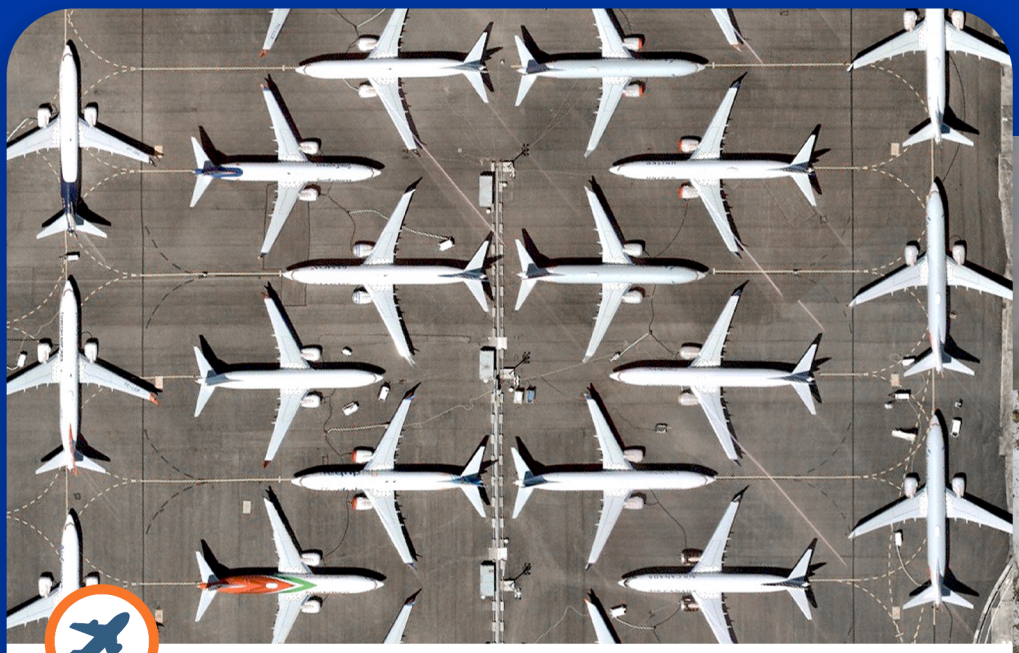
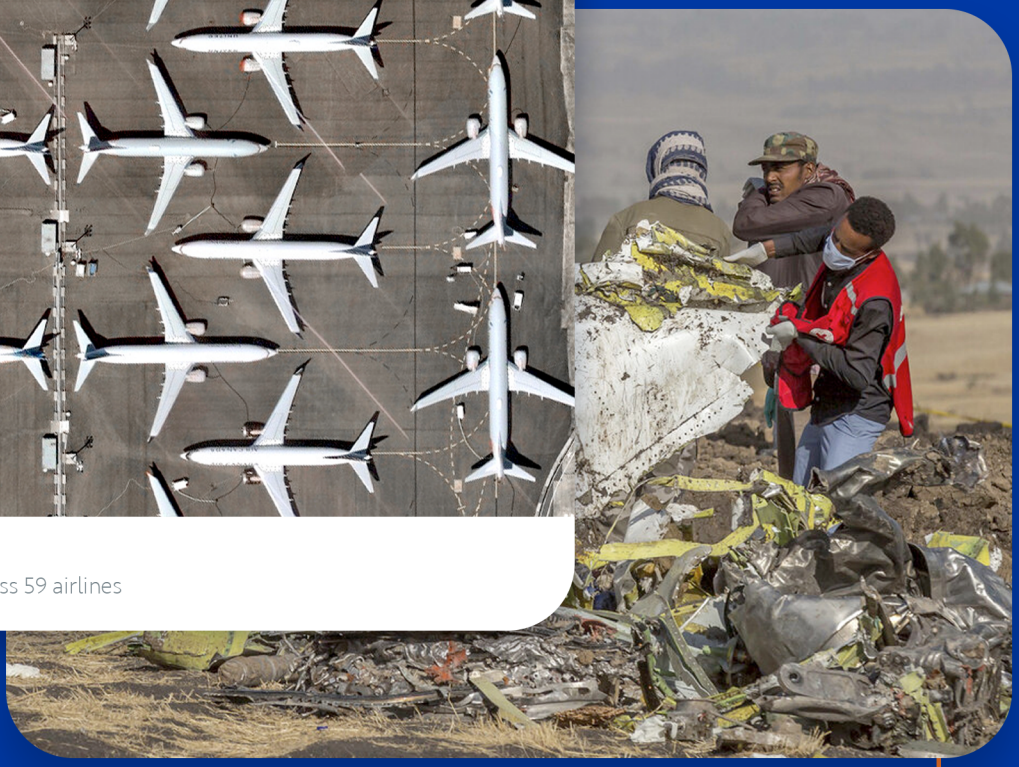
TMUN 2025



WEEKLY REPORT
8,600 flights affected across 59 airlines



TORONTO MODEL UNITED NATIONS PRESENTS

BOEING

BOARD OF DIRECTORS

The Boeing 737 MAX was grounded worldwide after two fatal crashes caused by issues with its MCAS software. It is now up to the board of directors to navigate this crisis.

BACKGROUND GUIDE

"If it ain't Boeing, I ain't going!"

Table of Contents

Table of Contents **1**

Letter from the Director **3**

Definitions **5**

Introduction **7**

A brief timeline **8**

Early History of Boeing 8

Modernization of the company 8

Crashes 9

A Brief History of The Boeing Company **10**

Birth of The Boeing Company 10

Boeing 737 10

McDonnell Douglas Merger 12

A Boeing post-merger **16**

Outsourcing 16

Case study: Production of the Boeing 787 Dreamliner 17

The Creation of the Boeing 737 MAX **18**

Airbus 18

The A320neo 19

Boeing's response 20

The Crashes **23**

Lion Air Flight 610 23

Maneuvering Characteristics Augmentation System (MCAS) 25

Ethiopian Airlines Flight 302 27

Topic A - Internal Reforms: Restoring Engineering Integrity and Corporate Accountability **29**

Guiding Questions 30

Topic B - External Relations: Rebuilding Public, Regulatory, and Customer Trust **31**

Guiding Questions 31

Character List and Descriptions 33

Bibliography 41

Letter from the Director

Dear delegates,

You have done it. You have made it to the top of the corporate ladder. Step into the boardroom. The meeting is about to begin, and much is needed to discuss. On behalf of the Dais, I am honoured to welcome you to *Boeing's Board of Directors*. My name is Tony, and I am in my last year at Collège Villa Maria in Montreal, Québec. In the past, I've attended numerous conferences as a delegate in Montreal and Canada, notably SSUNS and last year's TMUN. This will, however, be my first time directing a committee at an external conference, and I could not be more thrilled. In my free time, I can be found hanging out with friends, miserably studying for chemistry, and uncontrollably doomscrolling on TikTok.

Alongside me are the terrific people that make up the rest of your Dias. Aayan is honoured to be your chair for TMUN's Boeing Board of Directors committee. When not practicing his diplomatic skills at MUN conferences, he enjoys reading mystery novels, listening to classical music, and pondering how IB exams will turn out. In addition, the committee would not have been possible without your marvellous crisis analysts, Ananya and Arnav. Ananya is a Grade 11 student at St. Joan of Arc Catholic Academy in Scarborough. She just got into MUN this year, but has loved every single moment of it! Other than Model UN, she enjoys reading, listening to music, and praying her physics mark goes up (actually struggling right now). Arnav is a grade 12 student at Central Peel Secondary School in Brampton. Aside from Model UN, he loves going to the gym, learning history and the white Monster energy drink (exam season saviour). His favourite Model UN phrase is "The dias rules that as dilatory."

I hope you can find value in attending this conference, whether it is your first-ever experience with MUN. Should this be your first conference, I urge you not to shy away. Not so long ago, I was standing in your very shoes. When I attended my first conference, my experience was not very enjoyable. I was petrified and did not even dare to speak once in front of what seemed to be a sea of people. I advise you to take a leap and see where it gets you. The start might be rough, but the growth you'll experience will be worth every step. Rest assured that the

rest of the Dais and I are here to help you at any point during this conference. If you are an experienced delegate, set an example for the beginner ones by displaying leadership, collaboration, and respect. Your role extends beyond competing; you have the opportunity to guide others, offering support and encouragement when needed.

Moreover, this background guide is meant to be only the starting point of your research. Further exploring your character, the issues surrounding this scandal, possible solutions, and more will be instrumental in your success on this committee.

Finally, please email me if you have any questions, concerns, feedback, or anything else. Once again, I am truly ecstatic about this committee and excited to meet you all.

My very best,

Tony Lu
Director of *Boeing Board of Directors*, TMUN 2025
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"If it ain't Boeing, I ain't going."

Definitions

Aircraft types: The general classification of aircraft based on design and function, such as commercial jets, cargo planes, military aircraft, or private planes. Aircraft types can include subcategories like single-aisle, wide-body, or light aircraft.

Aircraft Variants: Different versions of a particular aircraft type that may have different specifications, configurations, or features. Variants can include differences in engine types, size, range, or intended use. For example, the Boeing 737 has several variants, such as the 737-800 or 737 MAX, each with unique attributes.

Angle of Attack (AoA): The angle between the chord line of the wing and the direction of the relative airflow. It is crucial in determining the lift generated by the wing, and if it becomes too high, it can lead to a stall where the wing can no longer generate sufficient lift.

ATC: ATC refers to the system that manages the safe and orderly flow of air traffic in the airspace and at airports. Air traffic controllers coordinate aircraft movements to prevent collisions and ensure efficient air traffic management.

FAA: The Federal Aviation Administration (FAA) is a regulatory agency under the U.S. Department of Transportation responsible for overseeing and regulating civil aviation in the United States. Its primary duties include ensuring the safety of aircraft operations, certifying aircraft and aviation personnel, managing air traffic control systems, and enforcing aviation laws and regulations. The FAA also plays a significant role in developing and implementing air travel policies, advancing aviation technology, and maintaining international standards for aviation safety.

FAA Certification: The process through which the Federal Aviation Administration (FAA) grants approval for aircraft, aircraft parts, or aviation-related operations to ensure they meet safety, regulatory, and performance standards. The FAA certification process involves rigorous

testing, inspections, and evaluations to verify that the aircraft or aviation operation complies with all relevant standards before being allowed for public use.

Grounding: The suspension of operations for a specific aircraft or fleet by regulatory authorities, airlines, or manufacturers. This action typically occurs due to identified safety concerns, mechanical defects, regulatory non-compliance, or pending investigations into incidents or accidents involving the aircraft. Grounding is a precautionary measure to ensure passenger safety and prevent further incidents while the issues are assessed and resolved.

MCAS: An automated flight control system on certain Boeing aircraft, such as the 737 MAX. The system was designed to improve the aircraft's handling characteristics at high angles of attack but became a focal point in the 737 MAX accidents after malfunctioning, leading to two fatal crashes.
*A more in-depth explanation of MCAS can be found later on in the background guide.

NTSC: The National Transportation Safety Committee is an Indonesian government agency charged with the investigation of air, land, rail, and marine transportation safety deficiencies.

NTSB: An independent U.S. government agency responsible for investigating civil transportation accidents, including those involving airplanes, trains, and boats. The NTSB determines the probable cause of accidents and makes safety recommendations to prevent future incidents.

Introduction

On October 28, 2018, Lion Air Flight 610 took off from Soekarno–Hatta International Airport in Jakarta, headed for Pangkal Pinang Airport, located on one of Indonesia's many islands. Carrying 181 passengers and eight crew members, a mere 13 minutes after takeoff, the plane crashed into the Java Sea, killing all on board. A few months later, there was another crash. This time near Tulu Fara village outside Bishoftu, Ethiopia, killing all of the 149 passengers and eight crew on board. The same aircraft type operated both flights: the 737 MAX 8, built by The Boeing Company.

A Boeing 737 MAX 8 was delivered to Air China during a ceremony at the company's Zhoushan facility in 2018.

The date is March 11, 2019, exactly one day after the crash of Ethiopian Flight 302. News has just begun spreading about the crash in Addis Ababa, Ethiopia. Notably, the People's Republic of China's Civil Aviation Administration has issued a grounding of all 96 B737 MAX in its country. This was followed by a grounding issued by Indonesia's Ministry of Transportation. Thus far, these two countries have grounded the MAX aircraft. Reporters from various media outlets are currently crowding outside Boeing's headquarters in Chicago, Illinois, demanding that the Board answer for the crash, the second of its 737 MAX aircraft in less than five months.

A brief timeline

Early History of Boeing

1916 - Boeing is founded by William E. Boeing in Seattle, Washington.

1957 - Boeing launches the 707, the first commercially successful jetliner.

1967 - The first iteration of the Boeing 737 enters service.

1997 - Boeing completes its merger with McDonnell Douglas.

Modernization of the company

2003 - Harry Stonecipher, the former CEO of McDonnell Douglas, becomes Chief Executive Officer and Chairman of the Board at Boeing.

2005 - James McNerney replaces Stonecipher as CEO after a scandal involving Stonecipher's inappropriate relationship with a Boeing executive led to his resignation.

2009 - Airbus officially announces the launch of the A320neo, promising increased fuel efficiency and lower operating costs.

April 10, 2001 - Boeing announces the move of its headquarters to Chicago, which separated itss corporate executives from its engineering and product development teams, which were still based in Seattle.

August 30, 2011 - Boeing launches the 737 MAX program as its response to the A320neo.

2015 - Dennis Muilenburg becomes Boeing's CEO and Chairman of the Board. He succeeds McNerney, who resigned after 10 years in the role when he reached Boeing's mandatory retirement age of 65.

2016 - The first 737 MAX 8 completes its maiden flight.

2017 - The FAA certifies the 737 MAX-8.

February 15, 2018 - The FAA certifies the 737 MAX-9.

Crashes

October 28, 2099 - Maintenance teams replace the faulty Angle of Attack sensor on the Lion Air 737 MAX the day before the fatal flight. Calibration is not performed.

October 29, 2018 - Lion Air 610 crashes into the Java Sea thirteen minutes after takeoff from Jakarta, killing all 189 passengers and crew.

November 6, 2018 - Boeing issues a bulletin to airlines operating the 737 MAX, advising pilots on responding to unintended MCAS activation.

November 28, 2018 - Indonesia's NTSC releases its preliminary report on Lion Air 610's crash, highlighting MCAS and a faulty AoA sensor.

March 10, 2019 - Ethiopian Airlines Flight 302 crashes in a field near Addis Ababa, Ethiopia, six minutes after takeoff, killing all 157 aboard.

March 11, 2019 - China and Indonesia ground the 737 MAX aircraft.

March 11, 2019 - Present day. Boeing's Board of Directors is convening for the first time after the crash of Flight 302.

A Brief History of The Boeing Company

At the start of the 21st century, Boeing was a dominant force in the aerospace industry, commanding the skies with a global reach. However, to fully understand this company's rise, starting with the planemaker's humble beginnings is essential.

