PROJECT REPORT

1. Introduction

1.1 Project Overview:

This Project analyzes housing market trends using Tableau. By leveraging data visualization, it aims to simplify complex data and promote better decision-making by utilities and policy-makers.

1.2 Purpose:

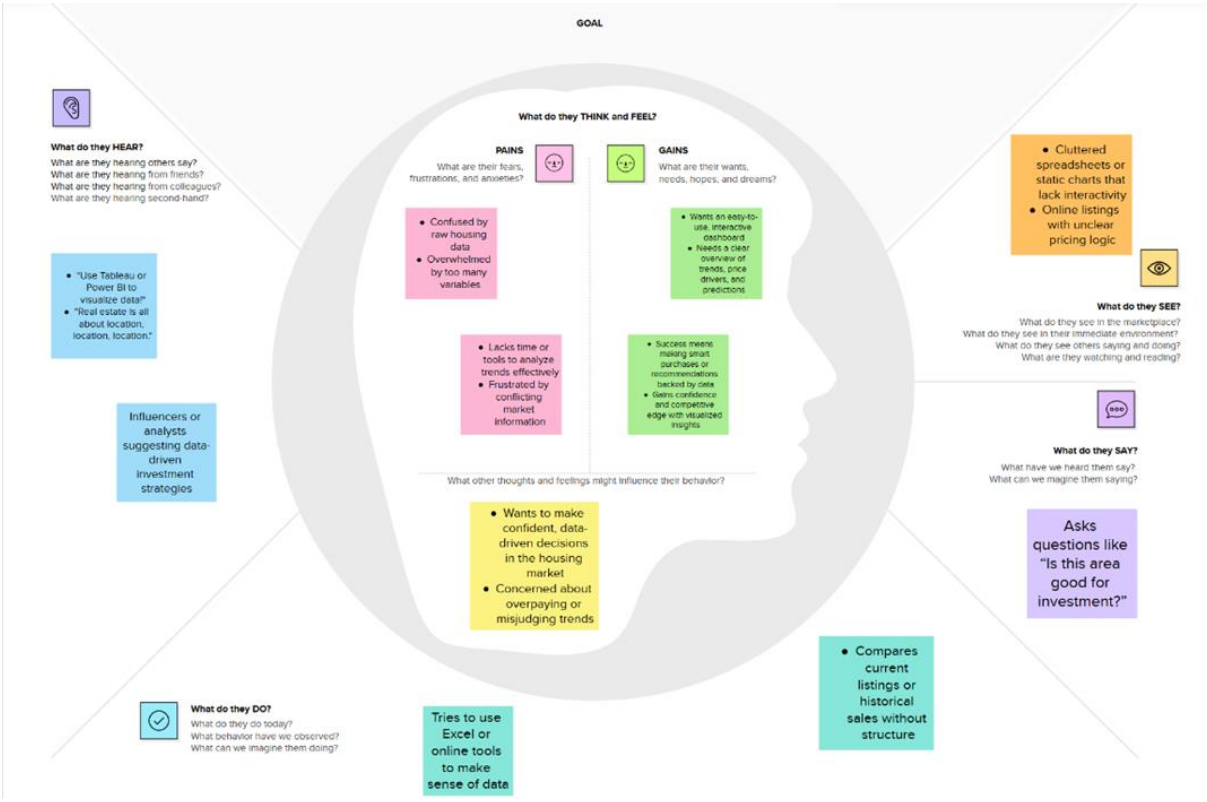
To Visualize housing market trends and analyzing the sale price and features.

2. Ideation Phase

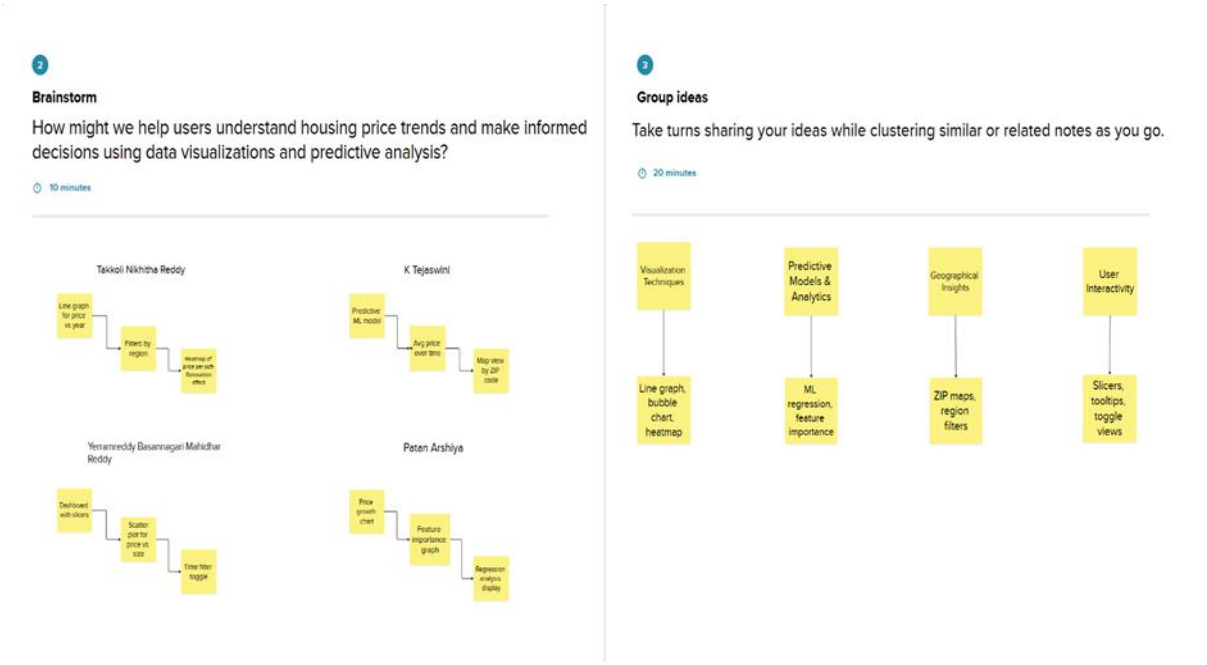
2.1 Problem Statement:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A customer who wants to understand market trends before making a decision.	Explore and interpret housing sale data to identify patterns in pricing and sales trends over time.	The raw data is complex, unstructured, and difficult to visualize without technical skills.	It lacks interactive visual elements and is spread across many variables like location, year, and condition.	Frustrated and uncertain about relying on the data for making confident housing or investment decisions.
PS-2	A customer who is interested in predicting house prices accurately.	Use historical data and key features to build a reliable model for predicting house prices.	It's difficult to identify which factors have the most influence and to visualize their impact clearly.	The relationships between variables (like size, year built, neighborhood) are not obvious without deep analysis or visualization.	Overwhelmed by the data complexity and uncertain about the reliability of predictions without proper tools.

