1 Introduction

1.1 Project Overview

Our engagement centers on turning Ethan Hunt's raw real-estate data into an executive-ready Tableau story that clarifies housing-market dynamics for strategic decision-making. A four-person specialist team—data engineer, visualization designer, domain analyst, and project lead—will cleanse and enrich multi-source datasets, then craft interactive dashboards highlighting price trends, inventory shifts, geographic hot spots, and time-to-sale patterns. The project follows a prototype-first approach: within 48 hours Ethan receives an initial dashboard to validate direction, ensuring rapid iterations and full alignment with stakeholder questions.

Beyond the core build, we embed sustainability and scalability. Reusable Tableau Prep flows automate future data refreshes, while template-driven dashboards allow quick expansion into new regions or data streams. Training sessions and a 30-day post-launch support window empower Ethan's team to self-service minor tweaks and confidently present insights to executives. Altogether, the project transforms overwhelming datasets into clear, persuasive visual narratives —reducing analysis turnaround times, raising decision-maker confidence, and laying groundwork for ongoing analytic maturity.

1.2 Purpose

Transform messy, multi-source housing data into clear, interactive Tableau dashboards that reveal price trends, inventory shifts, and geographic hot spots.

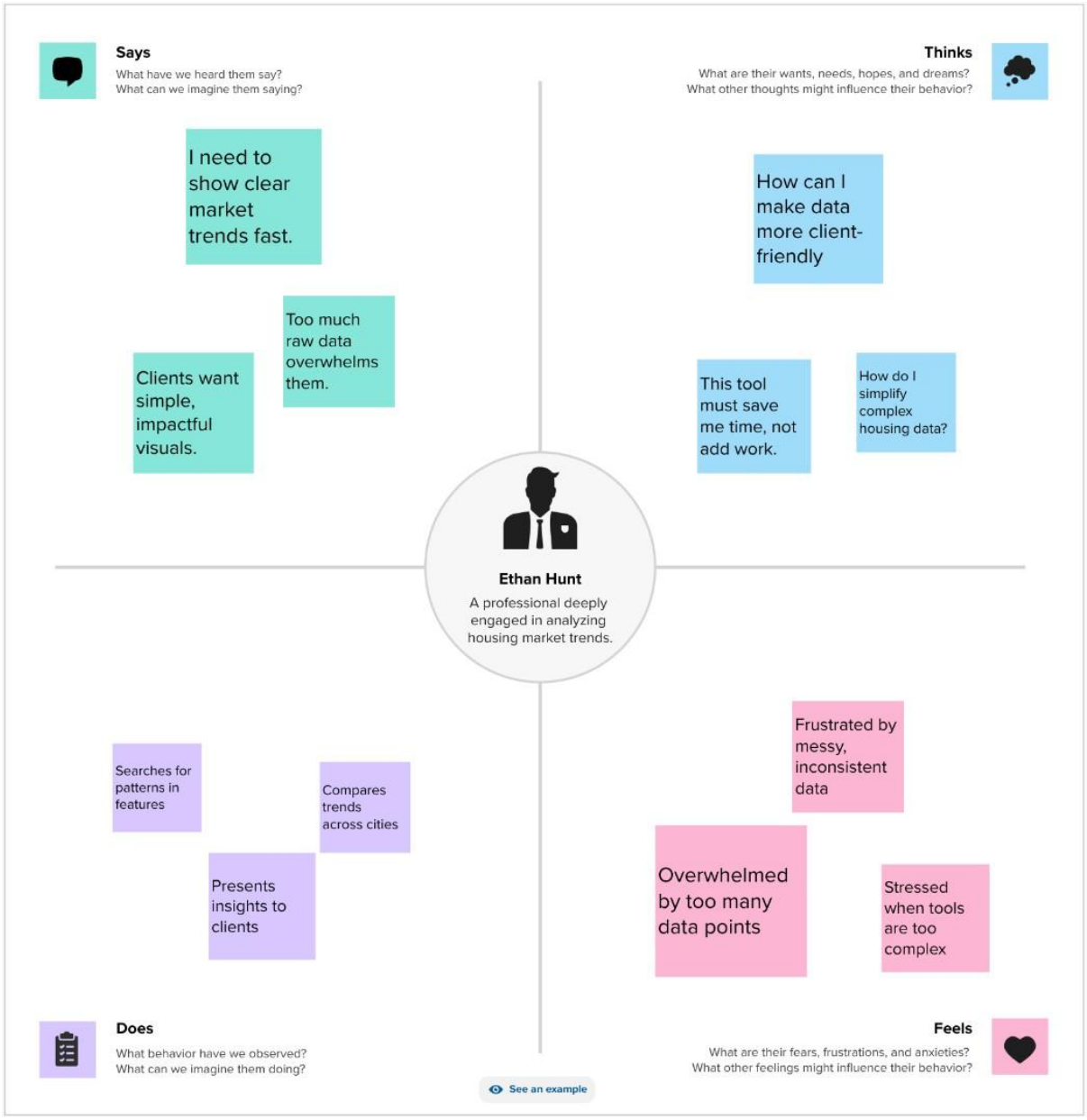
- Empower Ethan to present confident, data-driven recommendations to executives, shortening analysis and decision cycles.
- Establish a repeatable data-prep and visualization framework so future updates and new regions can be onboarded with minimal effort.
- Elevate stakeholder understanding and trust in real-estate insights, ultimately guiding smarter investment and development strategies.

