Solution Architecture

Project Design Phase

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Team ID: LTVIP2025TMID55453
Project Name: ShopMart: Your Digital Grocery Store Experience
Maximum Marks: 4 Marks

Solution Architecture

ShopMart's architecture is built using the **MERN stack**, offering a scalable, modular, and performant environment for delivering seamless online grocery services.

Tech Stack Components

MongoDB:
A NoSQL database used to store all structured data such as users, products, inventory, and order details.

Express.js & Node.js:
The backend power duo establishes RESTful APIs, handles core business logic, implements role-based security, manages payments, and enables admin operations.

React.js:
Client-side framework for rendering dynamic and responsive interfaces for customers, admins, and sellers using component-based architecture.

Key Features

JWT-based Secure Authentication:
Login and session handling via JSON Web Tokens.

Role-Based Access:

Customer: Browse and purchase groceries

Seller (Future Scope): Manage items, process orders

Admin: Monitor platform activity and manage listings

Real-Time Inventory Management:
Stock changes reflected immediately to keep catalog up to date.

Responsive UI:
Built using **React.js** and **Tailwind CSS** for mobile and desktop responsiveness.

Modular Backend API:
Reusable and clean API structure supporting future scalability.

Admin Dashboard:
Provides control on:

- Managing users, viewing orders
- Sales KPIs and system logs
- CRUD operations for products

Development Phases

Phase	Scope
Phase 1	Implement user registration, login, JWT authentication, and routing logic
Phase 2	Build the Customer UI for product browsing, category filtering, cart, and checkout
Phase 3	Introduce Seller dashboard for uploading/modifying products and viewing order history *(Future Scope)*
Phase 4	Admin panel: view user database, audit trail, product control, and order tracking modules
Phase 5	Payment Gateway Integration with support for secure online transactions and invoice generation *(Future Scope)*

Architecture Diagram (Conceptual)

text
[React.js Frontend]   ↓[Express.js + Node.js Backend API]   ↓[MongoDB Database]

User Roles Flow

Customer → Browse Products → Add to Cart → Checkout/Place Order → View Order Status

Admin → Login → View Dashboard → Manage Users & Products → Review Orders

(Future Scope) **Seller** → Login → Upload Products → Monitor Orders.