Future of Aviation Without Pilots

Final Year Project

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BATCH: 07

PROGRAM: BS-AVIATION MANAGEMENT

DEPARTMENT: INSTITUTE OF AVIATION STUDIES

FINAL YEAR PROJECT

FUTURE OF AVIATION WITHOUT PILOTS

UNIVERSITY OF MANAGEMENT AND TECHNOLOGY

SUBMISSION TO

RESOURCE PERSON: SIR KHALID FAROOQ CHISHTI

DATE: 2ND JUNE 2018

Signature of Resource Person: _____

Acknowledgement

It is acknowledged that I 'Shahtaj Sajid, Roll No. 14007001006', student of BS-Aviation Management Batch 7, of University of Management and Technology has successfully completed and submitted my final year project, "Future of Aviation without Pilots", which is the compulsory part of my Bachelor's degree, on 2nd June 2018. With this, I have completed the requirement of submitting my final year project which holds three credit hours in my Bachelor's degree.

Resource Person

I have completed this project under the supervision of Air Commodore (R) Khalid Farooq Chishti of Pakistan Air Force. Because of his motivation, support, and assistance, I have been able to complete my project. I am deeply grateful to him as his visionary way of doing things has assisted me to bring up this quality output.

Profile

Khalid Farooq Chishti joined the PAF in 1977, and served in different squadrons. He was also the Instructor Pilot, and with more than 3000 flying hours, was given the role of Assistant to Air Force Chief on Training and Education at Air Headquarters, and Base Commander of training base.

He retired at the rank of Air Commodore in 2012, and was assigned the role of General Manager at Shaheen Airport Services for four years. He had taught in National College of Arts (NCA) as a visiting faculty, and currently he is teaching in University of Management and Technology (UMT) Lahore as a visiting faculty member. He also runs his own business through a food production unit in Lahore.

Khalid Farooq Chishti is a successful person both in business and in life. He is a very patriotic person, and shares his lectures on Quaid-e-Azam Mohammad Ali Jinnah also.

Achievements

For his selfless commitment and extreme devotion to the duty, he was awarded Sitar-e-Imtiaz (Military) and Sitar-e-Basalat by Pakistan Government.

Dedication

In the Name of Allah, The most Merciful and The most Benevolent.

I would like to thank from the bottom of my heart to all those who supported me and prayed for me, as because of their prayers only I have been able to come so far in my life.

This project would not have been completed without the help of Allah SWT, my parents who prayed for my success in every field of life, my teachers whose guidance, support, and instructions showed me the right path, and my friends who gave me the support and strength I needed to get motivated and complete my project. I deeply say thanks to each and every one of these people as it's because of them that I have been so successful in my academics and my life.

Table of Contents

Table of Figures

1. Abstract

Aviation industry flourished with great speed after the invention of heavier-than-air aircraft by Wright Brothers in 1903. They laid the foundation of one of the greatest transportation industry of the world. From 1903 to up till now, various automation has been made in every field that has directly, and indirectly impacted the aircrafts, their designs and their technology. They have been made advanced to such an extent that now they could fly on their own with proper systems and some variations. Scientists and engineers have always tried to introduce new advancements in aviation, and now they are trying to introduce artificial intelligence to aircrafts. Such advancements have been the focus of aeronautics community.

1.1. Purpose of Study

The purpose of this study is to look into the inventions and advancements made and are being made in the aviation industry that ultimately created less reliance on humans especially pilots. All the research done is to determine whether the aviation industry has been made this much advance that the role of the pilots in the cockpit has decreased by the increased automation.

1.2. Project Goals

- To show the evolution of aircrafts, their technologies, and to show the advancement made and which are being made to increase their reliability, and safety.
- To determine that the various advancements have decreased the role of the pilots, and have allowed the aviation community to eliminate the pilot's just like they did with flight engineer, radio operator, and navigator from the cockpit.
- To explore various projects that are being developed in order to create autonomous and one pilot operated aircrafts.

2. Executive Summary

Aviation industry is a dynamic industry, and it is changing rapidly. After the invention of aircraft by Wright Brothers, new advancements and inventions were made to make aircrafts more stable, reliable, and safer. Their designs were changed and their aerodynamics was made advanced along with their systems in an effort to modernize them and make them able to fly large distances with more payloads.

New advancements are being made, from equipment to software and from trainings to strategies. The purpose of every stakeholder of this industry whether be it a manufacturer of aircrafts, or airlines, is to provide efficient products and services to its customers and in return make profits. This objective could only be achieved by increasing automation, and decreasing cost of operations, while providing safe and secure experience to the customers.

Air traveling is increasing daily, and airlines could not now, charge more fares to passengers in this very competitive industry. The strategies they have to adopt are more based on cost reduction agenda. And for that, they have to explore every possibility to increase their profits without compromising with customer satisfaction. One of the major cost which airlines bear, are of pilots. Decade ago, there were three people in cockpit, and now there are two, as flight engineer was eliminated thanks to the increase in automations. Now once again, the aeronautical community is in action to show the pilots a way out of the aircrafts.

Our world is getting advanced, and computers are taking over those works which were once done by humans. And they have shown that they are more reliable than humans. Same is the case with aviation industry. Technologies like autopilot, and other integrated systems now enable the aircraft to fly by computers. Aviation engineers and experts now are considering making autonomous aircrafts that would fly on their own, without input from the pilots. But the first step towards this goal is to create single pilot operated aircrafts with a super co-pilot on the ground that would handle many aircrafts simultaneously. This eventually will lead towards creation of pilotless aircrafts. Technologies for this type of aircraft are present already.

Various reports have been made regarding the concept of aircrafts without pilots, and how they will impact the aviation industry. Whether they would be beneficial for airlines, and

would be accepted by passengers or not are discussed in these reports. Many surveys have been conducted regarding the acceptability of such aircrafts by the passengers. Like every project, many are against it, but most of them are in favor as because this will reduce the operating cost of the aircrafts, and make them safer.

Many projects are underway that shows the credibility of this concept. Manufacturers like Boeing with its Centaur Project, and Airbus with its project Vahana, and Sagitta aircraft are working on the concept of single pilot aircrafts which will lead to pilotless aircrafts. Other companies like Embraer of Brazil and many others are also working on projects that would produce single pilot cockpit aircrafts and pilotless aircrafts. Other than this, NASA is also working on single pilot cockpit aircrafts, and is introducing software that would reduce the congestion in the sky.

The future of the aviation is aircrafts without pilots. Decade ago, there were flight engineers, air navigation officers, and radio communication officers in the cockpit along with pilots, and no one would have ever thought that these people might get eliminated. But it happened nonetheless only because of technology. Now again, the technology to remove pilots and show them the way out is present, and it just needs to be utilized in the right way to produce required and better outcomes.

3. Introduction

The advancements in automation of aircrafts led to the decrease in the role of humans in aircraft operations. From the day aircrafts were invented it has been one of the most useful invention ever operating in this world, and as the time flew by this technology evolved over time with new systems, equipment's, software's and controls etc.