**Autonomous Flight: The Benefits and Disadvantages**

**of Aviation's Future**

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**Autonomous Flight: The Benefits and Disadvantages of Aviation's Future**

As technology has continued to advance, the world has seen some drastic changes in the past decade. Irrigation systems are more efficient than ever before, medicine has raised life expectancy to new limits, and cars can drive themselves without human input. However,the aviation world is also experiencing extreme advancements with the implementation of drones. In general, most people think of drones as operational vehicles used for recreational use. Although, the potential of this type of program has far exceeded what most people are accustomed to. Aviation businesses are looking into using conventional drone capabilitiesand transforming aircraft into a large drone. Airline passengers could potentially step on a flight going from Chicago to New York without any pilots on board. The question that arises then is what becomes of the thousands of commercial pilots across the nation? It is my opinion that passengers would not feel comfortable without a pilot on board.

Autonomous flight is relatively new to the aviation world, however, self-flying planes have been around for decades. In 2018, NASA paired with Alaskan Airlines to implement Traffic Aware Strategic Aircrew Request, or TASAR. Alaskan airline pilots would use this software to help optimize the flight path, which ended up saving a substantial amount of fuel and flight time and caused a decrease in operating costs and carbon emission for the airliner. The testing done by NASA and Alaskan airlines prepared Alaskan airlines to potentially leading the world for autonomous flight planning, optimization, and potentially flying in the national airspace (Wing, D. 2019). These studies and test flights present a huge opportunity for aviation. The use of autonomous flight planning to create the most efficient routes possible not only

saves companies money, but it also frees up the pilots to focus a lot more on flying the airplane and less time trying to find the most efficient flight path (Wing, D. 2019). TASAR is even more impressive once you consider what airplanes can already do. With current technology, aircraft can autonomously fly on autopilot, but they are limited to the flight path created by the pilots and will strictly stick to that. In some situations, if the aircraft and runway are both equipped properly, a pilot can even use autopilot to complete a smooth landing (Colombo, P. 2019). With technology like TASAR, aircraft would be able to enable autonomous flight route planning, which could then be followed by the airplane's autopilot. With this combination, aircraft would be able to achieve completely autonomous flight and we might very well see that in the near future.

If autonomous flight was to be achieved, several benefits would arise from this. The first being the flight operations using it to save a fortune on operational costs. By using technology to plan routes, you are effectively eliminating human error and optimizing fuel burn and flight time. By using less fuel and spending less time in the air, flight operations would see huge savings on fuel costs alone. Flight operations would also be able to save money by switching to single-pilot operations or possibly even eliminating pilots. Fully autonomous flightwould be able better equipped to handle urban skies filled with obstacles than a human pilot would be able to, solely due to reaction time (Colombo, P. 2019). By eliminating the number of pilots onboard the aircraft, operational costs would decrease further because of the decrease in wage expenses. Passengers would also benefit from these savings. With it becoming less expensive to operate the aircraft, likely, the cost to be a passenger on the aircraft will also decrease. This would enable passengers to also see savings when using different aviation services, enabling wider access to flying and likely increasing the popularity of air travel.

Despite having countless advantages there is also one glaring disadvantage associated with it. This disadvantage is also listed as a previous benefit and that is the ability to eliminate the need for onboard pilots. The lack of a human pilot onboard the aircraft would be most prominent during critical stages of flight and emergencies. In these situations, like an inflight emergency, the AI on board would have to compile the data of everything going on around it and then select a course of action based on that data. If there is not an already programmed response for that specific situation, the AI would have to decide on a new response based and that might take some time. Interpreting a single piece of data wrong due to a faulty sensor or a hiccup in the programming could cause the AI to select the wrong response and endanger the passenger, cargo, and aircraft. A human pilot can react to that situationalmost instantly and can also deviate from specific responses based on current conditions, without having to over-analyze every little detail (Van Aarde, S. 2019). A human pilot would nothave to rely on several different sensors or be dependent on programming. Yes, technology is generally more efficient and reliable than human performance, but it has been seen time and timeagain that technology can fail. In an autonomous flight situation, a failure in technology could have devastating effects and could endanger the lives of those onboard and the lives of those on the ground as well. Another drawback for autonomous flight would be the inability tooverride the flight systems. With autonomous flight, it is unlikely aircraft would have flight controls or avionics in the cockpit if they were to have flights without onboard pilots. The lack ofonboard pilots, flight controls, and avionics would make overriding the AI impossible. In an event of autonomous failure and there was no onboard pilot, there would be no one there to assume control of the aircraft. If there happened to be a passenger on board with some type of flight experience, they would be unable to fly the aircraft due to the changes made to the cockpit

due to autonomous flight (Van Aarde, S. 2019). The biggest advantage of autonomous flight is the ability to conduct flights without the need for pilots, but there is still a way to go before technology has advanced enough to mitigate the risks involved with autonomous flight and gain the trust of the public.

It is my opinion that passengers would not feel comfortable without a pilot on board. Despite the obvious advantages of autonomous flight, there are still glaring disadvantages that would need to be addressed before airliners and passengers consider implementing the technology. However, this technology has proven its value, by helping save airlines money and decreasing the workload of pilots. As it continues to develop, I believe we will see autonomous flight technology slowly take on more of a role in flying the aircraft until, eventually, completely autonomous flight has finally been achieved.

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