Low Level Design (LLD)

Data Visualization of Bird Strikes between 2000-2011

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Document Control

Date	Version	Description	Author
20/06/2024	1.0	Introduction, Problem Statement	Sai Maneesha Gudimetla
23/06/2024	1.1	Dataset Information, Architecture Description	Sai Maneesha Gudimetla
25/06/2024	1.2	Final Revision	Sai Maneesha Gudimetla

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1. Introduction

1.1 What is Low Level Design Document?

The goal of the Low-level design document (LLDD) is to give the internal logic design of the actual program code for the Heart Disease Diagnostic Analysis dashboard. LLDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

1.2 What is Scope?

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

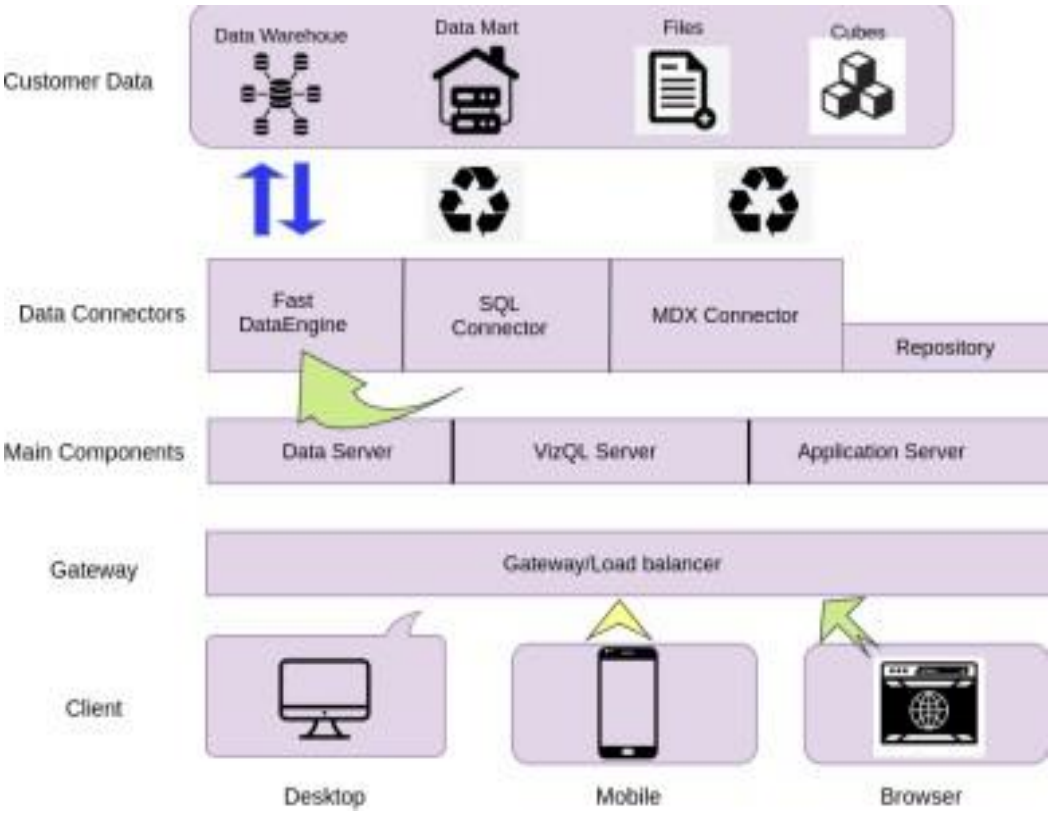
1.3 Project Introduction

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. The term is often expanded to cover other wildlife strikes - with bats or ground animals. 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. Bird strikes may occur during any 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. To have a closer look the following document visually depicts the data collected on Bird Strikes by FAA between 2000-2011.,

2. Problem Statement

The goal of this project is to analyse the bird strike incidents happened between 2000-2011. To achieve the goal, we used a data set that is collected by FAA during 2000-2011. The objective of the project is to perform data visualization techniques to understand insights of the data. This project aims apply various Business Intelligence tools such as Tableau or Power BI to get a visual understanding of the data.

3. Architecture



3.1 Architecture Description

1. **Raw Data Collection** The Dataset was taken from the information provided by Unified Mentor and the detailed description of the project.

2. Data Pre-Processing

Before building any model, it is crucial to perform data pre-processing to feed the correct data to the model to learn and predict. This Process includes-

a) Handling Null/Missing Values
b) Handling Skewed Data
c) Outliers Detection and Removal

3. Data Cleaning

Data cleaning is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate, or incomplete data within a dataset.

a) Remove duplicate or irrelevant observations
b) Filter unwanted outliers
c) Renaming required attributes

4. Exploratory Data Analysis (EDA)

Exploratory Data Analysis refers to the critical process of performing initial investigations on data to discover patterns, spot anomalies, test hypothesis and to check assumptions with the help of summary statistics and graphical representations.

