians and engineers, and in other areas of the workforce. We're putting great effort into adopting technology while still leading people, engaging them, and changing the culture to make it more cohesive and open-minded."

Innovation in technology will help mitigate workforce shortages.   © *Patrick Delapierre and AFIKLM E&M*
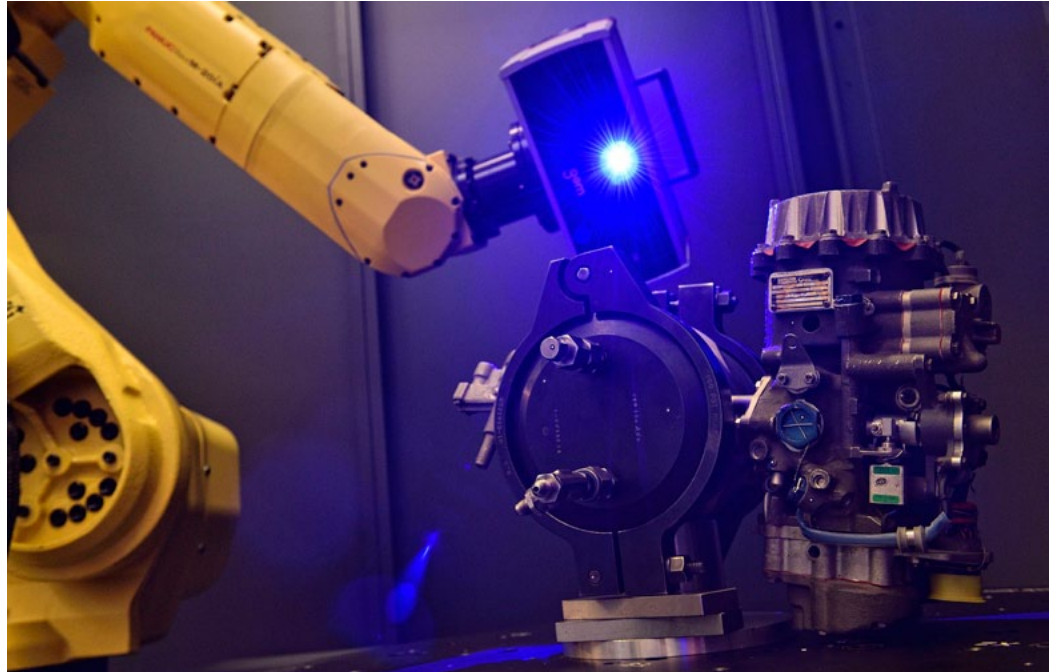

Craig Macpherson, Chief Information Officer, AJW

As a business, Macpherson says AJW is learning and embracing innovative technology and bringing the workforce on this journey while managing the change.

"It's nearly impossible to be successful at your job without knowing how to use technology that supports it. You can argue this is true for any job, not just within MRO," remarks Erkki Brakmann, CEO and Founder of SkySelect.

Brakmann feels technology is the way forward for the MRO industry and its push to digitise and specifically, AI plays which is playing a vital role in helping

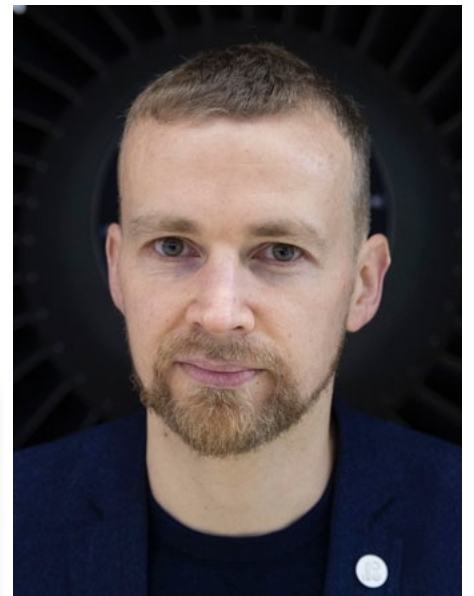teams navigate the labour shortage by optimising efficiency.