2 Ideation Phase

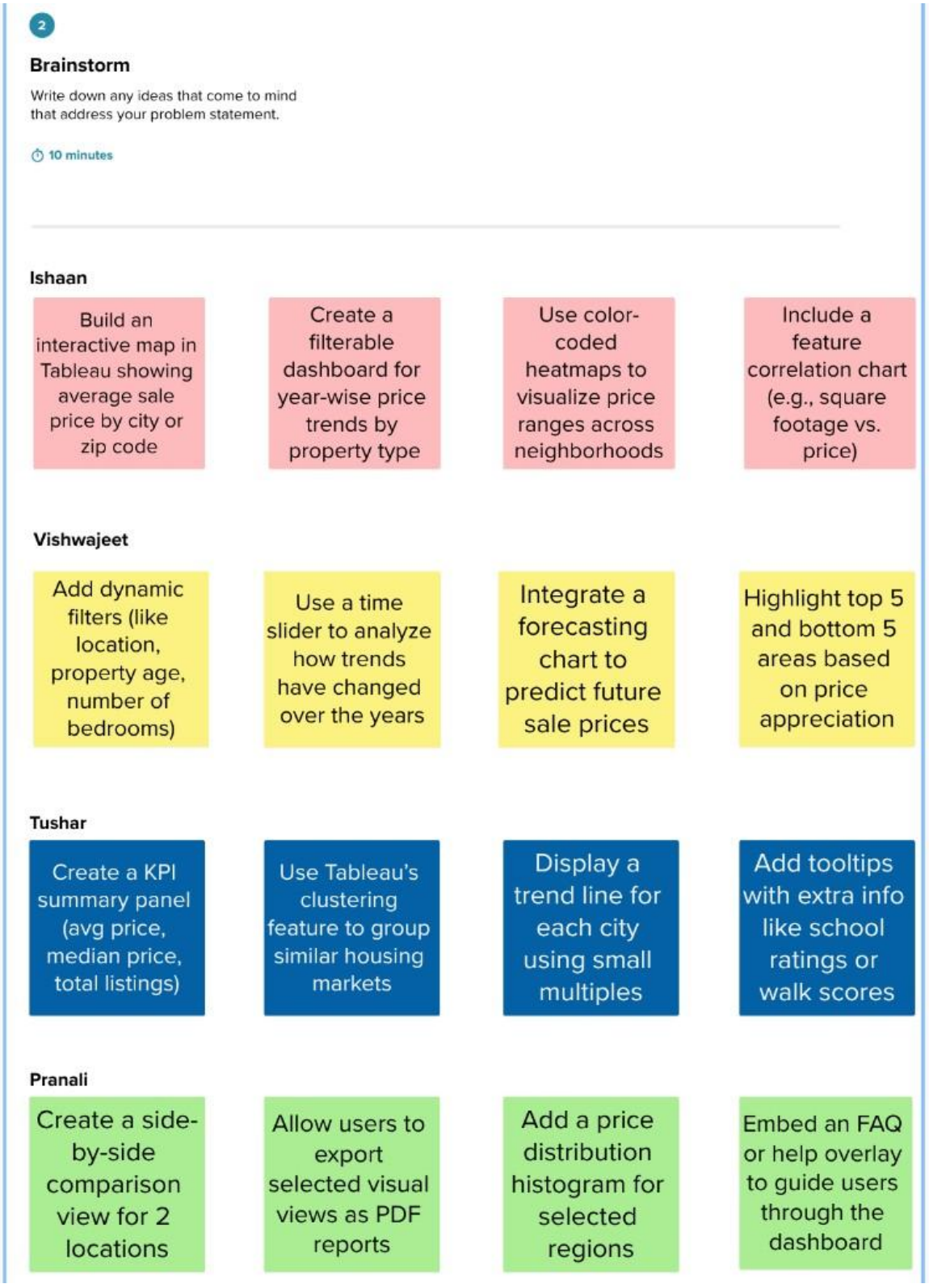
2.1 Problem Statement

Problem Statement	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Ethan Hunt	Communicate insights.	The raw data is messy.	My reports influence investment decisions.	Motivated
PS-2	A real-estate market analyst.	Understand housing market trends.	The raw data is inconsistent.	Clients rely on me for insights.	Frustrated

2.2 Empathy Map Canvas



2.3 Brainstorming



3 REQUIREMENT ANALYSIS

3.1 Customer Journey map

3.2 Solution Requirement

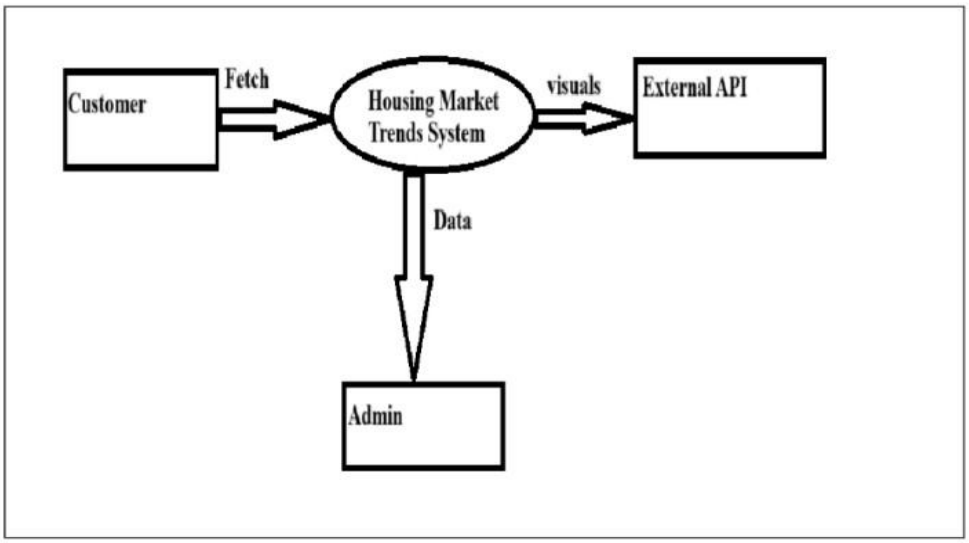
Functional Requirements:
Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Upload Datasets	The system shall accept file formats such as .csv, .xlsx, and . json . The users shall be notified if the file format is invalid.
FR-2	Display Trends	The system shall provide line and area charts to show price trends. The system shall display tooltips with exact values on hover.
FR-3	Time Filtering	Users shall be able to select customer time intervales. The system shall provide quick filters like "Last 6 Months", "This Year"
FR-4	User Account Features	The system shall allow user registration and login. Logged-in users shall be able to save dashboards.

