1 Introduction

1.1 Project Overview

Our initiative focuses on transforming Lucas raw and fragmented real-estate datasets into an executive-ready Tableau narrative that unlocks actionable housing-market insights for strategic decisions. A four-member expert team—consisting of a data engineer, visualization expert, market analyst, and team lead—will clean, enhance, and integrate multiple data sources, culminating in dynamic dashboards that spotlight pricing movements, inventory fluctuations, regional patterns, and sales velocity.

Taking a prototype-first approach, Ethan will receive an early version of the dashboard within 48 hours for quick validation. This enables fast iteration and ensures tight alignment with stakeholder priorities from the outset.

To build longevity and adaptability into the solution:

- Automated Tableau Prep workflows streamline future data updates.
- Modular dashboards allow rapid deployment across additional geographies or data types.
- Targeted training and 30-day post-deployment support empower Ethan's team to make independent refinements and deliver compelling presentations to senior leadership.

In essence, the project converts complex housing data into accessible, story-driven visuals—accelerating analysis timelines, enhancing leadership confidence, and fostering long-term data fluency

1.2 Purpose

- Convert disorganized, multi-source housing datasets into intuitive Tableau dashboards that highlight pricing patterns, supply changes, and regional demand.

- Enable Ethan to deliver data-backed recommendations to senior executives, speeding up both analysis and decision-making processes.

- Create a repeatable framework for data prep and visualization that simplifies updates and eases expansion to new markets.

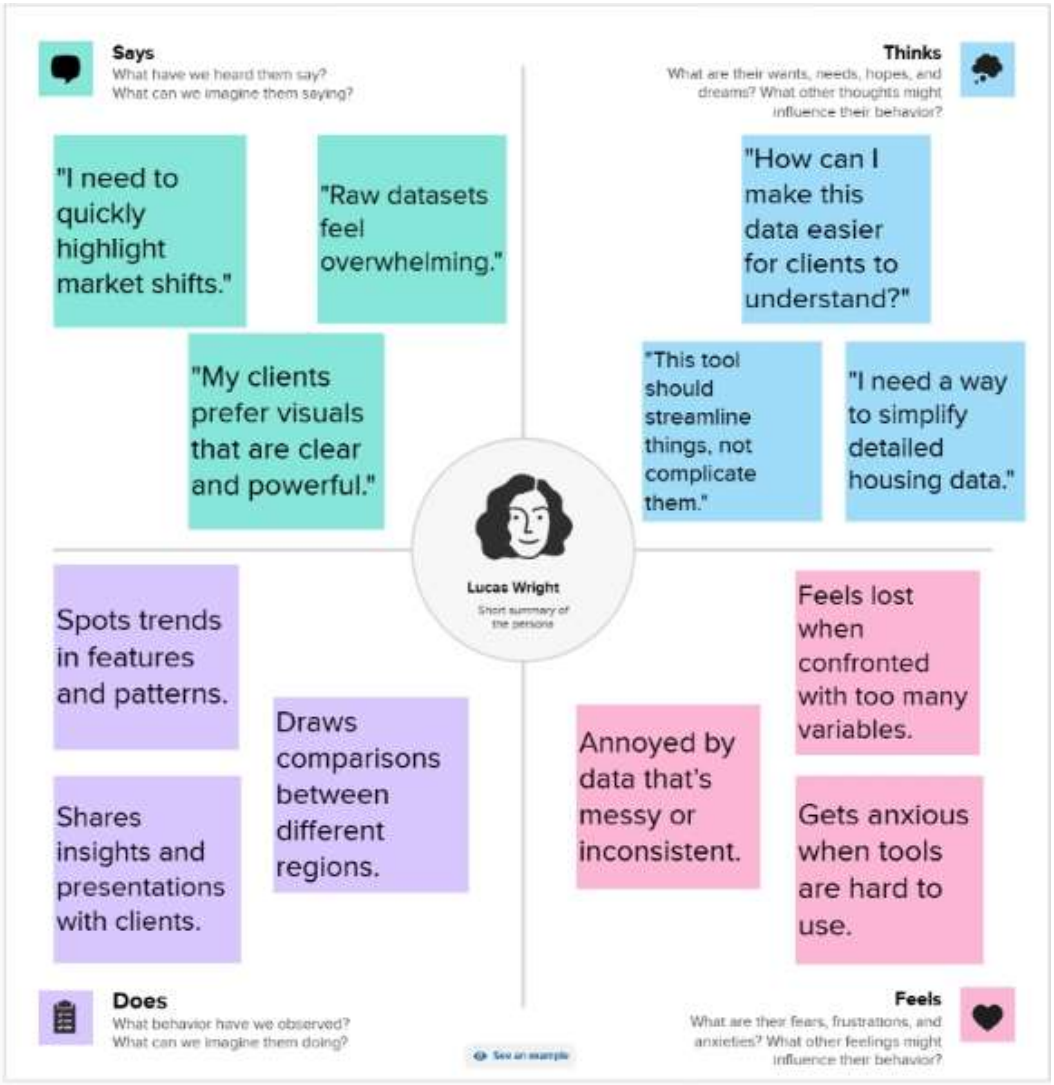
- Improve stakeholder comprehension and confidence in housing metrics—ultimately steering smarter real-estate investment and development decisions.

