**INDUSTRIAL/ORGANIZATIONAL PSYCHOLOGY CASE STUDY**
**SPRING 2020**
(Required for all applicants)

The Case Study provides an opportunity for applicants to put Psychology and Science into practice (as expected in the program). It represents a realistic preview of how one might be engaged to drive consultative intervention aimed at improving conditions for employers and employees alike.

This is a business case that asks you to write about the company, Boeing, an aerospace giant, from an I/O Psychology vantage point. In addition, it will allow for the inclusion of personal strengths, key background experiences, and personal perspective. Include personal challenges, priorities, career goals, and achievements that might bear on your candidacy for admissions to the program. Bring your own history, previous studies, business experiences, and interests into focus to address the real-world human capital challenges and opportunities the case presents.

**The Boeing Case:**

**Background**

Boeing is the world's largest aerospace company and a leading manufacturer of commercial jetliners, defense, space and security systems, and service provider of aftermarket support. Boeing is the largest manufacturing exporter in the U.S. It has customers in more than 150 countries. Boeing’s corporate offices are in Chicago, IL. They employ more than 153,000 people across the United States and in more than 65 countries. This is a reduction of 10,000 employees compared to 2015. Their workforce is one of the most diverse – culturally, geographically, and in skillsets. Boeing suppliers include hundreds of thousands more skilled people worldwide.

In 2017, Boeing recorded US$93.3 billion in sales, ranked 24th on the Fortune magazine "Fortune 500" list (2018), ranked 64th on the "Fortune Global 500" list (2018), and ranked 19th on the "World's Most Admired Companies" list (2018). Boeing’s 2018 revenues were US$101 billion in sales. They are a publicly traded company whose stock was valued at $440.62/share as recently as March 2019 and closed at $328/share on August 15, 2019. Boeing’s global market share of the commercial airlines market is 43% compared to their principal rival, Airbus, whose market share is 45%. 
**Commercial Airplanes**

Boeing has manufactured commercial jetliners for decades. Currently Boeing manufactures the 737, 747, 767, 777 and 787 families of airplanes and the Boeing Business Jet range. More than 10,000 Boeing-built commercial jetliners are in service worldwide, which is almost half the world fleet. The company also offers the most complete family of freighters, and about 90 percent of the world’s cargo is carried onboard Boeing planes. New product development efforts include the Boeing 787-10 Dreamliner, the 737 MAX, and the 777X.

**Boeing 737 MAX**

On December 1, 2010, Airbus launched its A320 family of planes whose engines had much improved fuel burn and operating efficiency. The A320 family received 667 orders at the June 2011 Paris Air Show for a total of 1,029 planes ordered since its launch, setting an order record for a new commercial airliner. Boeing had to respond.

For several years Boeing considered the design of a new plane that would follow the successful 787 Dreamliner. On August 30, 2011, Boeing's board of directors approved the launch of a new plane, the 737 MAX, expecting a fuel burn 4% lower than Airbus's A320 family and a range that would match or exceed the A320 family of planes.

On August 13, 2015, the first 737 MAX fuselage completed assembly in Wichita, Kansas. On December 8, 2015, the first 737 MAX was rolled out at the Boeing Renton Factory in the state of Washington and the first flight took place on January 29, 2016, at Renton Municipal Airport.

The 737 MAX gained Federal Aviation Administration (FAA) certification on March 8, 2017 after completing 2,000 test flight hours and 180-minute ETOPS (Extended-range Twin-engine Operational Performance Standards) testing requiring 3,000 simulated flight cycles in April 2017. Following the testing Boeing was reportedly notified of a possible manufacturing quality issue - low pressure turbine (LPT) discs in their LEAP engines. Boeing suspended 737 MAX flights on May 4, and resumed flights on May 12.

During the certification process, the FAA delegated many evaluations to Boeing, allowing the manufacturer to review their own product. It was widely reported that Boeing pushed to expedite approval of the 737 MAX to compete with the Airbus A320. The A320 aircraft hit the market nine months ahead of Boeing’s model.

The first delivery of a 737 MAX was to Malindo/Lion Air on May 16, 2017 and it entered service on May 22. Norwegian Air International was the second airline to put a 737 MAX into service. Southwest Airlines, the launch customer, took delivery of its first 737 MAX on August 29, 2017. Boeing planned to deliver at least 50 to 75 aircraft in 2017, 10–15% of the more than 500 737 MAXs to be delivered in the year. Boeing sought to match the 99.7% dispatch reliability of the 737 Next Generation (NG). After one year of service, 130 737 MAXs had been delivered to 28 customers, logging over 41,000 flights in 118,000 hours and flying over 6.5 million passengers. Flydubai observed 15% more efficiency than the 737NG, greater than the 14% promised, and dependability reached 99.4%.
The Problem with the 737 MAX

By March 2019 the 737 MAX had been involved in two fatal accidents within five months, raising potential safety concerns and prompting airline users and regulators around the world to ground the aircraft.

