

AIRS2026

Aviation Innovation & Research Symposium

24-25 April 2026



Editor: Prof. Dr. İnan ERYILMAZ

ABSTRACT E-BOOK



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Nevşehir, Türkiye

Aviation Innovation & Research Symposium

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AIRS 2026 - Nevşehir, Türkiye

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Published by: HAVADER Yayınevi

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Dr. Öğr. Üyesi Orhan YÜCEL	Kapadokya Üniversitesi
Dr. Öğr. Üyesi Cengiz Mesut BÜKEÇ	Girne Üniversitesi
Dr. Nusret ERCEYLAN	Atlantic Flight Academy

Symposium Program

UÇUŞ PLANI ONAYLANDI

AIRS2026 Uçuş Rotası
24 - 26 Nisan 2026 tarihleri arasında Kapadokya Üniversitesi Mustafaapaşa Yerleşkesinde gerçekleştirilecek etkinliğimizin detaylı dökümü

GÜN 1 / KALKIŞ
24 Nisan Cuma

GÜN 2 / SEYİR
25 Nisan Cumartesi

GÜN 3 / KESİF
26 Nisan Pazar

08:00
CHECK-IN

KAYIT BAŞLANGICI VE KARŞILAMA
Terminal: Oktay Sinanoğlu Konferans Salonu

10:00
TAKE-OFF

10:00 AÇILIŞ TÖRENİ VE PROTOKOL KONUŞMALARI

11:00 SPONSOR KONUŞMALARI (ADF MÜHENDİSLİK VE AFA)

12:00
SPECIAL

ÖZEL OTURUM
TÜBİTAK PROJE LANSMANI
Terminal: Oktay Sinanoğlu Konferans Salonu

A Study on Developing a Multi-Criteria Governance Quality Index for Civil Aviation Non-Governmental Organizations (NGOs)
İsmail Eryılmaz, Deniz Dikici, Aygün Dalkıran, Ayşe Aşık Yılmaz, Biyran Yildirim, Elif Çağrı Aytemir

12:30
CATERING

Öğle Yemeği (In-flight Catering)

14:00
FLIGHT 101

HAVACILIKTA YÖNETİM, İNSAN KAYNAKLARI VE KARIYER GELİŞİMİ

BOARDING

Avanos Salonu GATE A
STRATEJİK İK VE YETKİNLİK
OTURUM BAŞKANI:
DOÇ. DR. GÜLBENİZ AKDUMAN

1. Competency-Based Recruitment from a Strategic Human Resources Perspective: A Model Analysis of Cabin Crew Selection
İ. Gülbenez AKDUMAN, Gülşah KARAHAN

2. The Role of Aviation Student Clubs in Talent Development
İ. Arkan AR, Gamze ÖRMAN

3. From Wrench to Algorithm: Strategic Adaptation of Human Resources in the Aviation Maintenance Ecosystem. A Threat of Job Loss or a Role Evolution?
İ. Mehmet ERDEÇ, Ebru AYKAN, Adem ERDEÇ

4. Game-Based Teaching of Airport Operations: Design of The "Skyco: From Terminal to Route" Educational Board Game and An Investigation of Its Effects On Learning
İ. Rana ŞİMŞEK YILDIRIM, Şeyda Bursalı FİDANÇAK, Mehmet G., Serap KARAHANMAN, Yeliz ÇETİN

Ürgüp Salonu GATE B
LİDERLİK VE KARAR VERME
OTURUM BAŞKANI:
PROF. DR. DENİZ DİKİCİ

1. The Effect of Digital Leadership Perception on Adaptive Performance: The Mediating Role of Technostress in The Context of Air Traffic Controllers
İ. Yeşim TİM KILIÇ, Zeynep ŞİMŞEK, Biyran YILDIRIM

2. Manager Support in the Relationship Between Natural Decision-Making Behavior and Safety Climate: A Systematic Literature Review in Civil Aviation
İ. Aygün Sinanoğlu ENGERT

3. How Leader Support Reduces Mental Fatigue in Aircraft Maintenance Technicians: The Roles of Sleep Quality and Leader-Member Exchange
İ. Nurettin ERCEYLAN

Göreme Salonu GATE C
ÖRGÜTSEL DİNAMİKLER
OTURUM BAŞKANI:
DOÇ. DR. MEHMET ÖZTIRAK

1. Queen Bee Behavior in The Aviation Industry: A Qualitative Study of Career Advancement For Female Employees
İ. Tuğba İMADOĞLU KALKAN, Sıla KARŞIT

2. Turbulence in the Mind: The Impact of Organizational Gaslighting on Psychological Safety in the Aviation Industry
İ. Nurul MUHAMMAD, Mevlüt ÖZTIRAK

3. The Relationship Between Aviation Accidents, Decision-Making And Burnout Among Cadet Pilots
İ. Ayşel Merve KILIÇ, Emine Gül FİDAL, Yeliz ÇETİN, Savaş Çimen KESKİN

15:00
SERVICE

Kahve Arası (In-flight Service)

15:30
FLIGHT 102

KRİZ YÖNETİMİ, DAYANIKLILIK VE OPERASYONEL RİSK

BOARDING

Avanos Salonu GATE A
SİBER GÜVENLİK VE SİSTEM HATALARI
OTURUM BAŞKANI:
DR. ÖĞR. ÜYESİ CEMİLE ERGEN

1. Structural Complexity and Operational Resilience in Modern Aviation: A Case Study of the CrowdStrike Cyber-Physical Failure
İ. Cemile ERGEN

2. Analysis of Airport Operators' Compliance Level with Global Reporting Initiative Standard
İ. Seda EMİR, Ahmet ERTEK

3. Security Vulnerabilities and Countermeasures in ADS-B Systems
İ. Elif Pelin ÖZALP, Berkay KARADUMAN

Ürgüp Salonu GATE B
KRİZ İLETİŞİMİ VE EMNİYET KÜLTÜRÜ
OTURUM BAŞKANI:
DR. ÖĞR. ÜYESİ GÜLNAR KARAHAN

1. Global Crises on the Aviation Sector: A Research on Major Airlines' Social Media Crisis Communication Strategies
İ. Elif Çağrı Aytemir, Baki KÖRÜLÜ

2. Recovery Experience and Safety Behavior in Aviation: Mediating Role of Resilience
İ. Nurettin ERCEYLAN

3. Ownership is not a Behaviour: Why Governance Models Shape Aviation Safety
İ. Ertan BUTÜN, Gülşah ARDUN

Göreme Salonu GATE C
JEOPOLİTİK VE EKONOMİK RİSKLER
OTURUM BAŞKANI:
DR. ÖĞR. ÜYESİ LEVENT KAYA

1. Geopolitical Risks and Airline Operations: The Impact of Regional Conflicts
İ. Levent KAYA, Tuğba ÇOPUR, Mustafa ALTINTAŞ

2. Bankruptcy and Restructuring in the Turkish Aviation Sector: Rescue or Starting from Scratch? A Comparative Analysis of Onur Air and AtlasGlobal
İ. Ümit KANMAZ, Özgür ÖZGEN, Dilek ÇAN

3. Air Travel Demand Under Uncertainty: A Meta-Synthesis and Implications for Alternative Air Corridors
İ. Ömer ATEGÜÇ, Biyran YILDIRIM

4. How may air traffic controllers reduce Carbon emissions in air transport?
İ. Mehmet AKCA, Levent KAYA

20:00
NIGHT FLIGHT

FIRST CLASS / TÜRK GECEİ
GALA YEMEĞİ

DESTINATION
Karakuş Eğlence Merkezi

ROUTING
Pancarlık Mevki Mustafaapaşa Yolu Üzeri Ürgüp, Nevşehir.

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UÇUŞ PLANI ONAYLANDI

AIRS2026 Uçuş Rotası

24 - 26 Nisan 2026 tarihleri arasında Kapadokya Üniversitesi Mustafaapaşa Yerleşkesinde gerçekleştirilecek etkinliklerimizin detaylı dokümanı

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GÜN 2 / SEYİR
25 Nisan Cumartesi

GÜN 3 / KESİR
26 Nisan Pazar

10:00
FLIGHT 201

HAVACILIKTA TEKNOLOJİ, İHA SİSTEMLERİ VE YAPAY ZEKA

MSF SUPPORTER
BOARDING

Avanos Salonu GATE A

İHA TASARIMI VE UYGULAMALARI
OTURUM BAŞKANI:
DR. ÖZGÜR ÜYSEL TÜRKER (MADDEĞÜLLÜ KALKAN)

1. Comparison of Aircraft Profiles for a Fixed-Wing Unmanned Aerial Vehicle
2. Bahar ULKUN, Ergin REÇEL, Mehmet YETMEZ
2. Technical Architecture of UAV Communication and High-Gain Tracking Antenna Systems
3. Ömer Deniz ÇETİNTAŞ, Mustafa Zafer ÇİNGİRCİ
3. Conceptual Integration of Satellite Guided Fire Suppression Ammunition on Bayraktar Akıncı UAV for Precision Suppression of Wild Fires
4. Burak GÜLER, Bismillah POLAT, Halil BATTAL
4. The Use of UAVs in Cargo Transportation and Green Transformation
5. Tuğba İMADOĞLU KALKAN, Ömer Deniz ÇETİNTAŞ

Ürgüp Salonu GATE B

AKILLI SİSTEMLER VE EĞİTİMİ
OTURUM BAŞKANI:
PROF. DR. HASAN HÜSEYİN UZUNBACAK

1. AI-Driven Passenger Experience Management in Smart Airports: A Conceptual and Strategic Analysis
2. Baki YÖNCEL
2. Immersive and Intelligent Technologies in Aircraft Maintenance Technician Training: Bibliometric And Scientific Mapping Analysis of The 1987-2026 Literature
3. Serkan ÇANKURT, Hasan Hüseyin UZUNBACAK
3. Pilot Resilience as an Emergent Socio-Technical Property: A Safety-II Network Analysis of Aviation Accident Narratives
4. Ayşe ARI YILMAZ

Göreme Salonu GATE C

GELECEK VİZYONU VE DÖNÜŞÜM
OTURUM BAŞKANI:
DR. ÖZGÜR ÜYSEL TÜRKER (MADDEĞÜLLÜ KALKAN)

1. ESG and Financial Performance in Aviation: A Comparative Time Series Analysis
2. Sinay DÜLLÜ, Şimşek YARUZ, Seray YILMAZ, Ayşe ÖLMEZ
2. Human Factor Resistance and Opportunities in the Transition to Digital Apron Systems in Ground Handling Operations
3. Gülşah ÖZGEN, Harman ÇETKİN
3. A Policy Mix Analysis of U.S. Sustainable Aviation Fuel Governance: Instruments, Institutions and Transition Pathways
4. Burhan ARIOĞLU, Seray KARADURUKAN

11:00
SERVICE

Kahve Arası (In-flight Service)

