HIGH LEVEL DESING

DATA VISUALIZATION OF BIRD STRIKES BETWEEN 2000 – 2011

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1. Introduction

1.1 Why this High-Level Design Document?

This High-Level Design (HLD) document's goal is to provide the current project description with the extra depth it needs to reflect an appropriate coding model. This paper can be used as a reference guide to understand how the modules work at a high level and to help find conflicts before coding.

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

1.2 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.

2 General Description

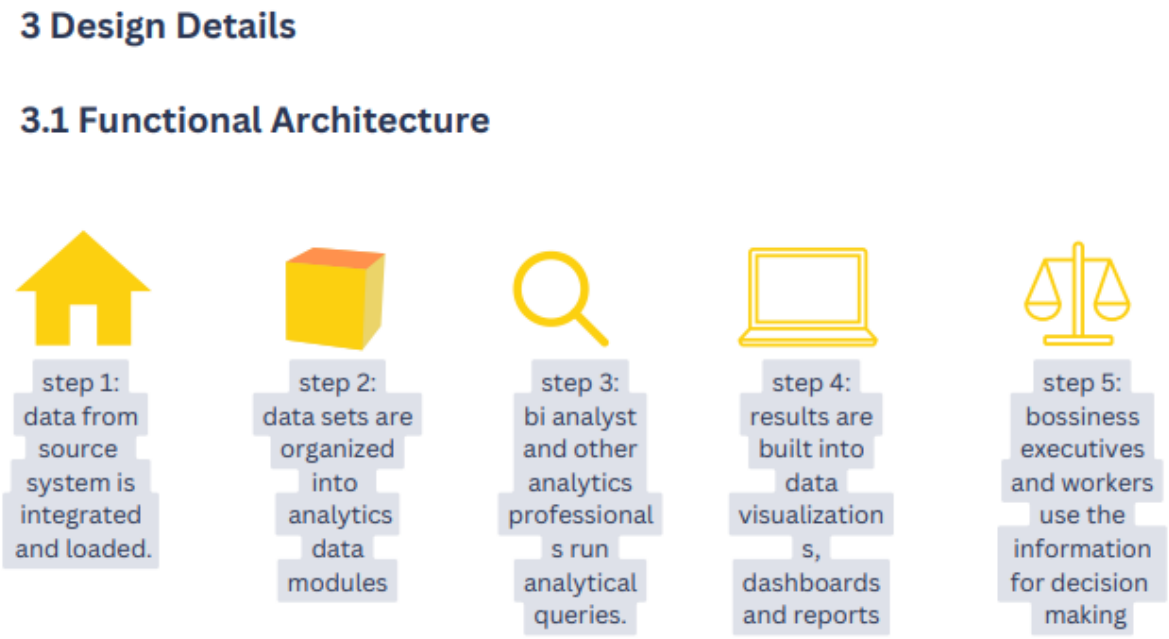
2.1 Product Perspective & Problem Statement

This Project aims to Analyze bird strikes from 2000 to 2011 to know more in-depth information about several aspects of data like cost to company in repairing damages, loss of life , injury , changes occurred due to strike etc.

3. TOOLS USED

3 Design Details

3.1 Functional Architecture



3.2 Optimization

1. Your 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 your 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 including 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 data filters.

Use Boolean or numeric filters. Computers process integers and Booleans (t/f) much faster than strings.

4. Optimize and materialize your 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.

LODs - Look at the number of unique dimension members in the calculation.

