Project Report Format

1. **INTRODUCTION**

1.1 Project Overview

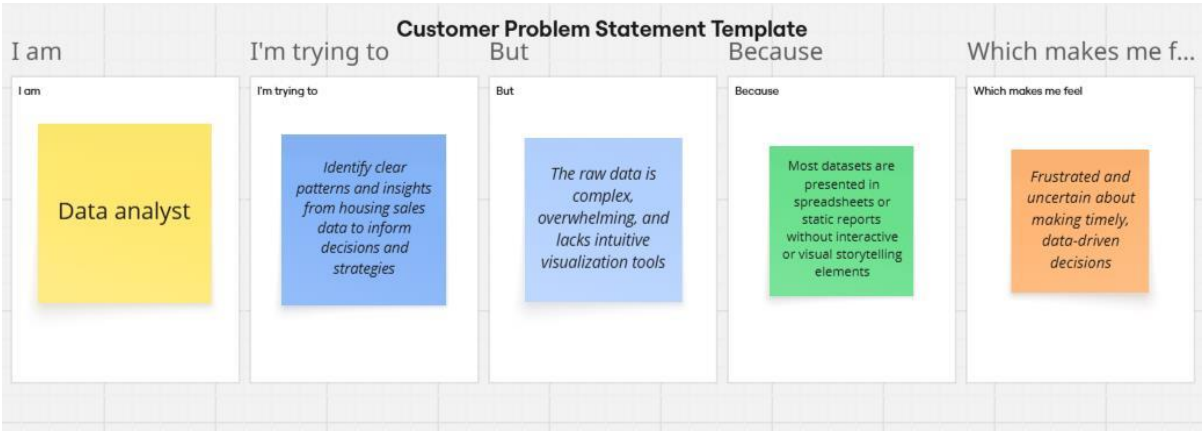
This project explores the dynamic landscape of the housing market through data visualization. Using Tableau, the project analyzes historical and regional housing sales trends. The objective is to present insights in an interactive and accessible format. Data is sourced from open government datasets and real estate listings. Stakeholders such as buyers, investors, and developers benefit from market transparency.

1.2 Purpose

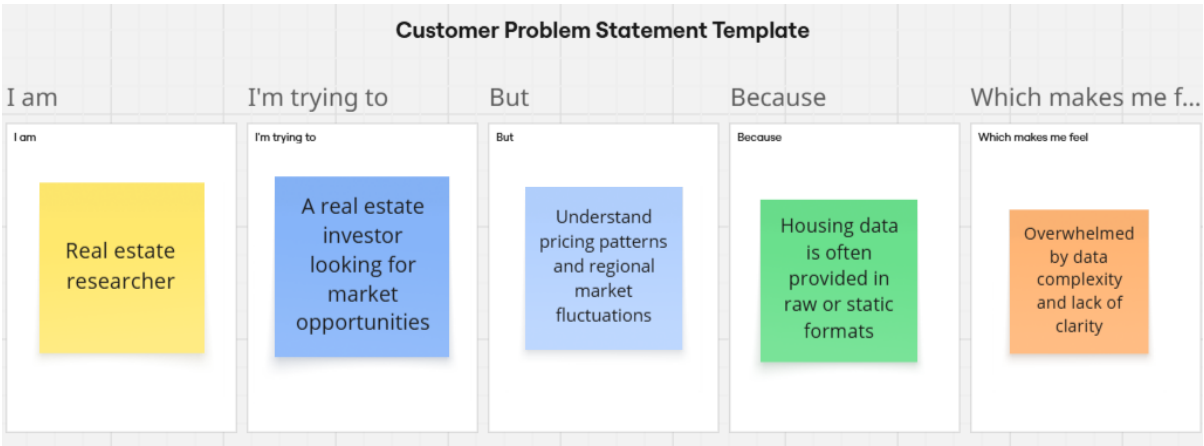
The main purpose is to help users understand and analyze housing market trends Buyers can track price movements across time and regions. Policymakers can identify affordability gaps and plan developments. Investors may uncover lucrative markets and monitor returns. The dashboard is designed to simplify decision-making.