11:30
FLIGHT 202

HAVAYOLU İŞLETMECİLİĞİ, FİLO PLANLAMA VE FİNANSAL PERFORMANS

MSF SUPPORTER
BOARDING

Avanos Salonu GATE A

HAVAYOLU VE FİLO STRATEJİLERİ
OTURUM BAŞKANI:
DOC. DR. MEHMET ÖZTÜRK

1. Analysis of Aircraft Type Selection in Airline Operations: Integration of Entropy and TOPSIS Methods
2. Sabire BOSTANCI, Elia ÇINARDOĞLU
2. The Impact of Airline Business Models on Fleet Structure: The Case of Turkish Airlines and Pegasus Airlines
3. Gülnar Arslan, Evren ALEK, Ahmet ERTEK
3. Mapping the Research Landscape of Airline Fleet Planning: A Bibliometric Analysis with LCC-FSC Perspectives
4. Özcan Özveren, Seray Yılmaz, Özkan Özdemir KANAT

Ürgüp Salonu GATE B

HAVACILIKTA PERFORMANS ANALİZİ
OTURUM BAŞKANI:
PROF. DR. İNAN ERYILMAZ

1. Navigating Digital Chaos: A Situational Crisis Communication Analysis of the CrowdStrike Outage in Aviation Media
2. Cemile ERDEN
2. Evaluating the Economic Sustainability of Dallas Fort Worth and London Heathrow Airports Using DEA and Malmquist Index Analysis
3. Filiz ERİCİ, İlay ÖZKAN
3. Operational Performance Evaluation of High-Passenger-Traffic Airports in Türkiye: A CRITIC-Supported MARCOS Application
4. Dima ELUT, Eda ÇINARDOĞLU

Göreme Salonu GATE C

FİNANS VE YÖNETİM
OTURUM BAŞKANI:
DR. ÖZGÜR ÜYSEL TÜRKER (MADDEĞÜLLÜ KALKAN)

1. Selling the Future Before It Exists: Strategic Communication and Empirical Deficits in Advanced Air Mobility
2. Fatih ÇAVDAR
2. Multi-Criteria Evaluation of Airline Performance: Operational, Service Quality, and Financial Perspectives
3. Deniz DİDİLİ, Ayşe DALKIRAN
3. Carbon Border Adjustment Mechanism and Air Cargo Logistics: Potential Implications for International Trade Costs
4. Ayşe TÜTÜNSATIR
4. The Dynamics of Governance and Leadership in Contemporary Turkish Aviation Sector / Digitalization and the Hybridization of Airline Business Models in Türkiye: A Multiple Case Analysis
5. Evren Berkay BAYRAKTAR, Cengiz Mevlüt BÜKEÇ

12:30
CATERING

Öğle Yemeği (In-flight Catering)

14:00
FLIGHT 203

BAKIM YÖNETİMİ VE BALON OPERASYONU

BOARDING

Avanos Salonu GATE A

BAKIMDA İNSAN FAKTÖRLERİ
OTURUM BAŞKANI:
DOC. DR. ALP ERKİCAN

1. The Dual Nature of Excitement in the Aircraft Maintenance Environment: A Human Factors Based Model Proposal
2. Tayfun AYDOĞDU
2. Detection of Stress and Fatigue in Aircraft Maintenance Personnel Using Wearable Technologies and Artificial Intelligence: A Review
3. Mustafa ŞENÖZGÜL, İnan ERYILMAZ
3. Occupational Low Back and Neck Pain Among Cabin Crew: A Preventive Exercise-Based Framework for Civil Aviation
4. Gülnar Arslan, Fatma

Ürgüp Salonu GATE B

YORDUNLUK ÖLÇÜMÜ VE ANALİZİ
OTURUM BAŞKANI:
DOC. DR. MEHMET ÖZTÜRK

1. The Impact of Fatigue Risk Management Systems (FRMS) on Aviation Safety Performance: An Analysis Based on Personnel Perceptions
2. Hakan Çaylak, Evren SEZER
2. A Research on the Development of a Fatigue Scale for Aircraft Maintenance Personnel
3. İnan ERYILMAZ, Ahmet KARACAN, Seray ÖDABAĞDOĞLU
3. Differential Effects of Multidimensional Mental Workload on Fatigue Severity in Air Traffic Controllers
4. Ali FURGAL, İzzet ÇEKEN, Nihal TAŞTENTİN
4. The Relationship Between Job Crafting and Burnout in Aviation Personnel: The Moderating Role of Self-Efficacy
5. Mehmet Ömer BALKAN, Seray ÖZKAN

Göreme Salonu GATE C

BALON OPERASYONLARI VE EMNİYET
OTURUM BAŞKANI:
DR. ÖZGÜR ÜYSEL RAMAZAN COBAN

1. Investigation of Factors Causing Hot Air Balloon Accidents Using the HFACS Model
2. Ramazan COBAN
2. Development of Hot Air Ballooning Activities in Civil Aviation: A Descriptive Analysis Evaluation
3. Seray GÜL, Ölcay ÖLMEZ
3. Comments from the Sky: An Examination of the Hot Air Balloon Experience from an Experiential Marketing Perspective
4. Seray AYDOĞDU

15:00
SERVICE

Kahve Arası (In-flight Service)

15:30
MEETING

ÖZEL OTURUM
Havacılıkta Sivil Toplum Kuruluşları
UTED, TATCA, ARFF ve TASSA Katılımlarıyla
Oturum Başkanı: Prof. Dr. İnan ERYILMAZ

Oktaay Sınanoğlu Konferans Salonu

17:00
LANDING

KAPANIŞ OTURUMU VE ÖDÜL TÖRENİ

- En İyi Bildiri Ödülü
- En İyi Hakem Ödülü

Oktaay Sınanoğlu Konferans Salonu

UDLS PLAKET İNŞAATLARI

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26 Nisan Pazar



EXPEDITION FLIGHT / 08:30 - 17:00

Kapadokya Kültür ve Doğa Gezisi

Sempozyumumuzun son gününde, Kapadokya'nın eşsiz tarihini ve doğasını birlikte keşfediyoruz. Dünyaca ünlü vadilerden, tarihi manastırlara ve sanatın kalbi atölyelere uzanan unutulmaz bir rota sizi bekliyor.



1. Sinasos & Keşlik Manastırı

Güne, tarihin kokusunu her taşında hissedeceğimiz eski acıyla Sinasos (Mustafapaşa) da başlıyoruz. Gayrimüslim mimarlığının en zengin örneklerini inceledikten sonra Cennet Köyü'ne geçerek höyükteki Keşlik (Keşiş) Manastırı'nı ziyaret ediyoruz.



2. Devrent Vadisi

Doğanın gizemli kokusunu yansıtan ve "Hayal Vadisi" olarak da bilinen Devrent Vadisi'ne geçiyoruz. Rüzgar ve suyun birleşimiyle şekillendiği eşsiz peribacaları ve kaya oluşumları arasında keyifli bir keşif yapıyoruz.



3. Avanos Çömlek Atölyesi

Öğle yemeği molasının ardından bölgenin sanat merkezi Avanos'a ulaşıyoruz. Dünyaca ünlü Çiğiz Galip'in atölyesinde toprağın sanatla buluşmasına tanıklık ediyor ve yöresel çömlekleri ediyoruz.



4. Yöresel Tatlar ve Kapanış

Kapadokya'nın meşhur çerezlerini yöresel lezzetlerin tadına bakıyoruz. Sonra, günün sonu da başladığımız noktaya, Mustafapaşa'nın huzurlu atmosferine geri dönerek turumuzu noklatıyoruz.

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Turbulence In the Mind: The Impact of Organizational Gaslighting on Psychological Safety In The Aviation Industry

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Abstract

This study investigates the impact of organizational gaslighting on employees' psychological safety in the aviation sector. Gaslighting is defined as a form of psychological manipulation that diminishes employees' perceptions, emotions, and experiences, fostering self-doubt and organizational mistrust. The research conceptualizes organizational gaslighting through two dimensions: trivialization and abusive manipulation. Data were collected from 400 employees working across various departments at Istanbul Airport using a structured questionnaire. The findings demonstrate a significant negative relationship between organizational gaslighting and psychological safety. Specifically, the trivialization of employee concerns and persistent psychologically abusive practices substantially weaken trust, open communication, error reporting, and perceived organizational support. These results indicate that gaslighting behaviors critically erode core elements of psychological safety. Accordingly, aviation organizations should prioritize leadership development, establish transparent communication mechanisms, and implement clear policies to prevent gaslighting. Such initiatives are essential not only for protecting employee well-being but also for sustaining safety and operational effectiveness in high-risk environments like aviation.

Keywords: Organizational Gaslighting, Psychological Safety, Aviation Sector, Employee Well-being

Occupational Low Back and Neck Pain Among Cabin Crew: A Preventive Exercise-Based Framework for Civil Aviation

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Abstract

Cabin work rarely allows perfect body mechanics. Overhead bin handling, repeated reaching in confined galley areas, pushing and pulling service carts, long periods of standing and sudden stabilization during turbulence place sustained mechanical demands on the lumbar spine and the neck. Research on cabin crew repeatedly identifies low back and neck pain among the most common musculoskeletal complaints; however, prevention in civil aviation has largely emphasized ergonomic modifications and organizational measures, while structured physical preparedness receives less attention. This paper synthesizes recent evidence on low back and neck pain in cabin crew and proposes an occupation-specific preventive conditioning framework aligned with operational cabin demands. A narrative review was conducted with emphasis on prevalence patterns, commonly reported risk factors and task-related loading characteristics, prioritizing recent peer-reviewed studies. Typical cabin tasks were mapped into movement and load patterns, such as overhead lifting under time pressure, reaching above shoulder level and awkward postures, repeated trunk rotation in narrow spaces, and prolonged static postures, to clarify which physical capacities are most relevant for prevention. Task mapping was informed by recurrent duty descriptions reported in the reviewed studies, including observational risk assessments (e.g., RULA) and occupational biomechanics principles. Across studies, low back and neck pain are commonly linked to cumulative spinal loading, awkward postures, repetitive upper-limb activity and limited recovery. Psychosocial strain and time pressure may further amplify symptom reporting, indicating that prevention should be considered within a broader occupational health context. While many recommendations focus on workplace redesign or procedural guidance, fewer contributions describe how to develop musculoskeletal capacity that matches the operational load profile of cabin duties. In response to this gap, the proposed framework emphasizes trunk endurance and control for lumbar load management, neck endurance and postural control for sustained head-neck demands, shoulder-girdle and upper-back control for repeated reaching and overhead handling, given its contribution to cervical loading and hip/trunk extensor endurance to support prolonged standing as well as frequent bending and rotation. Although shoulder symptoms are also frequently reported, the present framework prioritizes lumbar and cervical demands due to their central role in postural endurance and stabilization during cabin operations. The

framework is presented as an occupational health approach rather than a clinical rehabilitation protocol. Combining ergonomic measures with occupation-specific preventive conditioning principles can strengthen musculoskeletal resilience in cabin crew and support sustainable performance in civil aviation operations.