Birth of The Boeing Company

In 1910, William E. Boeing, an American timber merchant, attended the first Los Angeles International Air Meet and subsequently developed a passion for aviation. 6 years later, along with his friend U.S. Navy Lt. George Conrad Westervelt, he built his first product ever: the B & W Seaplane, named after their initials. The same year, in Seattle, Washington, Boeing incorporated Pacific Aero Products Co. for $100 000, which later was renamed Boeing Airplane Co. With a top speed of 75 miles per hour, two of the single-engine, two-seat seaplanes were built and later on offered to the U.S. Navy. When the Navy did not buy them, they were sold to the New Zealand Flying School, marking the company's first international sale. As the United States entered World War I in 1917, Boeing began building 'flying boats' for the Navy and later sold its trainers, pursuit planes, torpedo planes, and patrol bombers to the U.S. military.

In 1928, William Boeing formed Boeing Airplane & Transport Corporation to encompass both aircraft manufacturing and airline operations. However, in 1934, under the Air Mail Act of 1934, a new U.S. antitrust legislation, aircraft manufacturing had to be divorced from air transport. Consequently, United Aircraft and Transport dissolved into three major groups: Boeing Airplane Company, United Aircraft Corporation, and United Airlines, all of which still exist today.

Boeing 737

At this time, Boeing held a reputation so strong that the saying "If It Ain't Boeing, I Ain't Going" became common among loyal flyers. Following the release of the first commercially successful jet airliner, the 707 and the Boeing 727, a tri-jet designed for shorter domestic flights, came the Boeing 737. Influenced by the demand for a reliable, economical jet that could serve

short- to medium-haul routes, the 737 was born, providing “big-jet comfort on short-haul routes.” The first generation 737 was a much smaller aircraft, especially compared to the big multiengine jets that Boeing was synonymous with, earning it the nickname “Baby Boeing.” It was to have two skinny and long engines mounted under the wings. Its short fuselage and 2-by-3 seating configuration only allowed an 85-100 passenger seating capacity. Boeing designed the 737-100 to share many components with the 707 and 727 models that came before it, with the fuselage cross section and nose derived from the previous aircraft types. The production of this aircraft was characterized by the strive for engineering excellence, with large amounts of authority afforded to pilots and engineers, a lack of bureaucracy, and the willingness to break budgets.

Lufthansa Boeing 737-100 at Manchester Airport in 1972

On February 19, 1965, Lufthansa Airlines became the launch customer of the 737-100. Since then, the 737 has been developed into a whopping 13 different variants, including passenger, cargo, corporate and military, making this aircraft type massively costly yet hugely profitable as well. Spanning over 4 “generations,” this aircraft went from the first generation “original” series to the second generation “classic” series, leading to the third generation “Next Generation” (NG) series, and finally culminating in the fourth generation 737 MAX series that launched in August 2011.

Before the MAX crashes, over 7,500 Boeing 737s were in service; on average, 2,800 aircraft were airborne at any given moment. A 737 aircraft departed or landed every 1.5 seconds, carrying around three million passengers daily. At the time, the global 737 fleet had carried over

22 billion passengers since its introduction. Presently, in March of 2019, it is the highest-selling commercial aircraft ever.

McDonnell Douglas Merger

> "Although Boeing was supposed to take over McDonnell Douglas, it ended up the other way around."
>
> – Clive Irving, author of *Jumbo: The Making of the Boeing 747*

McDonnell Douglas Corporation was a major American aerospace manufacturing corporation and defence contractor. Formed from a merger between McDonnell Aircraft Corporation and Douglas Aircraft Company, McDonnell Douglas was solidly performing in the defence sector, developing key military aircraft such as the F-15 Eagle and the F/A-18 Hornet, which were crucial assets for the U.S. military and allied forces. The company also produced many popular commercial airplanes, some directly competing with Boeing's. By the 1980s, McDonnell Douglas faced increasing financial challenges from growing competition from other plane makers, which put pressure on its commercial aircraft division. As a result of these financial constraints, McDonnell Douglas shifted its focus towards its more profitable defence contracts and reduced investments in commercial aviation innovation. This strategy limited the company's ability to compete in the competitive commercial aircraft market, where Boeing all the meanwhile was making significant advancements.

Unlike Boeing's engineering-driven culture, McDonnell Douglas was a more financially driven company, focusing mainly on cost control. This is reflected in its management practices and decision-making. Its leadership prioritized operational efficiency and shareholder value, which would significantly impact Boeing after the merger.

In 1996, Boeing took up around 60% of the aircraft manufacturing industry's new commercial aircraft orders, whereas McDonnell Douglas took only around 5%. Faced with

ever-growing financial difficulties, McDonnell Douglas entertained the idea of a merger with Boeing. At that time, Boeing had coincidentally wished to diversify its offerings away from the turbulent commercial aircraft market with its cycle of booms and busts. In August of 1997, the companies officially merged under the Boeing name after the Federal Trade Commission ruled that it would not "substantially lessen competition or tend to create a monopoly in either defence or commercial aircraft markets." This $14 billion transaction combined McDonnell Douglas's robust defence and space expertise with Boeing's commercial aviation market domination, resulting in a more diversified and competitive aerospace giant.

Following this merger came heavy turbulence. Many key leadership positions at Boeing were filled by former McDonnell Douglas executives who brought their management style and priorities. Namely, the CEO of McDonnell Douglas, Harry Stonecipher, was to serve as chief operating officer of the new merged entity. Beginning his career at General Motors, Stonecipher admired then-CEO Jack Welch's "relentless focus on shareholders and stock buybacks at the expense of long-term innovation and worker well-being." This mindset would take over Boeing's corporate culture and identity. The new managers from McDonnell Douglas, led by Stoneceipher, drove the message that cash flow and profitability had to become Boeing's top goal. The Jack Welch protege and the business titans he brought along with him embraced the idea that any company has a single social responsibility: to increase its profits. This implementation of a "cultural revolution" at the company sought to belittle engineering expertise, undermine union employees, and empower middle managers to cut costs ruthlessly. The merger was described as "hunter-killer assassins" meeting "Boy Scouts." One former Boeing engineer said, "How do you merge those two management philosophies? The hunter-killer assassins will destroy the Boy Scouts. That's what happens." McDonnell Douglas had prevailed in this acquisition, hollowing out an iconic company that once stood as a model for innovation *and* profit.

At this time, McDonnell Douglas's cost-consciousness mindset, seemingly uncalled-for, was not unfounded. In fact, Boeing's traditional way of putting profits second was becoming increasingly out of touch with the industry's economics. Only a little less than two decades before this merger, the U.S. federal government controlled fares, routes, and the market entry of

new airlines. Heavy regulation by the federal government had enabled airlines to prosper in their early beginnings, but it also kept fares high for consumers. Later, deregulation under US presidents Jimmy Carter and Ronald Reagan paved the way for more industry competition. With fears of a destabilized industry, most airlines strongly opposed this deregulation. However, with the passing of the bi-partisan supported Airline Deregulation Act of 1978, airlines could fly where they wanted and charge what the market would bear. With control over ticket prices now, an airline might choose to lower its fares to attract price-sensitive flyers. Consequently, airlines realized they must cut costs to avoid passing on the cost to ticket prices, which is unattractive to consumers. To cut costs, airlines, as expected, looked harshly at aircraft sale prices. Hence, the days of the old Boeing breaking budgets to produce a plane of marvellous engineering would have to end, one way or another, if the company wanted to stay afloat financially.

Boeing headquarters in Chicago. The company moved its top executives there from Seattle in 2001.

Then Boeing CEO Phil Condit also decided to relocate Boeing's headquarters from Seattle to Chicago, Illinois, which was a powerful statement from the corporation. This move, most likely an attempt to shape shareholder perception, signalled Boeing's desire to be seen as more than an engineering firm. In a company statement, Boeing stated that its headquarters would be "a new, leaner corporate center focused on shareholder value." The Boeing World Headquarters opened in 2001, 36 stories above the Chicago River. The new location had been

especially disorienting for Boeing engineers. With management now in Chicago, far away from the disempowered engineering and production teams, the decision to emphasize financial operations and shareholder interests over day-to-day engineering and manufacturing became crystal clear.

Boeing CEO Condit has resigned after the aviation giant became involved in several scandals. His successor on Monday was the 67-year-old former Boeing President Stonecipher.

Six years after the merger, McDonnell Douglas' Harry Stonecipher was elected the company's Chief Executive Officer by the company's Board, replacing Condit after a defence procurement scandal. Stonecipher himself even said, "When people say I changed the culture of Boeing, that was the intent, so it's run like a business rather than a great engineering firm, [...]. It is a great engineering firm, but people invest in a company because they want to make money."

> "There were many decades when Boeign did extraordinary things by focusing on excellence and safety and ingenuity. Those three virtues were seen as the key to profit. It could work, and beautifully. And then they were taken over by a group that decided Wall Street was the end-all, be-all."

– Rory Kennedy, American documentary filmmaker, *Downfall: The Case Against Boeing*

A Boeing post-merger

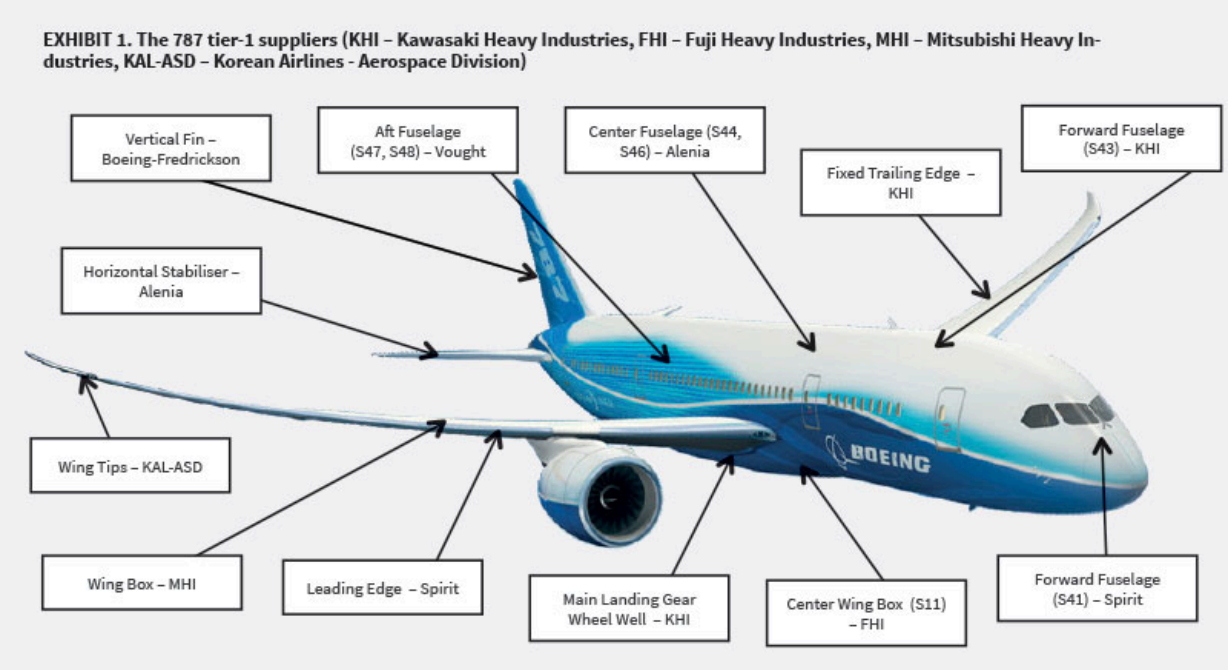
After the 1997 merger, Boeing was reorganized into three primary divisions: Boeing Commercial Airplanes, Boeing Defense, Space & Security, and Boeing Global Services. Until the 737 MAX crisis, the company's sales were robust, with its annual revenue consistently exceeding $90 billion. In 2018, the company delivered a record revenue of $101.21 billion. With operating profits at $10.7 billion that year, Wall Street investors were pleased by the healthy margins. It was equally the world's largest plane manufacturer, recording the delivery of 806 airplanes in 2018, making it the largest exporter of the United States. The airline industry functions in a way in which aircraft orders are received from customers long before they can be delivered. In fact, Boeing only delivered about 60-70 planes per month. Thus, every aircraft manufacturer has a backlog, representing all aircraft ordered by customers that have not been delivered yet. At the end of 2018, Boeing had an astonishing backlog valued at over $490 billion, with thousands of unfulfilled orders for commercial aircraft, particularly the 737 MAX and 787 Dreamliner. Additionally, its 27th rank on the Fortune 500 list that year clearly reflects its dominance as a leader in aerospace manufacturing.

Outsourcing

To cut costs in aircraft manufacturing, Boeing began to adopt an outsourcing model as part of its business strategy, which also had the benefit of speeding up production. Hence, they could deliver more planes more quickly. Instead of sourcing parts from various suppliers and developing and manufacturing the aircraft in-house, which is what Boeing used to do, it would now assign the production of large sections of its aircraft to external suppliers or strategic partners. These global suppliers would be responsible for manufacturing entire subassemblies of the plane, such as an aircraft's fuselage, wings, and tails. When these components were finished, they were to be shipped to Boeing's assembly lines, where they got put together into the final aircraft. With this model of outsourcing also came more lenient oversight from Boeing itself.

Instead of managing every manufacturing detail, Boeing would simply oversee the design and integration of the aircraft parts into the final airplanes. They would give suppliers an overall blueprint to follow, and then the specific parts of the design and manufacturing would be left to them.

Case study: Production of the Boeing 787 Dreamliner



The 787 tier-1 suppliers (KH1 - Kawasaki Heavy Industries, FHI - Fuji Heavy Industries, MHI-Mitsubishi Heavy Industries, KAL-ASD - Korean Airlines - Aerospace Division)

Boeing's outsourcing strategy manifested most prominently in its production of the 787 Dreamliner. It is the first airliner with an airframe primarily made of composite materials and makes greater use of electrical systems. Due to this, this twinjet had significant leaps in fuel burn reduction, strongly appealing to airlines who were looking to cut operating costs. However, the production failures of this aircraft also revealed some key drawbacks to this outsourcing model. Since Boeing's supply chain was now more complex, with over 50 suppliers responsible for manufacturing different aircraft parts, managing this global network proved challenging, particularly when suppliers failed to meet Boeing's required quality and safety standards. The delivery of the first B787 was delayed by nearly 3 years, causing airlines to push back their own plans to incorporate this aircraft into their fleets and routes. These grave delays led to substantial

cost overruns. Boeing had to negotiate with its customers to extend delivery timelines and offer compensation for the delays. It was reported that by 2013, the program had cost Boeing an additional $30 billion in overruns and adjustments. These delays have continued even today, with the plane still in production.

Despite the challenges like the initial production delays, the Dreamliner became one of Boeing's best-selling aircraft, with thousands of orders placed by airlines globally. It also showcased Boeing's ability to integrate new technologies and materials, cementing its reputation as a leader in aerospace innovation. Thus, Boeing's strategy refused to quit outsourcing, also believing in the cost-benefit it provided on the manufacturing side. Boeing thought the production of the 787 Dreamliner revealed no flaws with the business model but rather with its execution. Eventually, outsourcing would find its way into producing the B737 MAX.

