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Orient aviation

DETERMINED TO BE VIABLE

CEO Karam Chand pushing Royal Brunei Airlines beyond its legacy carrier comfort zone

Orient aviation 24 YEARS

Asia-Pacific LCCs bet on long haul expansion

Manufacturers chip away at delivery backlog

CEO Piya Yodmani walks away from Nok Air

INDUSTRY INSIGHT SPECIAL REPORT
Data analytics defining modern passenger management

PUBLISHED BY

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Travelport
New Distribution Conversations
We'll manage IATA's NDC. So you don't have to.
In today's exciting world of evolving distribution strategies, as the first NDC Level 3 Certified aggregator, we don't believe the conversation should be about any single source of content or connectivity, whether that's IATA's NDC, API, classic ATPCo – or whatever new technology comes next. Instead, we believe that we should all be around the tech table, talking about ways to ensure that we continue to make the experience of managing and buying travel continually better for everyone.
How can I maximize value from IATA's NDC?
Download our eBook and join the conversation
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Second time round for long haul LCCs

When the AirAsia Group pioneered long-haul, low-cost flying in 2009 with the launch of Kuala Lumpur-London and then Kuala Lumpur-Paris in 2010, naysayers abounded. Unfortunately, they were right. A combination of a fragile global financial environment and fuel prices that were going through the roof shut down the routes in 2012.

Eight years on, although fuel is again on the rise, the operating economics of new generation aircraft have convinced some forward thinkers in the industry that the era of viable long-haul low-cost flying has arrived.

In recent months, Japan Airlines announced it would join early adopters, AirAsia X and Singapore Airlines-owned Scoot, in setting up a subsidiary to fly long-haul low-cost from 2020. The LHLCC, called TBL (To Be Launched) Ltd will commence yet to be announced services with two B787s.

In Vietnam, already home to big spending LCC Vietjet, new LCC, Bamboo Airlines, is targetting destinations in North America and Europe for its privately funded network.

Europe's Norwegian Air and Lufthansa-owned Eurowings already are operating into Asia. LEVEL, the LHLCC of the International Airline Group (IAG) is flying to North and South America from Europe. Analysts predict it won't be long before it turns its attention to the Asia-Pacific, home of the world's fastest growing airline market.

At present, the LHLCC market share is tiny, at around 2% on Asia-Europe routes, but it is increasing. An indication of the future was demonstrated by the AirAsia Group's mid-July decision to order another 34 A330neo. The Farnborough Air Show signing increased the company's commitment for the type to 100.

The order by Bamboo Airlines for 20 B787-9s should raise a red flag among its domestic competitors. These aircraft were built to fly long haul. It is evident that increasing numbers of Asia-Pacific's middle class travelers are enjoying budget flying within the region and are now looking to do the same further afield.

They will accept a no-frills cabin and ancillary charges for food and services if they can fly to their desired destinations at prices they can afford. When the trend for LHLCC flying takes off in the region, the foresight of AirAsia X, Qantas-controlled Jetstar, SIA's Scoot and JAL's TBL Ltd in moving into the market early should give full service carriers pause. They have been there once and have suffered as budget flying absorbed 50% plus in some Asia-Pacific markets from a standing start 16 years ago.

A broad church of thought among analysts is that full service carriers who ignore the threat of the LHLCC market do so at their peril. ■

TOM BALLANTYNE
Chief Correspondent
Orient Aviation Media Group

Nok Air CEO quits after 11 months

Piya Yodmani, who was promoted from deputy CEO to the top job at Bangkok-based **Nok Air** a year ago, unexpectedly resigned from his positions at the low-cost carrier on August 23. His acting successor is **Pravej Ongarsittigul**, a Nok director and chairman of the executive committee at the airline.

Yodmani, whose resignation takes effect on September 22, appears to be departing on good terms. **Nok chairman, Prasert Bunsumpun**, said the fifty-five year old had waited until all senior positions at the airline were filled before he submitted his resignation.

Piya succeeded long-serving Patee Sarasin following a period of management upheaval that culminated in a long dispute with the carrier's pilots. The cockpit protests forced the cancellation of hundreds of Nok Air flights and heavy financial losses for an LCC that already was struggling in the very competitive Asian LCC sector.

In the last 12 months the airline has improved its reputation for chronic delays by delivering an average on time performance of 88%, an improvement that was a key goal of Piya when he took over management of the carrier.

Elsewhere in Thailand, the industry awaits the impact **Sumeth Damrongchaitham**, the president of Thai Airways International (THAI), on the carrier's operations and bottom line. Sumeth has a big job ahead of him, especially as he has no airline experience. Before his appointment to head THAI, he was managing director of an asset management firm that was 99.9% owned by the Ministry of Finance. The government department invests and manages state holdings, including government-owned properties, across Thailand. THAI has failed to report annual profits for most of the last decade. ■

Internal turmoil continues at HNA Group

Not a week goes by without more news about the perceived perilous state of the **HNA Group's** indebtedness. The group is the parent company of HNA Aviation and the ultimate owner of several Mainland carriers.

In early September, the **Financial Times** reported that the turmoil at the group was not confined to its over-committed loan portfolio. It said management conflicts had escalated into boardroom infighting following the recent accidental death of the group's co-founder, **Wang Jiang**.

Wang died in late July when he fell backwards while taking photographs of a church in Provence in France. On August 1, the HNA Group board quickly appointed co-founder, **Chen Feng**, as sole chairman and confirmed **Adam Tan** as chief executive.

Since then the Financial Times has reported, Chen has overseen the appointment of his son, **Chen Xiaofeng**, as a board director and deputy CEO of the group. His nephew also has secured a senior management role in the conglomerate.

In the meantime, **Guang Yang**, a reported fundraiser for defeated 2016 presidential candidate, Jeb Bush, has left the company. "It's an absolute mess now. It's gone from under pressure to complete internal politics and breakdown," an unnamed source who has had a long association with the HNA Group told the newspaper. ■

IATA global study forecasts jump in aviation jobs worldwide

An **International Air Transport Association (IATA)** global study has revealed that 73% of respondents forecast the major areas of job growth in the industry will be in ground operations and the customer service and cabin crew sectors in the next two years.

Identifying and attracting talented staff to their companies was identified by 48% of survey respondents as a challenge, mainly because of availability of skilled candidates and their high salary expectations.

Aviation human resources manages said that career progression ranked as a priority for 49% of their applicants and 33% of them valued development and training as reasons to stay loyal to an employer.

Only 28% of respondents believed current training programs were effective with many of them complementing their in –house training with external partners to improve staff performance.

Technology was changing customer service roles, IATA said, but was not replacing them. Other areas of growth were security and roles for regulators.

IATA commissioned the survey to better understand the decisions aviation human resources managers make to manage retention, training and skilled professionals for airlines, airports and ground handlers. ■

Air New Zealand and Qantas remain top of the profit charts

For the fiscal year to June 30, 2018, **Air New Zealand (Air NZ)** and the **Qantas Group** reported impressive results. Air NZ announced net earnings of US$220 million for the year, the airline's second best results in its history.

In Sydney, the Qantas Group reported an after tax profit of US$685.5 million on an underlying profit of US$1.2 billion. Both carriers shrugged off rising fuel costs and intense competition to report record results.