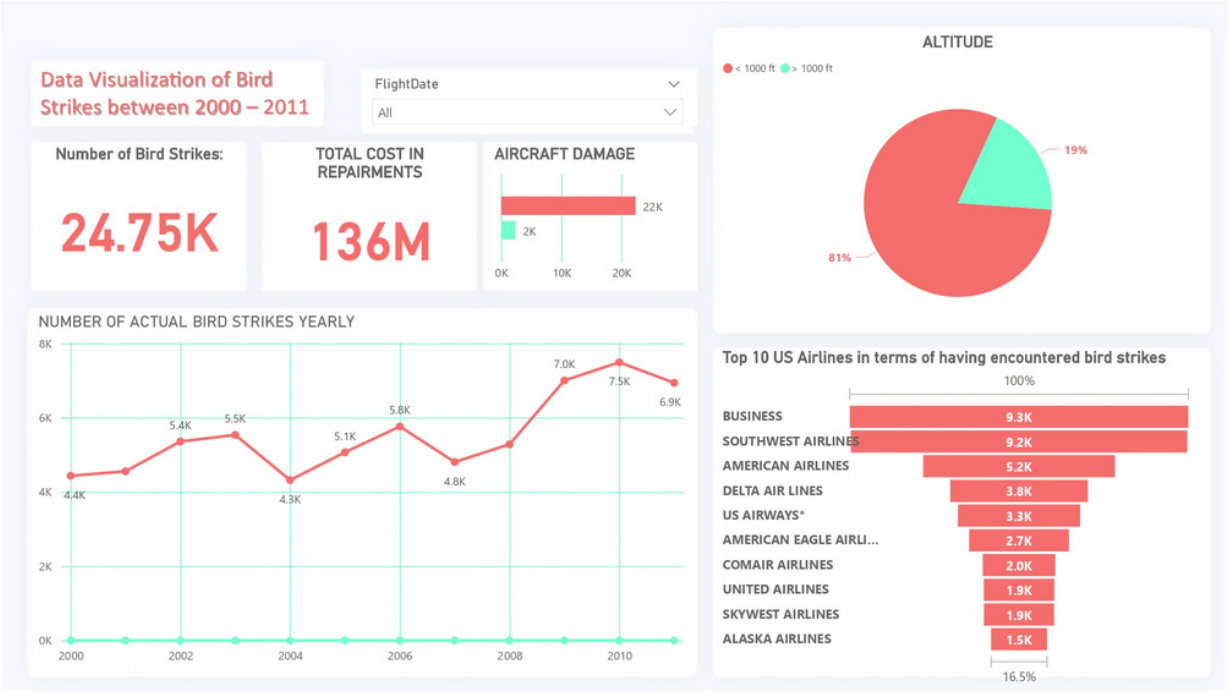
Table Calculations - the more marks in the view, the longer it will take to calculate.

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

4. KPI

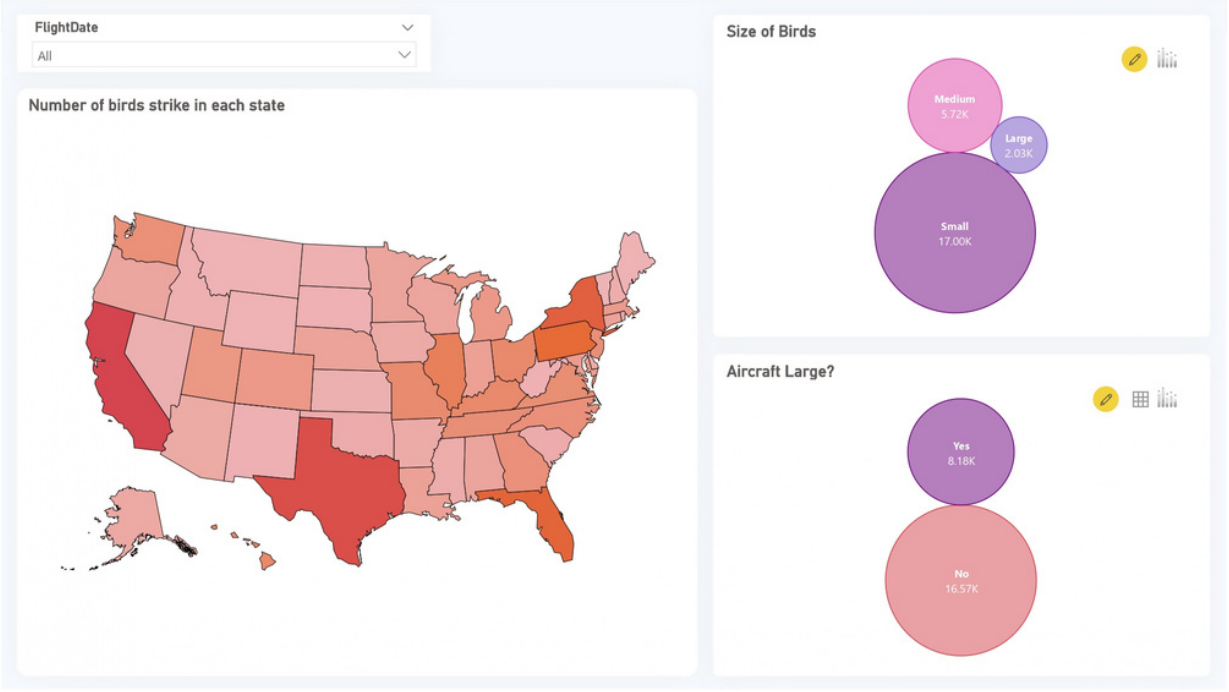
Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the disease.

