aviationbusinessnews.com
OCTOBER/NOVEMBER 2023 • VOLUME 25 • ISSUE 4

LOW-COST & REGIONAL

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Airline Business

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ARE LCCS LEAN... OR PARED TO THE BONE?

There's hardly anything in the world that some man cannot produce a little worse and sell a little cheaper, and the people that consider price only are this man's lawful prey", goes an old saying that can be traced to a letter to the *Advertiser's Trade Journal* in Edwardian times.

I'm not about to accuse the aviation industry of cutting costs, but the result of running everything to the tightest possible margin means that there is absolutely no wiggle room when something goes wrong, which ends up costing the airlines time, money and goodwill and suddenly the money 'saved' through ultra-lean practices doesn't look so great after all.

Consider Wizz having to decimate its capacity due to the ongoing maintenance issues with the GTF engine, and that is far from the only carrier affected. easyJet had to cut its schedule because of airspace problems earlier in the summer.

There are also problems on the ground that have nothing to do with the airlines. The breakdown at UK air traffic control back in August lasted only for a couple of hours and was immediately substituted with a manual system but, because of a total lack of capacity in the paired-back, privatised system, it ended up costing the industry millions.

There are signs that the industry is moving away from the ultra-low-cost model. Prices on all LCCs are up compared with pre-pandemic levels and

▲ Are the days of ultra cheap fares over?

even Ryanair's Michael O'Leary said in an interview in September that he felt fares were currently "too cheap" and that they must rise to meet the current realities of the aviation industry.

Lean, efficient management is here to stay, and the business of airlines large and small has been helped by these modern practices, but in my opinion the days of race-to-the-bottom giveaway fares must be at an end. However, I'd be interested to know your thoughts on this matter. Don't be shy, drop me a note at the address below and let me know your views.

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Printed in the United Kingdom by Micropress.

LOW-COST & REGIONAL Airline Business

Published by
Real. RESPONSE MEDIA

Cally Yard,
445 Caledonian Road,
London, N7 9BG

Contents

OCTOBER/NOVEMBER 2023

Boeing

BUSINESS BRIEFING

AIRPORTS

Contracts awarded for London Gatwick redevelopment

Crawley-based companies have been awarded contracts worth a combined total of more than £5 million as part of the redevelopment of London Gatwick's North Terminal departure lounge.

BP Installations Ltd, based on Crawley's Manor Royal trading estate, has been appointed as the principal contractor on the project. The role includes full site safety management, new electrical installation, new flooring and new information and display signage installations.

CCI Gatwick Ltd, also located on Manor Royal, will oversee the interior fitout and decorative finishes.

Alison Addy, Head of External Engagement and Policy, London Gatwick said: "Part of our procurement strategy at London Gatwick is to utilise the services of businesses across our local region where possible, supporting local people, making best use of local expertise and reducing the environmental impact.

"We are delighted to have two local companies so heavily involved in the redevelopment of our North Terminal departure lounge."

The North Terminal departure lounge is currently undergoing renovation. The project is scheduled to be completed in early 2024 and will see more than £10 million invested in a multitude of improvements, including new flooring, contemporary seating with accessible power points, a sustainable planting scheme, local artwork and improved sightlines and wayfinding.

NEWS

Ryanair boss calls for NATS' CEO to resign over fresh air traffic chaos

A shortage of air traffic controllers has caused chaos at Gatwick Airport, resulting in a call for a change in management.

The airport confirmed 22 cancellations at 10pm on 13th September, while scores of flights were delayed or diverted.

The problems happened just two weeks after a brief outage of National Air Traffic Service's system caused a week of disruption across UK airspace.

During the disruption, Ryanair's Michael O'Leary called for NATS CEO Martin Rolfe to resign. Saying that the CAA should "immediately intervene" to protect passengers from these "avoidable" disruptions, he said: "It is unacceptable that more flights and hundreds of passengers are suffering delays to/from Gatwick Airport for a third time in just two weeks due to NATS CEO Martin Rolfe's blatant failure to adequately staff UK ATC.

"Airlines are paying millions of pounds to NATS each and every year and should not have to see their passengers suffer avoidable delays due to UK ATC staff shortages. We call on Martin Rolfe to immediately resign and hand the job over to someone competent enough to do it."

TRAINING

Air Astana opens flight training centre

Kazakhstan-based Air Astana has commissioned a new flight training centre at Astana International Airport, with the facility being the first in Central Asia certified by the European Aviation Safety Agency (EASA). The centre is equipped with the latest generation flight simulators.

The equipment list includes the L3 Harris Reality Seven full-flight-simulator. The machine is the first one to enter service with Air Astana and the first ever installation in Kazakhstan. The centre will enhance pilot training capabilities within the country and in doing so will avoid the previous need to send pilots overseas for training. More than 500 pilots from the Air Astana Group will undertake training at the new facility, which will be open around the clock.

The airline has also invested in Cabin Emergency Evacuation Trainer (CEET) and Real Fire Fighting Trainer (RFFT), which are scheduled to be launched by the end of the year. Both simulators are 'state of the art' in international quality and standards and fully stimulate reality in all aspects of different aircraft evacuation and firefighting situations for in-house training.

IFE AND CONNECTIVITY

Viasat chosen for Malaysia IFE

Flag carrier Malaysia airlines has signed a deal with IFE provider Viasat to outfit the airline's new Boeing 737-8 fleet with its wireless In-Flight Entertainment (IFE) system. The airline also plans to introduce internet connectivity on the same aircraft. The agreement encompasses factory installation of Viasat's equipment on its aircraft, the first of which is expected to be delivered to Malaysia Airlines later this month.

The deal marks a change of strategy for the airline, which originally specified B737-8 aircraft with no IFE screens.

Ahmad Luqman Mohd Azmi, CEO of Malaysia Aviation Group (MAG), said, "We are committed to continuously seeking ways to elevate our customer experience, providing personalised offerings and delivering exceptional onboard experiences with Malaysian hospitality.

"By empowering passengers with the flexibility to enjoy on-demand entertainment through the new IFE system throughout their journey, this initiative represents just one facet of our ongoing commitment to innovation and continuous improvement."

BRIEFS

Change at the top at Avianca
Avianca Airlines has made changes to its management team. Frederico Pedreira (pictured), who has served as chief operating officer since 2021, will now be the company's deputy CEO. The airline also announced that Gabriel Oliva takes over as COO and will remain as CEO of Cargo.

Akasa Air Tours
Akasa Air, India's newest and LCC, will be offering tours and experiences to its online customers. The airline has partnered with tech provider TripAdmit, which will supply its white label booking product to the carrier.

Magnetic Power
Magnetic Creative has achieved certification to retrofit the Embraer ERJ190 with in-seat USB power. This will be welcome news as the firm has a contract to refit the interiors of SAS Airlines' fleet of aircraft of this type.

Britten-Norman back in UK
British aircraft manufacturer Britten-Norman has begun UK production of the Islander sub-regional aircraft, having shifted its manufacturing back to the UK from Eastern Europe.

Air Peace signs Embraer order
Nigeria-based Air Peace has placed a firm order for five Embraer E175 aircraft as the operator seeks to modernise its fleet.

2.3m

Boeing's predicted demand for new pilots, technicians and cabin crew over the next 20 years

22

Flight cancellations at Gatwick have led to calls for UK air traffic's boss to resign

43

Regional airports in India have signed an agreement with Sita to improve passenger 'touchpoints'

REGIONAL AIRLINES

BermudAir 'inks' deal with tech provider

New airline BermudAir has signed a deal with travel technology provider Ink Innovation to provide services including online check-in, load control and departure control systems.

"We are excited to partner with Ink to introduce their ecosystem of solutions to our airline operations. Ink's technology is recognised as the perfect match for a new airline," said George Henderson, chief experience officer at BermudAir.

"As a newly launched company, it is crucial for us to adopt flexible technology that can readily adapt to changing market demands. We are confident that Ink will provide us with the tools we need to streamline our passenger and baggage operations throughout our network."

The first flight took to the skies on 1 September, and BermudAir will be flying to Boston Logan International, Fort Lauderdale-Hollywood International and Westchester County Airport in New York from its base at Wade Intl airport in Bermuda.

A phased introduction has meant the airline's Embraer E175 aircraft has begun service with an 88-seat configuration, but with only 44 seats sold for each flight. Following delivery of its new suites on 1 November, the aircraft will be configured with just 30 seats.

"With the arrival of BermudAir, travelling to Bermuda from the US for an unforgettable island escape becomes much easier. We are delighted to be working with the team from BermudAir and look forward to supporting them on what promises to be an exciting journey, opening up new experiences for business passengers," said Blaine Powell, the chief sales officer at Ink.

LEASING

Aegean Airlines is to take delivery of an additional A321neo from lessor CBD Aviation

The Athens-based carrier is expected to take delivery of the aircraft in spring 2025 as it continues to expand in the European region by renewing its fleet and operating to new destinations, targeting to meet the robust passenger traffic levels to and from the country that are well ahead of 2019 levels.

"We're very pleased to have established our latest customer relationship with the largest Greek airline and a leading regional carrier in Europe," stated Jie Chen, CDB Aviation's chief executive officer. "This advanced, latest generation A321neo will be another well-suited member of Aegean's growing fleet, providing the level of efficiency and comfort that is aligned with the carrier's ongoing efforts to continuously improve its services."

Dimitris Gerogiannis, CEO of the airline commented, "Our partnership with CDB Aviation will help us achieve our fleet development and growth plan for the coming years."

CDB Aviation is a wholly owned Irish subsidiary of China Development Bank Financial Leasing Co Ltd.

