Introduction To Software Engineering

PAO
PROJECT PROPOSAL

Group 7

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1. Information

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2. Introduction

- Brief Description: We're thrilled to introduce our class project, an online shopping website! In today's digital age, online shopping is not just a convenience, it's a necessity. With this project, our objective is to demonstrate the critical importance of e-commerce in people's daily lives. This practical endeavor provides students with a hands-on opportunity to grasp the complexities of running an online platform and the pivotal roles of various stakeholders: the admin who manages the site, users who shop for products, sellers who list and sell items, and guests who browse. It's a timely and relevant project, preparing us for the digital future.
- Reasons why it is worth to do:
    - Real-World Relevance: E-commerce has become an integral part of our daily lives, and understanding the dynamics of online shopping is highly relevant in today's digital age.
    - Practical Skills: Building an online shopping website provides us with practical experience in web development, design, and management, which are valuable skills in the job market.
    - Entrepreneurship: It encourages entrepreneurial thinking by allowing us to explore the complexities of running a business, managing inventory, and serving customers online.

- Problem Solving: We can encounter and tackle real-world problems that arise during the development and operation of an online shopping platform, enhancing our problem-solving skills.
- Innovation: It encourages creativity and innovation as we need to seek to differentiate our online store from competitors.

3. Target users and environments

Target users:

- Target users: Individuals aged 18 – 24, who are vibrant, active, and allocate a substantial amount of their time engaging with smartphones and social media platforms.
- Focal User Locale: Ho Chi Minh City, a pivotal hub for sectors like finance, media, technology, education, and transit. The city contributes approximately a quarter of the nation's overall GDP and hosts numerous multinational corporations.

Environments: Web

- Web hosting: Heroku (Netlify)
- Web configuration:
  - Front-end:
    - ReactJS:
      - Use: Widely used to build interactive UIs, especially Single Page Applications (SPAs).
      - Components: Encourages component-based architecture, promoting reusability and maintainability.
      - Virtual DOM: Implements a virtual DOM to optimize rendering and improve app performance.
      - Ecosystem: Has a rich ecosystem with libraries/tools like Redux for state management, React Router for navigation, etc.
    - CSS3:
      - Use: Styles the visual presentation of web pages.
      - Selectors and Properties: Uses selectors to target HTML elements and apply styles using properties.
      - Responsive Design: Employs media queries to create responsive designs that adapt to different screen sizes.

- o Animations: Supports animations and transitions to enhance user interaction and experience.
- ▪ Back-end:
    - NodeJS:
        - o Event-Driven: Utilizes an event-driven, non-blocking I/O model, making it lightweight and efficient.
        - o NPM: Comes with a robust package manager (NPM) that provides access to a large ecosystem of libraries and tools.
        - o Frameworks: Supports various frameworks like Express.js for building web applications and APIs quickly.
        - o Asynchronous: Handles requests asynchronously with callback functions, promises, and async/await.
- ▪ Database:
    - MongoDB:
        - o Document-Oriented: Stores data in BSON format (binary JSON) which supports embedded documents and arrays.
        - o Schema-less: Allows records to have different fields, providing flexibility in data storage.
        - o Scalability: Built for scalability, supporting sharding and replication.
        - o Query Language: Provides a rich query language to retrieve and manipulate data.
        - o Drivers: Offers drivers for various programming languages, including Node.js, to interact with the database.
- ▪ Integration
    - Front-end and Back-end Communication: Typically, the front-end (ReactJS) communicates with the back-end (NodeJS) via HTTP requests, fetching or sending data to be processed or stored in the database (MongoDB).
    - Database Connection: NodeJS connects to MongoDB using drivers or Object Data Modeling (ODM) libraries like Mongoose, which facilitates data validation, querying, and data translation between the app and the database.
    - Deployment: The front-end and back-end parts of the application can be deployed separately (decoupled architecture) or together, depending on the use case and architecture choice.
- ▪ Additional Considerations:

- Security: Implement security best practices, like data validation/sanitization, HTTPS, and secure cookies.
- Performance Optimization: Optimize application performance by minimizing and compressing assets, implementing caching strategies, and optimizing database queries.
- User Experience: Ensure a smooth user experience by focusing on UI/UX design principles, usability, and accessibility.

4. Key features

Role Admin:

- Feature:
  - User Management: This includes creating, editing, deleting, and assigning user roles.
  - Content Management: This includes creating, editing, deleting, and categorizing content on the website.
  - Access control: This includes controlling user access to different parts of the website.
  - Control: This includes monitoring and controlling user activities on the website.
  - Manage Trending Section:
    - Add Products to Trending:
      - Choose products from the list or search for products.
      - Determine the display duration of the product in the Trending section (e.g., from this date to that date).
    - Remove Products from Trending:
    -
      - View the list of products currently in the Trending section.
      - Select and remove products that are no longer suitable or as required.
    - Adjust Display Order:
      - Rearrange product order based on criteria like popularity, sales volume, etc.

Role User:

- Feature:

- View product: information including price, description, images, and other details.
- Manage order: Manage orders including viewing order information, updating order status, and canceling orders.
- Shopping: add to cart, adjust quantity, checkout)
- Payment: Make payment for orders using different payment methods such as credit cards, e-wallets, bank transfers, COD (payment on delivery), …
- Rating: Rate the product by commenting on it and sharing experience with other users.
- Search: enter keywords, filter by various criteria)

Role Seller

- Feature:
  - Enable Sell Products: Sellers have the capability to list and sell their products on the e-commerce platform. This involves creating product listings, providing product details, setting prices, and managing inventory.
  - Update Products: Sellers can edit, and update product listings as needed. They should be able to modify product information, images, pricing, and availability.
  - Chat with Customers: Sellers should have a means of communication with customers, often through a messaging system. This allows them to address inquiries, provide customer support, and manage order-related communication.
  - Login/Register (create a seller account or login using a registered account)

Role Guest

- Feature:
  - View Products: Guests can browse and view product listings on the e-commerce website without the need to sign up or log in.
  - Sign Up and Log In: Guests have the option to register for an account or log in if they wish to access additional features or complete a purchase. This typically involves providing personal information, creating a username/password, and receiving a confirmation email for account activation.