THE TRAGEDY OF FLIGHT: A COMPREHENSIVE CRASH ANALYSIS

A PROJECT REPORT

Submitted by

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Smart Internz

1 **INTRODUCTION**

Overview

A brief description about your project

Purpose

The use of this project. What can be achieved using this.

2 **Problem Definition & Design Thinking**

Empathy Map

Paste the empathy map screenshot

Ideation & Brainstorming Map

Paste the Ideation & brainstorming map screenshot

3 **RESULT**

Final findings (Output) of the project along with screenshots.

4 **ADVANTAGES & DISADVANTAGES**

List of advantages and disadvantages of the proposed solution

5 **APPLICATIONS**

The areas where this solution can be applied

6 **CONCLUSION**

Conclusion summarizing the entire work and findings.

7 **FUTURE SCOPE**

Enhancements that can be made in the future.

8 **APPENDIX**

A. Source Code

Attach the code for the solution built.

THE TRAGEDY OF FLIGHT: A COMPREHENSIVE CRASH ANALYSIS

1. INTRODUCTION:

Traffic safety policy and research have mostly focused on road network measures and road design, vehicle safety and road user behaviour in the past decades. However, the role of built-environment factors in traffic safety has not yet been fully examined. For the Netherlands, this is rather surprised given the importance attributed to urban spatial planning and it being one of the most planned countries in the world.

Despite the considerable improvements that have taken place in traffic safety in urban areas over the decades, one-third of road fatalities still occur in the built-up areas of Netherlands (SWOV,2021). Considering the aim of construction of on average 75,000 new homes per year until 2025 (MinelenW,2018), understanding the relationships between the built-environment factors and traffic safety is invaluable to improving traffic safety.

When a person has been seriously injured or killed in a small private plane crash or a commercial airline crash, family members will be looking for an experienced attorney to handle their aviation accident lawsuit. Aircraft accidents require a specialized investigate skill and extensive knowledge of aviation law.

On 27th of December 1991, an aircraft of model MD-81 operated by Scandinavian Airline System (SAS), flight SK 751 departed from Arlanda International Airport in Stockholm, Sweden, On a route to Copenhagen, Denmark. In a couple of minutes after the departure both engines failed and the emergency landing had to be made on a field. Unfortunately, it did not succeed and the aircraft was broken in three pieces on impact with the ground.

1.1 OVERVIEW:

As Air Traffic increases, so does the risk that passengers will be involved in an aviation accident. Generally speaking, air traffic is considered a safe means for transportation. But when aviation accidents occur, they often result in fatalities smaller, less serious accidents involving private aircraft are more frequent than people realize because many of these incidents go unreported in the media.

An airplane crash analysis is a detailed investigation into the causes of an aviation accident. The goal of an airplane crash analysis is to identify any factors that contributed to the accident, with the ultimate goal of improving safety and preventing future accidents. The process of conducting an airplane crash analysis typically involves the collection and analysis of a wide range of data, including information about the aircraft and its systems, the operators, and any other relevant factors.

This data is typically collected from Kaggle. Once the data has been collected, it is analysed through tableau, to identify any potential causes of the accident. The results of an airplane crash analysis are typically published in a report, which may include recommendations may be implemented by the relevant authorities or industry organizations.

1.2 PURPOSE:

In 2015, the National Transportation Safety Board (NTSB) reported 1,282 civil aviation accidents in the United States, 1,210 of which belonged to General Aviation (GA). Of these 1,210 GA accidents, 238 involved a total of 406 fatalities. There are more than 220,000 general aviation aircraft in the United States, which conducted 24,142,000 flight hours in the same time period. That’s 1.68 deaths per 100,000 flight hours. Using an average speed of 60 mph for automobiles, it may be surprising to know that this number early 25 times the rate deaths per hour travelled by automobile.

For this reason, the promotion of air safety in the United States is a big deal. One of the primary means by which air safety is promoted is by the investigation of and probable cause analysis of all aviation accidents.

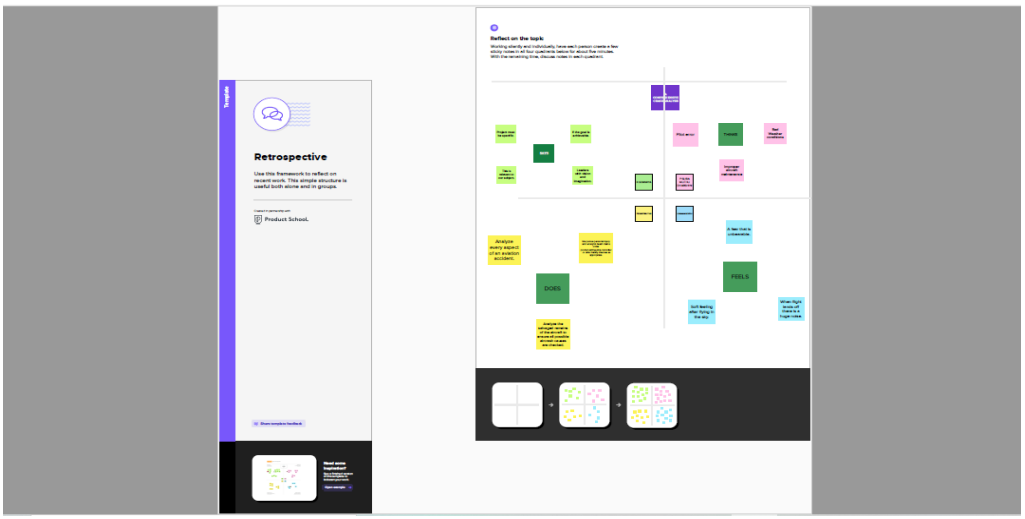
Bob Richards was having marital and other personal problems. He deliberately crashed his Piper Cherokee single-engine airplane onto the ground. He was alone in the plane and thus the only fatality.

To effectively discover the hazards that led to the accident and to prevent their recurrence in a future accident or incident. In the course of that investigation, additional hazards which increased damage and injury (inadequate crashworthy systems, system safeguards, rescue team response, etc.)