2.2 Empathy Map Canvas:



2.3 BrainStorming



3. Requirement Analysis

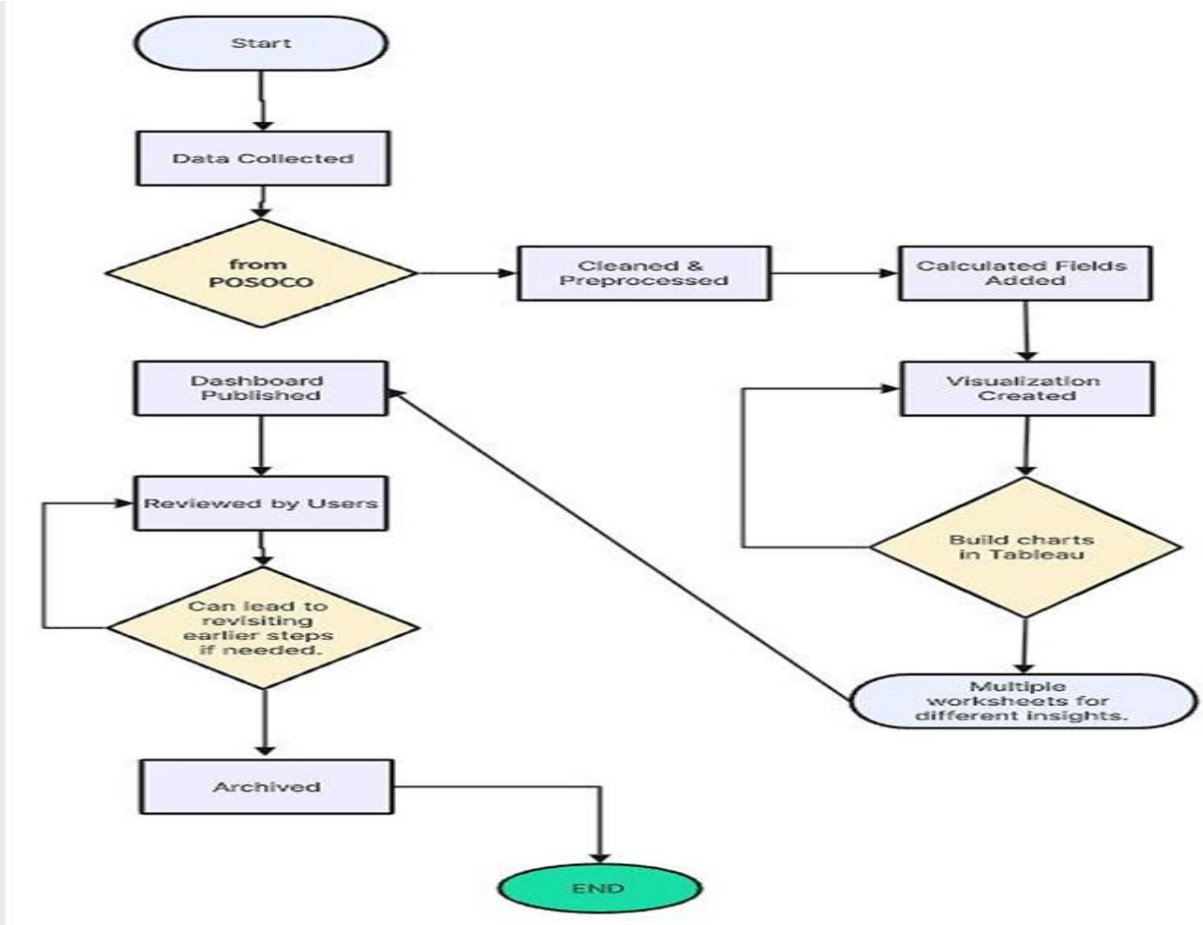
3.1 Customer Journey Map:

3.2 Solution Requirements:

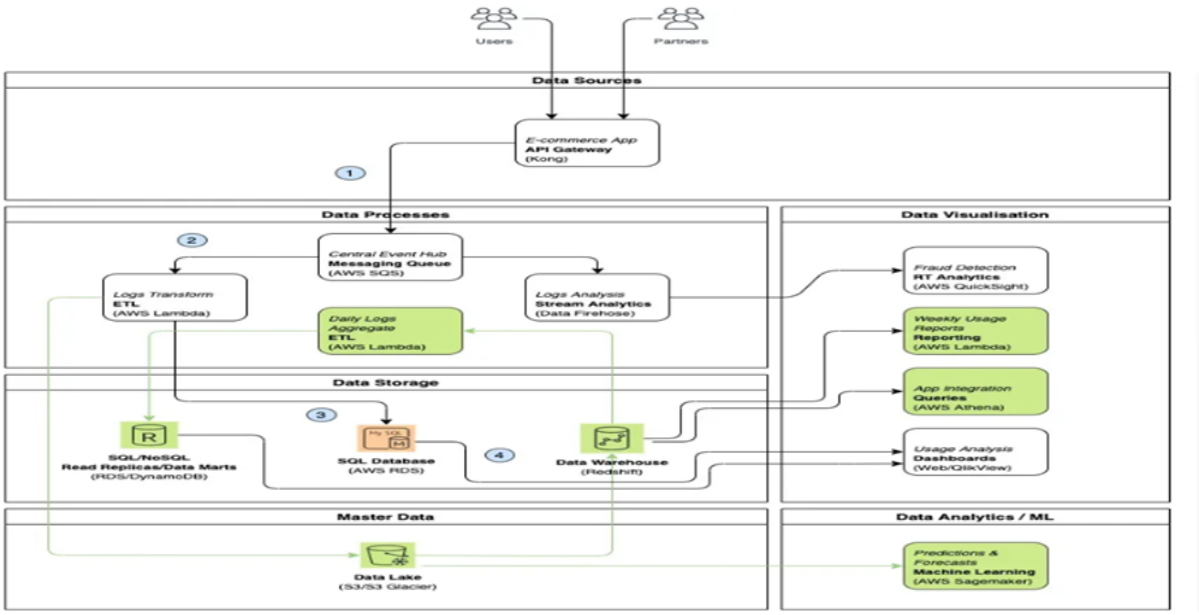
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Data Ingestion	Import property data via API Upload CSV datasets for offline analysis
FR-4	Data Preprocessing	Remove the unwanted or unnecessary data
FR-5	Visualization Dashboard	Display time-series price trends by region/type Filter and compare data by zip code, year, property type
FR-6	User Interaction & Alerts	Let users set preferences for location/type Notify users when price changes exceed threshold (via email/SNS)