The Creation of the Boeing 737 MAX

Airbus

To understand Boeing's reasoning for building the 737 MAX, we must first examine its competitor, Airbus. Airbus SE is a European aerospace corporation based in France and the Netherlands that, like Boeing, designs and manufactures commercial aircraft with a separate defence and space division. Emerging as a response to the American dominance in the aerospace industry, several European aerospace firms combined to form Airbus. Founded in 1970, this consortium of European companies is a newer company than its American rival. Airbus's commercial aircraft division generated 74% of the total revenue for the Airbus group in 2018, contributing to the 63.7 billion euros revenue the company recorded that year. With around 7500 unfulfilled orders that very year, the value of Airbus's backlog was nearly 411 billion euros. In the large airplane manufacturing industry, Boeing and Airbus form a rigid duopoly, holding nearly 99% of the market share. In 2018, Boeing had slightly less than 60% of the industry's market share, with Airbus holding slightly less than 40%.

The A320neo

On December 1st, 2010, Airbus shook up the market by announcing an updated version of its popular aircraft family. The A320 line is Airbus's series of narrow-body, meaning single-aisle, airliners, competing directly with Boeing's 737 line. These two aircraft families are the airlines' most successful and widely used ones worldwide. Usually seating 150 passengers and created for short-haul routes, anyone who's flown before has probably been on one of the two aircraft. Competing in the same market of narrow-body airplanes, the A320 and B737 are at the center of the biggest rivalry within the aviation industry.

The original A320 was launched in 1984, 19 years after the initial launch of its Boeing counterpart. It became known for its more technological advances than the B737, such as its digital fly-by-wire and side-stick flight controls. The A320 also introduced a glass cockpit with large digital displays. Its cabin is also slightly wider than the 737, improving passenger comfort. These features were more modern and intuitive than the now more dated ones of the 737. Importantly, Airbus designed the A320 family with a high degree of cockpit commonality for the airlines, meaning pilots could easily and quickly transition between different variants of the A320 family models and even some of its other aircraft models, like the A330 widebody, with minimal training. Pilots could even transition to Airbus's other families of jets, such as the widebody A330, with minimal designs. With no need for additional simulator pilot training to switch from one model to the next, this meant significant savings for airlines.

A320neo making its maiden flight on Sept. 25, 2014, over southern France. Airbus

Airbus kept this value in mind when launching the next generation of the A320. It would be called the A320 NEO family, standing for New Engine Option. Airbus promised that no significant additional pilot training would be required for pilots already certified in the A320 to switch to the A320neo. With this new aircraft model, Airbus offered a whopping 15% better fuel economy than its previous models. Given that fuel and labour are the most significant airline costs, combined with the state of rising fuel costs, these selling points of the NEO swiftly garnered the attention of airlines worldwide.

Numerous variants of the A320neo would be offered to airlines: the A319neo, A320neo, A321neo, and A321 XLR. With passenger seating capacities ranging from 120 to 244, these variants were designed to suit airlines' various needs and demands. Notably, the A321 XLR (Xtra Long Range) would open distant connections, otherwise unavailable to older narrow-body airplanes with less range. It could connect destinations such as New York to Rome and London to Vancouver. With this particular variant having a whopping 30% less fuel burn per seat, the opportunity for using this aircraft on point-to-point operations, meaning longer distances with lesser demand, opened up. In other words, airlines would no longer need to deploy a widebody aircraft on routes that wouldn't fill up, something that lost airlines money due to the more significant amount of fuel needed to fly these larger jets and the chance of the route not selling enough to fill up the plane.

Boeing's response

Following this news, Boeing needed to react quickly to prevent Airbus from stealing excessive market share. Boeing was faced with a dilemma. They could choose to design another aircraft type, which would take years. Meanwhile, Airbus would be garnering orders for their newly updated jet. The other option for Boeing was to update *their* single-aisle plane, which competes directly with the A320, the best-selling 737. Around a year after Airbus's announcement, in August of 2011, Boeing CEO Jim McNerney made an announcement. Following the Board's approval, Boeing had picked the ladder option. This new product would

be named the Boeing 737 MAX series, with Boeing promising they would meet or exceed the range of the Airbus A320neo.

The decision to redesign the aircraft with a then 44-year-old airframe came as a shock to some but was justifiably rooted in short-term economic thinking. Like Airbus, Boeing promised this aircraft variant was so similar to its predecessor that the new version 737 would not require costly pilot simulator training like simulator training. Pilots already certified in the previous generations of the 737 only had to take a two-hour iPad lesson about the plane to be able to fly it. The aircraft also gained airworthiness approval from the Federal Aviation Administration, which handles commercial aircraft certification based on preceding models of the 737, instead of a new design approval, significantly speeding up the process of getting the plane certified to fly. Like the A320neo family, the MAX's near indistinguishable value proposition rapidly attracted airlines's orders.

Left: Boeing 737 Classic cockpit.
Right: Instruments and controls sit in the cockpit of a Boeing 737 Max jetliner.

On the manufacturing side, for Boeing, updating an older preexisting plane reduced Boeing's development time and cost. Essentially, it would only have to slightly alter this variant's design to fit its new engines and the plane, at large, would maintain its ancient airframe design. The estimated cost to re-engine the plane with the new CFM International LEAP engines, the largest engines ever to fit on a 737, would cost only $2-3 billion. In contrast, the cost of producing a new plane would cost upwards of $10 billion. With this change, fuel consumption was also reduced by 14% compared to that of the 737 NG, the previous generation of the 737.

Other aerodynamic changes were also adopted to various aircraft parts in this new generation, including distinctive split-tip winglets and a revised tail cone, which aided in minor fuel efficiency improvements. This MAX series was offered in four variants, ranging from 138 to 204 seats named the 737 MAX 7, MAX 8, MAX 9, and MAX 10. Currently, the 737 MAX 7 and MAX 10 variants are still in process for certification, with the FAA declining to put any timetable on approval. Specifically, the MAX 10 competes directly with the A321neo, having similar passenger seating capacities and range. Prolonged delays in certification could disrupt airlines' fleet planning, potentially pushing them to consider alternative aircraft to meet operational and market demands, which would profoundly impact Boeing's sales.

Left: Placement of the engines on the Boeing 737 classic
Right: LEAP-1B Powering the Boeing 737 MAX

The engineers at Boeing concluded that the nose gear would also have to be raised to accommodate this new engine. In the original 737's conception, the airframe was designed to be much lower to the ground to facilitate the loading of luggage and cargo by ground workers. Its then cigar-shaped, narrow, and long engines did not cause any issues. However, these more significant engines could not fit under the wing due to the limited ground clearance. In fact, Airbus overcame this issue as their A320 was always, by design, higher off the ground than the B737. In addition to raising the nose gear, Boeing had to reposition the engines, mounting them further forward and slightly higher than the wing's top surface instead of fully underneath the wing. They were also further forward. These characteristics resulted in slight changes to the aerodynamic characteristics during flight. On takeoff, in some cases, the nose of the aircraft had a tendency to lift higher due to the new position of these engines. This was an issue, as this new

generation of 737 was supposed to behave exactly like the older ones; hence, no significant pilot training would be required.

Boeing dismissed this engineering detail by installing a software-based automatic flight control named MCAS, short for Maneuvering Characteristics Augmentation System, to counteract undesirable aerodynamic changes. Little was known about this system to those outside of Boeing, yet that was the company's very goal. With most of the evaluations delegated to Boeing itself by the Federal Aviation Administration, Boeing played down this new system. It was widely reported that Boeing pushed to expedite approval of the 737 MAX to compete with the Airbus A320neo, given that the plane had hit the market nine months ahead of the MAX. In fact, the FAA had approved Boeing's request to remove references to MCAS from the flight manual. Its very existence was not known to most pilots, with no mention of the system in the flight control manual in each 737 MAX aircraft. This would later come back to haunt Boeing.

In August 2015, the first 737 MAX fuselage completed assembly at Spirit Aerosystems, one of the manufacturers outsourced by Boeing. It took its first test flight in January the following year and gained FAA certification in March 2017. The plane became the fastest-selling plane in the company's history, exceeding the A320neo's orders with 5049 orders placed by the end of 2018. Boeing's stock price had hit an astonishing $320 a share by the end of 2018.

The Crashes

Lion Air Flight 610

On October 29, at 6:20 AM local time, Lion Air Flight 610 departed Soekarno-Hatta International Airport in Jakarta for Pangkal Pinang, the capital and largest city of the Bangka Belitung Islands in Indonesia. This short domestic flight was scheduled to arrive just an hour later, at 7:20 AM. The Boeing 737 MAX 8 operating this flight, powered by two of the new CFM International LEAP engines, was delivered brand new to Lion Air less than 3 months ago. The flight's cockpit crew included Captain Bhavye Suneja, who had more than 6000 hours of flight experience and had flown with the airline for over 7 years. The second in command, First

Officer Harvino, had more than 5000 hours of flight experience. 13 minutes after takeoff, communication between Air Traffic Control (ATC) and Flight 610 was suddenly lost. Workers on the oil platform recalled seeing the aircraft crash with a steep nose-down angle. Reports that Flight 610 had crashed a few kilometres from an offshore oil platform into the Java Sea began emerging, prompting three ships and a helicopter to be deployed to the area.

The flight path of Lion Air Flight 610 that crashed into Java Sea

Not only was this crash unexpected to the general public, but it also shook the aviation industry at its core. Due to stringent safety protocols and state-of-the-art technology, airplane crashes are uncommon, with fatal incidents happening in roughly 1 in 16 million flights. Additionally, the highly esteemed Boeing Company has constructed this new aircraft model, which undoubtedly incorporates advanced technology and has undergone rigorous safety evaluations. The notion that Boeing could engineer an unsafe aircraft is nearly unimaginable.

During the crash's immediate aftermath, Indonesia's National Search and Rescue Agency launched an operation with assistance from various military branches. It was to last seven days but was later extended by three days. On that same day of the crash, the director of operations for this agency delivered the tragic news that all on board were presumed dead and that the first

human remains had been recovered. Later, investigators concluded the victim identification process with 125 out of the 189 people on board identified. Another 64 bodies were unaccounted for. Combining passengers and crew, the public would later discover that the number of fatalities on this flight was 189, making it the deadliest air accident involving all generations and variants of the 737 family in history.

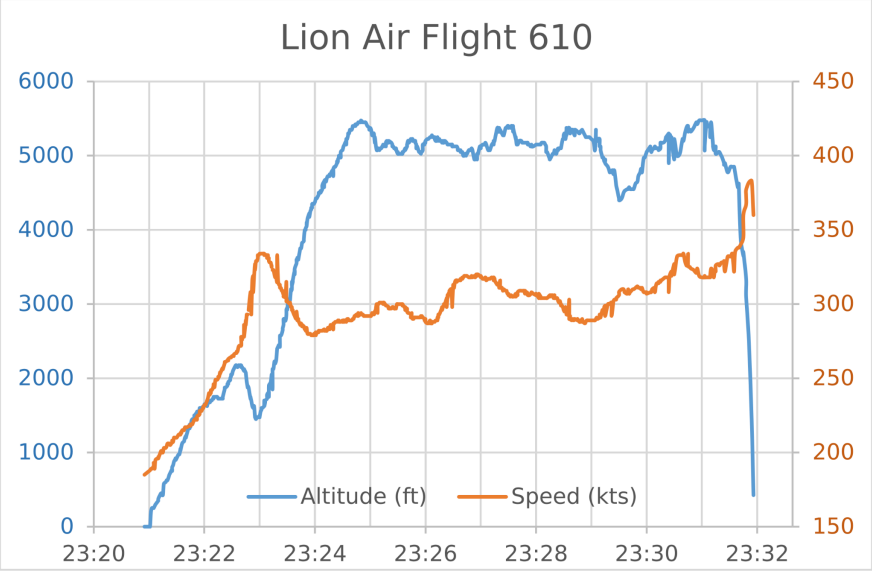
On the same day of the crash, Indonesia's Transportation Ministry ordered all of its airlines to conduct emergency inspections on their 737 MAX 8 aircraft. Yet the ministry soon deemed the aircraft still airworthy, and on October 31, all Indonesian 737 MAX 8s were allowed to resume normal operations. The subsequent investigation of the crash was to be led by the National Transportation Safety Committee (NTSC) of Indonesia. Personnel from the US Federal Aviation Administration (FAA) and engine manufacturer GE Aviation were also sent to Indonesia. Multiple potential causes of the crash were quickly ruled out. For example, the Indonesian Meteorology, Climatology, and Geophysical Agency reported that the weather was clear during the crash and that visibility was good, thus concluding it was unlikely that the weather had caused the plane to dive.

Following a decision made by the NTSC, this search-and-rescue operation would now focus on finding the aircraft's fuselage and flight recorders. On November 1, searchers successfully recovered the flight's flight data recorder, an electronic recording device placed in an aircraft to facilitate the investigation of aviation accidents. Its memory unit was separated from its housing, evidence of the extraordinary impact of the crash. This device reveals critical information about the aircraft's final moments, with investigators able to recover data from the aircraft's 19 most recent flights. It wasn't until only two months after the crash that the cockpit voice recorder was found at a depth of 30 meters below the water surface covered by mud that was 8 meters thick.

Maneuvering Characteristics Augmentation System (MCAS)

The US National Transportation Safety Board (NTSB) brought a Boeing engineering team to assist Indonesia's National Transportation Safety Committee (NTSC) with the investigation. When a Boeing technician examined the flight data recorder and was questioned

about the repeated automatic nose-down inputs, MCAS was brought up as the possible cause. The NTSC investigators, shocked, were hearing about this obscure automated system for the first time. Since the new engines on this plane were moved more forward and higher with the 737 MAX, on extremely rare occasions, the aircraft's nose would be pointed too far upwards, especially when the jet was in full thrust, in the case of takeoff. As detailed in the preliminary report released by the NTSC on November 28, the Maneuvering Characteristics Augmentation System (MCAS) was a software fix on the 737 MAX designed to push the plane's nose down automatically, should the angle of attack (AoA) sensor on the aircraft detected an unusually high angle of attack during takeoff, which could become unsafe and lead to a stall. The two AoA sensors on the plane, located on each side of the plane's nose, are small blades that move with the wind outside the plane. They measure the angle between the aircraft's nose and the oncoming airflow, which helps determine if the plane is flying at a too steep angle. Shockingly, it was revealed that MCAS relies on data from only one of the two AoA sensors located on both sides of the plane to trigger activation. This reliance on a single sensor is seemingly a basic engineering flaw since it creates a single point of failure. If the singular sensor provides faulty data, the system can activate erroneously and jeopardize the safety of the entire aircraft.



Altitude and speed of Lion Air Flight 610

In the case of Flight 610, the AoA sensor on the Captain's side was sending erroneous data, which caused MCAS to activate repeatedly and uncontrollably. It turned out that the new AoA sensor on this plane was miscalibrated due to an improper replacement just days before, which subsequently commanded nose-down trim. With no training on the function or disablement of MCAS, or even a single mention whatsoever in the flight manual, the pilots on Flight 610, clueless, were ultimately overwhelmed by MCAS's inputs, despite their repeated tries at manually lifting the nose of the plane back up. Following this revelation of the existence of MCAS to the public, Boeing guided airlines operating the 737 MAX by advising crews to disable MCAS. Boeing advised pilots to deactivate a separate system in the plane, named the stabilizer trim system, to disable MCAS. In the case of Flight 610, the pilots did not achieve this. In reality, Boeing purposely omitted it from pilot training materials with the all-important goal of shortening the certification time.

The NTSC's final report will provide a comprehensive incident analysis detailing the timeline, technical findings, root causes, contributing factors, and safety recommendations to prevent future accidents. However, a second crash, this time in Ethiopia, occurred before this report could be released.

