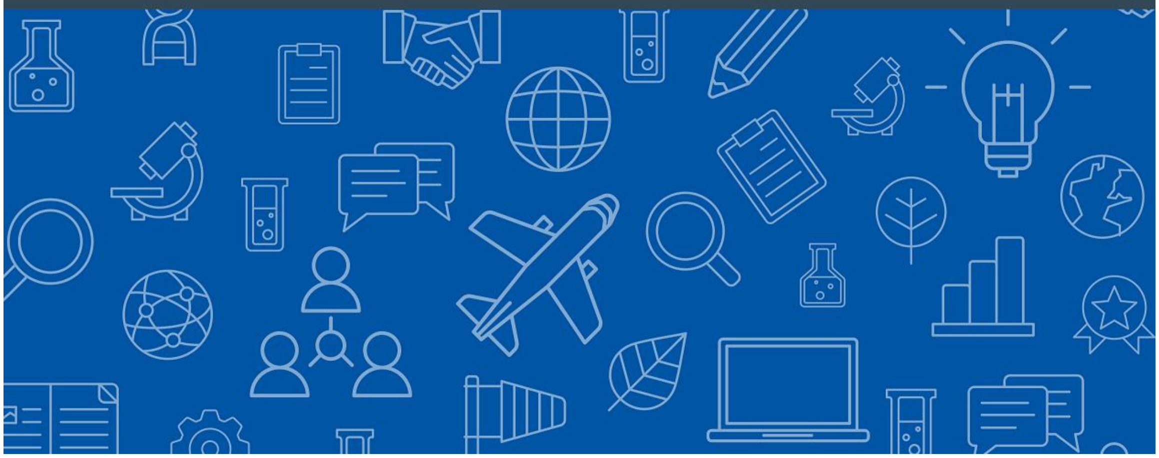
ICAO SCIENTIFIC INITIATIVE

ANALYTICS AND MANAGEMENT RESEARCH



Importance of Management in Aviation

Dennis Kira, Golnaz Rezai, Raafat George Saadé

Synopsis:

Despite growing interest and an incremental increase of published material on civil aviation, the bulk of existing research remains focused on topics related to operations and technical training. This represents a significant shortage in the body of literature on management issues such as marketing, finance, information technology, innovation, and social impact. This study addresses the limitations of aviation management research and calls for current and relevant research in the field of data (being a critical phenomenon) and aviation management.

Cite as:

Kira, D., Rezai, G & Saade, R. G. (2019). Importance of Management in Aviation. *ICAO – Scientific Review: Analytics and Management Research, 1,* 01-15.
Retrieved from: http://isr.icao.int/amr/Volume01/v1p01-015Kira4535.pdf

ICAO

SCIENTIFIC INITIATIVE DISCLAIMER

WWW.ICAO.INT

ICAO SCIENTIFIC REVIEW: ANALYTICS AND MANAGEMENT RESEARCH (AMR)

The ICAO Scientific Review (the Review) is a publication of the International Civil Aviation Organization (ICAO). It is published [monthly/quarterly/semi-annually/annually] as a scientific forum and is intended for educational, research, self-study, and reference purposes only.

The ICAO Scientific Review does not promulgate, constitute, or reflect ICAO policy. The opinions and conclusions expressed in the Review are solely those of the author and do not necessarily reflect the views or positions ICAO or its Member States.

Manuscripts are selected to appear in the Review on the basis of a double-blind review to help ensure that articles answer meaningful research questions and draw accurate conclusions based on professionally executed experimentation. ICAO however makes no express or implied warranty regarding and neither accepts nor assumes responsibility for the accuracy, completeness, currency, or use for any purpose, of articles or any information contained therein.

Nothing in or relating to this publication shall be deemed a waiver, express or implied, of any immunity from suit or legal process or any privilege, exemption or other immunity enjoyed or which may be enjoyed by ICAO, its officers and staff, either pursuant to the Convention on the Privileges and Immunities of the Specialized Agencies or any other applicable agreement, convention, laws or decrees.

ICAO further assumes no liability for any damages that may arise from the viewing, distributing, or copying of articles, nor for any violation or infringement of the rights of others due to the publication or use of articles or their contents.