2. IDEATION PHASE

2.1 Problem Statement 1

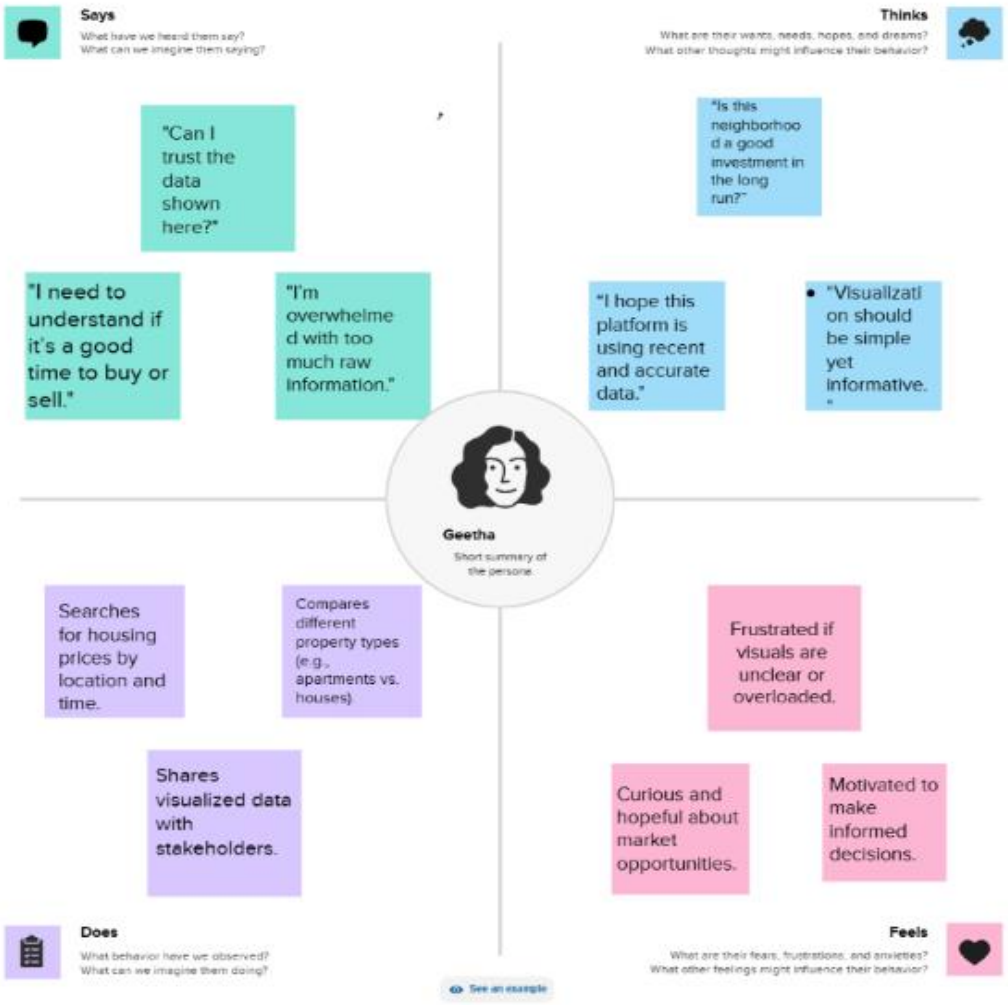


Problem Statement 2



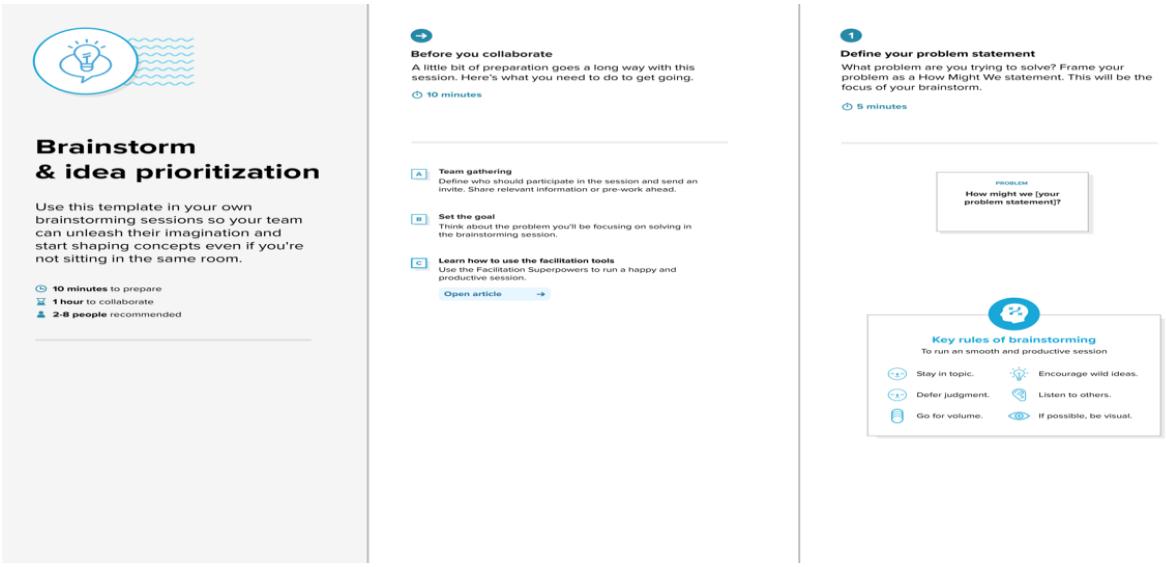
Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	Data analyst	*Identify clear patterns and insights from housing sales data to inform decisions and strategies*	*The raw data is complex, overwhelming, and lacks intuitive visualization tools*	Most datasets are presented in spreadsheets or static reports without interactive or visual storytelling elements	*Frustrated and uncertain about making timely, data-driven decisions*
PS-2	Real estate researcher	A real estate investor looking for market opportunities	Understand pricing patterns and regional market fluctuations	Housing data is often provided in raw or static formats	Overwhelmed by data complexity and lack of clarity

