# Project Design Phase-II
## Technology Stack (Architecture & Stack)

| Date | 15 July 2025 |
|---|---|
| Team ID | PNT2025TMID09511 |
| Project Name | Visualizing Housing Market Trends |
| Maximum Marks | 4 Marks |

**Technical Architecture:**

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2

**Example: Order processing during pandemics for offline mode**

**Reference:** **https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/**
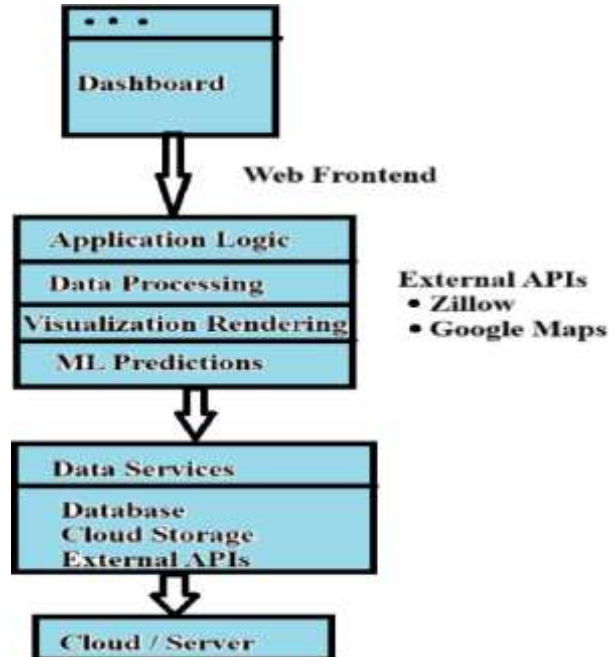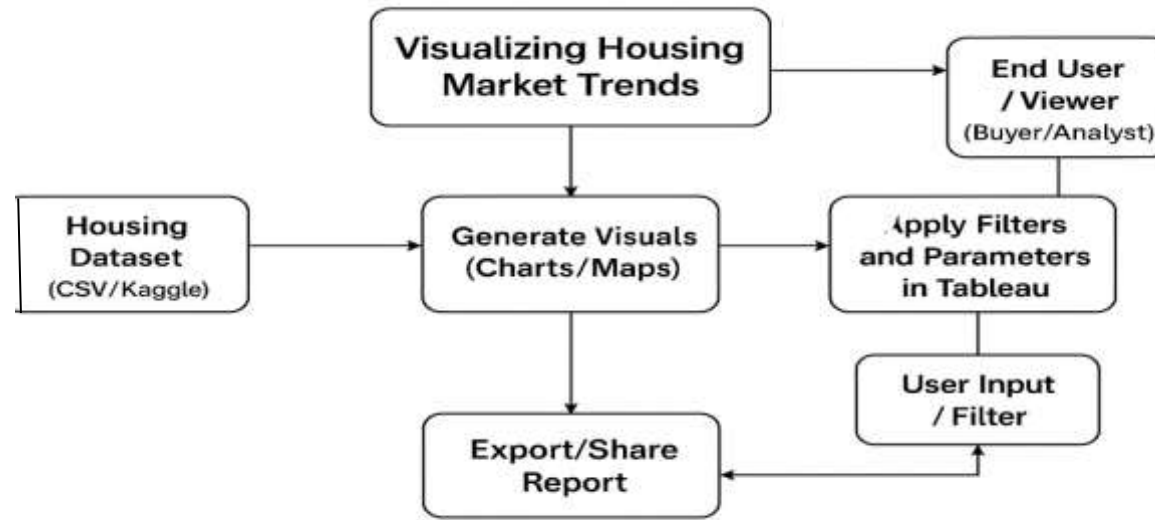
**Table-1 : Components & Technologies:**

| S.No | Component | Description | Technology |
|------|-----------|-------------|------------|
| 1. | User Interface | Web-based or Tableau dashboards for user interaction | Tableau / React.js / HTML / CSS |
| 2. | Application Logic-1 | Data preprocessing (cleaning, filtering, formatting) | Python (Pandas, NumPy) |
| 3. | Application Logic-2 | Creating and rendering visualizations | Tableau / D3.js / Plotly |
| 4. | Application Logic-3 | Optional prediction of housing prices | Python (scikit-learn, XGBoost) |
| 5. | Database | Structured data storage for housing details | MySQL / PostgreSQL |
| 6. | Cloud Database | Hosting the database on cloud infrastructure | AWS RDS / Google Cloud SQL |
| 7. | File Storage | Store uploaded or raw housing datasets | AWS S3 / Google Cloud Storage / Local |
| 8. | External API-1 | Fetch live housing market data | Zillow API / RapidAPI |
| 9. | External API-2 | Location visualization via maps | Google Maps API |
| 10. | Machine Learning Model | Optional: Predict prices using historical trends | Python ML Model (Linear/Tree-based) |
| 11. | Infrastructure | Hosting and deployment | Tableau Public / Heroku / AWS / Docker |

**Table-2: Application Characteristics:**

| S.No | Characteristics | Description | Technology |
|---|---|---|---|
| 1. | Open-Source Frameworks | Use of open-source libraries for development | Pandas, NumPy, Tableau Public |
| 2. | Security Implementations | Authentication if deployed as web app | HTTPS, Role-based Access (if web-based) |
| 3. | Scalable Architecture | Can scale data size and dashboards with more features | Tableau Server / Docker (optional) |
| 4. | Availability | Available online for users to view at any time | Tableau Public or Deployed Cloud Host |
| 5. | Performance | Efficient queries and dashboards for large datasets | Indexed Filters, Dashboard Optimization |

**References:**
**https://c4model.com/**

**https://aws.amazon.com/architecture/**

**https://cloud.google.com/solutions**

**https://www.zillow.com/howto/api/APIOverview.htm**

**https://rapidapi.com/search/real%20estate**