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The platform will have an intuitive UI with interactive charts and filters
NFR-2	**Security**	Secure user preferences and data with IAM roles and encrypted storage (KMS)
NFR-3	**Reliability**	The system must provide consistent predictions and dashboards without failure
NFR-4	**Performance**	Dashboards should load and update in under 3 seconds
NFR-5	**Availability**	System will be available 99.9% of the time via AWS-managed services
NFR-6	**Scalability**	Solution should scale to accommodate new cities, property types, or regions

3.3 Data Flow Diagram:

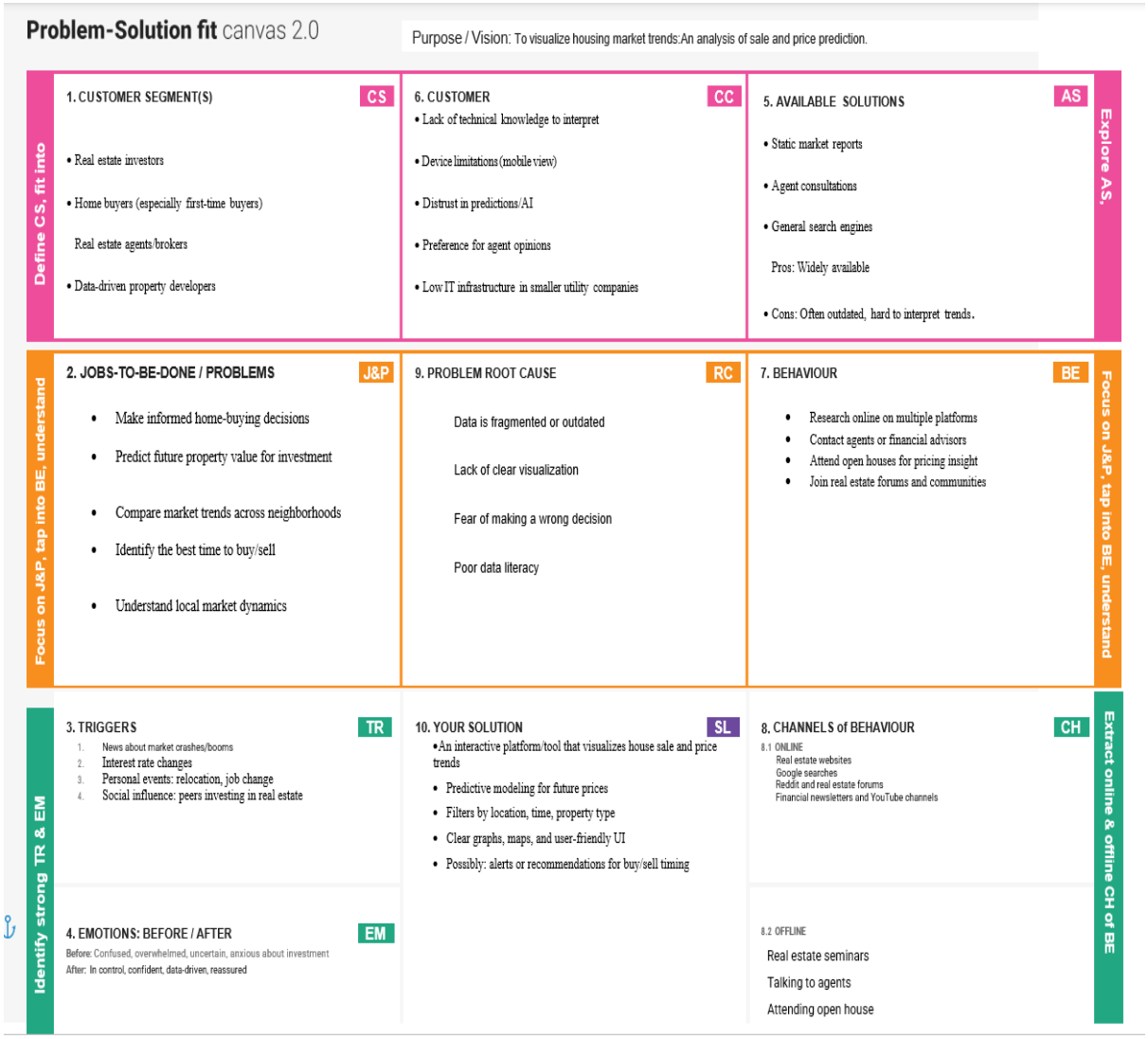


3.4 Technology Stack:



4. Project Design

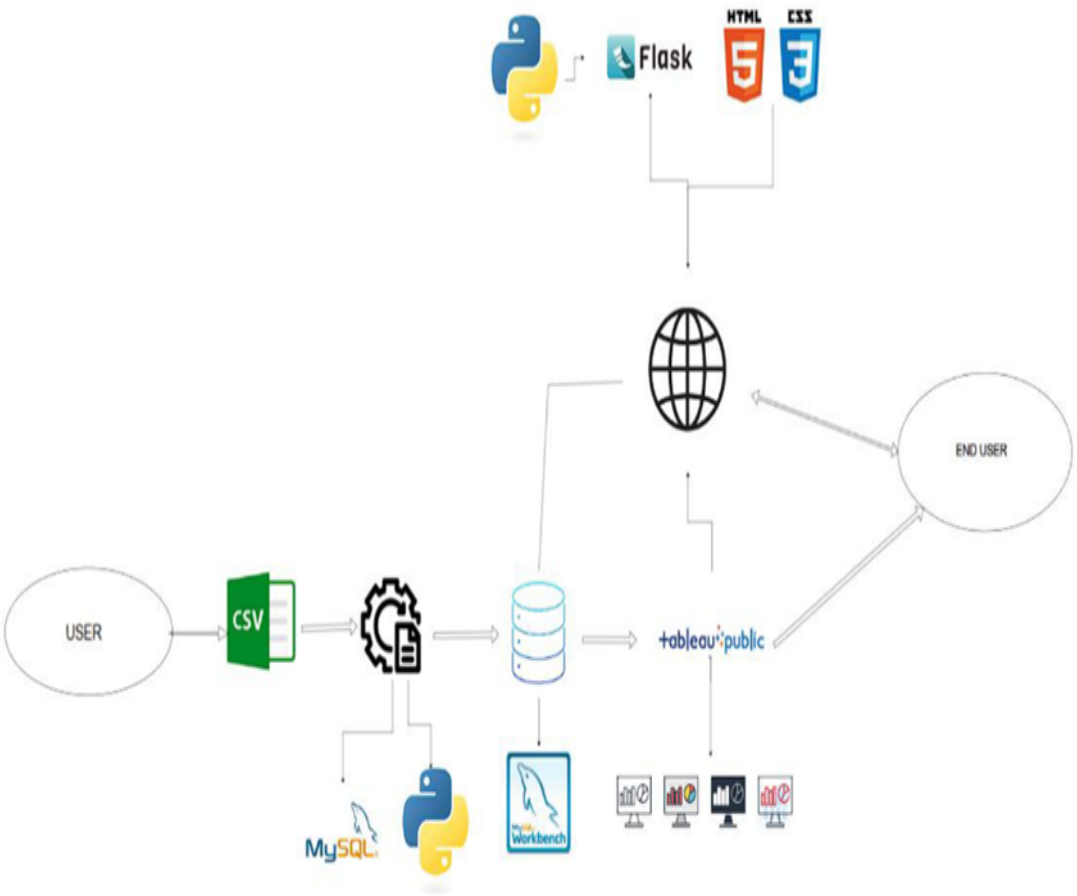
4.1 Problem Solution Fit:



4.2 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The real estate market is complex and often difficult to understand for buyers, investors, and agents due to fragmented, outdated, or hard-to-interpret data.
