**Solution Architecture: ShopSmart Date:** 26 June 2025

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**Project Name: ShopSmart – Your Digital Grocery Store Experience**

# Solution Architecture

Solution architecture is a structured process that connects business needs with technology solutions. In the **ShopSmart Project**, the goal is to build a seamless online grocery shopping platform with secure user authentication, product filtering, order management, and a modern, user-friendly interface.

# Goals of the Solution Architecture

*  Build a full-stack application using **MERN stack** (MongoDB, Express, React, Node.js).
*  Enable secure **user authentication** using JWT tokens.
*  Provide **category-wise filtering**, search, and product sorting.
*  Allow users to **add items to cart** and place orders.
*  Track and display **order history and order status**.
*  Build a visually rich UI with **product images, prices, brand names**, and smooth CSS styling.

# ShopSmart Project Architecture and Data Flow

A typical architecture and data flow for the ShopSmart platform includes:

## Frontend (React.js):

* + User registration & login
  + Product listing and filtering
  + Cart and checkout functionality
  + Order history and user profile

## Backend (Node.js + Express):

* + RESTful API endpoints for products, users, cart, orders
  + Authentication and authorization (JWT)
  + Business logic and route handling

## Database (MongoDB):

* + Collections: Users, Products, Orders, Cart Items
  + Schema-based modeling with Mongoose

## Authentication (JWT):

* + Secure token-based login and protected routes
  + Role-based access for admin and users

## Data Flow Overview:

* + User actions (e.g., add to cart) trigger frontend requests
  + Frontend sends data to backend API
  + Backend processes logic and updates the database
  + Responses are sent back and rendered in the UI