

# TOPICAL REPORT

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### AIRPORTS



#### Improving operational efficiency to reduce airport costs (WEBINAR)

"Improving operational efficiency to reduce airport costs airport operationsAs aviation enters a post-pandemic world and begins recovery, minimising costs wherever possible will be imperative to the bounce-back of airports...Therefore this webinar looked at the areas within airport operations that can be most easily improved in regard to efficiency, and the technologies available to help implement this."

Source: International Airport Review

#### Preparing for the new normal: Enabling safe terminals whilst optimising costs

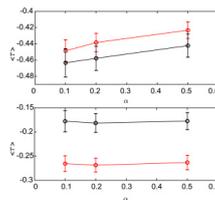
"Honeywell and International Airport Review hosted a webinar on 3 June 2020 exploring how airports can prepare for a safe return to travel amidst the unprecedented challenges that the COVID-19 pandemic has created globally."

Source: International Airport Review

#### Sharing information for a safer industry

"IATA launched the Security Risk Intelligence Portal (SRIP)—an incident reporting tool to help airlines mitigate and manage security risks. The portal

### AIR TRAFFIC MANAGEMENT



#### New centrality and causality metrics assessing air traffic network interactions

"Here we focus on centrality and causality metrics measuring, respectively, the importance of a node and the propagation of disturbances along links. By investigating a dataset of US flights, we show that existing centrality and causality metrics are not suited to characterise the effect of delays in the system."

Source: Journal of Air Transport Management

#### Characterizing the performance of queuing networks in terminal control systems

"In this study, air transportation networks are analyzed using a series of performance indicators that are based on a discrete-event system model."

Source: Journal of Air Transport Management

#### Air-Traffic-Based Synchronization of Ground Infrastructure

"This is a new method for synchronizing beacons for terrestrial pseudorangeing, with the aim of supporting a new generation of

### OUTLOOK



#### Post-pandemic Growth Opportunity Analysis of the Global Commercial Aircraft Market

"This analysis provides updates to the 2020 outlook of the commercial aircraft market focusing on original equipment manufacturers (OEMs), the supply chain, and aftermarket suppliers. Short-term, medium-term, and long-term effects are evaluated for multiple segments. Aircraft leasing companies are among the hardest hit for all three time periods."

Source: Frost and Sullivan

#### Europe; Visionary Innovation Leadership Award - Drone-based Food Delivery

"The global food delivery market has been growing at a rapid rate in the past few years. In 2018, the size of the global online food delivery market was \$82.04 billion, which is expected to increase to \$199.35 billion in 2025, at a CAGR of 13.5%. However, as the market grows, so will the number of delivery vehicles and the resulting increase in congestion. In addition, the food delivery industry will have to address the other inefficiencies of a burgeoning market, such as the increase in delivery agent wages, the sub-optimal number of deliveries made, and accidents."

Source: Frost and Sullivan

also includes the latest state and airport restrictions and requirements imposed because of the COVID-19 crisis."

Source: IATA

## Coronavirus outbreak: safety measures at major international airports

"Following preventive safety measures by some of the major and busiest international airports to prevent the spread of coronavirus (Covid-19) after its outbreak in Wuhan, China, many others initiated similar steps. The coronavirus has spread to 77 more countries in a month, inviting border closures and health emergencies declared by a number of countries."

Source: Aerospace Technology

## COVID-19: The need for resilience propels innovation

"Airports around the world have been confronted with a sudden change, steering them off regular scheduled programming. Airports are facing uncertainty and pressing decisions in order to get back on track as swiftly and smoothly as possible. Resiliency and reconstitution plans are all being put together to provide a clearer direction in terms of newly developed policies and next steps."

Source: ACI

## AIR TRAVEL



## Siemens Offers UV Light as Cabin Disinfection Solution

"Siemens Smart Infrastructure USA has joined the effort to provide the aviation industry with options to guard against the risk of Covid-19 infection. The group is now offering UV light systems that it claims provide an effective way to disinfect aircraft cabins or buildings such as FBOs."

