

Project Design Phase

Solution Architecture

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| Date | 31 January 2026 |
| Team ID | LTVIP2026TMIDS42166 |
| Project Name | ShopEZ : One-Stop Shop for Online Purchases |
| Maximum Marks | 4 Marks |

Solution Architecture:

1 Presentation Layer (Frontend)

- Built using **React.js**
 - Provides UI for Users and Admin
 - Features: Login, Register, Product Listing, Cart, Checkout, Admin Dashboard
 - Communicates with backend via REST APIs
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2 Application Layer (Backend)

- Built using **Node.js & Express.js**
- Handles:
 - Authentication (JWT-based login)
 - Product management
 - Cart operations
 - Order processing
 - Admin control
- Processes API requests and business logic.

3 Data Layer (Database)

- **MongoDB (MongoDB Atlas for cloud)**
- Stores:
 - User data
 - Product details

- Cart items
 - Order records
 - Admin information
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Architecture Flow (Data Flow)

1. User accesses the React frontend.
 2. Frontend sends API requests to Express server.
 3. Server processes request and interacts with MongoDB.
 4. Database returns data to server.
 5. Server sends response back to frontend.
 6. Admin dashboard accesses and manages product/order data through same backend.
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Infrastructure

- Local Development: Node.js server
- Cloud Deployment: Render / Vercel / AWS
- Version Control: Git & GitHub
- Database Hosting: MongoDB Atlas

Security Considerations

- JWT-based authentication
- Password hashing using bcrypt
- Protected admin routes
- Input validation and error handling

Example - Solution Architecture Diagram:

ShopEZ – Solution Architecture