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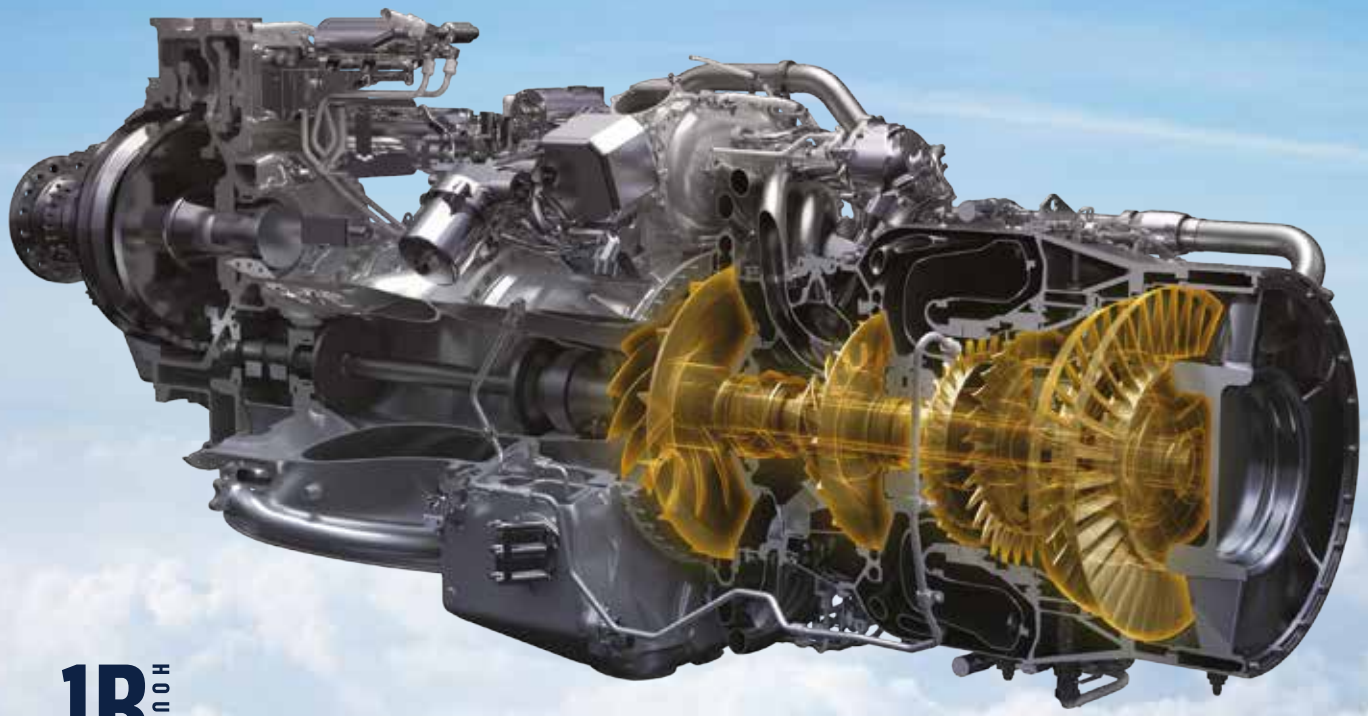

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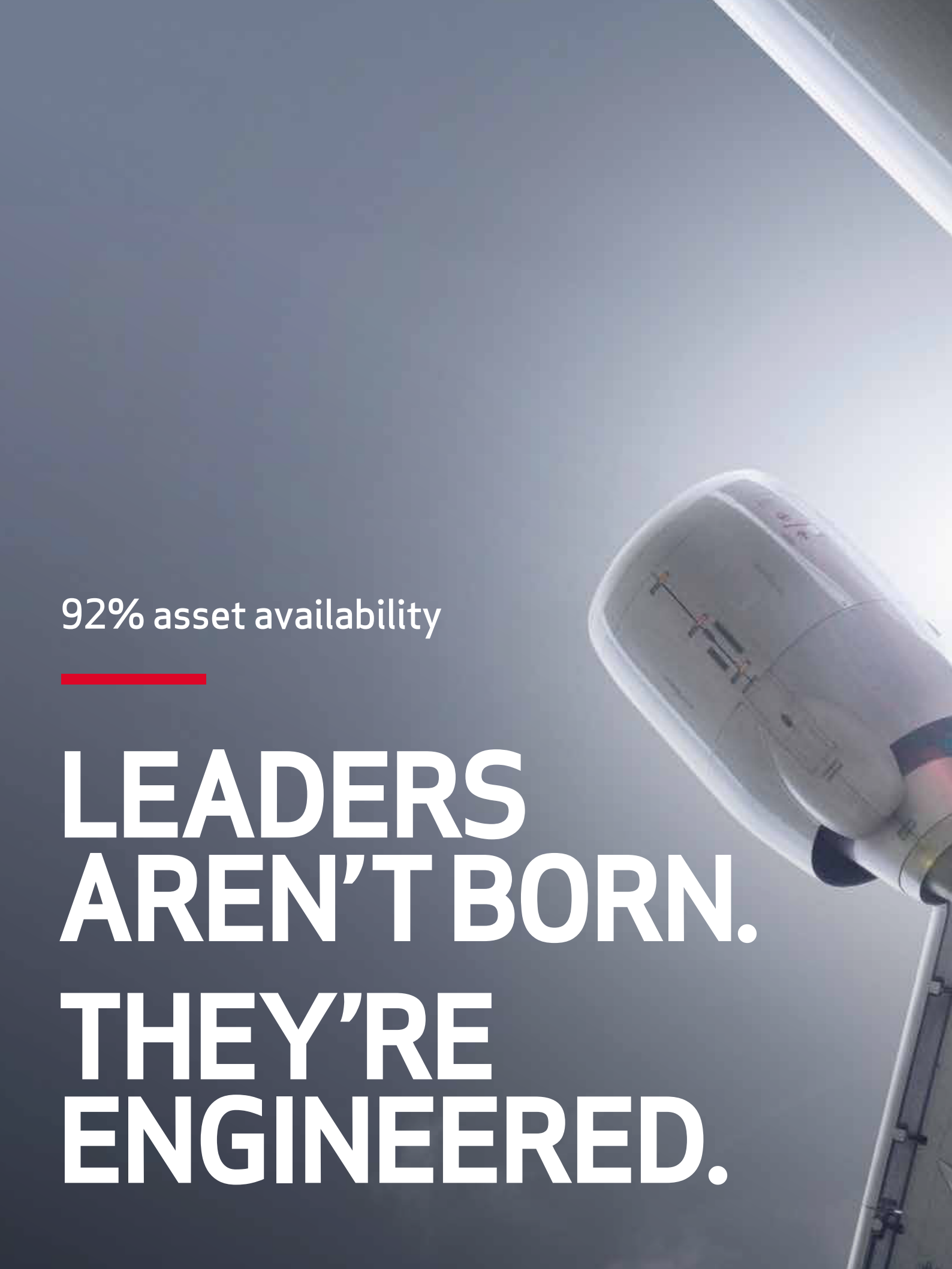
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DON'T SAY AI

Building trust will drive airline adoption, conference told

Trust must be built in Artificial Intelligence (AI) if the powerful new technology is to be embraced by airlines, according to experts who spoke at the T2RLEngage conference held in October in London.

A panel of technology vendors and airlines debated the prospects for AI in the sector amid widespread concerns among technologists that such technology will become too powerful and impossible to control.

Airlines said they are already using AI but the technology is becoming more complex so it is harder to explain how it is arriving at the answers it is generating.

Danielle Brown, chief marketing officer at ancillary revenue technology specialist Plusgrade, said the firm has been using AI since 2015 but a knowledge gap has since emerged.

"It was pretty easy to explain to airline partners at the time," she said, but added, "It's a very different world today than it was several years ago.

"Fast forward 10 years and we are saying we're going to take those reams of data and put it in a box of machine learning trained computers to think and plan, and we are going to be using deep learning. Trust us, we are going to spit out the answer.

1

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"Explainability is essential... explaining your working. We have been very clear about the trust and explainability of AI"

"It depends on where our partners are in their adoption journey, but the more trust we build the more we can work through some of the adoption issues."

Hard to explain

Conor O'Sullivan, chief product officer at Datalex, said the Dublin-based firm had trained two continuous pricing algorithms on different technology models including a more powerful AI neural networks system which was found to provide better outcomes.

"The problem was we could not explain the justification as to how we came to that answer," he said, "so there was no way they [airlines] wanted to put that into production. Regardless of the data or output we give, there is a trust issue."

O'Sullivan said Datalex has removed the term AI from its products in order to avoid any misunderstandings. "This is complicated and it's difficult to explain," he said.

Dee Waddell, global industry leader at technology giant IBM, said what he called 'explainability' is essential. "It goes back to maths class. It's all about explaining your working," he said. "We have been very clear about the trust and explainability of AI.

"You can find the tools that will create foundational models of data AI algorithms, but there's not the [way to simply explain] how to govern that model.

"You need to explain and that's going to be more and more important as the world figures out what it can do with AI."

IBM's Travel Platform has launched AI in a number of areas including personalised pricing and offers which was developed in its research lab which has over 60 patents. Waddell said this system is seeing high levels of offer acceptance among small to medium sized carriers resulting in a 20 per cent uplift.

Rosario Phillips, vice president of customer solutions at Chilean airline LATAM, said the airline is taking an "ambitious approach" to AI.

She explained that the firm is building a team of in-house experts in different applications by training existing employees. Particular areas of focus are in the contact centre and operations. "We want to make it [AI] very democratic and accessible to the entire organisation," she said.

3

1. Conor O'Sullivan, Datalex
2. Questions from the floor
3. Panel session at the event
4. Making connections at T2RL
5. Greg Gilchrist, Sabre Travel

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COVID LEGACY CASTS DOUBT ON AIRLINES' ABILITY TO INVEST

The airline industry needs to modernised

The global airline industry remains 26 per cent down on total Passengers Boarded (PB) following the Covid pandemic as it is facing the need to invest in modern retailing technologies.

The T2RLEngage conference in London in September heard that the industry is at an "inflection point" where legacy IT systems are starting to be replaced by more modern technologies.

However, there are questions about how airlines will find the money to invest in this new future as they continue to face the economic legacy of the pandemic.

T2RL uses PB metrics as a proxy to assess the size of the market because it drives revenues and there is a direct correlation between bookings and what airlines are charging.

26%

The global airline industry remains 26 per cent down on total passengers boarded following the Covid pandemic

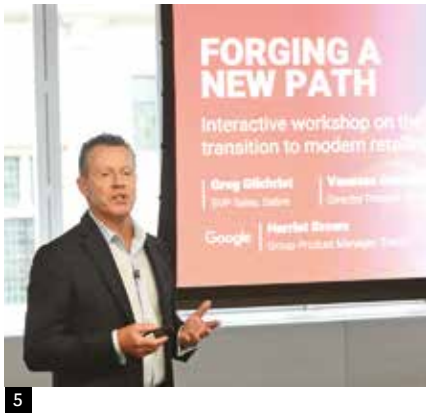
Inflection point

Bert Craven, deputy chief executive of T2RL, a specialist consultancy which works with airlines and IT vendors, said that PBs are forecast to recover to within five per cent of pre-Covid 2019 levels this year. However he added a note of caution: "Some regions have hit 2019 numbers and are well into recovery... while others are still climbing out of the deficit caused by Covid.

"What we have to bear in mind is that we are now missing four years of growth at around six per cent [per annum] so that means we are actually still in deficit by about 26 per cent of passengers boarded.

"This is important. It means there is some money missing – it means there is quite a lot of money missing from the industry. This is money that would have been planned into the investment cycle some years ago and it is not now being materialised.

"And that comes at an inflection point where we are going to transform the industry, and we are short of money. Not just the airlines but the [IT] vendors. We



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1. The event attracted scores of delegates
2. Networking opportunities abounded

"There's a big gap between competing at the lower fares end of the market and actually having lower costs"

need to think carefully about what this is going to mean because the investment needs to happen."

Craven said the transformation away from old legacy PSS (Passenger Service System) platforms to new Order, Offer, Settle, Delivery (OOSD) IT infrastructure will be transformative.

