

# E-Commerce Website Using Mern Stack

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## ABSTRACT

Electronic Commerce is the process of doing business through computer networks. A person sitting on his chair in front of a computer can access all the facilities of the Internet to buy or sell the products. Unlike traditional commerce which is carried out physically with effort of a person to go & get products, ecommerce has made it easier for a human to reduce physical work and to save time. E-Commerce which was started in the early 1990's has taken a great leap in the world of computers, but the fact that has hindered the growth of e-commerce is security. Security is the challenge facing e-commerce today & there is still a lot of advancement made in the field of security. The main advantage of e-commerce over traditional commerce is the user can browse online shops, compare prices and order merchandise sitting at home or starting in the early 1990's has taken a great leap in the world of computers, but security has hindered the growth of e-commerce in developing countries. For a developing country advancement in the field of e-commerce is essential. The research strategy shows the importance of e-commerce in developing countries for business applications.

Keywords: Electronic Commerce, MERN

## I. INTRODUCTION

The MERN stack is a popular collection of technologies used to develop web applications. It is made up of four technologies: MongoDB, Express.js, React.js, and Node.js. MongoDB is a database management system, Express.js is a web application framework, React.js is a JavaScript library for building user interfaces, and Node.js is a runtime environment for executing JavaScript code on the server-side. Together, these technologies provide a powerful and flexible platform

for building web applications, including e-commerce websites.

Flipkart is a leading e-commerce platform in India, offering a wide range of products across various categories, including electronics, home appliances, fashion, and more. Your project, a Flipkart clone, is a replica of the Flipkart platform, with similar features and functionality. Some key features of your e-commerce website could include a user-friendly and responsive design, a search function to help users find

products quickly and easily, a shopping cart to allow users to add and remove items, a checkout process to complete purchases, and a secure payment system to handle transactions. You could also provide features such as product ratings and reviews, personalised recommendations, and special offers and discounts to enhance the shopping experience for users.

## II. LITERATURE SURVEY

A literature survey is a review of existing research on a particular topic. In the context of an e-commerce web application project using the MERN stack, a literature survey could include a review of previous research on e-commerce web application development, as well as research on the specific technologies used in the MERN stack.

**E-commerce web application development:** This could include research on design and user experience, as well as technical topics such as database design and scalability.

**MongoDB:** This could include research on using MongoDB for e-commerce applications, as well as best practices for data modelling and indexing.

**Express:** This could include research on using Express for building web applications, as well as best practices for routing and middleware.

## III. EXISTING SYSTEM

There are several existing systems that could be used to develop an e-commerce website similar to Flipkart. One option is to use a content management system (CMS) such as WordPress or Magento. These systems provide a user-friendly interface for managing the website's content and can be easily extended with plugins or custom code to add ecommerce functionality. Another option is to use a dedicated e-commerce platform such as Shopify or BigCommerce. These platforms provide a comprehensive set of tools for managing an online store, including inventory

management, payment processing, and shipping integration. They also often include a range of customizable templates and design options to help create a professional-looking website. It is also possible to develop a custom ecommerce solution from scratch using a server-side programming language such as PHP or Python. This approach allows for greater flexibility and control over the website's functionality, but it requires a higher level of technical expertise and can be more time-consuming to implement. Overall, there are many different systems available for building an e-commerce website, and the best choice will depend on the specific requirements and goals of the project.

## IV. PROPOSED SYSTEM

The E-commerce Management System has many advantages, compared to traditional stores as one can compare the cost of a product with other e-commerce websites, and if a user dislikes any product he/she can return it. While we can make use of the current technology to overcome the problem with the existing system. The E-commerce Management System companies can use a flying robot, so when a user places an order, the company will send the product through the robot. The robot will find the user by using the GPS, and in this way, we can reduce the time to deliver a product. Before sending a product the e-commerce company will check if the product is the same or not with the requested order.

## V. IMPLEMENTATION

**Step 1: Plan and design the application:** Create a project plan, define the requirements, and design the architecture and user interface of the application.

**Step 2: Set up the development environment:** Install and configure the necessary software tools and frameworks, including Node.js, React, MongoDB, and Express.

**Step 3: Create the backend:** Set up the server and database using Node.js and MongoDB, define the API

endpoints using Express, and implement user authentication and authorization.

Step 4: Create the frontend: Build the user interface using React, implement the necessary components, and integrate them with the backend API.

Step 5: Implement features: Implement the core features of the application, including product catalog, shopping cart, checkout, order tracking, and payment processing.

Step 6: Test the application: Conduct functional and user acceptance testing to ensure that the application meets the requirements and is user-friendly.

Step 7: Deploy the application: Deploy the application to a production server, configure the necessary infrastructure, and ensure that the application is secure and scalable.

Step 8: Maintain and improve the application: Monitor the application performance and user feedback, fix bugs and issues, and implement new features and improvements.

