iNeuron

DATA VISUALIZATION OF BIRD STRIKES BETWEEN 2000 – 2011

BY
PRAKASH KUMAR GUPTA
FSDA, iNeuron.ai

2022-2023

TABLE OF CONTENT

High Level Document (HLD)

1. Introduction

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the
current project description to represent a suitable model for coding. This document is also
intended to help detect contradictions prior to coding, and can be used as a reference manual
for how the modules interact at a high level.

2. Why this High-Level Design Document

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:
  - : Security
  - : Reliability
  - : Maintainability
  - : Portability
  - : Reusability
  - : Application compatibility
  - : Resource utilization
  - : Serviceability

3. The Scope

The HLD documentation outlines the system's architecture, including the technology architecture, application architecture (layers), application flow, and database architecture. The HLD employs simple to somewhat complex concepts that system administrators should be able to understand.

4. General Description:

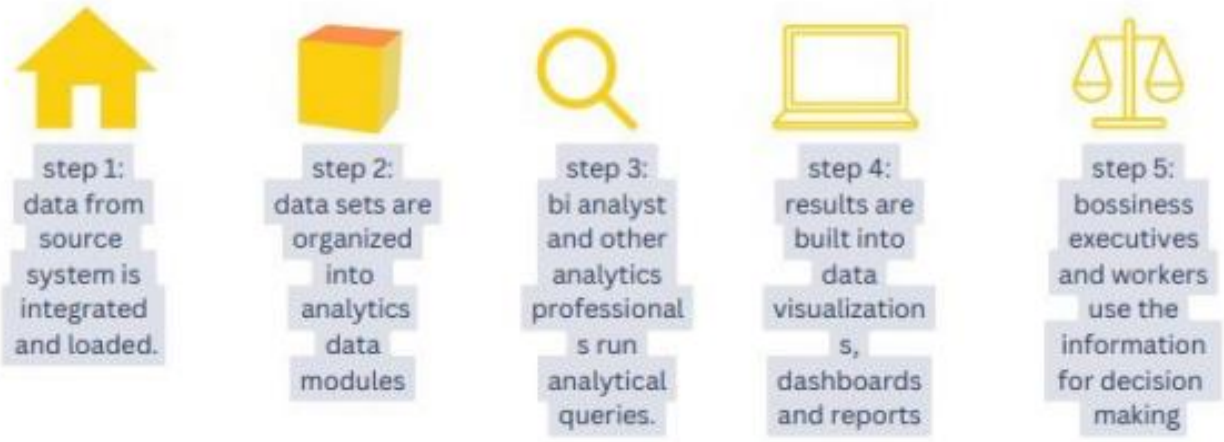
A bird strike is strictly defined as a collision between a bird and an aircraft which is in flight or on a take-off or landing roll. Bird Strike is common and can be a significant threat to aircraft safety. For smaller aircraft, significant damage may be caused to the aircraft structure and all aircraft, especially jet-engine ones, are vulnerable to the loss of thrust which can follow the ingestion of birds into engine air intakes. This has resulted in several fatal accidents.