Ethiopian Airlines Flight 302

The date is March 10, 2019, 4 months after the crash of Lion Air Flight 610. Ethiopian Airlines Flight 302, an international passenger flight from Addis Ababa, Ethiopia, to Nairobi, Kenya, departed from Addis Ababa Bole International Airport at 8:38 AM local time. Like Lion Air 610, this flight was operated by a Boeing 737 MAX 8, registered as ET-AVJ. Powered by the same CFM International LEAP engines, this flight was known as the "UN Shuttle" because of the popularity of UN officials travelling on board, as the route connected the African Union headquarters and UN regional offices in Addis Ababa and Nairobi. Captain Yared Getachew was in command of Flight 302. He had been with the airline for almost nine years and logged over 8,000 flight hours. At 29, he was the youngest captain at Ethiopian Airlines during the accident. First Officer Ahmednur Mohammed was an extremely new pilot, having only logged 361 flight hours.

Merely one minute into the flight, the crew reported a flight control problem. Two minutes later, MCAS was activated, like Lion Air Flight 610, forcing the plane to plunge toward the earth below. The pilots, managing to regain control briefly, were faced with the reactivation of MCAS a moment later, dropping the nose even further down. The crew requested permission from Air Traffic Control to return to the airport. After a constant battle between the Captain and the MCAS, the jet was plunging toward the ground despite the crew's consistent attempts to raise the nose. The aircraft crashed into a field in Bishoftu, Ethiopia, just 6 minutes after takeoff, at almost 8:44. Impacting the ground at nearly 1100 kilometres an hour, all 157 passengers and crew on board died, making it the most deadly accident on Ethiopian Airlines. The impact created a crater of about 28 meters wide and 40 meters long, with the wreckage driven up to 10 meters deep into the soil.

The whole story of the crash of Ethiopian Airlines Flight 302 has yet to surface. Yet, a scandal is already brewing. The 737 MAX has now been involved in two fatal crashes within a span of five months. One day after the crash, the government of China and Indonesia issued a grounding of the MAX jets, and mounting pressure was placed on the Boeing Company to demonstrate accountability. These crashes have already lost Boeing an immense amount of credibility and have severely damaged their reputation for engineering excellence and safety. Hence, without a doubt, more groundings are expected to come flooding, and so are lawsuits.

Forensics investigators and recovery teams at the crash site of Ethiopian Airlines Flight ET 302 on 12 March 2019 in Bishoftu, Ethiopia.

Topic A - Internal Reforms: Restoring Engineering Integrity and Corporate Accountability

In the aftermath of the 737 MAX crisis, Boeing is under intense scrutiny for the engineering flaws and safety lapses that led to two fatal crashes. Before all else, the Board of Directors must take immediate and comprehensive action to overhaul Boeing's internal practices, ensuring that failures in engineering are resolved and that the company can restore its reputation for safety and engineering excellence.

The central issues leading up to these accidents are design flaws in the 737 MAX, particularly the malfunctioning MCAS. The company is grappling with questions about the system's initial design, how it was certified, and the lack of sufficient pilot training regarding its functionality. These design flaws have caused significant damage to Boeing's credibility as a manufacturer of safe aircraft. Next, Boeing's role in certifying the 737 MAX, particularly the

delegation of responsibilities to itself by the FAA, has been heavily scrutinized. Questions over the effectiveness of Boeing's internal systems for identifying and addressing potential safety risks before they escalate will be asked. In addition, Boeing should anticipate criticism for its corporate governance, particularly regarding the decision-making processes that led to the 737 MAX's design flaws. A revision in the company's culture seems to be necessary now more than ever. Finally, the crashes have also shaken employee confidence within Boeing. Engineers and staff are concerned about the company's commitment to safety and transparency and the potential reputational damage that could result from the scandal. Whistleblowers within Boeing could further exacerbate the crisis by revealing internal issues, potentially leading to more scrutiny from regulators, damaging public trust, and intensifying legal and financial consequences for the company.

Guiding Questions

1. How should Boeing address the engineering flaws in the 737 MAX, particularly the MCAS system, and what steps should the company take to prevent such design failures in the future?
2. To what extent should Boeing revise its self-certification process, and what role should independent regulatory bodies play in ensuring future aircraft meet safety standards?
3. How can the Board demonstrate accountability for the decisions made during the 737 MAX development, and what actions should be taken to restore public and employee confidence in Boeing's leadership?
4. What structural changes should Boeing make to improve its internal safety culture, ensuring that engineers and employees feel empowered to report safety concerns without fear of retaliation?
5. How can Boeing address employee concerns about job security and ethics, and what measures can the Board take to maintain staff morale and loyalty during this turbulent time?

Topic B - External Relations: Rebuilding Public, Regulatory, and Customer Trust

With the MAX's safety thrown into question by these crashes, regulators are furiously awaiting Boeing's justifications for these crashes, and Boeing has begun to lose the credibility it once held onto so tightly. Besides the obvious engineering faults that need to be resolved internally within the company, external threats that threaten the company's livelihood also exist. Thus, it is essential that the Board devotes its efforts to engaging transparently with the aircraft regulators, managing the media fallout to regain credibility, and negotiating effectively with airlines. Firstly, regulatory bodies such as the FAA and international aviation authorities are expected to investigate Boeing's compliance with safety standards and certification protocols. Secondly, skepticism surrounding the company's commitment to safety and accountability has severely impacted public confidence. At the same time, media coverage and stakeholder concerns have intensified, creating additional reputational risks and directly affecting shareholders' view of the company. Thirdly, major customers of Boeing are contemplating the cancellation or suspension of their orders for MAX aircraft, citing safety concerns and a worry about Boeing's ability to resolve the issues. Cancelled orders and halted deliveries will threaten long-term revenue streams, causing significant financial strain for Boeing.

The company must take immediate steps to address the public's safety concerns since regaining trust with passengers, airlines, regulators, and the public cannot be more important to prevent the company from entirely collapsing. The clock is ticking, and the Board needs to act swiftly.

Guiding Questions

1. How should Boeing engage with regulatory bodies such as the FAA and international authorities to rebuild trust, and what transparency measures can be implemented to demonstrate compliance with safety standards moving forward?
2. What actions should Boeing take to manage the media narrative surrounding the crashes and restore the flying public's confidence in the safety and reliability of its aircraft?

3. With major airlines contemplating cancelling or suspending orders for the 737 MAX, how should Boeing approach negotiations with its customers to reassure them about the MAX's safety and reliability and prevent further sales losses?
4. In the wake of these crises, what steps can the Board take to prevent a further decline in shareholder confidence and mitigate the impact on Boeing’s stock price and long-term financial stability?
5. How can Boeing communicate the message that safety is a core value of the company?

Character List and Descriptions

Dennis Muilenburg

As Boeing's CEO and Chairman of the Board, Dennis Muilenburg brings decades of experience within the company, having risen through roles in engineering, program management, and business operations. With a background in aerospace engineering and a focus on innovation, Muilenburg is instrumental in driving Boeing's strategy toward expanding its commercial, defence, and space markets. Known for his operational efficiency and cost management, he champions initiatives to streamline production and enhance Boeing's competitiveness in the global aerospace industry. His approach is regarded as emphasizing technological advancement, customer focus, and maintaining Boeing's position as a leader in aviation and aerospace.

Robert A. Bradway

As Chairman and CEO of Amgen, Robert A. Bradway has a reputation for driving innovation and overseeing significant growth in one of the world's leading biotechnology companies. With a background in biology and finance, Bradway is recognized for his ability to navigate highly regulated industries, focusing on research, development, and global market expansion. Under his leadership, Amgen prioritized advancing cutting-edge therapies while maintaining a strong commitment to compliance and ethical standards. Bradway's strategic and financial acumen positioned him as a trusted advisor on corporate governance and long-term planning, focusing on balancing innovation and operational efficiency.

David Calhoun

David Calhoun is a senior executive at The Blackstone Group, the world's largest alternative asset manager, bringing extensive corporate restructuring and crisis management expertise. With leadership experience at Nielsen and General Electric, he has built a reputation for driving organizational transformation and operational efficiency. Known for his strategic thinking and focus on governance, he brought a pragmatic, results-oriented approach to leadership. Calhoun's knowledge of global supply chains and regulatory compliance is critical as Boeing addresses production challenges and restores trust with stakeholders.

Arthur Collins Jr.

Arthur Collins Jr. is a business leader known for his tenure as Chairman and CEO of Medtronic, where he guided the company through significant growth and innovation in the medical technology sector. He has extensive expertise in corporate strategy, risk management, and navigating complex regulatory environments. Collins is recognized for his focus on fostering innovation and sustainable business practices. His leadership style emphasizes accountability, long-term growth, and operational excellence.

Edmund Giambastiani Jr.

Edmund Giambastiani Jr. is a retired U.S. Navy admiral with extensive experience in defence, strategy, and technology development. His career included serving as the seventh Vice Chairman of the Joint Chiefs of Staff, where he advised on military operations, modernization, and national security strategy. Giambastiani is known for his systems integration, risk assessment, and organizational leadership expertise. He strongly focuses on innovation and collaboration, particularly in complex technical and strategic environments. His leadership reflects a commitment to efficiency, precision, and mission-focused outcomes.

Lynn Good

Lynn Good is a prominent business executive known for her role as the President and CEO of Duke Energy, one of the largest electric power companies in the United States. She has extensive experience in financial management, strategic planning, and the energy sector, focusing on transitioning to cleaner energy solutions. Good is recognized for her leadership in guiding companies through periods of significant transformation and regulatory challenges. Her approach emphasizes innovation, sustainability, and long-term value creation for stakeholders.

Nikki Haley

Nikki Haley is a diplomat and political leader known for her tenure as the United States Ambassador to the United Nations from 2017 to 2018. She previously served as the Governor of South Carolina, focusing on economic development and job creation. Haley is recognized for her strong leadership on global issues, including human rights, national security, and international diplomacy. Her experiences reflect a commitment to public service, pragmatic problem-solving,

and fostering economic growth. She is also known for her ability to navigate complex political environments and build bipartisan coalitions.

Lawrence Kellner

Lawrence Kellner is a seasoned business executive with extensive experience in the aviation and hospitality industries. He served as the Chairman and CEO of Continental Airlines, where he focused on operational efficiency, customer service, and strategic growth. Kellner is recognized for his expertise in corporate governance, financial management, and navigating complex regulatory environments. His leadership style emphasizes innovation, long-term planning, and building strong organizational cultures. He has also been involved in various advisory and leadership roles across different industries, reflecting his broad business acumen.

Caroline Kennedy

Caroline Kennedy is an attorney, author, and diplomat widely recognized for her public service and cultural contributions. She served as the United States Ambassador to Japan from 2013 to 2017, where she strengthened diplomatic ties and promoted U.S.-Japan relations, particularly in trade, defence, and cultural exchange. Kennedy is also known for her work as an advocate for education and the arts and her stewardship of her family's legacy. Her career reflects a commitment to civic engagement, diplomacy, and fostering international collaboration.

Edward Liddy

Edward Liddy is a business executive with extensive experience in finance and corporate leadership. He is best known for serving as Chairman and CEO of Allstate Corporation, where he focused on expanding the company’s market presence and improving operational performance. Liddy also played a critical role during the 2008 financial crisis when he was appointed to lead American International Group (AIG), overseeing its restructuring and stabilization. He is recognized for his expertise in risk management, corporate governance, and navigating challenging business environments. His leadership reflects a focus on accountability, strategic decision-making, and organizational resilience.

John Richardson

John Richardson is a business executive known for his leadership roles in the aerospace and defence industries. He served as the Senior Vice President of Boeing's International Business Development, where he focused on expanding the company's global presence and managing strategic international partnerships. Richardson has extensive experience in government relations, international markets, and defence technologies. His expertise in navigating complex regulatory and geopolitical environments has made him a key figure in Boeing's global strategy. He is recognized for his commitment to fostering international collaboration and driving growth in competitive markets.

Susan Schwab

Susan Schwab is an accomplished economist and public policy expert known for her role as the U.S. Trade Representative from 2006 to 2009. She played a key role in shaping U.S. trade policy, including efforts to expand trade agreements and promote global economic growth. Schwab has extensive experience in international trade, economic development, and public policy, having worked in both the private sector and government. Her leadership reflects a strong commitment to free trade, multilateral diplomacy, and enhancing global competitiveness. She is also a noted academic and thought leader in international economics and trade policy.

Ronald Williams

Ronald Williams is a business executive known for his leadership as the Chairman and CEO of Aetna, a major health insurance company, where he focused on expanding the company's services and improving healthcare access. Under his leadership, Aetna pursued a strategy of innovation, particularly in integrating technology and healthcare services. Williams is recognized for his healthcare policy, risk management, and organizational transformation expertise. He has also served on various boards, bringing valuable experience in corporate governance and strategic planning. His leadership emphasizes collaboration, long-term growth, and social responsibility in business.

Mike Zafirovski

Mike Zafirovski is a seasoned business executive with extensive experience in technology and telecommunications. He is best known for serving as the President and CEO of Nortel Networks, where he played a key role in efforts to revitalize the company during its challenging periods. Zafirovski also held leadership positions at other major companies, including General Electric and Motorola. His expertise spans corporate restructuring, operations management, and global business strategy. Zafirovski is recognized for his focus on innovation, driving efficiency, and guiding companies through periods of transformation and competitive challenges.

Greg Smith

Greg Smith is Boeing's chief financial officer (CFO), and he played a key role in the company's financial operations, including budgeting, reporting, and risk management. He was instrumental in overseeing Boeing's financial strategy during periods of growth and industry challenges. Smith is recognized for his expertise in financial management, corporate governance, and operational efficiency. His leadership helped guide Boeing through complex financial landscapes, balancing profitability with long-term strategic goals. He also served in various leadership roles at Boeing, contributing to the company's overall corporate and financial success.

J. Michael Luttig

J. Michael Luttig was a former federal judge and a respected legal expert known for his tenure as a judge on the U.S. Court of Appeals for the Fourth Circuit, serving from 1991 to 2006. After his judicial career, he became a prominent executive at Boeing, serving as the company's General Counsel and Senior Vice President. Luttig was critical in overseeing Boeing's legal affairs and navigating complex regulatory and litigation matters. Known for his legal acumen, he was instrumental in shaping the company's approach to compliance and governance. Luttig is also recognized for his leadership in corporate law and public policy.

Greg Hyslop

Greg Hyslop is an engineering executive known for his leadership at Boeing, where he served as the Chief Engineer and Senior Vice President of Engineering, Test, and Technology. Hyslop played a key role in overseeing the company's engineering operations, including developing

innovative technologies and ensuring the safety and reliability of Boeing's products. He has extensive experience in aerospace engineering, product development, and systems integration. Hyslop is recognized for his commitment to advancing technical excellence and driving the company's technological innovation while ensuring adherence to regulatory standards and safety protocols.

Stephanie Pope

Stephanie Pope is a business executive known for her leadership at Boeing, where she served in various senior roles, including as the President of Boeing Global Services. Pope oversaw the company's global services business in this capacity, which provides a wide range of support services for Boeing's commercial, defence, and space operations. She has extensive experience in operations, strategy, and organizational leadership, focusing on customer solutions and operational efficiency. Pope is recognized for her work in driving growth, enhancing service offerings, and fostering innovation within Boeing's global services division.