"We think it's going to change pricing, your costs and it may even change some of the business models that we have become accustomed to over many years. The question is what could these economic impacts be as a result of the deficit we are carrying?"

Craven said the market "continues to obsess" about LCCs because that is where it sees the potential for growth.

However, T2RL categorises airlines based on the complexity of the carrier's business model and estimates that true LCCs, like Ryanair, account for only 10 per cent of the global sector.

Richard Clarke, chief executive and founder of T2RL, said: "We classify airlines on the complexity of their business model which is reflected in IT systems which is reflected in PB fees."

Craven added: "There's a big gap between competing at the lower fares end of the market and actually having lower costs. Complexity of the business model is the primary driver of costs."

Clarke said: "As far as we are concerned, the migration to OOSD pays for itself because it should be simpler and cheaper to deliver than it is today with all of the complexity we have."

1

ABN WEBSITE LAUNCH PARTY AT T2RL

Aviation Business News marked the launch of its new branding and website with a networking event after the T2RLEngage conference in London.

The parent digital brand of *MRO Management*, *Aircraft Cabin Management*, *Air Cargo Management* and *Low Cost and Regional Airline Business* unveiled its new look in July alongside a redesigned website.

Last week's networking event was supported by sponsors DOHOP and TPConnects ad well as multimedia partner IBS Software.

ABN was the media partner for T2RLEngage during which the B2B aviation media brand launched Best Places To Work In Aviation, a new awards and accreditation programme to celebrate those firms that are leading the way in making the aviation sector an employer of choice.

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Nico Neumann
Chief operating officer,
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Anastasija Visnakova
VP, sales and marketing,
Deutsche Aircraft

DEUTSCHE AIRCRAFT

The way of the future

Deutsche Aircraft hasn't just designed a new aircraft; it has designed an all-new facility in a different part of the country in order to build it. COO **Nico Neumann** and sales director **Anastasija Visnakova** answer our questions

There can't be many instances where an aircraft type predates the company that constructs it but the 328, currently produced by Deutsche Aircraft, is one of them.

Originally designed by Fairchild Dornier, the 328 and 328JET were popular regional aircraft, but the manufacturer went bust in 2002.

The rights to build the planes were picked up by a company called AvCraft Aviation, but this firm also called in the receivers a few years later.

A complex set of takeovers of both the assets and MRO facilities followed over the next few years, with the result being that a company called 328 Support Services Group (328SSG), itself part of US engineering company Sierra Nevada Corporation, owns the rights to the aircraft, but not to the Dornier name, which now belongs to Airbus.

In 2019, 328SSG founded Deutsch Regional Aircraft GmbH, which would simply be known as Deutsche Aircraft. The firm planned to build a new version of the venerable 328, featuring a longer, 40-seat cabin. In order to do this, the firm was going to need new leadership and a modern facility with enough capacity to build the new aircraft.

Enter Nico Neumann and Anastasija Visnakova. Both joined in the third quarter of 2022 as COO (and co-MD) and VP, sales and marketing respectively. Neumann had previously been at 328SSG in various roles, so was no stranger to the business or what it wanted to achieve. Visnakova joined from DeHavilland Canada where she had held the position of sales director.

One task high up on the to-do list was to chose somewhere to build the new model. Various options were considered, but it was the Saxony town of Leipzig that ultimately won out.

"There is also, and I can't say it often enough, a great deal of political support in Leipzig to make a project like this happen," emphasises Neumann. "I'm not talking about money here. I'd say there is more will than in other places like Munich to get things like building applications and growth supported".

Leipzig also has a decent road and rail provision, making it a good choice for a production site. At the time of writing, production equipment is being installed in an all-new factory complete with a 'green' roof and other energy-saving measures.

"Being a greenfield site, it gives us the opportunity to move to CO_2 neutral production. Yes, it provides capacity – and how much depends on Anastasija and how well she sells!" he jokes.

The so-called 'brand Germany' effect of having a product manufactured in the country is also a selling point, says Neumann, although he is quick to point out that the team of engineers and technicians are a diverse bunch, hailing from 35 different nations.

Regional marketplace

There is a strong market for this size of aircraft according to the company, as a good number of tails still flying are due retirement.

"If we look at the regional fleet today, there are so many flying globally that are 25+ years old, both jets and props. So this is a great opportunity for us to re-fleet them," explains Visnakova.

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"Regional operators are the lifeline of communities. In the majority of cases people are flying because they NEED to"

A German operator called Private Wings, an existing 328 operator, has been announced as the launch customer, a deal that Visnakova says she "couldn't be prouder of" as it is an existing customer of the aircraft type who has seen the benefit of the new model.

SAF issue

The issue of SAF is an interesting one. The 328eco has been designed to run on 100 per cent SAF, but Visnakova is not shy to admit that the majority of users probably won't use it, not least because it isn't an option available to them.

"We have to move away a little from this Western-centric thinking," she says. "Regional operators are the lifeline of communities in that, for the majority of cases, people are flying regional aircraft because they NEED to fly to otherwise inaccessible places and not just because they want to fly for, like, €20 to Mallorca or Ibiza or wherever."

She adds that it is her wish that governments around the world might start differentiating between flights that are generally for leisure, and those operated out of necessity. "This is a lifeline operation, and it needs to be there. Our operators tend to be in very remote regions, such as the north of Canada or the interior of Australia. Even in Europe, our planes tend to operate in places like the north of Norway.

"Of course, customers are looking for a more sustainable solution, but it comes as a holistic solution," Visnakova continues. "The aircraft is more sustainable and burns less fuel, and also comes with the ability to select the type of fuel that you are using on a daily basis. You can operate SAF if it is available to you, but you can also operate on jet fuel.

"So, to answer the question, yes, there is a demand for a more sustainable solution, but when we look at the regional operators we have to offer them something that is very realistic and robust and something that can operate in any prevailing weather conditions."

Neumann makes an additional point about SAF: "You should always consider propulsion efficiency. For a regional aircraft, there is hardly any advantage speed-wise of a jet versus a turboprop, so you must think about propulsion efficiency and which engine makes sense for which routes on top of SAF availability."

Variants

While he will not be drawn on if a cargo version of the 328eco is in the works, Neumann hints that it is at least a possibility. "I think if look at the current platform, you can see that it is versatile and is flying in different forms, we have multi-mission and cargo, plus the ADAC [German roadside assistance] is flying it as a hospital. We want to keep that DNA of the aircraft also for the future," he says.

"The focus is passenger first, but we are keen on multi-mission aircraft and it is something we'd like to build on".

We'll be interested to see the 328eco in all its forms once it takes to the sky next year.

1. The 328eco features Garmin Companion avionics
2. Turboprop cabin will be quieter than competitors
3. Production will take place at a new Leipzig factory

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LIGHT SHOW

Adam Challenor explains why be believes that his company has the best solution for high-density low-cost cabin designs

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Cabin densification remains one of the highest priorities for low-cost airlines, meaning lightweight, low-cost solutions that do not compromise passenger experience in terms of living space and privacy are increasingly in demand. We are also seeing a decline in demand for IFE as airlines strive for maximum weight reductions, as well as passengers bringing their own devices onboard.

The Mirus Kestrel is a clever solution to all of these demands, offering unequalled levels of passenger living space and comfort in an ultra-lightweight, slimline, fixed back economy seat boasting a 28-inch pitch and comfortably weighing 7kg per pax fully dressed. The Kestrel ensures maximum fuel-saving opportunities for airlines, thus offsetting emissions and reducing costs while providing optimum passenger comfort.

Materials

We want to offer our customers the lightest seat achievable without the typical price tag that comes with using more exotic materials, so we've created a clever blend of aluminium, carbon fibre and polymers to develop a seat that's both lightweight and affordable.

In economic terms, the 7kg Kestrel is the lightest possible offering that sits within the economy-seat offering, making it a fantastic solution for lower budget airlines seeking to achieve maximum densification while also reducing their carbon emissions.

Another priority for low-cost airlines is speed to market, which we strive to solve with our recently launched Agility Program, which sees shipsets delivered in just six to eight weeks – almost half the lead time offered by our competitors. The Mirus Agility Program is designed to meet the unique requirements of aircraft leasing companies managing short aircraft transition schedules, with no compromise on quality or service.

The program is available immediately for Mirus' Hawk and from Q1 2024 for Mirus' Kestrel, which are both suitable for Airbus A320 family and Boeing 737 aircraft.

This, alongside our Mirus Care warranty, means customers can expect to have their investment returned within five to six years of purchase, which is around half of the expected lifetime of the seat.

Testing times

Our dynamic test sled, designed for high-impact testing, is the most technologically advanced available and eradicates the long wait times that come with having to outsource testing. Where previously test failure would delay us by weeks or even months, we are now able to apply our learnings and get our product back on the sled the very next day for re-testing. Now, we see test failure as an opportunity to learn and improve, which we can do more rapidly and efficiently than ever. The improvements made to the seat are also thanks to the work of a team of engineers and designers that have worked efficiently and strategically to exceed even our own weight-saving targets.

1. The Kestrel seat boasts a 28-inch pitch and weighs 7kg per pax fully dressed
2. A blend of materials means the Kestrel is incredibly lightweight

"We see a decline in demand for IFE as airlines strive for maximum weight reductions"

Adam Challenor is technical director of Mirus Aircraft Seating

For more information on Mirus, visit **mirus-as.com**

HYDROGEN COLLABORATION

An alliance of major players across aviation in the UK will work together to accelerate the practical roll-out of hydrogen fuel, but there are a number of problems to overcome

◀ GKN's Hydrogen concept

"COLLABORATION IS KEY WHEN IT COMES TO ACHIEVING NET ZERO AS AN INDUSTRY"

The use of hydrogen as a drop-in replacement for jet fuel, but without the tailpipe emissions, is something that has been talked about for years, but the technical problems of producing and distributing it have held it back. However, all of this could be about to change.

A group of big companies in the UK aviation and renewable energy sectors including easyJet, Rolls-Royce, Airbus, Ørsted, GKN Aerospace and Bristol Airport have established the Hydrogen in Aviation (HIA) alliance to accelerate the delivery of zero carbon aviation.

While there are various options for decarbonising the aviation sector, including sustainable aviation fuels (SAF), synthetic fuels or batteries, HIA believes that more attention should be paid to the potential of the direct use of hydrogen.

