Marketplace Technical Foundation - Furniture E-Commerce

1. System Architecture Overview

1.1 Overview

1. **Frontend (Next.js):**
    - User interacts with the website to browse products, add items to the cart, and complete the checkout.
    - Requests product data via the **Product Data API** from **Sanity CMS**.
2. **Sanity CMS (Backend):**
    - Serves as the content management system and stores product data, customer details, and orders.
    - **Product Data API** fetches product details like name, price, stock, and images for display on the frontend.
    - **Order API** stores order details (e.g., items, customer info, payment status) in Sanity when an order is placed.
3. **Third-Party APIs:**
    - **Shipment Tracking API:** After an order is placed, the frontend communicates with this API to get live shipment tracking data (order status, delivery updates).
    - **Payment Gateway API:** Once the user proceeds with checkout, this API processes payment transactions securely.

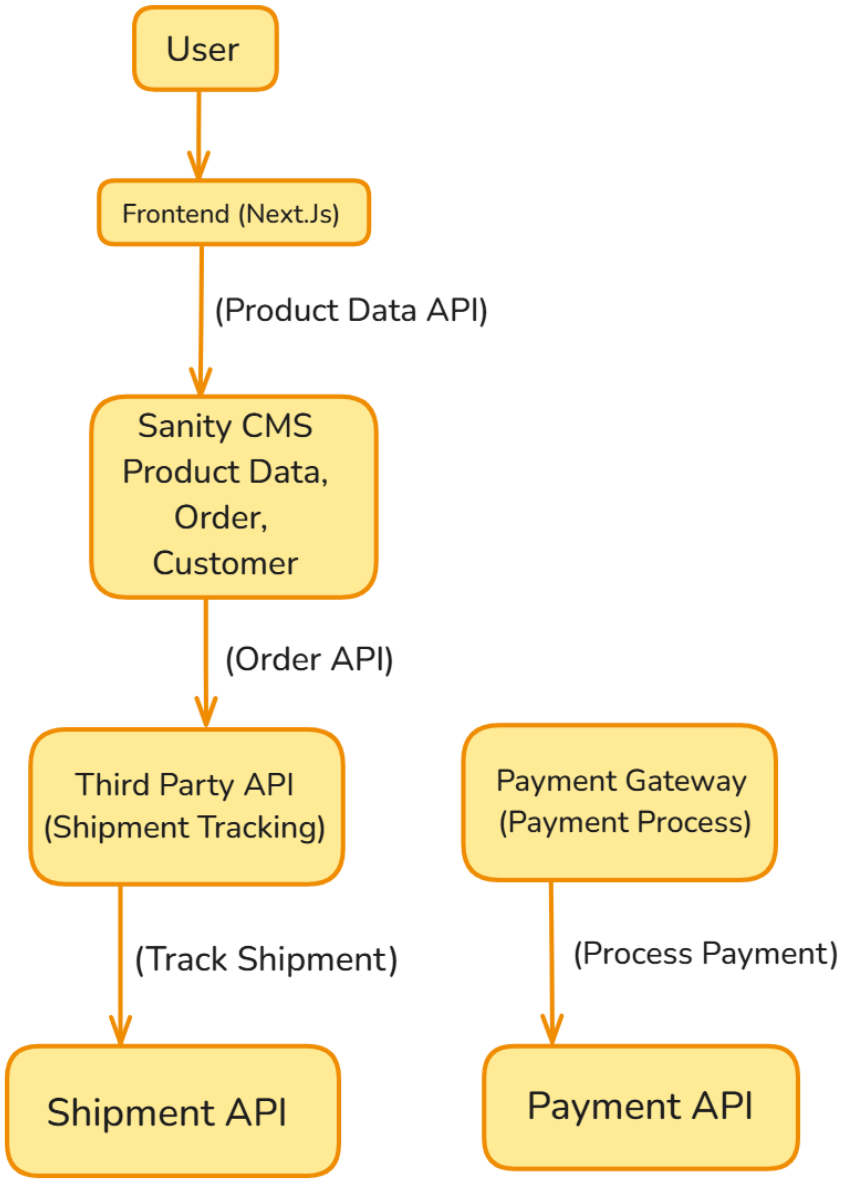
      Data Flow Example:
        i. **Step 1:** User browses products on the frontend → frontend makes a GET request to **Sanity CMS** to fetch product data.
        ii. **Step 2:** User adds items to the cart → frontend sends order details to **Sanity CMS** (via POST request to Order API).
        iii. **Step 3:** After placing an order, frontend sends payment data to **Payment Gateway API**.
        iv. **Step 4:** Once payment is successful, frontend communicates with the **Shipment Tracking API** to track and display the order's shipping status.