Source: AIOnline

## Airlines Aim for Takeoff as Lockdowns Ease and Demand Rises

"After a pronounced slump in air travel in the spring, airlines are adding back flights as they hope to salvage some lost revenue during the key summer travel season."

Source: USnews

## AIAA Aviation: Time for U.S. to get serious about electric, hybrid flight, report's author says

Alternative PNT for civil aviation. The paper discusses a variety of clock models and how the well-established Two-Way Time Transfer protocol can be applied to aviation, using aircraft as relays between ground beacons. With this setup we analyze real air traffic data to show how the proposed method could reduce the costs of providing APNT, while guaranteeing a network synchronized to within 50 ns."

Source: 2020 IEEE/ION Position, Location and Navigation Symposium (PLANS)

## Design and Evaluation of a Tool to Support Air Traffic Control with 2D and 3D Visualizations

"In this paper, we designed and assessed an application for visualizing air traffic in both orthographic (2D) and perspective (3D) views."

Source: 2020 IEEE Conference on Virtual Reality and 3D User Interfaces (VR)

## Analysis of Achievable Airborne Delay and Compliance Rate by Speed Control: A Case Study of International Arrivals at Tokyo International Airport

"Metering air traffic requires aircraft to delay their fly-over time at designated enroute fixes. This paper presents an analysis of achievable airborne delays by speed control. To ease real-world implementation, current practices set the same achievable airborne delay to all flights flying the same airway, instead of customizing the achievable delay for each flight."

Source: IEEE Access

## Measuring Airport Similarity to Create a Towering Decision Aid

"The focus of this project was on formulating a model and decision support tool to aid in the decision to build and maintain an Air Traffic Control Tower (ATCT). An important aspect of air travel are ATCTs, towers that help facilitate communication between the airport system and airplanes ascending and descending. ATCTs bring economic, safety, and efficiency benefits to airports and nearby communities."

Source: 2020 Systems and Information Engineering Design Symposium (SIEDS)

## AIRPORT



## Aircraft atypical approach detection using functional principal component analysis

## FAA Aerospace forecasts FY2020-2040

"The FAA has developed a set of assumptions and forecasts consistent with the emerging trends and structural changes taking place within the aviation industry. The purpose of the forecasts is to accurately predict future demand. FAA develops the commercial aviation forecasts and assumptions from statistical (econometric) models that explain and incorporate emerging trends for the different segments of the industry."

Source: International Federation of Robotics

## Post-COVID-19 technologies

"As the airline industry works towards a new normal, Hexaware considers the technologies that can overcome the challenges ahead."

Source: IATA

## AIRPORT



## Global Airport Privatization Practices

"The study attempts to provide the reader with a clear definition of airport privatization models and options, as well as the benefits that should arise from this type of joint ventures. It aims to clarify airport objectives from a public and a private perspective, and how the merging of public and private sectors could benefit entire communities. The importance of having a coordinated acquisition procedure with valid advisors is crucial for the balance of public bids. These ventures, if well executed, will create different growth opportunities inside and outside the airports' scope of operations."

Source: Frost and Sullivan

## The big bailout: AIR Issue 56 is out now

"In this issue: analysing government bailouts for airlines amid the Covid-19 pandemic, the impact of ridesharing apps on airports, the future of sustainable aviation fuels, and more."

Source: Airport Technology

## Is 5G the only wireless network that an airport needs?

"This whitepaper looks at the use cases, options and issues surrounding the modernisation of wireless communications for both passenger and operations"

Source: International Airport Review

"Congress should make advanced aerial mobility — the concept of new electric and hybrid aircraft delivering people and packages in novel ways — a national priority, the lead author of a NASA-sponsored report said today."

Source: AIAA

## Why airlines aren't rushing to redesign cabins for social distancing

"Air transport industry relying on small changes to reduce coronavirus transmission."

Source: Aerospace America

## AIAA Aviation: Boeing's "Confident Travel" effort targets permanent health improvements

"The coronavirus pandemic has tested the air transport industry like no event in history, but one Boeing executive believes that aerospace professionals already have the tools needed to overcome the challenge."

