

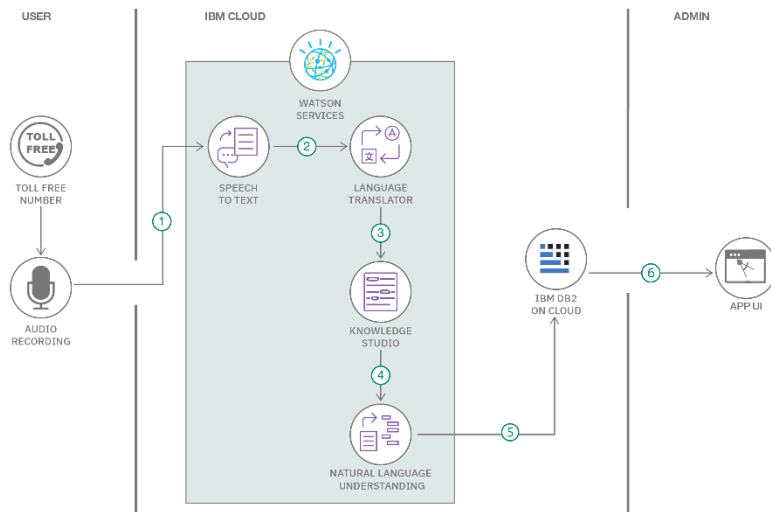
Project Design Phase-II Technology Stack (Architecture & Stack)

Date	22 June 2025
Team ID	LTVIP2025TMID54785
Project Name	LearnHub: Your Center For Skill Enhancement
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



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 Used
1	User Interface	Web-based UI for students, teachers, and admin interactions	React.js, HTML, CSS, JavaScript, Bootstrap
2	Application Logic – 1	Handles routing, API calls, course logic, and business operations	Node.js, Express.js
3	Application Logic – 2	Role-based login, user sessions, and secure access handling	JWT (JSON Web Token), bcrypt.js
4	Application Logic – 3	Chat system between students and teachers/admins (<i>future enhancement</i>)	Socket.io (<i>planned</i>)
5	Database	Stores users, courses, enrollments, roles, and learning progress	MongoDB
6	Cloud Database	Cloud-hosted scalable NoSQL storage	MongoDB Atlas
7	File Storage	For uploading media content (course images/videos/screenshots) (<i>optional</i>)	Local filesystem or Cloudinary (<i>optional</i>)
8	External API – 1	Location/IP tracking features (<i>future enhancement</i>)	IPInfo API (<i>optional</i>)

9	External API – 2	Not used in the current version	—
10	Machine Learning Model	Not applicable in this version	—
11	Infrastructure	Hosting frontend and backend on cloud platforms	Render (Backend), Vercel / Netlify (Frontend)

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology Used
1	Open-Source Frameworks	Core frameworks and libraries used in full-stack app development	React.js, Node.js, Express.js, MongoDB
2	Security Implementations	Implements secure user access, encrypted credentials, and token-based sessions	bcrypt.js, JWT, Helmet (Express middleware)
3	Scalable Architecture	Modular, layered design with separation of concerns (frontend, backend, database)	MERN Stack (3-tier architecture)
4	Availability	Deployed on cloud infrastructure ensuring high uptime and global accessibility	Render, MongoDB Atlas

5	Performance	Fast user interactions, asynchronous API calls, and optimized data handling	React, Axios, MongoDB
---	--------------------	---	-----------------------