William A. Ampofo II

William A. Ampofo II is a business executive known for his work in the aerospace and defence sectors. Since 2017, he has been Vice President of Business Aviation, General Aviation, and OEM Distribution Services. Throughout this career, he held various leadership positions, including roles in business development and program management, where he contributed to the growth and strategic direction of the companies he worked for. Ampofo's expertise lies in managing complex projects, government relations, and corporate strategy. His career focuses on innovation, operational efficiency, and navigating the challenges of the aerospace and defence industries. Ampofo is recognized for his ability to build strong relationships and drive business success in competitive environments.

Uma Amuluru

Uma Amuluru has a strong corporate governance, intellectual property, and cybersecurity background. Serving as Vice President and Assistant General Counsel at Boeing, she provides legal counsel to senior leaders across various departments. Amuluru's experience advising on complex matters related to supply chain, environmental issues, and risk management proved

invaluable in shaping Boeing's business strategies. Her prior roles in the federal government, including as associate White House counsel, added a unique perspective on compliance and oversight. Her leadership in legal affairs made her a key contributor to Boeing's corporate governance.

Michael Delaney

Michael Delaney serves as Vice President of Engineering and Vice President of Digital Transformation at Boeing. Formerly, he was also the 787 Chief Project Engineer, the Vice President of Engineering and the Vice President of Airplane Development. In these roles, he oversees Boeing's engineering operations and drives the company's efforts to integrate digital technologies across its various divisions. Delaney was key in advancing Boeing's engineering capabilities, focusing on innovation, safety, and quality. His leadership in digital transformation helped shape the company's approach to data analytics, automation, and technological advancements.

Mike Fleming

Mike Fleming is Senior Vice President and General Manager of Airplane Programs and Customer Support for Boeing Commercial Airplanes. In this capacity, he oversaw the production and delivery of all commercial aircraft, including the 737, 767, 777/777X, and 787 programs. Fleming worked closely with airline customers and Boeing services teams to provide comprehensive 24/7 support to the global fleet. He also led the enterprise Program Management Operations Council, driving functional excellence and best practices across the company. Before this role, Fleming held various leadership positions, including Vice President of Commercial Services for Boeing Global Services and Vice President of Fleet Services for Commercial Airplanes.

Brett C. Gerry

Brett C. Gerry serves as Vice President and General Counsel for Boeing Commercial Airplanes, overseeing the company's legal affairs within the commercial aircraft division. In this role, he provided legal counsel on various issues, including regulatory compliance, intellectual property, and contractual matters. Gerry's extensive experience in both the private sector and government,

including positions at the U.S. Department of Justice and the White House, equipped him with a deep understanding of legal and regulatory frameworks. His leadership was instrumental in navigating complex legal challenges and supporting Boeing's strategic objectives in the commercial aviation sector. Gerry's commitment to legal excellence and corporate governance was crucial in maintaining Boeing's reputation and operational integrity.

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Table of Contents

Table of Contents **2**
Letter from the Director **3**
Definitions **5**
Introduction **6**
A brief timeline **7**
Early History of Boeing 7
Modernization of the company 8
Crashes 9
A Brief History of The Boeing Company **9**
Birth of The Boeing Company 9
Boeing 737 10
McDonnell Douglas Merger 11
A Boeing post-merger **16**
Outsourcing 16
Case study: Production of the Boeing 787 Dreamliner 17
The Creation of the Boeing 737 MAX **18**
Airbus 18
The A320neo 18
Boeing's Response 20
The Crashes **23**
Lion Air Flight 610 23
Maneuvering Characteristics Augmentation System (MCAS) 25
Ethiopian Airlines Flight 302 27
Topic A - Internal Reforms: Restoring Engineering Integrity and Corporate Accountability **29**
Guiding Questions 29
Topic B - External Relations: Rebuilding Public, Regulatory, and Customer Trust **30**
Guiding Questions 31
Character List and Descriptions **31**
Bibliography **39**

Letter from the Director

Dear delegates,

You have done it. You have made it to the top of the corporate ladder. Step into the boardroom. The meeting is about to begin, and much is needed to discuss. On behalf of the Dais, I am honoured to welcome you to *Boeing's Board of Directors*. My name is Tony, and I am in my last year at Collège Villa Maria in Montreal, Québec. In the past, I've attended numerous conferences as a delegate in Montreal and Canada, notably SSUNS and last year's TMUN, and I could not be more thrilled to be directing this committee. In my free time, I can be found hanging out with friends, miserably studying for chemistry, and uncontrollably doomscrolling on TikTok.

Alongside me are the terrific people that make up the rest of your Dias. Aayan is honoured to be your chair for TMUN's Boeing Board of Directors committee. When not practicing his diplomatic skills at MUN conferences, he enjoys reading mystery novels, listening to classical music, and pondering how IB exams will turn out. In addition, the committee would not have been possible without your marvellous crisis analysts, Ananya and Arnav. Ananya is a Grade 11 student at St. Joan of Arc Catholic Academy in Scarborough. She has loved every moment of Model UN since she got into it! Besides MUN, she enjoys reading, listening to music, and praying her physics mark goes up (actually struggling right now). Arnav is a grade 12 student at Central Peel Secondary School in Brampton. Aside from Model UN, he loves going to the gym, learning history and the white Monster energy drink (exam season saviour). His favourite Model UN phrase is "The dias rules that as dilatory."

I hope you can find value in attending this conference, whether or not it is your first-ever experience with MUN. Should this be your first conference, I urge you not to shy away. Not so long ago, I was standing in your very shoes. When I attended my first conference, my experience was not very enjoyable. I was petrified and did not even dare to speak once in front of what seemed to be a sea of people. I advise you to take a leap and see where it gets you. The start might be rough, but the growth you'll experience will be worth every step. Rest assured that the rest of the Dais and I are here to help you at any point during this conference. If you are an

experienced delegate, set an example for the beginner ones by displaying leadership, collaboration, and respect. Your role extends beyond competing; you have the opportunity to guide others, offering support and encouragement when needed.

This background guide is meant to be only the starting point of your research. Further exploring your character, the issues surrounding this scandal, possible solutions, and more will be instrumental in your success on this committee. Moreover, this committee would not strictly adhere to the factual timeline of the events after March 11, 2019. The outcome of the crisis depends entirely on your actions.

Finally, please email me if you have any questions, concerns, feedback, or anything else. Once again, I am truly ecstatic about this committee and excited to meet you all.

My very best,

Tony Lu
Director of *Boeing Board of Directors*, TMUN 2025
tonyweihaolu@gmail.com

"If it ain't Boeing, I ain't going."

Definitions

Aircraft types: The general classification of aircraft based on design and function, such as commercial jets, cargo planes, military aircraft, or private planes. Aircraft types can include subcategories like single-aisle, wide-body, or light aircraft.

Aircraft Variants: Different versions of a particular aircraft type that may have different specifications, configurations, or features. Variants can include differences in engine types, size, range, or intended use. For example, the Boeing 737 has several variants, such as the 737-800 or 737 MAX, each with unique attributes.

Angle of Attack (AoA): The angle between the chord line of the wing and the direction of the relative airflow. It is crucial in determining the lift generated by the wing, and if it becomes too high, it can lead to a stall where the wing can no longer generate sufficient lift.

ATC: ATC refers to the system that manages the safe and orderly flow of air traffic in the airspace and at airports. Air traffic controllers coordinate aircraft movements to prevent collisions and ensure efficient air traffic management.

FAA: The Federal Aviation Administration (FAA) is a regulatory agency under the U.S. Department of Transportation responsible for overseeing and regulating civil aviation in the United States. Its primary duties include ensuring the safety of aircraft operations, certifying aircraft and aviation personnel, managing air traffic control systems, and enforcing aviation laws and regulations. The FAA also plays a significant role in developing and implementing air travel policies, advancing aviation technology, and maintaining international standards for aviation safety.

FAA Certification: The process through which the Federal Aviation Administration (FAA) grants approval for aircraft, aircraft parts, or aviation-related operations to ensure they meet safety, regulatory, and performance standards. The FAA certification process involves rigorous

testing, inspections, and evaluations to verify that the aircraft or aviation operation complies with all relevant standards before being allowed for public use.

Grounding: The suspension of operations for a specific aircraft or fleet by regulatory authorities, airlines, or manufacturers. This action typically occurs due to identified safety concerns, mechanical defects, regulatory non-compliance, or pending investigations into incidents or accidents involving the aircraft. Grounding is a precautionary measure to ensure passenger safety and prevent further incidents while the issues are assessed and resolved.

MCAS: An automated flight control system on the Boeing 737 MAX. The system was designed to improve the aircraft's handling characteristics at high angles of attack, but it became a focal point in the 737 MAX accidents after malfunctioning, leading to two fatal crashes. A more in-depth explanation of MCAS can be found in the background guide.

NTSC: The National Transportation Safety Committee is an Indonesian government agency charged with the investigation of air, land, rail, and marine transportation safety deficiencies.

NTSB: An independent U.S. government agency responsible for investigating civil transportation accidents, including those involving airplanes, trains, and boats. The NTSB determines the probable cause of accidents and makes safety recommendations to prevent future incidents.

Introduction

On October 28, 2018, Lion Air Flight 610 took off from Soekarno–Hatta International Airport in Jakarta, headed for Pangkal Pinang Airport, located on one of Indonesia's many islands. Carrying 181 passengers and eight crew members, a mere 13 minutes after takeoff, the plane crashed into the Java Sea, killing all on board. A few months later, there was another crash. This time near Tulu Fara village outside Bishoftu, Ethiopia, killing all of the 149 passengers and eight crew on board. The same aircraft type operated both flights: the 737 MAX 8, built by The Boeing Company.

A Boeing 737 MAX 8 was delivered to Air China during a ceremony at the company's Zhoushan facility in 2018.

The date is March 11, 2019, exactly one day after the crash of Ethiopian Flight 302. News has just begun spreading about the crash in Addis Ababa, Ethiopia. Notably, the People's Republic of China's Civil Aviation Administration has issued a grounding of all 96 B737 MAX in its country. This was followed by a grounding issued by Indonesia's Ministry of Transportation. Thus far, these two countries have grounded the MAX aircraft. Reporters from various media outlets are currently crowding outside Boeing's headquarters in Chicago, Illinois, demanding that the Board answer for the crash, the second of its 737 MAX aircraft in less than five months.

A brief timeline

Early History of Boeing

1916 - Boeing is founded by William E. Boeing in Seattle, Washington.

1957 - Boeing launches the 707, the first commercially successful jetliner.

1967 - The first iteration of the Boeing 737 enters service.

1997 - Boeing completes its merger with McDonnell Douglas.

Modernization of the company

2003 - Harry Stonecipher, the former CEO of McDonnell Douglas, becomes Chief Executive Officer and Chairman of the Board at Boeing.

2005 - James McNerney replaces Stonecipher as CEO after a scandal involving Stonecipher's inappropriate relationship with a Boeing executive led to his resignation.

2009 - Airbus officially announces the launch of the A320neo, promising increased fuel efficiency and lower operating costs.

April 10, 2001 - Boeing announces the move of its headquarters to Chicago, which separated itss corporate executives from its engineering and product development teams, which were still based in Seattle.

August 30, 2011 - Boeing launches the 737 MAX program as its response to the A320neo.

2015 - Dennis Muilenburg becomes Boeing's CEO and Chairman of the Board. He succeeds McNerney, who resigned after 10 years in the role when he reached Boeing's mandatory retirement age of 65.

2016 - The first 737 MAX 8 completes its maiden flight.

2017 - The FAA certifies the 737 MAX-8.

February 15, 2018 - The FAA certifies the 737 MAX-9.

Crashes

October 28, 2018 - Maintenance teams replace the faulty Angle of Attack sensor on the Lion Air 737 MAX the day before the fatal flight. Calibration is not performed.

October 29, 2018 - Lion Air 610 crashes into the Java Sea thirteen minutes after takeoff from Jakarta, killing all 189 passengers and crew.

November 6, 2018 - Boeing issues a bulletin to airlines operating the 737 MAX, advising pilots on responding to unintended MCAS activation.

November 28, 2018 - Indonesia's NTSC releases its preliminary report on Lion Air 610's crash, highlighting MCAS and a faulty AoA sensor.

March 10, 2019 - Ethiopian Airlines Flight 302 crashes in a field near Addis Ababa, Ethiopia, six minutes after takeoff, killing all 157 aboard.

March 11, 2019 - China and Indonesia ground the 737 MAX aircraft.

March 11, 2019 - Present day. Boeing's Board of Directors is convening for the first time after the crash of Flight 302.

A Brief History of The Boeing Company

At the start of the 21st century, Boeing was a dominant force in the aerospace industry, commanding the skies with a global reach. However, to fully understand this company's rise, it is essential to start with the planemaker's humble beginnings.

Birth of The Boeing Company

In 1910, William E. Boeing, an American timber merchant, attended the first Los Angeles International Air Meet and subsequently developed a passion for aviation. 6 years later, along with his friend U.S. Navy Lt. George Conrad Westervelt, he built his first product ever: the B & W Seaplane, named after their initials. The same year, in Seattle, Washington, Boeing incorporated Pacific Aero Products Co. for $100 000, which later was renamed Boeing Airplane Co. With a top speed of 75 miles per hour, two of the single-engine, two-seat seaplanes were built and later on offered to the U.S. Navy. When the Navy did not buy them, they were sold to the New Zealand Flying School, marking the company's first international sale. As the United States entered World War I in 1917, Boeing began building 'flying boats' for the Navy and later sold its trainers, pursuit planes, torpedo planes, and patrol bombers to the U.S. military.

In 1928, William Boeing formed Boeing Airplane & Transport Corporation to encompass both aircraft manufacturing and airline operations. However, in 1934, under the Air Mail Act of 1934, a new U.S. antitrust legislation, aircraft manufacturing had to be divorced from air transport. Consequently, United Aircraft and Transport dissolved into three major groups: Boeing Airplane Company, United Aircraft Corporation, and United Airlines, all of which still exist today.

Boeing 737

At this time, Boeing held a reputation so strong that the saying "If It Ain't Boeing, I Ain't Going" became common among loyal flyers. Following the release of the first commercially successful jet airliner, the 707 and the Boeing 727, a tri-jet designed for shorter domestic flights, came the Boeing 737. Influenced by the demand for a reliable, economical jet that could serve

short- to medium-haul routes, the 737 was born, providing “big-jet comfort on short-haul routes.” The first generation 737 was a much smaller aircraft, especially compared to the big multiengine jets that Boeing was synonymous with, earning it the nickname “Baby Boeing.” It was to have two skinny and long engines mounted under the wings. Its short fuselage and 2-by-3 seating configuration only allowed an 85-100 passenger seating capacity. Boeing designed the 737-100 to share many components with the 707 and 727 models that came before it, with the fuselage cross section and nose derived from the previous aircraft types. The production of this aircraft was characterized by the strive for engineering excellence, with large amounts of authority afforded to pilots and engineers, a lack of bureaucracy, and the willingness to break budgets.

Lufthansa Boeing 737-100 at Manchester Airport in 1972

On February 19, 1965, Lufthansa Airlines became the launch customer of the 737-100. Since then, the 737 has been developed into a whopping 13 different variants, including passenger, cargo, corporate and military, making this aircraft type incredibly costly yet hugely profitable as well. Spanning over 4 “generations,” this aircraft went from the first generation “original” series to the second generation “classic” series, leading to the third generation “Next Generation” (NG) series, and finally culminating in the fourth generation 737 MAX series that launched in August 2011.