Source: Aerospace America

## All Scheduled 2020 AIAA Events Will Be Fully Virtual

"The American Institute of Aeronautics and Astronautics (AIAA) announced today that all scheduled 2020 events and forums will be held virtually."

Source: AIAA

## Find alternatives to quarantine

"IATA urged governments to avoid quarantine measures when re-opening their economies."

Source: IATA

## AIR TRAFFIC MANAGEMENT



## FACTS about ROBOTS – EuropeCOVID-19 compels aviation industry to speed up the modernisation of the ATM system

"Today's operational ATC concept does not allow other sectors to immediately take-over operations, if area control centres (ACCs) are taken out of service. This calls for a modernisation of the ATM system, building on virtualised ATC centres for ACCs and tower, with built-in business continuity, beyond national or regional borders."

Source: Air Traffic Management

"In this paper, a post-operational detection method based on functional principal component analysis and clustering is presented and compared with regard to designed operational criteria."

Source: Journal of Air Transport Management

## Expanding airport capacity of cities under uncertainty: Strategies to mitigate congestion

"This paper's objective is to optimise a privately owned airport system's capacity investment decision in a city under demand uncertainty. Next to the investment size, our real options model incorporates the timing of the investment, as well as the cost of congestion."

Source: Journal of Air Transport Management

## Service quality in a mid-sized air terminal: A SEM-MIMIC ordinal probit accounting for travel, sociodemographic, and user-type heterogeneity

"In this paper, we propose an analysis of the services provided by an Italian airport based on an SEM approach. Specifically, we propose a SEM-MIMIC ordinal Probit capturing the heterogeneity in perceptions of air transport passengers and identify groups of passengers with similar assessments of the services."

Source: Journal of Air Transport Management

## The effects of use agreements on airport efficiency

"Bilateral contracting is integral to the working relationship between airports and airlines. In the U.S., the three common types of airport use agreements are the residual method, the compensatory method, and the hybrid method."

Source: Journal of Air Transport Management

## Deep Learning-Based Approach for Civil Aircraft Hazard Identification and Prediction

"Safety is an eternal issue in the civil aviation transportation. Once a civil aviation accident occurs, it will cause great casualties and economic losses. In order to ensure the civil aviation safety, the hazard identification and prediction of civil aircraft should be effectively and accurately realized."

Source: IEEE ACCESS

## Identification of critical airports for controlling global infectious disease outbreaks: Stress-tests focusing in Europe

"In this paper, analytical and realistic models have been integrated, for

## COVID-19 impacts and solutions to airport operations: Complete guide by Copenhagen Optimization

"This guide is for anyone involved in the airport operation – from the airport planner to the terminal manager and the airport executive."

Source: International Airport Review

## AIRLINE



## Analysis of the Global Airline IT Market, Forecast to 2025

"The major challenge for airlines is their dependence on legacy systems for their critical IT needs. Solution providers are developing digital solutions that will enable airlines to overcome this challenge and help them grow in their DT endeavor. The airline industry has faced numerous cyber threats over the past couple of years and such incidents have brought the focus of leaders to cyber security.."

Source: Frost and Sullivan

## Global Commercial Cabin Interiors Market, Forecast to 2030

"The study covers the global market and provides an 11-year forecast for the 2019–2030 time period. The total commercial cabin interiors market generated \$13.23 billion in 2019. The market is expected to grow at a CAGR of 0.9% and reach \$14.60 billion by 2030. The research covers commercial aircrafts cabin interiors market for cabin components, galley, lavatory, and seating. The aircraft cabin interiors forecast is based on new aircraft production of narrow-body, wide-body, and regional jets."

Source: Frost and Sullivan

## AUTOMATION

## The benefits of Robotic Process Automation

"As the aviation industry seeks to restart, RPA could be a potential game-changer, offering the opportunity to save costs, improve service and focus on higher value work."

Source: IATA

## Uber Designing eVTOL Skyports Despite Lack of Regulations, Standards

"Uber, through Uber Elevate, "is working with at least eight developers of electric vertical takeoff and landing (eVTOL) aircraft, to be used for urban aviation in concert with cars, scooters and other modes of public transportation."."