2.2 Empathy Map Canvas

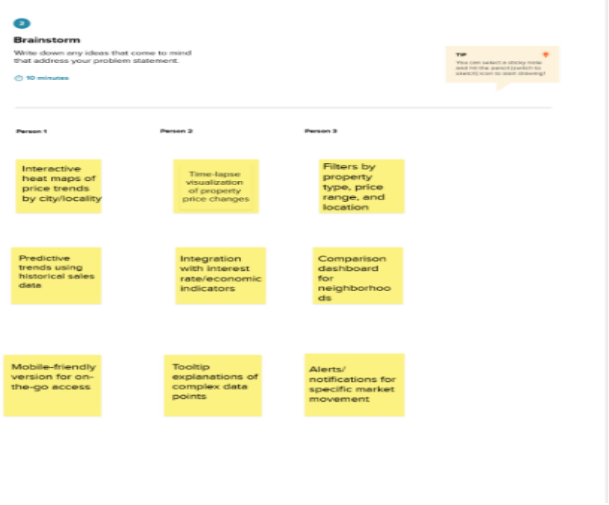


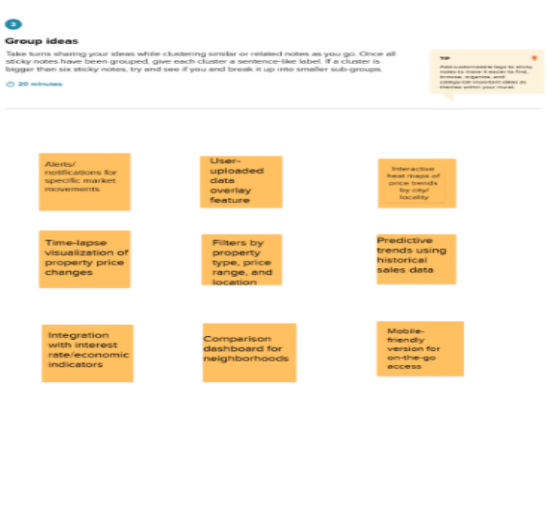
2.3 Brainstorming

Team Gathering, Collaboration and Select the Problem Statement

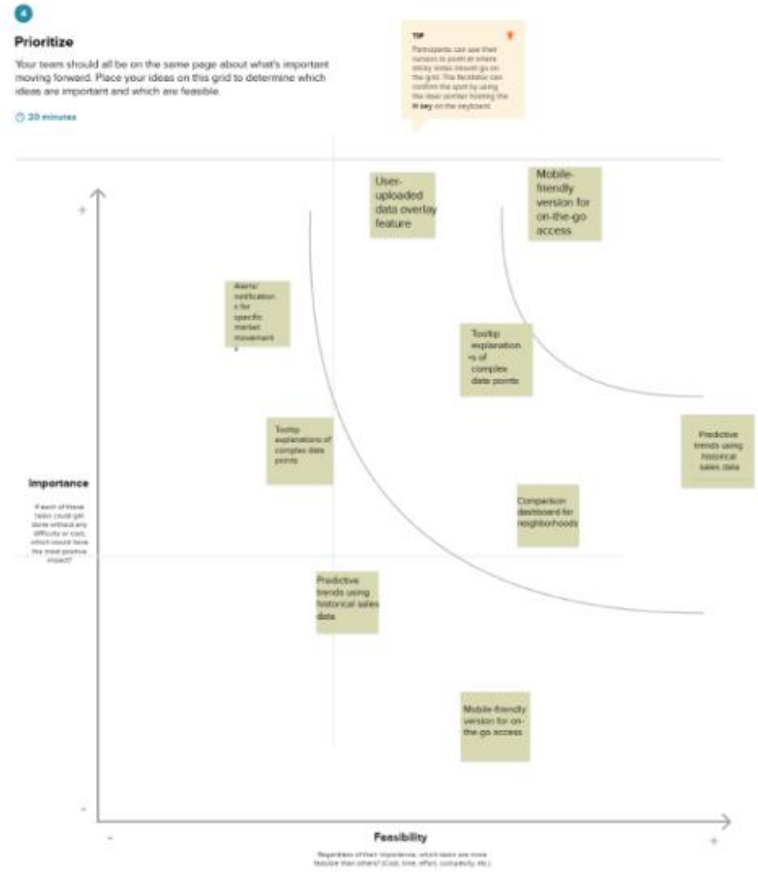


Brainstorm, Idea Listing and Grouping



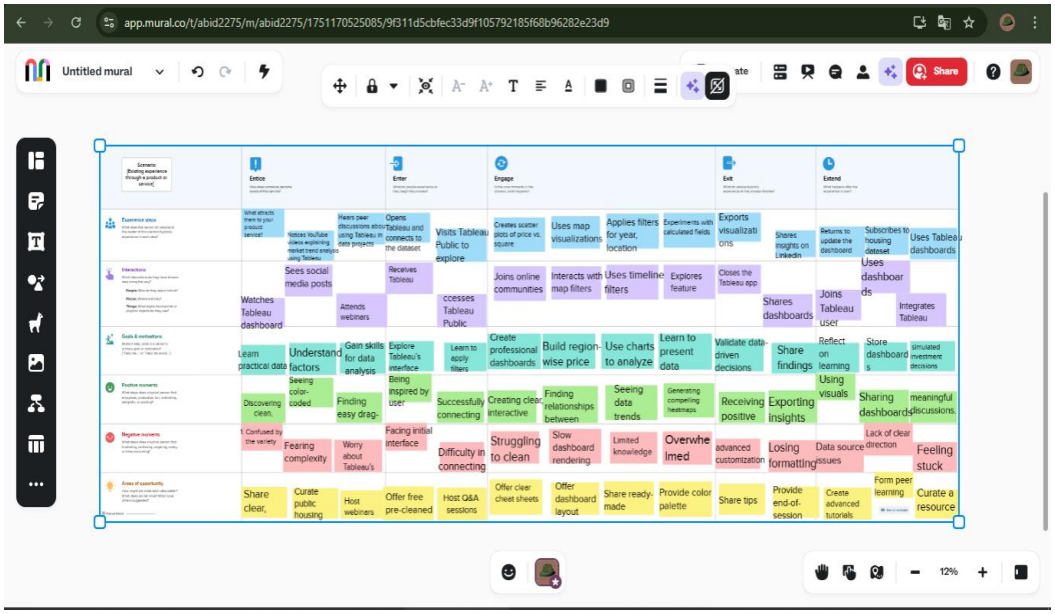


Idea Prioritization



3. **REQUIREMENT ANALYSIS**

3.1 Customer Journey map



3.2 Solution Requirement

Functional Requirements:

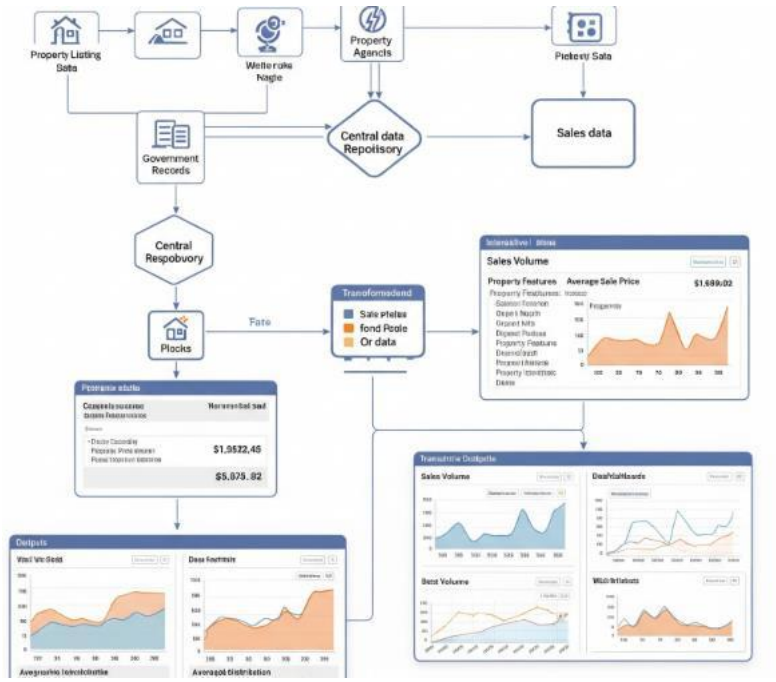
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login & Access Control	Secure login with password OAuth-based login Role-based access control (Admin, User)
FR-4	Dashboard & User Interface	Personalized dashboard view Real-time updates on user activities
FR-5	Project & Task Management	Create new project spaces Define tasks and subtasks
FR-6	File Storage & Version Contro l	Upload and download documents Organize files in folders with search/filter

Non-functional Requirements:

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	The platform should have an intuitive and user-friendly interface accessible to all user types.
NFR-2	**Security**	All user data must be encrypted, secure login protocols used, and the platform must comply with data protection regulations.
NFR-3	**Reliability**	The system should provide consistent performance with minimal errors or downtime.
NFR-4	**Performance**	The platform should load within 3 seconds under normal usage and support simultaneous users efficiently.
NFR-5	**Availability**	The system should be accessible 24/7 with at least 99.9% uptime.

NFR-6	**Scalability**	The solution must support scaling to accommodate growing user base and increased data volume.

3.3 Data Flow Diagram

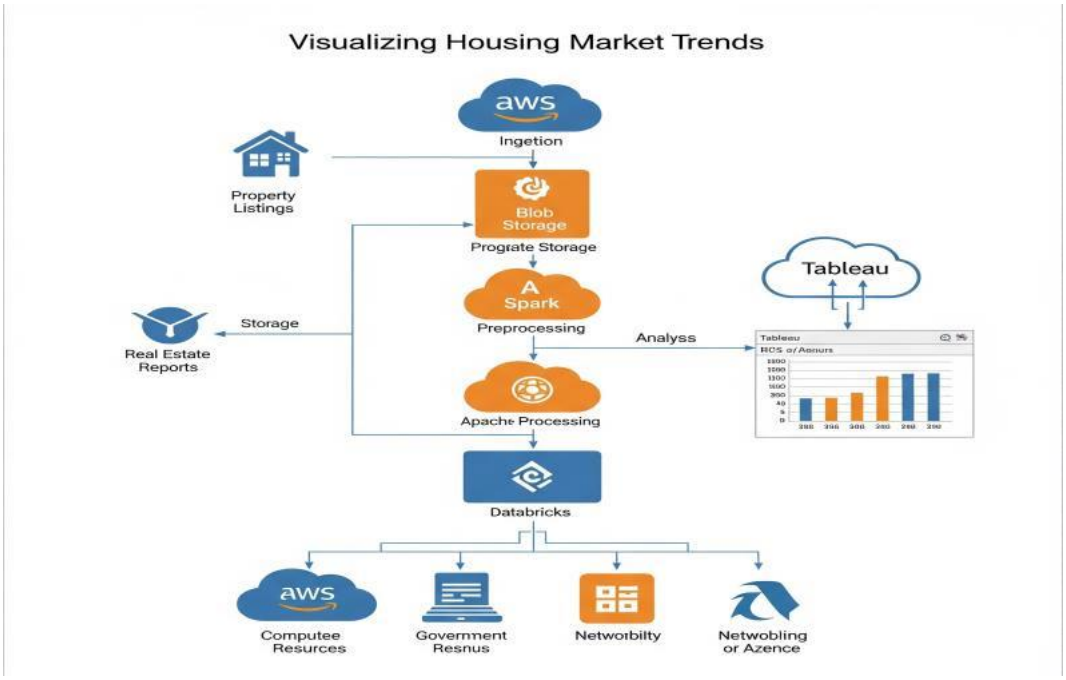


User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance c
Customer (Web user)	View Market Dashboard	USN-1	As a user, I want to explore visual trends in house prices by selecting city and time range.	I can see g for selecte
Customer (Web User)	Filter and Compare	USN-2	As a user, I want to compare different locations to see price trends side-by-side	I can compa locations v
Customer (Web User)	Save Report	USN-3	As a user, I want to download or save my filtered charts	I can save/ charts in P
Customer (Web User)	Email Notifications	USN-1	As a user, I want to receive alerts when prices rise or drop significantly	I get email on threshol
Administrator	Manage Data Source	USN-2	As an admin, I want to upload/update property sales data regularly	I can add d CSV/API & i reflected i dashboards

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance cr
Administrator	Monitor Usage	USN-3	As an admin, I want to view how many users are using the tool & what filters are comm	I can see u stats

