

## Abstract

The 732nd Airlift Squadron, responsible for handling various airlift operations and missions, aims to enhance their operational efficiency. This web application serves as a pivotal solution and offers a robust platform to store, access, and modify training mission data. The web application behaves as a secure gateway between the USAF officers that hold individualized access levels and the database that is hosted on a secure Azure SQL server. It has an intuitive user interface with features that allow easy navigation and a user friendly design, for individuals with low technological and programming experience. The web application, developed on an Express.js framework, streamlines crucial processes that include mass data upload from Excel, manual data entry directly into the database, data modification and deletion, as well as login and access level creation. With raw data accessibility and insightful Microsoft Power BI driven analytical visuals, it empowers informed decision making, therefore, optimizing training mission planning.

## Introduction

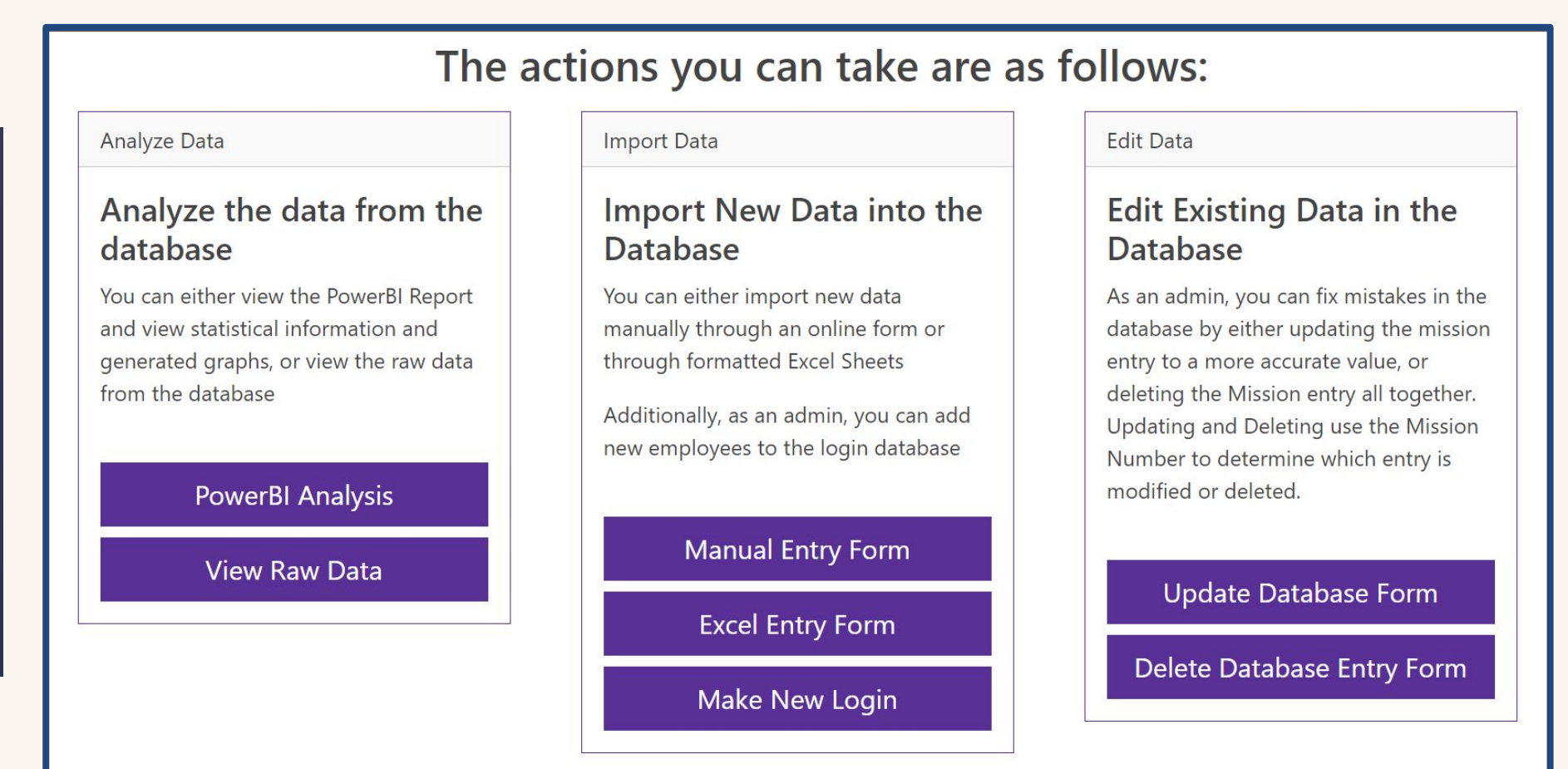
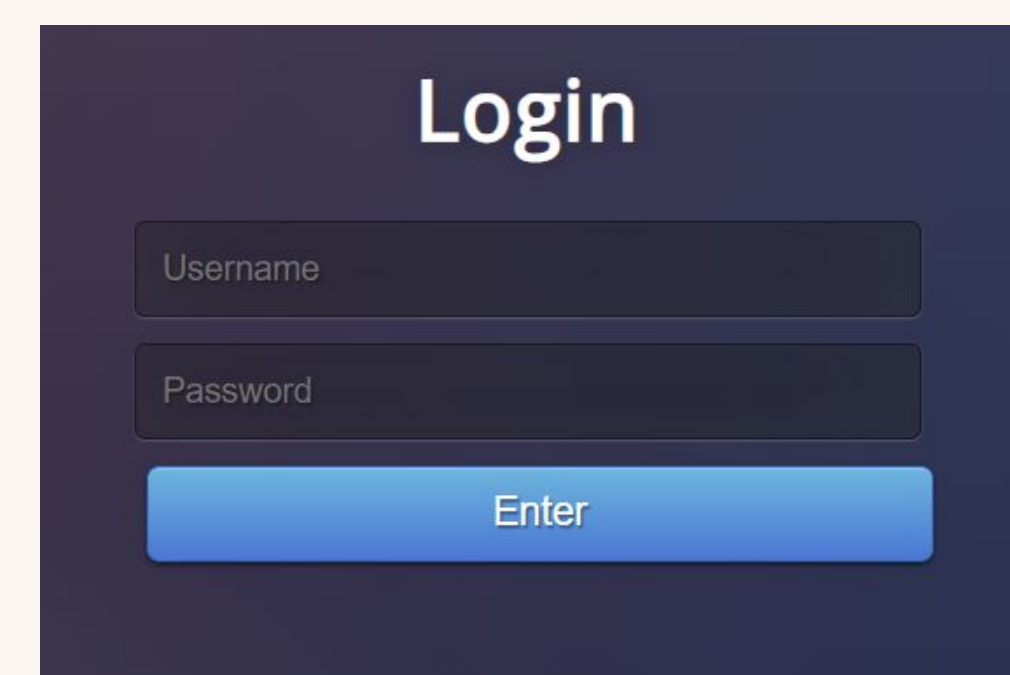
- The United States 732nd Airlift Squadron currently maintains a record of its training missions using Excel spreadsheets. These spreadsheets contain pivotal data encompassing missions spanning multiple years.
- However, the process of scanning through thousands of rows of rows of mission data is both inefficient and unreliable. There exists a pressing need for a more robust solution.
- The primary objective of this project is to develop a web application designed to perform essential functions. This application aims to enable seamless access and modification of the database and visualization of information. It will also operate within authorized and secure parameters to ensure data integrity and confidentiality.