In Auckland in June, **Air NZ CEO, Christopher Luxon**, said in a local media interview that the past 12 months had been his toughest year since he took on the job of running the carrier more than six years ago.

In the reported 12 months, the airline had to deal with a week-long rupture in the fuel line that supplied its airliners at its Auckland hub. Fuel had to be shipped from off shore and all staff endured huge customer pressure to maintain flight services. The airline is suing **Z Energy** and **BP** to recover losses of more than US$3 million from the fuel delivery breakdown.

Later in the year, corrosion on Trent 1000 engine blades that powered the airline's B787s were sufficiently numerous for the carrier to lease extra aircraft as well as train crews to fulfill customer bookings during its peak travel season. Several severe weather incidents also forced the carrier to cancel flights, an unavoidable situation that not every customer understood.

Ahead for the carrier are new routes from Auckland to Taipei and Chicago, the addition of new A320 family aircraft and three B787s to its fleet and management of rising fuel prices.

At Qantas, **group CEO, Alan Joyce**, said all the **Jetstar** brands in Asia were performing well despite intense competition from full service and low-cost rivals. They continued to give the group "a capital light foothold" in key growth markets", he said.

"The expansion of the Qantas hub in Singapore has been helped by traffic flows and onward connections with these airlines."

Strength in forward bookings and its continuing transformation program gave the Group confidence it could substantially cover higher fuel costs in the current fiscal year. The fuel bill in the current year is calculated at $2.87 billion, an increase of $504.4 million over the previous 12 months, Joyce said.

Higher fuel costs would be offset by savings from the Group's transformation program of $295.3 million. "We are facing another increase in our fuel bill for fiscal year 2018-2019. We are confident we will substantially recover this expenditure from capacity, revenue and cost efficiency measures as well as our hedging program," he said.

By chief correspondent, Tom Ballantyne. ■

Industry veteran Hill to return to Srilankan Airlines?

As **Srilankan Airlines** rumbles on in its shambolic way following a forced change of senior management earlier this year, it is rumoured that industry veteran, **Peter Hill**, who most recently has spent several years running TAAG in Angola, is returning to the carrier.

Hill was in charge of the SriLankan when **Emirates Airline** owned 44% of it. Hill then moved on to several consultancies before he took on **TAAG**, which also had the benefit of Emirates investment until the Gulf carrier sold out in 2014.

Emirates had a 10-year management contract with Srilankan but decided to walk away from renewal of the management agreement in 2008 after the government wanted paying Srilankan business class passengers to be bumped from a London-Colombo flight so family members of the then prime minister could be accommodated. Two years later, Emirates sold its equity in the carrier to the Srilankan government at a US$20 million loss. ■

Manufacturers chip away at aircraft delivery backlog

Boeing and Airbus have established aggressive goals for aircraft deliveries while the major engine manufacturers struggle to meet targets for both new and in-service aircraft.

Chief correspondent, Tom Ballantyne, reports

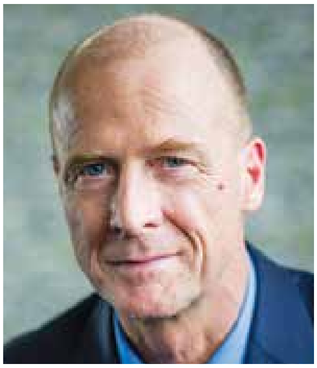
For a change, Airbus and Boeing are sharing some common ground. At their respective manufacturing centres in Europe and the U.S. dozens of their ordered jets are parked and unable to be delivered to customers because engines and other aircraft parts are missing production deadlines.

At press time, Airbus had close to 80 of its popular A320neo family aircraft waiting for engines from Pratt & Whitney because the manufacturer had missed delivery deadlines.

At Boeing in Seattle, at least 40 unfinished B737s and B787s were recently idle while the manufacturer's engineers dealt with the delivery of parts that had arrived out of sequence from suppliers.

The numbers tell the tale. In July, Boeing delivered 29 B737s compared with 56 in June. In the same month, it sent eight B787s to customers, down from 17 a month earlier, according to order-and-delivery data posted on the company's website.

Supplier shortages at Boeing and Airbus include LEAP engines from CFM International, a joint venture of General Electric and Safran. Boeing also is suffering



from delays and out-of-sequence arrivals of airframes from its subsidiary, Spirit AeroSystems Holdings. Spirit AeroSystems, in turn, is enduring delays from its own supply chain. At Rolls-Royce, in-service issues with the manufacturer's Trent 1000 engines on B787 aircraft continue to cause angst at the company and with B787 customers.

According to a report last month by Bank of America Merrill Lynch analyst, Ron Epstein, $1.8 billion of B737 inventory is sitting on the tarmac at Boeing's Renton complex. "The problem may worsen for Boeing before it gets better," he wrote.

"That said, Boeing is building inventory until it receives engines and other components. Once the parts arrive and deliveries are made, Boeing will have large cash inflows from airline customers and working capital."

Boeing chief financial officer, Greg Smith, has confirmed the company expected to deliver fewer B737s during the third quarter of this year before accelerating shipments by year end. Speaking at a Jeffries conference, he said work is being done to streamline production and tackle supplier bottlenecks. "We have a recovery plan in place for them and us, and it's about executing that plan," he said.

The question of compensation to airlines for late deliveries and the grounding of planes in service will be complicated. Last month Rolls-Royce gave a hint of the costs involved at its second quarter company results announcement.

The Derby-headquartered group has set aside US$1.9 billion to 2022 for the cost of repairs to its Trent 1000 portfolio. More recently, it revealed it was investigating serious issues with compressors in two batches of the engine type.

"We continue to be impacted by the challenge of managing significant Trent 1000 in-service issues and have recognized an exceptional charge of $703.2 million," said chief executive Warren East.

Fixing the engine faults is estimated to cost Rolls-Royce in excess of $761.6 million by year end, an additional $571.2 million in 2019 and $444.3 million in 2020. In May, the company confirmed it would retrench 10% of its workforce, or 4,600 jobs, to save $508 million annually. A company-wide restructuring is expected to cost $634.6 million to the end of 2020, a figure that will be offset by $508 million in annual savings.

While delivery delays at Airbus remain serious, they are easing. In July, Toulouse announced its second quarter profit had doubled after deliveries of its A320 picked up. Airbus CEO, Tom Enders, said the manufacturer had reduced aircraft waiting on the assembly line for engines from CFM and Pratt & Whitney.

In the first half of this year, Airbus delivered 110 A320neo. "Our operational focus in commercial aircraft remains squarely on securing the production ramp-up," Enders said. "Neo deliveries surpassed those for the original A320 model in the second quarter and the company stands by a goal of 800 handovers across its full aircraft lineup for 2018 although the target remained challenging." ■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ASIA'S LOW-COST CARRIERS BET ON INTERNATIONAL EXPANSION

New generation aircraft will propel Asia-Pacific low-cost carriers onto long-haul routes that will carve out a new passenger sector at the region's airlines.

Chief correspondent, Tom Ballantyne, reports

When the region's largest long haul low cost carrier, Malaysia's AirAsia X, added 34 A330neos to its order book at the mid-July Farnborough Air Show the commitment underscored the determination of co-founder, Tony Fernandes, to return the low-cost airline group to Europe after a six-year hiatus.