Source: AIAA

## FAA Approves Garmin's Automated Landing Technology for Small Planes

"Aerospace America reported that on Monday, the FAA approved Garmin's Autoland technology – "a set of software plus a radar altimeter and control servos that can land a small plane when a pilot is incapacitated."

Source: AIAA

## FABCE – FABEC ANSP Joint Declaration to deepen interFAB cooperation in support of the Single European Sky

"Air Navigation Service Providers from Functional Airspace Block Central Europe (FAB CE) and Functional Airspace Block Europe Central (FABEC) today signed a Joint Declaration to deepen cooperation with the aim of enhancing Air Traffic Management (ATM) performance."

Source: Air Traffic Management

## Air Navigation Solutions launches Attis Recovery Solutions for airports

"Air Navigation Solutions (ANSI) is today launching Attis, an operational compliance solution that will help airports to restart or increase operations as they recover from the effects of COVID-19. Many airports have closed or substantially reduced operations since March and, as they seek to scale up again, each has to confirm to the Civil Aviation Authority (CAA) that measures have been completed to ensure the compliance of their operation as well as the safety and proficiency of all staff."

Source: Air Traffic Management

## NAVCANATM to Supply ATM Technology for Tower Operations at Hong Kong International Airport

"ATM, a key technology supplier, announced today that it will be using its air traffic management technology, for the provision of an Integrated Tower System (ITS) for supporting the tower operations of the interim Two-runway System (I-2RS)

providing evidence on the spread dynamics of infectious diseases that may face Europe through the airlines system."

Source: Journal of Air Transport Management

## Mathematical formulations for large scale check-in counter allocation problem

"This article proposes novel exact integer linear programming formulations for implementing first-in-first-out queue discipline, controlling waiting time and determining variable counter allocation with adjacency constraints for real world problems."

Source: Journal of Air Transport Management

## Optimization of Aircraft Operations on Airport Surface

"This study presents the elaboration of an airport surface simulator using the output data of a first come first served (FCFS) planner to simulate the movement of these aircraft on the surface. Different scenarios of conflictual situations in airport surface traffic are analyzed and classified."

Source: 2020 IEEE 6th International Conference on Optimization and Applications (ICOA)

## AIRLINES



## Evaluating drivers of profitability for airlines in Latin America: A case study of Copa Airlines

"This research has identified a number of Key Performance Indicators that have underpinned Copa Airlines' financial prosperity through a Product and Organisational Architecture (POA) framework analysis whose results were validated and elaborated upon by the CEO of Copa Airlines."

Source: Journal of Air Transport Management

## Integrated airline productivity performance evaluation with CO2 emissions and flight delays

"This paper evaluates the airline productivity change by applying a modified global Malmquist productivity index (GMPI) model, incorporating both CO2 emissions and flight delays."

Source: Journal of Air Transport Management

## Price and marginal cost effects of on-time performance: Evidence from the US airline industry

and Three-runway System (3RS) at Hong Kong International Airport (HKIA)."

Source: Air Traffic Management

## **Aviation and Telecommunications come closer together**

"AirborneRF is TEOCO's connectivity data platform for beyond visual line-of-sight (BVLOS) drone operations in cellular networks. The solution enables information sharing between aviation and telecommunications. More specifically, how can mobile network operators and air navigation service providers (ANSPs) share information to enable the safe operation of drones in manned airspace?"

Source: Air Traffic Management

## **Skyguide launches U-Space Apps for drones**

"skyguide, the Swiss Air Navigation Service Provider, launches today its U-Space Apps for drones. These two new apps (mobile and web based) allow drone operators to efficiently plan and operate a flight including the airspace subject to air traffic control. Drone operators will be able to know whether a skyguide approval is required or not for their operations."

Source: Air Traffic Management

## **DSNA and Defence pioneering integration of MALE RPAS in civil air traffic**

"French civil and military authorities are committed to participation in the development of a European regulation to integrate Medium Altitude Long Endurance (MALE) RPAS in civil air traffic in nonsegregated airspace. During a three hour test, Bordeaux and Marseille control centers (ACCs) controlled a military MALE drone in their airspace FL 145 / FL 230 in a safe manner on the 19th of May, 2020."