1.2 System Components:

1. **Frontend (Next.js)**: Displays data fetched from Sanity CMS and provides interactive features like cart management, checkout, and payment.
2. **Sanity CMS**: Stores and manages content data such as product listings, customer information, and order records. It interacts with frontend through APIs.
3. **Third-Party APIs**:
    - **Shipment Tracking API**: Used to fetch real-time shipment tracking details, like status and expected delivery date.
    - **Payment Gateway**: Used to securely process payments for the orders.

1.3 Architecture Diagram

System Architecture Diagram:



2. Key Workflows

2.1 User Registration Workflow

1. User submits registration form.
2. User data is sent to Sanity CMS for storage.
3. Confirmation email is sent to the user.

2.2 Product Browsing Workflow

1. User visits the Furniture E-Commerce platform.
2. Next.js fetches furniture product listings from Sanity CMS.
3. Products are displayed dynamically with images, dimensions, material, and pricing.

2.3 Order Placement Workflow

1. User adds furniture items to the cart.
2. User proceeds to checkout.
3. Order details, including customizations (if applicable), are sent to Sanity CMS and stored.
4. Payment request is sent to PayFast API.
5. Upon successful payment, order status is updated in Sanity CMS.

2.4 Shipment Tracking Workflow

1. Order is placed successfully.
2. Tracking request is sent to ShipEngine API.
3. Real-time shipment status, including estimated delivery time, is fetched and displayed.

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3. API Specifications

3.1 API Endpoints

Endpoint	Method	Purpose	Request Payload	Response Example
`/products`	GET	Fetch all available furniture products	N/A	`{ "id": 1, "name": "Wooden Table", "price": 200, "material": "Oak Wood" }`
`/orders`	POST	Create a new furniture order in Sanity	`{ "customer": "Ali", "items": [...], "customization": "Color: Walnut" }`	`{ "orderId": 12345, "status": "Processing" }`
`/shipment`	GET	Track order status via API	`?orderId=12345`	`{ "orderId": 12345, "status": "Shipped", "ETA": "5 days" }`

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4. Sanity Schema Design

4.1 Furniture Product Schema

```
export default {
  name: 'product',
  type: 'document',
  fields: [
    { name: 'name', type: 'string', title: 'Product Name' },
    { name: 'price', type: 'number', title: 'Price' },
    { name: 'material', type: 'string', title: 'Material' },
    { name: 'dimensions', type: 'string', title: 'Dimensions' },
    { name: 'weight', type: 'number', title: 'Weight' },
    { name: 'stock', type: 'number', title: 'Stock Level' },
    { name: 'image', type: 'image', title: 'Product Image' }
  ]
};
```

4.2 Order Schema

```
export default {
  name: 'order',
  type: 'document',
  fields: [
    { name: 'customer', type: 'string', title: 'Customer Name' },
    { name: 'items', type: 'array', of: [{ type: 'reference', to: [{ type: 'product' }] }], title: 'Ordered Items' },
    { name: 'customization', type: 'string', title: 'Customization Details' },
    { name: 'status', type: 'string', title: 'Order Status', options: { list: ['Pending', 'Processing', 'Shipped'] } }
  ]
};
```

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5. Technical Roadmap

Milestone	Task Description	Estimated Completion
Day 3-4	Setup Next.js frontend & Sanity CMS for furniture products	✅
Day 5-6	Implement APIs (PayFast & ShipEngine)	✅
Day 7	Test full system & fix bugs	✅
Day 8	Deploy the Furniture E-Commerce platform	✅

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6. Conclusion

This document serves as the technical foundation for the Furniture E-Commerce marketplace, ensuring smooth integration between frontend, backend, and third-party services.