5. Reporting

Reporting is a most important and underrated skill of a data analytics field.

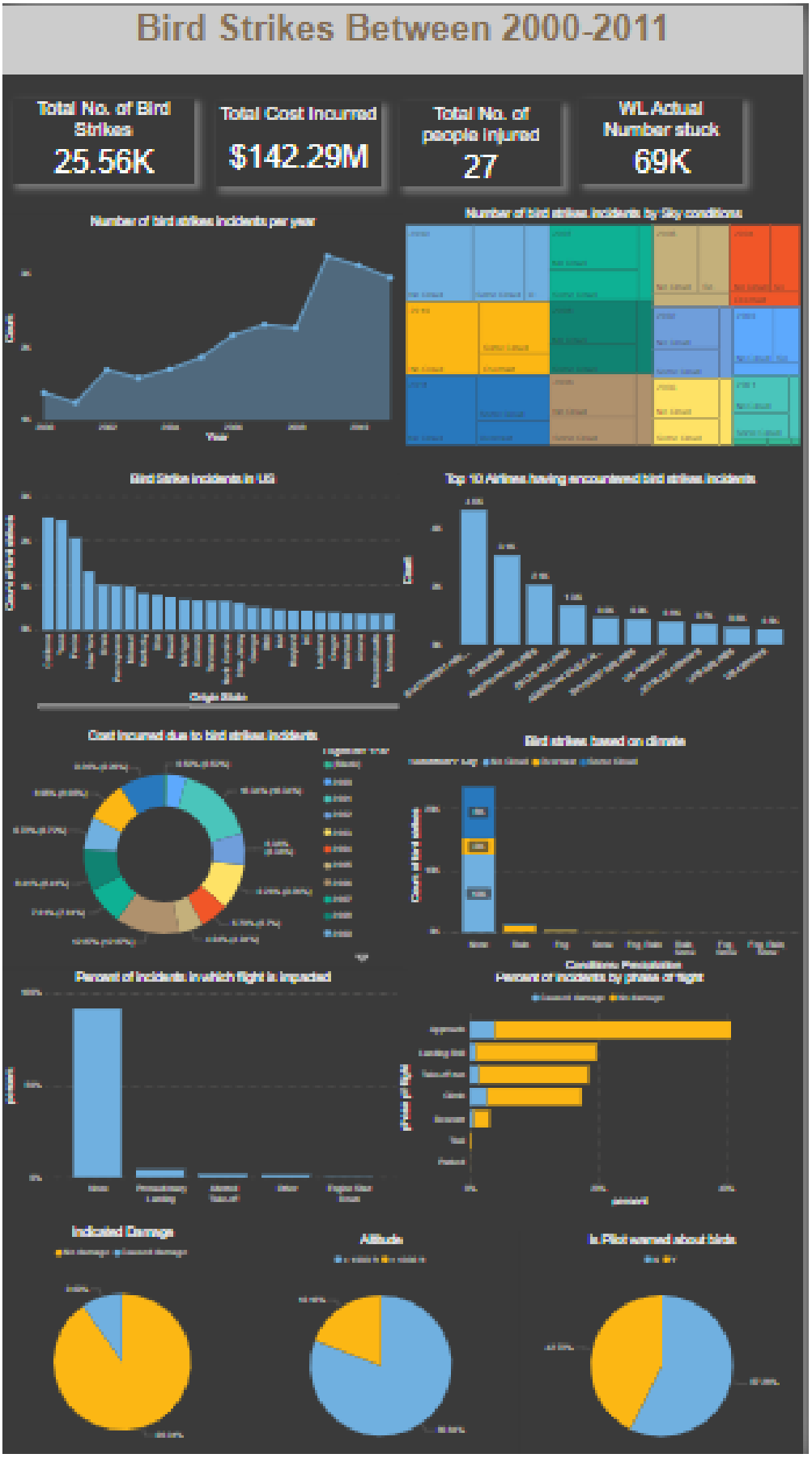
a) High Level Design Document (HLD)
b) Low Level Design Document (LLD)
c) Architecture
d) Wireframe
e) Detailed Project Report
f) Power Point Presentation

6. Modelling

Data Modelling is the process of analysing the data objects and their relationship to the other objects. The Data Model's main focus is on what data is needed and how we have to organize data rather than what operations we have to perform.

7. Deployment

We created a Power BI Dashboard


Bird Strikes Between 2000-2011
Total No. of Bird Strikes
25.56K
Total Cost Incurred
$142.29M
Total No. of people injured
27
WL Actual Number stuck
69K
Number of bird strikes incidents per year
Number of bird strikes incidents by Sky conditions
Bird Strike Incidents in US
Top 10 Airlines having encountered bird strikes incidents
Cost incurred due to bird strikes incidents
Bird strikes based on climate
Percent of incidents in which flight is impacted
Percent of incidents by phase of flight
Indicated Damage
Altitude
Is Pilot warned about birds