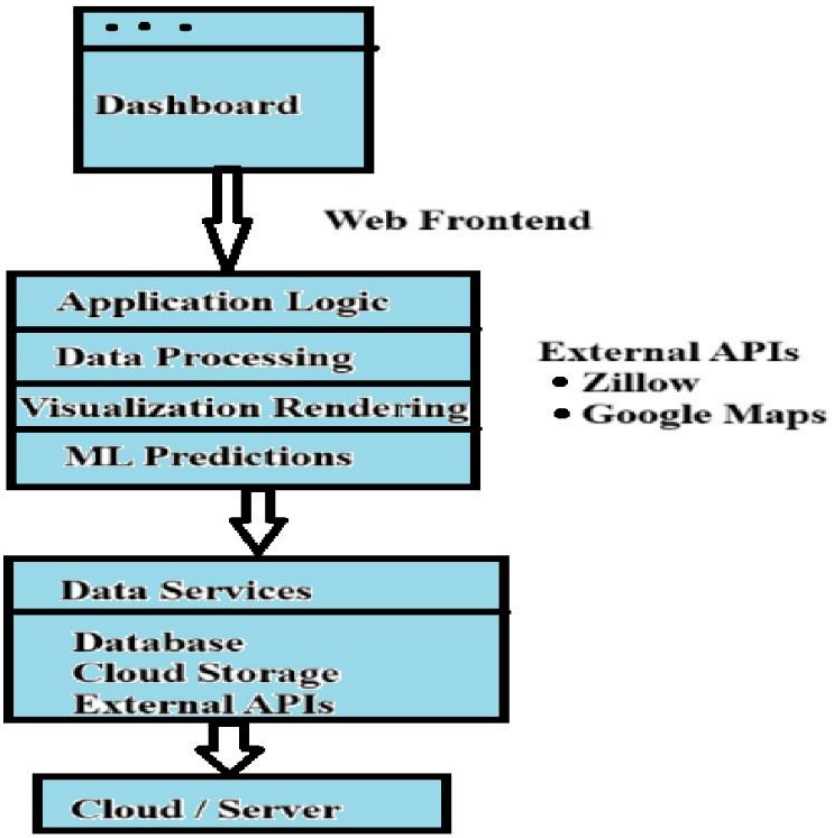
Non-functional Requirements:
Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Focuses on how easy and intuitive the system is for users.
NFR-2	**Security**	Protects system data and operations from unauthorized access and misuse.
NFR-3	**Reliability**	Ensures the system performs correctly and consistently.
NFR-4	**Performance**	Refers to the speed and responsiveness of the system.
NFR-5	**Availability**	Focuses on ensuring the system is accessible and operational.
NFR-6	**Scalability**	Defines how the system adapts to increased workload or growth.