Volume 1, 2019

IMPORTANCE OF AVIATION MANAGEMENT RESEARCH

Dennis Kira *	Concordia University Montreal, Canada	dennis.kira@concordia.ca
Golnaz Rezai	Concordia University Montreal, Canada	golnaz.rezai@concordia.ca
Raafat Saade	Concordia University Montreal, Canada	raafat.saade@concordia.ca

*Corresponding Author

Paper Category

☒ Position Paper	☐ Perspective Ideas	☐ Original Research
☐ Case Studies	☐ Technical Briefs/Notes	☐ SARPS Review
☐ Business Technology Reviews	☐ Student Paper	☐ Review Paper

Strategic Objectives	Key Initiatives	Focus Areas	Global Programmes
☐ Aviation Safety	☐ No Country Left Behind	☐ Improving ICAO's SARP and Policy Development	☒ Next Generation Aviation Professionals
☐ Air Navigation Capacity and Efficiency	☒ Aviation Development and ICAO World Aviation Forum	☐ Strengthening ICAO's Regional Presence	☒ Technical Cooperation Performance
☐ Security & Facilitation	☐ Performance-based Navigation	☐ Global planning and Strengthening Partnerships	☒ Global Aviation Training
☒ Economic Development of Air Transport	☐ Pandemic Response Coordination	☐ Implementation Support & Mobilizing Resources	☐ State Action Plans for Aviation CO_2 Reduction
☐ Environmental Protection	☐ Women in Aviation	☒ Effectively Responding to Aviation Emergencies	☐ CORSIA Initiative

ABSTRACT

Aim/Purpose:	Despite growing interest and an incremental increase of published material on civil aviation, the bulk of existing research remains focused on topics related to operations and technical training. This significant shortage of literature on civil aviation management issues. This study addresses the shortage of aviation management research and encourages research work in this field.
Context:	The aviation industry's socio-economic impact at both the domestic and global level should not be underestimated or dismissed to the side-lines. As air transport demand grows at a faster rate than system capacity, an efficient and effective management of system capacities becomes essential to the operation and wellbeing of the future global air traffic system. Although research spanning the past three decades has made significant progress in the relevant research fields of air traffic flow management and airport capacity modeling, research on topics of air traffic management significantly lacks in methodological quality and rigor.
Method:	This study examines published research on civil aviation management and groups the existing literature into five distinct journal categories. The purpose of this category breakdown is to investigate the lack of published material and research being conducted on civil aviation management.
Contribution:	This paper highlights the current gap in literature, and calls on academics and industry professionals to take heed of the potential for investigating and conducting research on topics related to the aviation management sector.
Findings:	The findings of this paper confirm that there is an incipient yet rapidly growing demand for creative, realistic and meaningful research to be conducted on aviation management. More importantly, it outlines how the aviation management industry has the potential to significantly contribute to the development of new business opportunities that are based on ICAO strategic objectives.
Recommendations:	The onus is on scholars and industry professionals to address the existing gap in civil aviation management research and to recognize that the domain ties to advancing ICAO's strategic goals. They should also recognize that aviation management is fundamental to the advancement of the aviation industry as a whole.

Keywords: *Aviation management, journal review, research, ICAO strategic goals*

INTRODUCTION

CIVIL AVIATION MANAGEMENT AND ICAO STRATEGIC GOALS

Civil aviation management encompasses business aspects of the air transportation industry (Lambert et al, 1998) and provides the knowledge necessary to oversee the proper functioning of all airline departments' and airports' end-to-end operations, from strategy to daily customer support and across clients, planning, suppliers and distribution management. It is primarily a fundamental management practice that aims to keep the industry safe, secure and efficient (Kinnison and Siddiqui, 2012; Sheehan, 2003), but at the same time specific due to the fact that the civil aviation industry functional needs and nature is very different form that of other industries. The management domain acts as the academic link that combines aviation law and regulations and applies business principles to airport and aviation industry operations (which is especially true for regulatory bodies). This is achieved by dividing focus between management concepts and practical aviation industry knowledge (Merkert and Morrell, 2012).

More importantly, civil aviation management research strongly supports the International Civil Aviation Organization's (ICAO) core mandate and the fulfillment of its strategic objectives. As ICAO's concentration on the fulfillment of its strategic objectives becomes more focused, the need and potential for civil aviation management research in the realization, implementation and support of these objectives becomes paramount.

Despite its potential influence, civil aviation management has received relatively little to no attention in existing academic research outlets. Most published research end up in secondary general area journals such as transportation, logistics, engineering and innovation, which makes it relatively difficult to find civil aviation research articles. This is especially true when we are dealing with civil aviation management where not only research in this area is limited, but outlets for this research is only a handful.

It is very important that a comprehensive understanding of the role of civil aviation management practices and outcomes support and contribute to achieving ICAO's strategic objectives. This is due to the existing gap in linking evidence-based research and of its effective application in practice. The lack of academic research in civil aviation management may be attributed to the overlooking of managerial roles in the industry. The study of civil aviation management has a great potential to maintain and strengthen ICAO's strategic goals which will contribute to its effectiveness in its impact through its primary role of fostering cooperation, collaboration and coordination across all stakeholders.