Speaking at the Farnborough signing, AirAsia Group co-founder and AirAsia X Group chief executive, Kamarudin Meranun, made clear the group's ambitions. "Long haul low-cost is something we strongly believe in. This order shows our confidence in the AirAsia X model," he said.

"We lobbied hard for the A330neo following the success of the A320neo. Working closely with Airbus, we are confident we have an aircraft that will allow us to expand our low fares offering beyond the Asia-Pacific to the rest of the world."

With its expected deliveries, AirAsia X will have the capacity to go global as the order was in addition to the 66 A330neo it already has in the Airbus order book. The announcement also confirmed AirAsia X as the largest LCC wide body airline in the Asia-Pacific and the biggest customer of the type with 100 orders. All the A330neo ordered by AirAsia X are for the larger A330-900. The Malaysian carrier will take delivery of its first -900 in the

fourth quarter of next year.

The aircraft can fly non-stop from Kuala Lumpur to Europe, including London, and will allow AirAsia X to offer very competitive fares between Europe and Asia.

There are 12 LHLCCs in the region that operate 92 wide body aircraft, including a fleet of 31 aircraft at three airlines in the AirAsia X Group.

Indications are that long-haul, low-cost flying, despite questions about its viability, will expand. In a July report, consultancy CAPA said: "Wide body LCCs have launched nine Asia-Europe routes in the last two years. There are five LHLCCs competing in the market compared with two in mid-2015."

Three LHLCCs, Europe's WOW, AirAsia X and Indonesia's Lion Air Group will be flying between Asia and Europe by 2020. WOW will become the sixth LHLCC serving Asia-Europe from December 2018 with the introduction of Reykjavik to Delhi. Thai AirAsia is planning to fly to Eastern Europe in 2019 and Thai Lion Air is aiming for destinations to western Europe after 2020.

Ambitious VietJet has made no secret of its long-haul ambitions and is evaluating A330neos, A350s and B787s to extend its network to international cities. In June, a new Vietnamese LCC, Bamboo Airlines, agreed to buy 20 B787-9s at list prices of $5.6 billion to service its global ambitions.

LCC Bamboo is owned by construction company FLC Group. Initially, it will fly within Vietnam before expanding to China, South Korea and Japan and onto Europe and North America.

"We are excited about introducing these new B787s to our fleet as we prepare to launch long-haul operations to international markets," said FLC Group chairman, Trinh Van Quyet.. "Our long-term vision is to connect Vietnam to key markets within Asia, Europe and North America. The capabilities of these new state-of-the-art Dreamliners will help us achieve our goals."

China also is in the game with Hainan Airlines subsidiary, Beijing Capital Airlines, now flying to London and Vancouver. It has six A330-200s with one more to be delivered, four A330-300s with another two to arrive at the carrier and an order for two A350-900s. All the aircraft are earmarked for long haul expansion.

Asian airlines are not the only LHLCCs to fly between Europe and Asia. Apart from WOW, Norwegian Air serves Bangkok and Lufthansa-owned Eurowings flies between Thailand's capital and Cologne. Both carriers are unlikely to be the last to expand their reach from Europe to Asia.

By year end, British Airways-led IAG's LHLCC, LEVEL, will be operating to Boston, Montreal, New York Newark, Guadeloupe, Martinique, Buenos Aires, San Francisco Oakland and Punta Cana, along with a summer service to Los Angeles. Analysts believed it would not be long before the airline turned its attention to the Asia-Pacific, the world's fastest growing airline market.

In the region, Singapore Airlines-owned LHLCC, Scoot, flies B787s to Athens and Berlin. Last month Japan Airlines formally announced a corporate LHLCC entity initially to be resourced with two B787s. It is planned to be launched in 2020 and has European and North American destinations on its radar.

The region's pioneer LHLCC, Qantas-owned Jetstar, has held back from Europe, but it flies to Hawaii as do rival LCCs Cebu Pacific, Scoot, AirAsia and Korean Air-owned Jin Air.

LHLCCs hold two per cent of Asia-Europe capacity and are not forecast to secure more than five per cent of the market in the foreseeable future. Intense competition from full service airlines, including the Gulf carriers, and rising fuel costs make the Asia-Europe market a challenging proposition for LHLCC entrants, analysts said.

An alternative view is that new aircraft types - the B787, A330neo and the A350 – are making long haul low-cost flying more viable because of lower operating and maintenance costs. The sector could grow beyond a five per cent market share.

AirAsia X will be the first airline in Asia to operate the A330neo, with deliveries scheduled to

start in the final three months of 2019. The A330neo will operate out of AirAsia X bases in Malaysia, Thailand and Indonesia.

In a separate report last June, CAPA said 15 LHLCCs have been launched since 2012, including subsidiaries of Air Canada, Hainan Airlines, Korean Air, Lufthansa, Qantas, Singapore Airlines and IAG.

The LHLCC model has been around for a decade, but it is only recently that the size of the sector has started to be significant, CAPA said.

"It surpassed 500,000 seats a week in June 2017. While this represented only 0.5% of the global market, LHLCC business is growing rapidly and will account for more than 1% of the global market within the next year or two," CAPA said.

"Malaysia has the largest amount of long haul low-cost capacity at approximately 7%, followed by Australia and Singapore at 4% each."

LHLCC expansion in Asia is expected to be held back by familiar problems: airport and ATC congestion and slot shortages. On the other hand, the region's rapidly expanding middle class and their penchant for budget travel is expected to drive growth of LHLCC business whatever the logistical barriers. ■

Asia Pacific wide body LCC fleet

22	AirAsia X
18	Scoot
11	Jetstar
8	Beijing Capital Airlines
8	Cebu Pacific
7	Thai AirAsia X
5	NokScoot
4	Lion Air
4	Jin Air
3	Thai Lion Air
2	Indonesia AirAsia X
1	Lucky Air

Source: CAPA Fleet Database August 2018

NEWS

California cool for SIA's record breaking Singapore-New York route

Singapore Airlines (SIA) has turned to leading global wellness group, Canyon Ranch, to re-invent the cabin experience on the carrier's new ultra long haul Singapore-New York service.

SIA and the wellness global group will introduce new standards of cuisine, rest and relaxation for passengers on the 18 hour 45 minute flight between Singapore and New York. The carrier has ordered seven of the type and will be the first airline in the world to fly the A350-900ULR aircraft commercially.

"SIA is firmly committed to continually elevating our customers' experience to be the number one in the industry. Our new partnership with Canyon Ranch builds on that commitment, as well as our strong legacy of service, tapping into their deep expertise and science-based recommendations and strategies to deliver an even more comfortable journey for our customers," said SIA acting senior vice president customer experience, Yeoh Phee Teik.

The partnership focuses on:

Wellness Cuisines developed by Canyon Ranch chefs and nutritionists focused on nutrition and hydration and taking into account longer flight duration with less body movement. The menus are offered in addition to SIA's own meal selection.

Rest and Relaxation designed for passengers in all classes to improve the duration and quality of rest. Specific light settings provide better cabin ambience for rest and relaxation.

Guided Stretching Exercises led by Canyon Ranch exercise physiologists and accessible from the airline's IFE seatback system.

