Power BI Project Documentation

Hoarding Analysis and Management

Aim

The primary aim of this collaborative Power BI project was to develop a comprehensive dashboard for hoarding analysis and management. This dashboard provides valuable insights to stakeholders at Embedded Creations, enabling them to effectively monitor and manage hoarding activities in Nagpur.

Introduction

This document details a collaborative Power BI project developed by a team for hoarding analysis and management. The project delivers valuable insights into compliance with regulations, hoarding types, location distribution, and addresses various data challenges to construct a comprehensive dashboard. The dashboard was developed for Embedded Creations in collaboration with MKSSS-AIT, providing real-time data on hoarding violations and agency finances in Nagpur.

Tools and Technologies Used

- **Power BI:** For data visualization and dashboard creation.
- **DAX (Data Analysis Expressions):** For creating custom queries and calculations.
- **Google Maps**: For location mapping

Data Preparation

The data preparation process involved several steps to ensure a clean and efficient dataset for analysis:

1. **Handling Missing Values and NA Values:**
    - Identified missing values in critical columns and applied appropriate techniques to address them.
    - Replaced NA values with suitable substitutes based on the data context, ensuring a more accurate analysis.
2. **Removing Unwanted Columns:**
    - Removed irrelevant or redundant columns that did not contribute to the analysis, streamlining the dataset for efficient processing.
3. **Data Cleaning and Transformation:**
    - Standardized data formats for dates, addresses, and categorical variables to ensure consistency.

Report Structure

Page 1: Permit Classification

- **Visualization:** Displays bar or pie charts to represent permit compliance rates across various entities responsible for the hoardings (e.g., advertising agencies, property owners).
- **Action:** Clicking on a category allows further exploration of detailed information for a particular agency using drill-through functionality.
    - Two additional buttons are included:
        - One button allows users to access detailed information about specific entities.
        - Another button provides access to account information.

Page 2: Detailed Entity Information

- **Visualization:** Showcases detailed information for the selected entity, including:
    - Applicable certificates for the agency.
    - Certificates requiring renewal.
- **Action:** Selecting a specific agency allows users to drill down to their location details using a DAX query.
    - The DAX query constructs a URL that utilizes Google Maps to display the location on a map.

Dax Query:

```
GoogleMapsURL = "https://www.google.com/maps/search/?api=1&query=" & [Latitude] & "," & [Longitude]
```

Page 3: Location

- **Functionality:** Allows navigation to maps through URLs.
- **Action:** Selecting a specific violation or entity on Slide 2 can trigger a location details drill-down using a DAX query.
- **Information:** Displays location details (address, URL) for the chosen violation or entity.

Page 4: Account Handling

- **Functionality:**
    - Compares revenue generated by compliant hoardings to non-compliant ones.
    - Shows trends in hoarding placements over time.
    - Provides cost analysis associated with hoarding violations.

Challenges Addressed

The project addressed several challenges that were hindering efficient hoarding management:

- **Connectivity Challenges:** Ensured stable and reliable connections for data updates and dashboard interactions.
- **Certificate Submission Tracking:** Improved tracking of certificate submissions and renewals.
- **Account Management Issues:** Streamlined account management processes for better financial oversight.
- **Location Tracing Problems:** Enhanced the accuracy and accessibility of location tracing for hoarding violations.
- **Data Overload and Analysis Difficulty:** Simplified data analysis by cleaning and transforming the dataset, making it easier to derive actionable insights.

Conclusion

The Power BI project for hoarding analysis and management effectively addressed critical challenges and provided a robust platform for monitoring and managing hoarding activities. By delivering real-time data insights, the project supports regulatory compliance, financial management, and strategic decision-making. The collaborative efforts of the team were instrumental in the project's success, demonstrating the power of teamwork in achieving complex analytical goals.