However, there are several challenges confronting the aviation industry despite the unprecedented innovations achieved since ICAO's establishment in 1947. While recent concerns for environmental impact and the development of next-generation aviation professionals is receiving serious attention, the global security and safety records continue to be major driving forces for a better industry. Aviation security continues to address critical issues considering the unprecedented terrorist attacks that have taken place in the world. Offsetting the risk of terrorist attacks calls for extensive collaboration in aviation management and ICAO plays an important role in achieving that – to that effect, research in this area, for example, can support ICAO in its endeavor. This, among other many similar examples, renders the domain of civil aviation management even more significant and timely. ICAO's 'No Country Left Behind' initiative launched in 2014 can only be re-strengthened through the global establishment of effective and efficient research management systems.

ARGUMENTATIVE REVIEW

WHY IS AVIATION MANAGEMENT PERTINENT?

Aviation managers are constantly striving to streamline processes and increase efficiency. They are required to make professional aviation oriented decisions and assessments that are likely to have immediate and long term effects on the implementation of technology in aviation management workflows and on fellow industry professionals (Wu and Liao, 2014). Information concerning existing processes and workflows are acquired from many resources, however, research that systematically describes a measurement of the existing situation is not easily accessible, especially in areas where existing research on the subject is scarce as has been reported as far back as 20 years ago by Helmreich et al. (1999), and which is still true today. Aviation management research is needed for four distinct reasons.

- The primary reason being for its ability to address critical challenges that are facing the industry (Di Gravio et al, 2015).
- Second, continued academic research ensures that the industry has access to the most current knowledge on available procedures (Button and Taylor, 2000). Aviation management principles ensure that there is a constant effort to keep up with the fast and ever-changing technology and operating philosophies in aviation (Chen and Chen, 2012). Being ahead of the game and constantly keeping up with technology advancement and changes allows aviation managers and industry professionals to remain well-grounded and effective in their work environments (Thomas, 2012).
- Third, continuous dedicated research will help maintain and advance the relative position of aviation management within academic circles whilst establishing a reputation for providing meaningful research and offering a forum for analysis, discussion and exchange of ideas in the field of aviation management. Once a research base is established, grants, manpower, facilities and other resources tend to follow (Gerede, 2015; Merkert and Morrell, 2012).
- Finally, conducting studies on aviation management may be instrumental in solving the challenges faced by the aviation community and will fuel incremental studies that will develop and advance the field, leading to increased management effectiveness in the short and long term (Yeşim and Gerede, 2017).

The reasons provided above highlight the lack of current focus provided to aviation management. Current, strong focal areas like aerospace systems, operations, optimization and planning of multi-modal transport networks and aeronautical aspects of transportation neglect management, and do not advance our knowledge of this area, creating a relative decline in valuable intelligence (Button, 2017; Button and Taylor, 2000; Walala, 2016). Aviation management research holds countless benefits such as the ability to ensure that overall business operation, fleet planning, revenue management, safety enforcement; employee hiring and marketing processes run smoothly. All the aforementioned factors emphasize the importance of sponsoring advancement in this field and highlight the need for increased research.

PURPOSE OF STUDY

The study of civil aviation management should be prioritized and closely defined in order to further the successful establishment of sustainable economies, environment, security and safety. While most of the publications address issues of interest to ICAO have important effects on aviation, what is more significant and currently overlooked, are the benefits that can be derived by recognizing aviation management's important role in the implementation of ICAO's strategic goals and initiatives. A

Google Scholar search of civil aviation management and ICAO strategic goals publications over a ten-year period between 2007-2017 resulted in very few publications of less than 50.

To that effect, this study attempts to illustrate the current gap and encourage/invite researchers, academics, civil aviation authorities, and industry players to contribute to the body of knowledge in civil aviation management via their investigations into, and publishing of, research supporting ICAO's strategic goals, key initiatives, focus areas and global programs.

The study also identifies distinct journals that could potentially provide management studies and research coverage of all major sectors of the industry such as airlines, airports, and associated infrastructures of air traffic control. This is provided herein as an aid for researchers doing work in this area to find outlets for the dissemination of their work.