- In October 2018, Lion Air Flight 610 crashed just minutes after taking off from Jakarta, Indonesia. It was the first fatal accident involving a 737 MAX, 189 people died.

- In March 2019, Ethiopian Airlines Flight 302, involving the same 737 MAX jet model, crashed minutes after takeoff, all 157 people on board died.

In both accidents, attention focused on the 737 MAX's new Maneuvering Characteristics Augmentation System (MCAS). MCAS can automatically lower the aircraft nose when a sensor indicates that a stall may occur. Satellite tracking data showed that after takeoff, both aircraft experienced extreme fluctuations in vertical speed. Pilots in both aircraft radioed they had flight control problems and wanted to return to the airport.

In March 2019, all 737 MAX jets were grounded – a total of 387 planes globally and 72 in the United States. In the US, the grounding impacted 350,000 passenger seats per week.

While conducting newly stringent tests on the Boeing 737 MAX flight control system, the FAA in June uncovered a new flaw that now has spurred Boeing to make a fundamental software-design change. Boeing is changing the MAX’s automated flight-control system’s software so that it will take input from both flight-control computers at once instead of using only one on each flight. Boeing believes the changes can be accomplished in time to win new regulatory approval for the MAX to fly again by October. Significant slipping of that schedule could lead to a temporary halt in production at its Renton plant where 12,000 workers assemble the 737.

Business impact

Boeing has lost sales and revenue. In July, a Saudi airline ordered 30 Airbus planes in a deal that replaced a $6 billion sale it had with Boeing for its 737 MAX jets. Boeing recently reported a massive second-quarter loss of $2.9 billion — its worst ever. Surely, Boeing will be greatly challenged to win back the confidence of its airline customers. That amount doesn’t include potential payouts from the multiple lawsuits that Boeing is facing over the crashes. It is possible that the lawsuits will not be litigated. Perhaps evidence will be discovered that results in Boeing being largely exonerated. Regardless, Boeing is going to give $50 million to crash victim families.
**Failures in design certification and training**

At a hearing before a US Congressional committee, one expert pilot stated that the MCAS on the 737 MAX "was fatally flawed and should never have been approved." He further stated that, "These crashes are demonstrable evidence that our current system of aircraft design and certification failed us." The president of the pilots’ union criticized Boeing for making "many mistakes" to reduce costs and speed development. Speaking of the MCAS, the union president stated that, "A huge error of omission was the fact that Boeing failed to disclose the existence of the MCAS system to the pilot community around the world; the final fatal mistake was the absence of robust pilot training in the event of an MCAS failure."

Experts called for more robust pilot training as part of the plan for allowing 737 MAX jets to fly passengers again, including experiencing an MCAS system failure while training on a simulator. Boeing has suggested such training could be accomplished with a one-hour session on a laptop or tablet device. Simulator training was not required for pilots transitioning from the previous 737 NG to the 737 MAX. Experts say that is not enough. They insist that all pilots should experience these challenging situations for the first time in a simulator, not in flight with passengers and crew on board. Reading about it on an iPad is insufficient. Pilots must experience it physically, firsthand, using a 737 MAX simulator. But there are few 737 MAX simulators in existence and providing such training for thousands of pilots around the world would be costly and logistically problematic. Additionally, the airlines purchasing the 737 Max were not seeking more pilot training, in fact, they were pushing back. It has been reported that the pilots, in many cases, didn’t read the operations manuals that were provided by Boeing.

**Boeing Leadership**

Boeing’s Board of Directors, including CEO Dennis Muilenburg, met to discuss the status of the 737 MAX after the first 737 MAX crash. The crash information they reviewed and their discussions led them to conclude that the accident was an “anomaly”, so they did not ground the 737 MAX. In fact, none of the government bodies privy to the details of the Lion Air investigation called for a grounding of the 737 MAX before the second crash. No doubt they were influenced by the excellent safety record for the 737 fleet. Across all models of Boeing 737 planes, a fatal crash happens 0.23 times in every million flights, according to data compiled by AirSafe.com.

Boeing said it told the FAA that their engineers had identified an MCAS issue in 2017, following their own internal review process. The Boeing engineers judged that the issue would not impact safety or operations. In December 2017, a Boeing safety review board convened and re-affirmed that the MCAS issue didn’t present a safety issue. They decided that the MCAS system issue was acceptable until the next planned software update.

Boeing knew months before the first deadly 737 MAX crash that MCAS wasn’t working properly. However, Boeing didn’t share its findings with their 737 MAX customers nor update operations manuals about proper handling of the MCAS issue. Boeing said its senior leadership wasn’t involved in the MCAS review. Senior leaders only became aware of the issue after the Lion Air accident.