SIA operates 21 A350-900s and has ordered 46 more including the seven ULR variants. ■

The "connected aircraft" will transform airline operations

Equipment to track any aircraft flying anywhere across the globe is market ready, reports chief correspondent, Tom Ballantyne, as the International Civil Aviation Organisation moves closer to mandatory 15 minute monitoring of the journeys of every commercial airliner in the world.

The disappearance of Malaysia Airlines flight MH370 above the Indian Ocean on March 8, 2014 was a tragic wake-up call for the aviation industry, Inmarsat senior vice president, Strategy and Business Development, Frederik van Essen, told Orient Aviation during the recent International Air Transport Association's 74th annual general meeting in Sydney.

As a result, the communications company, as well as its rivals, has developed fully digital systems that can constantly track all airplanes in flight across the globe. The technology meets the requirements of the International Civil Aviation Organization's (ICAO) proposed Global Aeronautical Distress Safety System (GADSS).

Inmarsat introduced its SwiftBroadband-Safety (SB-S) monitoring system to customers in April at the International Air Transport Association's (IATA) Safety and Ops conference in Montreal.

"In addition to the current services it provides a secure internet link to the cockpit. Included in the service is free position tracking," said van Essen. Among carriers operating the system, although it has not been mandated by ICAO, is China's Shenzhen Airlines and Hawaiian Airlines.

The Civil Aviation Administration of China (CAAC) has ruled its airlines must contact ground operations every four minutes. "That is driving take-up from Chinese airlines," said van Essen. "The Chinese market is a difficult market to operate in. There are a lot of special requirements." After a 12-month trial, Qatar Airways inaugurated the Inmarsat system for tracking the Doha-headquartered airline's flights worldwide.

Since the disappearance of MH370, ICAO has been working towards implementation of GADSS, which will require all aircraft to position report automatically at least every 15 minutes from November this year. By 2021, all airlines must have the capacity to report their aircraft every one minute if one of them is in distress.

The Inmarsat system can, in addition to GADSS requirements, identify an abnormal event triggered by the pilot or if the aircraft is being manoeuvred. An effected plane will automatically start streaming the most critical flight data to the ground.

"We call it the 'Black Box in the Cloud' because it is. The most important black box data is streamed automatically to the ground. You no longer need to find the aircraft. You already have the data because it has been streamed live," van Essen told Orient Aviation.

He believed it could take up to two years before the new rules are mandated by ICAO as a global standard. "I have learned decisions at this level always take longer than expected. Already, digitally advanced airlines are doing it ahead of the pack. You will get the big mass when the mandate comes into force."

Can we say now we truly have global coverage? "Absolutely, although I always have to put in a little star: except for the extreme poles because we are using geostationary satellites. They can look at a whole side of the Earth but they can't serve just the top of the poles basically," he said.

"You could launch a satellite over the poles but it is a business case issue as there are so few flights over the poles. Airlines are asking for it but they do not want to pay too much for it. Launching satellites specifically for that coverage is quite expensive. Having said that, our cockpit solutions operate to 85 degrees north and that is quite high."

Van Essen said he cannot guarantee another plane will not go missing. "From a technical perspective, being in contact with aircraft all the time and knowing their positions is absolutely not a technical problem. The first airlines to invest in this technology are now flying with equipment that is doing that," he said. ■

ICAO investigators won't eliminate possibility of a third party fatally diverting MH370

Following the publication of the official report into the unsolved disappearance of a Malaysia Airlines B777 carrying 239 passengers from Kuala Lumpur to Beijing on March 8, 2014, the head of Malaysia's Civil Aviation Authority (CAA) resigned. His resignation took effect on August 14.

CAA chairman, Azharuddin Abdul Rahman, said the MH370 report had not indicated the loss of the jet and all onboard was caused by Malaysian aviation officials, but "there were apparent findings with regard to the operations of the Kuala Lumpur Air Traffic Control Centre".

"The Malaysian International Civil Aviation Organisation (ICAO) Annex 13 report into the loss of MH370 said air traffic controllers in Kuala Lumpur and Ho Chi Minh City did not comply with certain standard operating procedures that included a failure to initiate "emergency phases".

"Therefore, it is with regret and after much thought and contemplation that I have decided to resign," Rahman said in a July 30 statement. "I tried my level best to assist in the search for MH370 in the last four years and I am saddened to have to leave in these circumstances."

The authors of the report could not explain why the B777 vanished but said the course of MH370 had been changed manually. They did not rule out the possibility of an individual other than the pilots diverting the jet.

Investigators said the communication lapses by air traffic controllers in Malaysia and Vietnam on the night of the jet's disappearance delayed search and rescue operations. Investigators said the mistake happened as MH370 was about to enter Vietnamese airspace.

A Ministry of Transport statement said it would review the ICAO recommendations and "take appropriate" measures to prevent similar accidents. "At the same time, we will conduct a thorough investigation and take action against any misconduct committed based on the findings under the existing provisions of the law," the ministry said.

Malaysia's Department of Civil Aviation has been overhauled and absorbed into a re-structured Civil Aviation Authority of Malaysia.

Research recently published by the Britain's London School of Economics and Political Science (LSE) has forecast the connected aircraft would reduce airline operating costs by US$15 billion a year by 2035 and has the potential to eliminate 21.3 million tonnes of CO_2 emissions from flights in the same period.

Contemporaneous data from the International Air Transport Association (IATA) combined with interviews with airlines, regulators and suppliers was published in Sky High Economics: Evaluating the Economic Benefits of Connected Airline Operations which said the major benefits of the connected aircraft are fuel savings, reduced flight delays, air traffic enhancements, greater MRO efficiency and improvements in safety.

The LSE study said the new efficiencies could cut annual airline operating costs of US$764 billion by 1% today and by US$15 billion in 2035. Optimisng flight routes in real time based on more accurate weather information for pilots could save 1% in fuel per flight, the authors of the study, produced in association with Inmarsat, said. Based on current oil prices, annual savings for airlines could be up to 3.39 billion litres of fuel, 8.3 million tonnes of CO_2 and US$1.3 billion.

Long-term, the study projected enhanced communication to and from the cockpit could produce further annual reductions in fuel of 8.5 billion litres, or 2.5% of total global requirements, which translated into 21.3 million few tonnes in of CO_2 emissions.

Flight delays worldwide cost the industry an estimated $123 billion a year, the report said, with weather responsible for 70% of them. Connected aircraft can avoid more many episodes of adverse weather with digital technology that could save airlines up to $1.3 billion a year. Crew re-scheduling is responsible for 3% of flight delays, a figure that could be reduced by 66% with enhanced connectivity, the LSE study said.

IP-enabled secure real time data exchange between air traffic controllers and aircraft using satellite-based navigation, automated aircraft position

reporting and introducing digital datalink communications between pilots and air traffic controllers could revolutionise air traffic management and save airlines an estimated $3 billion a year, report lead author, LSE media and communications, Dr. Alexander Grous, wrote.

Inmarsat Aviation senior vice president market and business development, Frederik van Essen said: "With finite airspace available to accommodate increasing passenger numbers, airlines need to act now in considering the technology and infrastructure they need to future proof their operations."