2 Ideation Phase

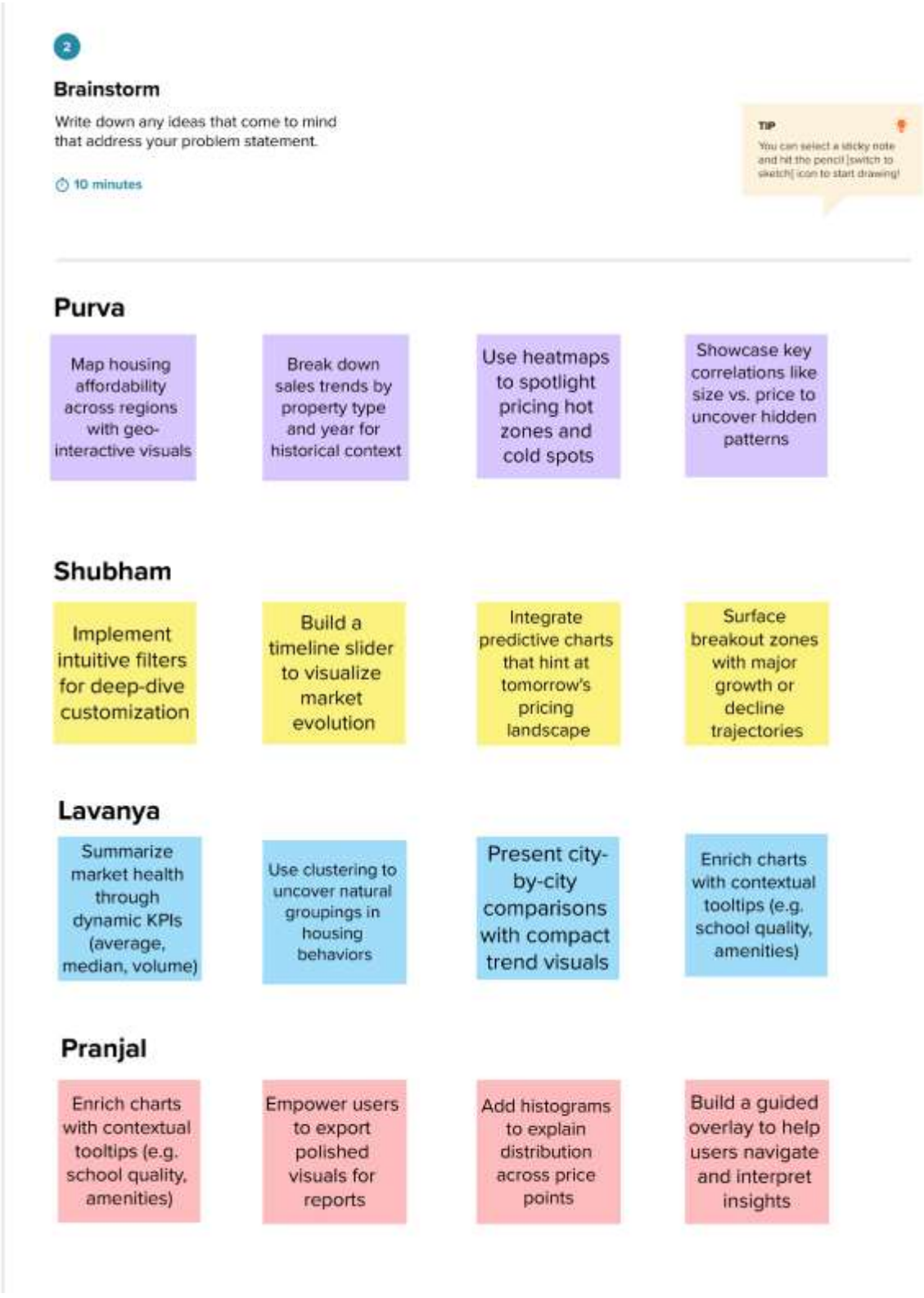
2.1 Problem Statement

Problem Statemen t	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Lucas Wright	Present clear housing market trends to my clients	The data is scattered across multiple sources and hard to consolidate	Clients rely on timely insights for investment decisions	Frustrated yet determined to streamline the process
PS-2	A real estate data strategist	Identify patterns in regional housing demand	Visualizations lack depth and don't reflect nuanced shifts tent.	Understanding local demand drives targeted development	Eager to enhance my data storytelling skills