2.	Idea / Solution description	The project aims to develop an intuitive platform that visualizes housing market trends using historical data and predictive analytics. It will allow users to: • Track property sale patterns over time • Predict future price trends using machine learning models
3.	Novelty / Uniqueness	Unlike existing static reports or property websites, this solution combines: · Dynamic, real-time visualizations · Predictive pricing powered by machine learning
4.	Social Impact / Customer Satisfaction	**Empowers buyers and investors** with data-driven insights, reducing risk and stress. **Increases transparency** in real estate transactions.
5.	Business Model (Revenue Model)	**Freemium Model:** Basic visualizations free; advanced analytics and predictions behind a subscription.
6.	Scalability of the Solution	· **Technically scalable:** Can integrate more cities, countries, or property types over time.

4.3 Solution Architecture:



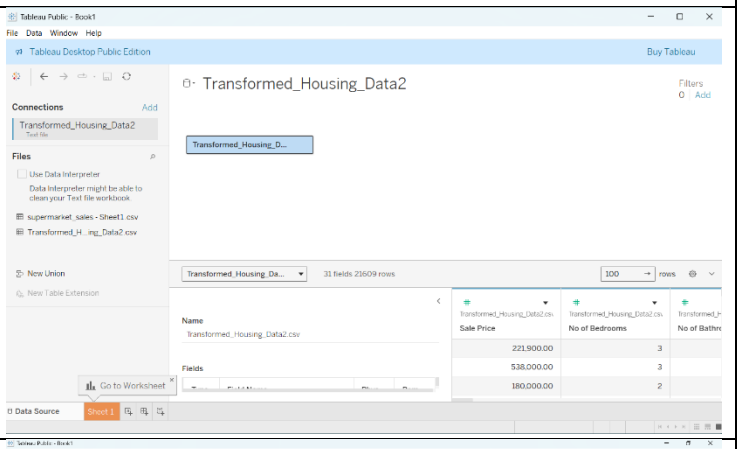
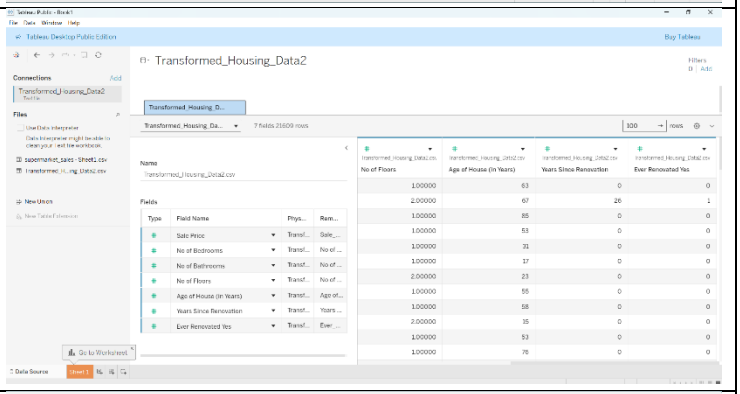
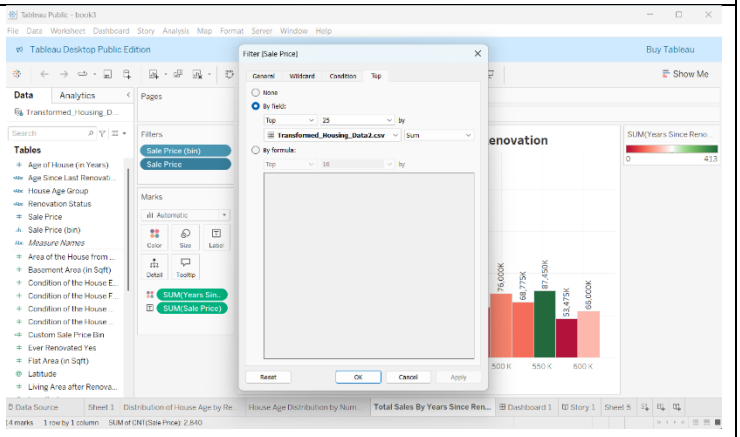
5. Project Planning and Scheduling