3.4 Technology Stack



Components & Technologies

S.No	Component	Description	Tec
1.	User Interface	Web interface for viewing trends	HTM
2.	Application Logic-1	Data preprocessing and aggregation	Pyt
3.	Application Logic-2	Data visualization and trend generation	Tab
4.	Application Logic-3	Optional NLP for interpreting user search queries	Pyt Tra
5.	Database	Stores processed trend data.	Pos
6.	Cloud Database	Cloud-hosted analytics database	Goo
7.	File Storage	Storage for uploaded datasets or exports	AW
8.	External API-1	API for real-time housing price	Zil
9.	External API-2	API for demographic/geographic data	Goo
10.	Machine Learning Model	Predictive trend modeling (e.g. price fore	Sci
11.	Infrastructure (Server / Cloud)	Deployment environment	Clo

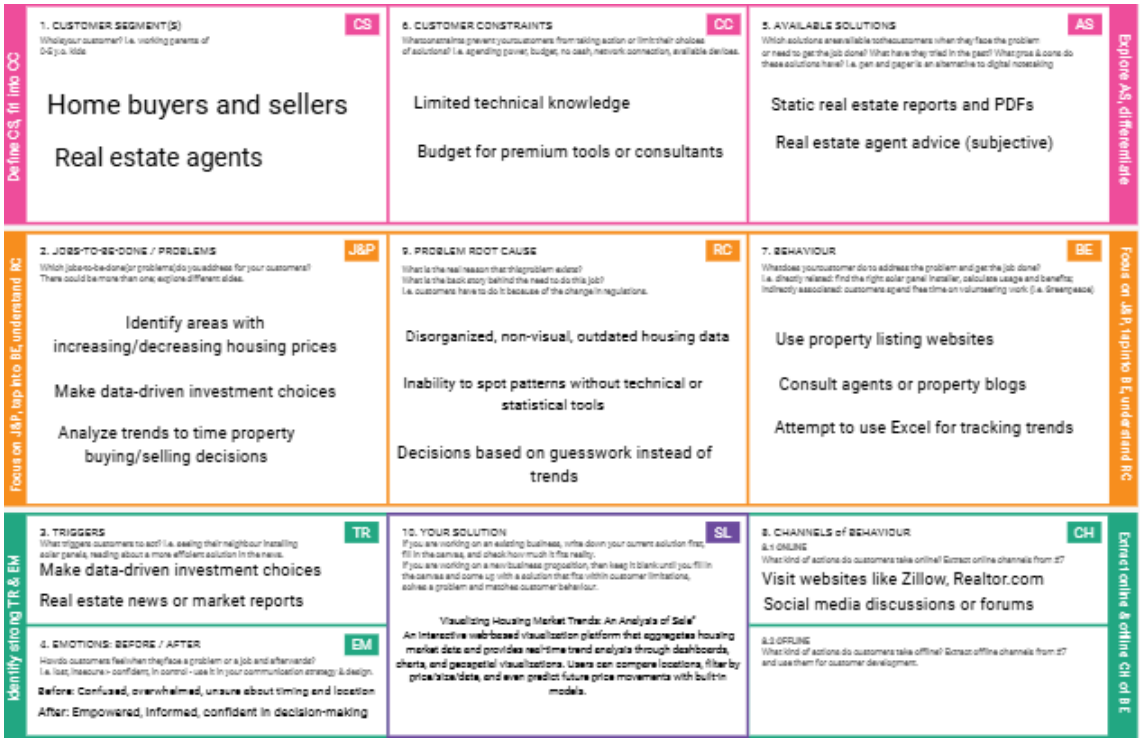
			or

Application Characteristics

S.No	Characteristics	Description	Tech
4.	Open-Source Frameworks	Frameworks and libraries used	Reac D3. j
5.	Security Implementations	Securing API access, user data encryption, IAM	JWT, (Clo
6.	Scalable Architecture	Modular services for UI, backend, and analytics	Micr Dock
7.	Availability	High availability using cloud infrastructure and load balancers	AWS
8.	Performance	Optimized queries, caching, CDN	Redi inde