The report is the second installment in the Sky High Economics series. The opening chapter explored the revenue and economics of inflight passenger connectivity. The final chapter will examine the impact of passenger connectivity on loyalty and behaviour. ■

DETERMINED TO BE VIABLE

Royal Brunei's Karam Chand is drawing closer to being the CEO of the world's youngest fleet, an operating position that will equip the carrier for its long planned expansion into Europe.

By chief correspondent, Tom Ballantyne

Royal Brunei Airlines (RB) CEO, Karam Chand, is having a busy year. For a start, thanks to the lengthening of Brunei's international airport's runway, the carrier will launch a non-stop B787 service to London from next month. Previously, the route was served via Dubai. The new service will reduce Brunei-UK flying time by three hours and a half hours.

"For the first time, Brunei and England will be seamlessly connected by a direct air link," said Chand. "With the capabilities of the aircraft, we are profiting from the runway at Brunei lengthening. We depart at maximum take-off weight so we can do London direct. The aircraft is capable and the runway supports it. No direct connectivity between London and Brunei was a missed opportunity. This is a big one for us."

Royal Brunei also has ordered seven A320neo, with options on another three of the type. The first two neos

"Come October our average fleet age will be two years. I don't know anybody in the world with a fleet that young"

Karam Chand
Royal Brunei Airline CEO

arrived in Brunei in May and June. "It does two things for us," Chand said. "One, we can increase frequencies in several markets. We want to be daily or double daily where possible. So, Singapore double daily, Bangkok double daily and Jakarta and Surabaya double daily.

"The second opportunity, with expansion to nine narrow-bodies is a growth opportunity. We have added Seoul and will add more frequency there. We are flying to Nanjing twice a week. We are flying to Hangzhou in China, so secondary cities [are a goal]."

The airline also hopes to return to Beijing. It is awaiting clearance for the route from China's regulators. "One of the significant issues of course is slots," he said. "If we get the slots we will operate Beijing by the end of this year. If we don't get the slots, we'll target the new airport, Beijing's second airport at Daxing, which will bring all the latest technologies and connections to the city as well."

At press time, Chand confirmed RBA will launch direct flights to Taipei on December 3. Tokyo is the next goal.

Chand presented the RB board with a forward network expansion strategy in July. "It's kind of obvious in a way. We don't have a very strong footprint in North Asia. We go to Hong Kong and Shanghai and we want to strengthen that. And then there is India. It is a very large market and we don't fly there. That's an opportunity as well.

"The attraction of the A320neo is its range. The seat capacity is not that significant. With 150 seats you can find new markets without taking too much risk. That's the exciting part. The other exciting part is we can execute a complete fleet regeneration. We will have the latest technology aircraft: the Dreamliners and the neos."

State-owned RB does not disclose its financial results, but Chand is more than happy with the carrier's progress. "In 2010, we had a five-year plan which is done and dusted. We have made significant improvements against all the performance indicators," he said. "In the current five-year plan we are very, very focused on increasing productivity and efficiencies."

The fleet planning was "a once in a decade opportunity to reset our cost base. We are doing that with maintenance costs, fuel burn and ownership costs. We are a 43-year-old legacy airline so we need to take cost out of our business from time to time.

"We also provide 80% of the seats to and from Brunei or very soon will be. It puts a huge responsibility on us as the national airline so operational reliability is critical', he said.

"The new fleet will allow us to do that. We are very lucky. Our on-time performance is 90% and we have maintained that quite well. Our arrivals are 92% actually. As the national airline with that kind of capacity we have to fly to places such as Singapore, Kuala Lumpur and Hong Kong where they can connect to other flights. Operational reliability is a very key part of that."

Chand told Orient Aviation reducing unit costs over the next three years is a priority. "We are saving up to 22% in fuel compared with the B777-200. The A320neo brings us a 20% saving compared with the A320-300. We are buying the aircraft, not leasing them, so we have lower costs there. Having the latest technology on both fleets is a huge outcome for us."

Service is not being ignored by Chand. "We pitched it to our team by explaining we are a boutique airline. We are never going to have a massive differentiated product vis-à-vis our competitors. But we are not a low-cost carrier, so let's be very service driven. It's our differentiating point.

"We are undertaking a Skytrax audit. We want to be a 4-star airline by the end of this year. We want to be a value carrier with very good service. We will have seat back audio video on demand in every seat. From this month, we put 1,000 items of entertainment on our planes. We are in a market where people are comparing you to other people and you have to do that."

"We are a network carrier even though we are one of the smaller network carriers. We are always going to have sixth freedom traffic on our planes," he said.

"In the last two to three years, we have changed the mix to a 50/50 split as opposed to 60%. It will eventually come down to 40% connecting traffic and 60% point to point. We are putting a big emphasis on tourism. In the past it was not a major economic issue, but the government is keen to reap the economic benefits of tourism. As the national airline we want to play our role in this initiative very actively." ■

Airbus embarks on big push for A220 business

Airbus welcomed its newest single aisle offering, the A220, in July after taking majority control of Bombardier's C Series program. Can the global aircraft manufacturer revitalize sales of the re-christened regional aircraft? And can it convince more Asia-Pacific airlines to order it? Chief correspondent, Tom Ballantyne, reports from Toulouse.

Airbus has identified North America as the major market for its new A220 aircraft, a region where the manufacturer expected to generate 40% of all sales of the former Bombardier C Series regional jet. The question is: can the A220 achieve a major breakthrough in the world's fastest growing airline region, the Asia-Pacific, where selling regional jets has proved to be an uphill battle?

The A220 type comes in two variants: A220-100 that fits into the 100-135 seat category and the A220-300 with a seat range of 130 to 160. Historically, Asia-Pacific airlines, whether full-service, low-cost or start-up, almost universally have built their fleets with larger A320s and B737s. Bombardier's sole C Series customer in the region is Korean Air. The airline operates six A220-300s.

Selling the regional jet in Asia will be a challenge, conceded head of sales for the A220, David Dufrenois, at a press conference in Toulouse shortly before the re-branded A220, resplendent in its Airbus livery, made its debut in July.

"We will try to convince some airlines with the A320 to consider the A220 at the same time. We also will have to tackle smaller regional airlines to see if we can help them to develop with the A220 with a module that is a bit less risky than the A320 and then go into the bigger league."

Or, as head of product marketing for the A220, Antonio Da Costa, put it: "The -100 is our lowest risk aircraft. It is an ideal entry level aircraft offering low costs to operate and perfect to open small routes. It is a great growth path for regional carriers that want to go beyond 100 seats as traffic grows."

Airbus took charge of the C Series program on July 1 with the formation of CSALP (C Series Aircraft Limited Partnership). Airbus owns 50.01%. Bombardier's holding is approximately 34% and the government investment arm, Investissement Quebec, is the third partner with 16%.

The Airbus investment has breathed new life into a program that was failing. Bombardier spent more than $6 billion - $2 billion over budget - to develop the C Series after its launch in 2008. By late 2015 it had received a $1 billion bailout from the Quebec government to keep the program alive. At the time Toulouse took majority control, 402 C Series planes had been ordered and 38 delivered to customers from early 2017. If the A220 is to succeed it will need to win significantly more orders.