Four distinct categories of journals related to aviation were found and are outlined in this study. The first set of journals deal mainly with the aviation industry and are focused on the aerospace community, existing educational processes, air traffic management and aviation operations of all flight vehicles (See Appendix, Table A1). The second group of journals covers cognate topics for all transportation modes. They mainly publish conceptual and theoretically-informed papers with empirically oriented contributions (See Appendix Table A2). The third group of journals concentrates on transportation articles that have a high impact factor and look into policy analysis, formulation and evaluation as well as emerging technologies and mathematical analysis (See Appendix Table A3). The fourth and final group consists of journals related to optimization, transportation, operational reproach in addition to decision making and traffic management topics. Overall these four journal groups or categories have, by both necessity and concern, been acting as the driving force in aviation research at the academic level. There is an inordinate emphasis placed on the operations, technological changes, technical training whilst other potential topics have been overlooked, or, have taken the research backseat. Thus, explaining the lack of material and research in aviation management publishing.

SITUATIONAL ANALYSIS

As elaborated above, the goal of this study is to draw attention to the importance of aviation management studies and the need for further research on this topic. A Google Scholar search of civil aviation management publications over a ten-year period between 2007-2017 results in a total of 147 articles that have "civil aviation management" in their title. If a time range is not entered, a total of 231 articles are found. Searching for the term "civil aviation management" as a key-phrase result in 307,000 articles, however, the majority of these articles do not specifically touch on the topic of aviation management. Even if the term "management" was featured in the refereed publications, it is not emphasized as the main topic. In addition, searching 'ICAO strategic objectives' in a title or content along with 'aviation management' leads to a few articles as shown in Table1.

In Table 1, the 'Title' column means that the search term was found in the title, while 'Content' means it was found within the document, but not in the title. The numbers in the column represent the number of articles found. It is also important to note that this search was based on the most common search terms based on ICAO's objective goals. Ignoring synonyms and variations, the current study is intended to provide a snapshot of the publications focusing on civil aviation management coupled with ICAO's strategic objectives.

Table 1.

Google Scholar search of the term: "civil aviation management" coupled with ICAO's strategic objectives (2007-2017)

Search term	Title	Content
Civil Aviation Management System	46	260,000
Civil Aviation Management	231	386,000
Safety	10	185,000
Security	2	150,000
Efficient	1	98,500
Economically Viable	4	82,400
Environmentally Responsible	1	4,400

As shown in the Table 1, there is a significant gap in the number of articles that discuss management and strategic goals in civil aviation. There are no articles to be found with both "civil aviation management" and "ICAO's strategic objectives" in the title. This corroborates the current hypothesis for a need to establish formal platforms and research initiatives in civil aviation management. For statistical purposes, the number of publications on Civil Aviation Management is compared to the number of publications in Transportation Management Systems (TMS). TMS is a subset of supply chain management concerning transportation and the majority of transportation studies that are either initiated or mandated by TMS. Many of these studies tightly concentrated TMS from suppliers all the way to users without considering the mode of transport. There are studies which look at the mode of transport management systems in detail such as aviation management system and rail transport management system. In order to calculate the relative comparisons, TMS, transport management and rail transport were selected to be searched on Google Scholar platform. A Google Scholar search of "transportation management system" in the title of the publication results in 1,300 articles while in the content, a total of 2,690,000 articles are found (See Table 2).

Table 2.

Google Scholar search of "transportation management system" and "rail transport management" coupled with ICAO's strategic objectives (2007-2017)

Search term	Title	Content		Title	Content
Transportation Management System (TMS)	1300	2,690,000	Rail transport management system	643	1,170,000
Transportation Management	639	2,880,000	Rail transport management	2,550	1,330,000
Transportation Management and Security	43	2,230,000	Rail transport management and safety	110	636,000
Transportation Management and Safety	145	2,200,000	Rail transport and management and security	25	426,000
Transportation Management and Efficient	24	2,220,000	Rail transport management and Efficient	10	319,000
Transportation Management and Economy	33	2,330,000	Rail transport management and Economy	12	593,000
Transportation Management and Environmental	81	2,450,000	Rail transport management and Environmental	11	417,000

It is generally accepted that the economic importance of TMS has encouraged many researchers to investigate the topic. However, when the studies are categorized based the transportation modes, the gap between aviation management systems and rail transport systems keeps widening (See Figure 1). There is a wide range of studies on rail transport with the particular focus on management and TMS, yet, the growth of these studies in the aviation field is not consistent.