2.2 Empathy Map Canvas

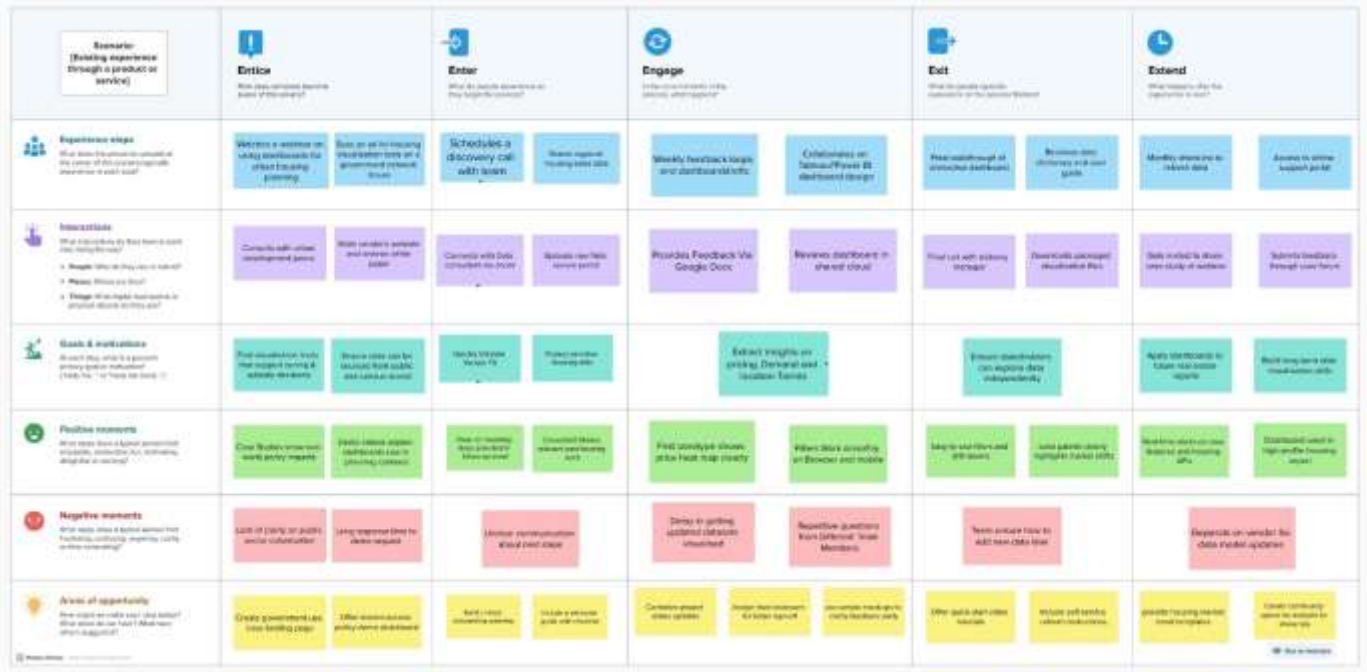


2.3 Brainstorming



3 REQUIREMENT ANALYSIS

3.1 Customer Journey map



3.2 Solution Requirement

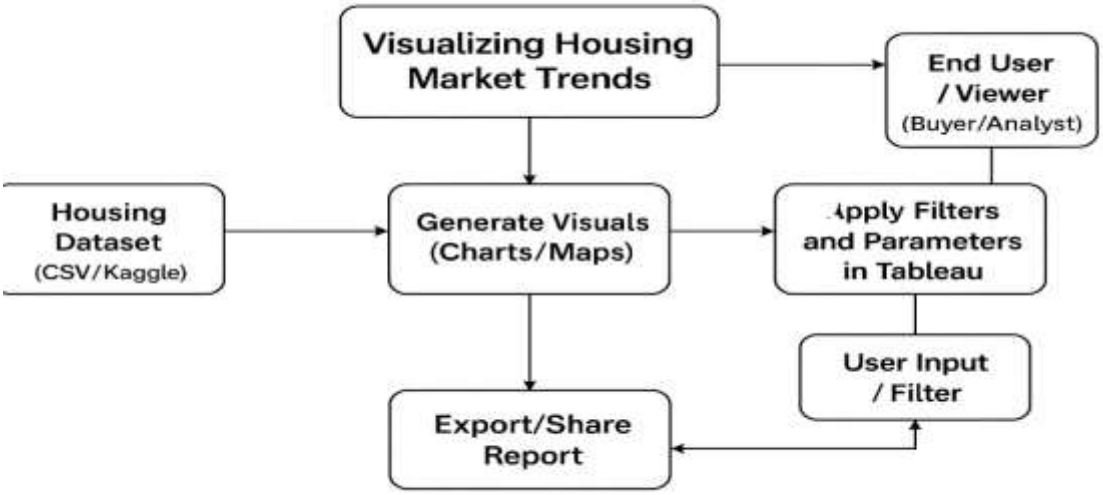
Functional Requirements:
Following are the functional requirements of the proposed solution.

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.

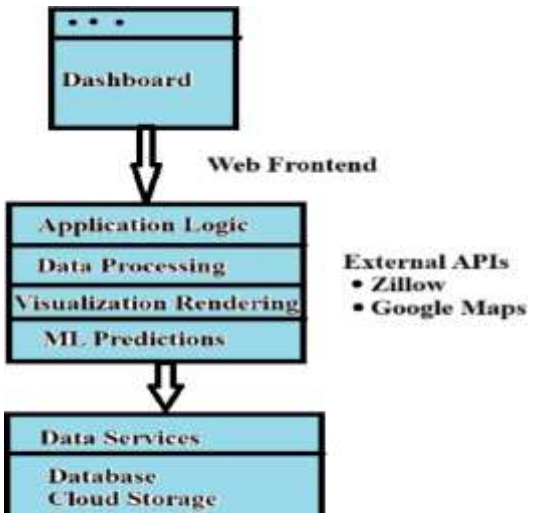
Non-functional Requirements:
Following are the non-functional requirements of the proposed solution.