## Methods

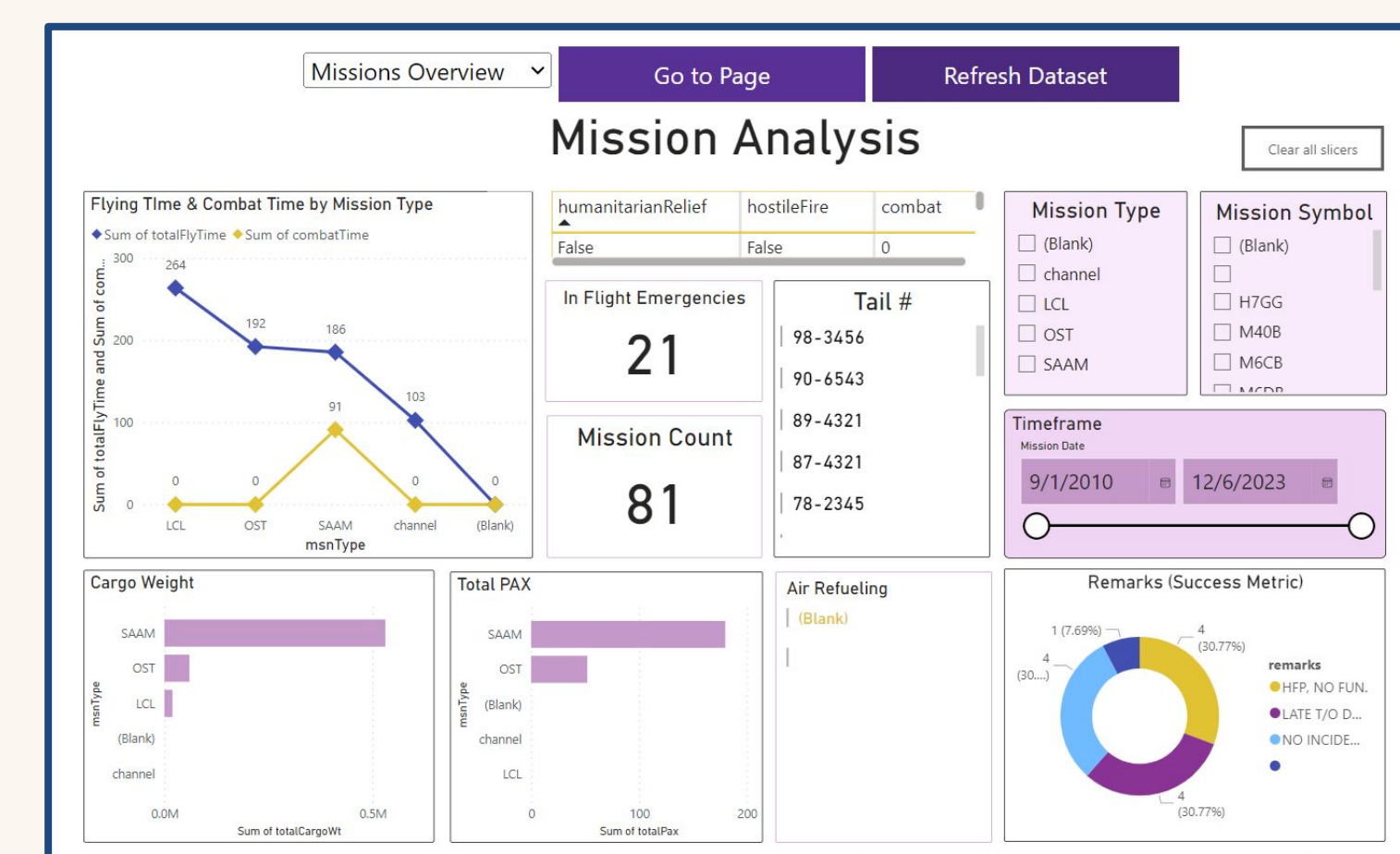
- **Database: Azure SQL**
  - With the provided Excel workbook for reference, a well structured database was created using Microsoft Azure SQL Database. It included a Mission Tracker table with all the mission data and Login table for the web application user login information.
- **Framework: Express.js utilizing Node.js**
  - Express.js and Node.js are JavaScript frameworks that allow us to do backend coding with JavaScript. Express.js is a backend framework for web applications and handles all of the routing and the backend actions through middlewares utilizing Node.js Libraries.
- **User Interface: Bootstrap with Bootswatch Templates, Custom CSS, and Custom JavaScript**
  - Bootstrap is a popular frontend framework to build websites with pre-built templates. Bootswatch is a template of Bootstrap that uses their code to function
  - Custom CSS and JavaScript was written to create custom actions and event handlers
- **Data Visualization: Power BI**
  - The data to populate the Power BI visuals was retrieved by forming a connection to the Azure SQL Server Database Instance. Through critical thinking, various graphs, charts, cards, and filter slicers were created and organized across the report. Once published, the embed code was retrieved and added to the web application.
- **Data Importation and Modification**
  - The web application's frontend allowed the user to perform several manipulations to the database. This was done by forming a connection to the database and crafting extensive backend code to create interfaces that are task specific.

