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Artificial Intelligence in the Aviation Sector

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Abstract

Artificial Intelligence continues to evolve and expand; companies are seeing big changes in their field. The travel industry as a whole is disrupted by AI. From automobiles to railways, the way we get around is changing for the better. While the race for an autonomous car and improvements to our driving experience remains in the headlines, the airline industry is making strides as well. The major sectors that the AI is helping this industry to grow are Crew Management and Flight Operation. The paper introduces several main concepts regarding the adoption of artificial intelligence in the aviation sector.

Keywords: artificial intelligence, aviation, airline, virtual assistant

Introduction

Artificial Intelligence (AI) continues to evolve and expand; companies are seeing big changes in their field. Big name brands are investing in AI technology to enhance their products and services to better serve their customers. Aviation Sector has become an important industry as

it is considered to be the industry where it will bring the world together and making really a small village, Aircraft manufacturers are building each year new innovative aircrafts that are more developed and efficient than the previous ones, besides the airlines that are growing fast and order each year up to 100 aircraft minimum, such as Qatar Airways, Emirates or Lufthansa.

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Artificial Intelligence is striking positively and negatively the aviation sector. According to MarketsandMarkets.com, "The artificial intelligence (AI) in aviation market was valued at USD 112.3 Million in 2017 and is likely to reach USD 2,222.5 Million by 2025, at a CAGR of 46.65% during the forecast period" (Markets and Markets, 2018). The fast uptake of AI in the aviation sector is driven by the use of big data in the aerospace industry and the increased use of cloud-based applications and services.

AI impact on Aviation

In my study, I agree with Saed Hussain (2018) and his article on data-driven (Hussain, 2018) but according to my research, Artificial Intelligence helped the sector of aviation to be more dynamic, grow more rapidly, and function in an innovative way.

The major sectors that the AI is helping this industry to grow are:

- **Crew Management**. Even though each airline has more than 1000 flight crew members, there are always some flights that a crew get sick or doesn't show up for private reason, to reschedule each crew for each flight is a really difficult task with the existence of AI in this field, it helps to reschedule and manage automatically to replace the crew member that didn't show off based on the qualification and the experience he/she has taking into consideration the route distance and time. This is really helpful in huge airlines such as Qatar Airways or Emirates or American Airlines.

- **Flight Operation**. Nowadays, with the existence of AI, aircraft have automated timetable each day based on the demand and passenger and the number of cycles the aircraft had also, taking into consideration if the aircraft passed the necessary each period of time, and this is indeed

an important note that each passenger or reader should understand. If an aircraft is at maintenance it does not mean that your flight will be affected as there is always other aircraft available.

Ticket-Pricing when using AI in Aviation

AI impacts also the revenue side of the business. In order to maximize revenue, airlines are optimizing ticket price according to journey characteristics and travelers' segmentation. There are many variables that are considered in the ticket price, for example, the time of the travel (whether during a holidays period), the number of free seats on the plane, taxes, the charges at home country airport and the destination taking into consideration if boarding is via jetway or stairs, the type of aircraft, if it is medium or long haul aircraft (the bigger the aircraft the higher the expense and the higher the price), etc. Moreover, nowadays airlines are part of international alliances and, on specific routes, the ticket price is based on what other partners can offer under bilateral agreements. Some of these parameters cannot be automated just yet, however, to maximize revenue and profit, airline companies use AI to cover many of the routine human tasks, for example, scheduling or organizing the flight plan, which can impact the ticket-price (MindTitan, 2017).

AI Virtual Assistance in Aviation

Virtual assistants based on AI can improve the productivity and efficiency of pilots by reducing their repetitive tasks, such as changing radio channels, reading wind forecasts, and providing position information on request, among others (Social Hospitality, 2018). For example, companies such as Garmin (US) offer already AI-enabled audio panels to pilots (Social Hospitality, 2018).

AI virtual assistance exists not only in the cockpit, but it is used also in the cabin; the chief cabin crew can now change many things such as temperature or mood lighting by a single button. Thus, AI assistance helps the entire crew to have less stress during the flight without, however, interfering with flight safety in general or in emergency situations.

AI virtual assistance is also being used in airports. For example, "United Airlines has teamed up with Amazon Alexa to help customers check in and get information about their flights. Delta Air Lines is using self-service kiosks that use facial recognition technology to verify customer identity by matching customer faces to passport photos. Other airlines are using AI before customers even get to the airport, to upsell loyalty program passengers on business class upgrades or extra baggage by having AI automatically designs the website checkout process to appeal to different groups of users" (Social Hospitality, 2018).

Low-cost airlines are also familiar with AI especially at the airport as it reduces their costs. For example, with the AI system, a low-cost airline does not need to open anymore a check-in desk and therefore they will not pay additional taxes. Passengers nowadays have all the necessary data on their smartphone, and most if not all the low-cost passengers (but not only) have only a handbag and/or a carryon, which do not require a check-in desk to drop off luggage.

Conclusion

AI system is helping the industry of aviation from many perspectives, yet, as it is at the beginning, many aspects must be taken into consideration, especially when it comes about flight safety and security.

No one knows right now where the AI system is going to take the aviation industry, and which point it will reach in the future. As an aviation geek, I expect positive innovation and growth.

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