The existing production line in Mirabel Quebec is designed to deliver 120 jets annually, a target that is far from being achieved. A second production line is being built in Mobile, Alabama alongside the existing Airbus A320 Final Assembly Line. It is scheduled to open in 2020 and will have a production capacity of 50 to 60 aircraft a year.

The joint venture has started well. A day after the A220 reveal in Toulouse, U.S. airline, Jet Blue, ordered 60 A220-300s. At the Farnborough Air Show a week later, 60 of the type were ordered by a planned U.S. start-up that has Jet Blue as an investor.

Airbus sales leaders are supremely confident in their ability to deliver more sales of the airplane. Head of customer Service for CSALP, Rob Dewar – known as the father of the C Series – said Airbus brings a world leading capability to the program.

"It has huge production rates and its ability and network of suppliers will be very helpful. I can see in the discussions we have had in the last seven months that there is a lot of capability and help that came [to us].

"Basically, we are going to build sales volume and ramp up the program. Volume will help us and our suppliers to reduce our downward earnings curve and lower production costs. We have had some preliminary discussions with our suppliers. They are very supportive. We are confident that together we are going to develop a very successful program."

Dufrenois added: "I need to sell the aircraft. That is my job under the leadership of Airbus chief commercial officer, Eric

> "The Asia-Pacific was probably not the first market for the C Series, he said, but the region could still account for 15% to 20% of sales. It's a great market for the 100-150 seater. You are right. The A320 has been very successful in the Asia-Pacific and still dominates the market. We will probably have to find a start-up, some airline that wants to start afresh with a new model"
>
> **David Dufrenois**
> Airbus A220 head of sales

Schultz. We have mobilized our sales teams worldwide and the feedback we have from the market is extremely positive. I don't doubt we will be successful."

Asked if Airbus could produce the new jet at a price customers are prepared to pay, he said: "yes, otherwise we would not continue an endeavor with this program. Airbus did a very thorough assessment of the market, including the pricing and the costing of the aircraft."

Before the acquisition, Airbus had been dismissive about the C Series and had downplayed the potential of the 100-150 seat market. Forecast demand in the A220-A319 category in the next two decades is for 7,200 airplanes. with 6,100 of the jets predicted to be in the A220 size. Airbus expected to win at least 50% of these orders, it said.

Dufrenois did not think Airbus could be accused of underestimating the market in the past. "We did give our colleagues at Bombardier a very hard time when it came to the C Series versus the A319/320 to the extent we grabbed a lot of this market. But that was not actually to underestimate the market itself nor the program," he said.

"John [Leahy, retired Airbus Commercial Aircraft sales chief, sales chief] said it was a cute little plane and I think he meant it. It is still a cute little plane. The point is that at one stage we had to make this decision. We have made this decision and we are going to make this C Series a great success.

"All the 100-seaters that came on the market were regional aircraft that were stretched, but Bombardier took the bet and the commitment to design a new aircraft specifically for the 100-seat market. It was extremely risky at the beginning because they were hitting the lowest part of the A320 segment."

A challenge for Airbus is marketing the A220 as it is essentially the same size as the A319, an aircraft with a common type rating with the A320 series. Dufrenois said the A220 will be "fully integrated" into the A320 family.

He conceded that "at the beginning" there would not be full commonality between the two cockpits and no common type rating. That is something that could be worked out in the future, he said.

"First of all, there are a lot of similarities in the cockpits, side sticks and similar technologies. The first focus is ramping up the program, building sales and cutting our costs. Then we can look at opportunities in development with the Airbus family. It will not be done in one shot. Our first priority is on the ramp up," he said. ■

Entering the era of fewer pilots in the long haul cockpit

By chief correspondent, Tom Ballantyne

Forecast demand for pilots in the Asia-Pacific to 2037 declined by five per cent, to 240,000 cockpit crew, said Boeing in its latest annual Boeing Pilot and Technician Outlook released last month.

The report said the region would account for 33% of demand for pilots as Asia-Pacific carriers expanded their fleets to 40% of airliners worldwide by 2037. Global demand by 2037 would be 635,000 commercial airline pilots. China alone would require 128,500 new pilots in the next two decades.

Airbus and Boeing differ in their forecasts of the make-up of the future global fleet. Boeing said it would be 42,730 jets. Airbus predicted a 37,400 global aircraft fleet. Variations aside, the numbers are huge and training academies are expanding, especially in the Asia-Pacific, to accommodate airline growth.

At the Farnborough Air Show in July experts said expanding crew training facilities worldwide may only be part of the answer to crewing aircraft in future decades.

Artificial intelligence (AI) could allow big jets to be flown by fewer pilots, particularly on long haul flights, said Airbus and Thales. The European manufacturers said AI was "a fertile avenue of exploration". They said crews of three or four pilots on long routes could be reduced to two by 2023 because technology would reduce cockpit workloads.

"That's not an absurd date. Reducing crew on long-range looks to be the most accessible step," Airbus head of engineering, Jean-Brice Dumont, said at a media briefing at the UK air show.

At Boeing, it is understood its engineers are examining the option of reduced manning for

the cockpit of the proposed midsized aircraft (MDA), a plane that could be in service by 2025. Boeing has made no decision about an MDA program.

Options included embedding of AI in cockpits, airborne connectivity that would allow for decision-making on the ground and replacement of current cockpit instruments with digital interfaces. Longer term, a fully autonomous commercial jet, developed along the lines of the driverless car, may be a reality by 2040, Thales said.

Cockpit crew cutbacks would most likely begin with cargo flights but for the aerospace architects of the world, it is progress. In the 1980s, cockpit crew numbers were reduced from three to two as new generation jets eliminated the need for flight engineers. Financial services group UBS said that a one pilot cockpit could save airlines $15 billion a year. From a passenger perspective, this is a most unwelcome outcome. A UBS poll revealed only 13 percent of respondents would board a jet flown with a single pilot.

There are other issues to overcome when re-engineering cockpit manning. There are safety reasons for having more than two pilots in the cockpit on long-haul flights and at least two on shorter journeys. The costs outweigh benefits, argue sceptics of the one pilot aircraft.

If it is assume new technology will make reduced cockpit crew manning inevitable, the biggest hurdle to this operating outlier would be regulatory. Convincing regulators of the safety of such a radical departure from past operating axioms as well as achieving certification for the change would take longer than the development of the one pilot cockpit.

Dumont said the single pilot operation is not an absolute must. "It may be necessary because of the disparity between the number of aircraft entering fleets and number of pilots needed to fly them," he said.

The pilot squeeze has shown up most recently in India where the government has been forced to extend the deadline for phasing out foreign pilots at the nation's carriers from December this year to December 31, 2020 because of a shortage of up to 250 pilots. It is estimated that Indian airlines, which have more than 1,100 airliners on order, will need 10,00 new pilots to fly the expanded national fleet.

Separately, the Qantas Group announced last month that it would build two rather than one pilot training schools in regional Australia with location of the first facility to be announced in weeks. ■

CFM International and IATA agree to MRO code of conduct

Joint venture engine manufacturer, **CFM International**, and the **International Air Transport Association (IATA)** have reached an agreement "to maintain and foster robust and open MRO competition as well as the competitive nature of its MRO model".