2. PROBLEM DEFINITION & DESIGN THINKING:

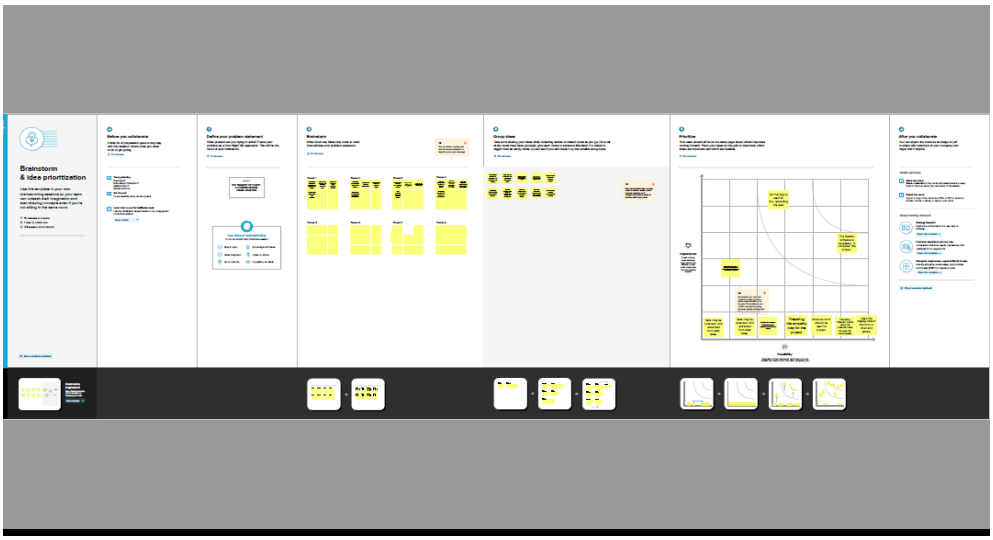
2. 1 EMPATHY MAP:

An Empathy Map is a collaborative tool teams can use to gain a deeper insight into their customers. Much like a user persona, an empathy map can represent a group of users, such as a customer segment. The empathy map was originally created by Dave Gray and has gained much popularity within the agile community.



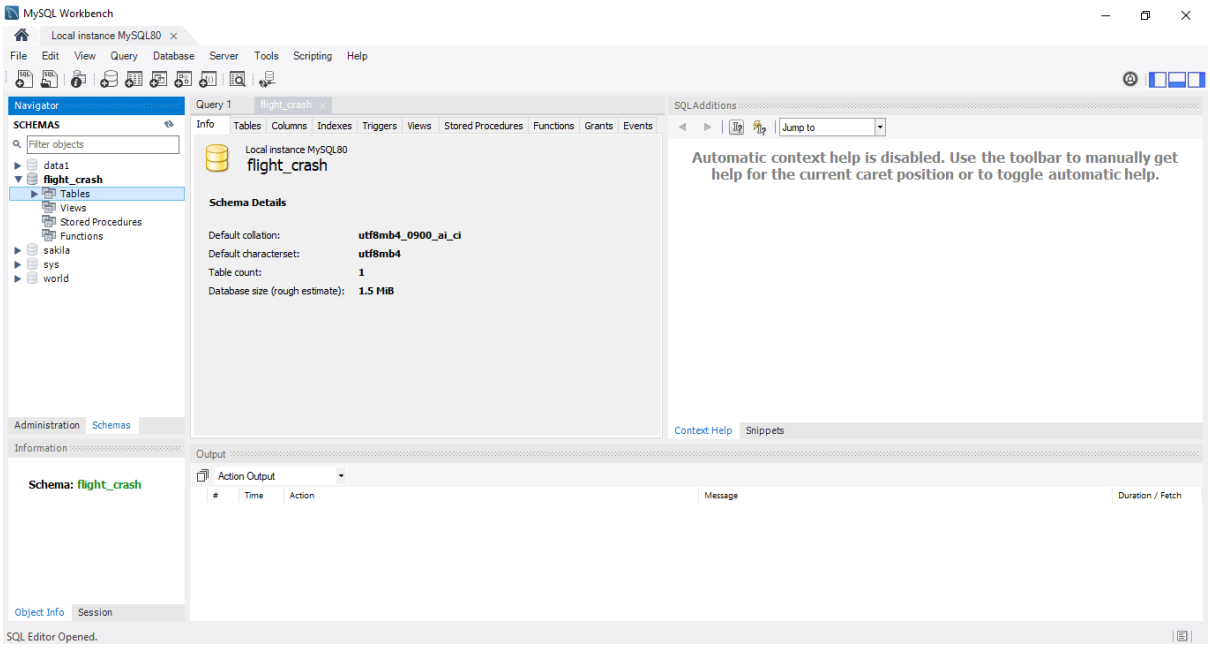
2.2 IDEATION & BRAINSTORMING MAP:

Ideation is often closely related to the practice of brainstorming, a specific technique that is utilized to generate new ideas. A principal difference between ideation & brainstorming is that ideation is commonly more thought as being an individual pursuit, while brainstorming is almost always a group activity.

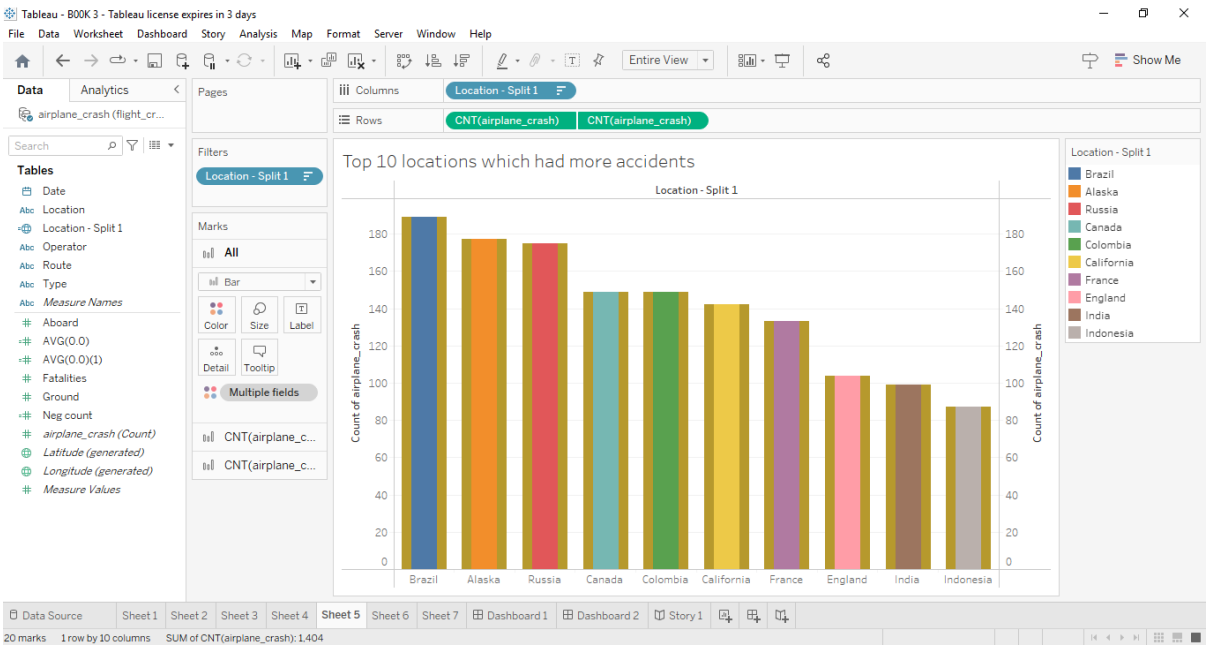


3.RESULT:

