Project Design Phase-II

Technology Stack (Architecture & Stack)

Team Details:

Team ID	LTVIP2025TMID20429
Project Name	ShopEZ: One Stop Shop For Online Purchases
Project Name	19 July 2025
Date	4 Marks
Maximum Marks	

Date: 19 July 2025

Maximum Marks: 4 Marks

Technical Architecture:

ShopEZ is a full-stack e-commerce web application built using the MERN stack. It facilitates seamless product browsing, cart management, ordering, and seller dashboards. The application is divided into frontend, backend, and database components, hosted locally or on cloud infrastructure.

Architecture Diagram Summary:
- Frontend: User interacts via Web UI built with ReactJS.
- Backend: Node.js + Express handles API requests.
- Database: MongoDB stores user, product, order, and cart data.
- Infrastructure: Runs on local server or can be deployed on cloud platforms.
- External APIs: None currently, but architecture supports future integration.

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	Web interface for user/admin to interact	ReactJS, HTML, CSS, JavaScript
2	Application Logic-1	Handles routing, authentication, and request processing	Node.js, Express.js
3	Application Logic-2	Handles shopping logic (cart, checkout, order processing)	Node.js, Express.js
4	Application Logic-3	Admin functionalities (add	Node.js, Express.js

		products, view users/orders)	
5	Database	Stores users, products, orders, carts	MongoDB, Mongoose
6	Cloud Database	Optional hosting on cloud-based MongoDB (MongoDB Atlas)	MongoDB Atlas
7	File Storage	Stores media/images locally or on cloud	Local File System or AWS S3
8	External API-1	(Future scope) Product recommendation / payment integration	Stripe API (optional)
9	External API-2	(Future scope) Authentication or location API	Google Maps API / Firebase Auth
10	Machine Learning Model	(Future scope) Personalized recommendations	TensorFlow.js (optional)
11	Infrastructure	Local development or cloud deployment	Localhost / AWS / Render / Vercel

Table-2: Application Characteristics:

S.No	Characteristics	Technology
1	Open-Source Frameworks: MERN stack: MongoDB, Express.js, React.js, Node.js	Open-source JavaScript stack
2	Security Implementations: Password hashing, secure checkout, role-based access	bcrypt, JWT, HTTPS
3	Scalable Architecture: 3-tier architecture; supports microservices structure	React frontend + RESTful APIs
4	Availability: Supports cloud deployment; can use load balancing	Nginx, PM2, AWS Elastic Load Balancer
5	Performance: Uses async processing, MongoDB indexing, API caching (optional)	Node.js, MongoDB, Redis (optional)

References:

https://c4model.com/

https://www.mongodb.com/docs/

https://reactjs.org/

https://developer.mozilla.org/

https://aws.amazon.com/architecture/