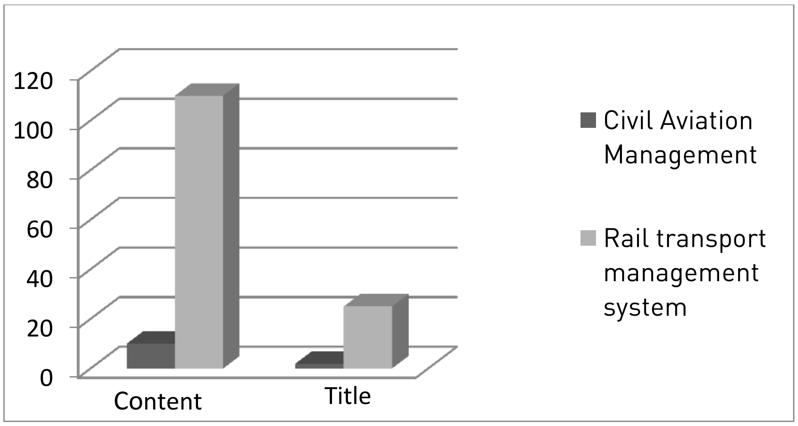


Figure 1.
Number of publications on TMS (title and content) in both fields of civil aviation management and rail transport management system

The development of ICAO's strategic goals can increase the reliability, efficiency and cost effectiveness of the aviation industry, as well as provide solutions for the management of safety and security issues. However, Figure 2 presents the number of aviation management studies related to these goals and showing that they are significantly less than the studies undertaken in a different industry. Papers written on civil aviation management which have regard for ICAO's strategic goals will provide researchers with strategies for creating viable studies and valuable papers.

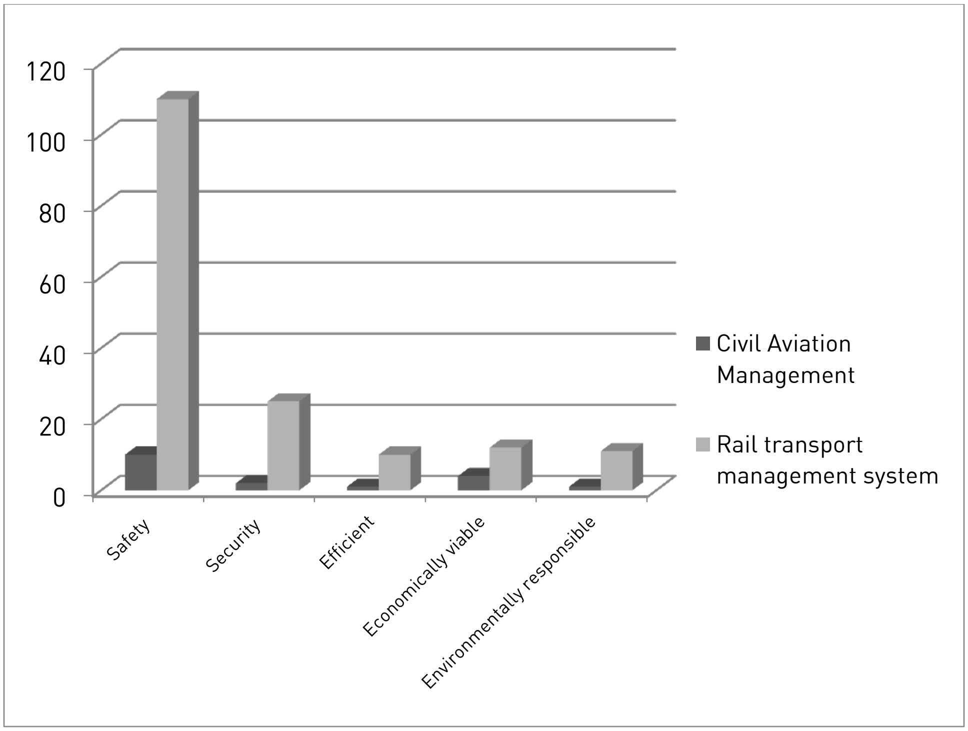


Figure 2.
Studies with content related to ICAO goals (civil aviation management vs rail transport management system)

RELEVANT OUTLETS

As mentioned earlier, research outlets for the dissemination of civil aviation management work is limited. Consequently, it is worthwhile to mention those outlets and provide a brief analysis of their focus, in order to give all stakeholders a view of what exists and the extent of what is needed. The following looks at the academic and non-academic journals that feature civil aviation management topics. These journals cover major sectors of the industry (management included) and are broken down into the following five categories:

1. **Aviation management specific academically peer reviewed publications**
   This category includes a variety of areas dedicated to major economic, management and policy issues facing the air transport industry today. Featured in this category are journals primarily dedicated to topics of aviation management, law, innovation, design and operation. This group of publications is considered as the first choice of writers looking to publish research that meets the criteria for management studies. Examples of this category are: *Air and Space Law, Air Traffic Control Quality* and *the Journal of Air Transport Management* (Full list on Appendix, Table A1).
2. **Non-aviation management specific academic peer reviewed publications**
   The subject matter of publications in this category does include aviation however; the overall focus is on aspects of management within the transportation industry. Aviation related research is accepted by these publications; however, the number of aviation management articles is negligible when compared to the total number of articles published by these journals as a whole. Journals such as *Journal of Travel Research, Transport Policy and Transport Review* are examples of the type of journals that fall under this category (Full list featured on Appendix, Table A2).

