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

Date	31 January 3035
Team ID	Team ID : PNT2025TMID09489
Project Name	Visualizing Housing Market Trends An Analysis of Sale Prices and Features using Tableau
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:

Component	Description / Purpose	Technology / Tools Used
Application Logic - 1	**Data preprocessing: clean, transform, and normalize housing data**	**Python (Pandas, NumPy, Jupyter Notebook)**
Application Logic - 2	**Speech-to-text for user voice input to filter housing queries (optional advanced feature)**	**IBM Watson Speech to Text (STT)**

Component	Description / Purpose	Technology / Tools Used
Application Logic - 3	Chatbot to assist users with real estate insights via natural conversation	IBM Watson Assistant
Database	Store structured housing and sales data, region info, renovation status, etc.	MySQL, PostgreSQL
Cloud Database	Cloud-based backup and sync of cleaned housing datasets	IBM Cloudant
File Storage	Store CSV, Excel files, and exports from Tableau or ETL steps	IBM Block Storage, Local Filesystem
External API - 1	Integrate real-time weather for regional impact on housing demand	IBM Weather API
External API - 2	Verify homeowner identity or demographics using national ID (optional, if in scope)	Aadhar API
Machine Learning Model	Predict housing prices based on features like area, location, renovation, etc.	Regression Model (Python - scikit-learn)
Infrastructure (Server/Cloud)	Application deployment, processing & dashboard sharing	Local: Windows/Linux + Tableau Desktop Cloud: IBM Cloud (Cloud Foundry, Kubernetes), Tableau Public

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Frameworks and libraries used for ETL, modeling, and UI	Python (Pandas, NumPy, scikit-learn), React.js
2.	Security Implementations	Data access control, secure dashboard sharing, encryption of datasets	SHA-256, SSL/TLS for Tableau Public, IAM Controls
3.	Scalable Architecture	Modular architecture with decoupled ETL, storage, visualization (3-tier or cloud-native setup)	3-Tier Architecture, Cloud Foundry, Kubernetes
4.	Availability	Use of Tableau Public (high uptime), IBM Cloud distributed services, optional load balancers	Tableau Cloud, IBM Load Balancer, Distributed Servers
5.	Performance	Optimized data queries, use of filters in Tableau, caching of processed datasets	Tableau Extracts, Python Preprocessing, Redis (opt.)

References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture

https://aws.amazon.com/architecture

https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d