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

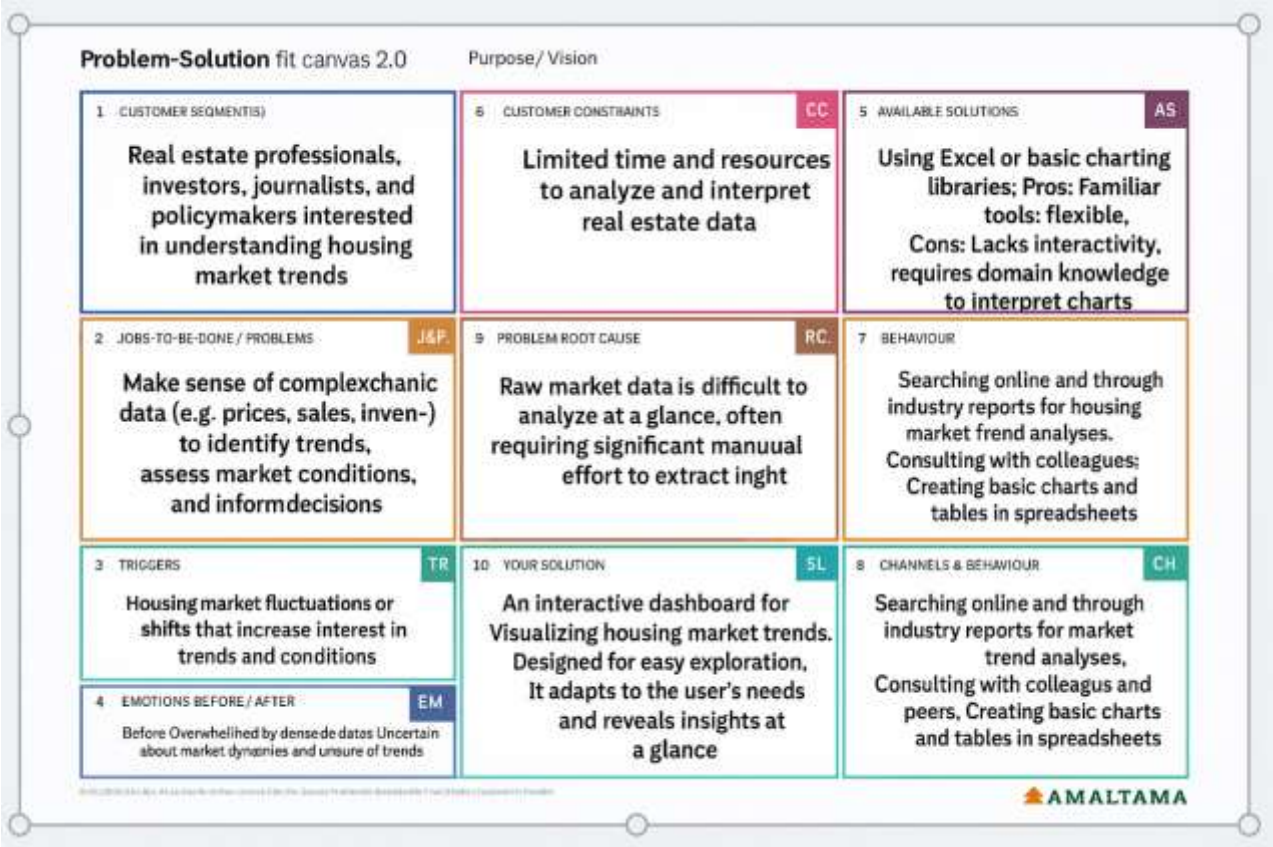


3.4 Technology Stack



4 PROJECT DESIGN

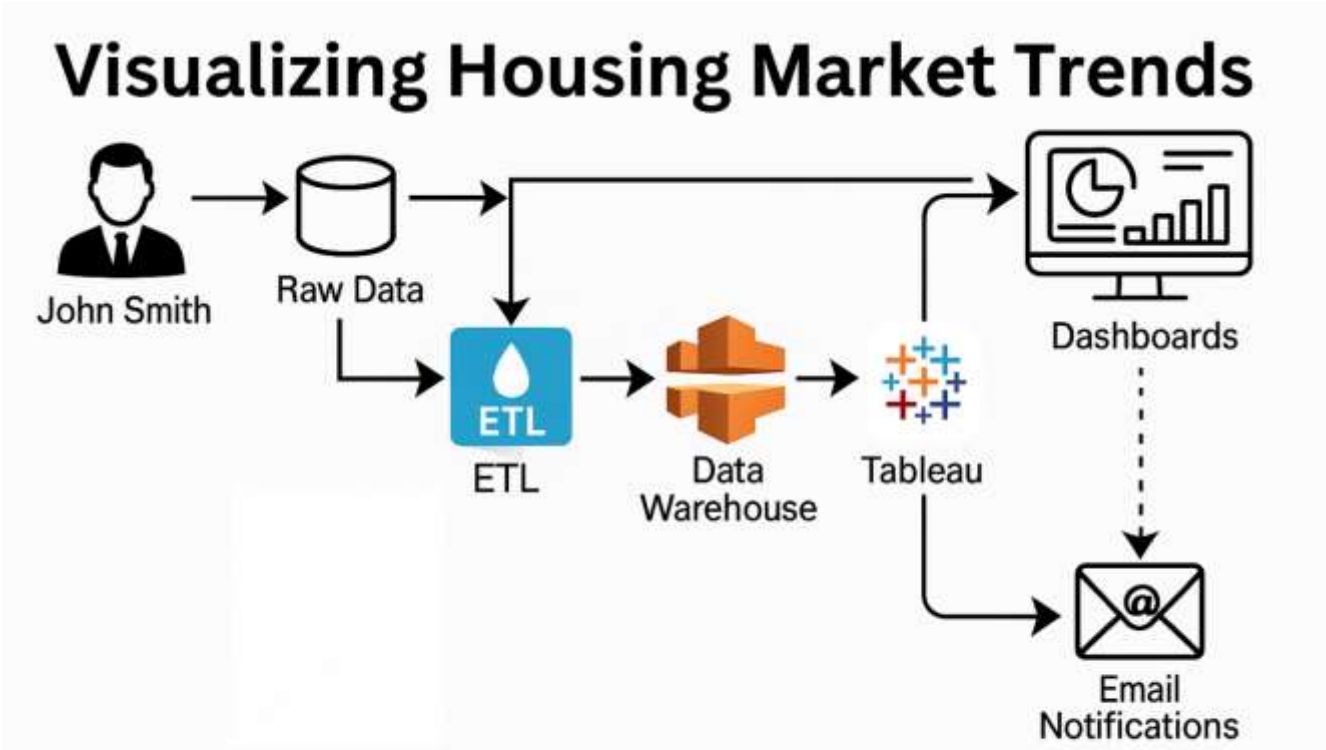
4.1 Problem Solution Fit



4.2 Proposed Solution

S. No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Real estate analysts manage bulky, unstructured housing data but lack efficient tools and time to turn it into executive-grade insights.
2.	Idea / Solution description	Provide a ready-to-deploy Tableau solution that streamlines data cleaning and delivers dynamic dashboards within 48 hours, followed by fast, collaborative refinement rounds.
3.	Novelty / Uniqueness	Combines specialized domain knowledge in real estate with top-tier Tableau expertise to deliver instant geo-visualizations and predictive layers.
4.	Social Impact / Customer Satisfaction	Structured pricing with fixed tiers per project, plus optional monthly plans for regular data updates, customer support, and company-wide training packages.
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 data-processing scripts and dashboard templates allow rapid client onboarding and expansion into related data areas without increasing headcount.

4.3 Solution Architecture


Visualizing Housing Market Trends
John Smith
Raw Data
ETL
ETL
Data Warehouse
Tableau
Dashboards
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	Import Housing Dataset	USN-1	As a user, I want to upload Excel/CSV datasets for housing prices and features.	2	High	Customer
Sprint-2	Integrate Real-Time Data API	USN-2	As a user, I want to retrieve real estate data through API integration.	1	Medium	Customer
Sprint-2	Data Cleaning & Enrichment	USN-3	As a user, I want to remove null values and standardize data formats.	2	High	Customer
Sprint-2	Generate Graphs & Charts	USN-4	As a user, I want to explore interactive bar, line, and map-based visualizations.	2	Medium	Customer
Sprint-3	Export Dashboard Insights	USN-5	As a user, I want to download the visualizations and insights in various formats.	1	Low	Customer
Sprint-3	User Role Management	USN-6	As an admin, I want to control access and manage user permissions.	2	High	Admin
Sprint-2	Apply Custom Filters	USN-7	As a user, I want to apply filters such as location, budget, and year range.	2	High	Customer
Sprint-4	Feature Usage Monitoring	USN-8	As an admin, I want to monitor how users interact with different dashboard tools.	2	High	Admin