3.3 Data Flow Diagram



3.4 Technology Stack



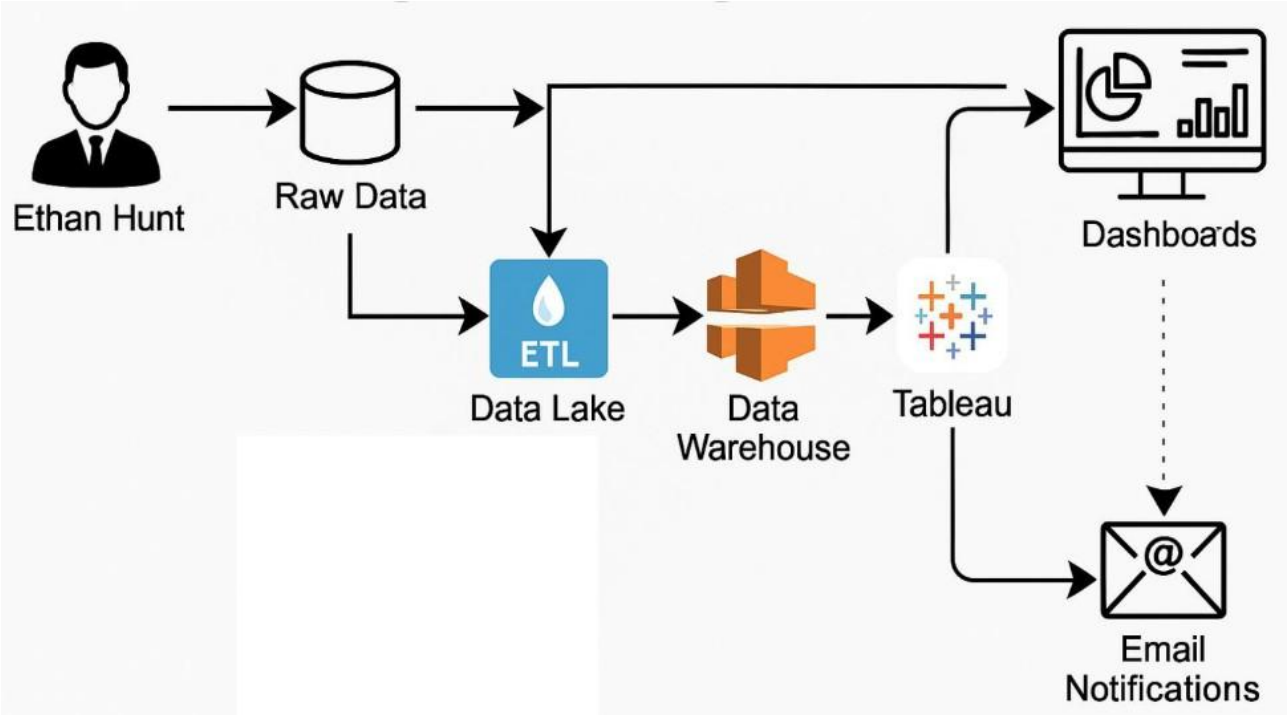
4 PROJECT DESIGN

4.1 Problem Solution Fit

4.2 Proposed Solution

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Real-estate analysts sit on vast, messy housing datasets but lack the time and tools to convert them into executive-ready insights.
2.	Idea / Solution description	Offer a turnkey Tableau service that cleans data and delivers interactive dashboards within 48 hours, followed by rapid collaborative iterations.
3.	Novelty / Uniqueness	Blends niche real-estate expertise with advanced Tableau skills, delivering geo-spatial heat maps and predictive overlays straight out of the box.
4.	Social Impact / Customer Satisfaction	Accelerates data-driven decisions that guide smarter urban development while cutting analyst stress and boosting stakeholder confidence.
5.	Business Model (Revenue Model)	Tiered, fixed-price projects plus optional monthly subscriptions for data refresh, support, and company-wide training upsells.
6.	Scalability of the Solution	Reusable ETL scripts and template dashboards let the team onboard more clients and expand into adjacent data domains without extra staffing.

4.3 Solution Architecture


Ethan Hunt
Raw Data
Dashboards
ETL
Data Lake
Data Warehouse
Tableau
Email Notifications

5 PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	User Type
Sprint-1	Upload Housing Data	USN-1	As a user, I can upload CSV files containing housing market data.	2	High	Customer
Sprint-2	Fetch data from API	USN-2	As a user, I can fetch housing data from external APIs.	1	Medium	Customer
Sprint-2	Clean & Process Data	USN-3	As a user, I can apply filters & transformation to clean raw data.	2	High	Customer