Amount of Data Rendered to DB:



Utilization of Data Filters:



No. of Calculation Fields:

FIG:1

Comparing Aboard vs Fatalities vs Ground:

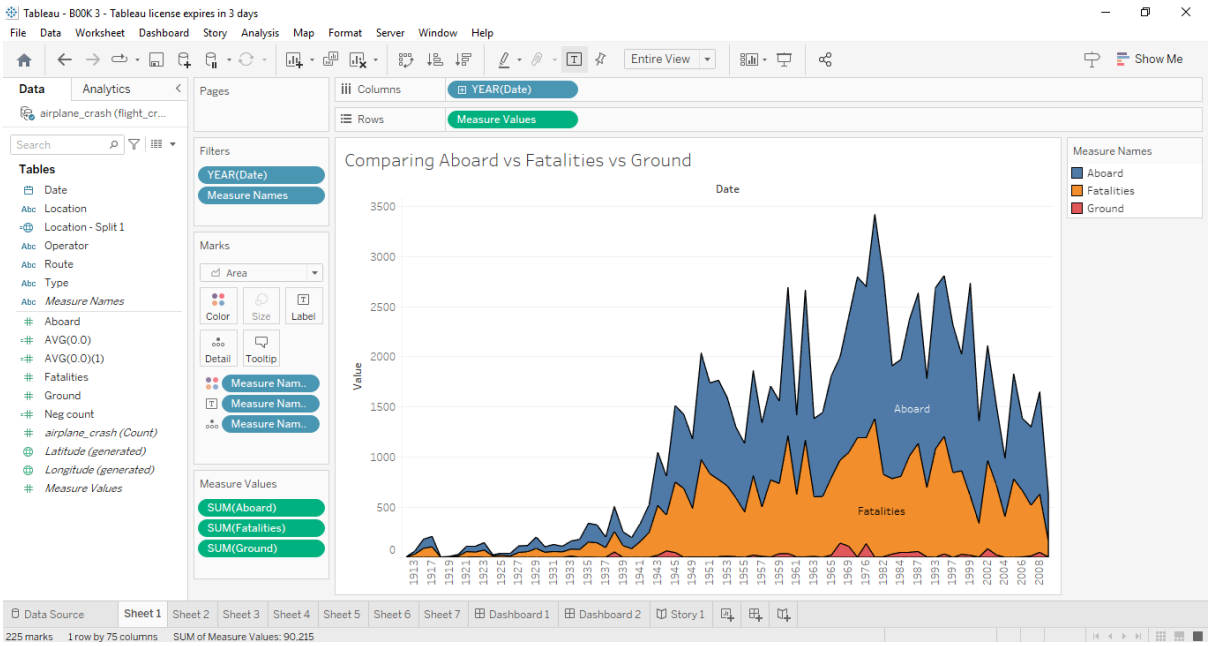


FIG:2

Max accidents based on years:

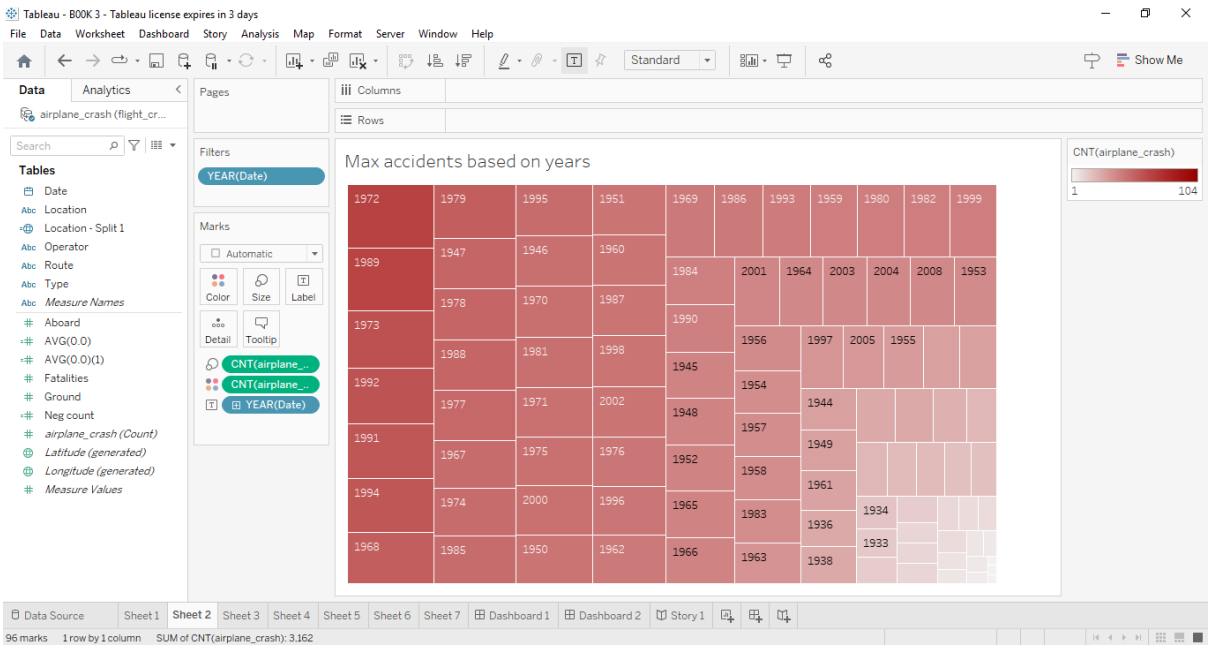


FIG:3

Accidents happened in 1972 (MAX ACCIDENTS) based on months:

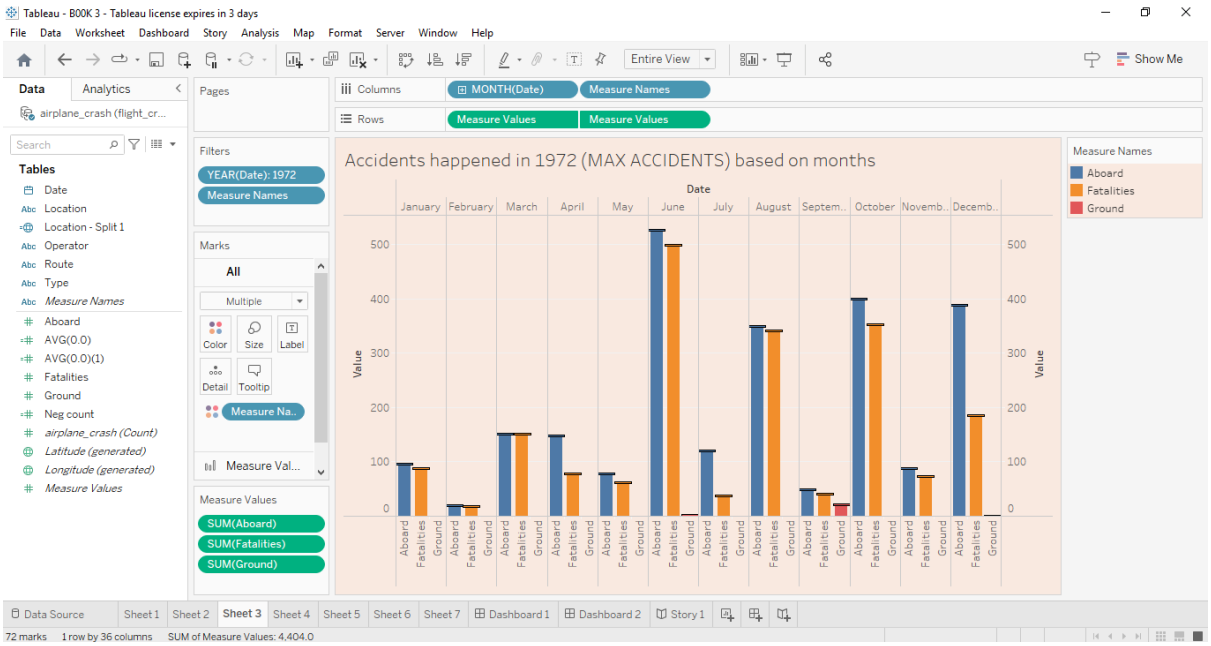


FIG:4

Highest No. of accident happened by Operators:

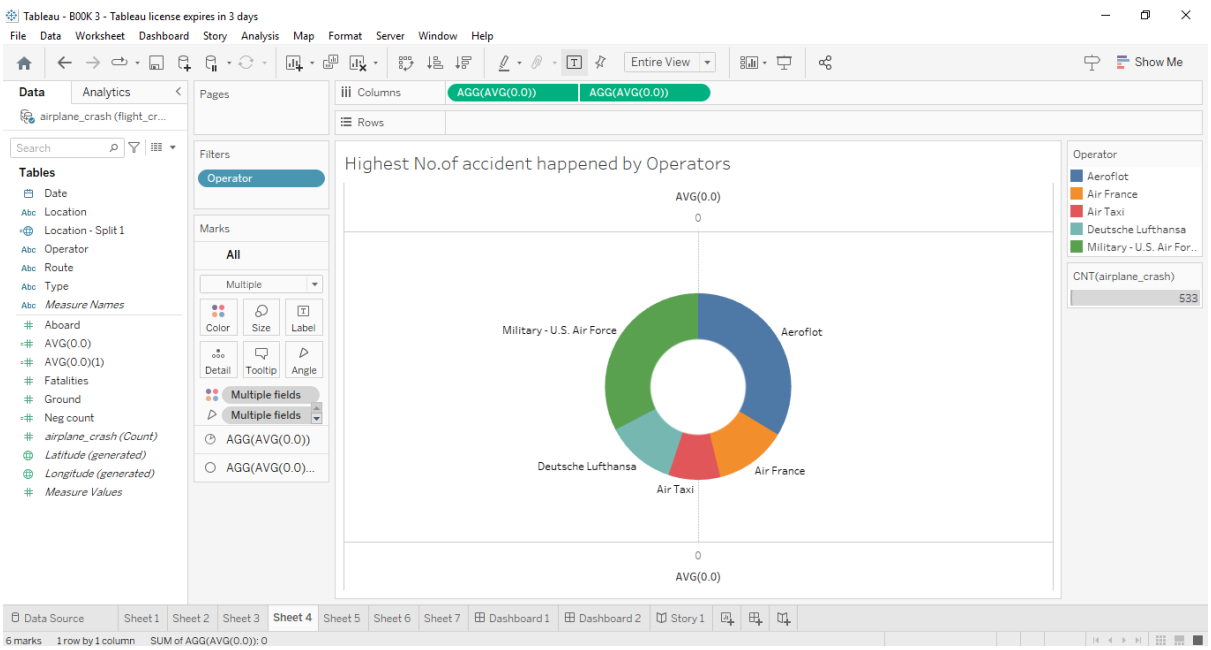


FIG:5

Top 10 locations which had more accidents:

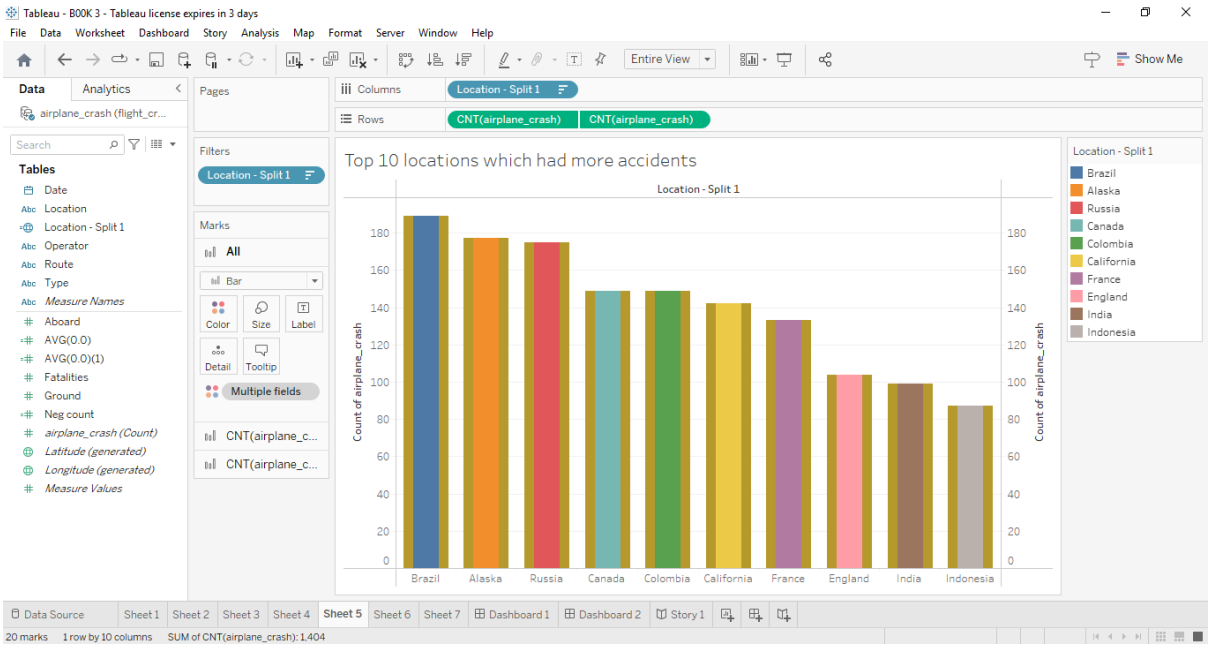


FIG:6

Top 3 flights which have max accident history:

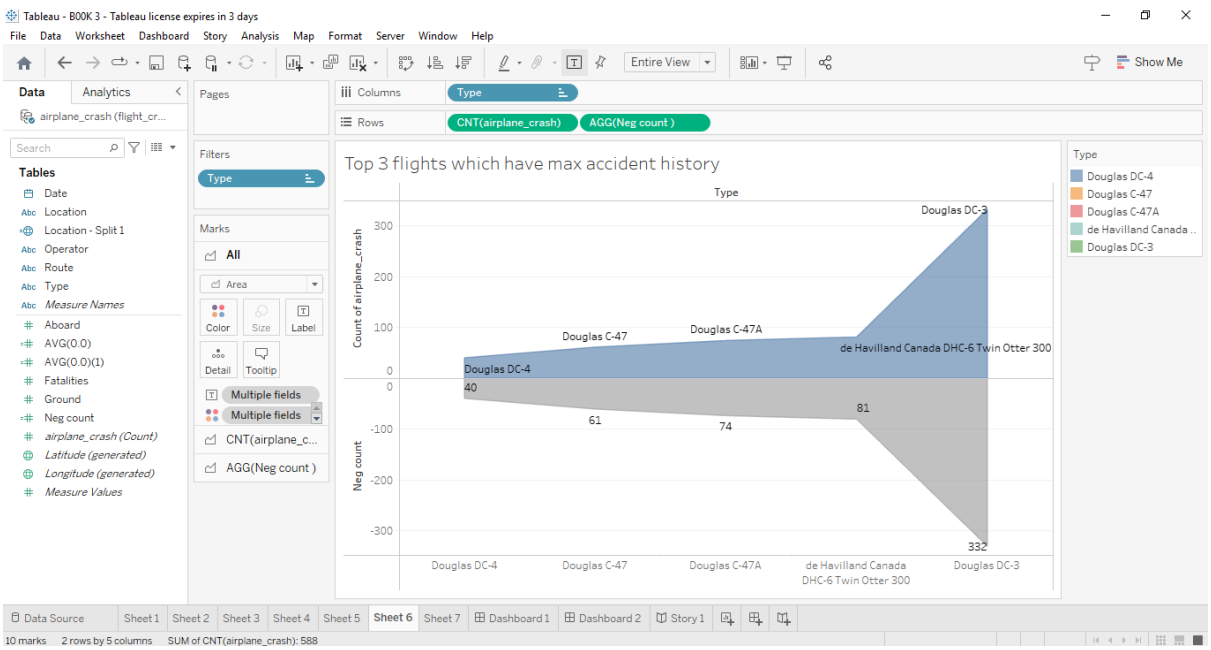


FIG:7

Accidents based on regions:

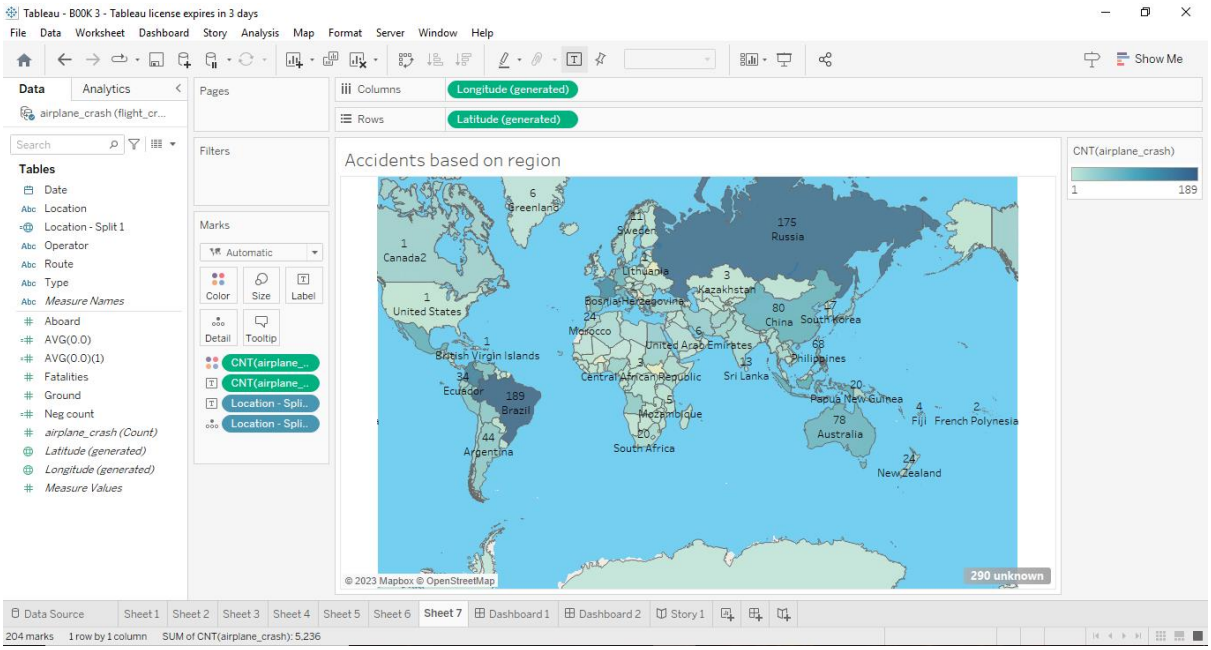
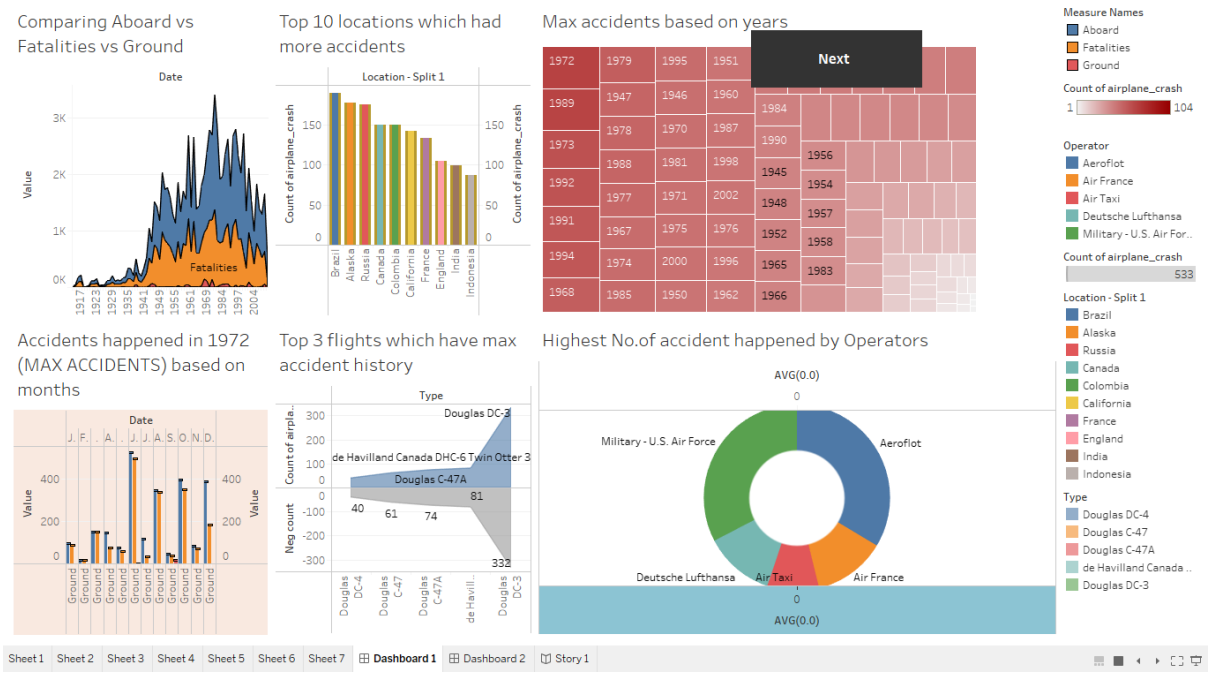


