**Introduction To Software Engineering**

PA0

PROJECT PROPOSAL

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# Information

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# 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.

# 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.
        + Animations: Supports animations and transitions to enhance user interaction and experience.
    - Back-end:
      * NodeJS:
        + Event-Driven: Utilizes an event-driven, non-blocking I/O model, making it lightweight and efficient.
        + NPM: Comes with a robust package manager (NPM) that provides access to a large ecosystem of libraries and tools.
        + Frameworks: Supports various frameworks like Express.js for building web applications and APIs quickly.
        + Asynchronous: Handles requests asynchronously with callback functions, promises, and async/await.
    - Database:
      * MongoDB:
        + Document-Oriented: Stores data in BSON format (binary JSON) which supports embedded documents and arrays.
        + Schema-less: Allows records to have different fields, providing flexibility in data storage.
        + Scalability: Built for scalability, supporting sharding and replication.
        + Query Language: Provides a rich query language to retrieve and manipulate data.
        + 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.

# 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.