Keywords: Cabin crew, low back pain, neck pain, occupational health, ergonomics, biomechanical load, preventive conditioning, RULA.

The Dual Nature of Excitement in The Aircraft Maintenance Environment: A Human Factors - Based Model Proposal

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Abstract

The aviation industry, characterized by stringent safety requirements, intense time pressure, and an extremely low tolerance for error, provides a work environment in which human factors play a critical role. In this context, the emotional states experienced by aircraft maintenance technicians who perform maintenance activities are of great significance for flight safety and operational performance. Although factors such as stress, workload, and fatigue have been widely addressed in the literature, the role of excitement within the aviation maintenance environment has received limited scholarly attention. This study examines the dual nature of excitement in the aircraft maintenance environment and aims to evaluate this concept within a conceptual framework grounded in a human factors' perspective. Drawing on the existing aviation human factors literature, the study adopts a conceptual analysis approach and proposes a model associated with the operational experiences of maintenance technicians. In the proposed model, excitement is conceptualized as a central variable shaped by factors such as time pressure, task criticality, professional seniority, and organizational support. The findings suggest that when maintained at optimal levels, excitement can generate positive outcomes such as enhanced attention, improved learning, and increased professional satisfaction. However, when uncontrolled or excessive, it may contribute to haste, procedural violations, and an elevated risk of error. In conclusion, this study emphasizes that excitement in aviation maintenance activities should not be regarded merely as an individual emotional state, but rather as a critical human factor that requires effective management. The proposed model is expected to provide a theoretical foundation for both safety-oriented practices within the aviation industry and future empirical research in the academic domain.

Keywords: Aircraft Maintenance, Excitement, Human Factors, Aircraft Maintenance Technicians, Flight Safety

Detection Of Stress and Fatigue in Aircraft Maintenance Personnel Using Wearable Technologies and Artificial Intelligence: A Review

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Abstract

Aircraft maintenance operations involve demanding physical tasks, irregular schedules, and high responsibility levels, making maintenance personnel particularly vulnerable to stress and fatigue. These human factors directly influence operational reliability and aviation safety. This study presents a comprehensive narrative review examining how wearable sensor technologies and artificial intelligence methods can be utilized to detect and monitor stress and fatigue among aircraft maintenance personnel. The reviewed literature indicates that physiological signals such as heart rate variability, electrodermal activity, eye movement, and brain activity provide reliable indicators of cognitive and physical strain. When processed using machine learning and deep learning algorithms, these signals enable continuous, real-time assessment of operator condition. Multimodal approaches combining physiological, contextual, and environmental data demonstrate improved robustness and predictive capability compared to single-source monitoring methods. The findings suggest that integrating wearable sensing systems with AI-based analytics can support proactive safety management by enabling early detection of fatigue-related risks and facilitating data-driven decision-making in maintenance operations. However, challenges related to model generalization, sensor ergonomics, privacy concerns, and organizational acceptance must be addressed before widespread operational deployment. Overall, the convergence of wearable technologies and AI offers significant potential to enhance human performance monitoring, reduce maintenance-related risks, and strengthen safety culture within aviation maintenance environments.

Keywords: Aviation Maintenance Management, Safety Culture, Fatigue Risk Management Systems, Wearable Sensor Technologies, Human Factors in Aviation

AI-Driven Passenger Experience Management in Smart Airports: A Conceptual and Strategic Analysis

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Abstract

The aviation industry has undergone rapid digital transformation driven by increasing passenger expectations, operational complexity, and technological innovation. Within smart airport ecosystems, artificial intelligence (AI) has emerged as a strategic instrument for managing passenger experience and operational efficiency. This study conceptually examines the role of AI-driven systems in passenger experience management through a qualitative integrative document analysis. Drawing upon academic literature and institutional aviation reports, the study identifies key AI applications including biometric identification, predictive analytics, chatbots, digital assistants, and automated service systems. Findings indicate that AI contributes significantly to operational efficiency, security enhancement, and personalized service delivery while simultaneously generating managerial challenges related to data privacy, cybersecurity, ethical governance, and investment costs. The study concludes that AI should be positioned not merely as a technological innovation but as a strategic governance mechanism shaping airport service design and competitive positioning.

Keywords: Artificial Intelligence, Smart Airport, Passenger Experience Management, Airport Management, Digital Transformation

From Wrench to Algorithm: Strategic Adaptation of Human Resources in the Aviation Maintenance Ecosystem. A Threat of Job Loss or A Role Evolution?

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Abstract

Revolutionary developments in Unmanned Aerial Vehicles (UAVs), autonomous driving systems, and artificial intelligence in the aviation industry call into question the future of the piloting profession while confronting technicians, the backbone of the maintenance ecosystem, with a profound transformation. This study aims to examine whether the integration of autonomous systems into maintenance processes creates a threat of "job loss" or a "role evolution" for technicians. A qualitative design was adopted as the methodology; semi-structured interviews were conducted with 13 licensed aircraft maintenance technicians with varying levels of experience using the thematic analysis method. The research findings revealed three main themes: 85% of the participants view robots as "ergonomic assistants" that reduce physical workload rather than as a threat, but they find the "human touch" and intuition indispensable regarding legal responsibility and signing authority (certification). Furthermore, it was determined that existing training is insufficient for the 2040 vision and that there is a "competency gap". In the discussion section, the "Automation Paradox," where human oversight responsibility increases as the level of automation increases, was confirmed, and it was verified that the process is a strategic evolution rather than a replacement. Consequently, it is predicted that in the 2040 vision, the technician will evolve into a "System Verifier" role, equipped with digital literacy and system integration competencies, approving cyber-physical systems. For the successful management of this transformation, it is a strategic necessity to shift training models from mechanical skills to data interpretation and digital oversight.

Keywords: Aviation Maintenance, Autonomous Systems, Cobots, Human Resources Management, Digital Transformation, Industry 5.0, Artificial Intelligence, Robotic Systems.

Structural Complexity and Operational Resilience in Modern Aviation: A Case Study of The CrowdStrike Cyber-Physical Failure

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Abstract

The CrowdStrike incident on July 19, 2024, exposed the systemic vulnerabilities of modern interconnected infrastructures, serving as a definitive "Digital Black Swan" within a hyper-connected Complex Cyber-Physical-Social System (C-CPSS). This study provides a comprehensive theoretical analysis of the crisis by synthesizing the Black Swan concept with Charles Perrow's Normal Accident Theory. It evaluates how extreme centralized technological dependencies and "tight coupling" within digital supply chains create catastrophic single points of failure that transcend traditional IT boundaries to paralyze global aviation operations. Through a qualitative review of the crisis, the research examines the transition of the human factor from a potential source of error to a vital "remediating agent" and operational buffer during systemic collapses. The findings indicate that mitigating such risks requires a fundamental shift away from technological over-reliance toward a socio-technical resilience model. The study concludes by proposing the establishment of "Digital Airworthiness" standards and strategic recommendations, such as concentric ring update models and provider diversity, to manage the structural fragility inherent in digital modernization. Ultimately, this research offers a holistic framework for transforming reactive troubleshooting into proactive systemic resilience within the aviation industry.

Keywords: CrowdStrike, Complex Cyber-Physical-Social Systems (C-CPSS), Normal Accidents Theory, Digital Black Swan, Digital Systemic Fragility

Differential Effects Of Multidimensional Mental Workload On Fatigue Severity In Air Traffic Controllers

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Abstract

The aim of the study is to determine the impact of the multidimensional mental workload (cognitive, temporal, emotional, and performance) experienced by air traffic controllers on fatigue severity. The research sample consists of 221 air traffic controllers working in various air traffic control units. Data were collected using a demographic information form, the CarMen mental workload questionnaire, and the fatigue severity scale. Descriptive statistics, correlation and regression analyses, and difference tests were employed for data analysis. The results indicated that the participants' mean fatigue severity score was 4.42, indicating a state of significant fatigue. Furthermore, the regression analysis revealed that overall mental workload explained 28.9% of the variance in fatigue ($\beta = .538$, $p < .001$). When examining the sub-dimensions of mental workload, performance demands yielded the highest mean score, yet this dimension demonstrated no significant correlation with fatigue. In the multiple regression model, emotional workload emerged as the only sub-dimension that significantly predicted fatigue severity ($\beta = .507$, $p < .001$). These findings demonstrate that fatigue among air traffic controllers is driven not merely by operational intensity or cognitive load, but substantially by emotional workload. Although the perceived requirement for high performance is profound, the fact that it does not directly determine fatigue suggests this pressure is internalized and normalized as an inherent characteristic of the profession.

Keywords: Air Traffic Control, Aviation, Fatigue, Human Factor, Mental Workload.

Comments From the Sky: An Examination of The Hot Air Balloon Experience from An Experiential Marketing Perspective

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Abstract

This study examines consumer reviews shared on “TripAdvisor” regarding hot air balloon tourism from an experiential marketing perspective. Designed with a qualitative research design, the study analyzes 10 years of data from three businesses using thematic content analysis. Open coding was employed to create sub-themes and, consequently, main themes. Due to the unequal number of reviews for each business, percentage density was used. The findings support the integrated nature of experiential marketing. The main themes of experiential marketing exhibit a hierarchical structure. Emotional and behavioral main themes are reflected in consumer reviews with primary intensity, while sensory and cognitive main themes are reflected with secondary intensity.

Keywords: Experience economy, experiential marketing, hot air balloon tourism.

Competency-Based Recruitment from A Strategic Human Resources Perspective: A Model Analysis of Cabin Crew Selection

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Abstract

Current human resources literature emphasizes that recruitment processes should no longer be solely focused on identifying suitable candidates; they should be designed from a strategic perspective and integrated with organizational sustainability, candidate experience, employer branding, and long-term performance outcomes. The success of the recruitment process should be evaluated not only by the hiring of suitable candidates but also by the experience of all candidates who participated. Candidates experience dissatisfaction with the frequency of information provided, response times, and the level of transparency regarding assessment results during the recruitment process. Dissatisfaction with the candidate experience can weaken employer brand perception and organizational attractiveness. In this context, standardizing digital feedback systems and integrating step-by-step, development-oriented, individualized feedback practices are areas for improvement that can increase the effectiveness of the recruitment process. This study analyzes the multi-stage, competency-based assessment center model used in cabin crew recruitment from a Strategic Human Resources Management perspective. Within this scope, structured feedback mechanisms have also been put in place to ensure continuous communication with candidates. Within this framework, the model encompasses selecting the right candidates, measuring job-person fit, maintaining continuous communication with candidates, identifying development areas, and integrating post-recruitment training planning. With the implemented model, 65% of the candidates participating in the recruitment process were hired, and 96% of those hired are still actively performing flight duties. This high retention rate demonstrates that the model supports not only accurate selection but also long-term performance alignment and organizational commitment.

