Hackathon Day 2 Planning the Technical Foundation.

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Technical Planning Documents Overvie

Key Technology

- **Frontend:** Next.js
- **Backend:** APIs
- **Database:** MongoDB
- **CMS:** Sanity
- **Payment Gateway:** Stripe
- **Shipping Integration:** ShipEngine

Technical Architecture

- Microservices architecture
- API-first approach
- Scalable and secure design

System Overview

- E-commerce platform for buying and selling furniture.
- Key components:
    1. User management
    2. Order management
    3. Payment management
    4. Shipment management
    5. Integration with Sanity CMS for content management
    6. Integration with ShipEngine for shipping management
    7. Integration with Stripe for payment processing

Database (MongoDB)

- NoSQL database for storing user data, orders, products, and delivery zones.
- Designed to be scalable and secure.

CMS (Sanity)

- Headless CMS for managing content

- Integration with frontend for displaying content

Order Tracking (ShipEngine)

- Integrated with ShipEngine for real-time tracking of orders.

Authentication (MongoDB)

- Secure and scalable user authentication using MongoDB.

Deployment

- Cloud-based deployment using AWS or Google Cloud.
- Designed for scalability and security.

System Components and Workflow

- **User Management**
- **Order Management**
- **Payment Management**
- **Shipment Management**
- **Integration with Sanity CMS and ShipEngine**

API Endpoints

- **User Management:**
  - `/users`, `/users/{id}`
- **Order Management:**
  - `/orders`, `/orders/{id}`
- **Payment Management:**
  - `/payments`, `/payments/{id}`
- **Shipment Management:**
  - `/shipments`, `/shipments/{id}`
- **Product Management:**
  - `/products`, `/products/{id}`
- **Category Management:**
  - `/categories`, `/categories/{id}`

Additional Features

1. Performance Optimization

- **Caching Mechanisms:** Implement caching (e.g., Redis) to speed up frequently accessed data.
- **Lazy Loading:** Enable lazy loading for images and content to improve frontend performance.
- **Efficient Pagination and Filtering:** Optimize data retrieval for large datasets, such as products and orders.

2. Scalability Planning

- **Autoscaling:** Configure AWS/Google Cloud for autoscaling to handle traffic spikes efficiently.
- **Independent Scaling:** Ensure microservices like users, orders, and payments can scale independently.

3. Analytics and Reporting

- **Real-Time Analytics:**
  - **Sales Reports:** Track daily, weekly, and monthly sales.
  - **User Activity Reports:** Monitor user engagement and purchasing patterns.
  - **Shipping Performance:** Analyze delivery times and delays.

4. Advanced Security Measures

- **OAuth 2.0:** Secure user login and session management.
- **Payment Tokenization:** Ensure Stripe uses tokenized payments to avoid storing sensitive card details.
- **Rate Limiting:** Implement API rate limiting to protect against DDoS attacks.
- **Role-Based Access Control (RBAC):** Set distinct access levels for admins, sellers, and customers.

5. Customer Experience Enhancements

- **Advanced Search:** Add smart search functionality with filters like category, price range, and brand.
- **Recommendation Engine:** Use AI or rule-based logic to suggest relevant products to users.
- **Multilingual Support:** Make the platform accessible in multiple languages.
- **Mobile Optimization:** Prioritize a mobile-first design for enhanced user experience.

6. Testing Strategy

- **Unit Testing:** Ensure individual components function as expected.
- **Integration Testing:** Validate the seamless connection between APIs and services.
- **Load Testing:** Test system performance under heavy traffic.
- **User Acceptance Testing (UAT):** Gather feedback from real users for improvements.

7. Future Enhancements (Roadmap)

- **Loyalty Program:** Introduce a rewards system for frequent buyers.
- **Subscription Model:** Add furniture rentals or maintenance services.
- **Augmented Reality (AR):** Enable users to virtually place furniture in their space.

- **Third-Party Integrations:** Expand integrations with logistics partners or marketing tools.

8. Environmental Impact

- **Sustainable Shipping:** Offer eco-friendly delivery options.
- **Carbon Offsetting:** Dedicate a percentage of revenue to environmental initiatives.
- **Recycling Programs:** Encourage users to recycle old furniture responsibly.

Deployment Plan

- Deploy the platform on AWS or Google Cloud.
- Ensure the deployment is scalable, secure, and optimized for high availability.

Database Security Considerations

- **Data Encryption:** Encrypt sensitive data such as passwords and payment details.
- **Access Control:** Restrict database access to authorized personnel only.
- **Security Audits:** Conduct regular security audits and penetration tests.

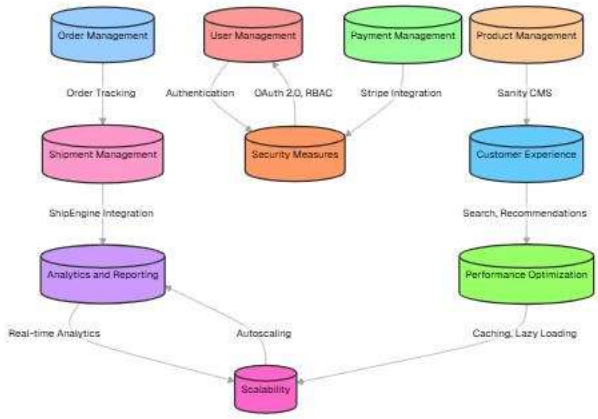
Monitoring and Maintenance

- **Real-Time Monitoring:** Use monitoring tools to track system performance and uptime.
- **Regular Updates:** Implement continuous updates for security and functionality improvements.
- **Backup and Recovery:** Have a robust backup and disaster recovery plan.

Timeline

1. **Development:** 6 weeks.
2. **Testing and Debugging:** 2 weeks.
3. **Deployment:** 1 week.
4. **Maintenance and Updates:** Ongoing.

E-commerce Furniture Platform - Workflow and Features



E-commerce Furniture Platform - System Architecture