The agreement stipulates CFM will publish its Conduct Policies and associated Implementing Measures that support policies and guidelines for licensing, warranties, servicing, technical support, repairs, communications and contracting.

The OEM and IATA hope CFM's transparency about its MRO operating model will be adopted by other stakeholders in the aerospace sector. "This agreement reflects CFM's continuous commitment to customer satisfaction," the engine maker's president and CEO, **Gael Meheust**, said. ■

AIRCRAFT INTERIORS

Vistara orders Bluebox Wow portable streaming platform

Joint venture full service carrier, India's **Vistara**, has agreed that Scotland's **Bluebox Wow** will provide portable wireless IFE aboard its 21 A320s and additions of the type to the fleet from this month. **Vistara World's** 70 hours of video and audio content will be streamed wirelessly to the personal devices and laptops of Vistara passengers.

"With the introduction of wireless streaming of IFE content, we will deliver a product our customers have said they desired, enhancing overall customer satisfaction and experience with an efficient and cost-effective IFE solution," Vistara chief strategy and commercial officer, Sanjiv Kapoor, said.

"We are eagerly awaiting the final approvals required so we can deliver wireless IFE aboard Vistara. Bluebox is a powerful and convenient solution that suits Vistara's current needs and is flexible enough to support the airline's growth as well as keeping the airline's passengers engaged on its expanding network," said **Bluebox business development director, David Brown**.

Bluebox's portable wireless streaming platform can store up to 1.6 terabytes of film, TV, audio, games and other digital content. The lunch box sized unit has more than 40 airline customers. ■

Travelport embraces IATA's New Distribution Capability

Global distribution platform, **Travelport**, which was the first GDS to receive IATA New Distribution Capability (NDC) Level 3 certification, is conducting pilot programs with several carriers to determine how NDC works for them.

Travelport senior vice president and managing director air commerce, Derek Sharp, said in a recent company study that Travelport viewed NDC as an extension of Travelport's business of decades, "ensuring relevant bookable content is served to anyone wanting to book travel by whichever means they have chosen to connect" with us.

Travelport has launched a multi-year agreement with **Qantas Airways** that includes distribution of the carrier's content and integration in the national airline's NDC platform, the **Qantas Distribution Platform**.

"This is an important development in our roadmap and we are looking forward to working with other major airlines," said Sharp. "Our plans to offer an application enabling travel agents to book NDC content alongside GDS content are progressing well with products to be rolled out from the latter part of 2018.

"As well as embracing the technology that is available to us today, we know that even greater change is on the way. So whether the discussion is about NDC, automation demands or greater personalization or even artificial intelligence Travelport is planning for tomorrow and building solutions to drive your business forward." ■

Orix Corporation buys into HNA Group controlled lessor Avolon

Aviation to services conglomerate , the **HNA Group**, has agreed to sell 30% of its leasing subsidiary, **Avolon**, to **Japan's Orix Corporation** for US$2.2 billion. Avolon is controlled by **Bohai Capital** which in turn is majority-owned by China's HNA Group. In the August announcement of the sale, Orix said subject to government approvals, the deal should be finalized by November.

"By virtue of the acquisition of the shares of Avolon, Orix aimes to achieve sustainable long-term growth of its business by way of strengthening its access to the manufacturer order positions that Avolon holds and also further expand its aircraft leasing business investment universe," said an Orix statement.

Bohai acquired Avolon in early 2016 and then merged it with Hong Kong Aviation Capital. In the final quarter of that year it successfully bid for the CIT Group's aircraft leasing unit for what was reported at the time to be an all-cash transaction of US$10 billion. ■

Easing passenger irritation at Asia-Pacific airports

By chief correspondent, Tom Ballantyne

At any Asia-Pacific hub airport – and many of the region's smaller ones – long check in queues, backed up lines at security barriers and delayed flights are the norm. If that is the situation in 2018, what will air travel be like for the 4.1 billion passengers forecast to fly in the region in 2036?

SITA CEO, Barbara Dalibard, said the answer is "smart use of technology to help manage rising passenger numbers, limited infrastructure and increased complexity." Like its rivals, Sabre and Amadeus, SITA is banking on its offerings in biometrics, artificial intelligence, machine learning, robotics and Blockchain to cope with the air passenger bulge that is close to overwhelming many airports in the region.

"Biometrics is becoming more commonplace at airports worldwide. The technology is delivering secure seamless travel from check-in to boarding," said Dalibard. "We have biometric self-service solutions operating globally, including in Australia, the U.S., Mexico and the Middle East."

In acknowledgement of the importance of managing air passenger growth, the International Air Transport Association (IATA) has announced its inaugural Global Airport and Passenger Symposium (GAPS), which will be held in the first week of October in Athens.

The association said the primary drivers of change will be data-driven technology solutions. Primarily, they are the transfer of some airport processes off site, wider implementation of real-time exchange of operational data, back office efficiencies and innovation in identity management (One ID).

IATA and its OEM partners also aimed to improve aircraft design and on-board systems to provide airlines with more options for product innovation and revenue generation.

"Air travel is expected to double by 2036. The industry will not be able to handle the growth or evolving customer expectations with current processes, installations and ways of doing business. GAPS brings together experts to share research and learnings and collectively shape solutions for the future passenger journey," said IATA's senior vice president, airport, passenger, cargo and security, Nick Careen.

An estimated US$430 billion either is being invested in airport expansion or planned to be so. Accompanying this infrastructure pipeline is widening agreement that bricks and mortar alone won't solve the problem.

After Australia introduced ePassports in 2005, Sydney Airport began rolling out smartgates at its arrival terminals two years later. The technology, after some operational difficulties, was expanded to departure terminals in 2015. Now, the e-gates are the primary method for processing travellers through Australia's major international airports. At peak travelling times, a single SmartGate can handle as many as 150 passengers an hour or one person every 24 seconds.

A number of the region's airports are experimenting with biometrics to speed up passenger processing. Last May, Seoul's Incheon International Airport launched SITA's self-service bag drop technology at its new Terminal 2 to cope with the recent Winter Olympics Games visitor influx and to prepare the airport for the 100 million passengers a year it is forecast it will need to process by 2030. Drop&Fly simplifies the bag drop process, commands less space in terminals and improves accuracy in baggage handling.

In June, the Malaysia Airports Berhad, which operates the country's 39 airports, introduced a mobile app that applies Big Data Analytics (BDA) to the passenger experience. Using MYairports passengers can plan their journey to the airport ahead of time and be navigated intelligently from airport check points to the boarding gate in the fastest possible time.

Malaysia Airports is undergoing a digital transformation with BDA

DATA ANALYTICS DEFINE MODERN PASSENGER MANAGEMENT

applications and the Internet of Things (IoT) devices that will anticipate foot traffic flows, manage facilities for passenger comfort and reduce queuing congestion.

MAB managing director, Badlisham Ghazali, said: "The MYairports mobile app is meant to help passengers plan their journeys in the palm of their hands. The app gives live updates of flight information, time left to board flights, shopping and dining promotions, critical airport information and way finding around the airport."

At London Heathrow, one of the world's busiest airports, Vietnam Airlines can move its flights from Gatwick to Heathrow because the airport's more efficient use of digital data allows it to add slots to its daily roster. It is technology that would benefit many of the region's congested hubs.