## VI. SOFTWARE TOOLS

Operating system: windows 7,8 & 10(32/64 Bit)

Coding language:

CSS, Bootstrap, reactjs, mongodb, REST API, POSTMAN.

## VII. FUNCTIONAL REQUIREMENTS

Product catalogue: The application should display a list of products with their descriptions, prices, and images.

Shopping cart: The application should allow users to add and remove products from their cart, and view the total cost of their order.

Checkout process: The application should provide a checkout process where users can enter their shipping and billing information, choose a payment method, and confirm their order.

User account management: The application should allow users to create an account, login, and logout. It should also provide features such as password reset, order history, and profile management.

Admin panel: The application should provide an admin panel where administrators can manage the products, orders, and users of the application.

## VIII. NON-FUNCTIONAL REQUIREMENTS

Performance: The application should be fast and responsive, with low page load times and minimal downtime.

Scalability: The application should be designed to handle a large number of users and transactions, and should be able to scale horizontally and vertically.

Security: The application should be secure, with features such as encryption, authentication, and authorization. It should also comply with relevant security standards such as PCI DSS.

Usability: The application should be easy to use and navigate, with a clear and intuitive user interface.

Accessibility: The application should be accessible to users with disabilities, with features such as alternative text, keyboard navigation, and screen reader support.

## IX. ADVANTAGES

Rapid development: The MERN stack provides a set of powerful and flexible tools that allow developers to quickly create and deploy web applications.

High performance: The MERN stack is designed to handle large amounts of data and high traffic, making it suitable for e-commerce applications that require fast and responsive user interfaces.

Scalability: The MERN stack allows for easy scalability, with features such as load balancing and horizontal scaling.

Flexibility: The MERN stack allows for easy integration with third-party APIs and services, making it easy to add new features and functionality to the application.

Open-source community: The MERN stack is built on open-source technologies and has a large community of developers and contributors, which means that there is a wealth of resources and support available for developers.

## X. DISADVANTAGES

**Complexity:** The MERN stack is composed of multiple technologies and frameworks, which can make it difficult for developers who are not familiar with all of them.

**Debugging:** The MERN stack can be challenging to debug due to its distributed nature and the use of multiple programming languages.

**Security:** The MERN stack requires developers to implement security measures such as authentication and authorization, which can be time-consuming and complex.

**Learning curve:** Developers who are new to the MERN stack may need to invest time and effort to learn the technologies and frameworks involved.

**Deployment and hosting:** Deploying and hosting an application using the MERN stack can be complex and require a certain level of expertise, especially when it comes to configuring and managing servers and databases.

**Dependence on technology:** Farmers who rely heavily on technology for disease detection may become overly reliant on it, potentially neglecting other important aspects of crop management.

**High initial costs**

## XI. APPLICATIONS

**Online retail:** An e-commerce application can be used by online retailers to sell their products to customers.

**Business-to-business (B2B) e-commerce:** An e-commerce application can be used by businesses to purchase products and services from other businesses.

**Marketplace:** An e-commerce application can be used to create a marketplace where multiple vendors can sell their products to customers.

**Auctions:** An e-commerce application can be used to create an auction platform where users can bid on products and services.

**Subscription-based services:** An e-commerce application can be used to offer subscription-based

services, such as online streaming services or monthly subscription boxes.

**Digital products:** An e-commerce application can be used to sell digital products, such as software, eBooks, music, and video games.

**Non-profit fundraising:** An e-commerce application can be used by non-profit organisations to collect donations from supporters.

**Crowdfunding:** An e-commerce application can be used to create a crowdfunding platform where users can raise funds for their projects and ideas.

## XII. CONCLUSION

In conclusion, an e-commerce application using the MERN stack can provide a robust and scalable solution for businesses looking to sell their products and services online. With its powerful combination of technologies, including MongoDB, Express.js, React, and Node.js, this stack can offer a full-stack solution that can handle the entire e-commerce process, from user management and product listings to shopping cart and payment processing. Additionally, the use of this stack can provide several benefits, such as faster development time, flexibility, and high performance. However, it's important to consider the functional and non-functional requirements, advantages, and disadvantages of the project before embarking on the development process. Overall, when implemented correctly, an e-commerce application using the MERN stack can provide a seamless and enjoyable shopping experience for customers and a convenient and efficient way for businesses to sell their products and services online.

## XIII. Future Aspects

**Mobile app development:** With the growing use of mobile devices, developing a mobile app can provide users with a more convenient and accessible shopping experience.

AI-powered product recommendations: Implementing AI algorithms can provide personalised product recommendations based on users' browsing and purchase history.

Voice commerce: Integrating voice-enabled assistants, such as Amazon Alexa or Google Assistant, can provide users with a hands-free shopping experience.

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