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Production/Operational Management Failures of Boeing 737 Max

Muhammad Waqar Naeem ¹ and Nadeem Ur Rehman²

1, MS scholar, Department of Economics, The Islamia University of Bahawalpur, Pakistan

waqarnaem845@gmail.com

2, MS Scholar, Department of Management, UK

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Abstract

The paper reviews the incidents of Lion Air Flight 610 and Ethiopian Airline Flight 302 to better understand the operational and management flaws of the Boeing 727 MAX. The investigation of the scenario was made by the respective authorities of each country, as well as FAA. The findings of the investigation revealed that initial causes of the crashes were serious issues in the system's internal software. Now the paper aims to demonstrate the reason of failure in design with the assumptions that employees' false assumptions and lack of communication lead to the failure in the system. Furthermore, key Strategic Operations Management Decisions were not properly addressed by the Boeing 737 MAX developmental and manufacturing stages. Thus, there is need to take strict measures to improve the management and avoid such incidents in future.

Introduction

According to Air traffic's statistics of 2019, around sixteen millions of passengers travel by air annually, via airlines which are supported by their public and private airfields (Air traffic by the numbers, 2019). Not only this, but also airline travel contributed around \$2.5 trillion dollars revenue to the country's economy via domestic and intercontinental inbound flights. It also provides around 15 million employments in the United States, which directly and indirectly leaves deep impact on the aviation industry. In this all progress, the contributions of legendary American Company, Boeing cannot be neglected (Nicas, Kitroeff, & Gelles, 2019). The company has been serving since decades as manufacturer of aircrafts and is famous for its services worldwide. However, recently its failure in automated system led to unfortunate two tragedies, which reflected its lack of operational management and strategic decision (Heizer et al., 2017). Now, the purpose of the current study is to investigate the incidents and analyze the operational management failure of Boeing 737 Max. The findings will be helpful to avoid any such incident in future.

Boeing Company as Aircraft Manufacturer

Boeing Company is world's largest aeronautical entity which has been serving as great manufacturer of aircraft systems. Its presence is felt in 150 nations through its manufacturing, engineering, designs, and furnishing of military aircrafts as a super fleet. It has been serving to 153,000 workers with employment opportunities and is trying its best to enhance its manufacturing standards via implication of advanced technology. Some of the most outstanding aircrafts of Boeing Company are Boeing 737, 777, 77m Apache, Super Hornet, and Harrier. Not

only this, but also the company is a global leader in aerospace technology with production of satellite technology or GPS products (Heizer, Render, & Munson, 2017; Weiss & Amir, 2018). Today, many of the airlines buy aircrafts from Boeing, such as Delta, British Airways, Air China, and AeroMexico.

Being Company's Vision

The vision of the company is stated by the company as purpose and values to inspire and focus on shared future and reaffirm that together, with employees, company can meet the coming challenges efficiently (Boeing, 2021). Moreover, the company is focused to safeguard environment from any danger. The company has set high expectations for itself to avoid any bad incident that may affect its integrity and respect in national and global market.

Boeing 737 MAX

Boeing 737 Max is the fastest selling aircraft due to its energy efficient specifications and better fuel range (About the Boeing 737 Max, n.d). The body of the Boeing 737 is equipped with AT Winglets design which allows it to have streamline flow. The Boeing Sky interior personifies elegance to the craft, whereas its latest CFM LEAP-1B twin engines are composes of titanium and carbon fiber fan blades to enhance its capabilities as craft. This all reflects that the company is focused to introduce new and advanced technologies in its system to serve its customers with best services and introduce more efficient crafts to the market. However, this all requires deep quality checks, and experiments on craft before they are produced to the market, as new system consists of more security and operational risks. In 2017, Boeing introduced new 737 MAX

systems with all new automatic technology and 15 inches screen in pilot cabin. However, this model led the company to the great challenges due to several flaws associated with the system.

Controversial Flight Tragedies

Boeing new launch of the 737 Max led it to the fast track of success until it suffered from severe security challenges as a result of tragedies that happen with two flights, resulting in death of 346 flight crew and passengers. Such incidents shook the world, as air travel is considered to be the safest and fastest way to travel throughout the world. These incidents led to the horrifying fear amongst the passengers, as such bad incidents led new history of aviation accidents. The authorities immediately took action and investigated the reasons behind two classes of Ethiopian Airline and Lion Air, which brought shocking results regarding issues in manufacturing system by Boeing Company.

Issues with Lion Air Flight 610

The event occurred on October 29, 2018 when the flight was on route to Pangkal Pinang in Indonesia. The incident happened exactly after the eleven minutes after the flight took off (Tjahjono, 2018). It was a deadly crash, whereas the investigation revealed that pilot was facing flight control issues in the beginning of the journey (Tjahjono, 2018). The inspection of the incident revealed that the flight 610 departed around 6:21 a.m. without any problem in the system. The inspection did not highlight any issue with the flight and everything was ready for the flight. After the complete quality checks, the airline engineers allowed 189 passengers and crew to take off but soon after taking off, the pilot advised flight control that they need to return

to the airport because of any issue with the control system of the flight. The pilot lost the communication with the air traffic control, whereas the flight lost visual of the plane. The plane went missing for around two days and finally on November 1, 2018, it was found in a totally destroyed condition.