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


Data Visualization of Bird Strikes between 2000 – 2011
FlightDate
All
Number of Bird Strikes:
24.75K
TOTAL COST IN REPAIRMENTS
136M
AIRCRAFT DAMAGE
22K
2K
0K
10K
20K
ALTITUDE
< 1000 ft
> 1000 ft
19%
81%
NUMBER OF ACTUAL BIRD STRIKES YEARLY
8K
6K
4K
2K
0K
4.4K
5.4K
5.5K
4.3K
5.1K
5.8K
4.8K
7.0K
7.5K
6.9K
2000
2002
2004
2006
2008
2010
Top 10 US Airlines in terms of having encountered bird strikes
100%
BUSINESS 9.3K
SOUTHWEST AIRLINES 9.2K
AMERICAN AIRLINES 5.2K
DELTA AIR LINES 3.8K
US AIRWAYS* 3.3K
AMERICAN EAGLE AIRLI... 2.7K
COMAIR AIRLINES 2.0K
UNITED AIRLINES 1.9K
SKYWEST AIRLINES 1.9K
ALASKA AIRLINES 1.5K
16.5%


Phase of Flight
All
Average Altitude of the airplanes in different phases at the time of strike
801.54
Average of Feet above ground
Count of Wildlife: Number Struck Actual by Effect: Indicated Damage
Count of Wildlife: Number Struck Actual
20K
10K
0K
Were Pilots Informed?
31K (47.07%)
35K (52.93%)
Pilot warned of birds or wildlife?
N
Y
Impact on Flight
60K
40K
20K
0K
None
Precaution... Landing
Aborted Take-off
Other
Engine Shut Down


FlightDate
All
Airport: Name
Count of Wildlife: Number struck
DALLAS/FORT WORTH INTL ARPT 802
SACRAMENTO INTL 676
SALT LAKE CITY INTL 479
DENVER INTL AIRPORT 476
KANSAS CITY INTL 452
PHILADELPHIA INTL 442
ORLANDO INTL 408
BALTIMORE WASH INTL 401
LOUISVILLE INTL ARPT 394
JOHN F KENNEDY INTL 389
CHARLOTTE/DOUGLAS INTL ARPT 367
NASHVILLE INTL 364
LAMBERT-ST LOUIS INTL 363
CHICAGO O'HARE INTL ARPT 331
PORTLAND INTL (OR) 313
NEWARK LIBERTY INTL ARPT 305
CINCINNATI/NORTHERN KENTUCKY INTL ARPT 302
ATLANTA INTL 296
CHICAGO MIDWAY INTL ARPT 295
HOUSTON-HOBBY 293
When do most bird strikes occur?
None 23K
Rain 1K
Fog 0K
Fog, Rain 0K
Snow 0K
Rain, Snow 0K
Fog, Snow 0K
Fog, Rain, Snow 0K
0K
10K
20K
When do most bird strikes occur?
10K
5K
0K
10.2K
4.9K
4.6K
4.2K
0.8K
0.1K
0.0K
Approach
Landing Roll
Take-off run
Climb
Descent
Taxi
Parked


FlightDate
All
Number of birds strike in each state
Size of Birds
Medium 5.72K
Large 2.03K
Small 17.00K
Aircraft Large?
Yes 8.18K
No 16.57K

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THANK YOU