3. **Non-aviation related journals**
   These publications fall under a transportation category and the subject matter may include all modes of transportation. The number of aviation studies conducted by these journals is smaller when compared to other subject matter articles that are featured (Appendix, Table A3). Moreover, the scope of these publications is dedicated to topics related to technical, engineering, scientific innovation and advancements. Examples of this type of publications would be the *International Journal of Applied Aviation Studies* and *Transportation Research*.
4. **Preparation sciences and logistics journals**
   Articles in this group are dominated by algorithmic development due to the nature of the problems addressed in most articles (Appendix, Table A4). Typically, regardless of the domain of study, the topics are related to optimization of given performance measures and the improvement of algorithms based on speed, cost or superior model formulation. Typical problem areas are fleet planning, risk management, and safety management. *Journal of Air Transportation* and *Transportation Science* fit under this category (Table A4).
5. A fifth unofficial category that was not included in the preliminary list is worthy of being mentioned. This category includes non-academic aviation articles that are freely accessible on the internet and via the public press. These publications do not apply an academic refereed process and provide a general overview of the industry. This category by far has the largest number of articles that deal with aviation management. The lack of academic authorship however, means they have little academic value (See Appendix, Table A5).

CONCLUSIONS AND RECOMMENDATION

There is a clear need to conduct and support research on aviation management studies. The analysis and discussion in this paper show that there is a significant and potentially retarding lack of thought generation, expansion and refinement in the area of aviation management. It is vital that work begins on studying this area and building knowledge for the benefit of the entire industry.

It is expected that the sharing of management related concepts and knowledge to and from the aviation industry will stimulate the development of new management ideas and the publication and dissemination of scholarly aviation management articles. For example, American Airlines is credited for developing the foundational science behind revenue management that is utilized by all industry airlines in inventory management of perishable goods such as hotel rooms (Freestone, 2015). Similar developments took place in the creation of loyalty programs. Due to e-commerce and payment infrastructure, it is now possible for anyone to start a reward/loyalty program for their store or site (Stone, 2016). Another example of the dissemination of new ideas in the aviation industry is the Hub Location Problem Paradigm (HLP) that was adopted as spoke-hub distribution model by Delta Airlines in 1955. This model helped revolutionize the transportation logistics industry. It is a form of transport topology optimization problem formulation in which traffic routes are organized as a series of "spokes" that connect outlying points to a central "hub". The distribution topology was subsequently adopted by the telecommunications and information technology sector in the late seventies, and is referred to as the Star Network Topology.

The journal categories and listings discussed in this paper offer a comprehensive compendium of aviation specific and non-aviation specific academically peer reviewed journals. These journals do not solely focus on aviation management studies (Button and Yuan, 2013; Peoples and Bitzan, 2017). The scope of the majority of listed publications is based on theoretical, technical and operational aspects of aviation research. The argument here is that aviation management has matured as a science and emerged as a recognized field of study (Florida et al, 2015).

This paper proposes a dynamic strategy for the development of platforms that focus on civil aviation management based upon fundamental factors such as ICAO strategic goal implementations. It also suggests that scholars and professionals should be encouraged to concentrate more on aviation management and understand its value and potential in advancing the aviation industry. With stability of management and working cooperatively with researchers and academia, ICAO stands a better chance to effectively address security and prevent terror attacks on aviation, illegal trade in wildlife, and depletion of aviation professionals, in addition to poor safety performance. Effective and practical studies in civil aviation management set new and improved standards that sustain aviation as a vital economic sector and development catalyst.

REFERENCES

Button, K. (2017). *Wings across Europe: towards an efficient European air transport system*. Taylor & Francis.

Button, K., & Taylor, S. (2000). International air transportation and economic development. *Journal of air transport management*, *6*(4), 209-222.

Button, K., & Taylor, S. (2000). International air transportation and economic development. *Journal of air transport management*, *6*(4), 209-222.

Button, K., & Yuan, J. (2013). Airfreight transport and economic development: an examination of causality. *Urban Studies*, *50*(2), 329-340.

Chen, C. F., & Chen, S. C. (2012). Scale development of safety management system evaluation for the airline industry. *Accident Analysis & Prevention*, *47*, 177-181.

Di Gravio, G., Mancini, M., Patriarca, R., & Costantino, F. (2015). Overall safety performance of the air traffic management system: Indicators and analysis. *Journal of air transport management*, *44*, 65-69.