The safety authorities and transportation safety board took immediate actions, where the Safety Boards of the United States and Singapore, worked along with Australian Transport Safety Bureau to salvage the Crash Survivable Memory Unit (Specia, 2018). The Cockpit voice record was also retrieved from the wreckage which was used in the later investigation. This revealed that pilot lost his control over the system, where the flight deviated left and exerted a series of irrational altitude shifts, resulting in crash at Java Sea (Specia, 2018).

Issues with Ethiopian Airlines Flight 302

On March 10, 2019, the Ethiopian Airline Flight 302 faced a bad crash after coming out of Addis Ababa, Ethiopia (Hawkins, 2019). The flight took off at 5:44 a.m. with 157 passengers and the crew, after which the pilot asked flight control permission to return back to the airport. The same incident happened with this flight, as it lost the communication with air traffic and got crashed in the small town of Bishoftu. Eventually, Flight Data Recorder and cockpit recorder was attained on March, 11 (Hawkins, 2019). The investigation of the incident was done under U.S. National Transportation Safety Board and the Transport Safety Board of Ethiopia.

The investigation revealed that angle of attack sensor gave false reading, which resulted in activation of left stick shaker. This all caused deviation in the airspeed and altitude and caused

dramatically difference in right side diversion of the aircraft, resulting in catastrophic crash. The incident shows similar accidental issues in the flight, as of Lion Air Flight 610. As both flights were using same system Boeing 737 Max, so it proved that there was some issues with the Boeing aircraft system and thus the investigation teams got the company involved in this all process.

Boeing Strategic and Operational Management Issues

For a manufacturing company of aircrafts, it is crucial to focus on its Strategic Operations Management Decisions. The objective of these decisions is to recognize and manage the manufacturing process, and investigate the success of initial stages creation, consumers' expectations, production quality, and all associated security risks factors with the aircraft. Not only this, but also as a well-known company, it is the responsibility of Boeing manufacturers to check and test the aircrafts before they are handed to the consumers. As Boeing is world's largest aeronautics company, so it must show responsibility attitude towards its production. It is a well-reputed company and thus none of the airline could imagine of having such flaws with the Boeing 737 Max system. Unfortunately, company focused more on the addition of advanced technology rather than security measures, which led to the strategic issues with the design of the system and two severe incidents.

Design Issues

Boeing Company wanted to gain a prominent position in the market and therefore it created one of the kind aircraft for its customers. The aircraft was indigenous in its design and was created after great innovative technology advances. With this manufacturing, Boeing

company was expecting a great growth in its demand, and better international position in the market. However, things went against their expectations due to lack of focus on the design of the aircraft (Gates & Baker, 2019). The design of the Boeing 737 Max aircraft may have seemed to have covered the required operations and even met the product design, but it fell short of this task. The company's major focus remained on the glance, attraction, and advancement where they left security behind. For a success of any aircraft, security measures play crucial role and therefore engineers need to work on safety analysis before they handover the craft to their customers, as hundreds and thousands of lives are relying on aircraft when taking off from the ground (Gates & Baker, 2019).

Quality Measures

Boeing CEO Dennis Millenbug focused more on revenue rather than security of the aircrafts and this led to the severe challenges to the airlines, as well as Boeing Company (Bushey, 2019). Also, the statements of the company revealed that Boeing, exactly after the incidents, reduced its manufacturing which led to loss in billions of dollars. However, the company's focus should never be the profit or revenue; instead they must focus on quality and security of the craft. More secure crafts will surely grab the consumers' attention and will bring more revenue for the company (Bushey, 2019). Now, the quality issues with Boeing 737 Max led to the loss of many lives, who left their families behind. Such big loss cannot be covered with anything and therefore manufacturers need to act responsibility in their production.

Strategic and Human Resources

When analyzing the strategic operation of the Boeing 737 Max, the capacity and strategic approach of the Boeing Company are great questions. According to the staff, Boeing could have improved the aircraft's security by applying more sensors to the system. The company focused on only their personal benefits and profits and therefore just relied on single sensor, which was used in turn MCAS. The sensor was also not installed properly and was not passed through security checks, due to which its malfunction led the aircrafts to the activation of MCAS, and deviation to the right side. This led great shock amongst the airlines, as they could not expect such negligence from world's famous manufacturing company. However, in response to the incidents, CEO of Boeing Company stated that "*We will continue to assess our production plans, and we'll make decisions at various waypoints as to whether further rate adjustments are needed based on information we have at that time*" (Boeing, 2019).

Conclusion

In the aviation industry, security plays crucial role. Therefore, the manufacturers of the aircrafts must keep security at the priority. Boeing is one of the famous manufacturers of the aircrafts in global market, and they are expected to behave more sensitively rather than other manufacturers. However, in 2017, the company introduced new Boeing 737 Max, with more advanced technology and automatic system. The company claimed this as the improved version of their secure aircrafts, and expected huge response from the audience. However, the aircraft led to several operational issues, as lack of sensors, and issues with its automatic activation system led two flights, Lion Air Flight 602 and Ethiopian Airline Flight 302, to severe crash. This

incident led to loss of 400+ lives, including passengers and crew. The investigation of the aircraft system revealed that company had compromised on the security for the sake of profit generation, which led to loss of hundreds of lives.

Boeing 737 Max's manufacturing was more concerned towards profit making and attraction for the consumers, reflecting huge strategic and manufacturing failure of the Boeing 737 Max. The fatal flaws with the aircraft attributed to poor design and aggressive overhauling. This made it clear that strategic and operational management leaves deep impact on manufacturing company and production of secure aircrafts. If the Boeing had focused on more security based strategic approach in manufacturing of Boeing 737 Max, it would have not faced such issues with the flights.

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