## Results

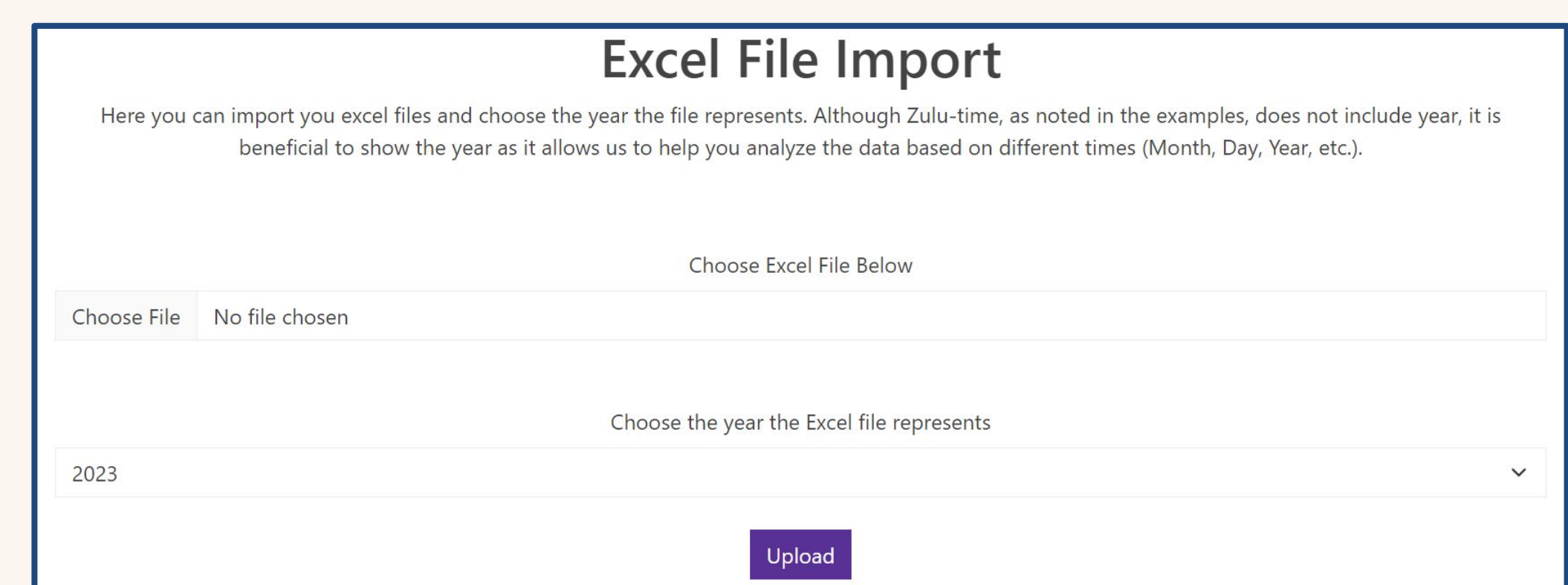
- The outcome of this project is a fully functional website seamlessly integrated with an Azure SQL Database that facilitates functionalities for enabling population and alterations to the database.