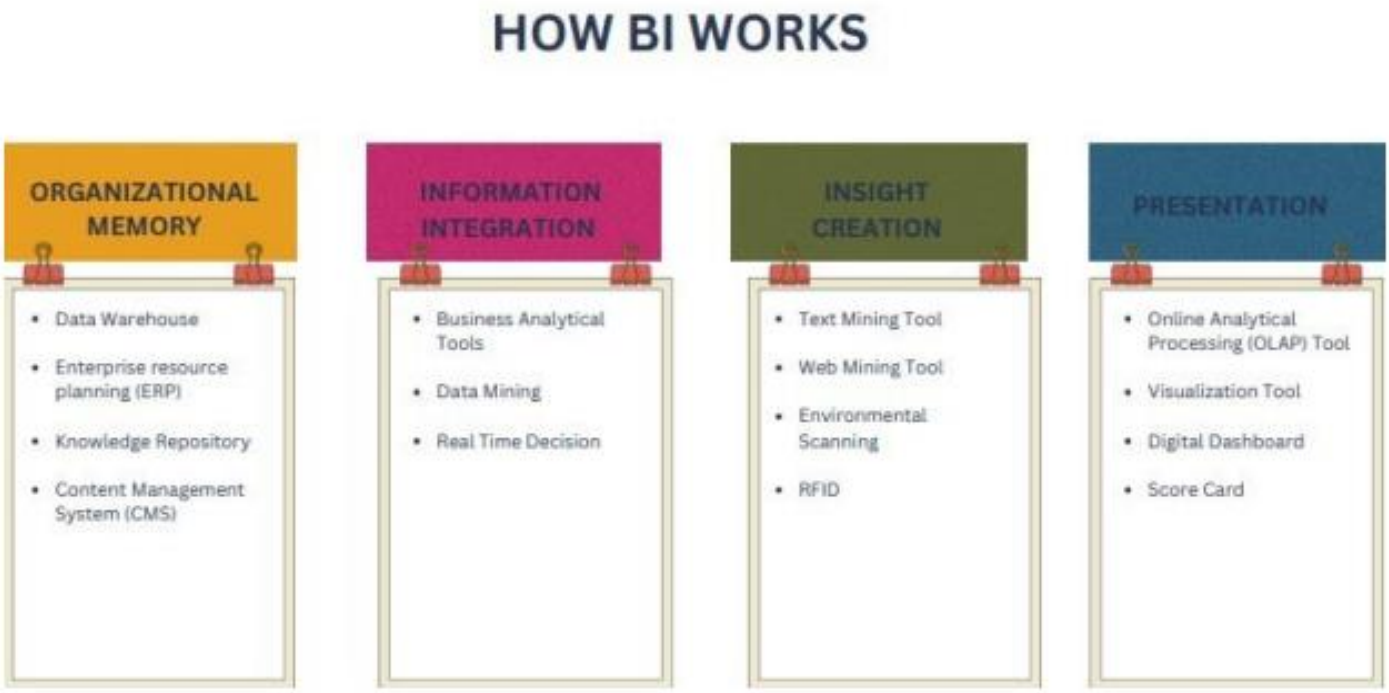
5. Product Perspective & Problem Statement:

Bird strikes may occur during different phase of flight, but are most likely during the take-off, initial climb, approach and landing phases due to the greater numbers of birds in flight at lower levels. so, the aim of this project is to analyze bird strikes in us from 2000 to 2011 to know more in-dept information about several aspects.

6. Tools Used:

7. Design Details:





8. Optimization

1.Data strategy drives performance

- Minimize the number of fields
- Minimize the number of records
- Optimize extracts to speed up future queries by materializing calculations, removing columns and the use of accelerated views

2.Reduce the marks (data points) in your view

- Practice guided analytics. There's no need to fit everything you plan to show in a single view. Compile related views and connect them with action filters to travel from overview to highly-granular views at the speed of thought.
- Remove unneeded dimensions from the detail shelf.
- Explore. Try displaying your data in different types of views.

3.Limit filters by number and type

- Reduce the number of filters in use. Excessive filters on a view will create a more complex query, which takes longer to return results.
- Double-check your filters and remove any that aren't necessary.
- Use an include filter. Exclude filters load the entire domain of a dimension, while include filters do not. An include filter runs much faster than an exclude filter, especially for dimensions with many members.
- Use a continuous date filter. Continuous date filters (relative and range-of-date filters) can take advantage of the indexing properties in your database and are faster than discrete date filters.
- Use Boolean or numeric filters. Computers process integers and Booleans (t/f) much faster than strings.
- Use parameters and action filters. These reduce the query load (and work across data sources)

4. Optimize and materialize calculations:

- Perform calculations in the database
- Reduce the number of nested calculations.
- Reduce the granularity of LOD or table calculations in the view. The more granular the calculation, the longer it takes.
- Where possible, use MIN or MAX instead of AVG. AVG requires more processing than MIN or MAX. Often rows will be duplicated and display the same result with MIN, MAX, or AVG.
- Make groups with calculations. Like include filters, calculated groups load only named members of the domain,
- Use Booleans or numeric calculations instead of string calculations. Computers can process integers and Booleans (t/f) much faster than strings.

Boolean>Int>Float>Date>DateTime>String

9. KPI (Key Performance Indicators)

Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the disease.

As and when the system starts to capture the historical/periodic data for a user, the dashboards will be included to display charts over time with progress on various indicators or factors

Key Performance Indicators: Key indicators displaying a summary of the Bird Strikes with different metrics are:-

1. Visuals Depicting the Number of Bird Strikes
2. Yearly Analysis
3. Bird Strikes in US
4. Top 10 US Airlines in terms of having encountered bird strikes
5. Airports with most incidents of bird strikes – Top 50
6. Yearly Cost Incurred due to Bird Strikes
7. When do most bird strikes occur?
8. Altitude of airplanes at the time of strike
9. Phase of flight at the time of strike
10. Average Altitude of the airplanes in different phases at the time of strike
11. Effect of Bird Strikes
12. Impact on Flight
13. Effect of Strike at Different Altitude
14. Were Pilots Informed?
15. Prior Warning and Effect of Strike Relation