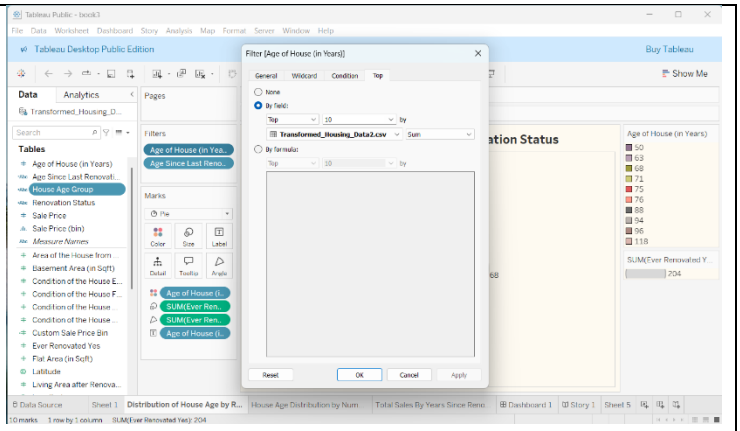
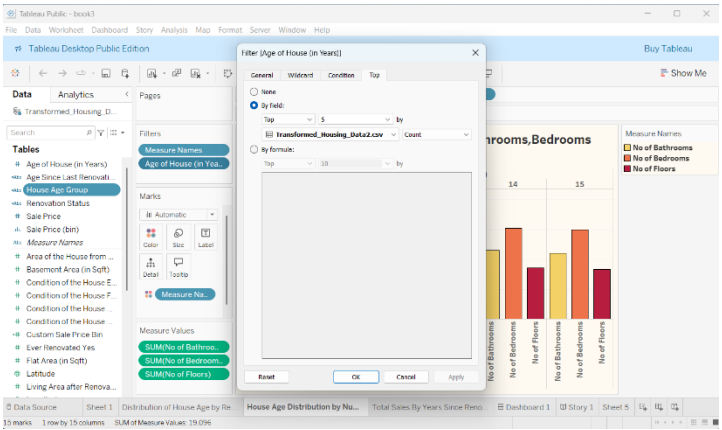
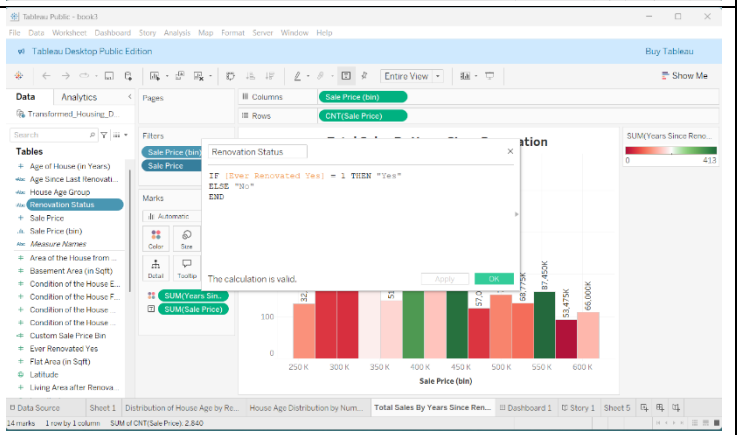
5.1 Project Planning:

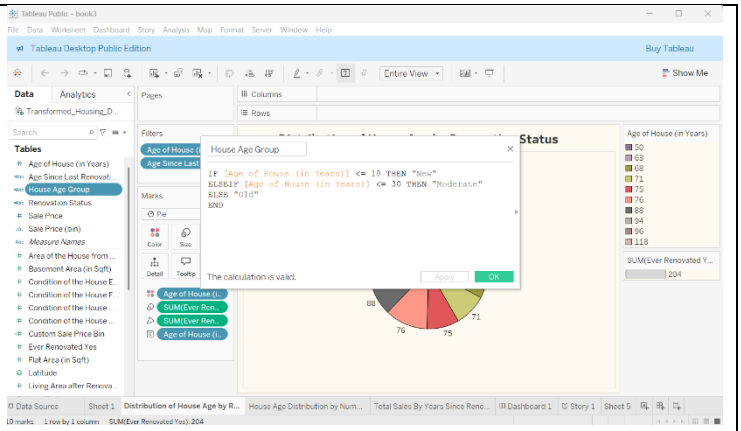
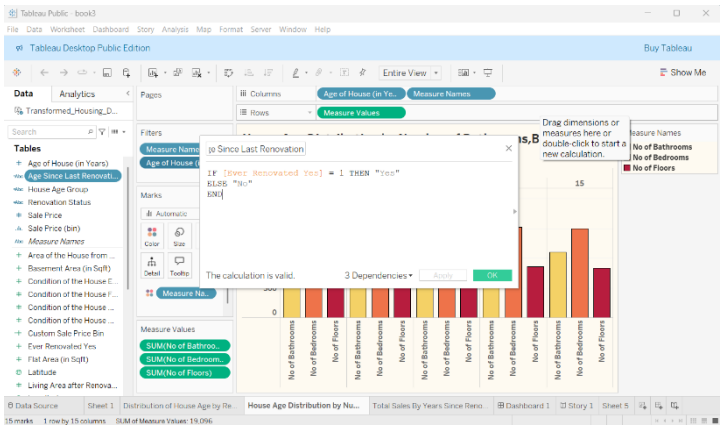
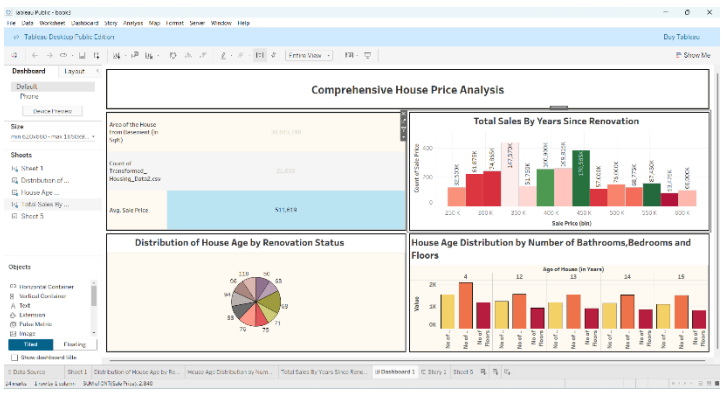
Sprint	Epic	User Story No.	User Story / Task	Points	Priority	Assigned To
Sprint-1	Registration	USN-1	As a user, I can register with my name and email	2	High	T. Nikhitha Reddy
Sprint-1	Upload CSV	USN-2	As a user, I can upload housing market trends data in CSV format	3	High	K. Tejaswini
Sprint-1	Data Cleaning	USN-3	As a developer, I can clean and preprocess uploaded data using Python	4	High	Y. Mahidhar Reddy
Sprint-1	Database Storage	USN-4	As a developer, I can store cleaned data into MySQL	2	Low	P. Arshiya
Sprint-2	Tableau Dashboard	USN-5	As a user, I can view dashboards generated using Tableau	5	High	T. Nikhitha Reddy
Sprint-2	Web Integration	USN-6	As a user, I can access the dashboard via Flask UI	3	High	K. Tejaswini
Sprint-2	Add Filters	USN-7	As a user, I can filter the data by region, year, and quarter	2	Medium	Y. Mahidhar Reddy
Sprint-3	Data Story	USN-8	As a user, I can view a Tableau Story with key market trends insights	2	Low	P. Arshiya
Sprint-3	Forecasting	USN-9	As a developer, I can forecast usage using Prophet	3	Low	T. Nikhitha Reddy
Sprint-3	Documentation	USN-10	As a team, we can prepare final project documentation	2	Medium	K. Tejaswini
Sprint-4	Deployment	USN-11	As a developer, I can deploy the Flask app and publish the Tableau dashboard online	3	High	Y. Mahidhar Reddy
Sprint-4	Demo Prep	USN-12	As a team, we can prepare a live demo walkthrough for stakeholders	2	Medium	P. Arshiya
Sprint-4	Bug Fixing	USN-13	As a developer, I can test and fix UI/visual bugs from user feedback	2	Medium	T. Nikhitha Reddy