6 FUNCTIONAL AND PERFORMANCE TESTING

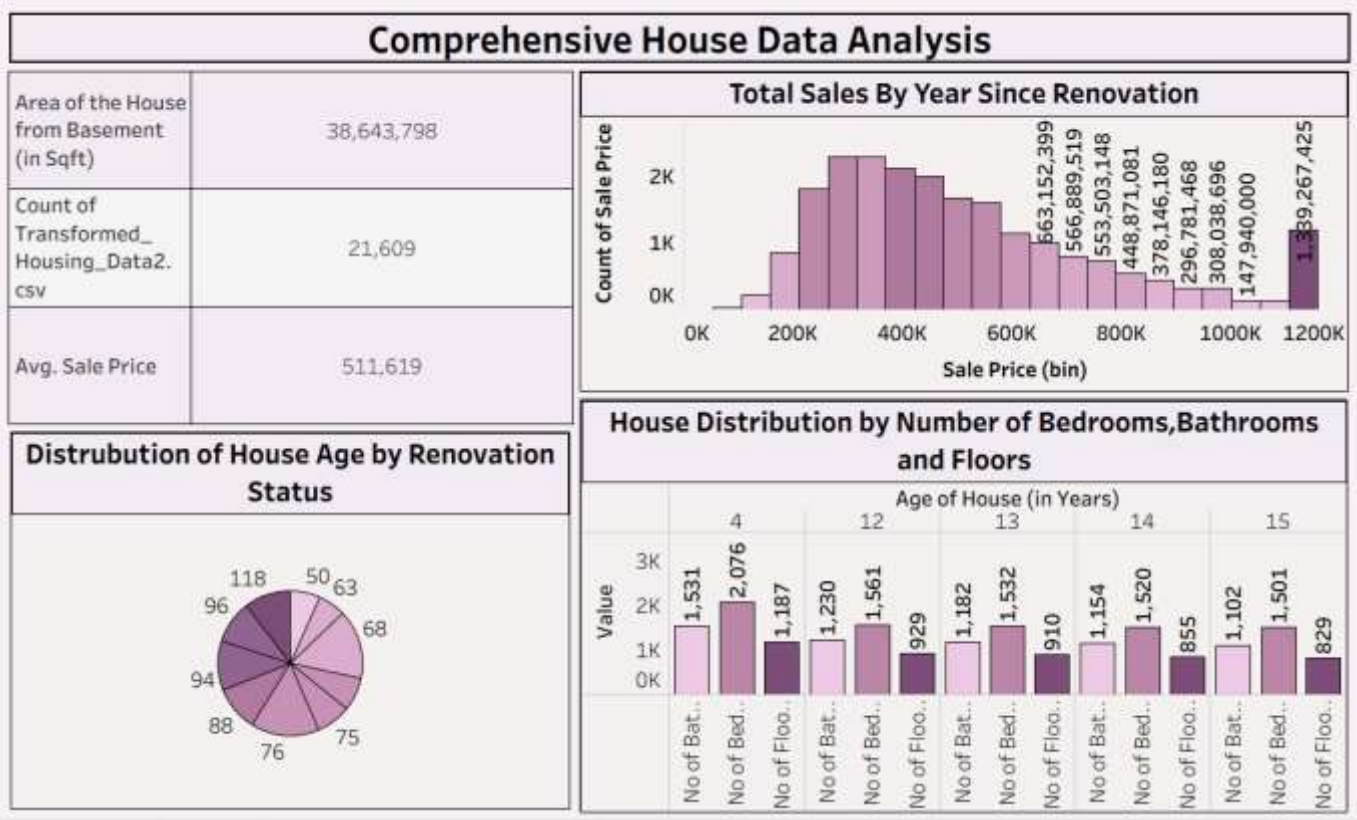
6.1 Performance Testing

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	All curated housing market datasets (including property listings, transactional pricing, spatial coordinates, and time series sales metrics) were fully loaded and accurately rendered with integrity-checks confirming the absence of null and anomalous entries.
2.	Data Preprocessing	Executed preprocessing routines encompassing deduplication, format harmonization of temporal and monetary fields, imputation of missing attributes, and relational integration with auxiliary datasets such as census-derived demographic variables.
3.	Utilization of Filters	Provisioned dynamic parameterized filtering on geographical hierarchies, price intervals, categorical property classifications, listing lifecycle statuses, and temporal windows, enabling multidimensional segmentation of market datasets for granular analysis.
4.	Calculation fields Used	Configured advanced calculated columns, including spatially-resolved price-per-unit-area computations, year-over-year differential metrics, rolling window aggregations (moving averages), and composite scoring algorithms for trend prioritization.

5.	Dashboard design	Constructed multi-panel, interactive dashboard environments featuring color-encoded temporal trends, geospatial heatmap overlays, and inline key performance indicator (KPI) summaries; interface design ensures adaptive responsiveness across desktop and tablet form factors.
6	Story Design	Orchestrated a sequential Tableau Storyboard workflow: macro-level market panorama, deep-dive analytical visualizations, identification of high-opportunity geospatial clusters, and synthesis of algorithmically-driven strategy recommendations, thus facilitating interpretive insight traversal for end users.

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 Lucas Wright 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, Lucas 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 Lucas 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

10.1 Dataset Link→

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

10.2 GitHub & Project Demo Links:

Github→ https://github.com/purvajagtap93/Visualizing-Housing-Market-Trends

Project Demo Link→
https://drive.google.com/file/d/1N7PBNUj2r60HUmO0Y5hgClUeYCNu10Ab/view?usp=sharing