Keywords: Strategic Human Resources Management, Competency-Based Recruitment, Job-Person Fit, Retention, Human Capital, Digital Recruitment Process. Cabin Crew Selection.

The Relationship Between Aviation Accidents, Decision-Making and Burnout Among Cadet Pilots

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Abstract

This study examines the complex relationship between flight decision-making styles and burnout levels among cadet pilots, which constitutes a fundamental component of aviation safety. Given that pilot training requires high cognitive load and continuous attention, decision-making mechanisms adopted by candidates play a decisive role in operational safety. Quantitative analyses conducted with 335 cadet pilots from aviation schools in Istanbul, Ankara, and Samsun reveal that all decision-making approaches—excluding the rational style—show positive and significant correlations with burnout dimensions. Specifically, the use of intuitive, dependent, avoidant, and spontaneous decision-making styles is associated with risk factors that create vulnerabilities in flight discipline and may contribute to aviation accidents. These orientations are linked to burnout syndrome, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. The findings suggest a cyclical relationship between flawed decision-making patterns and burnout, wherein stress from incorrect decisions may exacerbate burnout, while high burnout levels can further impair situational awareness, potentially leading to unsafe acts. Consequently, to maximize aviation safety and minimize accident risks, priority should be given not only to technical skills but also to cognitive decision-making strategies and psychological resilience programs within training curricula.

Keywords: Aviation Safety, Decision-Making Styles, Burnout, Cadet Pilots, Aviation Psychology.

Comparison Of Airfoil Profiles for A Fixed-Wing Unmanned Aerial Vehicle

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Abstract

In this study, prominent airfoil profiles for a fixed-wing unmanned aerial vehicle (UAV) in the literature namely NACA 2410, NACA 0015, NACA 4415, and NACA 4412 is considered for the further improvements. The biggest problem encountered during the design phase is the need to both increase the aircraft's lift capacity and keep air resistance as low as possible. Although the NACA 2410 profile, frequently used in the literature, provides low drag, it is insufficient in terms of payload capacity; while the NACA 4415, despite producing high lift, leads to excessive form drag due to its 15% thickness, reducing flight efficiency. This project aims to solve the aerodynamic problem. The study consists of two parts: Numerical part includes the performance of 2D and 3D aerodynamic analyses (XFLR5), structural static tests (ANSYS), and flight dynamics simulations (MATLAB/Simulink) on the selected NACA profiles over a wide Reynolds numbers. In order to introduce a new prominent airfoil profile, further calculations for the effects of this geometry on the lift coefficient (CL), drag coefficient (CD), and pitching moment (Cm) at different angles of attack are also taken into account. Experimental part covers the comparison of the numerical results of the prominent airfoil profile. Numerical and experimental results are given in tabular and graphical forms.

Keywords: Fixed-Wing UAV, Aerodynamic Analysis, Carbon Fiber Composite, Pitch Moment, Finite Element Analysis

Analysis Of Aircraft Type Selection in Airline Operations: Integration of Entropy and TOPSIS Methods

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Abstract

Costs, which are the key for the success in operations, involve the expenses of whole products and service during the process and specify the profitability. Especially minimizing the expenses is important for the operations which have intensive funds like airways. Two of the expense items in airways are plane type and expenses for it. Choosing the plane type in air transportation is one of the critical factors which specify the financial sustainability and operational productivity. This process is evaluated with 8 criteria like purchasing expense, maintenance expense, fuel consumption, range, passenger capacity, maximum take-off weight, wingspan and warranty period. While doing this it was observed over 8 plane type. The chosen planes Airbus A220-300, Airbus A319 Neo, Airbus A320 Neo, Airbus A321 Neo, Boeing 737-700, Boeing 737-800, Boeing 737 Max 8 and Embraer E195-E2 are observed by using Entropy (Objective Weighting Method) and TOPSIS (Ranking Preferences Based on Similarity to the Ideal Solution). Consequently Airbus A319 Neo was found as the most advantageous model.

Keywords: Aircraft type, Entropy, TOPSIS.

Human Factor in The Transition To Digital Apron Systems in Ground Handling Operations: Resistances and Opportunities

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Abstract

The significance of digital transformation in the aviation sector has been steadily increasing in terms of operational efficiency and safety. Within this context, employees' acceptance of technology and their levels of resistance to change play a critical role in the adoption of digital apron systems. The aim of this study is to examine the adaptation processes of airport ground handling personnel to digital systems within the framework of demographic characteristics. A quantitative research design was employed in the study. Data were collected through a survey instrument, and a relational screening model was applied. The findings indicate that demographic variables such as age, education level, and gender have significant effects on technology acceptance; employees in younger and middle-age groups, as well as those with higher levels of education, demonstrated a more favorable attitude toward technology. In contrast, resistance to change was found to be largely independent of demographic variables. Furthermore, a negative but weak relationship was identified between technology acceptance and resistance to change. In conclusion, digital transformation initiatives should simultaneously incorporate training programs aimed at enhancing individual technology acceptance and organizational support mechanisms supported by effective change management strategies.

Keywords: Digital Apron Systems, Technology Acceptance, Resistance to Change, Airport Ground Handling Services, Digital Transformation.

Queen Bee Behavior in The Aviation Industry: A Qualitative Study of Career Advancement for Female Employees

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Abstract

This study aims to examine, through a qualitative approach, the impact of queen bee behaviors exhibited by female leaders in the aviation sector on the career advancement processes of female employees. Within a sector dominated by a male-oriented organizational culture, the ways in which female leadership is reflected in career dynamics are addressed through a phenomenological research design. The study is based on semi-structured interviews conducted with 35 employees working in airline companies, airports, and ground handling service organizations in Turkey. The data were analyzed using inductive content analysis, and the findings were organized under seven main themes. The results indicate that despite a strong perception of equality within the sector, a perception of disadvantage toward married and pregnant women persists, particularly in promotion processes. Although female leaders are generally perceived as displaying egalitarian and supportive attitudes, in certain cases higher performance expectations and the destructive dimensions of intra-gender competition draw attention. The findings reveal that queen bee behavior is associated not with individual traits but rather with structural factors such as a male-dominated organizational culture, limited promotion opportunities, and performance pressure. The study highlights the need for more inclusive leadership practices and transparent career management policies in the aviation sector.

Keywords: Queen bee syndrome, female leader, career advancement, aviation industry.

Navigating Digital Chaos: A Situational Crisis Communication Analysis of The CrowdStrike Outage in Aviation Media

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Abstract

This study aims to determine how media framing and responsibility attribution shaped the reputational landscape for airline companies during the global CrowdStrike IT outage on July 19, 2024, through the lens of Situational Crisis Communication Theory (SCCT). Using a qualitative content analysis design, the research examines 22 purposively selected news articles from prominent Turkish aviation portals, including AirportHaber, AirlineHaber, and HavaHaber. Findings indicate that sectoral media consistently categorized the crisis within the “Victim Cluster,” effectively positioning airlines as passive stakeholders caught in a systemic failure rather than the originators of operational chaos. By acting as a “reputation watchdog,” the media successfully redirected public frustration away from aviation brands and toward third-party technology providers, demonstrating that perceived crisis responsibility is significantly constructed through media-driven interpretive frames in a digitally dependent ecosystem. The significance of this research lies in its highlight that managing digital disruptions necessitates a strategic shift from technical problem-solving toward perception management, providing critical insights into maintaining stakeholder trust amidst cascading outages.

Keywords: CrowdStrike Outage, Situational Crisis Communication Theory (SCCT), Aviation Management, Digital Aviation Media.

The Impact of Fatigue Risk Management Systems (FRMS) on Aviation Safety Performance: An Analysis Based on Personnel Perceptions

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Abstract

This study investigates the relationship between perceived fatigue levels and safety attitudes among aircraft maintenance technicians and ground handling personnel within the framework of Fatigue Risk Management Systems (FRMS). Although fatigue has been widely examined in relation to flight crews, empirical research focusing on ground operations remains limited. Using a quantitative relational survey design, data were collected from 255 aviation personnel working in Türkiye. The study employed the Fatigue Severity Scale (FSS) and the Safety Attitudes Questionnaire (SAQ) to measure fatigue levels and safety perceptions. Statistical analyses revealed that safety attitudes differed significantly according to education level, industry experience, and gender. In contrast, fatigue severity showed limited variation across demographic variables. A moderate positive correlation was identified between fatigue severity and safety attitudes. The findings suggest that safety perception is influenced by professional exposure and educational background, whereas fatigue appears to be more closely associated with organizational and structural conditions. The results underline the strategic importance of systematically managing fatigue within ground operations and emphasize that sustainable aviation safety requires an integrated, data-driven approach addressing both human performance and organizational design.

Keywords: Fatigue Risk Management, Safety Attitudes, Ground Handling Personnel, Human Performance, Aviation Safety Management.

Game-Based Teaching of Airport Operations: Design Of The "Skyco: From Terminal to Route" Educational Board Game and An Investigation of Its Effects On Learning

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Abstract

The dynamic, time-pressured, and safety-critical nature of airport operations requires aviation students to develop systemic operational awareness beyond mere theoretical knowledge. However, the discipline-oriented and fragmented approach prevalent in current aviation curricula limits students' experience of the vital interdependence between ground handling, flight operations, and cabin processes. This study analyzed the impact of the "SkyCo: From Terminal to Route" board game—specifically designed to bridge this pedagogical gap—on learning outcomes. The research was conducted using a one-group pre-test/post-test quasi-experimental design with 51 students from Civil Aviation Cabin Services, Flight Operations Management, and Civil Air Transport Management programs at Istanbul Esenyurt University. Data indicated that game-based learning significantly increased academic achievement ($t(50) = -37.82$, $p < .001$) with a remarkably high effect size (Cohen's $d = 2.15$). Furthermore, the game's "Common Safety Score" mechanism enhanced students' non-technical skills, including situational awareness and communication, transforming the process from individual competition into collective safety culture cultivation. The results demonstrate that SkyCo serves as an effective simulation tool that evolves theoretical knowledge into permanent operational reflexes, particularly emphasizing the synergy between ground, cabin, and flight operations units.

Keywords: Airport Operations, Game-Based Learning, Safety Management, Aviation Education, Educational Game Design.