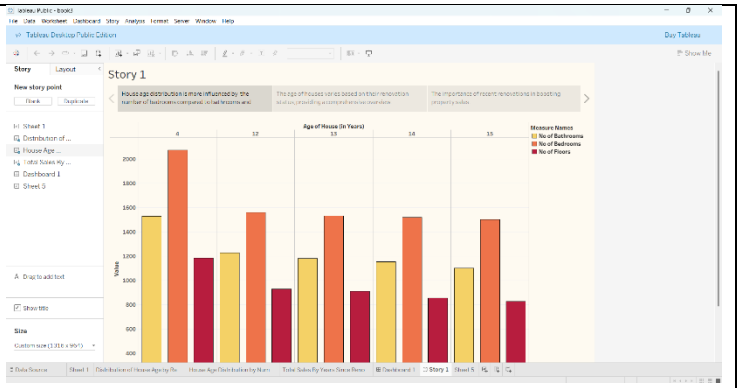
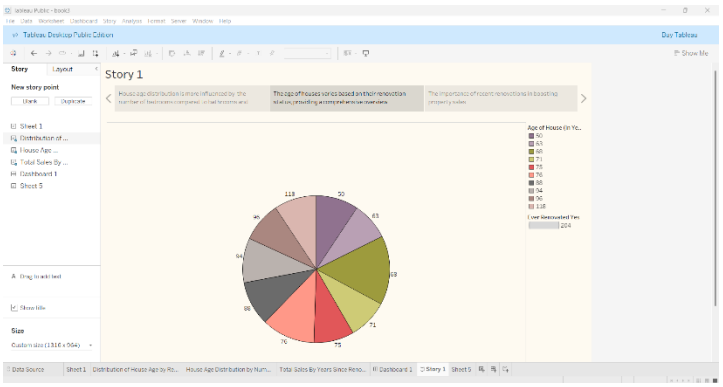
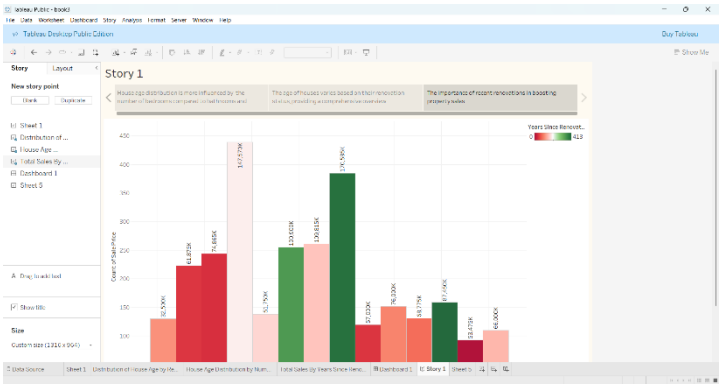
6. Performance Testing

6.1 Tableau:

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	
2.	Data Preprocessing	
3.	Utilization of Filters	