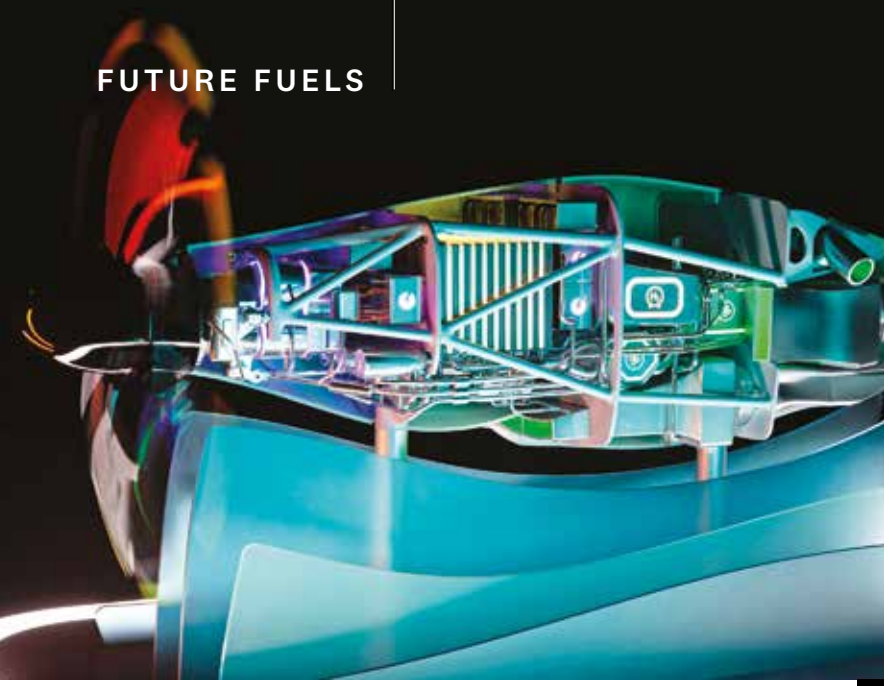
Hydrogen is touted as a real possibility to become an alternative fuel option for short-haul aviation. Airbus is developing new hydrogen-powered aircraft with the aim of entering commercial service from 2035 and Rolls-Royce has already proven that hydrogen could power a jet engine following successful ground tests in 2022. Furthermore, many smaller operators are making rapid progress on hydrogen-powered aircraft, notably ZeroAvia and Universal Hydrogen which have already carried out flight tests.

Combined expertise

The group will be drawing on the expertise of its members to propose a decent plan to achieve hydrogen-powered aviation. The organisation says that it will work 'constructively' with the UK Government, local authorities and the aviation and hydrogen sectors to enable the nation to fulfil its potential as a global leader in this application of hydrogen technology. This will include setting out a plan for scaling up the infrastructure and the policy, regulatory and safety frameworks needed so that large scale commercial aviation can become a reality.

However, no single private business, no matter how large, can hope to solve the problem alone, hence the need for a collaboration. Grazia Vittadini, chief technology officer at Rolls-Royce, explains: "Collaboration is key when it comes to achieving our net zero ambitions as an industry, which is why we are proud to be part of the Hydrogen in Aviation Alliance. Our contribution to HIA is the capability and experience we have in pioneering new technologies and solutions – we have already tested a modern aero engine on green hydrogen and we strongly believe it is one of the solutions that will help decarbonise aviation in the mid to long-term."

Sabine Klauke, chief technology officer at Airbus, concurs. "As Airbus continues to mature the aircraft technologies needed to deliver hydrogen-powered flight, a united industry voice is needed to secure a robust ecosystem of renewably sourced hydrogen," she says.



2

1. Fuel cell engine demonstrator
2. Fuel cell engine model
3. ZEROe turboprop concept

3

"Joining our peers from across the UK aviation landscape in a targeted approach to policy and investment action brings us closer to a decarbonised future of flying."

The level of investment is heavy in the short term, but the group insists that in the medium to long term, the amount of money hydrogen business could generate will be large. Discussing how the industry needs to work together to find these 'radical solutions', Johan Lundgren, CEO of easyJet and first Chair of HIA, says: "There is no doubt that the UK has the potential to become a world leader in hydrogen aviation, which could bring with it a £34bn per annum boost to the country's economy by 2050, but in order to capture this opportunity, rapid change is needed and the time to act is now".

Studies suggest that hydrogen is a fuel that the public are happy to see used in aviation. The group cites a report from market research firm 3gem of consumer attitudes towards zero-carbon emission solutions has revealed that 81 per cent of the British public believe that hydrogen is the best option to decarbonise aviation. Four in 10 think it's the most important factor while a similar number say they understand it will take hydrogen combined with other solutions such as sustainable aviation fuel and direct air carbon capture (DACC) to reach net zero.

"STUDIES SUGGEST PUBLIC IS READY TO ACCEPT HYDROGEN IN AVIATION"

81%

of the British public believe that hydrogen is the best option to decarbonise aviation

Drawbacks

There are of course good reasons why hydrogen hasn't seen mass adoption as a jet fuel up to this point. Hydrogen has a lower energy density by volume than jet fuel, which means that more fuel tank space is needed to store the same amount of energy. This can increase the weight and drag of the aircraft, reducing its performance and efficiency. Hydrogen can be stored as a compressed gas or a liquid, but both options have drawbacks. Compressed gas requires high-pressure tanks that are heavy and bulky, while liquid hydrogen requires cryogenic tanks that need to be kept at very low temperatures (-253°C) to prevent evaporation.

There's also an environmental impact on using it as a fuel. Although hydrogen does not emit carbon dioxide when burned, it does emit water vapour, which is a greenhouse gas that contributes to global warming. Water vapour also forms contrails, which are artificial clouds that reflect and trap heat in the atmosphere. As well as this, there is the issue of cost. To produce green hydrogen, which is made from water using renewable electricity, electrolysers are needed. These devices are still costly and inefficient and require a large amount of electricity to operate.

Safety issues are always brought up in relation to hydrogen, and it is little wonder as it is a highly flammable and explosive gas that can pose fire and explosion hazards if not handled properly. Hydrogen also has a wide flammability range, which means that it can ignite easily in a mixture of air as was demonstrated with such devastating effect in the Hindenburg disaster. Additionally, hydrogen can cause embrittlement and corrosion of metal components, which can compromise the structural integrity of the aircraft.

Nonetheless, a collaboration between some of the industry's largest companies shows that there is a will in the industry to overcome the technical hurdles and replace jet fuel with a more sustainable alternative.

Such progress should be welcomed by all.

1

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Dinakara Nagalla
chief executive officer
EmpowerMX

EMX VISION

Soft Launch

Cloud-based aircraft maintenance software company EmpowerMX has announced the launch of EMX Vision, an AI-based module. CEO **Dinakara Nagalla** answers our questions about the new technology

Visit: **empowermx.com** for more information

What is EMX Vision and how does it utilise AI and predictive modelling to benefit MRO organisations?
EMX Vision is a revolutionary tool developed by EmpowerMX, designed to transform the maintenance, repair and overhaul (MRO) operations with the application of AI and predictive modelling. The driving force behind it is a robust machine learning base that utilises large volumes of both internal and external data.

By deploying this new module, EMX Vision draws from historical data, real-time task flows, milestones and OEM data to predict labour requirements, material probabilities, defects and turn-around time (TAT) with an impressive degree of precision. This data is then used to help MRO organisations, regardless of size, to plan and act more effectively.

This solution signifies a significant technological leap forward, as it provides a faster and more accurate way to not only estimate costs but to also optimise nearly every aspect of MRO operations. By offering the potential to reduce costs, increase efficiency and boost productivity, EMX Vision ensures that MRO organisations have the competitive edge they need to thrive in today's challenging marketplace.

1

Why do you think it is important that businesses have access to modern material management and procurement processes?
Access to modern material management and procurement processes is absolutely vital for MRO organisations. Given that materials represent a significant portion of an organisation's MRO costs, it's critically important to optimise material planning, procurement and storage.

Traditional labour-intensive practices for managing and tracking materials can often lead to mistakes, inefficiencies and high inventory carrying costs. In contrast, EMX Vision empowers MRO organisations with an AI-driven approach to material management. This includes forecasting material needs, planning procurement in alignment with need-by-dates and managing aspects such as storage locations and shipping.

By leveraging AI and machine learning, EMX Vision can predict material requirements based on work schedules and historical data, allowing for much more accurate and efficient planning and procurement. This minimises the chance of costly shortages or overstocks and ensures optimal inventory levels.

The end result is a dramatic reduction in inventory carrying costs, wasted materials and productivity losses, leading to enhanced operational efficiency and profitability. This makes modern material management and procurement systems an essential investment for any forward-thinking MRO organisation.

What advantages does EMX Vision offer MRO clients in terms of Request for Proposals (RFPs), Request for Quotations (RFQs) and Quoting processes?
EMX Vision acts as a powerful mechanism for MRO clients to secure a competitive advantage. Leveraging AI and machine learning, EMX Vision accurately forecasts a range of key operational dimensions far more advanced than traditional commercial analysis.

2

3

“Our AI-based recommendation engine will forecast requirements with precision, thereby removing exorbitant costs and inefficiencies”

These include labour costs, material needs, defect probabilities and TATs, providing MRO clients with robust and precise estimations, thereby increasing the level of accuracy, ultimately leading to a greater success. In the end, organisations are better prepared to propose more precise and competitive quotes, thanks to the precision data provided by our systems.

In addition to front end predictions, EMX Vision aids MRO organisations in effectively allocating resources, contributing to more efficient cost management. By reducing estimation errors and facilitating enhanced resource allocation, EMX Vision boosts operational efficiency, magnifies competitiveness and enables MRO organisations to improve profitability while maintaining, or in many cases, reducing operational costs, ensuring that the contract that are won are also executed as effectively as possible.

What can you tell us about the additional AI-based impacts that EMX Vision plans to introduce in key areas of MRO operations?

EMX Vision’s AI-based scope doesn’t stop with planning and forecasting. The solution is geared to unleash further benefits through added use cases within MRO operations in the near future, such as additional data access with integrations and floor level support functions.

Upcoming advancements will impact material management, procurement and aligned processes, including tooling, ground support equipment and need-by-dates planning. Our AI-based recommendation engine will forecast requirements with precision, thereby removing exorbitant costs and inefficiencies related to inventory mismanagement, over-storage or lack of timely procurement.

Moreover, EMX Vision is working towards enhancing workforce distribution. By harnessing algorithmic staffing adjustment recommendations, skill-based crew building and task assignments, we aim to optimise workforce distribution and task assignments. This approach will likely lead to substantial increases in productivity and reductions in span times.

Also, we’re looking towards introducing an intuitive interface for seamless access to mission-critical information. This expansion of AI-based impacts will further drive precision, efficiency and highly informed decision-making, leading to overall workflow enhancement in an industry that’s ever-growing.

1. Accurate predictions will lead to reduced operational costs and greater efficiency
2. EmpowerMX software offers real-time monitoring
3. Workforce distribution can be better planned

CHANGE FROM THE GROUND UP

As low-cost carriers and their business models continue to evolve, **Mabel Kwan** notes that challenges such as inflationary pressures and pilot shortages also present opportunities for further innovation

"LCCs can build on their past success to reinvent and future-proof their business models in response to changing market conditions"

Mabel Kwan is managing director at Alton Aviation Consultancy

For more information, visit altonaviation.com

At Alton Aviation Consultancy, we've recently explored how LCCs can further build on their past success to re-invent and future-proof their business models in response to changing market conditions. The success of this business model shift also relies on ground handling agents (GHAs) responding to meet the changing requirements of LCCs by adapting processes and adopting new technologies.