Analysis of Airport Operators' Compliance Level With Global Reporting Initiative Standards

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Abstract

This study aims to examine the level of compliance of airport operators with environmental sustainability indicators within the framework of the Global Reporting Initiative (GRI) 300 series. A qualitative research approach was adopted, and document analysis and content analysis methods were applied. The dataset consists of the 2022 sustainability reports of IGA Istanbul Airport and TAV Airports Holding. These operators were selected due to their leading roles in the Turkish airport sector and their regular publication of GRI-based sustainability reports. The year 2022 was preferred as it represents a period in which airport operations stabilized after the COVID-19 pandemic, allowing for a more reliable and comparable assessment of environmental performance indicators. The analysis focuses on nine selected GRI 300 environmental indicators, while certain indicators such as GRI 304 (Biodiversity) were excluded due to the lack of comparable quantitative data in the reports. The findings indicate that IGA Istanbul Airport complied with all nine environmental indicators examined (100%), whereas TAV Airports Holding complied with seven of the nine indicators (77.8%). The difference is mainly associated with the absence of energy and emissions intensity indicators in TAV's reporting. The results suggest that although both operators demonstrate commitment to sustainability reporting, differences exist in terms of reporting scope, standardization, and the use of intensity-based performance metrics.

Keywords: Corporate Sustainability, GRI Standards, Sustainability Reporting, Airport Operations, Environmental Performance.

Immersive And Intelligent Technologies in Aircraft Maintenance Technician Training: Bibliometric and Scientific Mapping Analysis of The 1987-2026 Literature

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Abstract

This study investigates the thematic configuration and temporal evolution of immersive technologies (virtual, augmented, and mixed reality) and intelligent technologies (artificial intelligence and digital twin) within the aircraft maintenance technician training literature through a bibliometric approach. Existing research demonstrates that virtual reality applications have been utilized in maintenance inspection, visual assessment, and procedural training contexts (Vora et al., 2002), whereas augmented reality has been positioned as an operational guidance and task-support tool in maintenance environments (De Crescenzo et al., 2011). More recent studies highlight the potential of digital twin and artificial intelligence-driven systems to enable data-oriented restructuring of maintenance training ecosystems and enhance process traceability (Kabashkin, 2025a, 2025b). A total of 104 publications indexed in Scopus between 1987 and 2026 were analyzed. The findings indicate a marked increase in publication activity after 2010, with virtual reality-based research constituting the conceptual nucleus of the field. In contrast, digital twin and artificial intelligence-related concepts have gained prominence in recent years, reflecting a shift from simulation-oriented instructional environments toward integrated, data-driven digital training architectures. Despite this technological progression, the literature remains predominantly technology-centered, with limited conceptual integration of regulatory frameworks and competency validation structures. By systematically mapping this transformation, the study contributes a structural perspective on the evolving technological landscape of aircraft maintenance training and provides a conceptual basis for future research.

Keywords: Aircraft maintenance technician training, Virtual reality, Artificial intelligence, Digital twin, Bibliometric analysis.

Security Vulnerabilities and Attack Detection Methods in ADS-B Systems: A Focused Review

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Abstract

Automatic Dependent Surveillance-Broadcast (ADS-B) is a surveillance system within the FAA's NextGen Air Transportation System that continuously broadcasts aircraft position and status information. It contributes to flight safety and operational efficiency and is now mandatory in regulated airspaces. However, ADS-B messages are transmitted without encryption or source authentication, creating vulnerabilities to attacks such as spoofing, replay, jamming and message injection. These attacks can generate ghost aircraft, disrupt situational awareness and mislead both pilots and air traffic controllers. To address these vulnerabilities, the literature proposes detection methods across four categories: similarity-based approaches, machine learning and deep learning models, physical layer verification, and cryptographic mechanisms. This study conducts a focused literature review to classify ADS-B attack types and to comparatively evaluate proposed detection methods in terms of accuracy, infrastructure requirements, real-time capability and operational feasibility. Twenty-three studies published between 2012 and 2026 were analysed. The findings indicate that no single detection method adequately addresses all attack types and that hybrid, multi-layered approaches combining evidence from different verification layers offer the most promising path toward operationally viable ADS-B security.

Keywords: Automatic Dependent Surveillance-Broadcast, Cybersecurity, Spoofing, Intrusion Detection, NextGen.

Selling The Future Before It Exists: Strategic Communication and Empirical Deficits in Advanced Air Mobility

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Abstract

The Advanced Air Mobility (AAM) sector has generated an unusually voluminous body of promotional literature relative to its commercial achievements. This study interrogates that imbalance through a systematic comparative review of 60 sources — 39 peer-reviewed academic articles and 21 industry-generated market reports — published between January 2020 and November 2025. Applying signal theory, institutional isomorphism, and expectation management as interpretive lenses, and introducing the concept of performative futurism to account for the constitutive function of industrial forecasting, the analysis identifies consistent and structurally explicable divergences across four dimensions: market size projections, consumer acceptance rates, commercialisation timelines, and technology readiness assessments. Industry sources project market valuations two to three times larger than academic modelling supports, report consumer willingness-to-fly rates 20–40 percentage points above those obtained under experimentally controlled conditions and have recurrently displaced commercialisation horizons forward by two to three years across successive reporting cycles — a pattern now spanning nearly a decade. These divergences correlate strongly with methodological quality differentials, including undisclosed sampling frames, directive question framing, and absent peer review. The findings suggest that AAM market discourse is shaped less by independent empirical analysis than by the signalling imperatives of pre-revenue firms operating under capital-market pressure, amplified by mimetic isomorphism among competing consultancies. The study argues that in safety-critical sectors where trust constitutes a foundational adoption condition, sustained credibility deficits represent not merely an ethical problem but a measurable strategic liability.

Keywords: Advanced Air Mobility, aviation marketing, signalling theory, expectation management, institutional isomorphism, performative futurism.

How Leader Support Reduces Mental Fatigue in Aircraft Maintenance Technicians: The Roles of Sleep Quality and Leader–Member Exchange

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Abstract

The aviation industry operates within a high-reliability organizational context where safety margins are extremely narrow and operational errors can have severe consequences. Aircraft maintenance technicians work under intense cognitive demands, strict time pressure, and significant operational responsibility, making effective recovery processes essential for sustaining performance and ensuring safety. Drawing on the Job Demands–Resources (JD-R) model, this study examines the relationship between leader support for employees’ work–life boundaries and mental fatigue among aircraft maintenance technicians. Specifically, the study proposes a moderated mediation model in which sleep quality mediates the relationship between leader boundary respect and mental fatigue, while Leader–Member Exchange (LMX) moderates the relationship between leader boundary respect and sleep quality. Data are collected from aircraft maintenance technicians using validated measurement scales assessing leader boundary respect, sleep quality, cognitive fatigue, and LMX quality. The hypothesized conditional indirect effects are tested using Hayes’ PROCESS macro (Model 7). The findings are expected to demonstrate that leaders who respect employees’ non-work boundaries facilitate improved sleep quality among technicians, which in turn reduces mental fatigue. Furthermore, this relationship is expected to be stronger in high-quality leader–member exchange relationships. By integrating leadership behavior, recovery processes, and fatigue outcomes, this study aims contributing the aviation human factors literature and provides practical insights into how leadership practices can indirectly enhance operational safety through employee recovery mechanisms.

Keywords: Aircraft Maintenance, Mental Fatigue, Sleep Quality, Leader–Member Exchange, Job Demands–Resources Model.

Technical Architecture of UAV Communication and High-Gain Tracking Antenna Systems

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Abstract

In the operation field of Unmanned Aerial Systems (UAS), the link between the Unmanned Aerial Vehicle (UAV) and the Ground Control Station (GCS) is the Radio Frequency (RF) communication systems. These systems are paramount to achieve a continuous flow of messages between the UAV and the GCS, the loss of messages while almost certain due to the nature of wireless communications, are always desired to be limited to a certain minimum. While modern airframes have achieved great aerodynamic features and light materials complement their endurance, the utility of these platforms remains strictly governed by the signal-to-noise ratio (SNR) and the link margin of the communications medium as these systems become hazards instead of capabilities when communication experiences loss. Antenna performance, specifically gain and directivity, dictates the effective radius of Command and Control (C2) and the real-time throughput of mission-critical payload data. Without a robust RF architecture, even a very developed and advanced platform becomes an expensive, unguided liability.

Keywords: Unmanned Aerial Vehicle (UAV), Radio Frequency (RF), Command and Control (C2), tracking antennas, data fusion.

The Use of Uavs in Cargo Transportation and Green Transformation

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Abstract

This study aims to analyze the contribution of the use of Unmanned Aerial Vehicles (UAVs) in cargo transportation to green transformation and its success factors in this context. Qualitative data obtained from interviews with senior executives from eight different cargo companies in Nevşehir province were subjected to content analysis with a phenomenological approach. Conventional methods of last parcel delivery which are usually medium sized vans have been studied. Actual fuel use and the carbon emissions have been calculated based on the data obtained from the senior executives. Marking down the current operation values as a reference, the foreseeable performance of UAVs in the field have been studied. The findings indicate that UAVs hold significant potential in areas such as operational efficiency, independence from human resources, and environmental benefits. In particular, reducing carbon emissions, reducing fuel consumption and developing sustainable transportation alternatives at the local level through regional practices are considered as strategic contributions to environmental transformation. At the same time, the study emphasizes that not only technical but also systemic, legislative, and political infrastructures need to be strengthened in order to successfully integrate these technologies.

Keywords: Cargo transportation, UAV, green transformation, success factors, carbon emissions.

Development Of Hot Air Ballooning Activities In Civil Aviation: A Descriptive Analysis Evaluation

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Abstract

Hot air ballooning is developing as a significant sub-sector within the civil aviation industry, particularly under tourism activities. In recent years, hot air balloons have been widely used in many countries for both recreational activities and tourism-oriented flight operations. Turkey holds a globally significant position with balloon flights conducted in various regions, primarily in Cappadocia. This study aims to examine the development, operational structure, and safety practices of hot air ballooning within the scope of civil aviation. The research utilizes a literature review method, and the obtained data are evaluated through descriptive analysis. Academic articles, reports from civil aviation authorities, and sectoral data were examined. Research results indicate that hot air ballooning has developed in integration with tourism, and operational safety standards are shaped by national and international regulations. Additionally, the economic contribution of the sector is increasing, and it possesses significant potential for future sustainable tourism.

Keywords: Civil aviation, hot air balloons, balloon tourism, flight operations, descriptive analysis.

A Research on The Development of A Fatigue Scale for Aircraft Maintenance Personnel

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Abstract

In the aviation industry, the sustainability of flight safety depends not only on pilot performance but also on the accurate, careful, and timely execution of activities by aircraft maintenance personnel. Long working hours, shift work, night shifts, and organizational pressures increase fatigue levels in maintenance personnel; this, in turn, increases safety risks through decreased attention, reduced cognitive performance, difficulty in decision-making, and an increased probability of error. Although many subjective, performance-based, and physiological measurement tools exist in the literature for assessing pilot fatigue, a valid and reliable fatigue scale specific to aircraft maintenance personnel is lacking. The aim of this study is to develop a fatigue scale that can assess the physical and cognitive fatigue levels of aircraft maintenance personnel in a multidimensional way and to examine its psychometric properties. This includes conducting the scale development process, testing content and construct validity, performing reliability analyses, and evaluating the applicability of the developed scale to a sample of maintenance personnel. The findings are expected to contribute to the scientific measurement of fatigue risk in maintenance organizations and support data-driven decision-making processes in safety management systems.

