

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	16th April 2025
Team ID	SWTID1744119659
Project Name	ShopEZ: Online E-Commerce Platform
Maximum Marks	4 Marks

Technical Architecture:

The system architecture of **ShopEZ**, an online e-commerce platform, is designed to ensure a seamless, scalable, and secure user experience for both customers and administrators.

At the core of the platform lies the **cloud-based infrastructure**, which hosts the **Frontend**, **Databases**, and **Payment Services**.

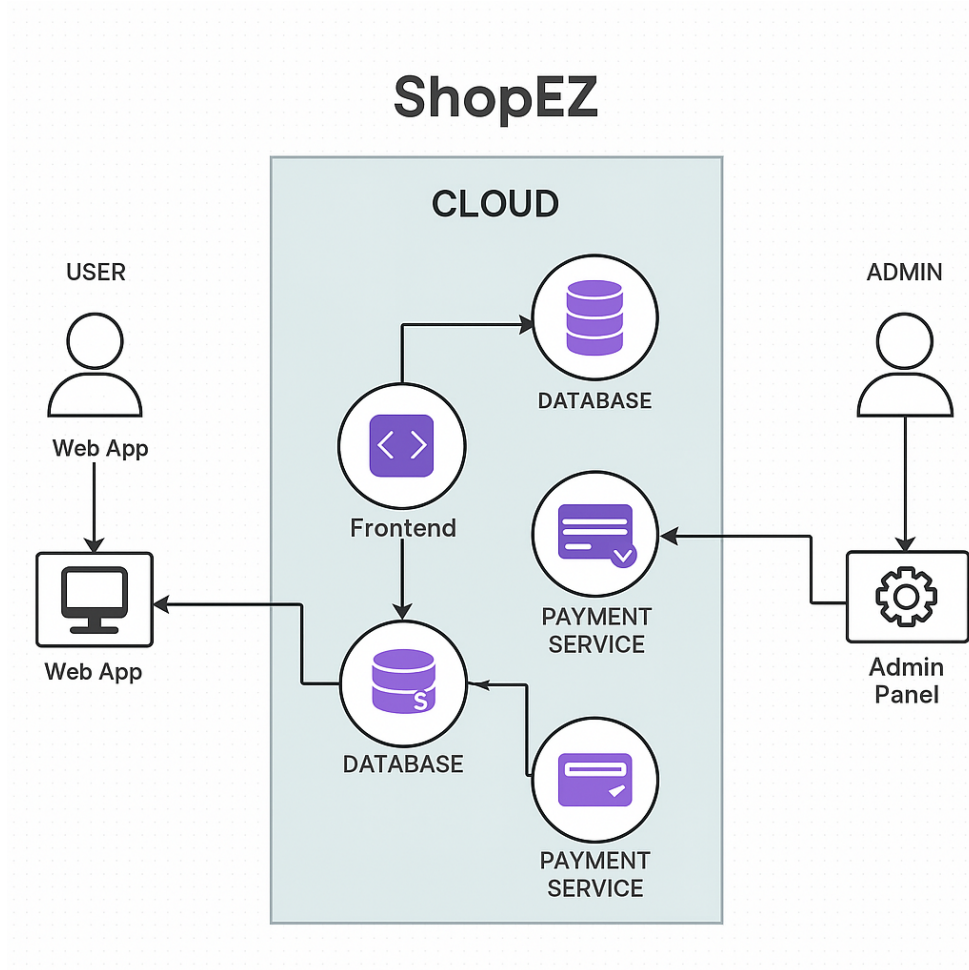
Customers interact with the system through the **Web App**, where they can browse products, manage their cart, and complete purchases. This interface is powered by the **Frontend**, which communicates with the **cloud database** to retrieve real-time product information, user data, and order history.

To ensure secure financial transactions, the frontend is integrated with third-party **Payment Services** that handle tasks like card processing, EMI options, and confirmation of successful transactions.

On the administrative side, **Admins** access the **Admin Panel** to oversee backend operations. They can manage product listings, update order statuses, handle user support queries, and monitor payment issues. This panel connects directly with

the payment services and database to maintain synchronization between user activity and internal operations.

Overall, this architecture supports real-time data exchange, fast performance, and modular service integration, providing a robust foundation for ShopEZ's digital commerce ecosystem.



Components & Technologies:

S.No.	Component	Description	Technology
1	User Interface	Web UI where users browse products, register/login, checkout	HTML, CSS, JavaScript, React.js
2	Application Logic-1	Handles authentication, product search, add to cart, order logic	Node.js, Express.js
3	Application Logic-2	Session management and cart logic	Express-session, JWT
4	Database	Stores users, products, orders, and cart data	MongoDB
5	File Storage	Storing product images	Local filesystem (uploads folder)
6	External API-1	Payment gateway for order checkout	Razorpay / Paytm API
7	Infrastructure	Hosting platform	Render / Vercel for frontend, Railway for backend

Application Characteristics:

S.No.	Characteristics	Description	Technology
1	Open-Source Frameworks	Frontend & backend built using open-source tech	React.js, Node.js, Express.js, MongoDB
2	Security Implementations	Password hashing, JWT-based authentication, HTTPS	bcrypt.js, JWT, Helmet.js, HTTPS
3	Scalable Architecture	Modular code with scalable database and REST APIs	3-tier architecture with RESTful services
4	Availability	Deployment on reliable cloud platforms with downtime minimization	Railway, Vercel, MongoDB Atlas
5	Performance	Fast-loading frontend with optimized queries, CDN for static assets	Lazy loading, MongoDB indexing, Cloudflare CDN