

2- Workflows

1. User Registration and Login

1. User enters details in the signup/login form.
2. The frontend sends data to `/api/auth/signup` or `/api/auth/login`.
3. Backend:
 - Validates the data.
 - Stores password securely using `bcrypt`.
 - Issues a JWT token upon successful login.
4. The frontend stores the token in `localStorage` or cookies for subsequent requests.

2. Product Browsing

1. Users navigate to the homepage or product category page.
2. Frontend fetches product data from `/api/products`.
3. Backend fetches data from MongoDB and caches frequent queries in Redis.
4. Products are displayed with pagination.

3. Search and Filtering

1. Users enter search terms or apply filters.
2. Frontend sends the parameters to `/api/products/search`.
3. Backend:
 - Processes query parameters.
 - Searches the database with indexing for optimized performance.
 - Returns filtered results.

4. Shopping Cart

1. Users add products to their cart.
2. Cart state is managed using Redux Toolkit.
3. For logged-in users:
 - Cart data is synced with the backend via `/api/cart`.
 - Data is persisted in the database for later sessions.

5. Checkout and Payment

1. Users review the cart and proceed to checkout.
2. Frontend collects address and payment details and sends them to `/api/checkout`.
3. Backend:
 - Verifies user details and payment information.
 - Initiates payment using Stripe/PayPal API.

- On success:
 - Saves the order details in the database.
 - Sends a confirmation email to the user.

6. Admin Workflow

1. Admin logs in via /admin.
2. Admin dashboard allows:
 - Product management (add, update, delete)
 - Viewing and processing orders
 - Managing user roles
3. APIs for these actions:
 - /api/admin/products
 - /api/admin/orders
 - /api/admin/users