Project Design Phase-II

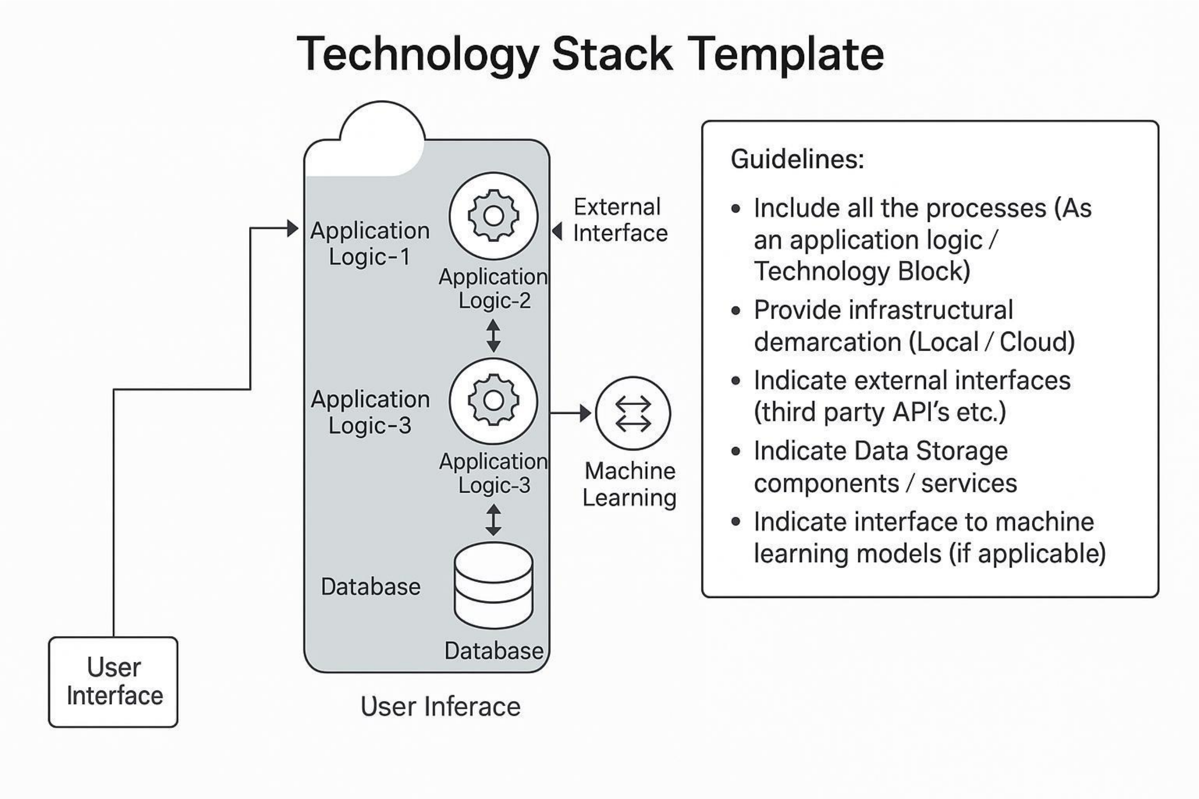
Technology Stack (Architecture s Stack)

Date	16 February 2026
Team ID	LTVIP2026TMIDS81707
Project Name	ShopEZ:One-Stop Shop for Online Purchases
Maximum Marks	4 Marks