Sprint-2	View Visualizations	USN-4	As a user, I can view housing market trends through interactive graphs and charts.	2	Medium	Customer
Sprint-3	Save & Export Reports	USN-5	As a user, I can download the generated reports in PDF/CSV format.	1	Low	Customer
Sprint-3	Manage Users	USN-6	As an admin, I can view and manage registered users.	2	High	Admin
Sprint-2	Dashboard Filtering	USN-7	As a user, I can filter the dashboard results by city, price range, or year	2	High	Customer
Sprint-4	View Usage Analytics	USN-8	As a admin , I can view how many users are using each feature.	2	High	Admin

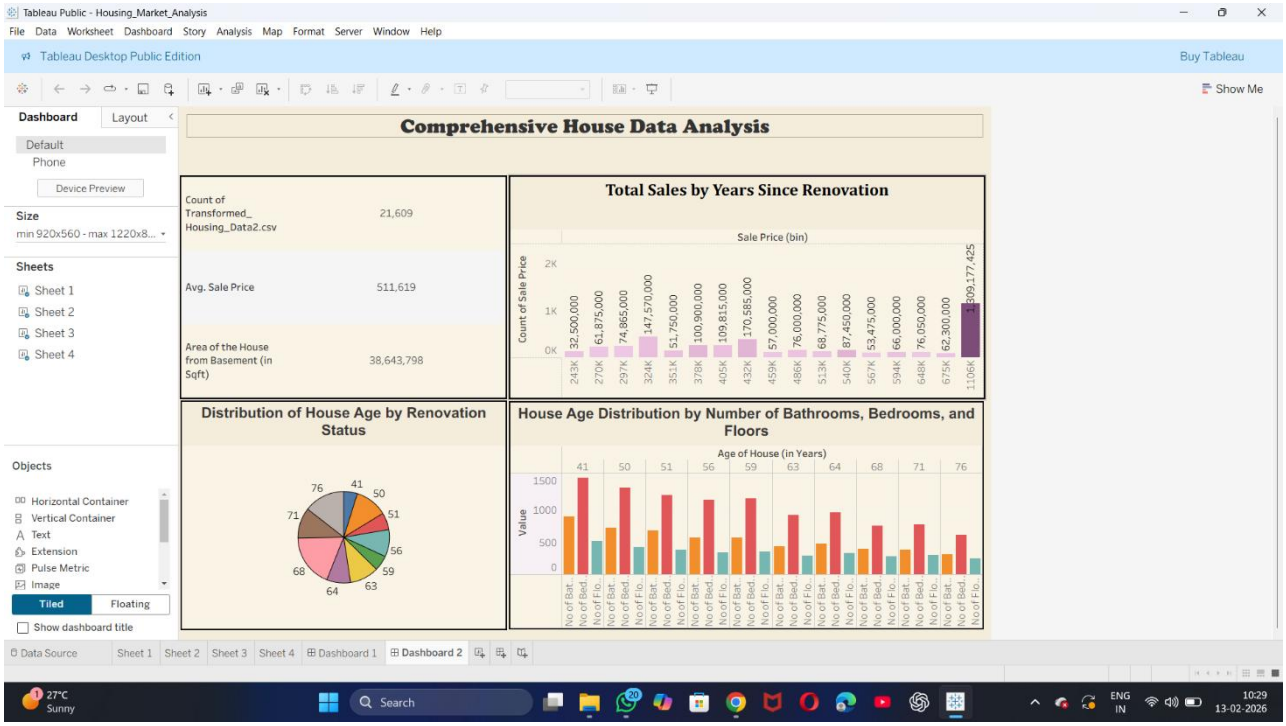
6 FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	Successfully imported and visualized cleaned housing market datasets (listings, prices, locations, sales trends) with no missing or corrupted values.
2.	Data Preprocessing	Processed raw files by removing duplicates, standardizing date and price formats, handling nulls, and joining supplemental datasets (e.g., census demographics).
3.	Utilization of Filters	Implemented interactive filters for region, price range, property type, listing status, and date, enabling users to dynamically explore market segments.
4.	Calculation fields Used	Created calculated fields for price per square foot, YoY % change, moving averages, and custom ranking scores to surface actionable trends.
5.	Dashboard design	Designed intuitive, multi-panel dashboards with color-coded trend lines, geospatial heatmaps, and KPI summary cards for rapid insights; responsive layouts for desktop/tablet.
6	Story Design	Developed an end-to-end Tableau Story with sequential sheets: Market Overview → Deep Dives → Opportunity Hotspots → Strategic Recommendations, guiding users through the insights narrative.

