DAY 2 PLANNING THE TECHNICAL FOUNDATION

System Architecture Document

1. Technical Requirements:

Frontend:

- I'm using **Next.js** for its server-side rendering capabilities and dynamic routing, which ensures my platform is fast and SEO-friendly. To style the application, I've chosen **Tailwind CSS** for its utility-first approach, allowing me to build responsive and clean designs quickly. For UI components, I'm integrating **ShadCN UI**, which provides reusable and customizable elements that match my design requirements.
- My frontend includes essential pages like Home, Product Listing, Product Details, Cart, Checkout, and Order Confirmation. All pages are designed to be responsive, ensuring an excellent experience across mobile and desktop devices.

Backend and Database:

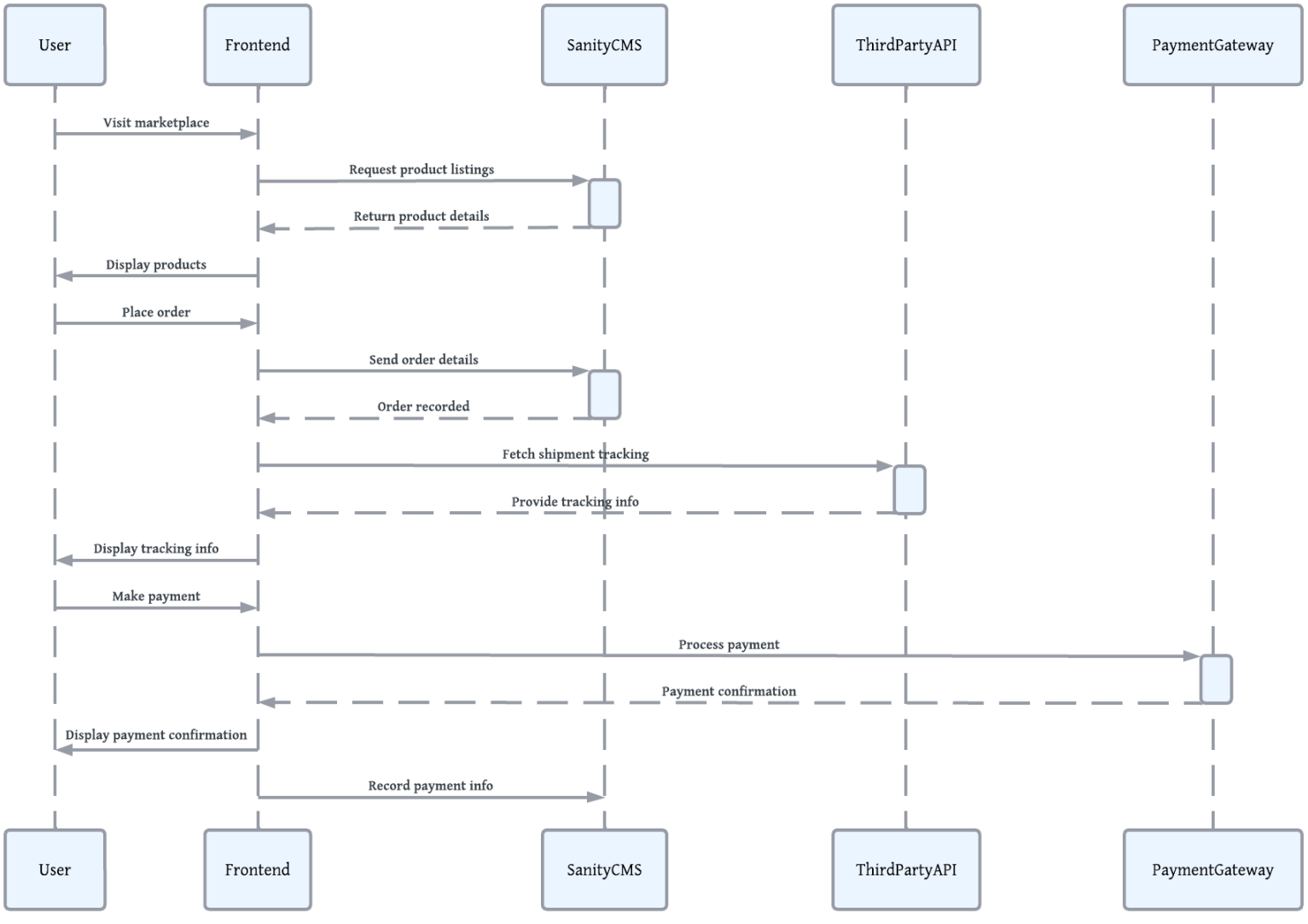
- I will manage product data, customer details, and order records using **Sanity CMS**. By designing schemas that align with my platform's business goals, I can ensure easy updates and reliable backend functionality.
- For dynamic cart functionality, I'm using **PostgreSQL** hosted on **Vercel**. It stores all cart-related data and synchronizes with Sanity to ensure consistency in inventory and orders.

Third-Party API Integrations:

- For shipment tracking, I'm integrating **ShipEngine**, which lets me provide real-time tracking updates to customers. I'm also using it to generate shipping labels to streamline the delivery process.
- I've chosen **Stripe** as my payment gateway because it's secure and easy to integrate. It handles all payment processing and ensures a smooth checkout experience with instant payment confirmations.
- Additionally, I'm working with APIs to enhance the frontend functionality, like fetching shipment statuses, payment updates, and order information in real time.

2. System Architecture:

High-level diagram showing how my system components interact:



Brief Explanation of Role of each Component:

I'll explain the role of each major component and how they work together in my marketplace system:

The User represents the customer interacting with my marketplace. They initiate the core actions like browsing products, placing orders, and making payments. Think of them as the conductor of the orchestra, starting each process based on their shopping needs and decisions.

The Frontend serves as the interface between the user and all backend services. Like a skilled translator, it takes user actions and converts them into appropriate API calls, then transforms the responses back into user-friendly displays. It handles everything from showing product listings to managing the shopping cart and presenting order confirmations.

SanityCMS acts as my system's central nervous system. It's not just storing data – it's actively managing my product catalog, maintaining order records, and keeping track of all transactions. Think of it as a highly organized librarian who knows exactly where every piece of information is and how it relates to other data in the system.

The ThirdPartyAPI, specifically focused on shipment tracking in this diagram, acts like a GPS system for customer's orders. It provides real-time updates about where packages are in their journey from warehouse to customer. It's eyes and ears in the delivery process, keeping both the system and customers informed about order progress.

The PaymentGateway functions as my marketplace's bank teller, handling all financial transactions securely. It processes payments, verifies their success, and sends back confirmations. This component is crucial for maintaining PCI compliance and ensuring secure handling of sensitive financial data.

What's particularly interesting about this architecture is how these components interact in a choreographed sequence. For example, when

a user places an order, we see a cascade of actions: the frontend collects the order details, SanityCMS records them, the payment gateway processes the transaction, and eventually the tracking API begins monitoring the shipment. Each component plays its part at exactly the right moment, creating a smooth, reliable shopping experience.