In the days following the second crash, the Boeing Board of Directors acted quickly to ground the 737 MAX fleet of 300 jets. The reputations of Boeing’s board members are at stake. An investor advisory group recently recommended that shareholders vote to remove one director because the audit committee he oversees “should have taken a more proactive role in identifying the risks associated with
the 737 MAX aircraft.” The Board of Directors is currently reviewing its process for making decisions about grounding airplanes. No one was fired but some leaders have been redeployed and the head of the 737 MAX program recently retired.

Some have criticized Boeing leadership believing that their actions do not represent sufficient leadership accountability. Some have suggested that the CEO Muilenburg step down. Some critics claim that the relationship between the FAA and Boeing leadership is too collegial.

**Employee Morale**

Boeing employees face challenging days ahead. While there is, understandably, a crisis of trust and confidence among airline pilots and passengers there is also a crisis of trust and confidence among Boeing employees. Some employees have turned whistleblower and called the FAA with reports of design flaws and damage to MCAS components. Design engineers and quality assurance engineers are on the defensive and anxious to avoid blame. Some blame others for the tragic failures. There’s a growing tendency among employees whose work hours and jobs are at risk to find a scapegoat inside Boeing.

The news outlets clamor for interviews with workers at the Renton plant where the 737 MAX is manufactured. The plant employs 12,000 workers and produces 52 737 MAXs per month. As of January 2019 the backlog of orders was 4,667 which represents a log of job security. Concern for lost sales, potential job loss, and the sadness of the disasters weigh heavily on these shift workers. Said one employee, “Everybody feels it, it’s like being under a dark cloud in there.” He declined to give his name, in part because Boeing forbids workers from talking to the media.

**Case Study Guidelines:**

Write a 1,500 word case study describing how you might advise and help Boeing. The interpersonal issues and customer challenges must be addressed on multiple levels including operational, technology, employee engagement, leadership, morale and commitment – and put into the larger context of a slow growth global economy, Airbus competition, added government imposition with trade barriers, tariffs, and price pressure.

Specifically, what are the major areas of concern you have about the current situation at Boeing in terms of the challenges in the current business context? What data might be gathered and analyzed to understand airline passengers, airline customers, and pilots concerns and potential solutions? What might be done to address staff concerns? In what ways might the issues parallel those for other competitors under scrutiny vs. spring uniquely from this specific situation, leadership, and staff at Boeing?

In what ways might leadership positioning and the relationships with employees improve? What benefits might be gained by a consultative intervention at Boeing? What risks or downsides need to be avoided?

What tradeoffs need to be evaluated? How might individual staff, work teams, and the overall organization be involved to understand what to do now? How could successful change be measured? What might indicate that the intervention had addressed the most important problems needing to be
addressed? What might a realistic practical business solution involve?

From a personal and professional development perspective, what components from previous training, education, and work experience would help you to investigate, inform and improve the situation for Boeing? Why might you be the best candidate to address these issues? Which of your personal strengths, skills and special abilities might be utilized enhance the likelihood that the firm you work for will be selected by Boeing to engage in this assignment? How might taking on this assignment through the NYU I/O Psychology program address your professional development and career aspirations?

Your case study must be unique and an original work of your own creation. The document submitted must not exceed 1,500 words, not including references. The essay should be solely of your own writing and ideas. Content beyond 1,500 words will not be considered. As science, parsimony is key. You may cite research, or other ideas by including explicit references for any external resources paraphrased or copied from other sources.

Evidence that this case study has quoted material or ideas lifted without proper reference or written by third parties will result in application rejection. This assignment is designed to engage and reflect your understanding of models of psychology, business, science, analytical methods, and your professional development goals in the service of applied problem solving. Therefore, minimize restating the problem and information given in the prompt and focus on value-added ideas: prioritizing, ordering and answering questions, providing solutions.

In addition, create a short video (no more than 5 minutes in length) of yourself addressing two topics:

- An executive summary of your approach to the case study. The key topics and resolution suggested should be presented as if to an organization in a business format and context.
- Explain your career goals and interests as they relate to the approach presented in the case study.

You will find detailed instructions for uploading your written case study and the URL link to your video in the online application. (When you are logged in to the online application, click “Psychology” in the list of links on the left, then scroll down the page to “Industrial/Organizational Applicants Only”.)
**Business Case References:**

Head of Boeing's 737 MAX Program Retires. Wall Street Journal

The First Major Airline Just Dropped Boeing's 737 Max for a Rival Airplane. Time Magazine.

Boeing reports $2.9 billion quarterly loss — its worst ever — after taking 737 Max charge. CNBC.

Boeing to change 737 Max flight-control software to address flaw. CNBC.

Did the FAA’s deference to Boeing compromise safety of 737 MAX? Public Broadcasting Station (PBS).

*You may also want to consider other reference books, magazines, journal articles, or business sources to inform your thinking about I/O Psychology and the particular issues involved within the Boeing case.*