**Project Design Phase**

**Solution Architecture**

| Date | 14 April 2025 |
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| Team ID | SWTID1743516636 |
| Project Name | SB Food Ordering App |
| Maximum Marks | 4 Marks |

**Solution Architecture:**

#### 1. Finding the Best Tech Solution for Food Service Challenges

The SB Foods Ordering App addresses common issues in food delivery and restaurant management, such as:

* The need for a user-friendly ordering interface for customers
* Real-time order tracking and kitchen updates for restaurants
* Seamless coordination with delivery personnel
* Secure and fast payment processing

The MERN stack was chosen to meet these needs due to its scalability, performance, and strong developer community:

* **MongoDB** stores dynamic content like menus, user preferences, order histories, and delivery logs
* **Express.js** and **Node.js** power backend APIs, business logic, and user authentication
* **React.js** delivers a responsive and fast frontend UI for customers, restaurant staff, and delivery partners

#### 2. Describing the Software Architecture to Stakeholders

The SB Foods Ordering App is built using a **3-tier architecture**:

* **Presentation Layer (React.js):** Handles all UI components such as menu views, cart systems, real-time order status, admin panels, and delivery dashboards
* **Application Layer (Express.js + Node.js):** Manages business logic like order processing, user authentication, payment flow, and communication between stakeholders
* **Data Layer (MongoDB):** Stores user data, order records, restaurant profiles, delivery routes, and analytics data

**Additional Key Features Include:**

* Real-time order status updates for customers and kitchens
* Customizable menu and inventory management for restaurants
* Role-based dashboards for restaurants, delivery staff, and administrators
* Secure integration with Stripe for online payments
* Multilingual and location-based support

#### 3. Defining Features, Development Phases, and Requirements

**Key Features:**

* Interactive customer-facing ordering system with search and filters
* Dynamic menu builder and inventory control for restaurants
* Real-time order tracking and status updates
* Delivery partner coordination module
* JWT-based secure authentication
* Admin reporting dashboard with analytics
* Notification system (email/SMS) via Nodemailer or third-party APIs

**Development Phases:**

* **Phase 1:** UI Development for Customers, Restaurants, and Delivery (React.js)
* **Phase 2:** Backend Architecture & API Development (Express.js / MongoDB)
* **Phase 3:** Authentication, Role Management, and Payment Integration
* **Phase 4:** Real-Time Order Tracking and Notifications
* **Phase 5:** Admin Panel, Analytics, and Deployment

**Requirements:**

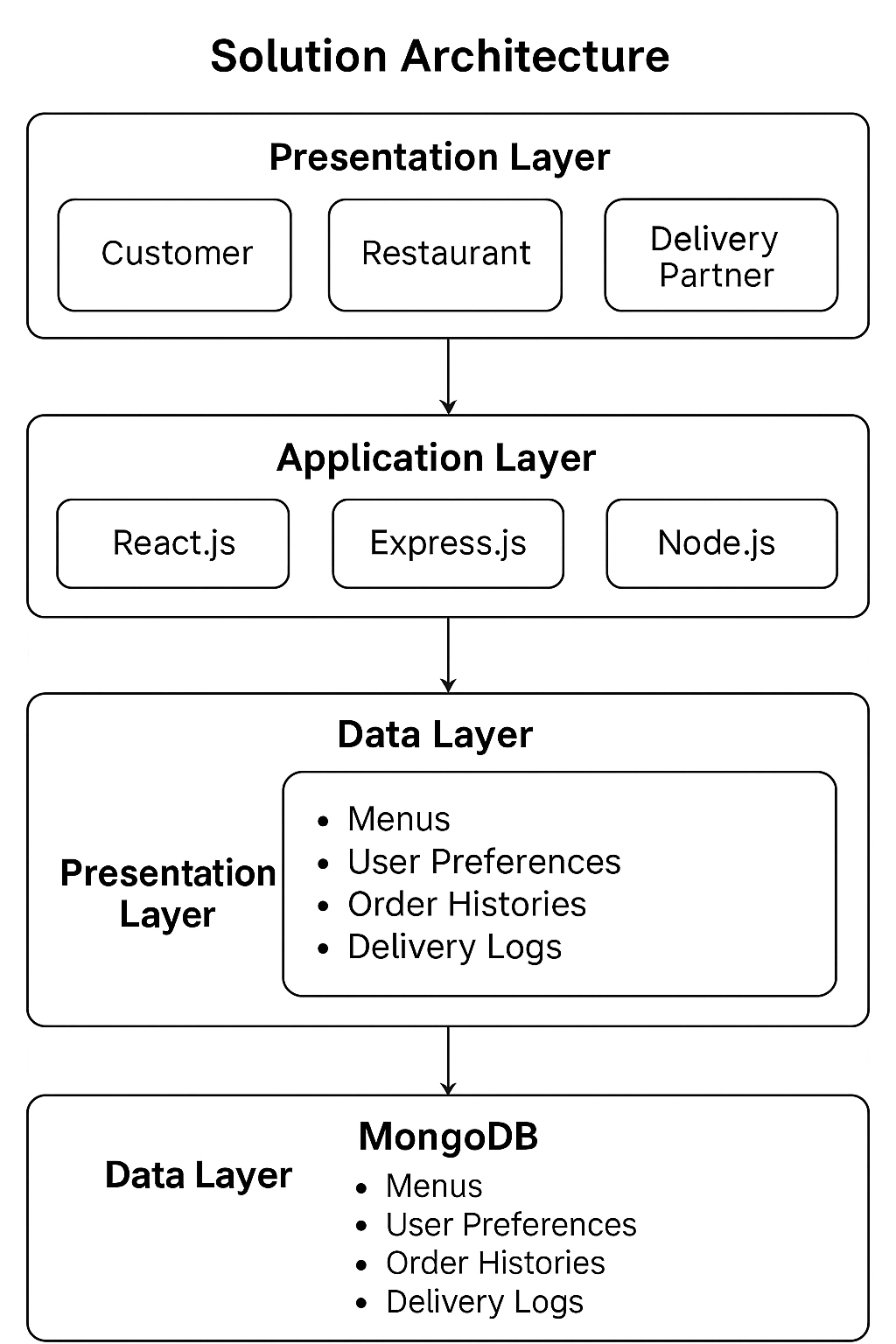
* Fully responsive design across all device types
* Role-based access (Customer, Restaurant, Delivery, Admin)
* Scalable backend to handle high concurrency during peak hours
* Modular structure for easy feature expansion

#### 4. Providing Specifications for Managing and Delivering the Solution

The SB Foods Ordering App adopts modern DevOps and deployment best practices:

* **Version Control:** Git/GitHub for source management and collaboration
* **CI/CD:** Automated testing, build, and deployment pipelines for continuous delivery
* **Containerization:** Docker for consistent development and production environments
* **Cloud Deployment:** AWS, Vercel, or Render for high availability and auto-scaling
* **Monitoring:** Tools like PM2, New Relic, or LogRocket for performance monitoring, error tracking, and system health insights

**Example - Solution Architecture Diagram:**

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