Marketplace Technical Foundation - [E-COMMERCE MARKETPLACE]

1. System Architecture Overview

Diagram

Components and Roles

- **Frontend**:
  - Built with Next.js and Tailwind CSS for a responsive, user-friendly UI.
  - Handles user interactions, renders data from APIs, and manages client-side state.
- **Sanity CMS**:
  - Manages content for products, categories, and user data.
  - Provides a schema-driven content structure for dynamic updates.
- **APIs**:
  - Integrates third-party services for inventory, shipping, and real-time tracking.
  - Facilitates communication between the frontend and backend systems.
- **Database**:
  - Stores user, order, and product details.
  - Optimized for quick read/write operations to ensure smooth user experiences.

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2. Key Workflows

User Workflows

1. Adding Products to Cart

1. **User Action**: User selects a product and clicks "Add to Cart."
2. **Frontend**:
   - Sends a POST request to the `/cart` endpoint.
   - Updates local cart state for immediate feedback.
3. **Backend**:
   - Validates product availability via the `/products/{id}` endpoint.
   - Updates the cart in the database.
4. **Response**:

- Returns updated cart details to the frontend for rendering.

2. Checkout Process

1. **User Action**: User clicks "Proceed to Checkout."
2. **Frontend**:
   - Validates user inputs and cart data.
   - Sends a POST request to `/checkout` with order details.
3. **Backend**:
   - Processes payment via a third-party payment API.
   - Creates an order entry in the database.
   - Sends confirmation email to the user.
4. **Response**:
   - Returns order confirmation details to the frontend.

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3. Category-Specific Instructions

Q-Commerce Features

- **Real-Time Inventory Updates**:
  - Endpoint: `/inventory/{productId}`
  - Method: GET
  - Purpose: Fetches current stock levels for a product.
- **Delivery SLA Tracking**:
  - Endpoint: `/delivery-status/{orderId}`
  - Method: GET
  - Purpose: Provides real-time delivery status for an order.
- **Express Delivery Workflows**:
  - Endpoint: `/express-delivery-status`
  - Method: GET
  - Purpose: Fetches SLA and tracking updates for express deliveries.

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4. API Specifications

Endpoint	Method	Purpose	Request Body	Response Example

`/products`	GET	Fetches all product details	N/A	`{ "id": 1, "name": "Product A", "price": 100 }`
`/products/{id}`	GET	Fetches details of a single product	N/A	`{ "id": 1, "name": "Product A", "price": 100, "stock": 50 }`
`/cart`	POST	Adds product to cart	`{ "productId": 1 }`	`{ "cartId": 123, "items": [...] }`
`/checkout`	POST	Processes order and payment	`{ "orderDetails": {...} }`	`{ "orderId": 456, "status": "success" }`

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5. Data Schema Design

Sanity Schema: Product

```
export default {
  name: 'product',
  type: 'document',
  fields: [
    { name: 'name', type: 'string', title: 'Product Name' },
    { name: 'price', type: 'number', title: 'Price' },
    { name: 'stock', type: 'number', title: 'Stock Level' },
    { name: 'category', type: 'reference', to: [{ type: 'category' }], title: 'Category' }
  ]
};
```

Database Schema

- **Users**:
  - Fields: `id`, `name`, `email`, `password`, `address`
- **Products**:
  - Fields: `id`, `name`, `price`, `stock`, `category`
- **Orders**:
  - Fields: `id`, `userId`, `productIds`, `totalAmount`, `status`

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6. Technical Roadmap

Milestones and Deliverables

1. **Milestone 1**: Setup Environment (Week 1)
    - Configure Next.js, Tailwind CSS, and Sanity CMS.
    - Implement basic routing and layout.
2. **Milestone 2**: Core Features (Week 2-3)
    - Develop product catalog and cart functionality.
    - Integrate Sanity CMS.
3. **Milestone 3**: API Integrations (Week 4)
    - Add real-time inventory and delivery tracking endpoints.
4. **Milestone 4**: Testing and Deployment (Week 5)
    - Perform end-to-end testing.
    - Deploy to Vercel or another hosting platform.

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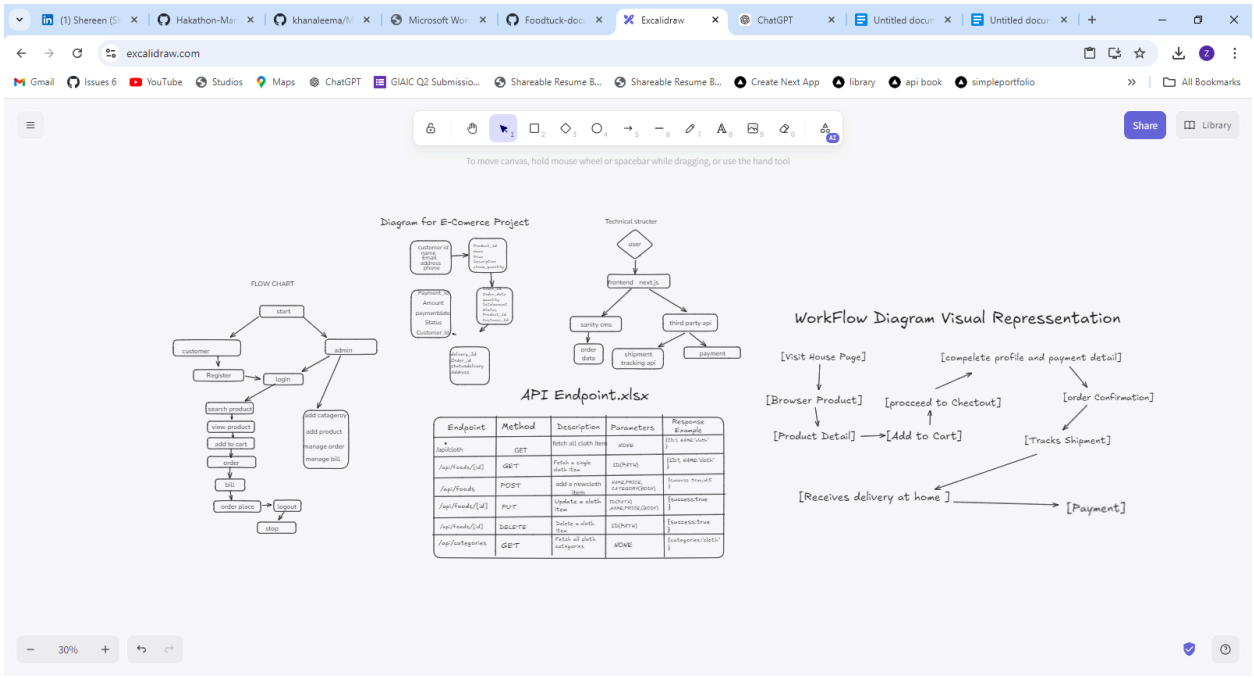
7. Collaboration Tools

- **Communication**: Slack, Discord, Google Meet
- **Version Control**: GitHub
- **Project Management**: Trello, Jira

This structured documentation provides a clear roadmap for the Marketplace project and ensures alignment among all stakeholders.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