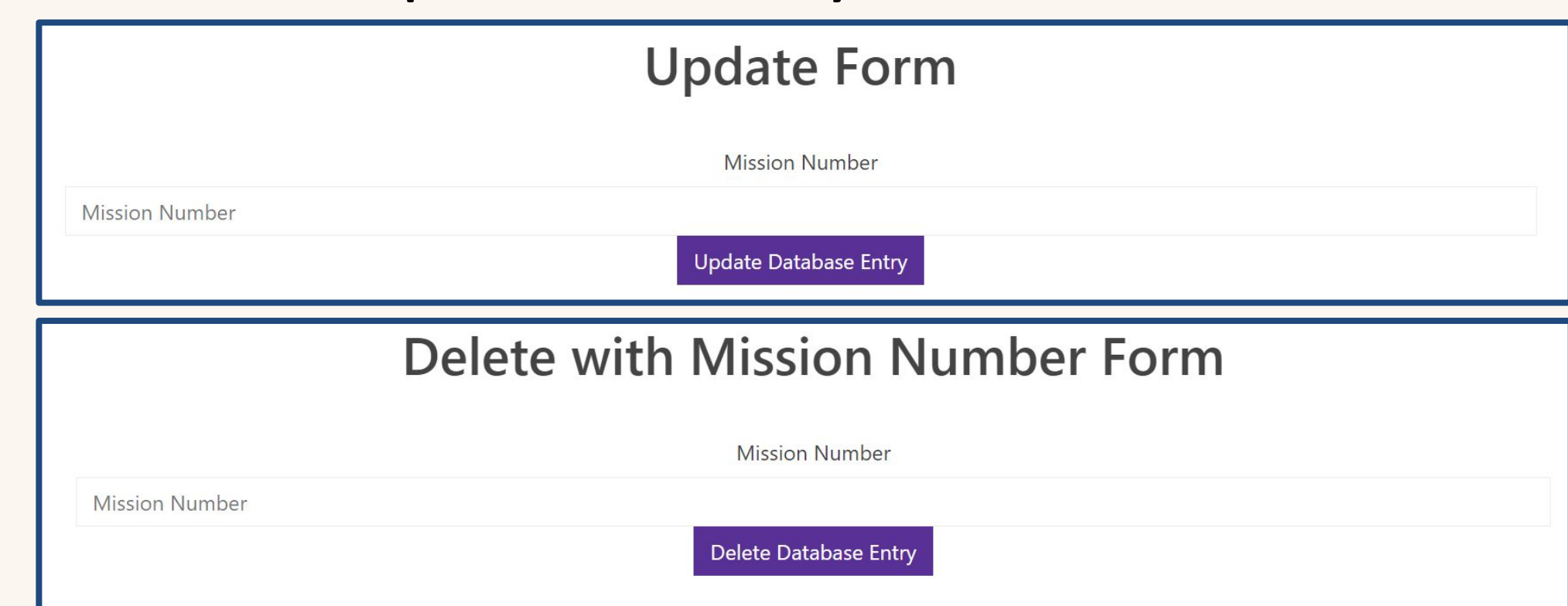
- The website offer two options to analyze data. First, is the ability to query for data, so users can view the database information. Second, is the option to view the fully interactive analytical Power BI report.



- In order to enter new information into the database users may use two methods: manual entry or import an excel. Importing allows previously stored data from multiple excel files to be added into the database.



- Editing the database can be done directly on the website. User have the option to either update already stored data or delete it.



## Future Implementation

- Future implementations of this website would include more functionalities with the database, data manipulation, and representation. This may include:
  - Adding addition table to the database, as well as more fields to existing ones.
  - Performing more protected and secure manipulations on data
  - Creating more Power BI reports specific to particular tasks, or types of web application users.