"For example, if we talk about spare parts, AI can drastically shorten the procurement process. As soon as a mechanic has identified a part that is needed, AI can identify the most probable vendors and book the purchase in a matter of minutes. In today's world, procuring a part can easily take days as the requirement passes from one person to another.

"And when surges or dips in demand occur, it's much easier to scale your technology-backed operations up or down compared to always balancing your labour force with your workload," Brakmann tells.

Brakmann emphasises that the MRO sector will not only benefit from efficiency gains, but also from cost savings, which are always important in the cost-conscious aviation industry. "By leveraging

benefits such as supply forecasting, procurement teams can save up to 20% on the costs of their parts by being proactive and optimising orders based on time and geographic locations."

The third problem that Brakmann mentions is that technology clears up the opaque supply chain and by moving from manual offline processes to digital tools and workflows, everything becomes more transparent, making it easier to track, measure and optimise the supply chain.

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Erkki Brakmann, CEO & Founder at SkySelect

Thierry Lefevre, Head of Technical Training Centre at Air France Industries KLM Engineering & Maintenance argues that while new technologies will contribute to addressing the workforce shortfall, they will not solve the lack of skilled labour because of difficulties in recruiting. He says developments such as the use of IT tools to optimise existing synergies within organisations will have to be considered in the design of training so that users are properly trained beforehand.

"A mix of distance for theory and face-to-face practice is now an increasingly popular solution that seems to meet the needs, especially for staff posted abroad," notes Lefevre. "Another permanent objective is to improve the quality of training content by producing training courses using more attractive and interactive teaching materials, integrating upstream the use of new technologies and effectively mixing theory and practical exercises both in the room through VR and on the aircraft," he adds.

Certainly, AI, AR, and blockchain technologies have the potential to significantly alleviate the workforce shortage in aircraft maintenance. At Vallair, they are convinced these technologies offer a range of innovative solutions that can enhance efficiency, productivity, and accuracy in the maintenance process,

Digital training innovations are increasingly vital in training programmes. © *AFI KLM E&M*

ultimately reducing the burden on human resources.

"AI will help us to anticipate effectively enabling us ultimately to engineer out defects before they happen," notes Armel Jezequel, Corporate Officer at VALLAIR. "If we can use AI to automate various tasks and processes that traditionally require human intervention but where the person adds little value, it will release the workforce to focus on those areas where they do."

Jezequel says with AI-powered predictive analytics and machine learning algorithms, aircraft systems can be continuously monitored, enabling early detection of potential issues and thereby enable proactive maintenance preventing breakdowns and minimising downtime.

AI can also be used to streamline routine maintenance checks by analysing historical data and generating insights on optimal maintenance schedules.

On AR technologies, Jezequel explains how it can enhance the capabilities of aircraft maintenance personnel by overlaying digital information onto the real-world environment. "Maintenance technicians can wear AR headsets or use handheld devices to access technical manuals, diagrams, and step-by-step instructions. This reduces the time spent referencing manuals or seeking assistance, allowing technicians to perform tasks more quickly and accurately."

Coughlin from SetnaiO adds that adaptive learning stands out as a vital technology that can leverage AI to customise training programmes based on

individuals' strengths, weaknesses, and preferred learning styles. "By doing so, we can ensure that each person receives the most relevant and effective training possible, maximising their potential."

Furthermore, Coughlin feels augmented and virtual reality is an exciting tool that has already found applications in the military, and as technicians transition from the armed forces to the commercial sector, and it's only natural to witness the adaptation of this technology across the workforce. He says these technologies are poised to play a significant role in revolutionising MRO training methodologies, providing immersive and interactive experiences that enhance learning outcomes.

Coughlin continues: "Another area poised for growth is predictive maintenance programmes. Major industry players like Boeing have already entered this space, leveraging advanced data analytics to optimise maintenance programmes. As the optimisation efforts continue to evolve, MRO providers will be able to achieve more with their workforce, effectively streamlining operations and preventing bottlenecks."