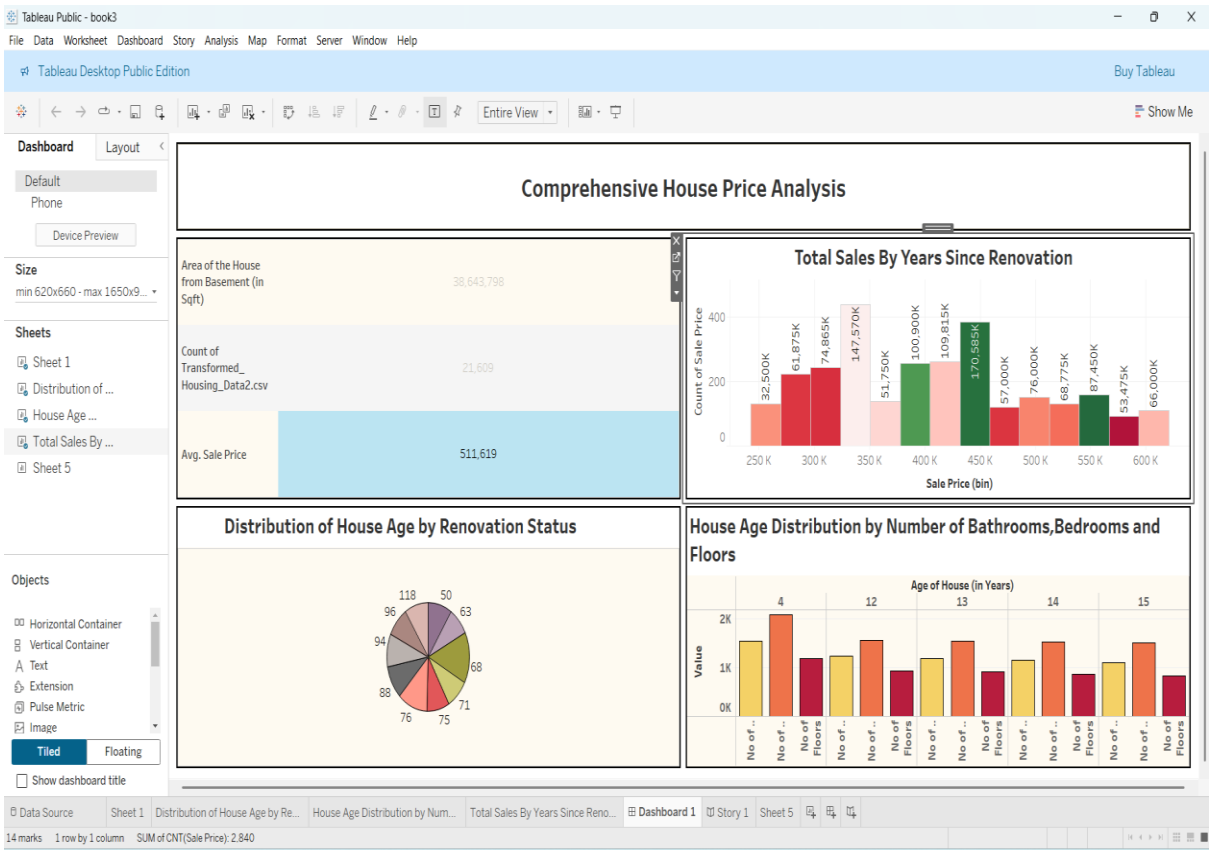
		 
4.	Calculation fields Used	

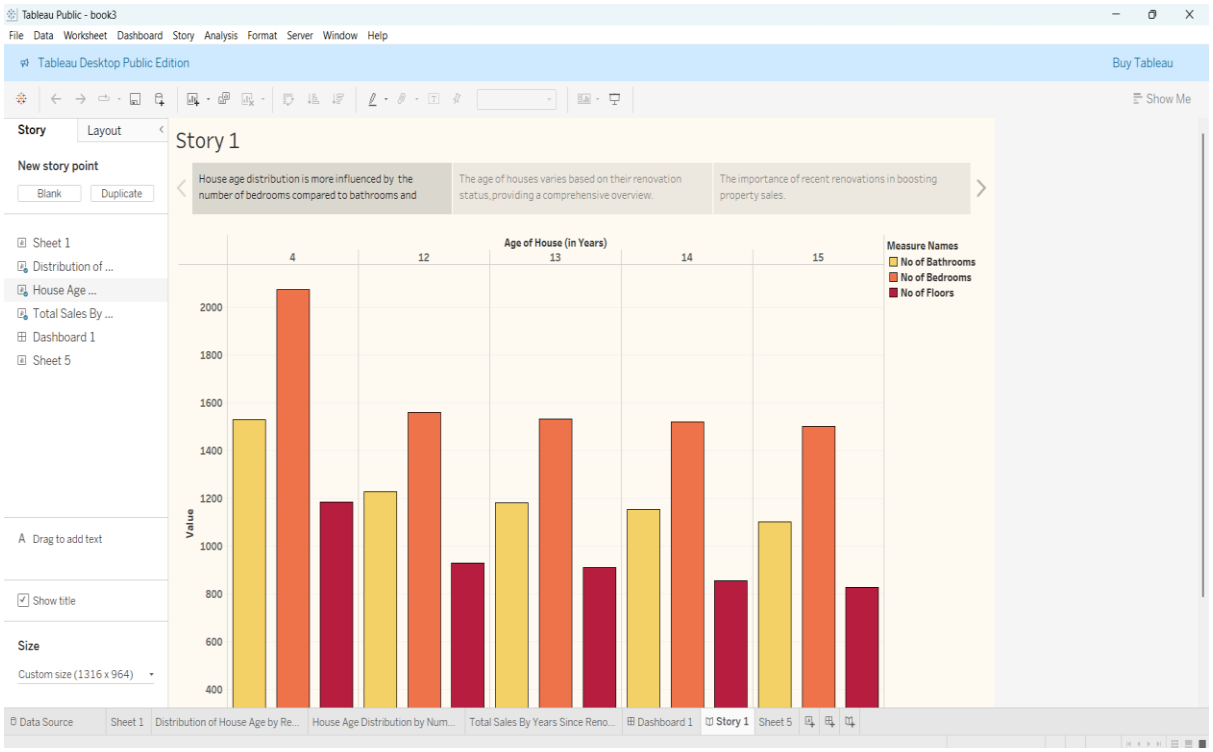
		 
5.	Dashboard design	No of Visualizations / Graphs - 4 visualizations 
6	Story Design	No of Visualizations / Graphs - 3 visualizations