The Cloud, Blockchain, The Internet of Things and Big Data will better manage the tremendous growth of coming years. Amadeus' global head of commercial for travel intelligence, Didier Mamma, pointed out at the recent IATA Aviation Data

Symposium in Berlin that data was the key to unlocking so much opportunity, but it required a new mindset.

"There was an ever-greater need and opportunity for the industry to employ sophisticated personalization techniques and intelligent merchandizing to optimize their operations and reduce costs," he said.

"Airlines [and airports] that harness data and analytics for operational and customer experience transformation will be the winners," he said. "One of the success factors in becoming data-driven is creating a company culture that places data at the heart of the organization.

"The technologies that will change the future are not new, but they exploit the fundamental laws that are converting our world from analogical to digital and creating the foundations for innovation."

For airport operators, data mining provides great potential for revenue generation. With the relevant data, airports can prompt passengers to use their waiting time to shop and dine at venues digitally determined to match their preferences.

Dalibard said airline-owned SITA was investing in technologies with its industry partners, including a US$25 million project to tackle poor on-time performance. "SITA's technology harnesses advance machine learning and artificial intelligence to forecast aircraft arrival times as far out as 24 hours giving airports the opportunity to proactively manage and mitigate disruption," she said.

"Autonomous vehicles and the potential use of robotics is another field of development, with particular interest shown in Kansai Airport's trial of KATE, SITA's autonomous check-in robot."

Another example of the future of airports is baggage management. This year IATA Resolution 753, which heralds the implementation of baggage tracking, came into force. The tracking system's data identifies where baggage processes can be improved.

"We won't see a sudden change in 2018, but it is a real turning point for the industry as airlines begin to unlock the value of tracking data for the 4.65 billion bags they carry. Looking ahead, combining data collected from bag tracking with data science and machine learning promises even more significant improvements in baggage handling operations," said Dalibard. ■

Hong Kong wins plaudits for efficiency

A Global Airport Performance Benchmarking Task Force report released at a recent conference in Seoul awarded top scores to several Asia-Pacific airports for their superior operations in demanding situations.

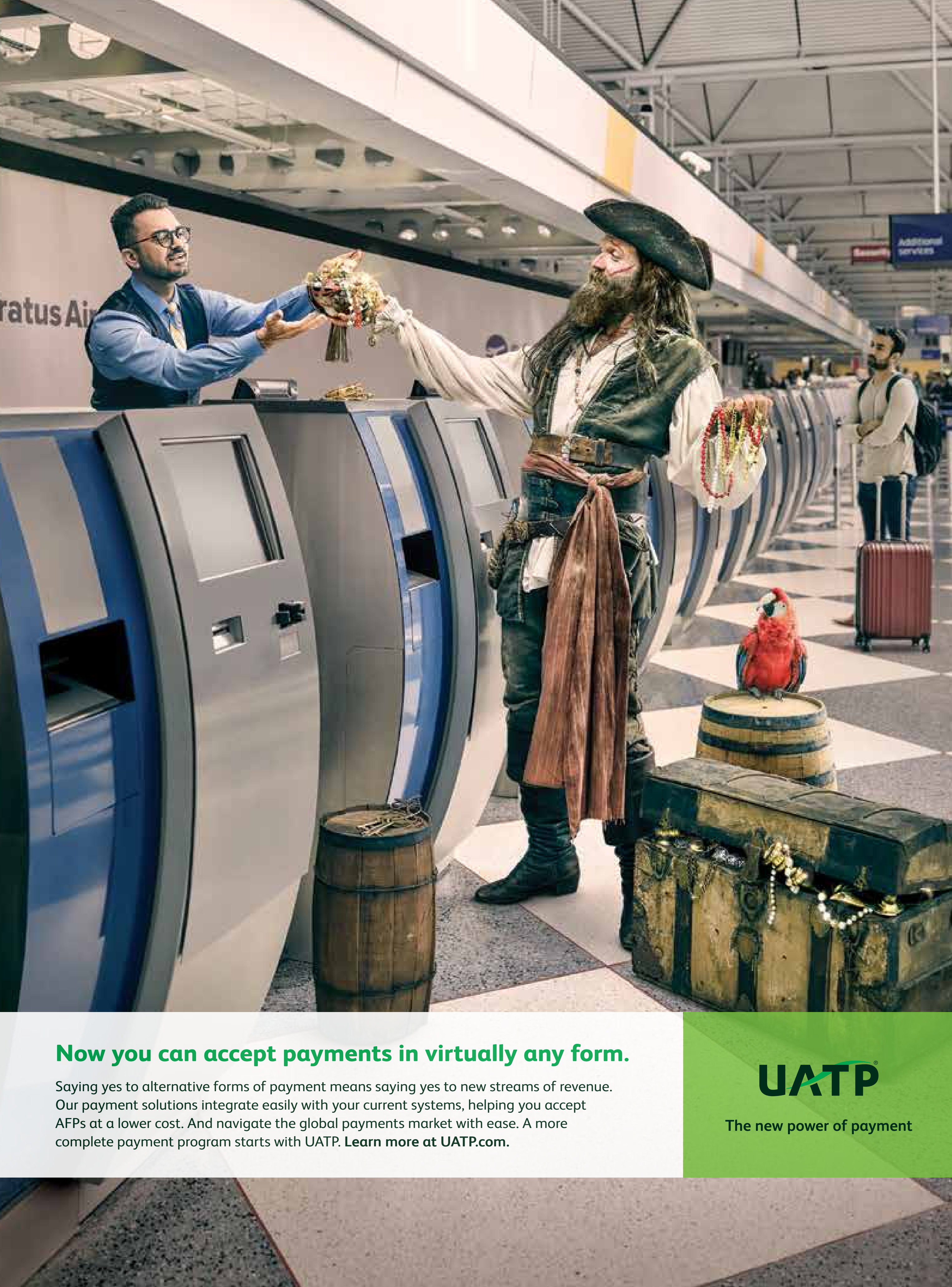
Hong Kong International Airport was named as the number one airport for performance in the over 40 million passengers per year category. A.B. Won Pat International Airport in Guam was ranked as the most efficient in the below 10 million airline passengers a year category.

Other winners in the region were Jeju International Airport at 25-40 million passengers a year and Gimhae International Airport at 10-25 million passengers annually. For the eighth consecutive year, Sydney Airport was determined to be the most efficient airport in Oceania, the study said.

The benchmark project is compiled by the College of Business at Embry-Riddle University in Daytona Beach, Florida with the goal of providing comprehensive, unbiased comparisons of airport performance worldwide.

The research team measured 205 airports and 24 airport groups for their productivity, operating/management efficiency, unit cost competitiveness and comparative airport charges.

"Airports have to be efficient and innovative to compete for airline business, passenger popularity and cargo operators," said professor of air transport management in Embry–Riddle's College of Business and the task force project's manager, Dr. Chunyan Yu.


Additional services
Now you can accept payments in virtually any form.
Saying yes to alternative forms of payment means saying yes to new streams of revenue. Our payment solutions integrate easily with your current systems, helping you accept AFPs at a lower cost. And navigate the global payments market with ease. A more complete payment program starts with UATP. Learn more at UATP.com.
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