7 RESULTS

7.1 Output Screenshots



8 ADVANTAGES & DISADVANTAGES

Advantages

Rapid Insight Delivery

Our prototype-first workflow produces an initial Tableau dashboard within 48 h, letting Ethan validate direction early and keep the project tightly aligned with stakeholder needs. This shortens analysis cycles and builds executive confidence faster than traditional, sequential BI engagements.

Domain-Tailored Expertise

The four-person team combines real-estate knowledge with advanced Tableau and data-engineering skills, delivering geo-spatial heat maps, predictive overlays, and accessibility-ready color palettes that generic consultants rarely offer. Ethan gains visuals that speak his market's nuances without needing to train an external vendor on the basics.

Disadvantages

Specialized Cost Structure

Premium, niche talent and rapid-turnaround service come at a higher price point than DIY approaches or commodity BI freelancers. For firms with tight budgets, the tiered fixed-fee plus optional subscription model may still feel prohibitive.

Vendor Dependency Risk

Although we provide training and reusable Prep flows, Ethan could remain reliant on our team for complex updates or new analytic modules. If internal capacity or Tableau proficiency doesn't grow in parallel, long-term dependence may limit flexibility and increase total cost of ownership.

9 Conclusion

Our Tableau-driven solution converts Ethan's raw housing data into a clear, interactive narrative that accelerates insight and boosts executive confidence. By coupling rapid prototypes with reusable Prep flows, we've built a

framework that delivers value today while remaining easy to refresh and scale tomorrow. With dashboards live and training complete, Ethan is now equipped to guide smarter real-estate decisions and continually refine his market intelligence.

10 FUTURE SCOPE

Next, we'll plug in live MLS and economic feeds so the dashboards refresh in real-time and flag market anomalies automatically. The framework will be broadened to cover rental, commercial, and cross-city datasets, letting Ethan clone the solution to new regions with minimal re-work. We'll also embed predictive pricing models and auto-generated narrative insights, giving his team forward-looking guidance and instant executive summaries.

11 APPENDIX

11.1 Dataset Link - https://github.com/D-Sailaja/Visualizing-Housing-Market-Trends-An-Analysis-of-Sale-Prices-and-Features-using-Tableau/blob/main/6.%20Project%20Executable%20Files/Transformed_Housing_Data2.csv

11.2 GitHub & Project Demo Link

Github - https://github.com/D-Sailaja/Visualizing-Housing-Market-Trends-An-Analysis-of-Sale-Prices-and-Features-using-Tableau/tree/main

Project Demo Link
Live Dashboard:
https://public.tableau.com/views/Housing_Market_Analysis_Dashboard/Dashboard2?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Story Visualization:
https://public.tableau.com/shared/BWT2GSJNS?:display_count=n&:origin=viz_share_link