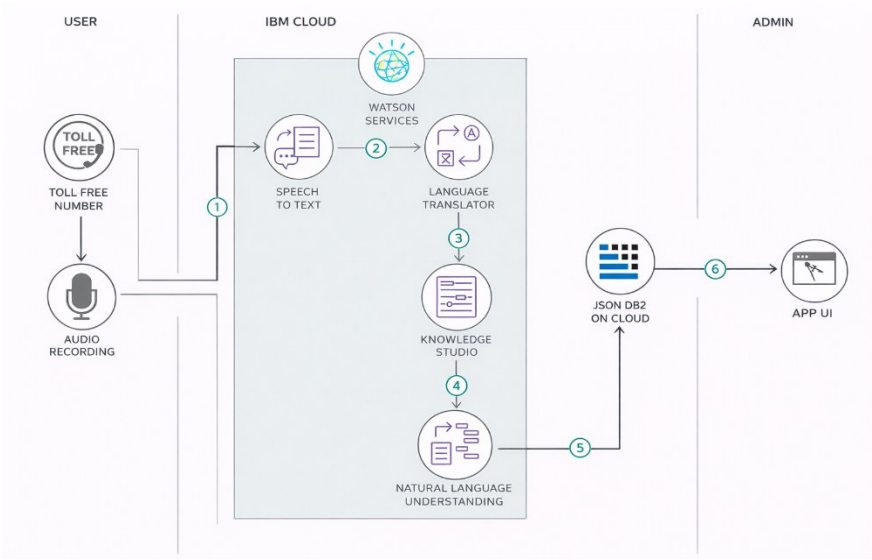
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	19 February 2026
Team ID	LTVIP2026TMIDS62229
Project Name	Exploratory Analysis of Rain Fall Data in India for Agriculture
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:



Guidelines:

- Include all the processes (As an application logic / Technology Block)
- Provide infrastructural demarcation (Local / Cloud)
- Indicate external interfaces (third party API's etc.)
- Indicate Data Storage components / services
- Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	Web interface where users enter weather parameters and view prediction results	HTML, CSS, Bootstrap, Flask (Jinja2 Templates)
2	Application Logic – 1	Handles user input processing and request routing	Python (Flask Framework)
3	Application Logic – 2	Data preprocessing including feature selection and scaling	Scikit-learn (StandardScaler), Pandas, NumPy
4	Application Logic – 3	Machine Learning prediction logic	Random Forest Classifier (Scikit-learn)
5	Database	Stores weather dataset used for training	CSV Dataset (weatherAUS.csv)
6	Cloud Database	(Optional for deployment) Cloud-based data storage	IBM Cloud / AWS S3 / Azure Blob (Optional)
7	File Storage	Stores trained model and scaler files	Local File System (.pkl files)
8	External API – 1	(Optional Enhancement) Fetch real-time weather data	OpenWeather API
9	External API – 2	(Optional Enhancement) Location-based weather input automation	Weather Data API (Optional)
10	Machine Learning Model	Predicts whether it will rain tomorrow based on input features	Random Forest Classifier
11	Infrastructure (Server / Cloud)	Deployment of application	Local Server (Flask) / Cloud Deployment (Heroku / AWS / IBM Cloud)

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1	Open-Source Frameworks	Web framework and ML libraries used in development	Flask, Scikit-learn, Pandas, NumPy
2	Security Implementations	Input validation, secure server communication, model protection	Flask input validation, HTTPS (for deployment)
3	Scalable Architecture	Application follows modular architecture separating UI, logic, and ML model	3-Tier Architecture (UI – Logic – Model)
4	Availability	Application can be deployed on cloud for 24/7 availability	AWS / IBM Cloud / Heroku
5	Performance	Optimized ML model for fast prediction and low latency	Random Forest (optimized), Pickle model loading

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