With an innovative approach, the LCC evolution – and the GHA response – can enable cost-effective travel that provides an enhanced customer experience and greater connectivity, while delivering business benefits to both parties. Here's how that will look.

The LCC shift

Alternative LCC models are beginning to emerge, with carriers moving into a 'hybrid' approach, offering features that place them in between traditional LCCs and full-service carriers (FSCs).

These hybrid LCCs, particularly those at hub airports, have moved away from their original business model of providing pure point-to-point services and are now offering travellers connection opportunities. Traditionally, LCCs did not offer connection options on airline booking engines, requiring LCC passengers to 'self-connect' with no facilitation at the airport.

Further enhancing the experience of traveller segments willing to pay higher fares – and to capture ancillary revenue – some LCCs have moved to offer additional bundled products and services more typically provided by FSCs, such as seat and meal selection, for higher fare bands and premium class passengers.

Meanwhile, new equipment and reduced operating costs have enabled LCCs to establish longer-haul flights, a segment that was traditionally a strong foothold for full-service carriers and their widebody aircraft.

Beyond this, while 98 per cent of the global LCC fleet currently consists of narrowbody aircraft, several LCCs have taken on widebody aircraft and operate a mixed fleet. About 40 widebody aircraft are also on the order books of six LCCs. This introduction of widebodies not only improves the commercial viability of LCCs serving the long-haul low-cost segment, but also presents opportunities

98%

While 98 per cent of the global LCC fleet currently consists of narrowbody aircraft, several LCCs have taken on widebody aircraft and operate a mixed fleet

"This introduction of widebodies not only improves the commercial viability of LCCs serving the long-haul low-cost segment, but also presents opportunities for LCCs to enter the cargo business"

for LCCs to enter the cargo business, which they have traditionally avoided because of limitations on narrowbody belly hold capacity.

The GHA response

The evolution of LCCs has added increased complexity to their operations. Despite this, the core principles of achieving cost and operational efficiencies remain important to the success of their low-cost business models.

For GHAs to create the most successful partnerships with LCCs and to future-proof their businesses, they need to adapt their offering to simultaneously meet traditional LCC requirements, as well as respond to developing models.

2

For example, as network connections grow for hybrid LCCs, GHA processes to ensure minimum connection times have had to change. Despite the additional cost, dedicated processes and resourcing for connecting passengers and baggage has been utilised by a number of airlines and GHAs to meet performance expectations.

GHAs could also be expected to service cargo operations for LCC customers increasingly taking widebody aircraft into their fleet. GHAs will need to prepare by ensuring they have effective processes and equipment in place to handle air cargo (some of which are time and temperature sensitive), while meeting requirements for short LCC turnaround times.

Cost efficiency

The additional process requirements in response to new LCC models need to be complemented by technology to drive organisational cost efficiency. With ground handling digital optimisation, such as automated data capture in aircraft and ground communication systems, real-time visibility across the ecosystem is now possible, enabling preventive intervention. Beyond status monitoring, advanced technology, such as using artificial intelligence to accurately forecast passenger flow at security control lines weeks in advance, enables dynamic planning and creates business intelligence tools, thereby improving productivity.

Airlines and GHAs need to adopt a collaborative approach to foster a strong partnership, beyond a transactional agent-client relationship. For instance, as LCCs increasingly channel their customer services and ancillary sales online and push self-service initiatives, the role of passenger handling agents has evolved from operational processing at counters to customer service ambassadors competent in issues management and building airline customer loyalty.

Ultimately, GHAs will need to devise ground handling strategies that complement the overall business objective of the airline – there is no one-size-fits-all at a time of rapid evolution. The symbiotic relationship between airlines and GHAs has become more apparent than ever.

1. Ground handling has had to change
2. LCCs need to future-proof their businesses

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MACHINE LEARNING

ILLUSTRATION PHIL COUZENS

Lee Woodward started Skyborne, one of the most modern and best equipped flight schools in the UK. But he dreams of the day when he can extend pilot training to even more people

Lee Woodard is in a good mood. This is hardly surprising as Skyborne, the pilot training academy that he co-founded and is CEO of, has just received the news that it has been selected by BA to be its partner for the airline's 'Speedbird' training programme, where talented candidates are given the opportunity to begin a rewarding career in the cockpit with the airline, regardless of their background.

Following a joint selection process, students lucky enough to get on the training school's UK CAA Integrated ATPL programme have the £99,500 of tuition costs covered in full.

The sponsored programme is the first that BA has run since the mid-1990s and it is hoped that under-represented groups in aviation, including people from Black, Asian and minority ethnic backgrounds and women will take part.

Finding a way to train promising candidates has been a lifelong passion for Woodward. Originally a pilot, he later set up a training academy. This was later sold in the 2000s, but Woodward banked the knowledge gleaned from the experience and considered how he might do better in the future.

There's no question that the industry needs to attract new talent. Following the pandemic, demand has outstripped the supply of suitably qualified flight crew around the world.

The demand for travel from the public took the aviation industry by surprise. "I think it's fair to say the United States is recovering at a faster rate than probably any other region on the planet right now, and I think the UK and Europe is somewhere in the region of 9-12 months behind what we're seeing in the US," says Woodward, adding that other regions, notably the Middle East and India, were also experiencing strong growth.

Funding

Despite the shortage of commercial pilots globally, there is one sticking point for would-be highflyers.

"The single biggest barrier in the UK is finance," clarifies Woodward. "The market in this country is just so far behind. In the US there are six or seven lenders that will loan the money, no problems. In Europe, there's ABN Amro and in France you can borrow from Credit Agricole."

It wasn't always this way. "In the early days [of his previous business] we had HSBC extending what was known as their professional studies loan, and it worked well, with 93 per cent of entrants taking that loan, but then the global financial crisis hit, and HSBC got out of that entire market. That loan covered doctors, dentists, vets, lawyers, you name it – and pilots!"

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Following the withdrawal of this product, for a time it was possible to get a loan secured on a valuable asset, usually property. This, of course, seriously narrowed the pool of applicants. However, at the time of writing, even this loan isn't available. "Now, it is principally the Bank of Mum and Dad," says Woodward, mournfully.

It is a real problem. Woodward estimates that the number of serious, eligible candidates is slashed by up to 95 per cent when there is no obvious way to fund the training, and those that can still train will naturally come from the wealthiest backgrounds. Projects like the Speedbird programme are welcomed with open arms, but there is only a set number of places available, so the number of people able to train is still somewhat limited.

2

The lack of funding for training isn't for want of Skyborne trying to get a package made available. Woodward says, "I've championed it and worked so hard to get a package over the past four of five years. We took it all the way to the CEOs of NatWest and RBS. We've shown and demonstrated what the risk looks like and how low it is."

Woodward explains that the organisation has established dialogues with secondary and tertiary lending platforms to provide a funding package for trainees. While no definitive agreement on a financial product has yet been reached, "some headway" has been made, although he is clear that getting even to this stage has been "labour intensive" and a "slow burner".

"What we're looking at now is an organisation that has the FCO (UK financial regulator) approvals and has the banking platform, but does not have capital. We can then put a prospectus out to investor groups to provide the funding to power the loans. That's where we're at right now," he says.

1

Courses

Another financial pressure comes as at Skyborne (as with other training academies), working during the course duration is discouraged.

"Frankly, if you've made that kind of investment, you want to have the odds in your favour of passing the training as much as possible," says Woodward.

Effort has been made to reduce as many distractions as possible. The course is residential and things like uniform and equipment are provided. There's a money-back guarantee should would-be pilots turn out to not have a head for

1. A trainee gets to grips with the controls in a simulator
2. Skyborne's Lee Woodward
3. Would-be pilots get a feel for flying in a variety of light aircraft

50

TONNE

Trainees can use a sim that replicates the Boeing 737Max, as flying a 50 tonne passenger aircraft is somewhat different to training in a two-seater Diamond DA42

2

heights after all, though Woodward says that this is very rarely claimed, as anyone who has managed to raise funds and start the course knows what the job will entail.

"The guarantee does go quite a long way to remove some of the anxiety associated with the consequences of failure," Woodward explains.

Training itself takes part in the classroom, on a variety of small aircraft and on flight simulators. Interestingly, the pilots will fly on the light planes before they are let loose on the simulators.

"We use light aircraft simulators as the pilots are beginning to learn their instrument flying and that's really where the simulator comes into its own, says Woodward, "because at that stage, the pilot doesn't really require visual reference, as they're very much learning instrument procedures and instrument procedures."

Simulators also mean that a variety of flight scenarios and weather conditions can be tried (where being able to fly by instruments alone is particularly important). Trainees will also be able to use a sim that replicates the Boeing 737Max, as flying a 50 tonne passenger aircraft is somewhat different to training in a two-seater Diamond DA42.

"SIMULATORS MEAN A VARIETY OF FLIGHT SCENARIOS AND WEATHER CONDITIONS CAN BE TRIED"

"First and foremost, you know, they're really honing their skills on how to apply an accurate instrument departure. But equally we can explore, particularly on the more complex multi-engine aircraft that we operate, using various scenarios," says Woodward. "Then when we get to the jet simulators, you're obviously teaching the pilot to operate in the multi-crew environment on an aircraft that weighs circa 50 tonnes and a swept wing jet with all the characteristics that are radically different from light piston engine aircraft. We also begin to introduce more complex failures where the non-technical skills are really developed, like teamwork and all of the crew resource management aspects."

No time like the present

For all the barriers to overcome in acquiring the funding in the UK, Woodward still recommends it as an excellent career.

"You know, it's a really exciting world going to fly with an airline," he says. "For the first three to five years, you're just getting to grips with it, but after that there's a whole plethora of options that most airlines will offer.

"I'm biased, but I still think it's the best job in the world. I mean, I'm 57 years old, and I've been in this now for 30 years. I still get excited. I love it. I love being around the whole environment. It's partly why I started Skyborne because I really am passionate about it.

"Personally I find it extremely rewarding to see a young man or woman about to embark on their career when I know what's ahead of them. It sounds a bit poetic, I know!"

Poetic or not, while there is commercial demand for pilots, a way will surely be found to get more of them from dreaming to being on the flight deck soon.

1

1. Some training is classroom based...
2. ...While some takes place in the sky

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▲ Digital records are starting to be used in MRO

Modern MRO Management

Airlines of all sizes need to conduct maintenance operations and software allows for the most efficient way to manage a fleet

Any regional airport is likely to have a mix of aircraft on its aprons. From turboprops to bizjets and from narrowbody jets to piston aircraft and perhaps even the odd gyrocopter, these machines are tied with a common theme, which is the need for frequent and thorough maintenance.