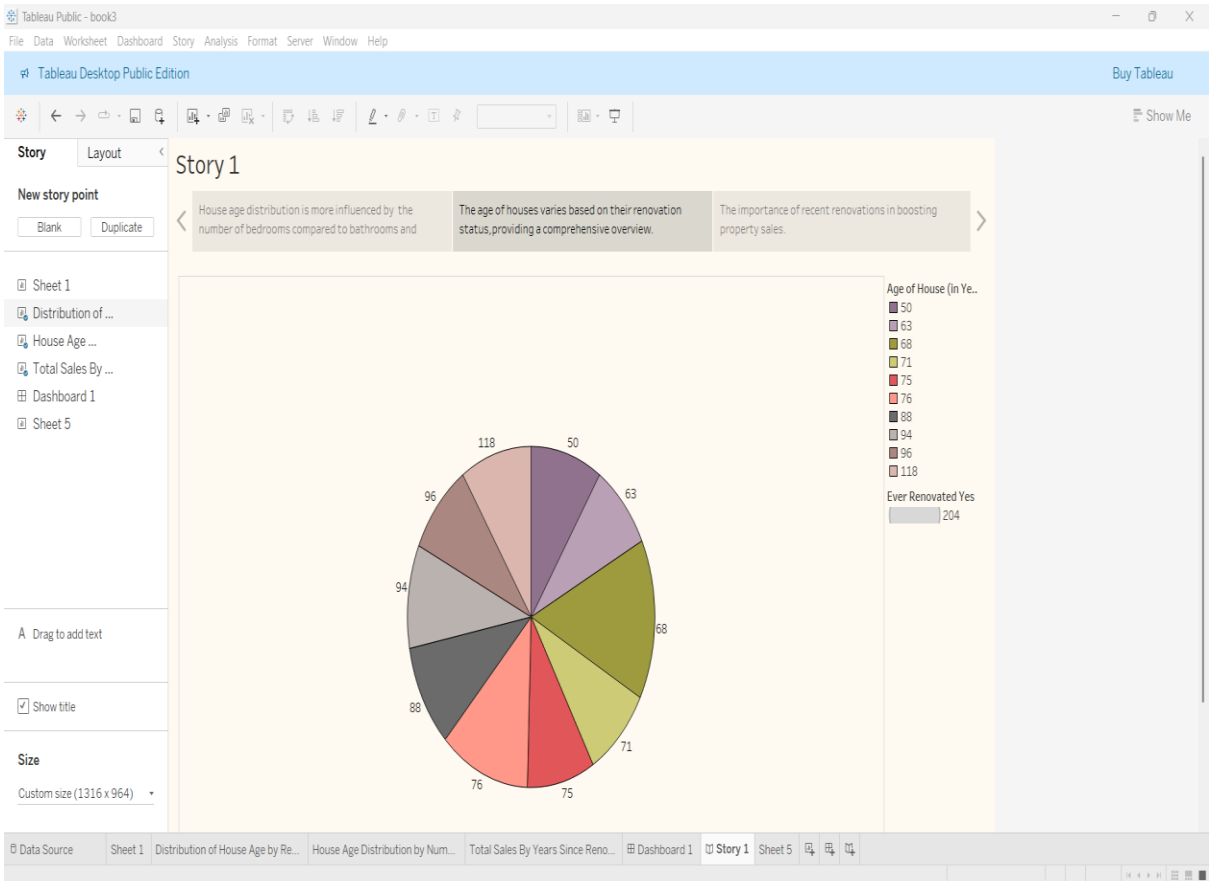
		  

7. Results

7.1 Output Screenshots:



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Total Sales By ...
Dashboard 1
Sheet 5
Story 1
House age distribution is more influenced by the number of bedrooms compared to bathrooms and
The age of houses varies based on their renovation status, providing a comprehensive overview.
The importance of recent renovations in boosting property sales.
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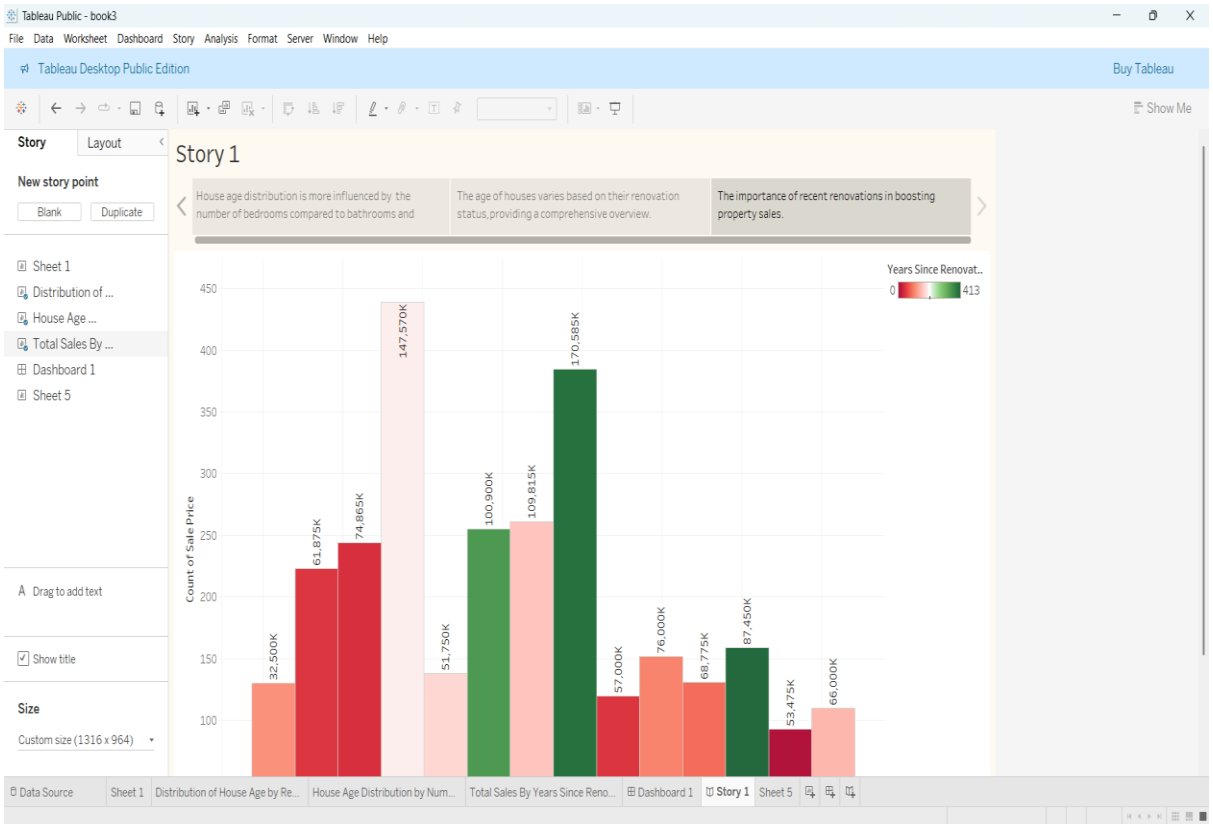
Story 1
Sheet 5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House age distribution is more influenced by the number of bedrooms compared to bathrooms and
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The importance of recent renovations in boosting property sales.
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Dashboard 1
Story 1
Sheet 5

Dashboard:

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Story:

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8. Advantages and Disadvantages

Advantages	Disadvantages
Free, open-source technology stack	Depends on Tableau Public hosting
Visually rich dashboards with no coding	Manual data upload (not automated)
Easy to scale and reuse with other datasets	Limited customization in Tableau Public
Interactive filters and storytelling	Requires stable internet for live dashboards

9. Conclusion

The project successfully demonstrated how data visualization can transform housing market trends data into actionable insights.

10. Future Scope

- Extend the platform to cover more cities or countries, integrating diverse housing markets globally.
- Add support for rental price trends and predictions to attract tenants, landlords, and rental investors.
- Launch a mobile-friendly version for real-time, location-based insights and alerts on the go.
- Integrate deep learning models (e.g., LSTM, transformers) for more accurate and dynamic price predictions.

- Notify users of significant market changes and provide personalized recommendations based on their preferences.

11. Appendix

Source Code: NIL

Dataset Link:

https://www.kaggle.com/datasets/rituparnaghosh18/transformed-housing-data-2

Github Link:

https://github.com/NikhithaReddy-2224/Visualizing-Housing-Market-Trends-An-Analysis-of-Sale-Prices-and-Features-using-Tableau.git