Covid–19 ignites unexpected revolution at aviation shopfloors

Amid the grim reports of airline closures and bankruptcies as Covid-19 continues to wreak havoc on the global aviation industry, an unexpected revolution has taken place across the tarmacs, hangars and shopfloors of carriers and maintenance, repair and overhaul (MRO) service providers worldwide.

The International Civil Aviation Organisation (ICAO) has estimated that the pandemic-hit civil aviation sector experienced reductions of 50% of seats and 2.7 billion passengers in 2020, with the total loss of gross passenger operating revenue equalling US$370 billion (RM1.5 trillion). Airports and air navigation services lost a further US$115 billion and US$13 billion respectively. More than 40 carriers have folded, leaving thousands of pilots and aircrew laid off or furloughed.

But behind the headlines, there is a silver lining — the less-heralded but long-overdue transformation of maintenance and engineering, management of spares, certification, MRO and integration of disparate systems that determine how an aircraft is maintained and deemed fit to take-off.

Despite the rapid advances in aeronautical engineering, which gave us faster and more fuel-efficient aircraft, adoption of e-commerce and online marketing of seats, the back end of the aviation sector, has long been a laggard in technological innovation.

Engineers and mechanics still grapple with paper or outmoded methods to record or certify an aircraft. Due to legacy issues, software systems of engines, avionics, equipment, spares and MROs are still largely trapped in silos. Even though cloud computing and artificial intelligence/machine learning (AI/ML) have been around for years, digital transformation has eluded the aviation shopfloor.

However, change has come quite unexpectedly, in no small part due to the pandemic. The combined shock of mothballed aircraft and huge layoffs has served as a wake-up call, with many non-commercial aviation sectors leading the charge towards digital transformation.

Even though 2020 was an annus horribilis for commercial airlines, other aviation sectors have been kept busy. These include operators supporting air logistics, specialised fixed-wing aircraft of use in fighting forest fires (as experienced in Australia, Europe and North America in recent years), defence as well as medical evacuation (medevac).

MY Say

BY SAM JACOB

Indeed, Covid-19 triggered a sharp increase in medevac operations — mostly for helicopters — due to heightened incidences of emergency airlift for infected patients or, more recently, of vaccines.

Whether for commercial carriers or for such specialised services, the pandemic has thrown into sharp focus the urgent need to overhaul the back end to achieve three critical objectives.

The first is to reduce costs by streamlining processes and to migrate from paper to digital systems to improve efficiency and cycle times; the second is to achieve an integrated process-level approach that targets the full value chain throughput, rather than interventions towards silo-ed efficiencies; and the third is to leverage technology and continuous innovation as a tool for exponential operational impact so as to obtain a competitive advantage.

The industry realises that the post-pandemic state would be very different — business is likely to contract. The only way to be successful is to offer significantly differentiated products and services, delivered at a much lower cost of execution, on a scalable, flexible and agile delivery model. Digital transformation is no longer an option, but a need to sustain and secure long-term business health.

So how can organisations achieve digital transformation, in an aviation industry context?

Eliminating paper from MRO operations: There is no second option for the industry to transition to paperless operations as paper-based activities are prone to inefficiencies and longer turnaround times.

Rapid advancement and maturation of mobile technologies and digital content, including availability of technical documentation including manuals and job cards, have made shopfloor digitalisation a reality.

The use of mobile technology in deep-level technical functions drives digital content consumption and also facilitates real-time system usage and reporting. These functions include maintenance task card execution, inspections, warehousing operations, flight planning and operations and document approvals. This has an exponential impact on cycle time, data accuracy, decision-making quality and operational agility and scalability.

Automation of manual and

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repetitive tasks: This is key to achieving more with less. Candidates for automation are routine and repetitive back-end activities and tasks such as procurement planning and execution, technical record-keeping, maintenance and materials planning and routine finance operations. Modern applications can achieve a very high level of automation through AI/ML functions leveraging past data to detect behavioural and action patterns, domain-specific rule engines and intelligent real-time alerts and notification structures.

Automation allows organisations to scale rapidly without having to add expensive back-end overheads that only facilitate linear business growth. It also eliminates or reduces the "drag and wait effect" of back-end "processors" to a value chain, thereby increasing velocity, throughput and massive reductions in cycle time.

Integration with ecosystem: There is a lot of interdependence among operators, MROs, original equipment manufacturers (OEMs) and maintenance departments. They have to work seamlessly to exchange technical documentation (manuals, service bulletins and advertisements), operational data, part availability information, work package and compliance data and commercial documents such as purchase orders and invoices.

Business applications need to be interoperable and ready to be integrated or deployed in hybrid models. This will facilitate management of an integrated automated business process — a seamless self-orchestrated platform — that transcends organisational boundaries.

Applications need to be built on modern application architectures, have built-in adaptors with industry platforms such as OneAero and Aeroxchange, have pre-built integrations and must integrate with solutions to manage specialised functions, such as expense management, bank integrations and shipper aggregators.

Our industry has held on to the old way of doing things for far too long. The pandemic has forced us to modernise and innovate. It can well be the catalyst for true digital transformation of aviation shopfloors, globally. ⬛

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