At AJW Technique in Montreal, they are implementing the use of machine learning and artificial intelligence in their predictive maintenance console, as well as an industry blockchain pilot for parts trace and provenance, RFID to manage assets and tooling with real-time turnaround time and location precision, paperless workflow apps to ensure maximum efficiency and no waste at every stage of process, digital

Armel Jezequel, Corporate Officer – VALLAIR

VR has become a major component to improve the quality and efficiency of training.   © AFI KLM E&M

twins in engineering to simulate models and effects, robotics testing, and more," Macpherson lists.

As far as the skills labour shortage goes, Macpherson observes the aviation industry continues to face a skilled workforce shortfall. "This is in part due to the retirement of older mechanics and the accelerated growth of the airline and aircraft manufacturing industries post-pandemic. At the height of Covid, there was a reduction in aerospace employees being trained and this shortage put pressure on the aviation supply chain. This led to longer lead times for maintenance and repairs, which in turn affected flight schedules."

The impact has been felt throughout the supply chain, through parts shortages and delayed lead times, Macpherson notes.

Building new technologies into training programmes

The industry is seeing growing popularity in areas like data visualisation, automation and digital inspections, and other similar technologies but some industry observers have questioned if there is enough capacity in the market to build such technologies to support training programmes.

"Whether the market can adopt these technologies, depends on whether businesses have the capacity to implement them within their current technical resources, whether they have the availability of skilled professionals to implement them, and whether they have the means to invest in research and development," responds Macpherson.

Additionally, he feels the need for collaboration between aviation industry stakeholders, technology companies, and educational institutions to leverage existing expertise and resources to develop and implement these technologies effectively – "These partnerships can also provide opportunities for knowledge sharing and innovation, however, the process is slow," Macpherson adds.

At AFIKLM E&M, they regularly see new solutions that have required major IT developments appearing on the market, such as virtual aircraft designed for educational purposes but developed from the technical specifications of aircraft. "These make it possible to have autonomous means to carry out training in virtual mode without the need to have an aircraft or a slot in simulators that are often already saturated by the needs of pilots," states Lefevre.

He adds: "The problem that arises with the use of new technologies in training is more in the field of accompaniment and anticipation of difficulties, both of use and appropriation, that will meet instructors who will have to adapt their habits and review the animation of their training.

"In addition, the arrival of AI should have a significant impact in all areas of training, whether for the establishment of specifications or the production of training without forgetting the design."

When it comes to technology growth, a very important aspect is technological adoption, instead of simply implementing technology, refers Brakmann from

SkySelect. "One of the key factors to help with adoption is how intuitive the solutions are to use, and this is where tech providers have a lot to improve. The easier you make the usage, the less training it requires and the faster the adoption — it is all interconnected."

Brakmann cites several examples in the aviation industry of organisations investing in large scale technology projects, costing millions of dollars, only for the projects to never get off the ground – "In many situations, it's because all the time and investment were spent on implementing all the components from a technical perspective.

"However, people are also a very important part of this process, as they are the users of these tech products. Therefore, consideration must be given to change management and understanding how employees will interact with the technology," Brakmann points out.

Jezequel echoes similar views across the discussion reiterating that implementation of new technologies will often require collaboration between various stakeholders, including training institutions, aircraft manufacturers, maintenance organisations, and regulatory bodies. He says assessing the willingness and ability of these stakeholders to work together in adopting and implementing data visualisation, automation, and digital inspections is crucial for success.

"In my opinion, data visualisation plays a pivotal role in all types of businesses," adds Coughlin. "It has been a tool we use in our operations across all our businesses, from parts trading to MRO services. Similarly, automation has proven to be a valuable tool, although it does have its limitations. While humans will always remain crucial in most aspects, automation can undoubtedly enhance their capabilities and improve efficiency. We believe in fostering innovation while maintaining the human touch that has been at the core of our business's success."

Ultimately, the consensus is that adoption of these technologies will continue to grow, and as they mature and become more widely available, that capacity will also continue to expand.