Keeping track of maintenance and inspections on the mechanical, hydraulic and avionics systems is obviously critical, but so are the parts of an aircraft that the users touch, feel, sit in and otherwise interact with.

Apart from the obvious safety considerations, keeping track of maintenance in the aircraft cabin is good for business. Imagine having to de-plane a passenger on an otherwise full flight because their seatbelt buckle won't fasten? If that fault had been reported but not acted on, it would be a costly mistake in the long run.

Similarly, the residual value of an aircraft that has been impeccably maintained, and has the records to back it up, will obviously be higher than one without.

Managing tasks

Modern software packages can help with all of the tasks associated with MRO, including inventory management, work order management, scheduling and reporting in order that tasks can be completed around the aircraft's crew and flight scheduling, meaning problems like a faulty seat belt can be acted on before they become a major issue.

There are a number of packages available from companies including EmpowerMX, Ultramain, Swiss Aviation Software (Swiss AS) and Rusada, and these all have their USPs that can make them the best fit for one operator or another. However, while the detail of what they can offer might vary, the element that connects them is that they are all, to an extent, modular, so users can acquire the package that is most suitable for their needs.

John Stone, vice president of product management at software provider Ultramain says: "Being able to know and schedule all resources needed to execute a plan is critical to avoid downtime and delays. Having an efficient way to digitally communicate additional work requirements found during a check to customers and obtain their authorisation to proceed, with agreement on additional costs, is critical to minimising overall

1. MRO operations underway
2. Repairs can be logged with software for greater efficiency

2

"KNOWING WHAT YOU SHOULD BE DOING, WHAT YOU ARE DOING AND HOW YOU ARE DOING IS CRITICAL"

check time and receiving timely payment without billing disputes.

"Knowing the work completion status of each task at all times informs management if the check will be accomplished according to the plan – and if not, why not," he continues. "Knowing in advance if the check plan will be profitable is critical to sustaining growth management. Knowing what you should be doing, what you are doing and how you are doing is critical to a successful MRO business. Successful execution of maintenance in accordance with the plan will result in satisfied customers, more business, more profit – and more growth."

1

Getting the right package and ensuring that it has been properly implemented and tested is critical of course. Dinakara Nagalla, CEO of EmpowerMX, is quite clear about the issues that could arise if the proper processes are not in place. "The implications for MRO operations are enormous. Uncertainty and inaccuracy in check completion times can lead to costly delays, inefficient utilisation of resources and erosion of customer trust," he says.

Paper trail

Getting rid of physical paper is the first and most immediate benefit of employing an MRO system. However, persuading all involved in the chain in a famously conservative industry can be an uphill struggle.

Chris Clements, sales representative at Swiss AS, notes that while there has been a desire to change to paperless systems from airlines, the rest of the industry have been slow to get their heads around the idea. "We have a major low-cost customer that became paperless over four years and a large part of their effort was educating the regulator. Then they needed to ensure that their lessors were happy to take digital records.

"With all that proven, we are now seeing regulators encouraging start-ups to go paperless from day one. But it's not yet the norm and when we bring customers on board, we regularly deal with mixed paper and digital records from the operator, third-party MROs and spare parts vendors – it means there is an important change management task from regulatory and company culture perspectives."

Peter Mortimer, VP, business development at Rusada, explains that for those using spreadsheets, disconnected databases or other legacy software to manage operations, transitioning to a modern integrated solution will be worthwhile. "Rusada has an extensive API catalogue for integrating with other software providers or aircraft hardware," he says. "We use the latest technology to ensure flexible and fast data transfer so that you are always able to see the correct information either within Envision or in your other tools. These interfaces vary from commercial finance packages such as SAP, with whom we have official accreditation, to predictive maintenance systems."

EmpowerMX's Nagalla agrees: "Many MRO organisations have limited access to comprehensive, real-time data that is intelligently prepared and delivered, leading to inefficiencies and reduced productivity.

"EmpowerMX's EMX Vision uses data to forecast crucial aspects of MRO operations. This offers MRO organisations a more accurate and comprehensive understanding of their reality on the ground."

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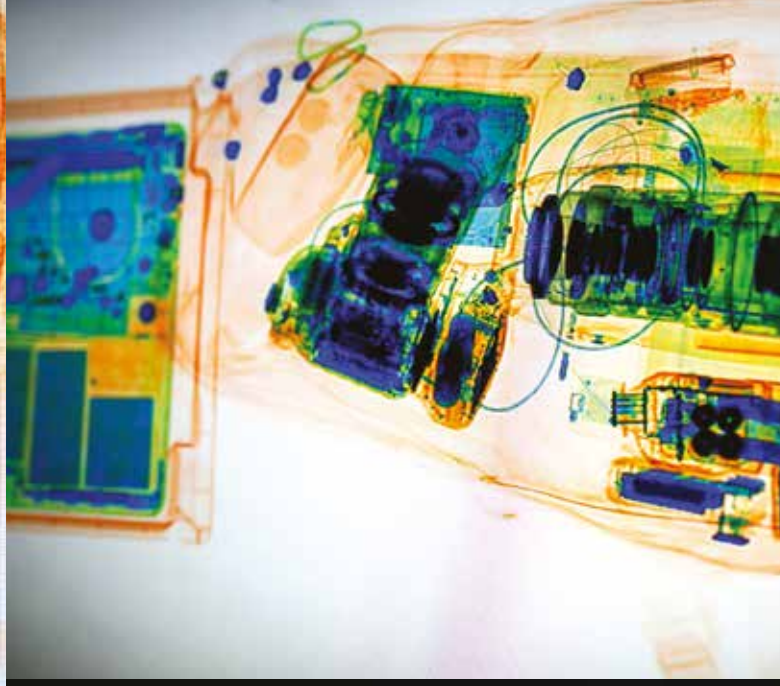
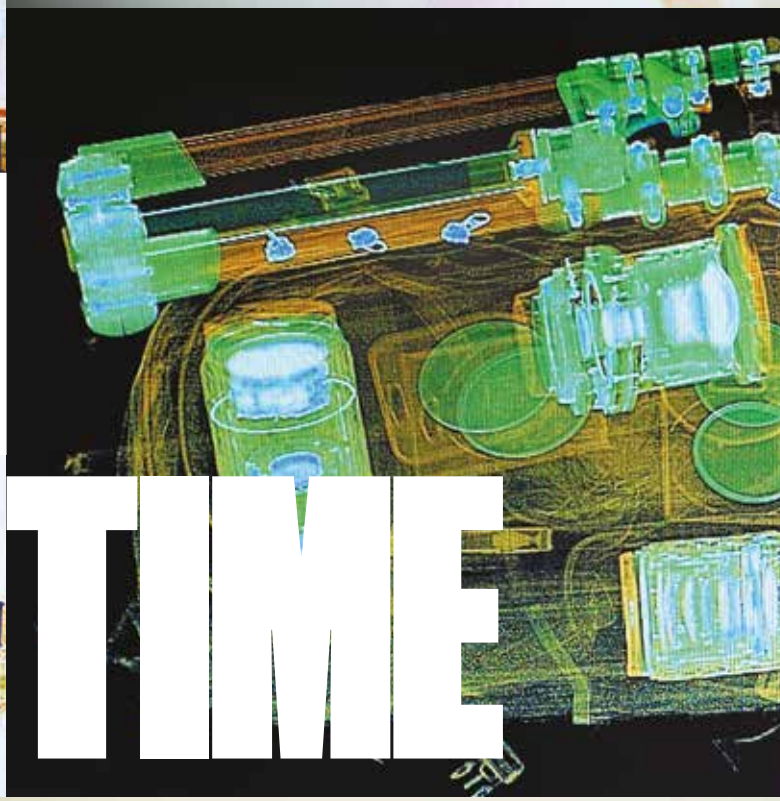
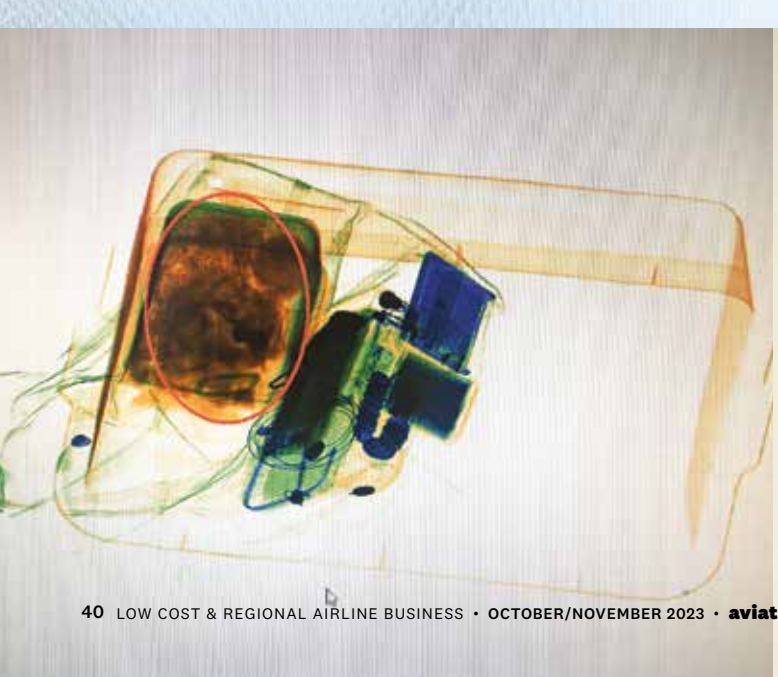


SCREEN TIME





Booming e-commerce during the pandemic put pressure on screening systems but has also helped to drive some advances. ***Kevin Rozario*** reports

The security threat from air cargo and baggage is ever-present. December this year will be the 35th anniversary of Pan Am's ill-fated flight 103, downed over Lockerbie in Scotland due to an explosion in the aircraft hold: it killed 273 people.

The incident is a reminder of the terrorist threat, but it is not the only one. Aviation faces many others such as the carriage of illegal goods, biohazards, rare species and fireworks, as well as emerging threats like lithium batteries. Alongside has come tightening global regulation from airline association IATA and other bodies.

Today, regulators request advance data from carriers and other parts of the supply chain with the application of risk management processes to target high-risk cargo that can help facilitate legitimate freight flows. Advance cargo information requirements are now implemented, or in the process of being implemented, in more than 110 countries worldwide, according to IATA.

The association has developed relevant standard messages (Cargo-XML) that are compliant with other international standards set by regulators such as the World Customs Organization SAFE Framework. "These assist member airlines and regulators in setting up requirements that can meet the regulators' objectives while taking into account the airline industry's capacity and constraints," states IATA.

In July, WCO and the International Civil Aviation Organization (ICAO) released a publication called *Moving Air Cargo Globally – Air Cargo and Mail Secure Supply Chain and Facilitation*. This third edition aims to mitigate security threats with updated information on security as well as raise awareness of how to better secure supply chains.