Technical Architecture Overview

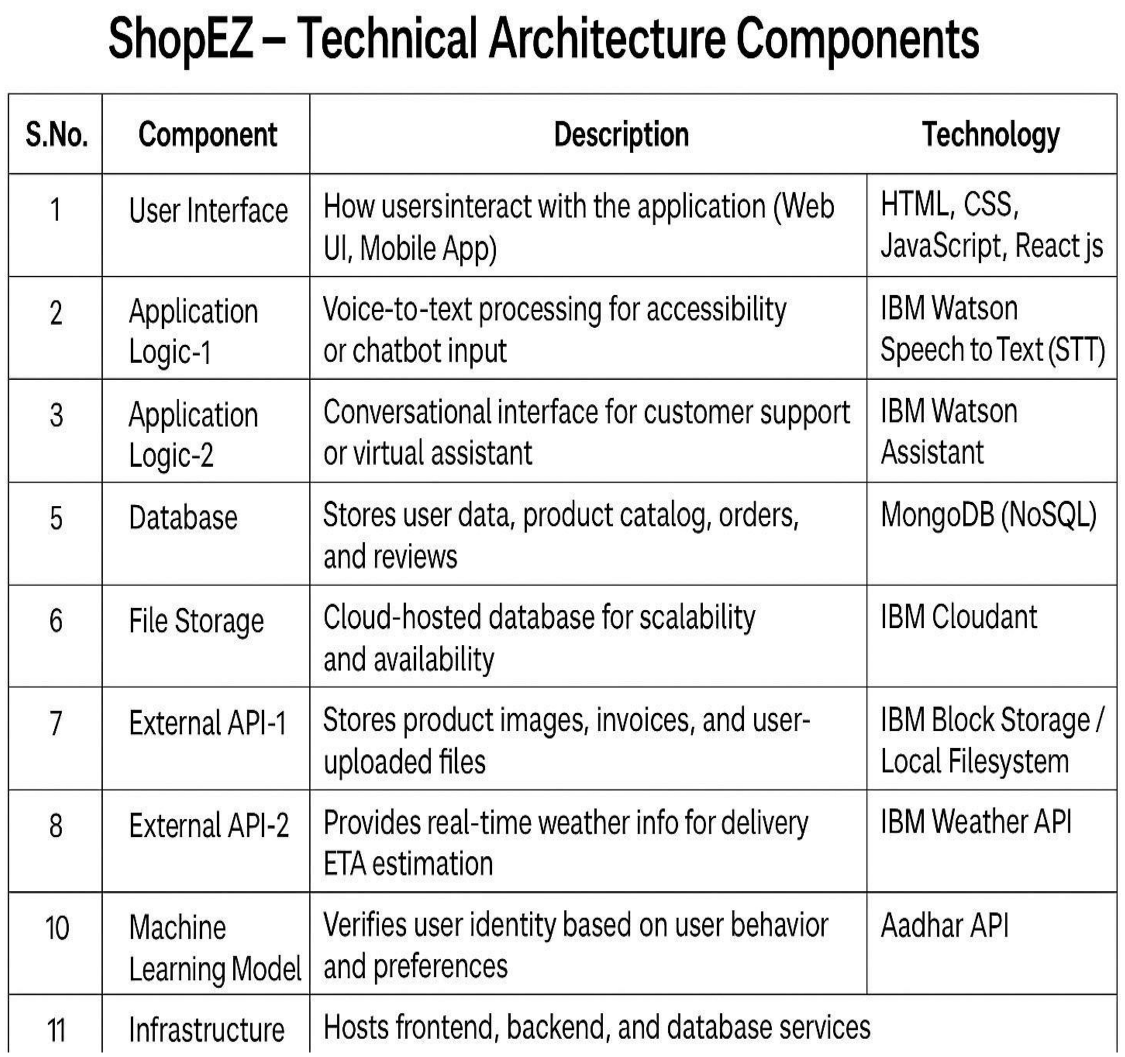
ShopEZ is a full-stack e-commerce platform built using the **MERN stack** (MongoDB, Express.js, React.js, Node.js). The architecture ensures scalability, modularity, and secure data flow between components.

Reference: https://github.com/sameekshaapatel/Shopez-E-commerce-Application-sameeksha/blob/main/README.md