Keywords: Aircraft maintenance personnel, Fatigue, Fatigue scale, Scale adaptation.

Carbon Border Adjustment Mechanism and Air Cargo Logistics: Potential Implications for International Trade Costs

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Abstract

The European Green Deal has introduced new regulatory mechanisms that place environmental sustainability at the center of the global trading system. The Carbon Border Adjustment Mechanism (CBAM) is one of the tools for this transformation and aims to prevent carbon leakage by applying carbon pricing to imports entering the European Union (EU) market. While CBAM's priority is carbon-intensive sectors such as steel, cement, and fertilizers, its indirect impacts on international logistics systems, and especially air cargo transportation, have not been sufficiently investigated. This study aimed to examine the potential impacts of CBAM and the revised EU Emissions Trading System (EU ETS) on international air transport and foreign trade costs. This research employs a qualitative research design based on document analysis. Key policy documents examined within the scope of the study include the EU CBAM Regulation (2023/956), ICAO's CORSIA regulations, and Turkey's Green Deal Action Plan. The findings shows that carbon pricing mechanisms can indirectly increase logistics costs, particularly for air cargo transportation used to move high-value and time-sensitive goods. The analysis identified three key impacts: implicit carbon tariffs that may arise through logistics costs, increased administrative costs due to emission reporting obligations, and potential mode of transport shifts from air transport to alternative modes for certain product groups. These developments are likely to affect the competitiveness of exporters, particularly those from developing economies, in the EU market. The study highlights that the use of sustainable aviation fuels, green logistics practices, and the integration of carbon accounting systems are becoming increasingly important for maintaining competitiveness in a low-carbon trading environment.

Keywords: CBAM, Green Deal, International Trade, Air Cargo Logistics, International Trade Cost.

Manager Support in The Relationship Between Natural Decision-Making Behavior and Safety Climate: A Systematic Literature Review in Civil Aviation

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Abstract

The rapidly developing aviation sector, which continues to remain relevant with today's technology, is of critical importance for ensuring safe transportation. Within the scope of this research, the behaviors, experience, and competencies of individuals in the decision-making process, as well as the safety climate in the field, are shaped by managerial support. Aim of this research is to examine the relationship between natural decision-making behavior and safety climate, manager support in the field of civil aviation, through a systematic literature review. The PRISMA 21 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) document was used in the design, execution, and reporting process of the study. The literature review was conducted using the nationally recognized "National Thesis Center" and "Journal Park" databases; conducted using internationally recognized databases such as Web of Science, Scopus, Wiley, and PubMed. The keywords used in the study were “natural decision-making,” “safety climate,” “managerial support,” and “civil aviation.” The titles and abstracts of the studies obtained were examined. Full texts of the appropriate research suitable were recorded using the Zotero program and filed under the relevant headings. Duplicate records were removed from the research. The resulting data are discussed and evaluated in the discussion section. Although there are separate studies on each concept, no study has been found that examining the relationship between them. From this perspective, the aim is to contribute to the literature in the field of aviation. Suggested that the relationships between the concepts can be supported with quantitative data to provide support for future studies.

Keywords: Manager Support, Natural Decision-Making, Safety Climate, Civil Aviation, Systematic Review.

The Impact of Airline Business Models on Fleet Structure: The Case of Turkish Airlines and Pegasus Airlines

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Abstract

This study aims to empirically examine the relationship between airline business model and fleet structure using the example of Turkey. High capital requirements and intense competition in the civil aviation sector make fleet planning decisions a strategic element. While the impact of traditional airline (FSC) and low-cost airline (LCC) business models on operational structure and cost strategies has been discussed in the literature, comparative analyses using long-term fleet data are limited. Therefore, this research examines the fleet data of Turkish Airlines and Pegasus Airlines for the period 2010–2025 using document analysis. The findings show that business model preferences are decisive in determining fleet diversity, narrow-body–wide-body distribution, passenger-cargo ratio, and network structure preferences. It was found that Turkish Airlines, with its traditional business model, has a more diversified and wide-body-dominated fleet structure, while Pegasus Airlines, adopting a low-cost business model, follows a narrow-body and standardized fleet strategy. This study aims to contribute to the literature by demonstrating the strategic alignment between business model and fleet structure, and to offer strategic implications for fleet planning for airline executives.

Keywords: Business Model, Fleet Structure, Low-Cost Airline, Strategic Management, Traditional Airline.

Operational Performance Evaluation of High-Passenger-Traffic Airports in Türkiye: A CRITIC-Supported MARCOS Application

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Abstract

Airports in the aviation industry are not merely infrastructure providers but also central to operational efficiency and economic sustainability. The purpose of this study is to analyze the operational performance of 8 prominent public airports in Türkiye in terms of passenger traffic using 2024 data. In the study, the CRITIC method, one of the multi-criteria decision-making techniques, was used to determine criterion weights, while the MARCOS method, based on distances to ideal and anti-ideal solutions, was employed to rank the operational performance of airports. A total of 15 basic performance criteria were adopted in the analysis. According to the findings obtained with the CRITIC method, Gross Domestic Product (GDP/C13) was identified as the most influential criterion affecting the operational performance of airports. In the 2024 operational performance ranking conducted with the MARCOS method, Van Airport ranked first, Trabzon Airport second, and Kayseri Airport third. The airport with the lowest operational performance in the relevant period was determined to be Konya Airport.

Keywords: Airports, MCDM, CRITIC Method, MARCOS Method, Operational Performance.

Mapping The Research Landscape of Airline Fleet Planning: A Bibliometric Analysis With LCC–FSC Perspectives

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Abstract

This study examines the structure and development of the academic literature on airline fleet planning and aircraft type selection using a bibliometric analysis approach based on the Web of Science (WoS) database. Within this scope, the structure of the literature, thematic concentration areas, and the level of representation of business model perspectives are evaluated within the framework of the concepts of airline fleet, aircraft type, LCC, and FSC. The WoS Core Collection was chosen as the data source because it offers a reliable and systematic search opportunity by including SCI-Expanded, SSCI, and ESCI indexes. The study is based on a two-stage bibliometric analysis approach. The time frame is set as 2005-2025. This choice was made to see how the literature has developed and evolved in the last twenty years. In the first stage, a performance analysis was conducted. The productivity level of the literature, publication trends, and journal and country distributions were examined. In the second stage, a science mapping analysis was applied to create keyword co-occurrence networks and reveal thematic clusters. In conclusion, fleet planning appears to have become a central research area in the literature, diversifying thematically over time. Keyword co-occurrence analysis revealed that the concept of fleet planning is at the core of the network and establishes strong relationships with methodological and strategic concepts. Four main themes were identified as a result of the analysis: fleet planning and decision models, aircraft selection and fleet structuring, business model-based planning within the LCC framework, and airline strategy and management. The fact that the LCC concept forms a separate cluster indicates that this area has become a distinct research line in the literature. In contrast, the FSC concept does not form a central cluster.

Keywords: Airline Fleet Planning Aircraft Type Selection, Bibliometric Analysis, Aviation Management.

ESG And Financial Performance in Aviation: A Comparative Time Series Analysis

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Abstract

This study examines the effects of environmental, social and governance (ESG) performance of airlines in the aviation sector on financial performance. The study used data from Turkish Airlines (THY) and Lufthansa (DLH), which are considered the two flag carriers, for the years 2010-2024. ARDL bounds test method was used in the analysis. Return on assets (ROA) and return on equity (ROE) were used as dependent variables, while ESG score, environmental (E), social (S) and governance (G), emission score, current ratio and equity ratio data were used as independent variables. The stationarity of the data was checked with the Augmented Dickey-Fuller (ADF) unit root test, which is one of the econometric methods. Then, the long-term relationships between the variables were examined with the Autoregressive Distributed Lag (ARDL) bounds test. As a result, it is clear that the impact of ESG indicators on financial performance varies between companies; It was determined that environmental performance exhibited a stronger relationship with profitability in THY, while the impact was more limited and mostly negative in DLH.

Keywords: Air Transport, Aviation Management, ESG Score, Financial Management, ARDL.

Evaluating The Economic Sustainability of Dallas Fort Worth and London Heathrow Airports Using DEA and Malmquist Index Analysis

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Abstract

This study examines the economic sustainability of Dallas Fort Worth (DFW) and London Heathrow (LHR) airports for the period 2019-2023. The study uses the Malmquist efficiency index with output-oriented Data Envelopment Analysis (DEA) under variable returns to scale. The first of the two economic models used in the study assesses how effectively aircraft movements and Scope 1–2 CO₂ emissions are converted into passenger volume and annual revenue. The second focuses on resource-based financial efficiency by relating electricity consumption, water consumption, and total waste to annual revenue. The results show that LHR demonstrates stronger and more resilient economic sustainability than DFW in both models. In Model I, LHR achieves full technical and scale efficiency in 2023, while DFW steadily improves but remains below the efficiency frontier. In Model II, LHR achieves full efficiency in 2022 and maintains full variable return efficiency in 2023, while DFW remains weak compared to LHR in converting public service and waste-related inputs into revenue. Malmquist results indicate a severe contraction for both airports in 2020 during the pandemic period, followed by a sharper and faster recovery at Heathrow. Findings show that Heathrow's economic resilience stems from stronger efficiency recovery and better scale alignment, while DFW still has unrealized efficiency gains, particularly in resource-to-revenue conversion.

Keywords: Airport sustainability, economic efficiency, DEA, Malmquist index, Heathrow, Dallas Fort Worth.

Global Crises on The Aviation Sector: A Research on Major Airlines' Social Media Crisis Communication Strategies

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Abstract

This study examines the social media crisis communication strategies of major global airlines such as Turkish Airlines, Emirates, and Lufthansa during the unprecedented Middle East airspace closures that occurred in March 2026. The primary objective of the research is to analyze how these aviation organizations managed reputation risks and operational turbulence within the framework of Situational Crisis Communication Theory (SCCT). Using a mixed-methods approach integrating digital netnography and content analysis, the corporate messages on the companies' official X and Instagram accounts during the acute crisis phase were examined. Findings indicate a clear shift in communication styles from interactive engagement to one-way operational broadcasting in Customer Relationship Management (CRM). Airlines under extreme logistical pressure prioritized systematic “informativeness” to communicate flight cancellations and safety directives, intensively using ‘Justification’ and “Excuse Finding” strategies. Although “Rebuilding” tactics such as ticket flexibility were implemented, a paradox was observed: while information sharing increased, customer engagement weakened. Due to massive passenger volumes, the suppression of personalized “attention” created a serious empathy gap, leading to disappointment among stranded passengers. Findings indicate that while airlines effectively managed the initial external shock, the lack of empathetic interaction carries the risk of transforming an uncontrollable event into a preventable reputation crisis. To optimize future crisis resilience, the integration of AI-supported empathy protocols and decentralized digital communication networks is recommended.