Florida, R., Mellander, C., & Holgersson, T. (2015). Up in the air: the role of airports for regional economic development. *The annals of regional science*, *54*(1), 197-214.

Freestone, R., & Wiesel, I. (2015). Privatisation, property and planning: the remaking of Canberra Airport. *Policy Studies*, *36*(1), 35-54.

Gerede, E. (2015). A study of challenges to the success of the safety management system in aircraft maintenance organizations in Turkey. *Safety science*, *73*, 106-116.

Helmreich, R. L. (2000). On error management: lessons from aviation. *BMJ: British Medical Journal*, *320*(7237), 781.

Helmreich, R. L., Merritt, A. C., & Wilhelm, J. A. (1999). The evolution of crew resource management training in commercial aviation. *The international journal of aviation psychology*, *9*(1), 19-32.

Kinnison, H. A., & Siddiqui, T. (2012). *Aviation maintenance management*.

Lambert, D. M., Cooper, M. C., & Pagh, J. D. (1998). Supply chain management: implementation issues and research opportunities. *The international journal of logistics management*, *9*(2), 1-20.

ICAO Business Plane 2017-2019, accessible at https://www.icao.int/Meetings/a39/Documents/Business%20Plan%202017-2019.pdf

Merkert, R., & Morrell, P. S. (2012). Mergers and acquisitions in aviation–Management and economic perspectives on the size of airlines. *Transportation Research Part E: Logistics and Transportation Review*, *48*(4), 853-862.

Peoples, J., & Bitzan, J. (Eds.). (2017). *Economics of Airport Operations* (Vol. 6). Emerald Group Publishing.

Sheehan, J. J. (2003). *Business and Corporate Aviation Management: On-Demand Air Transportation*.

Stone, M. J. (2016). Impact of delays and cancellations on travel from small community airports. *Tourism and Hospitality Research*, 1467358416637252.

Thomas, M. J. (2012). *A systematic review of the effectiveness of safety management systems* (No. AR-2011-148). Australian Transport Safety Bureau.

Walala, M. (2016). *A cross-sectional and mixed-method assessment of safety culture and safety climate at a regional airline* (Doctoral dissertation, Purdue University).

Wu, W. Y., & Liao, Y. K. (2014). A balanced scorecard envelopment approach to assess airlines' performance. *Industrial Management & Data Systems*, *114*(1), 123-143.

Yeşim, K. U. R. T., & GEREDE, E. (2017). Evaluation of Safety Management Systems in the Turkish Ground Handling and Airport Terminal Companies. *Elektronik Sosyal Bilimler Dergisi*, *16*(61), 369-384.

APPENDIX

Table A1: Example of Peer Reviewed Publications Covers Aviation Management

Title	Typical topics
Air and Space Law	Information on law applicable to aerospace activities
German Journal of Air and Space Law	Domestic and international air law and the law of space applications
Air Traffic Control Quarterly https://www.atca.org/air-traffic-control-quarterly	Air traffic management and aviation operations of all flight vehicles
Collegiate Aviation Review (CAR)	Air and flight education
International Journal of Aerospace Psychology (previously known as The International Journal of Aviation Psychology)	Development and management of safe, effective aerospace systems from the standpoint of the human operators and occupants.
Journal of Advance Transportation	Design operations, optimization and planning of multi-modal transport networks, transit & traffic systems, transport technology and traffic safety
Journal of Air and Law Commerce (JALC)	Economic problems affecting aviation and space
Journal of Air Transport Management https://www.journals.elsevier.com/journal-of-air-transport-management/	Major economic, management and policy issues facing the air transport industry today.
Journal of Transportation Worldwide (JATWW)	Aeronautical aspects of transportation
Journal of Aviation/Aerospace Education & Research (JAAER)	Aviation and aerospace community and educational process in the industry

Table A2: Non-Aviation Management Specific Academically Peer Reviewed Publications

Title	Typical topics
The Journal of the Human Factors and Ergonomics Society	Systematic management systems, machines, and environments
Journal of Transportation Geography (JTG)	Focuses on the geographical dimensions of transport, travel and mobility
Journal of Transportation management (JTM)	Focuses on managerial and policy articles in the transportation, logistics and supply chain fields
Journal of Transportation and Statistics (JTS)	Role of transportation in society, its function in the economy, and its interactions with the environment
Journal of Transportation Research Forum (JTRF)	Focuses on passenger and freight transportation

