Christian Santander
B.J. Johnson
CMSI 401
October 2, 2019

The Lessons of ValueJet 592

The ValueJet 592 flight crashed in May 1996 which finished at Everglades Holiday Park. Everyone died from the impact; two pilots, three flight attendants, and 105 passengers. It is amusing to think that even–by convention–the safest transportation medium can lead to big tragedies. There are many questions regarding the security measures and the prevention mechanisms for cases like this, but in order to dive deeper into them it's important to point out the kinds of airplane accidents first and then to analyze the exact reasons why the accident happened along with those solutions that can be applied with the use of Systems Engineering.

There are mainly three types of airplane accidents. The most common one is called "procedural". These types of mistakes come from simple obvious errors that could be easily avoided and understood in simple terms. To avoid procedural accidents, the pilot must avoid flying into violent thunderstorms, take off with ice on their wings, or perform a premature descent. There isn't the need to apply a specific software that could help with this accident, these belong to the training of staff and the security measures enforced.

The second kind of accidents can be called "engineered". These consist of material failures that designers are responsible for. These failures are first hard to understand, nonetheless, after some careful examination, it can result in tangible solutions. These types of failures seem really familiar, however, but they are quite rare for their occurence. Aside from these two types of errors, the ValueJet accident is pretty different and belongs to a different category of disaster.

The third type of accident–belonging to the ValueJet accident–is called “system accident,” these do not require conventional solutions and just a few group of people. Charles Perrow describes this type of accidents as “normal accidents” because he believes that they are normal for our time. The airline system is complex and it could start from government regulations to the compensation to the employees. One of the primordial starting points to analyze this accident, we should start with the notion that commercial flying is to make money. And as much as safety should be first, it isn’t. The goal is to get the passengers from point A to point B in the cheapest and fastest way possible.

There are a lot of small mistakes that happened because those people in charge make decisions out of convenience or for money. As much as it would be ideal to blame those who were directly involved, in order to avoid this from happening again it is better to find the root of the problem as a starting point. All airplane accidents tend to have a little from each type of accident, of course with one of them being the dominant reason for it.

Both pilots in charge of flight 592, Captain Candalyn Kubeck and copilot Richard Hazen represent a new kind of commercial pilot. They are experienced in the cockpit especially in the deregulated airline industry, both have been part of low-paid flying jobs before starting at ValueJet. They had to also pay for their own training, which shows a trend of disconnect between the employee satisfaction and the company’s culture. Flight attendants, ramp agents, and mechanics made also a lot less than the traditional airline. A big portion of the work was outsourced to part time employees and independent contractors which took ValueJet to be sometimes called a “virtual airline”.

One of the ways Software Engineering could solve these three types of accident problems is by first having a good tracking mechanism that would have the ability to detect careless mistakes that could end up in tragedy. For example, and not limited to, a

thermometer that would see if the airplane is in good conditions to depart. The second type of application of software is to engineered accidents. With a good quality control software that works as a checklist before departure in cases like making sure all the parts of the airplane are in place, all the doors are closed with the right air pressure present, etc.

The third type of accident, the one which belongs to flight 592 is a little more complicated in this case. There are three reasons why this happened. The first one belongs to SabreTech not properly packaging and storing hazardous material, in order to avoid this problem the best thing that could be done is to create a system that provides a thorough checkout on what the hazardous materials are and those that are allowed in a flight. The second belongs to ValueJet not properly supervising SabreTech, this is caused by not having a proper staff and outsourcing tasks to make the process cheaper. There should be perhaps a database where all the process from scheduling a flight to the departing is supervised by a program. The final reason is due to the FAA not mantating smoke detection and fire suspension systems in cargo holds, this belongs to the same supervising software that includes those rules mandated by a higher authority.