High Level Design (HLD)

E-Commerce Application Clone

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Contents

1. Document Version Control

Date	Version No.
15/07/24	1

2. Abstract

In the digital age, e-commerce websites have revolutionized the way businesses operate and consumers shop. These platforms have enabled both small and large enterprises to reach a global audience, breaking geographical barriers and expanding market reach. E-commerce websites provide a convenient and efficient way for consumers to access a wide range of products and services from the comfort of their homes. They offer various features such as secure payment gateways, user-friendly interfaces, and personalized shopping experiences, which enhance customer satisfaction and loyalty. The continuous advancements in technology and the increasing internet penetration have further fueled the growth of e-commerce, making it an integral part of the modern economy.

The E-Commerce Application Clone project is designed to replicate the core functionalities of a modern e-commerce platform using ReactJS solely for the frontend. This document provides a high-level design of the application, detailing its system architecture, component design, and user interface. The application will focus on delivering a user-friendly shopping experience with features such as product listing, shopping cart management, and a checkout process. This design does not include backend development, relying instead on static or mock data to simulate real-world interactions. The primary objective is to build a scalable and maintainable frontend that mirrors the essential functionalities of a typical e-commerce site.

3. Introduction

3.1 Why this High-Level Design Document?

The purpose of this High-Level Design (HLD) Document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions prior to coding, and can be used as a reference manual for how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:
    - Security
    - Reliability
    - Maintainability
    - Portability
    - Reusability
    - Application compatibility
    - Resource utilization
    - Serviceability

3.2 Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system.

4. General Description

4.1 Product Perspective

This E-Commerce Application is a React.js based project which enable both small and large enterprises to reach a global audience, breaking geographical barriers and expanding market reach.This application provides clothes divided into men, women & kids category which enhances it further adding to a cart_page, product_page.

4.2 Problem Statement

To design an “E-Commerce Application Clone” where the users can see the collection of products, and individual products, and add the product to the cart.

4.3 Proposed Solution

1. Design a homepage to show the available products.
2. A Category/Collection page where a particular type of product can be displayed.
3. A page where the items that are added to the cart can be displayed.
4. Checkout page where the users can place the order.

4.4 Further Improvements

This Application can further be enhanced to maintain health, grocery, electronic devices, can be added with recommendation systems to recommend what exactly user needs based on their past history or even based on product ratings.

5. Tools Used

- **HTML, CSS, Bootstrap, React.js:** These all are collectively used for designing the frontend-application in a responsive manner.
  - **GitHub:** Version Control System.
  - **VS Code:** Used as an IDE.

HTML

CSS

Bootstrap

React.js

GitHub

VS Code

6. Design Details

Process Flow

Designing Navbar

Designing pages for men, women & kids separately for browsing products.

Designing Cart Page that shows the total number of items pushed into the cart and also their subtotal.

Adding Responsiveness to the website for its proper functioning on different devices.

A checkout page

7. Resource Utilization

Memory Usage:

1. Optimized memory usage by minimizing unnecessary data.
2. Efficient manage of data to avoid leaks.
3. Monitor memory usage during peak traffic to ensure it doesn't exceed available resources.

Resource utilization directly impacts performance, user experience, and cost. Regular monitoring, load testing, and optimization are essential for maintaining a robust e-commerce platform.

Assumptions:

1. This application will be developed using ReactJS with static data.
2. o backend services are included in this project.

8. Purpose of an E-Commerce Website

An e-commerce website serves as a digital platform for buying and selling products or services over the internet. Its primary purpose is to facilitate transactions, connect buyers with sellers, and provide a seamless shopping experience. Here are some key objectives:

Sales & Revenue Generation:

- Drive sales by showcasing products, offering promotions, and enabling secure transactions.
- Increase revenue through online purchases.

Customer Experience Enhancement:

- Provide a user-friendly interface for browsing products, comparing prices, and making informed decisions.
- Ensure smooth navigation, quick load times, and intuitive design.

Brand Visibility & Recognition:

- Establish an online presence for your brand.

Market Expansion:

- Reach a global audience beyond physical store boundaries.

9. Conclusion

In the bustling world of online commerce, e-commerce websites have become the virtual marketplaces where buyers and sellers converge. These digital platforms offer a plethora of features, revolutionizing the way we shop, transact, and experience retail.

The E-Commerce Application Clone project outlines a high-level design for replicating the essential features of a modern e-commerce platform using ReactJS for the frontend. This document has provided a comprehensive overview of the system architecture, component design, data design, and user interface design, focusing on creating a responsive and interactive user experience.