**Abstract**

Over the last few decades, the [aviation industry](https://www.sciencedirect.com/topics/social-sciences/aviation-industry) has produced several innovative solutions that have benefited the air travel [industry](https://www.sciencedirect.com/topics/economics-econometrics-and-finance/industry) and many other industrial and service organisations. However, few attempts have been made to map out these innovations and, more importantly, assess how they add value to aviation businesses. This paper aims to address this gap by providing a [Systematic Literature Review](https://www.sciencedirect.com/topics/social-sciences/systematic-review) to analyse themes, content relationships, approaches, and how innovations create value in this sector. We achieve this aim by analysing 57 peer-reviewed academic publications from 1999 to 2018. The thematic and content analysis made it possible to consolidate the findings by developing an overview of the themes and how innovation has supported them. The results identified ten main themes, i.e. airports, services, management, technology, airlines, system, development, market, customers, and processes. Through the content analysis, 114 value-creating innovations were identified, primarily towards ‘efficiency’, ‘convenience, new features and portfolio differentiation’, and ‘sustainable growth and environment'.

**Apa Refferences { Pereira, B. A., Lohmann, G., & Houghton, L. (2021). Innovation and value creation in the context of aviation: a Systematic Literature Review. *Journal of air transport management*, *94*, 102076.}**

## Abstract

The concept of Industry 4.0 arose in Germany in 2011 and spread to other countries. Industry 4.0 refers to a strategic step that was introduced by the German government seeking ways to change industrial manufacturing through digitalization and the development of new technologies. It introduced the world with new technologies such as cybersecurity, big data, the cloud, simulations, augmented reality, additive manufacturing, etc. The technologies also spread to other fields of business sectors such as aviation, agriculture, health, etc. Thanks to these technologies aviation sector underwent a change named Aviation 4.0. In this chapter, we first discuss the Industry revolution, Industry 4.0, and its technologies. Then, we explain Aviation 4.0 and technologies used in Aviation 4.0. Aviation 4.0 technologies are divided into three categories as follows: Ground services application in Aviation 4.0., Maintenance and production in Aviation 4.0, Unmanned aerial vehicles technology in Aviation 4.0. Furthermore, we give a brief discussion about Aviation 5.0. Finally, the conclusion is given.

**Apa Refferences {**Aydın, S., & Kahraman, C. (2021). Aviation 4.0 Revolution. In *Intelligent and Fuzzy Techniques in Aviation 4.0: Theory and Applications* (pp. 3-19). Cham: Springer International Publishing.}

## Abstract

The history of aviation and the dream of flight dates back many centuries and includes pioneers such as Leonardo da Vinci, Otto Lilienthal and the Wright Brothers, who contributed to this quest. The last century brought along a remarkable growth of the aviation sector and resulted in considerable economic importance of the industry. The aviation industry can be projected along the aviation value chain and comes with its own special characteristics. Whilst aviation creates a high value for customers and other stakeholders, the profit margins are typically low due to high fixed costs and its dependence on external factors. The benefits of aviation to the economy as well as other drivers create positive effects for many stakeholders who are directly or indirectly involved in the system. The aviation system is surrounded by different environments: the economic, ecological, social, technological and political environments. Each environment exerts influence on the aviation system and is simultaneously affected by it.

**Apa Refferences {** Wittmer, A., & Bieger, T. (2021). Fundamentals and structure of aviation systems. *Aviation systems: Management of the integrated aviation value chain*, 39-78.}

## Abstract

Politics have a considerable impact on the aviation industry, which again depends on politics itself. This ranges from conventions concerning air traffic rights to regulatory affairs that govern aspects such as safety or market conditions. Beyond the political sphere, technology has provided a major boost to innovations and developments in the aviation industry, thus improving the economic and ecologic efficiency of air travel. From an economic perspective, aviation creates considerable economic effects, may it be directly at the airports or beyond the aviation system. Aviation has also shaped our society by raising living standards and promoting cultural understanding. Nevertheless, the environmental impacts of aviation, such as pollution and noise, cannot be neglected and will provide an important topic for the years to come.

**Apa Refferences {** Wittmer, A., & Müller, A. (2021). The environment of aviation. *Aviation Systems: Management of the Integrated Aviation Value Chain*, 79-117.}

**Abstract**

In the last 40 years, the aeronautical industry has managed to move from a specialized sector to a worldwide leading industry. Companies, governments and associations all over the world acknowledge the importance of the aviation industry in supporting global development and the economy. However, aviation will be facing new challenges related to sustainability and performance in a technological environment in evolution. To succeed, the aeronautical industry must keep innovation as one of its main assets. It must master a wide range of technologies and then collaborate to integrate them into an aircraft design and development program. A collaborative approach to innovation is key to achieve these goals. The main purpose of this paper is to analyze the structure of technological innovation networks in the aviation industry and to characterize the map of the “Aviation Technology Space”. Two different approaches and methods are used. In one approach, we performed a bibliometric network analysis of aviation research scientific publications using a keyword co-occurrence analysis method to map the aerospace collaboration structures. Complementarily, we performed a patent analysis to evaluate the innovation capacity of the aviation industry in the cutting-edge technologies previously identified. From the results of this analysis, the paper provides recommendations for future innovation and research policies to allow the sector to fulfill the demanding goals by the year 2050.

**Keywords:**

[**ACARE**](https://www.mdpi.com/search?q=ACARE); [**aviation**](https://www.mdpi.com/search?q=aviation); [**innovation**](https://www.mdpi.com/search?q=innovation); [**sustainability**](https://www.mdpi.com/search?q=sustainability); [**technology space**](https://www.mdpi.com/search?q=technology+space); [**co-occurrence analysis**](https://www.mdpi.com/search?q=co-occurrence+analysis); [**patent analysis**](https://www.mdpi.com/search?q=patent+analysis)

**Apa Refferences** { Arnaldo Valdes, R. M., Burmaoglu, S., Tucci, V., Braga da Costa Campos, L. M., Mattera, L., & Gomez Comendador, V. F. (2019). Flight path 2050 and ACARE goals for maintaining and extending industrial leadership in aviation: a map of the aviation technology space. *Sustainability*, *11*(7), 2065.}