

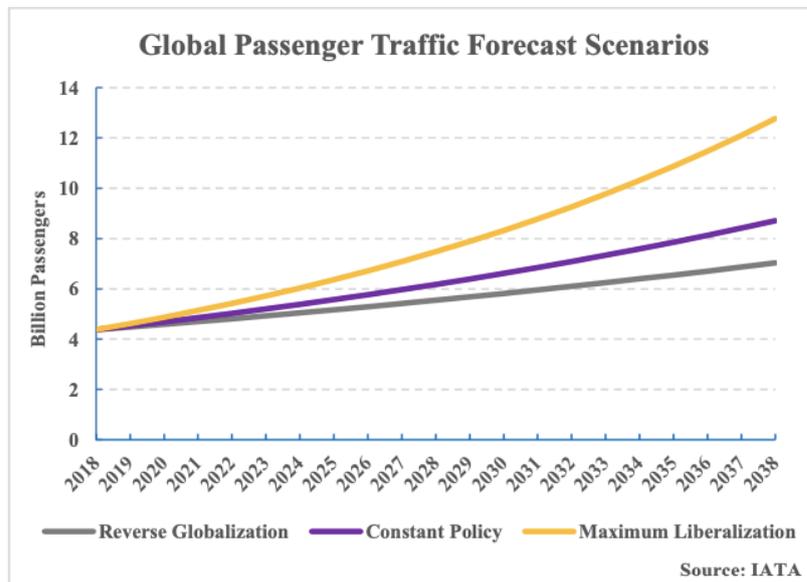
Digitalization, AI in Aviation and the Human Factor

Presented by AACO

1. Introduction

In spite of the global challenges, demand for air travel is growing at a steady pace. According to the latest IATA 20-year forecast, the total number of passengers could double by 2038, reaching around 8.7 billion passengers (at constant policy scenario*), which could support 100 million jobs globally.

Travel demand is increasing amid the rise of the middle class in emerging and developing economies and the increase in their disposable income, a growing number of millennials willing to travel, and the decrease in airline fares over growing competition.



In order to cope with the growing number of passengers, operational complexities, and advanced fleet, airlines started adopting new technologies to ensure efficient and effective performance. One of those technologies is artificial intelligence (AI), which can be defined as giving computer machines the ability to think, learn, and recommend decisions.

Today, an enormous amount of data is generated by aircraft systems, ATCs, airport operation systems, and other stakeholders. These data sets represent new opportunities that may bring added value to the whole aviation ecosystem. AI technologies are key enablers for developing new services and practices to enhance customers' experiences, safety, security, and environmental efficiency. However, in order to achieve those targets, industry stakeholders must collaborate to set up the necessary framework in terms of training, certification, operational interoperability, and data exchange.

***Constant policy scenario: forecast based on the current trends in the market (economic and trade sensitivities, geopolitical tensions, and unchanged liberalization policies).**

2. Discussion

2.1. How Can Aviation Proactively Embrace AI

As technologies continue to advance, Artificial Intelligence (AI) will play more prominent roles in our future. At present, many industries have already started incorporating AI technology in their operations. The availability of meaningful data is critical to support the implementation of AI. Therefore, in order to facilitate the use of AI in the aviation industry, data sharing is needed between industry stakeholders. Moreover, regulations and standards defining how the data is processed, by whom, and how data security is ensured need to be set by the concerned governing bodies. On the technical side, changes must be made on the legacy infrastructure level. Implementing AI

technology while overcoming legacy systems requires an established plan that needs to be set by all concerned stakeholders for what can be achieved with pre-existing systems.

There are many challenges to overcome in implementing AI. Accordingly, the shift from current procedures and systems should be done gradually. It is recommended that concerned stakeholders conduct an impact assessment after each implementation phase to assess the results and take necessary actions, as we still do not quite fully understand what AI is capable of and how it will impact the aviation industry.

2.2. Impact on Existing Regulations

The use of AI in the aviation industry would require certification and qualification by regulating bodies. National authorities and governing bodies should ensure that the use of AI is safe and secure, considering the operational complexity of the aviation industry. In terms of data security, adequate cybersecurity measures should be implemented that such sensitive data is not leaked, which may cause operational disruptions.

Also, operating procedures and other related standards might require revision upon the use of AI. As AI continues to be adopted by industry stakeholders, the interaction between humans and machines is progressing, making systems able to recommend appropriate decisions during complex situations. Accordingly, the enhanced capabilities of AI should be recognized in standard and recommended practices issued by the aviation regulating bodies, which include ICAO, IATA, and National Authorities. This will allow industry stakeholders to fully utilize AI systems in various fields, including safety, security, and operations.

2.3. Impact on the Aviation Current Workforce

Automation is expected to disrupt the aviation's workforce current scheme. Several projects have been tested by different stakeholders moving from the autonomous aircraft concept, 3-D printing for aircraft parts, drone technology in aircraft inspection, and Augmented Reality devices in maintenance. Accordingly, it is expected that automated technologies will partly or entirely replace some repetitive jobs. However, such technologies will not replace critical positions involving immediate decision making that requires human logic, experience, and common sense.

Therefore, the trend of the Next-generation workforce requires human and machine interaction. The flight crew will be assisted by smarter avionics and will focus more on flying rather than aircraft systems. Similarly, advanced air traffic control systems may fill in gaps in the current scheme. Looking at the National level, AI may assist states in the certification and oversight practices through the effective use of the available data.

Considering the upcoming leap in the use of technology, the New-generation workforce, including flight crew, engineers, technicians, air traffic controllers, and inspectors need to possess an updated skill set. Accordingly, concerned stakeholders are recommended to identify the necessary training required to ensure that the current workforce is equipped with an adequate skill set to cope with technological improvements.

3. Conclusion

There is no doubt that the use of Artificial Intelligence in the Aviation Industry can make tasks and operations easier, faster, and more efficient. However, unlike other industries, the aviation industry remains the one with the greatest risk as the real-life harms are exponentially higher. Therefore, the adoption of AI should be thoroughly studied, well calculated, and gradually implemented. That being said, the industry needs to evaluate every level of implementation further, assess the results, and take necessary actions to ensure the required benefits are achieved.

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