Journal of Travel Research	Focuses on travel and tourism behavior, management and development
Knowledge technology & policy (previously known as Philosophy & Technology)	Addressing the expanding scope and unprecedented impact of technologies
Transport Policy	Aiming to bridge the gap between theory and practice in transport
Transport Review	covering all modes of transport
Transportation Journal	Addresses new knowledge relating to all sectors of the supply chain/logistics/transportation field
Transportation Law Journal	Major platform in the field of transportation law
Transportation Research Record	Covers all kinds of transportation-related topics

Table A3: Non- Aviation Related Journals

Title	Typical topics
Transportation Research Part A: Policy and Practice	Covers all passenger and freight transportation modes: policy analysis, formulation and evaluation
Transportation Research Part B: Methodological Editorial Board	Focuses on all methodological aspects of the subject, particularly those that require mathematical analysis
Transportation Research Part C: Emerging Technologies	Addresses development, applications, and implications, in the field of transportation, of emerging technologies
Transportation Research Part D: Transport and Environment	Focuses on the environmental impacts of transportation, policy responses to those impacts
Transportation Research Part E: Logistics and Transportation Review	Articles drawn from across the spectrum of logistics and transportation research
Transportation Research Part F: Traffic Psychology and Behavior	Focuses on the behavioral and psychological aspects of traffic and transport
International Journal of Applied Aviation Studies	Enlists the support of an international panel of consulting editors

Table A4: Optimization and Algorithm

Title	Typical topics
Transportation Science	Focuses on transportation analysis related optimization and fleet optimization
European Journal of Operational Research	contributes to the methodology of operational research (OR) and to the practice of decision making
Journal of Air Transportation	Describes new developments in air traffic management and aviation operations of all flight vehicles

Table A5: Non-Academic Aviation Articles

Title	Typical topics
TRID: The TRIS and ITRD Database (Transportation Research Board of the National Academies)	Contains records for articles, books, reports, and conference papers about aviation and other transportation industries
Business Source Complete	Covers aviation trade journals
Wall Street Journal (1984-present)	Includes access to Aviation Week and Space Technology with a one month embargo
Accident and Incident Data (FAA)	Includes runway incursion data and research, commercial carrier fatalities, the Aviation Safety Information Analysis and Sharing (ASIAS) databases
Airport Cooperative Research Program	Is an industry-driven, applied research program that develops near-term, practical solutions to problems faced by airport operators
Aviation Weather Center (NOAA)	Links to METARs, TAFs, Radar, forecasts, Satellite images, Winds/Temperatures, Icing, Prog Charts, etc.
Military & Government Collection	Contains links to safety advisories, aircraft and technical information, rules and regulations, licensing, information about becoming a mechanic, etc.
Aviation Safety Information Analysis and Sharing System (ASIAS) (FAA)	Links to nine databases, including FAA Accident/Incident Data System (AIDS), Air Registry, Aviation Safety Reporting System, Bureau of Transportation Statistics, Near Midair Collision System, NTSB Safety Recommendations to the FAA with FAA Responses, NTSB Aviation Accident and Incident Data System, Runway Safety Office Runway Incursion, and World Aircraft Summary

BIOGRAPHIES

Dr. Dennis Kira is a professor at the Department of Supply Chain and Business Technology Management (SCBTM), at the John Molson School of Business, Concordia University in Montreal, Canada. He obtained his Ph.D. from University of British Columbia in Management Sciences. Dr. Kira teaches System design, decision support systems, data management, data mining, Internet related programming, e-commerce, forecasting and structured equation modeling. His other academic appointments were with The University of Hong Kong, Visiting Faculty at NSYSU in Taiwan and well as SUP DE CO Montpellier in France. His research activities include E-commerce, web design, distance learning, decision making under uncertainty, neural networks, machine learning, and financial modeling. He was a research associate at IARE, UBC. Dr. Kira has published in IEEE, Operational Research Quarterly (ORQ) and Management Science among other refereed journals.

Dr. Golnaz Rezai is a Research Associate at the Marketing Department of the John Molson School of Business at Concordia University. After obtaining her PhD, Golnaz continued to gain teaching and research experience at Universiti Putra in Malaysia and Saint Joseph's University. She has published and presented over 70 articles on topics related to her field and her research interests lie in green behavior, consumer psychology, and supply chain management.

Dr. Raafat G. Saadé has been teaching in Concordia University since 1998. He also received the Canadian National Research Council postdoctoral fellowship, which he completed at McGill University in Montreal. Currently he is the chair of the Supply Chain and Business Technology Management. Dr. Saade has published over 100 research articles in journals such as Information & Management, Decision Sciences, and Expert Systems with Applications. His research interests include the development and assessment of information systems, and the supply chain of digital information products. His research interest is in development of complex systems, knowledge engineering and Management of information systems/technologies.