Before the MAX crashes, over 7,500 Boeing 737s were in service; on average, 2,800 aircraft were airborne at any given moment. A 737 aircraft departed or landed every 1.5 seconds, carrying around three million passengers daily. At the time, the global 737 fleet had carried over

22 billion passengers since its introduction. Presently, in March of 2019, it is the highest-selling commercial aircraft ever.

McDonnell Douglas Merger

> "Although Boeing was supposed to take over McDonnell Douglas, it ended up the other way around."
>
> – Clive Irving, author of *Jumbo: The Making of the Boeing 747*

McDonnell Douglas Corporation was a major American aerospace manufacturing corporation and defence contractor. Formed from a merger between McDonnell Aircraft Corporation and Douglas Aircraft Company, McDonnell Douglas was solidly performing in the defence sector, developing key military aircraft such as the F-15 Eagle and the F/A-18 Hornet, which were crucial assets for the U.S. military and allied forces. The company also produced many popular commercial airplanes, some of which directly competed with Boeing's. By the 1980s, McDonnell Douglas faced increasing financial challenges from growing competition from other plane makers, which put pressure on its commercial aircraft division. As a result of these financial constraints, McDonnell Douglas shifted its focus towards its more profitable defence contracts and reduced investments in commercial aviation innovation. This strategy limited the company's ability to compete in the competitive commercial aircraft market, where Boeing all the meanwhile was making significant advancements.

Unlike Boeing's engineering-driven culture, McDonnell Douglas was a more financially driven company, focusing mainly on cost control. This is reflected in its management practices and decision-making. Its leadership prioritized operational efficiency and shareholder value, which would significantly impact Boeing after the merger.

In 1996, Boeing took up around 60% of the aircraft manufacturing industry's new commercial aircraft orders, whereas McDonnell Douglas took only around 5%. Faced with

ever-growing financial difficulties, McDonnell Douglas entertained the idea of a merger with Boeing. At that time, Boeing had coincidentally wished to diversify its offerings away from the turbulent commercial aircraft market with its cycle of booms and busts. In August of 1997, the companies officially merged under the Boeing name after the Federal Trade Commission ruled that it would not "substantially lessen competition or tend to create a monopoly in either defence or commercial aircraft markets." This $14 billion transaction combined McDonnell Douglas's robust defence and space expertise with Boeing's commercial aviation market domination, resulting in a more diversified and competitive aerospace giant.

Following this merger came heavy turbulence. Many key leadership positions at Boeing were filled by former McDonnell Douglas executives who brought their management style and priorities. Namely, the CEO of McDonnell Douglas, Harry Stonecipher, was to serve as chief operating officer of the new merged entity. Beginning his career at General Motors, Stonecipher admired then-CEO Jack Welch's "relentless focus on shareholders and stock buybacks at the expense of long-term innovation and worker well-being." This mindset would take over Boeing's corporate culture and identity. The new managers from McDonnell Douglas, led by Stoneceipher, drove the message that cash flow and profitability had to become Boeing's top goal. The Jack Welch protege and the business titans he brought along with him embraced the idea that any company has a single social responsibility: to increase its profits. This implementation of a "cultural revolution" at the company sought to belittle engineering expertise, undermine union employees, and empower middle managers to cut costs ruthlessly. The merger was described as "hunter-killer assassins" meeting "Boy Scouts." McDonnell Douglas had prevailed in this acquisition, hollowing out an iconic company that once stood as a model for innovation *and* profit.

At this time, McDonnell Douglas's cost-consciousness mindset, seemingly uncalled-for, was not unfounded. In fact, Boeing's traditional way of putting profits second was becoming increasingly out of touch with the industry's economics. Only a little less than two decades before this merger, the U.S. federal government controlled fares, routes, and the market entry of new airlines. Heavy regulation by the federal government had enabled airlines to prosper in their early beginnings, but it also kept fares high for consumers. Later, deregulation under US

presidents Jimmy Carter and Ronald Reagan paved the way for more industry competition. With the passing of the bi-partisan supported Airline Deregulation Act of 1978, airlines could fly where they wanted and charge what the market would bear. With control over ticket prices now, an airline might choose to lower its fares to attract price-sensitive flyers. Consequently, airlines realized they must cut costs to avoid passing on the cost to ticket prices, which is unattractive to consumers. To cut costs, airlines, as expected, looked harshly at aircraft sale prices. Hence, the days of the old Boeing breaking budgets to produce a plane of marvellous engineering would have to end, one way or another, if the company wanted to stay afloat financially.

Boeing headquarters in Chicago. The company moved its top executives there from Seattle in 2001.

Then Boeing CEO Phil Condit also decided to relocate Boeing's headquarters from Seattle to Chicago, Illinois, which was a powerful statement from the corporation. This move, most likely an attempt to shape shareholder perception, signalled Boeing's desire to be seen as more than an engineering firm. In a company statement, Boeing stated that its headquarters would be "a new, leaner corporate center focused on shareholder value." The Boeing World Headquarters opened in 2001, 36 stories above the Chicago River. The new location had been especially disorienting for Boeing engineers. With management now in Chicago, far away from the disempowered engineering and production teams, the decision to emphasize financial

operations and shareholder interests over day-to-day engineering and manufacturing became crystal clear.

Boeing CEO Condit has resigned after the aviation giant became involved in several scandals. His successor on Monday was the 67-year-old former Boeing President Stonecipher.

Six years after the merger, McDonnell Douglas' Harry Stonecipher was elected the company's Chief Executive Officer by the company's Board, replacing Condit after a defence procurement scandal. Stonecipher even said, "When people say I changed the culture of Boeing, that was the intent, so it's run like a business rather than a great engineering firm, [...]. It is a great engineering firm, but people invest in a company because they want to make money."

> "There were many decades when Boeign did extraordinary things by focusing on excellence and safety and ingenuity. Those three virtues were seen as the key to profit. It could work, and beautifully. And then they were taken over by a group that decided Wall Street was the end-all, be-all."
>
> – Rory Kennedy, American documentary filmmaker, *Downfall: The Case Against Boeing*

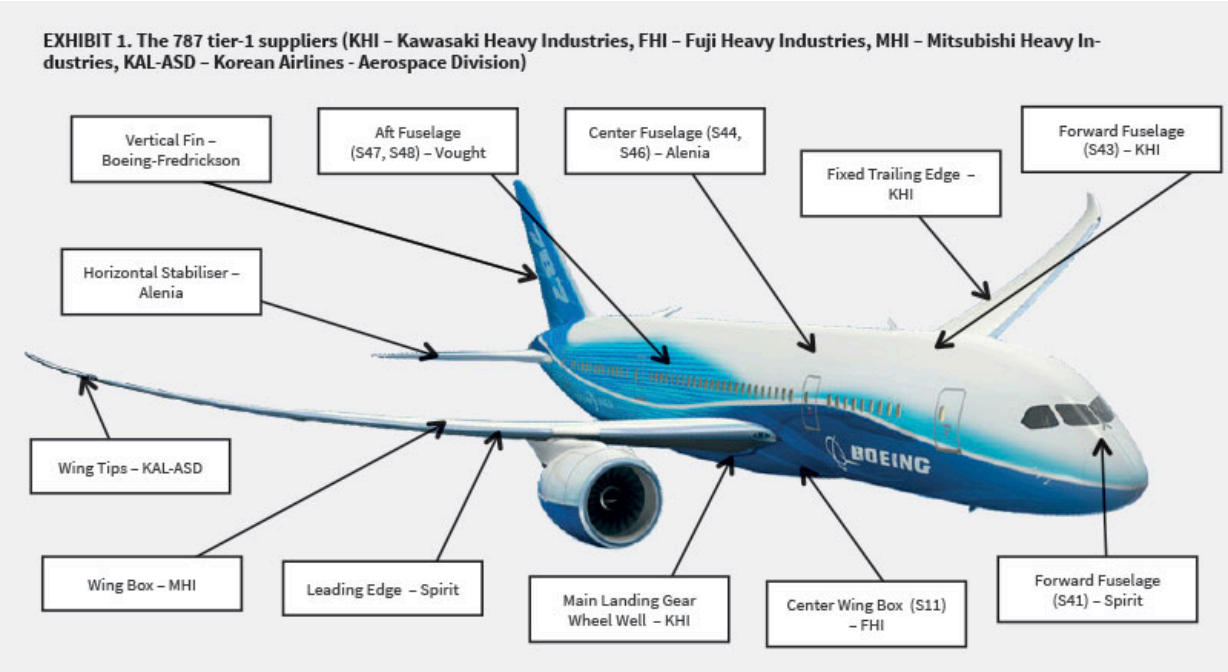
A Boeing post-merger

After the 1997 merger, Boeing was reorganized into three primary divisions: Boeing Commercial Airplanes, Boeing Defense, Space & Security, and Boeing Global Services. Until the 737 MAX crisis, the company's sales were robust, with its annual revenues consistently exceeding $90 billion. In 2018, the company delivered a record revenue of $101.21 billion. With operating profits at $10.7 billion that year, Wall Street investors were pleased by the healthy margins. It was equally the world's largest plane manufacturer, recording the delivery of 806 airplanes in 2018, also making it the largest exporter of the United States. The airline industry functions in a way in which aircraft orders are received from customers long before they can be delivered. In fact, Boeing only delivered about 60-70 planes per month. Thus, every aircraft manufacturer has a backlog, representing all aircraft ordered by customers that have not been delivered yet. At the end of 2018, Boeing had an astonishing backlog valued at over $490 billion, with thousands of unfulfilled orders for commercial aircraft, particularly the 737 MAX and 787 Dreamliner. Additionally, its 27th rank on the Fortune 500 list that year clearly reflects its dominance as a leader in aerospace manufacturing.

Outsourcing

To cut costs in aircraft manufacturing, Boeing began to adopt an outsourcing model as part of its business strategy, which also had the benefit of speeding up production. Hence, they could deliver more planes more quickly. Instead of sourcing parts from various suppliers and developing and manufacturing the aircraft in-house, which is what Boeing used to do, it would now assign the production of large sections of its aircraft to external suppliers or strategic partners. These global suppliers would be responsible for manufacturing entire subassemblies of the plane, such as an aircraft's fuselage, wings, and tails. When these components were finished, they were to be shipped to Boeing's assembly lines, where they got put together into the final aircraft. With this model of outsourcing also came more lenient oversight from Boeing itself. Instead of managing every manufacturing detail, Boeing would simply oversee the design and integration of the aircraft parts into the final airplanes. They would give suppliers an overall blueprint to follow, and then the specific parts of the design and manufacturing would be left to them.

Case study: Production of the Boeing 787 Dreamliner



The 787 tier-1 suppliers (KH1 - Kawasaki Heavy Industries, FHI - Fuji Heavy Industries, MHI-Mitsubishi Heavy Industries, KAL-ASD - Korean Airlines - Aerospace Division)

Boeing's outsourcing strategy manifested most prominently in its production of the 787 Dreamliner. It is the first airliner with an airframe primarily made of composite materials and makes greater use of electrical systems. Due to this, this twinjet had significant leaps in fuel burn reduction, enormously appealing to airlines who were looking to cut operating costs. However, the production failures of this aircraft also revealed some key drawbacks to this outsourcing model. Since Boeing's supply chain was now more complex, with over 50 suppliers responsible for manufacturing different aircraft parts, managing this global network proved challenging, particularly when suppliers failed to meet Boeing's required quality and safety standards. The delivery of the first B787 was delayed by nearly 3 years, causing airlines to push back their own plans to incorporate this aircraft into their fleets and routes. These grave delays led to substantial cost overruns. Boeing had to negotiate with its customers to extend delivery timelines and offer compensation for the delays. It was reported that by 2013, the program had cost Boeing an additional $30 billion in overruns and adjustments. These delays have continued even today, with the plane still in production.

Despite the challenges like the initial production delays, the Dreamliner became one of Boeing's best-selling aircraft, with thousands of orders placed by airlines globally. It also showcased Boeing's ability to integrate new technologies and materials, cementing its reputation as a leader in aerospace innovation. Thus, Boeing's strategy refused to quit outsourcing, also believing in the cost-benefit it provided on the manufacturing side. Boeing thought the production of the 787 Dreamliner revealed no flaws with the business model but rather with its execution. Eventually, outsourcing would find its way into the production of the B737 MAX.

The Creation of the Boeing 737 MAX

Airbus

To understand Boeing's reasoning for building the 737 MAX, we must first examine its competitor, Airbus. Airbus SE is a European aerospace corporation based in France and the Netherlands that, like Boeing, designs and manufactures commercial aircraft with a separate defence and space division. Emerging as a response to the American dominance in the aerospace industry, several European aerospace firms combined to form Airbus. Founded in 1970, this consortium of European companies is a newer company than its American rival. Airbus's commercial aircraft division generated 74% of the total revenue for the Airbus group in 2018, contributing to the 63.7 billion euros revenue the company recorded that year. With around 7500 unfulfilled orders that very year, the value of Airbus's backlog was nearly 411 billion euros. In the large airplane manufacturing industry, Boeing and Airbus form a rigid duopoly, holding almost 99% of the market share. In 2018, Boeing had slightly less than 60% of the industry's market share, with Airbus holding marginally less than 40%.

The A320neo

On December 1st, 2010, Airbus shook up the market by announcing an updated version of its most popular aircraft family. The A320 line is Airbus's series of narrow-body, meaning single-aisle, airliners, competing directly with Boeing's 737 line. Usually seating 150 passengers and created for short-haul routes, anyone who's flown before has probably been on one of the

two aircraft. Competing in the same market of narrow-body airplanes, the A320 and B737 are at the center of the biggest rivalry within the aviation industry.

The original A320 was launched in 1984, 19 years after the initial launch of its Boeing counterpart. It became known for its technological advances compared to the B737, such as its digital fly-by-wire and side-stick flight controls. The A320 also introduced a glass cockpit with large digital displays. Its cabin is also slightly wider than the 737, improving passenger comfort. These features were more modern and intuitive than the now more dated ones of the 737. Importantly, Airbus designed the A320 family with a high degree of cockpit commonality for the airlines, meaning pilots could easily and quickly transition between different variants of the A320 family models and even some of its other aircraft models. Pilots could even transition to Airbus's other families of jets, such as the widebody A330, with minimal designs. With no need for additional simulator pilot training to switch from one model to the next, this meant significant savings for airlines.

A320neo making its maiden flight on Sept. 25, 2014, over southern France. Airbus

Airbus kept this value in mind when launching the next generation of the A320. It would be called the A320 NEO family, standing for New Engine Option. Airbus promised that no significant additional pilot training would be required for pilots already certified in the A320 to switch to the A320neo. With this new aircraft model, Airbus offered a whopping 15% better fuel

economy than its previous models. Given that fuel and labour are the most significant airline costs, combined with the state of rising fuel costs, these selling points of the NEO swiftly garnered the attention of airlines worldwide.

