

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	13-11-2023
Team ID	Team-591736
Project Name	Walmart Store Sales Forecasting
Maximum Marks	4 Marks

Technical Architecture for Walmart Sales Forecasting

Architectural Diagram:

Architecture

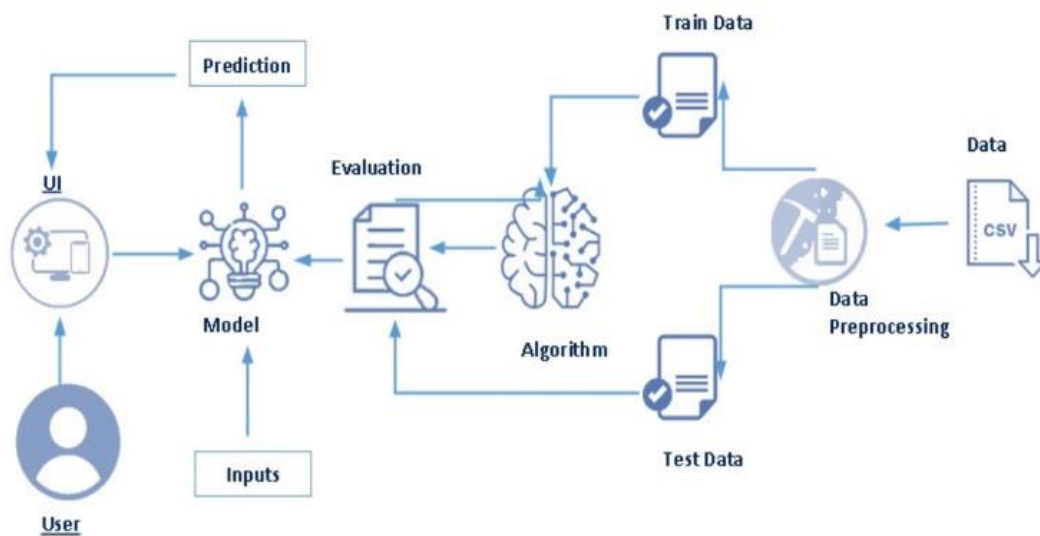


Table-1: Components & Technologies

S.No	Component	Description	Technology
1.	User Interface	Web UI for user interaction	HTML, CSS, JavaScript / Angular Js / React Js
2.	Application Logic-1	Main application logic for processing	Java / Python
3.	Application Logic-2	IBM Watson Speech-to-Text (STT) service	IBM Watson STT service
4.	Application Logic-3	IBM Watson Assistant for chatbot	IBM Watson Assistant
5.	Database	Data storage (e.g., store information)	MySQL, NoSQL, etc.
6.	Cloud Database	Cloud-based database service	IBM DB2, IBM Cloudant, etc.
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	External API for weather information	IBM Weather API, etc.
9.	External API-2	External API for additional information	Aadhar API, etc.
10.	Machine Learning Model	ML model for sales forecasting	ARIMA, Random Forest, XgBoost
11.	Infrastructure (Server / Cloud)	Application deployment	Local Server Configuration, Cloud Server Configuration (Cloud Foundry, Kubernetes, etc.)

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Open-source frameworks used in the project	Technology of Opensource framework
2.	Security Implementations	Security measures, access controls, firewalls, etc.	SHA-256, Encryption, IAM Controls, OWASP, etc.
3.	Scalable Architecture	Scalability justification, e.g., 3-tier, Microservices	Technology used for scalability considerations
4.	Availability	Availability justification, load balancers, distributed servers	Technology used for availability considerations
5.	Performance	Performance considerations, requests per sec, cache usage, CDN	Technology used for performance considerations

Additional Notes:

- The machine learning models (ARIMA, Random Forest, XgBoost) will be integrated into the Application Logic for sales forecasting.
- Data storage will include historical sales data, store information, and other relevant data for training and testing the models.
- Cloud deployment on services like IBM Cloud allows for easy scaling, storage, and integration of Watson services.
- Security measures like SHA-256, encryption, and IAM controls will be implemented to ensure data integrity and user access controls.
- The use of load balancers, distributed servers, and cloud-based services contributes to the scalability and availability of the application.
- Performance considerations include optimizing the application for the number of requests per second, efficient use of cache, and potential utilization of Content Delivery Networks (CDN).