FIG:8

Dashboard:



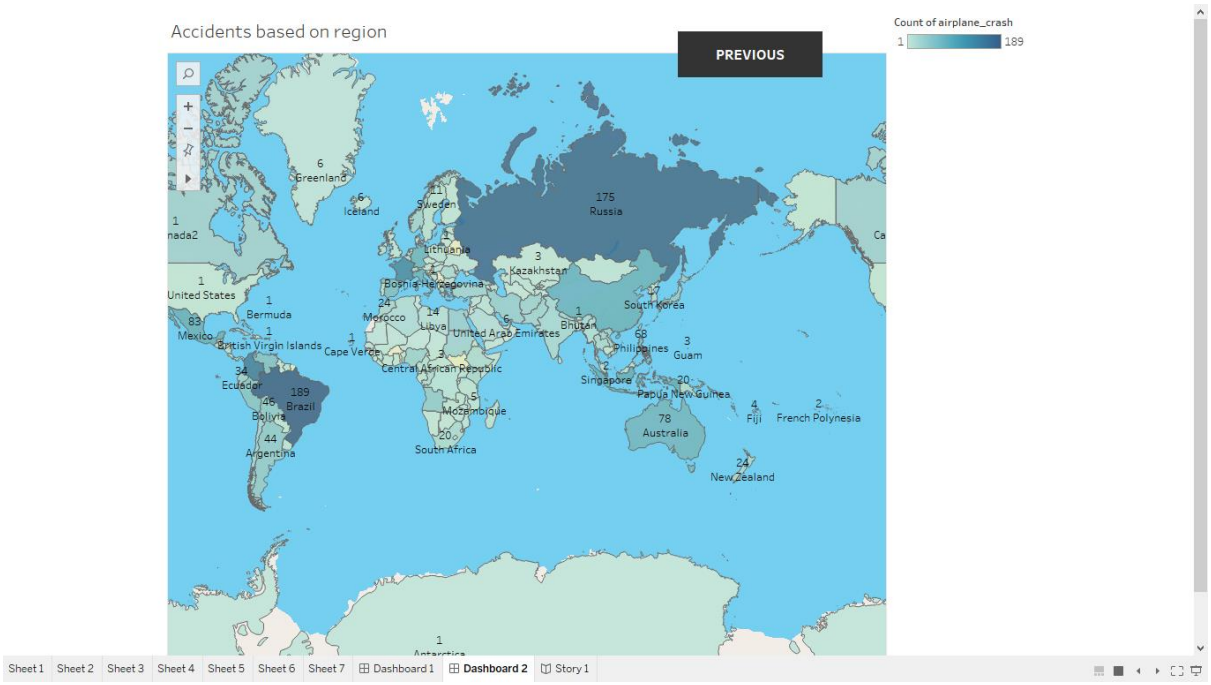

Accidents based on region
Count of airplane_crash
1
189
PREVIOUS
Greenland
Iceland
Sweden
Russia
Lithuania
Kazakhstan
Bosnia-Herzegovina
United States
Bermuda
Mexico
British Virgin Islands
Morocco
Libya
United Arab Emirates
Cape Verde
Central African Republic
South Korea
Bhutan
Philippines
Guam
Singapore
Papua New Guinea
Ecuador
Brazil
Bolivia
Argentina
Mozambique
South Africa
Australia
Fiji
French Polynesia
New Zealand
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Dashboard 1
Dashboard 2
Story 1

FIG:9

Story:

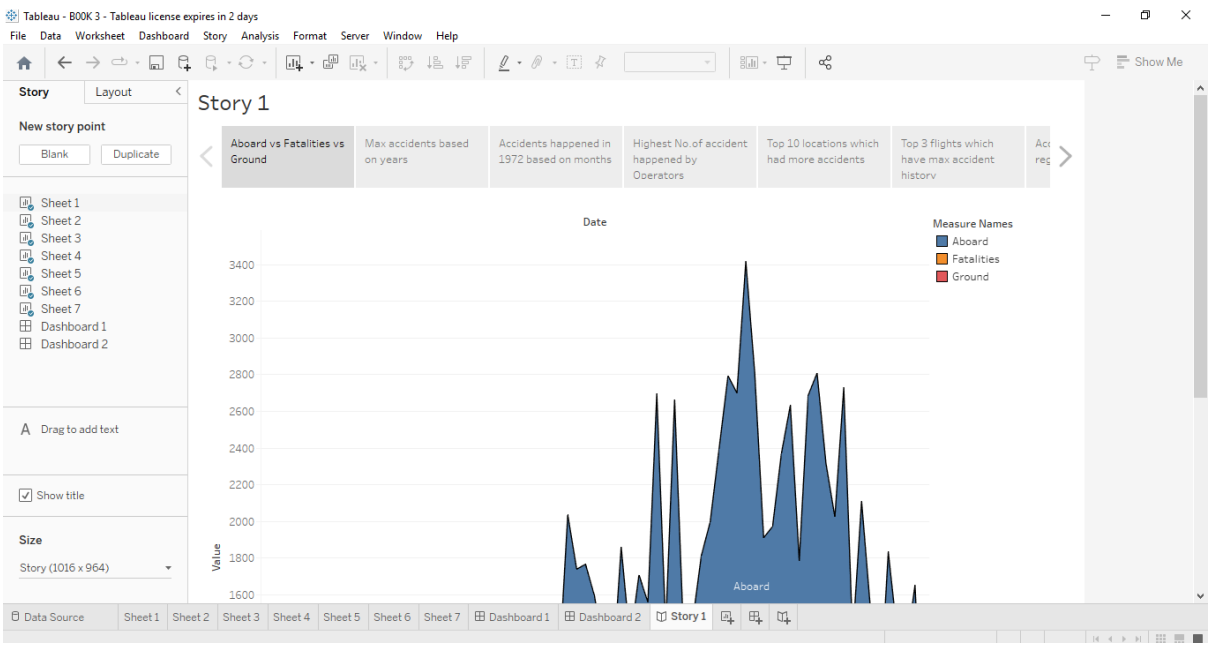


Tableau - B00K 3 - Tableau license expires in 2 days
File Data Worksheet Dashboard Story Analysis Format Server Window Help
Show Me
Story
Layout
New story point
Blank
Duplicate
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Dashboard 1
Dashboard 2
Drag to add text
Show title
Size
Story (1016 x 964)
Story 1
Aboard vs Fatalities vs Ground
Max accidents based on years
Accidents happened in 1972 based on months
Highest No.of accident happened by Operators
Top 10 locations which had more accidents
Top 3 flights which have max accident history
Date
Measure Names
Aboard
Fatalities
Ground
Value
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
Aboard
Data Source
Sheet 1
Sheet 2
Sheet 3
Sheet 4
Sheet 5
Sheet 6
Sheet 7
Dashboard 1
Dashboard 2
Story 1

FIG:10

Web Integration:

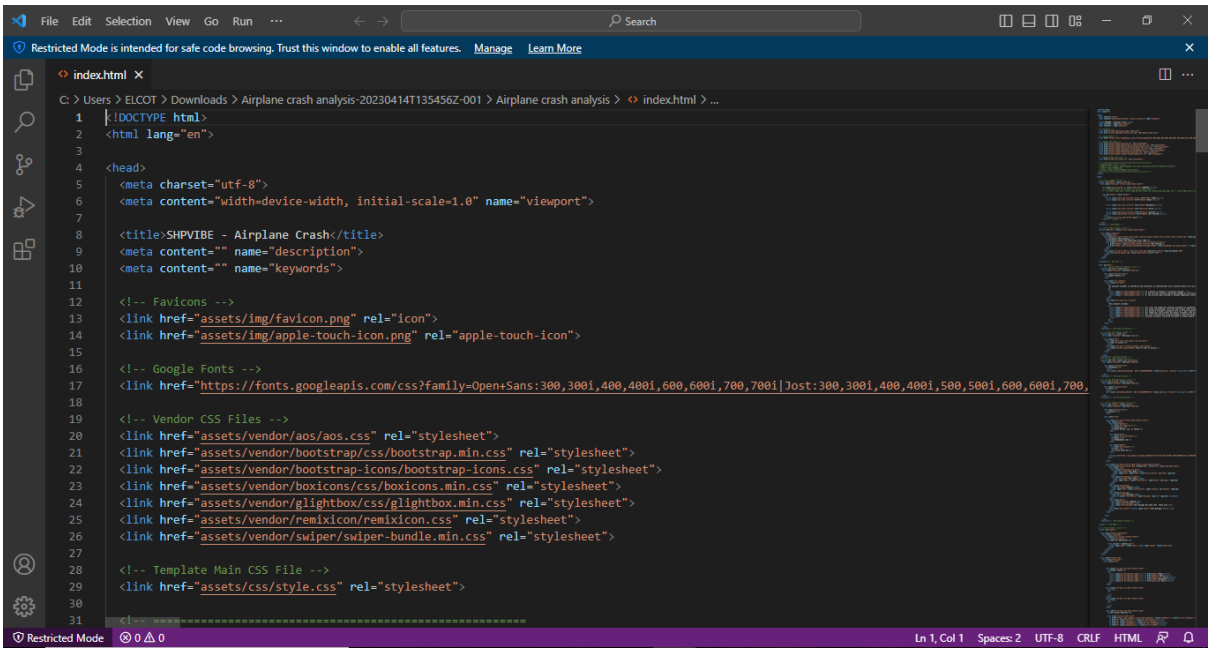
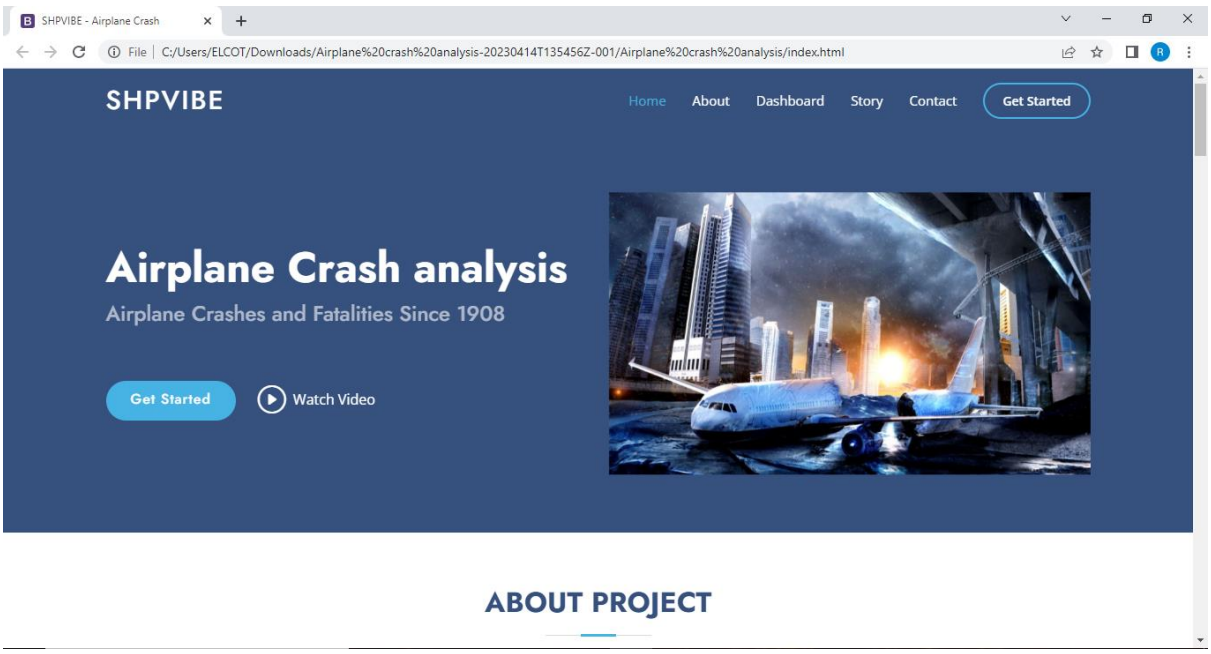