Numerous variants of the A320neo would be offered to airlines: the A319neo, A320neo, A321neo, and A321 XLR. With passenger seating capacities ranging from 120 to 244, these variants were designed to suit airlines' various needs and demands. Notably, the A321 XLR (Xtra Long Range) would open distant connections, otherwise unavailable to older narrow-body airplanes with less range. It could connect destinations such as New York to Rome and London to Vancouver. With this particular variant having a whopping 30% less fuel burn per seat, the opportunity for using this aircraft on point-to-point operations, meaning longer distances with lesser demand, opened up. In other words, airlines would no longer need to deploy a widebody aircraft, which often lost airlines money due to the more significant amount of fuel required to fly these larger jets and the chance of the route not selling enough to fill up the plane.

Boeing's Response

Following this news, Boeing needed to react quickly to prevent Airbus from stealing excessive market share. Boeing was faced with a dilemma. They could choose to design another aircraft type, which would take years. Meanwhile, Airbus would be garnering orders for their newly updated jet. The other option for Boeing was to update *their* single-aisle plane, which competes directly with the A320, the best-selling 737. Around a year after Airbus's announcement, in August of 2011, Boeing CEO Jim McNerney made an announcement. Following the Board's approval, Boeing had picked the ladder option. This new product would be named the Boeing 737 MAX series, with Boeing promising they would meet or exceed the range of the Airbus A320neo.

The decision to redesign the aircraft with a then 44-year-old airframe came as a shock to some but was justifiably rooted in short-term economic thinking. Like Airbus, Boeing promised this aircraft variant was so similar to its predecessor that the new version 737 would not require costly pilot simulator training like simulator training. Pilots who were already certified in the previous generations of the 737 only had to take a two-hour iPad lesson about the plane to be

able to fly it. The aircraft also quickly gained airworthiness approval from the Federal Aviation Administration, which handles commercial aircraft certification based on preceding models of the 737, without a new design approval, significantly speeding up the process of getting the plane certified to fly. Like the A320neo family, the MAX's near indistinguishable value proposition rapidly attracted airlines's orders.

Left: Boeing 737 Classic cockpit.

Right: Instruments and controls sit in the cockpit of a Boeing 737 Max jetliner.

On the manufacturing side, for Boeing, updating an older preexisting plane reduced Boeing's development time and cost. Essentially, it would only have to slightly alter this variant's design to fit its new engines and the plane, at large, would maintain its ancient airframe design. The estimated cost to re-engine the aircraft with the new CFM International LEAP engines, the largest engines ever to fit on a 737, would cost only $2-3 billion. In contrast, producing a new plane would cost upwards of $10 billion. With this change, fuel consumption was also reduced by 14% compared to that of the 737 NG, the previous generation of the 737. Other aerodynamic changes were also adopted to various aircraft parts in this new generation, including distinctive split-tip winglets and a revised tail cone, which aided in minor fuel efficiency improvements. This MAX series was offered in four variants, ranging from 138 to 204 seats named the 737 MAX 7, MAX 8, MAX 9, and MAX 10. Currently, the 737 MAX 7 and MAX 10 variants are still in process for certification, with the FAA declining to put any timetable on approval. Specifically, the MAX 10 competes directly with the A321neo, having similar passenger seating capacities and range. Prolonged delays in certification could disrupt

airlines' fleet planning, potentially pushing them to consider alternative aircraft to meet operational and market demands, which would profoundly impact Boeing's sales.

Left: Placement of the engines on the Boeing 737 classic
Right: LEAP-1B Powering the Boeing 737 MAX

The engineers at Boeing concluded that the nose gear would also have to be raised to accommodate this new engine. In the original 737's conception, the airframe was designed to be much lower to the ground to facilitate the loading of luggage and cargo by ground workers. Its then cigar-shaped, narrow, and long engines did not cause any issues. However, these more significant engines could not fit under the wing due to the limited ground clearance. In fact, Airbus overcame this issue as their A320 was always, by design, higher off the ground than the B737. In addition to raising the nose gear, Boeing had to reposition the engines, mounting them further forward and slightly higher than the wing's top surface instead of entirely underneath the wing. These characteristics resulted in slight changes to the aerodynamic characteristics during flight. On takeoff, in rare cases, the nose of the aircraft had a tendency to lift higher due to the new position of these engines. This was an issue, as this new generation of 737 was supposed to behave exactly like the older ones, which was why significant pilot training would be required in the first place.

Boeing tried to resolve this engineering problem by installing a software-based automatic flight control called MCAS, which is short for Maneuvering Characteristics Augmentation System, to counteract undesirable aerodynamic changes. Little was known about this system to those outside of Boeing, yet that was the company's very goal. With most of the evaluations

delegated to Boeing itself by the Federal Aviation Administration, Boeing played down this new system. It was widely reported that Boeing pushed to expedite approval of the 737 MAX to compete with the Airbus A320neo, given that the plane had hit the market nine months ahead of the MAX. In fact, the FAA had approved Boeing's request to remove references to MCAS from the flight manual. Its very existence was not known to most pilots, with no mention of the system in the flight control manual in each 737 MAX aircraft. This would later come back to haunt Boeing.

In August 2015, the first 737 MAX fuselage completed assembly at Spirit Aerosystems, one of the manufacturers outsourced by Boeing. It took its first test flight in January the following year and gained FAA certification in March 2017. The plane became the fastest-selling plane in the company's history, exceeding the A320neo's orders with 5049 orders placed by the end of 2018. At that same time, Boeing's stock price hit an astonishing $320 a share.

The Crashes

Lion Air Flight 610

On October 29, at 6:20 AM local time, Lion Air Flight 610 departed Soekarno-Hatta International Airport in Jakarta for Pangkal Pinang, the capital and largest city of the Bangka Belitung Islands in Indonesia. This short domestic flight was scheduled to arrive just an hour later, at 7:20 AM. The Boeing 737 MAX 8 operating this flight, powered by two of the new CFM International LEAP engines, was delivered brand new to Lion Air less than 3 months ago. The flight's cockpit crew included Captain Bhavye Suneja, who had more than 6000 hours of flight experience and had flown with the airline for over 7 years. The second in command, First Officer Harvino, had more than 5000 hours of flight experience. 13 minutes after takeoff, communication between Air Traffic Control (ATC) and Flight 610 was suddenly lost. Workers on an oil platform near the crash site recalled seeing the aircraft crash with a steep nose-down angle. Reports that Flight 610 had crashed a few kilometres from that same offshore oil platform into the Java Sea began emerging, prompting three ships and a helicopter to be deployed to the area.

The flight path of Lion Air Flight 610 that crashed into Java Sea

Not only was this crash unexpected to the general public, but it also shook the aviation industry at its core. Due to stringent safety protocols and state-of-the-art technology, airplane crashes are uncommon, with fatal incidents happening in roughly 1 in 16 million flights. Additionally, the highly esteemed Boeing Company has constructed this new aircraft model, which undoubtedly incorporates advanced technology and has undergone rigorous safety evaluations. The notion that Boeing could engineer an unsafe aircraft was nearly unimaginable.

During the crash's immediate aftermath, Indonesia's National Search and Rescue Agency launched an operation with assistance from various military branches. It was to last seven days but was later extended by three days. On that same day of the crash, the director of operations for this agency delivered the tragic news that all on board were presumed dead and that the first human remains had been recovered. Later, investigators concluded the victim identification process with 125 out of the 189 people on board identified. Another 64 bodies were unaccounted for. This was the deadliest air accident involving all generations and variants of the 737 family in history.

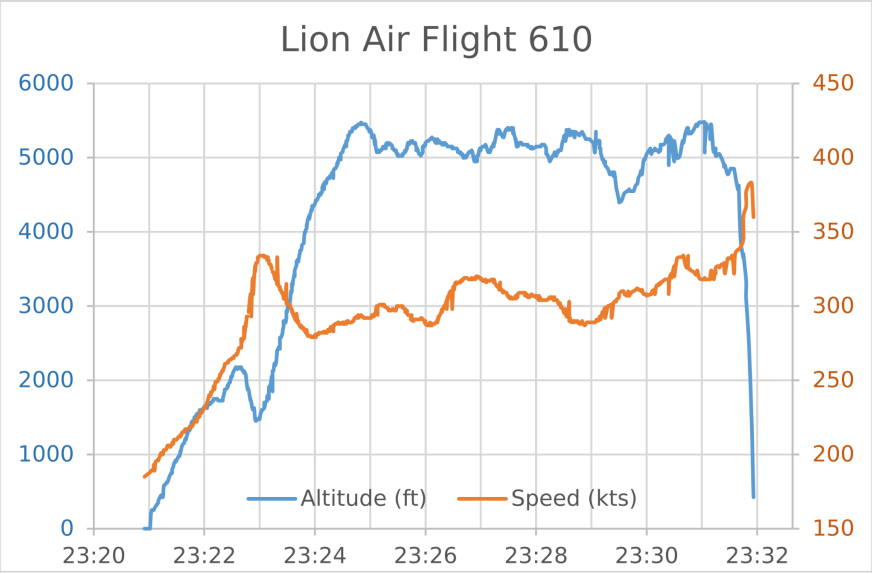
On the same day of the crash, Indonesia's Transportation Ministry ordered all of its airlines to conduct emergency inspections on their 737 MAX 8 aircraft. Yet the ministry soon deemed the aircraft still airworthy, and on October 31, all Indonesian 737 MAX 8s were allowed to resume normal operations. The subsequent investigation of the crash was to be led by the National Transportation Safety Committee (NTSC) of Indonesia. Personnel from the US Federal Aviation Administration (FAA) and engine manufacturer GE Aviation were also sent to Indonesia. Multiple potential causes of the crash were quickly ruled out. For example, the Indonesian Meteorology, Climatology, and Geophysical Agency reported that the weather was evident during the crash and that visibility was good, thus concluding it was unlikely that the weather had caused the plane to dive.

Following a decision made by the NTSC, this search-and-rescue operation would now focus on finding the aircraft's fuselage and flight recorders. On November 1, searchers successfully recovered the flight's flight data recorder, an electronic recording device placed in an aircraft to facilitate the investigation of aviation accidents. Its memory unit was separated from its housing, evidence of the extraordinary impact of the crash. This device reveals critical information about the aircraft's final moments, with investigators able to recover data from the aircraft's 19 most recent flights. It wasn't until only two months after the crash that the cockpit voice recorder was found at a depth of 30 meters below the water surface covered by mud that was 8 meters thick.

Maneuvering Characteristics Augmentation System (MCAS)

The US National Transportation Safety Board (NTSB) brought a Boeing engineering team to assist Indonesia's National Transportation Safety Committee (NTSC) with the investigation. When a Boeing technician examined the flight data recorder and was questioned about the repeated automatic nose-down inputs, MCAS was brought up as the possible cause. The NTSC investigators, shocked, were hearing about this obscure automated system for the first time. As detailed in the preliminary report released by the NTSC on November 28, the Maneuvering Characteristics Augmentation System (MCAS) was a software fix on the 737 MAX designed to push the plane's nose down automatically, should the angle of attack (AoA) sensor on the aircraft detected an unusually high angle of attack during periods where the jet

would be in full thrust, such as during the takeoff, something that could become unsafe and lead to a stall. The two AoA sensors on the plane, located on each side of the plane's nose, are small blades that move with the wind outside the plane. They measure the angle between the aircraft's nose and the oncoming airflow, which helps determine if the plane is flying at a too steep angle. Shockingly, it was revealed that MCAS relies on data from only one of the two AoA sensors located on both sides of the plane to trigger activation. This reliance on a single sensor is seemingly a fundamental engineering flaw since it creates a single point of failure. If the singular sensor provides faulty data, the system can activate erroneously and jeopardize the safety of the entire aircraft.



Altitude and speed of Lion Air Flight 610

In the case of Flight 610, the AoA sensor on the Captain's side was sending erroneous data, which caused MCAS to activate repeatedly and uncontrollably. It turned out that the new AoA sensor on this plane was miscalibrated due to an improper replacement just days before, which subsequently commanded nose-down trim. With no training on the function or disablement of MCAS, or even a single mention whatsoever in the flight manual, the pilots on Flight 610, clueless, were ultimately overwhelmed by MCAS's inputs, despite their repeated tries at manually lifting the nose of the plane back up.

Following the public's revelation of MCAS's existence, Boeing guided airlines operating the 737 MAX by advising crews on the steps needed to disable it. Boeing advised pilots to deactivate a separate system in the plane, the stabilizer trim system, to disable MCAS. In the case of Flight 610, the pilots did not achieve this. In reality, Boeing purposely omitted it from pilot training materials with the all-important goal of shortening the certification time.

The NTSC's final report is expected to provide a comprehensive incident analysis detailing the timeline, technical findings, root causes, contributing factors, and safety recommendations to prevent future accidents. However, a second crash, this time in Ethiopia, occurred before this report could be released.

Ethiopian Airlines Flight 302

The date is March 10, 2019, 4 months after the crash of Lion Air Flight 610. Ethiopian Airlines Flight 302, an international passenger flight from Addis Ababa, Ethiopia, to Nairobi, Kenya, departed from Addis Ababa Bole International Airport at 8:38 AM local time. Like Lion Air 610, this flight was operated by a Boeing 737 MAX 8, registered as ET-AVJ. Powered by the same CFM International LEAP engines, this flight was known as the "UN Shuttle" because of the popularity of UN officials travelling on board, as the route connected the African Union headquarters and UN regional offices in Addis Ababa and Nairobi. Captain Yared Getachew was in command of Flight 302. He had been with the airline for almost nine years and logged over 8,000 flight hours. At 29 years old, he was the youngest captain at Ethiopian Airlines during the accident. First Officer Ahmednur Mohammed was an extremely new pilot, having only logged 361 flight hours.

Merely one minute into the flight, the crew reported a flight control problem. Two minutes later, MCAS was activated, like Lion Air Flight 610, forcing the plane to plunge toward the earth below. The pilots, managing to regain control briefly, were faced with the reactivation of MCAS a moment later, dropping the nose even further down. The crew requested permission from Air Traffic Control to return to the airport. After a constant battle between the Captain and the MCAS, the jet was plunging toward the ground despite the crew's consistent attempts to raise the nose. The aircraft crashed into a field in Bishoftu, Ethiopia, just 6 minutes after takeoff, at

almost 8:44. Impacting the ground at nearly 1100 kilometres an hour, all 157 passengers and crew on board died, making it the most deadly accident on Ethiopian Airlines. The impact created a crater of about 28 meters wide and 40 meters long, with the wreckage driven up to 10 meters deep into the soil.

The whole story of the crash of Ethiopian Airlines Flight 302 has yet to surface. Yet, a scandal is already brewing. The 737 MAX has now been involved in two fatal crashes within a span of five months. One day after the crash, the government of China and Indonesia issued a grounding of the MAX jets, and mounting pressure was placed on the Boeing Company to demonstrate accountability. These crashes have already lost Boeing an immense amount of credibility and have severely damaged their reputation for engineering excellence and safety. Hence, without a doubt, more groundings are expected to come flooding, and so are lawsuits.

Forensics investigators and recovery teams at the crash site of Ethiopian Airlines Flight ET 302 on 12 March 2019 in Bishoftu, Ethiopia.

Topic A - Internal Reforms: Restoring Engineering Integrity and Corporate Accountability

In the aftermath of the 737 MAX crisis, Boeing is under intense scrutiny for the engineering flaws and safety lapses that led to two fatal crashes. Before all else, the Board of Directors must take immediate and comprehensive action to overhaul Boeing's internal practices, ensuring that failures in engineering and management are resolved so that the company can restore its reputation for safety and engineering excellence.

