

1. PROJECT IDENTIFICATION

- **Project Title:** Visualizing Housing Market Trends: An Analysis of Sale Prices and Features using Tableau
 - **Project Lead:** M Vasu (Project Lead & Data Visualization)
 - **Team:** M Vasu & Liyakath Ali
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2. PROJECT OVERVIEW

2.1 Purpose

This project aims to decipher the variables influencing real estate values. By analyzing comprehensive housing data, we provide stakeholders with a clear understanding of how structural features and renovation history impact market pricing and sales volume.

2.2 Core Features

- **KPI Overview:** Instant access to Average Sales Price, Total Record Count, and Total Area.
 - **Renovation Impact Analysis:** Histogram-based tracking of sales relative to the "Years Since Renovation."
 - **Age Segmentation:** Pie chart distribution comparing property age and renovation status.
 - **Structural Deep-Dive:** Grouped bar charts analyzing the relationship between house age and floor/room counts.
 - **Web Integration:** Tableau dashboards embedded into a custom Flask web application.
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3. TECHNICAL ARCHITECTURE

3.1 Architecture Overview

The system utilizes a modern data visualization pipeline:

3.2 Frontend & Visualization

- **Tableau Stories:** Sequential narrative dashboards created for data interpretation.
- **HTML/CSS:** Custom web wrapper for the embedded Tableau visualizations.
- **Flask (Python):** Handles the web routing to serve the data stories to end-users.

3.3 Data Processing

- **Data Preparation:** Cleaning and normalizing housing datasets (Excel/CSV) to ensure visual accuracy.
 - **Calculated Fields:** Custom Tableau formulas to determine "Years Since Renovation" and age-based categories.
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4. SETUP & FOLDER STRUCTURE

4.1 Prerequisites

- Tableau Desktop / Tableau Public
- Python 3.x
- Flask

4.2 Folder Structure

Plaintext

Housing_Market_Analysis/

```
├── app.py          # Flask app to host the dashboard
├── housing_data_clean.csv  # Preprocessed dataset
├── Tableau_Workbook.twbx  # Tableau Packaged Workbook
├── static/
|   ├── css/        # Custom styling for the web UI
└── templates/
    ├── index.html   # Web interface with Tableau Embed code
```

5. ANALYTICAL RESULTS & TESTING

- **Functional Testing:** Verified that all Tableau filters (Bedrooms, Bathrooms, Floors) dynamically update the Average Sales Price.
- **Performance Testing:** Optimized the workbook to ensure dashboard responsiveness when handling large datasets.
- **Key Insight:** Properties renovated within the last decade show a **25% higher average sales price** compared to non-renovated homes of the same age.

6. CONCLUSION & FUTURE SCOPE

This project successfully transforms complex real estate data into a visual story. It allows ABC Company to make data-backed decisions on property investments.

Future Enhancements:

- **Predictive Pricing:** Integrating a Scikit-learn regression model to predict future prices directly in the Flask app.
- **Geospatial Mapping:** Using Tableau's mapping features to track price trends by neighborhood.
- **Live API:** Connecting the dashboard to real-time property listing sites.