Source: Air Traffic Management

## **AI in the Sky**

"Artificial Intelligence (AI) holds a great deal of promise to assist organisations with enhanced information to support tasks that still need to be led by a human. Air Traffic Management (ATM) is one of those areas where we've only seen baby steps to date due to the safety-critical nature of these tasks."

Source: Air Traffic Management

## **SESAR Deployment Manager creates ATM modernisation COVID-19 measures**

"In order to support its partners in the deployment of SESAR ATM modernisation projects amidst COVID-19, the SESAR Deployment

"We examine the impact of flight delay on market power in the U.S. airline industry. Consistent with the literature, our estimation results confirm that flight delays are associated with negative consumer welfare effects."

Source: Journal of Air Transport Management

## **A new model of luggage storage time while boarding an airplane: An experimental test**

"The boarding process is on the critical path of the turn-around. Reduction in boarding time can benefit airline carriers and airports and improve passenger satisfaction."

Source: Journal of Air Transport Management

## **Hassles of cabin crew: An exploratory study**

"The purpose of this study was to explore the hassles of cabin crew. Based on content analysis, this study extracted four themes of hassles: job hassles, peer interaction hassles, passenger service hassles, and personal hassles. Job hassles come from the gap between work standards and practical operations, inadequate service capacities of aircraft facility, irregular work schedules, and emergencies."

Source: Journal of Air Transport Management

## **An efficient airline seat reallocation algorithm considering customer dissatisfaction**

"an efficient airline seat reallocation algorithm to minimize customer dissatisfaction is introduced in this study, which is based on mathematical model-based optimization with several types of objective functions that reflect customer dissatisfaction levels."

Source: Journal of Air Transport Management

## **Research on Flight Fuel Prediction based on Historical Data Mining**

"With the rapid development of the air transport industry, aircraft fuel consumption continues to increase. Reducing unnecessary fuel consumption by more accurately loading aircrafts with fuel is emerging as an important consideration to enable airlines to optimize cost management and measures in response to energy conservation and emission reductions."

Source: IEEE INFOCOM 2019 - IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)

Manager has introduced a range of measures."

Source: International Airport Review

**UAS**



### **Droniq and Sky Drone enable real time command & control via mobile network for long-range drone flights**

"Frankfurt-based Droniq and Sky Drone have entered into a strategic partnership that allows Droniq to use Sky Drone's unique technology for controlling UAS (Unmanned Aircraft Systems) remotely in real-time and without any limitation in range. Droniq will act as the exclusive distributor for this solution in the German market.."

Source: Air Traffic Management

### **North Dakota to build a statewide unmanned aircraft systems (UAS) network**

"The State of North Dakota has signed an agreement with Thales to build a statewide unmanned aircraft systems (UAS) network for safe BVLOS operations and to support safe airspace integration of unmanned aircraft."

Source: Air Traffic Management

### **Altitude Angel and Inmarsat to offer air traffic management for UAVs**

"Altitude Angel, a provider of Unmanned Traffic Management (UTM) technology, and Inmarsat, a leader in global mobile satellite communications, today announced a collaboration to develop and deliver advanced flight tracking and management capability for Unmanned Aerial Vehicles (UAVs), commonly known as drones."

Source: Air Traffic Management

### **Aviation plus Telecommunications – the answer to safe drone management?**

"The sixth and final installment of the ongoing series of webinars from The Global UTM Association (GUTMA), the connection between aviation and mobile network operators (MNOs) was the topic of the day. Four speakers addressed this, all with views from different geographic regions. The companies joining the call were TEOCO, KPN, OneSky and Telstra."

Source: Air Traffic Management

## **Long-range drone flights now a reality**

"Droniq has launched the first fully operational traffic management system for drones in Germany. This means drones, also known as unmanned aircraft systems (UAS), can be safely integrated into airspace and commercial drone flights over long distances are possible."

Source: Air Traffic Management

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