Keywords: Crisis Communication, Aviation Industry, Social Media, Situational Crisis Communication Theory, Operational Disruptions.

Recovery Experience and Safety Behavior in Aviation: Mediating Role of Resilience

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Abstract

The aviation industry is characterized by high cognitive load, irregular working hours, and a zero-error tolerance policy, making human performance the most critical link in the safety chain. This study investigates the impact of recovery experiences -the process through which employees replenish their energetic resources during non-work time- on safety behaviors, specifically safety compliance and safety participation. Furthermore, it explores the mediating role of psychological resilience in this relationship. Drawing on the Conservation of Resources (COR) theory, it is hypothesized that effective recovery (psychological detachment, relaxation, mastery, and control) strengthens an individual's resilience, which in turn fosters more vigilant and compliant safety behaviors. Data are currently being collected from flight and ground staff using a quantitative survey methodology. Preliminary theoretical assessments suggest that recovery experiences significantly predict safety outcomes, and this effect is intensified by the individual's level of resilience. The findings aim to provide civil aviation authorities and airline managers with evidence-based insights to design better fatigue risk management systems and mental health support programs.

Keywords: Recovery Experience; Safety Behavior; Psychological Resilience; Aviation Safety; Human Factors in Aviation.

A Policy Mix Analysis of U.S. Sustainable Aviation Fuel Governance: Instruments, Institutions and Transition Pathways

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Abstract

Aviation is among the few transport sectors in which demand growth consistently outpaces incremental efficiency gains, making fuel-based emissions difficult to reduce through operational or technical measures alone. Sustainable Aviation Fuels (SAF) offer one route around this constraint: because they are chemically compatible with existing turbine engines and refuelling infrastructure, they can be substituted for conventional jet fuel without redesigning aircraft or airports. In 2021, the United States government established the SAF Grand Challenge, a joint initiative of the DOE, DOT, and USDA targeting three billion gallons of annual SAF production by 2030 and full domestic supply by 2050. This paper analyses the initiative as a case of federal policy design. Using document analysis and qualitative content analysis of primary federal documents and secondary institutional literature, the study examines how institutional mandates are allocated across agencies, how fiscal instruments under the Inflation Reduction Act address early-stage investment risk, and how lifecycle emissions standards are structured and verified. The analysis is organised around four dimensions — economic, environmental, social, and geopolitical — and finds that the initiative's coherence depends on three unresolved conditions: standardised lifecycle accounting, sustained de-risking of pre-commercial capital, and verifiable feedstock sustainability.

Keywords: Sustainable Aviation Fuel, Decarbonization, Policy analysis, transition governance, SAF Grand Challenge.

Geopolitical Risks and Airline Operations: The Impact of Regional Conflicts

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Abstract

The aviation sector plays a critical role in global transportation and economic sustainability. At the same time, it is highly sensitive to external factors due to its dependence on international networks. In this context, geopolitical developments as particularly regional conflicts have a direct impact on airline operations. In recent years, conflicts in the Middle East have led to significant operational challenges such as airspace closures, route changes, increased costs, and heightened safety risks. These developments have forced airlines to adjust their operational planning and adopt more flexible risk management strategies. This study aims to examine the impact of geopolitical risks on airline operations in light of recent developments in the Middle East. It focuses on key factors such as airspace restrictions, route changes, operational costs, and safety risks. The study adopts a qualitative approach based on literature review and document analysis. Academic studies, industry reports, and publications from international aviation organizations were reviewed. The findings show that geopolitical risks significantly affect airline operations and require airlines to develop more adaptive and flexible planning approaches. Overall, the study highlights the growing importance of integrating geopolitical risk considerations into airline decision-making processes.

Keywords: Geopolitical Risks, Regional Conflicts, Airline Operations, Airspace Restrictions

Ownership Is Not A Behaviour: Why Governance Models Shape Aviation Safety

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Abstract

The concept of ownership in aviation organizations has long been defined as an individual behavioral expectation as part of the safety culture discourse. However, the reluctance of operational personnel to take initiative and confront risks indicates that this situation is too widespread and even persistent to be explained by individual motivation. This study seeks the origin of this pattern not in individual attitudes but in the structural design of organizational governance. Using Just Culture theory, governance theory, and safety science literature together, the study examines the conceptual level of the mismatch between accountability and decision-making authority in aviation organizations. This examination reveals how escalation procedures become a risk management tool in the absence of decision-making authority and how employees develop a normal adaptation by minimizing their initiative within these organizations. The study argues that ownership behavior is shaped not by leadership rhetoric but rather by decision-making authority, accountability, and responsible risk-taking with institutional assurance. Accordingly, initiative-taking behavior is reframed not as an individual deficiency but as a normal outcome of organizational governance.

Keywords: Safety Culture, Organizational Governance, Ownership, Accountability.

Multi-Criteria Evaluation of Airline Performance: Operational, Service Quality, And Financial Perspectives

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Abstract

The airline industry is a sector characterized by intense competition. Therefore, evaluating airline performance solely based on financial indicators is insufficient. A comprehensive assessment of airline performance requires considering operational efficiency, service quality, and financial performance dimensions together. The purpose of this study is to present a comprehensive and multi-criteria performance evaluation approach through the integration of the three dimensions in question. The performance of Europe's leading 8 airlines was analyzed using the Multi-Criteria Decision Making methods CRITIC and MAIRCA. The relative weights of the 11 performance indicators identified in the study were calculated using CRITIC, and the airlines' performance rankings were determined using MAIRCA. The analysis results show that the performance evaluation criterion with the highest weight is operating cost, while the speed and timing of the service provided by the cabin crew and the in-flight entertainment system are also seen to have relatively high importance. Furthermore, according to the analysis results, Turkish Airlines is the airline with the best performance, followed by Iberia and Swiss International Air Lines. On the other hand, Finn Air has been identified as the alternative with the lowest performance.

Keywords: Aviation Management, Airline Performance Evaluation, Service Quality, CRITIC Method, MAIRCA Method.

Conceptual Integration of Satellite Guided Fire Suppression Ammunition on Bayraktar Akıncı UAV For Precision Suppression of Wild Fires

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Abstract

Wildfires have become one of the most important environmental and economic problems at the global level and they require an urgent aerial intervention. Although the aerial-firefighting vehicles such as helicopters and amphibious assault vehicles have powerful suppression capacity, they have disadvantages such as high costs, inability to work at night, and low accuracy in complex terrain. Therefore, in this conceptual study, the satellite-guided fire-fighting-bombs were introduced by transforming the Bayraktar Akıncı UAV into an aerial-firefighting vehicle. In this study, it is aimed to determine whether the 200 kg SATUAV fire-extinguishing-bomb can be mounted on the Bayraktar Akıncı UAV, and design suggestions were made by taking into account the geometric and aerodynamic interfaces of the guided missile TEBER (MK-82). The Bayraktar Akıncı UAV, which has a payload capacity of around 1350 kg, an endurance time of over 24 hours and high speed operational capacity, can carry a maximum of six 200 kg fire-fighting ordnance on a single mission. Main objectives within the scope of conceptual operational framework are to provide precise suppression of wildfires, provide rapid intervention at ignition points, and to support ground-firefighting units. While conventional water-dropping aircraft have low accuracy, the missiles steered by satellites have higher accuracy and they can reach hard-to-reach areas where other firefighting aircraft cannot operate due to operational difficulties. Thus, the results obtained from the study show that the use of long-range drones with precision guided firefighting tools is an alternative method for efficient wildfire management, particularly for precision firefighting and initial suppression tasks.

Keywords: Wildfire Suppression, UAV Firefighting Systems, AKINCI UCAV, Precision Aerial Firefighting, Fire Suppression Munition.

Bankruptcy And Restructuring in The Turkish Aviation Sector: Rescue or Starting from Scratch? A Comparative Analysis of Onur Air and Atlasglobal

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Abstract

Airline companies face significant challenges in entering the market and sustaining their operations due to their labor- and capital-intensive structures, high entry costs, and relatively low profit margins. In the aviation industry, fuel and labor expenses constitute the largest cost components. When these structural characteristics are combined with external shocks such as economic fluctuations, political crises, pandemics, and wars that lead to demand contractions, the financial sustainability of airlines becomes even more difficult. Before the liberalization period, airline bankruptcies were relatively limited due to the regulated nature of competition in the sector. However, following liberalization, a considerable number of airlines have declared bankruptcy. This study aims to examine airline bankruptcies through a multidimensional and qualitative perspective by focusing on the cases of AtlasGlobal and Onur Air, two airlines that ceased operations while operating in Türkiye. The sample of the study consists of employees and managers who previously worked for these airline companies. In the data collection process, a survey designed using a five-point Likert scale was employed. The findings of the study are expected to contribute to a better understanding of bankruptcy and restructuring processes in the airline industry and to provide insights for developing strategies to manage similar crises in the future.

Keywords: Aviation Governance, Bankruptcy Law, Airline Restructuring, Financial Stability, Turkish Aviation Sector.

The Effect of Digital Leadership Perception on Adaptive Performance: The Mediating Role of Technostress in The Context Of Air Traffic Controllers

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Abstract

In the aviation sector, air traffic controllers, who are at the heart of critical decision-making processes and form the backbone of safety and operational efficiency, are strategically important for their ability to adapt agilely to business processes transformed by intense digitalization. However, this adaptation process requires managing technological pressures and ensuring the availability of guidance models suited to the digital age. This study aims to examine the impact of air traffic controllers' perceptions of digital leadership on their adaptive performance and to determine whether technostress mediates this relationship. The study sample comprises air traffic controllers providing air traffic services within Turkish airspace (n=91). The research model and hypotheses were tested using confirmatory factor analysis and multiple regression analyses, based on data from the relevant sample. To examine the mediation effect, the Medmod macro in Jamovi was used. According to the research findings, air traffic controllers' perceptions of digital leadership have a positive but non-significant impact on both adaptive performance and technostress. In contrast, it has been found that technostress negatively and significantly affects adaptive performance. Finally, the research findings revealed that technostress does not mediate the relationship between digital leadership and adaptive performance. Although the study has certain limitations, recommendations for managers and future research have been presented based on the findings.

Keywords: Digital Leadership, Adaptive Performance, Technostress, Air Traffic Controllers, Turkish Civil Aviation Sector.