Most advance cargo electronic information is required before the arrival of an aircraft. However, several countries, such as Canada, European Union (EU) member states, United Arab Emirates (UAE), the UK, and the US, also request some advance data prior to loading (pre-loading advance cargo information (PLACI)) for additional scrutiny.

More focus on pre-loading

Newer pre-loading cargo rules for the EU and UAE are entering into force this year, while Canadian and UK requirements are expected to come in next year. Customs authorities are also increasingly looking at developing similar pre-arrival and pre-loading requirements for mail.

The Covid years showed that the industry could cope under stress. ICAO secretary general Juan Carlos Salazar comments: "Maintaining operational efficiency and commercial viability has always been at the cornerstone of ICAO's efforts towards improving aviation security, as demonstrated by the tremendous adaptability and resilience the air cargo sector showed during the pandemic."

Equipment manufacturers have helped by advancing technology to support the safe and efficient movement of cargo. Systems generally fall into four main categories:

X-ray scanners

The most common security screening solution for air cargo. They create x-ray images of cargo, which can then be inspected for dangerous materials or contraband.

Explosive detection system

EDS machines automatically detect explosive material concealed inside hold baggage and cargo.

Explosive trace detection

ETD systems use sensors to detect trace amounts of explosives. They can be used in secondary screening after x-ray machines for suspicious cargo items.

"NEWER PRE-LOADING CARGO RULES FOR EU AND UAE ARE ENTERING INTO FORCE THIS YEAR"

2

"RISK-BASED SCREENING IS ACKNOWLEDGED AS THE NEXT MAJOR STEP FOR AIR CARGO"

Computed tomography scanners

CT scanners also uses x-rays but create three-dimensional images of cargo. This allows operators to see inside items of cargo that would not be visible with traditional x-ray machines. CT units are more expensive but they offer a higher level of security.

Machine learning is also enabling new screening solutions to identify threats more accurately and efficiently. ML algorithms can examine image datasets of dangerous materials for example and 'learn' to identify them even when hidden or disguised.

1

One of the biggest players in the threat detection and screening technology market is Smiths Detection which uses all of the above and is probably best known for its Hi-Scan detections systems. The company has just launched the SDX 100100 DV series, comprising two dual-view x-ray scanners.

The high conveyor model (HC) is specifically designed to meet the needs of airports, parcel services, carriers, customs facilities and other high-security environments. The low conveyor model SDX 100100 DV LC supports the screening of oversized baggage and break-bulk freight up to 100x100cm in size.

Dual-view x-ray technology provides a horizontal and vertical view, facilitating the viewing of tightly packed objects and shortening inspection times. To further enhance security, the scanners can be supplemented with Smiths' automated threat detection software for weapons and lithium batteries (iCMORE).

Joachim Petry, product manager for hold baggage and air cargo solutions at Smiths Detection says: "With accelerated growth in international trade and e-commerce, very short delivery times and more interconnected global supply chains, the need for efficiency across the air cargo ecosystem, both in mandatory security screening and in screening for contrabands or dangerous goods, is ever-increasing."

Rise of risk-based screening

Smiths Detection sees risk-based air cargo screening as a good way to go because of the efficiencies it can generate using ML techniques. "The adoption of risk-based screening as a complement to other developments is acknowledged as the next major step for screening air cargo," says Petry. "Special treatment requirements for shipments from a high-risk origin country, or cargo that has obviously been tampered with, are already in place. Moving forward, aggregating data from various sources could provide a more refined risk analysis."

He adds: "Such integrated/networked security solutions should enable different security measures to be triggered automatically in response to a change in threat level, for example by applying different detection algorithms or automatically diverting all items from a high-risk origin country."

By using this kind of layered intelligence, and a higher level of interoperability between systems, security can be enhanced and sped up. Risk-based screening is also more flexible in that it can deliver a process that can adapt to changing circumstances while also complying with data and privacy laws.

Petry comments: "The technical means to introduce risk-based screening are available now. Many of the latest security solutions can integrate sensors and interface with wider information systems to respond to changing threat levels by flight, destination or sender."

3

1. The Dual View Hi-Scan system in action
2. As air cargo figures rise, efficiency is of the essence
3. Lithium battery detection
4. Joachim Petry from Smiths Detection

4

$9 MILLION

OSI Systems' security division had a $9 million order in May from an international aviation customer to supply a range of inspection equipment platforms

Equipment suppliers like Leidos, Rapiscan and Smiths Detection, and screening service providers such as PRS Distribution and Airport Aviation Security already have machines using CT, x-rays and ML/artificial intelligence (AI).

Deployment of x-ray diffraction technology is a step up. Petry says: "It provides highly accurate identification of molecular structures and allows for greater accuracy in material analysis and detecting substances. Diffraction could be used to automatically clear alarms generated by CT scanners, as well as to identify currently hard-to-detect substances, such as narcotics and home-made explosives."

OSI Systems – the vertically integrated designer and manufacturer of electronic systems and owner of the Rapiscan brand – has been deploying security scanning at airports for many years, and is ramping up its business.

The company's latest deal was a $12 million service order from a European customer for its RTT 110 (real-time tomography) EDS, used for advanced security inspections. CEO Deepak Chopra says: "Through our global services team, we partner with airports to support efficient and effective security measures for air passenger safety."

The RTT employs a proprietary stationary gantry approach to provide high-resolution 3D imaging, enabling inspection of both hold baggage and air cargo while maintaining the capability to meet the latest threat-detection requirements such as ECAC HBS EDS Standard 3.

OSI Systems' security division also had a $9 million order in May from an international aviation customer to supply a range of inspection equipment platforms. These included the RTT 110, the Orion 920CT checkpoint baggage inspection system and the Orion 920DX dual-view x-ray system.

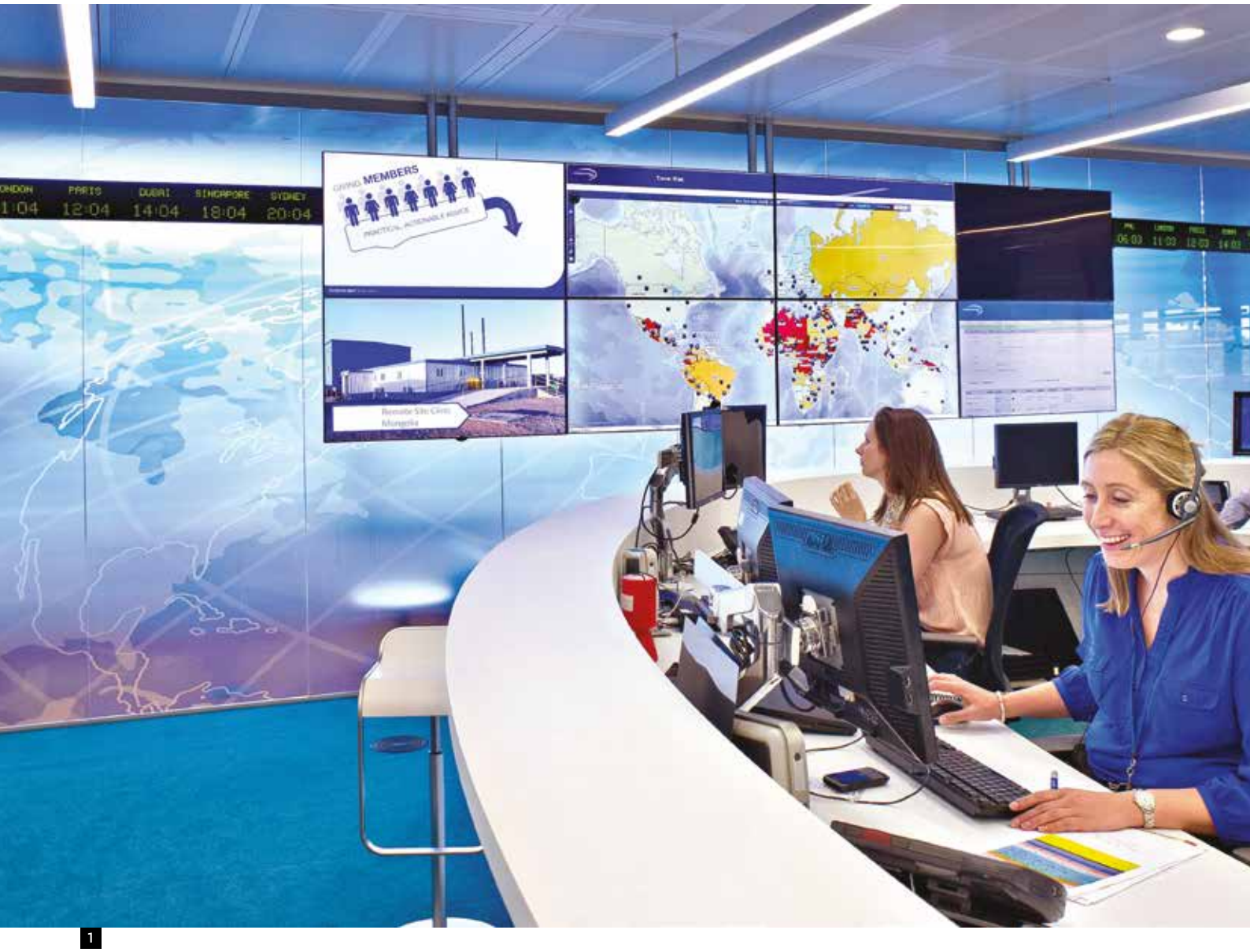
Manufacturers tend to operate multi-year maintenance services and support as part of their contracts in order to ensure a stable revenue stream. This also gives airports and air logistics providers peace of mind, knowing that downtime – which is operationally costly – will be minimal.

For major cargo hubs, like Hong Kong, Memphis (a big hub for FedEx), Ted Stevens Anchorage and Narita airports with consistently high volumes and/or multiple cargo locations, wide-area networks (WANs) can enable centralised and remote image evaluation.

Although centralisation is not new, shared image analysis is more novel. Smiths Detection's Petry says: "WANs can facilitate the real-time sharing of images between different areas of a building or sites (or even countries and continents) enabling greater resource prioritisation and efficiency. The benefits are clear when it comes to countries with many regional airports spread far apart which see fluctuating cargo volumes."

He adds: "The future of air cargo security will be driven by data informing risk-based decisions and using integrated sensors and devices from multiple providers. It will require open equipment interfaces and common data formats with an oversight mechanism to provide assurance on aspects such as technical standards, certification and liability."

This kind of open architecture OA in airport security screening needs to be stepped up as it can deliver more flexibility and quicker implementations of new services. The issue is the cost of linking systems seamlessly which requires the integration of third-party algorithms, data sharing and centralised image processing.