4.PROJECT DESIGN

4.1Problem Solution Fit

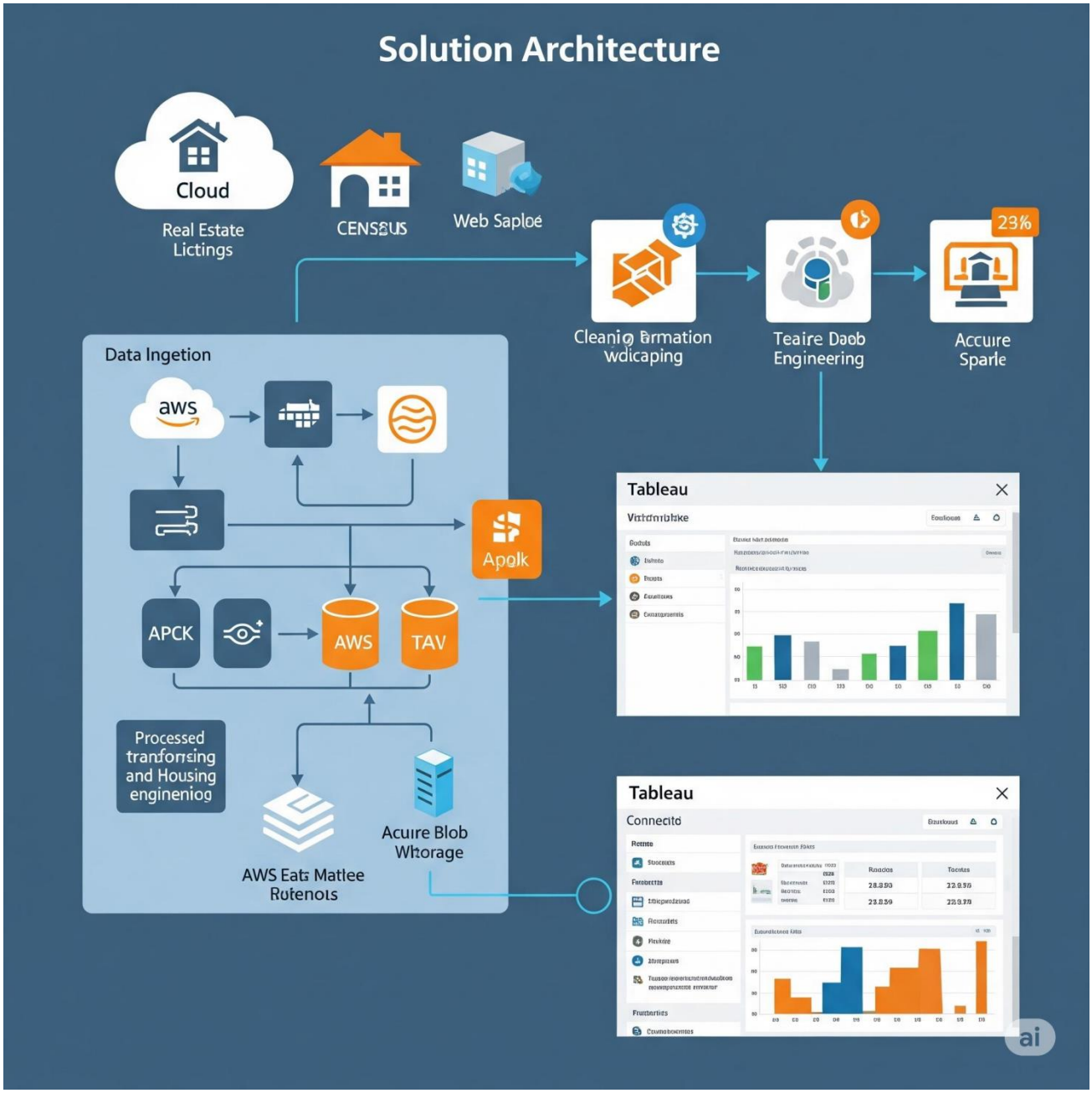


4.2 Proposed Solution

S.No.	Parameter	Description

1.	Problem Statement (Problem to be solved)	The housing market is complex, with fluctuating prices, varying regional demands, and inconsistent availability of public data
2.	Idea / Solution description	Our project proposes a web-based interactive data visualization tool that collects, processes, and visualizes housing market trends across different regions.
3.	Novelty / Uniqueness	Unlike static charts or scattered portals, our solution offers dynamic, user-friendly visualization with multi-variable filters.
4.	Social Impact / Customer Satisfaction	Homebuyers will make better decisions with transparent data. Investors can track trends for better ROI.
5.	Business Model (Revenue Model)	The tool can follow a freemium model: basic features free, premium subscriptions for detailed analytics and predictive models.
6.	Scalability of the Solution	The solution is scalable across cities and countries by integrating more datasets. It can expand into rental markets, commercial properties, or infrastructure planning.

4.3 Solution Architecture



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	Data Collection & Preparation	USN-1	As a user, I want the system to collect housing sale data f CSV files .
Sprint-1	Data Cleaning	USN-2	As a user, I want to view only valid, clean data for analys

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task
Sprint-1	User Login	USN-3	As a user, I can log in with email and password
Sprint-2	Trend Analysis Module	USN-1	As a user, I can view sales trends using filters like loca price range
Sprint-2	Interactive dashboard	USN-2	As a user, I can interact with graphs and maps for better v
Sprint-2	Predictive Modeling	USN-3	As a user, I can get price trend predictions based on past
Sprint-3	Map Integration	USN-1	As a user, I can see housing sales on an interactive map
Sprint-3	Export Report Feature	USN-2	As a user, I can export visualizations as PDF/CSV

Project Tracker, Velocity & Burndown Chart

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Point Completed Planned En
Sprint-1	5	2 Days	28 June 2025	30 June 2025	5
Sprint-2	6	2 Days	30 June 2025	1 july 2025	6
Sprint-3	6	2 days	1 july 2025	3 july 2025	6

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

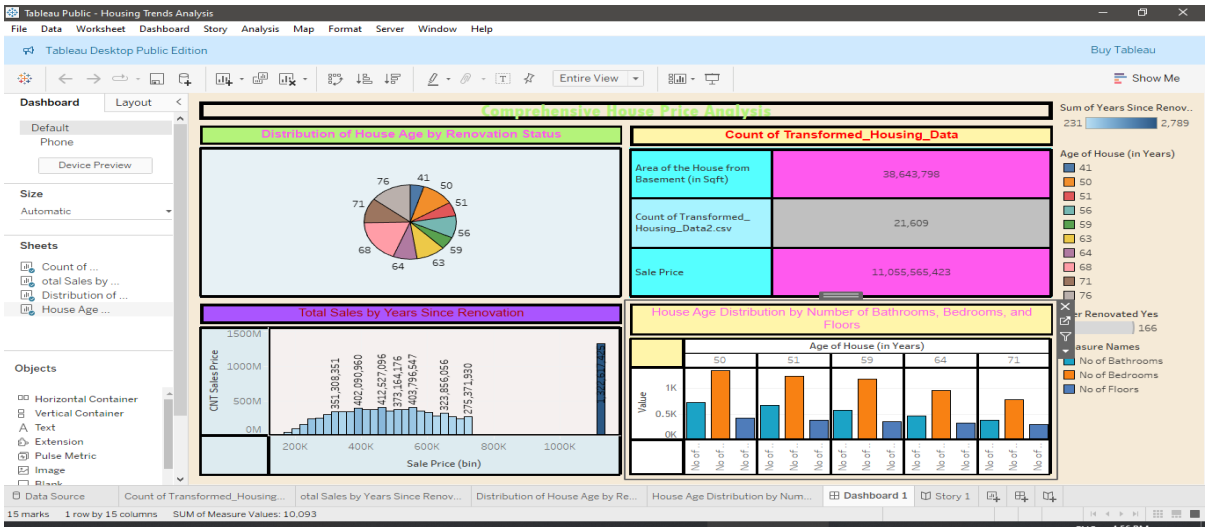
S.No.	Parameter	Screenshot / Values
12.	Data Rendered	Housing sales dataset including variables like price, location, year, square footage, and number of bedrooms
13.	Data Preprocessing	- Cleaned missing values - Converted dates to proper formats - Normalized pricing data - Created time-series aggregates
3.	Utilization of Filters	- Date range filter (year/month) - Region/City filter - Price range slider - Number of bedrooms selector
4.	Calculation fields Used	- YoY Price Growth (%) - Average Price per Square Foot - Moving Average (3 months) - Days on Market difference