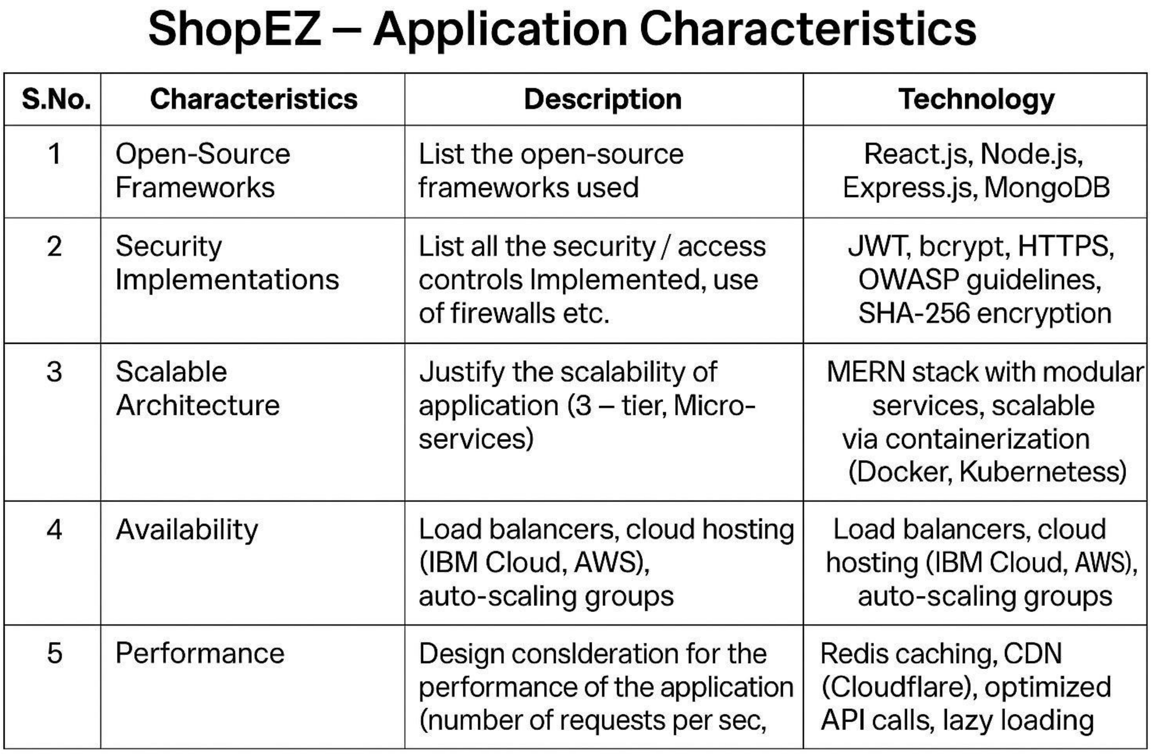
Guidelines:

- 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)



ShopEZ – Technical Architecture Components

S.No.	Component	Description	Technology
1	User Interface	How usersinteract with the application (Web UI, Mobile App)	HTML, CSS, JavaScript, React js
2	Application Logic-1	Voice-to-text processing for accessibility or chatbot input	IBM Watson Speech to Text (STT)
3	Application Logic-2	Conversational interface for customer support or virtual assistant	IBM Watson Assistant
5	Database	Stores user data, product catalog, orders, and reviews	MongoDB (NoSQL)
6	File Storage	Cloud-hosted database for scalability and availability	IBM Cloudant
7	External API-1	Stores product images, invoices, and user-uploaded files	IBM Block Storage / Local Filesystem
8	External API-2	Provides real-time weather info for delivery ETA estimation	IBM Weather API
10	Machine Learning Model	Verifies user identity based on user behavior and preferences	Aadhar API
11	Infrastructure	Hosts frontend, backend, and database services	



ShopEZ – Application Characteristics

S.No.	Characteristics	Description	Technology
1	Open-Source Frameworks	List the open-source frameworks used	React.js, Node.js, Express.js, MongoDB
2	Security Implementations	List all the security / access controls Implemented, use of firewalls etc.	JWT, bcrypt, HTTPS, OWASP guidelines, SHA-256 encryption
3	Scalable Architecture	Justify the scalability of application (3 – tier, Micro-services)	MERN stack with modular services, scalable via containerization (Docker, Kubernetess)
4	Availability	Load balancers, cloud hosting (IBM Cloud, AWS), auto-scaling groups	Load balancers, cloud hosting (IBM Cloud, AWS), auto-scaling groups
5	Performance	Design consIderation for the performance of the application (number of requests per sec,	Redis caching, CDN (Cloudflare), optimized API calls, lazy 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

https://github.com/sameekshaapatel/Shopez-E-commerce-Application-sameeksha/blob/main/README.md

https://nme.smartinternz.com/saas-guided-project/1/shopez-e-commerce-application

https://www.cliffsnotes.com/study-notes/12909922