Investigation Of Factors Causing Hot Air Balloon Accidents Using The HFACS Model

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Abstract

The aim of this research is to examine the factors causing hot air balloon accidents from different perspectives by presenting them through sample balloon accidents. A qualitative research method was adopted for this purpose, and the "case study" design, a qualitative research design, was used to guide the research. Sample balloon accidents were selected according to purposive sampling and data saturation methods. The sample consists of 50 balloon accidents that occurred in different locations in the United Kingdom between 1996 and 2025. Document analysis was used as the data collection method. Data was collected by examining official balloon accident reports published on the institutional website of the UK Government Air Accidents Investigation Branch. The data obtained in the research were analyzed using content analysis based on the HFACS model. According to the research findings, environmental factors account for 66% of the factors causing balloon accidents. In particular, the strength and sudden changes in wind direction during flight were found to be the most important environmental factors causing balloon accidents. After environmental factors, unsafe behavior of the balloon pilot (18%) and organizational factors (15%) were found to be effective in the occurrence of accidents. The effect of factors related to unsafe supervision on accidents is approximately 1% and is extremely limited. It is thought that the research findings will make a unique contribution to the literature on hot air balloon accidents and will shed light on the operational processes of balloon operators and pilots.

Keywords: Hot Air Balloon, Balloon Accidents, HFACS, Aviation Accidents, Accident Analysis.

The Dynamics of Governance and Leadership in Contemporary Turkish Aviation Sector

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Abstract

The global aviation industry is currently traversing one of its most profound periods of structural change, driven by the convergence of technological innovation and shifting consumer behaviors. This research examines the impact of digitalization on the market behaviors and business model transformations of airline enterprises in Turkey during the first quarter of the 21st century. Utilizing a multiple case study analysis of Turkish Airlines, Pegasus Airlines, SunExpress, and AJet, the study evaluates how digital maturity acts as a strategic lever for competitive advantage. The findings demonstrate that digitalization is catalyzing a process of hybridization, where the traditional boundaries between Full-Service Carriers and Low-Cost Carriers are becoming increasingly blurred. Furthermore, the analysis reveals that Turkey's strategic positioning—codified in the 2053 Transport and Logistics Master Plan—has facilitated record-breaking passenger traffic, reaching 247.2 million travelers in 2025. The research underscores the critical role of leadership in integrating advanced technologies such as Artificial Intelligence and the New Distribution Capability (NDC) to optimize ancillary revenue streams and enhance operational resilience. This study contributes to the literature by offering practical insights for industry stakeholders navigating the digital-first aviation landscape.

Keywords: Aviation Governance, Digital Transformation, Hybrid Business Models, New Distribution Capability.

The Role of Aviation Student Clubs in Talent Development

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Abstract

Universities are expected not only to provide academic knowledge but also to support the personal and professional development of students. In this context, student clubs play an important role in developing skills that are required in professional life. Although previous studies have examined the contribution of student clubs to personal and professional development, research focusing specifically on aviation education remains limited. This gap is particularly important because the aviation industry requires highly qualified human resources capable of operating in complex and dynamic environments. The aim of this study is to examine the contribution of aviation student clubs to the development of students' skills and competencies. A survey was conducted with students who are members of aviation-related student clubs. The questionnaire included questions about leadership development, teamwork skills, communication abilities, and sectoral awareness. The findings show that participation in aviation student clubs contributes positively to students' leadership skills, teamwork experience, and communication abilities. In addition, club activities help students gain better knowledge about the aviation industry and improve their career preparation. The results suggest that student clubs can be considered as important informal learning environments that support talent development in aviation education. The study provides practical implications for universities and aviation education programs regarding the support of extracurricular activities.

Keywords: Student Clubs, Talent Development, Skill Development, Aviation Students, Aviation Education.

Pilot Resilience as an Emergent Socio-Technical Property: A Safety-II Network Analysis of Aviation Accident Narratives

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Abstract

This study reconceptualizes pilot resilience as an emergent socio-technical property arising from the interaction of multiple human-performance factors within aviation systems. Drawing on Hollnagel's Safety-II and Resilience Engineering framework, the research moves beyond traditional Safety-I approaches that focus on linear causation and failure analysis. Instead, it examines how resilience-related performance factors are structurally configured within aviation accident narratives. Using National Transportation Safety Board (NTSB) "Probable Cause" reports, a lexicon-driven computational text mining approach was applied to extract resilience-related themes, including procedural compliance, decision-making, situational awareness, workload regulation, crew resource management (CRM), automation awareness, and environmental management. These themes were modeled as nodes in a weighted co-occurrence network to analyze their structural interdependencies. Network analysis reveals a highly dense and interconnected architecture in which procedural compliance, control handling, weather management, and decision-making function as central hubs, while workload, communication, CRM, and automation awareness act as bridging mechanisms across domains. The findings demonstrate that aviation safety emerges from system-wide interactions rather than isolated failures, providing empirical support for the Safety-II paradigm. The study contributes theoretically by redefining resilience as a distributed network property, methodologically by integrating text mining with network analysis, and practically by identifying structural leverage points for resilience-oriented pilot training.

Keywords: Pilot resilience, Safety-II, Resilience Engineering, Network analysis, Aviation safety.

The Relationship Between Job Crafting And Burnout in Aviation Personnel: The Moderating Role of Self-Efficacy

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Abstract

Pilot burnout represents a growing occupational health concern within the aviation industry, with established associations with attentional narrowing, compromised aeronautical decision-making, and elevated incident probability. Despite the theoretical relevance of job crafting as a burnout prevention strategy, its relationship with burnout in aviation personnel has not been empirically examined. Drawing on the Job Demands-Resources Model (JD-R; Bakker & Demerouti, 2007) and Social Cognitive Theory (Bandura, 1997), this study investigates the relationship between four dimensions of job crafting and burnout among Turkish aviation personnel, and tests whether self-efficacy moderates this relationship. Data were collected from 381 participants (65% pilots, 35% cabin crew) using validated Turkish-language measures of job crafting (Tims et al., 2012; adapted by Cetin et al., 2021), burnout (Pines & Aronson, 1988; adapted by Capri, 2006), and general self-efficacy (Schwarzer & Jerusalem, 1995; adapted by Aypay, 2010). Structural equation modeling and moderated regression analyses revealed that all four job crafting dimensions negatively predicted burnout (β ranging from $-.19$ to $-.47$, $p < .001$). Self-efficacy emerged as a significant negative predictor of burnout ($\beta = -.42$, $p < .001$) and as a significant moderator of the job crafting–burnout relationship ($\beta = -.09$, $p = .013$; $\beta R^2 = .008$), such that the protective effect of job crafting was amplified among individuals with higher self efficacy. These findings advance the JD-R model into the aviation domain and offer concrete implications for workforce wellbeing programs and crew resource management training.

Keywords: job crafting, burnout, self-efficacy, aviation human factors, JD-R model.

How May Air Traffic Controllers Reduce Carbon Emissions in Air Transport?

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Abstract

The aviation sector is developing day by day. Liberalization movements for the sector, technological developments, modernization of aircraft, and airport investments affect the development of aviation activities. As a result, airspace density increased by the rise of traffic. Moreover, in the fact that aircraft produce carbon during flight operations, it increases gas emissions. Therefore, it is important to manage carbon emissions in the aviation sector. On the other hand, air traffic control services are activities that aim to carry out air transportation activities safely, quickly and regularly. Air traffic control services are a part of air traffic management. Strengthening the technologies used in air traffic control services in terms of preventing collisions, reducing air traffic controller workload, airspace design, and providing fuel savings will contribute to reducing carbon emissions and approaching the Carbon Zero target of 2050. In this study it is tried to explain air traffic control services and evaluate the impact of climate change on the aviation sector. Besides, it is aimed to discuss the practices of air traffic controllers that may reduce carbon emissions. Finally, with the participation of fourteen air traffic controller from Türkiye, an interview was conducted. It is revealed that air traffic controller's practices are observed as similar to literature.

Keywords: Air traffic control, carbon emissions, air traffic controllers, climate change.

Air Travel Demand Under Uncertainty: A Meta-Synthesis and Implications for Alternatives Air Corridors

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Abstract

Despite the structural advantages afforded by global connectivity, the aviation sector remains an extremely vulnerable system, highly susceptible to external shocks due to the dynamics of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA). This study examines the effects of health (COVID-19), security (terrorism), and geopolitical crises (the Russia-Ukraine war and tensions in the Middle East, among others) on the aviation ecosystem, within the framework of the interaction between passengers' risk perceptions and the organizational resilience practices of industry actors. Within the scope of the research, a total of 12 scientific studies aligned with the topic and objectives were selected from the Web of Science and Scopus databases, and a thematic meta-synthesis approach, incorporating both qualitative and mixed-methods research, was adopted. As a result of the in-depth analysis, the main themes related to crises were identified as “psychological risk and trust management,” “strategic flexibility and adaptation,” “macro-political and systemic interventions,” and “technological and operational continuity.” The findings reveal that demand dynamics during crisis periods cannot be explained by rational economic models; rather, subjective experiences such as uncertainty, loss of control, and erosion of trust are the determining factors. In this context, passenger behavior is being restructured around the “perceived trust” axis, while the concept of service quality is evolving to include dimensions of health, hygiene, and organizational transparency. At the organizational level, traditional “bouncing back” approaches have proven insufficient; instead, “bouncing forward” strategies—which incorporate structural adaptations such as fleet flexibility, route agility, and revenue diversification—have emerged as the preferred approach. Consequently, aviation crises are assessed not merely as technical or operational issues, but as multi-stakeholder and socio-psychological processes. Effective crisis management must be redefined in VUCA environments based on proactive communication, corporate transparency, and dynamic strategic flexibility.

Keywords: Aviation, Risk, Crisis and Uncertainty, Demand Dynamics, Meta-synthesis.

Introducing A Mechanism for Measuring Good Governance in Civil Aviation

CSOs: Setting the Way for AVIAGOV

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Abstract

Even though robust governance dictates organizational legitimacy within the aviation ecosystem, this critical dimension remains notably under-researched. To bridge this literary gap, our study examines the specific governance priorities of Turkish aviation stakeholders, directly contrasting academic perspectives with the practical insights of CSO practitioners. Our descriptive data shows that while ‘institutional structure’ and ‘transparency and accountability’ represent paramount concerns, ‘environmental sustainability’ is routinely relegated to the absolute lowest priority. Interestingly, although quantitative testing confirms a striking consensus between academia and practitioners over these baseline benchmarks, a vital friction point persists because the data highlights a stark contrast between rapid operational digitalization and the lagging demand for strategic institutional maturity. Ultimately, a localized divergence emerges where CSO respondents consistently prioritize immediate practice-oriented elements like digital execution, whereas academic evaluators focus more heavily on formal, overarching governance architectures. This divergence suggests that governance quality is not perceived uniformly across stakeholder groups but reflects their positional and experiential differences within the field. Our study paves the way for the construction of an AVIAGOV index for ranking aviation CSOs’ governance performance.

Keywords: Aviation CSOs, Governance, Management Culture, Digitalization, NGO Governance, Performance Metrics, NGO Leadership and Legitimacy.