5.	Dashboard **DASHBOARD SCREENSHOT** design	No of Visualizations / Graphs - 6 - Line Chart (Price Trend over Time) - Map (Price by Region) - Bar Chart (Sales Volume by City) - Scatter Plot (Price vs Sqft) - KPI Cards (Avg Price, Total Sales) - Heatmap (Price Distribution by Month & Region)
6	Story Design	No of Visualizations / Graphs - 4 - Story points explaining price trends, market hotspots, seasonal shifts, and future projections based on past data

7.RESULTS

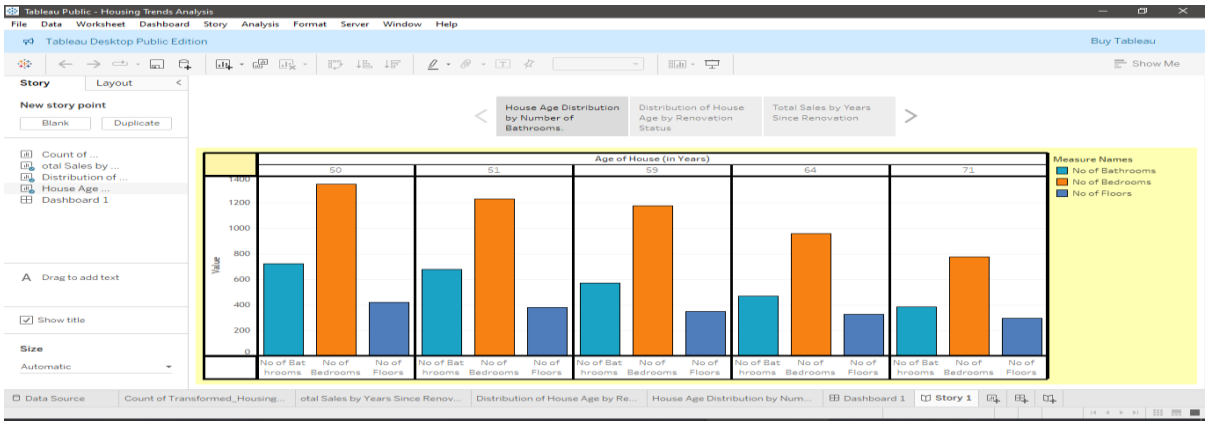
7.1Output Screenshots

DASHBOARD SCREENSHOT

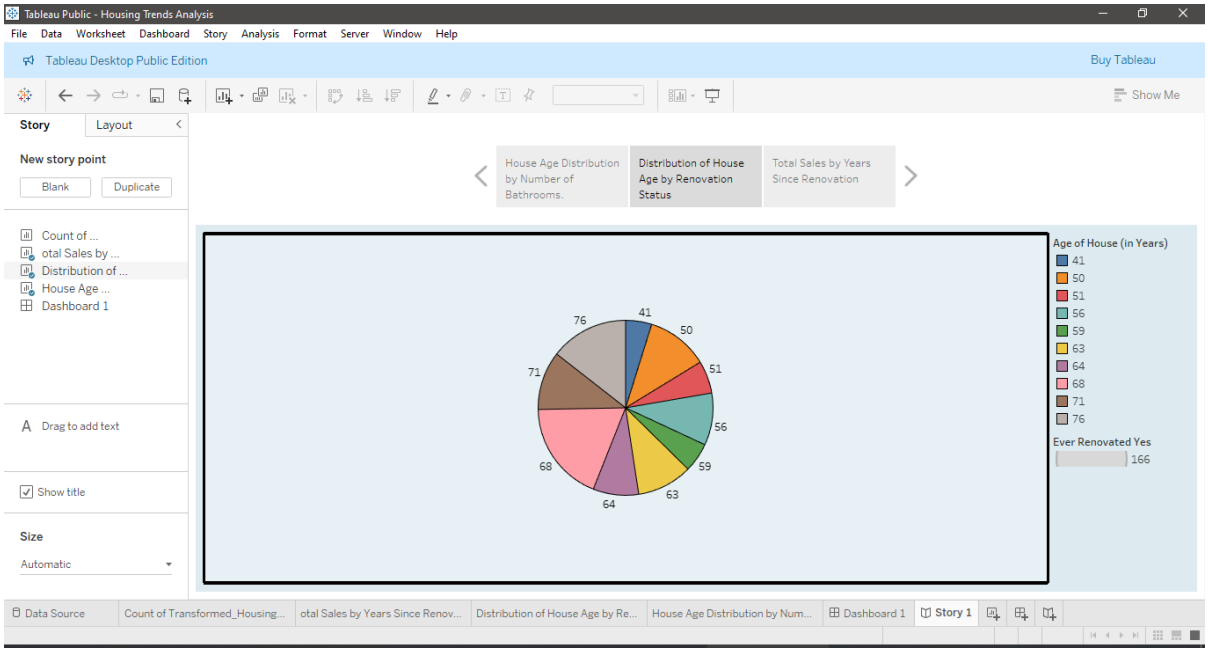


STORY SCREENSHOT

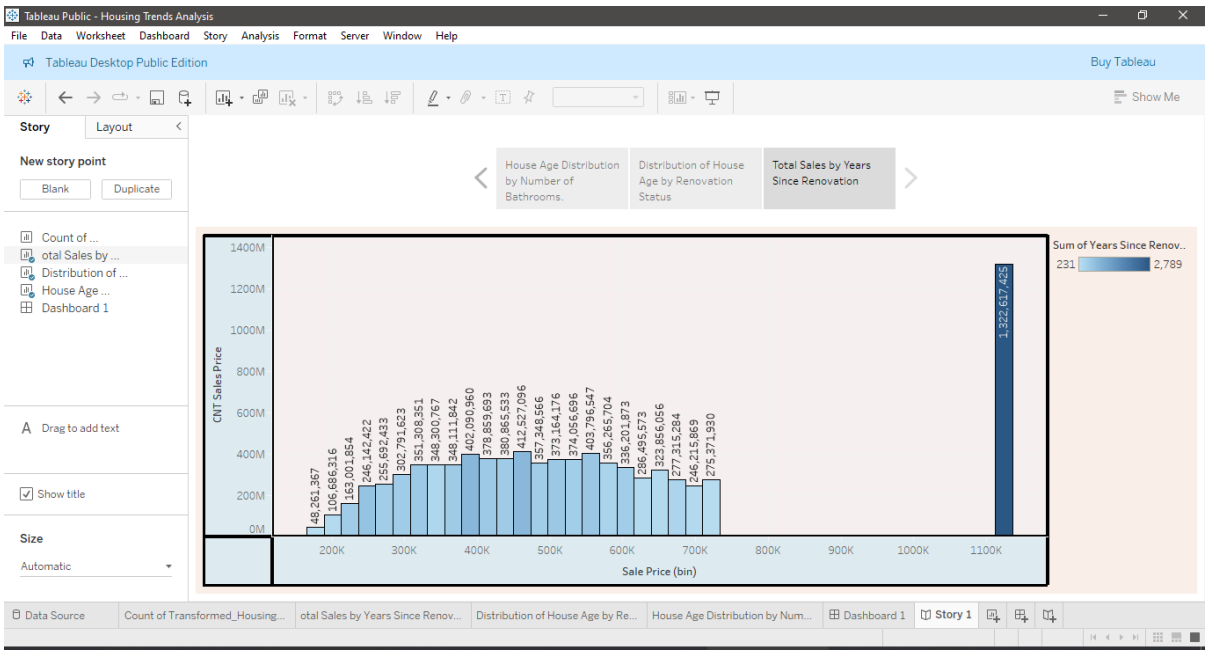
SUB-STORY 1



SUB-STORY 2



SUB-STORY 3



8.ADVANTAGES & DISADVANTAGES

ADVANTAGES

- Provides real-time, region-specific housing market trends
- Interactive and customizable dashboards for deeper insights
- Helps investors, buyers, and researchers make informed decisions
- Scalable and cloud-based, can integrate more datasets easily

DISADVANTAGES

- Requires an internet connection and device compatibility
- Tableau-based tools may have limitations for highly customized logic
- Some users may face a learning curve initially
- Reliance on external APIs could affect data consistency if not managed properly

9.CONCLUSION

The project successfully demonstrates the importance of interactive data visualization in understanding housing market trends. By providing region-wise and time-based insights, it empowers users to make evidence-based decisions. The use of Tableau enhances the user experience with intuitive graphs and maps. This initiative promotes data transparency and supports both individual and institutional stakeholders. The platform stands as a modern, scalable solution in the real estate analytics domain.