FIG:11

Template:



4. ADVANTAGES & DISADVANTAGES:

ADVANTAGES:

- Air is the type of freight capable of travelling long distances in short periods of time. This makes this model an optimum choice if the client has an urgent need to ship a product or if their freight demands special standards of protection or acclimation.
- Air transportation offers convenient, reliable and fast services of transport. It is considered the cheapest way to ship peregrinated goods. It offers a standard, convenient, reliable and fast service.
- In regions that are not readily accessible to other modes of transport, air transport is considered to be the only means of transport.
- High standard of protection with a low risk of robbery and injury. Shipping by air has a high degree of security since airport restrictions on cargo are strictly enforced.
- An aircraft can fly to any location without seeing any natural obstacles or barriers. Since customs formalities are easily complied.
- Air exports, in general, entail less hard packaging than ocean shipments. This ensures you save both time and money by not having to provide extra packaging services.

DISADVANTAGES:

- Air travel is the riskiest mode of transport, since there can be considerable losses to goods, customer and crews as a result of a minor crash.
- Air travel is considered to be the most expensive means of transportation. The cost of maintaining aircraft is higher and the costs for the building of aerodromes and avions are much higher.

- There is a whole variety of materials not suitable for such products, from explosives, gases, batteries, fired solids cannot be shipped by air to name but air to name but a few.
- The aircraft have no room and therefore are not deal for carriage of voluminous and cheaper materials.
- Air travel calls for enormous spending in aerodrome building and servicing. It also calls for professional, qualified and qualified staff that need a significant investment.
- The journey can be long if you have stopovers. It can be expensive depending on the route and season.

5. APPLICATIONS:

- Air India Flight 855 was a scheduled passenger flight from Santa Cruz Airport, Bombay to Dubai International Airport, Dubai. On New Years Day in 1978, the Boeing 747 operating the flight crashed about a 3 km off the coast of Bandra, Bombay.
- All 213 passengers and crew on board were killed. An investigation into the crash determined the most likely probable cause was the captain becoming spatially disoriented after the failure of one of the flight instruments in the cockpit.
- It was Air India’s deadliest aircraft crash until the bombing of Flight 182 in 1985. It was also the deadliest aviation accident in India until the Flight in 1996.
- As of 2023, Flight 855 is still the second deadliest aircraft crash in both of these categories.

ACCIDENT

Date	1 January 1978
Summary	Instrument malfunction, leading to loss of situation awareness followed by pilot error, crashed into water.
Site	Arabian Sea, 3 km West of Santacruz Airport, Bombay India.

AIRCRAFT

Aircraft type	Boeing 747-237B
Aircraft name	Emperor Ashoka
Operator	Air India
Call sign	AIR INDIA 855
Registration	VT-EBD
Flight origin	Santacruz Airport Bombay, India
Destination	Dubai International Airport Dubai, United Arab Emirates
Occupants	213
Passengers	190
Crew	23
Fatalities	213
Injuries	0

6. CONCLUSION:

This analysis revealed that among the pilots that caused the targeted accidents, 22 had flight experience for 301 to 1000 hours and 20 had 1001 or more hours of experience. By age, those in their 50s and 60s combined were 34, accounting for nearly 60% of the total.

Pilots with the total flight time of 301 to 1000 hours may have accumulated experience in familiarization flights and recreational flights after obtaining a license and may have become confident in their skills.

On the other hand, the analysis of casual factors shows the involvement of human factors, such as wrong assumptions carelessness and negligence, as well a gap between perceptions and reality concerning skills, in many of the accidents. There was also a case where a pilot's excessive self -confidence triggered the accident.

In the interviews, some pointed out the importance of cautioning oneself against all dangerous situations instead of taking them lightly. However experienced you may be, you should refrain from dangerous and reckless flights.

Be aware that you may do something careless or make errors at any moment, be sure to conduct periodic checks and prior confirmation, and try to take action as soon as possible instead of ignoring any abnormalities or anxiety you may notice during the flight. Such attitude of each pilot will lead to preventing aircraft accidents.

Lastly, we extend our appreciation to the people from the Japan Flying Association and the AOPA-JAPAN who kindly responded to our interviews and offer best wishes for their further success.

FUTURE SCOPE:

Many people use the terms "SAFETY" and " SECURITY " a lot, especially as they relate to travel. Sometimes the two words are used synonymously. But there is a significant difference between the two words when it comes to air travel.

AVIATION SAFETY:

Aviation safety refers to the efforts that are taken to ensure airplanes are free from factors that may lead to injury or loss. Jet airplanes always have been safe – they have to be, or the manufacturers would not be in business long. Commercial airlines and major manufacturers like Boeing

Commercial Airlines (NYSE:BA) adhere to every safety regulation mandated by the regulatory agencies and then some.

"Commercial jet travel is one of the safest modes of transportation," said Steve Atkins, vice president, Airplane Safety & Airworthiness, Boeing Commercial Airplanes.

Atkins points out that more than 3 million people fly safely on commercial flights around the world every day and 70 percent of the airplanes flying today were built by Boeing.

AVIATION SECURITY:

Aviation Security is only one component that may affect passenger safety. It is not so much related to the airplane itself, but rather to intelligence gathering, pre-boarding procedures and airport security personnel. It is mainly aviation security that has been receiving urgent attention.

The Boeing Company is developing enhanced security flight deck doors for 747,767 and 777 airplanes. The new security features include increased blunt-force and ballistics-resistant material and devices to open the door or release special panels for sudden decompression.

The new doors also include an electronic lock that will give pilots authority to admit or deny access to the flight deck. Federal Aviation Administration certification and installation will begin the summer of 2002.

Appendix:

Source code

https://drive.google.com/file/d/1hAkVdOJDUisp0JAFKUi6Pw3S2sQBqIUi/view?usp=sharing