The company is grappling with questions about the system's initial design, how it was certified, and the lack of sufficient pilot training regarding its functionality. These design flaws have caused significant damage to Boeing's credibility as a manufacturer of safe aircraft. Next, Boeing's role in certifying the 737 MAX, particularly the FAA's delegation of responsibilities to itself, has been heavily scrutinized. Questions will be asked about Boeing's internal systems' effectiveness in identifying and addressing potential safety risks before they escalate. In addition, Boeing should anticipate criticism for its corporate governance, particularly regarding the decision-making processes that led to the 737 MAX's design flaws. A revision in the company's culture seems to be necessary now more than ever. Finally, the crashes have also shaken employee confidence within Boeing. Engineers and staff are concerned about the company's commitment to safety and transparency and the potential reputational damage resulting from the scandal. Whistleblowers within Boeing could further exacerbate the crisis by revealing internal issues, potentially leading to more scrutiny from regulators, damaging public trust, and intensifying legal and financial consequences for the company.

Guiding Questions

1. How should Boeing address the engineering flaws in the 737 MAX, particularly the MCAS system, and what steps should the company take to prevent such design failures in the future?
2. To what extent should Boeing revise its self-certification process, and what role should independent regulatory bodies play in ensuring future aircraft meet safety standards?

3. How can the Board demonstrate accountability for the decisions made during the 737 MAX development, and what actions should be taken to restore confidence in Boeing's leadership?
4. What structural changes should Boeing make to improve its internal safety culture, ensuring that engineers and employees feel empowered to report safety concerns without fear of retaliation?
5. How can Boeing address employee concerns about job security and ethics, and what measures can the Board take to maintain staff morale and loyalty during this turbulent time?

Topic B - External Relations: Rebuilding Public, Regulatory, and Customer Trust

With the MAX's safety thrown into question by these crashes, regulators are furiously awaiting Boeing's justifications for these crashes, and Boeing has begun to lose the credibility it once held onto so tightly. Besides the apparent engineering faults that need to be resolved internally within the company, external threats that threaten the company's livelihood also exist. Thus, the Board must devote its efforts to engaging transparently with the aircraft regulators, managing the media fallout to regain credibility, and negotiating effectively with airlines.

Firstly, regulatory bodies such as the FAA and international aviation authorities are expected to investigate Boeing's compliance with safety standards and certification protocols. Secondly, skepticism surrounding the company's commitment to safety and accountability has severely impacted public confidence. At the same time, media coverage and stakeholder concerns have intensified, creating additional reputational risks and directly affecting shareholders' view of the company. Thirdly, major customers of Boeing are contemplating the cancellation or suspension of their orders for MAX aircraft, citing safety concerns and a worry about Boeing's ability to resolve the issues. Cancelled orders and halted deliveries will threaten long-term revenue streams, causing significant financial strain for Boeing.

The company must take immediate steps to address the public's safety concerns. Regaining the trust of passengers, airlines, and regulators is crucial to preventing the company from entirely collapsing. The clock is ticking, and the Board needs to act swiftly.

Guiding Questions

1. How should Boeing engage with regulatory bodies such as the FAA and international authorities to rebuild trust, and what transparency measures can be implemented to demonstrate compliance with safety standards moving forward?
2. What actions should Boeing take to manage the media narrative surrounding the crashes and restore the flying public's confidence in the safety and reliability of its aircraft?
3. With major airlines contemplating cancelling or suspending orders for the 737 MAX, how should Boeing approach negotiations with its customers to reassure them about the MAX's safety and reliability and prevent further sales losses?
4. In the wake of these crises, what steps can the Board take to prevent a further decline in shareholder confidence and mitigate the impact on Boeing's stock price and long-term financial stability?
5. How can Boeing communicate the message that safety is a core value of the company?

Character List and Descriptions

Dennis Muilenburg

As Boeing's CEO and Chairman of the Board, Dennis Muilenburg has decades of experience within the company, having risen through roles in engineering, program management, and business operations. With a background in aerospace engineering and a focus on innovation, Muilenburg is instrumental in driving Boeing's strategy toward expanding its commercial, defence, and space markets. Known for his operational efficiency and cost management, he champions initiatives to streamline production and enhance Boeing's competitiveness in the global aerospace industry. His approach is regarded as emphasizing technological advancement, customer focus, and maintaining Boeing's position as a leader in aviation and aerospace.

Robert A. Bradway

As Chairman and CEO of Amgen, Robert A. Bradway has a reputation for driving innovation and overseeing significant growth in one of the world's leading biotechnology companies. With a background in biology and finance, Bradway is recognized for his ability to navigate highly regulated industries, focusing on research, development, and global market expansion. Under his leadership, Amgen prioritized advancing cutting-edge therapies while maintaining a strong commitment to compliance and ethical standards. Bradway's strategic and financial acumen positioned him as a trusted advisor on corporate governance and long-term planning, focusing on balancing innovation and operational efficiency.

David Calhoun

David Calhoun is a senior executive at The Blackstone Group, the world's largest alternative asset manager. He brings extensive expertise in corporate restructuring and crisis management. With leadership experience at Nielsen and General Electric, he has built a reputation for driving organizational transformation and operational efficiency. Known for his strategic thinking and focus on governance, he brought a pragmatic, results-oriented approach to leadership. Calhoun's knowledge of global supply chains and regulatory compliance is critical as Boeing addresses production challenges and restores stakeholder trust.

Arthur Collins Jr.

Arthur Collins Jr. is a business leader known for his tenure as Chairman and CEO of Medtronic, where he guided the company through significant growth and innovation in the medical technology sector. He has extensive expertise in corporate strategy, risk management, and navigating complex regulatory environments. Collins is recognized for his focus on fostering innovation and sustainable business practices. His leadership style emphasizes accountability, long-term growth, and operational excellence.

Edmund Giambastiani Jr.

Edmund Giambastiani Jr. is a retired U.S. Navy admiral with extensive experience in defence, strategy, and technology development. His career included serving as the seventh Vice Chairman of the Joint Chiefs of Staff, where he advised on military operations, modernization, and national security strategy. Giambastiani is known for his systems integration, risk assessment, and organizational leadership expertise. He strongly focuses on innovation and collaboration, particularly in complex technical and strategic environments. His leadership reflects a commitment to efficiency, precision, and mission-focused outcomes.

Lynn Good

Lynn Good is a prominent business executive known for her role as the President and CEO of Duke Energy, one of the largest electric power companies in the United States. She has extensive experience in financial management, strategic planning, and the energy sector, focusing on transitioning to cleaner energy solutions. Good is recognized for her leadership in guiding companies through periods of significant transformation and regulatory challenges. Her approach emphasizes innovation, sustainability, and long-term value creation for stakeholders.

Nikki Haley

Nikki Haley is a diplomat and political leader known for her tenure as the United States Ambassador to the United Nations from 2017 to 2018. She previously served as the Governor of South Carolina, focusing on economic development and job creation. Haley is recognized for her strong leadership on global issues, including human rights, national security, and international diplomacy. Her experiences reflect a commitment to public service, pragmatic problem-solving,

and fostering economic growth. She is also known for her ability to navigate complex political environments and build bipartisan coalitions.

Lawrence Kellner

Lawrence Kellner is a seasoned business executive with extensive experience in the aviation and hospitality industries. He served as the Chairman and CEO of Continental Airlines, where he focused on operational efficiency, customer service, and strategic growth. Kellner is recognized for his expertise in corporate governance, financial management, and navigating complex regulatory environments. His leadership style emphasizes innovation, long-term planning, and building strong organizational cultures. He has also been involved in various advisory and leadership roles across different industries, reflecting his broad business acumen.

Caroline Kennedy

Caroline Kennedy is an attorney, author, and diplomat widely recognized for her public service and cultural contributions. From 2013 to 2017, she served as the United States Ambassador to Japan, where she strengthened diplomatic ties and promoted U.S.-Japan relations, particularly in trade, defence, and cultural exchange. Kennedy is also known for her work as an advocate for education and the arts and her stewardship of her family's legacy. Her career reflects a commitment to civic engagement, diplomacy, and fostering international collaboration.

Edward Liddy

Edward Liddy is a business executive with extensive experience in finance and corporate leadership. He is best known for serving as Chairman and CEO of Allstate Corporation, where he focused on expanding the company’s market presence and improving operational performance. Liddy also played a critical role during the 2008 financial crisis when he was appointed to lead American International Group (AIG), overseeing its restructuring and stabilization. He is recognized for his expertise in risk management, corporate governance, and navigating challenging business environments. His leadership reflects a focus on accountability, strategic decision-making, and organizational resilience.

John Richardson

John Richardson is a business executive known for his leadership roles in the aerospace and defence industries. He served as the Senior Vice President of Boeing's International Business Development, where he focused on expanding the company's global presence and managing strategic international partnerships. Richardson has extensive experience in government relations, international markets, and defence technologies. His expertise in navigating complex regulatory and geopolitical environments has made him a key figure in Boeing's global strategy. He is recognized for his commitment to fostering international collaboration and driving growth in competitive markets.

Susan Schwab

Susan Schwab is an accomplished economist and public policy expert known for her role as the U.S. Trade Representative from 2006 to 2009. She played a key role in shaping U.S. trade policy, including efforts to expand trade agreements and promote global economic growth. Schwab has extensive experience in international trade, economic development, and public policy, having worked in both the private sector and government. Her leadership reflects a strong commitment to free trade, multilateral diplomacy, and enhancing global competitiveness. She is also a noted academic and thought leader in international economics and trade policy.

Ronald Williams

Ronald Williams is a business executive known for his leadership as the Chairman and CEO of Aetna, a major health insurance company, where he focused on expanding the company's services and improving healthcare access. Under his leadership, Aetna pursued a strategy of innovation, particularly in integrating technology and healthcare services. Williams is recognized for his expertise in healthcare policy, risk management, and organizational transformation. He has also served on various boards, bringing valuable experience in corporate governance and strategic planning. His leadership emphasizes collaboration, long-term growth, and social responsibility in business.

Mike Zafirovski

Mike Zafirovski is a seasoned business executive with extensive experience in technology and telecommunications. He is best known for serving as the President and CEO of Nortel Networks,

where he played a key role in efforts to revitalize the company during its challenging periods. Zafirovski also held leadership positions at other major companies, including General Electric and Motorola. His expertise spans corporate restructuring, operations management, and global business strategy. Zafirovski is recognized for his focus on innovation, driving efficiency, and guiding companies through periods of transformation and competitive challenges.

Greg Smith

Greg Smith is Boeing's chief financial officer (CFO), and he played a key role in the company's financial operations, including budgeting, reporting, and risk management. He was instrumental in overseeing Boeing's financial strategy during periods of growth and industry challenges. Smith is recognized for his expertise in financial management, corporate governance, and operational efficiency. His leadership helped guide Boeing through complex financial landscapes, balancing profitability with long-term strategic goals. He also served in various leadership roles at Boeing, contributing to the company's overall corporate and financial success.

J. Michael Luttig

J. Michael Luttig was a former federal judge and a respected legal expert known for his tenure as a judge on the U.S. Court of Appeals for the Fourth Circuit, serving from 1991 to 2006. After his judicial career, he became a prominent executive at Boeing, serving as the company's General Counsel and Senior Vice President. Luttig was critical in overseeing Boeing's legal affairs and navigating complex regulatory and litigation matters. Known for his legal acumen, he was instrumental in shaping the company's approach to compliance and governance. Luttig is also recognized for his leadership in corporate law and public policy.

Greg Hyslop

Greg Hyslop is an engineering executive known for his leadership at Boeing, where he served as the Chief Engineer and Senior Vice President of Engineering, Test, and Technology. Hyslop played a key role in overseeing the company's engineering operations, including developing innovative technologies and ensuring the safety and reliability of Boeing's products. He has extensive experience in aerospace engineering, product development, and systems integration. Hyslop is recognized for his commitment to advancing technical excellence and driving the

company's technological innovation while ensuring adherence to regulatory standards and safety protocols.

Stephanie Pope

Stephanie Pope is a business executive known for her leadership at Boeing, where she served in various senior roles, including as the President of Boeing Global Services. Pope oversaw the company’s global services business in this capacity, which provides a wide range of support services for Boeing's commercial, defence, and space operations. She has extensive experience in operations, strategy, and organizational leadership, focusing on customer solutions and operational efficiency. Pope is recognized for her work in driving growth, enhancing service offerings, and fostering innovation within Boeing's global services division.

William A. Ampofo II

William A. Ampofo II is a business executive known for his work in the aerospace and defence sectors. Since 2017, he has been Vice President of Business Aviation, General Aviation, and OEM Distribution Services. Throughout this career, he held various leadership positions, including roles in business development and program management, where he contributed to the growth and strategic direction of the companies he worked for. Ampofo's expertise lies in managing complex projects, government relations, and corporate strategy. His career focuses on innovation, operational efficiency, and navigating the challenges of the aerospace and defence industries. Ampofo is recognized for his ability to build strong relationships and drive business success in competitive environments.

Uma Amuluru

Uma Amuluru has a strong corporate governance, intellectual property, and cybersecurity background. Serving as Vice President and Assistant General Counsel at Boeing, she provides legal counsel to senior leaders across various departments. Amuluru’s experience advising on complex matters related to supply chain, environmental issues, and risk management proved invaluable in shaping Boeing's business strategies. Her prior roles in the federal government, including as associate White House counsel, added a unique perspective on compliance and

oversight. Her leadership in legal affairs made her a key contributor to Boeing's corporate governance.

Michael Delaney

Michael Delaney serves as Vice President of Engineering and Vice President of Digital Transformation at Boeing. Formerly, he was also the 787 Chief Project Engineer, the Vice President of Engineering and the Vice President of Airplane Development. In these roles, he oversees Boeing's engineering operations and drives the company's efforts to integrate digital technologies across its various divisions. Delaney was key in advancing Boeing's engineering capabilities, focusing on innovation, safety, and quality. His leadership in digital transformation helped shape the company's approach to data analytics, automation, and technological advancements.

Mike Fleming

Mike Fleming is Senior Vice President and General Manager of Airplane Programs and Customer Support for Boeing Commercial Airplanes. In this capacity, he oversaw the production and delivery of all commercial aircraft, including the 737, 767, 777/777X, and 787 programs. Fleming worked closely with airline customers and Boeing services teams to provide comprehensive 24/7 support to the global fleet. He also led the enterprise Program Management Operations Council, driving functional excellence and best practices across the company. Before this role, Fleming held various leadership positions, including Vice President of Commercial Services for Boeing Global Services and Vice President of Fleet Services for Commercial Airplanes.

Brett C. Gerry

Brett C. Gerry serves as Vice President and General Counsel for Boeing Commercial Airplanes, overseeing the company's legal affairs within the commercial aircraft division. In this role, he provided legal counsel on various issues, including regulatory compliance, intellectual property, and contractual matters. Gerry's extensive experience in both the private sector and government, including positions at the U.S. Department of Justice and the White House, equipped him with a deep understanding of legal and regulatory frameworks. His leadership was instrumental in

navigating complex legal challenges and supporting Boeing's strategic objectives in the commercial aviation sector. Gerry's commitment to legal excellence and corporate governance was crucial in maintaining Boeing's reputation and operational integrity.

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