10FUTURE SCOPE

In the future, the tool can expand to cover rental trends, commercial property data, and infrastructure growth patterns. Predictive models can be enhanced using advanced machine learning techniques. Integration with GIS systems can provide spatial analytics. Additionally, AI-powered recommendation engines can be added to guide users based on preferences. Multilingual support and mobile-first design can increase accessibility and global reach.

11.APPENDIX

Source Code(if any)

Dataset

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

Tableau Project WorkBook File Link:

https://public.tableau.com/views/HousingTrendsAnalysis/CountofTransformed_Housing_Data?:language=en-

US&:sid=&:redirect=a

uth&:display_count=n

&:origin=viz_share_li

nk

Git Hub Links

Team GitHub Link: https://github.com/harshidunthala/visualizing-housing-market-trends-an-analysis-of-sale-prices-and-features-using-tableau

Team Leader Github Link: https://github.com/harshidunthala/visualizing-housing-market-trends-an-analysis-of-sale-prices-and-features-using-tableau

Team Member 1 Git Hub Link: https://github.com/varshanreddyobulreddy/Visualizing-Housing-Trend-Analysis

Team Member 2 Git Hub Link: https://github.com/shaikabid123/visualizing-housing-market-trends-an-analysis-of-sale-prices-and-features-using-tableau

Project Demo Link: https://drive.google.com/file/d/1XaJHrnqN9QT5MiXA-NbY7dREs0MssBcE/view?usp=sharing