1

COVERED FOR MEDICAL EMERGENCIES

We pay a visit to a MedAire call centre to find out more about the emergency handlers for business jets

2

1. The call centre in West London
2. The firm has designed an app to help air crew
3. Emergencies can be responded to worldwide

Business aviation hasn't had a great press recently. You'll probably have seen pictures of private jets in Europe daubed with paint as climate protesters take a position on what they see as an egregious waste of resources.

What the protesters might not be aware of is the type of business such aircraft are often engaged in. Charter flights might be taking engineers to oil rigs (OK, they might not be wild about that) or teams to business meetings, but increasingly they spend a lot of time picking up very sick or injured people from remote parts of the globe and taking them to places where they can receive the appropriate treatment.

This is a point that is echoed by general manager of International SOS Peter Tuggey. "At a time when business aviation is sometimes characterised in an unflattering light, we get to see a different angle," he explains. "We get to see the best uses for humanitarian, evacuation and rescue – all the things that most of the world doesn't get to see."

However, the organisation of such flights and the resources that the crew will need takes a certain set of skills and contacts. This is where MedAire, a subsidiary of International SOS, comes in. Headquartered in Phoenix, but with offices in 27 locations worldwide, the company is well known for its comprehensive first aid kits for private aircraft, but it offers much, much more than that.

75%

The firm offers assistance and security for some 4,500 aircraft and 180 airlines of varying sizes worldwide. This includes 75% of Fortune's top 100 companies' corporate aircraft

As we found out when visiting the London office, the firm offers assistance and security for some 4,500 aircraft and 180 airlines of varying sizes worldwide. This includes 75 per cent of Fortune's top 100 companies' corporate aircraft.

Call handlers

Essentially the operation consists of call centres with operators all connected to each other and to large databases via their computer terminals, so if a call comes in with a passenger requiring medical treatment while in-flight for example, the operator can make recommendations to the crew, while arranging whatever assistance might be necessary on the ground at the same time. The company has around 5,000 hospitals on its books and some 92,000 audited medical and security providers in 90 countries.

"MedAire services are asset based, we are all about the aircraft," says Tuggey. "So everyone who crews it, travels in it or owns it can benefit from our services. People use their aircraft differently. Sometimes it's a contract flight, or perhaps it's your biggest customer flying on your jet, or perhaps you are moving your teams from A to B. Now they are covered by our services."

The firm can also provide advice on security issues, which is particularly useful in a world where a number of people are openly hostile to small aircraft, while it can also arrange for assistance on the ground.

The service is used more often than you might think as well. For medical calls alone, each year the call centre handles more than 300 calls per day, amounting to around 14,000 per year.

"We are not the MedAire you think you know," remarks Tuggey. "I would say that business aviation is really the incubator of innovation in aviation, and we [at MedAire] are no different to that." He goes on to add that some of the processes and apps introduced by MedAire have since been adopted by the wider International SOS group.

So, whatever the emergency might be, this company has it covered.

"WE GET TO SEE BUSINESS AVIATION FROM A DIFFERENT ANGLE"

3

WHAT A CARRY ON!

1

Carry-on luggage slows boarding and causes problems for LCCs, but is there an alternative beyond simply making bigger stowage bins?

Back in those long-ago times before the pandemic it was all but unheard of for airlines to charge for carry-on baggage. Most had strict dimensions for how large the bag could be, and Ryanair weighed cabin bags, but there was no question that you would be allowed to put an item in the storage bins.

This changed in early 2021 when easyJet began charging for the carry-on. In Europe, Wizz, Norwegian and Ryanair quickly followed suit. In the US, LCCs including Frontier, Spirit, JetBlue and Allegiant also started charging and by the end of the first quarter of 2021 it had become an industry norm. Even some of the legacy carriers now charge for cabin luggage on domestic and regional routes.

Strictly speaking, most airlines haven't been so crass as to literally charge for the bag to come on board. Instead, they have invented a new fare structure where you pay a 'basic' rate and get no allowance, but the 'standard' fare allows you to carry a bag into the cabin.

Far be it from us to question how LCCs increase ancillary revenues, but this practice has been questioned by many travellers on social media as the 'basic' price is now the same or more expensive than what the 'standard' price would have been before the new structure was brought in.

2

1. Safran Cabin's Embraer solution
2. 'Wheels First' storage

Decoy option

In sales terms, this is often known as 'decoy marketing' where a second or third option is introduced to make what might be perceived as a poor deal look more attractive.

It isn't simply a matter of extracting more money from passengers without them realising it though. The crush load of bags on budget flights needed to be reduced as there was never quite enough room for all of them to fly. This often meant that LCCs had to bribe passengers into checking bags into the hold anyway, and this was usually achieved by offering free speedy boarding or similar, although this is an option that generally isn't popular with either party.

"Passengers carry more and larger carry-on luggage into the cabin nowadays," according to Matthias Haas of Diehl Aviation. "On the one hand, there are business travellers who do not want to wait at the luggage belts and have optimised their cabin luggage to be their only piece of baggage. On the other hand, there are budget-conscious passengers who want to save on extra fees on checked-in bags and max out the amount and size of carry-on luggage."

"AIRCRAFT DESIGNERS HAVE BEEN INCREASINGLY UNDER PRESSURE TO COME UP WITH LARGER AND LIGHTER CABIN STORAGE OPTIONS"

All of this means that aircraft designers have been increasingly under pressure over the past decade to come up with cabin storage options that are both larger and lighter than what has gone before. They also have to work hard on making sure said bins can be reliably opened and closed tens of thousands of times over a period of many years.

Perhaps the best-known answer to this problem is Boeing's Space Bins. First demonstrated in 2015 and now flying in B737 cabins everywhere (and sold either as an option when the aircraft is new, or available for retrofit), the firm says it increased storage space by 50 per cent at a stroke. The design also meant that the storage was easier to open and close than conventional pivot bins.

As with any engineering development, the pay-off was that the bins are around 5cm lower than they were previously,

"THE PRODUCT HAS MINIMUM PENETRATION INTO THE CABIN IN AN 'OPEN AIR' CONCEPT"

which the airframe manufacturer said would make the vent and light controls easier to reach. Nonetheless, it did restrict headroom slightly for taller passengers.

Making space

A press statement from Boeing states: "Space Bins answer the call for more space to stow carry-on bags. Each of the larger Space Bins will hold six standard sized bags, two more than the large current Boeing Sky Interior pivot bins installed on many next-generation 737s.

"Airlines can expect quicker boarding and turnaround processes at the gate and passengers will benefit from decreased concern about finding a spot for their carry-on bag when boarding a flight."

The statement continues: "With a lower bin lip height, Space Bins provide increased visibility into the back of the bins and make bag loading even easier. They're also easier to close than the current pivot bins."

Boeing's option isn't the only product for LCCs wishing to magic up a bit more space for bags. Safran Cabin's ECOS overhead pivot bins are designed to take cases wheels first. The system has one bin bucket per seat.

23kg

easyJet's current premium Flexi fare product includes a full weight (23kg) check bag as well as an onboard meal, fast track security where available and lounge entry if travelling from its Gatwick hub

Paul Neary, VP Sales and Marketing at Safran Cabin notes: "In the product, we provided a large stowage solution with minimum penetration into the cabin in an 'open air' cabin concept. This brings a real advantage in providing a new bin technology for narrow body and regional aircraft, for both new aircraft and retrofitting existing fleets."

He adds that the bins increased stowage space by up to 60 per cent, mentioning that demand from business travellers on some types of regional aircraft to bring their carry-on from a long-haul flight onto a connecting aircraft was one of the motivations behind developing larger bins for Embraer E-Jet and Bombardier CRJ aircraft types.

Making larger and more efficient cabin bins is obviously one answer to the problem of too much luggage carried into the cabin. An interesting point to note is that since LCCs started to charge for hold luggage in the early 2000s, boarding time and delays actually increased. While it's inconceivable that carriers will simply include a hold allowance in the price of a regular ticket, it is possible that they will 'nudge' willing consumers into buying a ticket that gets them the check baggage as well as a few other perks.

As an example, easyJet's current premium Flexi fare product includes a full weight (23kg) check bag as well as an onboard meal, fast track security where available and lounge entry if travelling from its Gatwick hub.

If more customers avail themselves of an offer like this, then the problems with overloaded lockers and slow boarding can be avoided... but if bundled luggage, in-flight meals and lounge access becomes the norm, doesn't the future of the LCC look a lot like what came before?

▲ Expanded storage will always be at the expense of some cabin space

Green Sky

EURO SAF

New rules are set to start the phase-out of traditional jet fuel at airports inside the EU

For all the talk in the aviation industry about SAF, how much do you think you'll find in a typical airport? Perhaps one percent of the total amount of the fuel available?

Well, the European Commission has passed a proposal that will increase, albeit very gradually, the amount of SAF available at refuelling stations.

The proposed regulation sets minimum obligations for all fuel suppliers to gradually increase the share of sustainable aviation fuels supplied to operators at member state airports. The Commission aims to set the minimum share of SAF at each EU airport at two per cent in 2025, rising to five per cent by 2030.

An obligation is planned for synth fuel take-up

These modest amounts will then increase to 20 per cent by 2035; 32 per cent in 2040; 38 per cent by 2045; and reach 63 per cent in 2050.

A transition period until the end of 2029 is envisaged, in which fuel suppliers may supply the minimum share of SAF as an average over all the aviation fuel they supplied to EU airports.

Requirements

Within the requirement, a sub-obligation is also planned to promote the uptake of synthetic aviation fuels, such as fuel synthesised from algae or gas-to-liquid conversion from fuel industry by-products. This would increase from 0.7 per cent in 2030 to 5 per cent in 2035; 8 per cent in 2040; 11 per cent in 2045; and 28 per cent in 2050.

With a view to preventing what the European Parliament calls 'fuel tankering practices' (refuelling the aircraft with more jet fuel than necessary for the flight to avoid refuelling partially or fully at more costly destination airports), the proposed regulation establishes the obligation for airlines to ensure that the yearly quantity of aviation fuel uplifted at a given EU airport is at least 90 per cent of the yearly aviation fuel required.

63%

Amount of SAF required at EU airports by 2050

This provision was introduced with the aim of ensuring that the amount of fuel taken before a departure from an EU airport corresponds to the amount of fuel needed for the flight departing from that airport, while complying with the fuel safety rules.

The Commission has argued that tankering practices need to be addressed in the new regulation, as it believes they are detrimental both to EU efforts to reduce environmental impacts from transport and to 'level the playing field'.

On the one hand, increased weight due to a larger amount of fuel than needed for a flight would increase fuel consumption and related emissions. On the other, these practices – which are expected to grow because of higher aviation fuel costs for airlines – can result in a competitive advantage for some operators that are able to refuel at favourable prices at their home base, although we suspect that this would be a particularly difficult area to police, particularly with LCCs that might have aircraft making multiple stops in and out of EU airports through the course of each day.

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