

## E-COMMERCE WEBSITE USING MERN STACK

<sup>1</sup>Nishant Sharma, <sup>2</sup>Nitin Jain, <sup>3</sup>Kapil Kumar Sharma

Bhagwan Mahaveer College of Engineering and Management (affl. to GGSIPU) Sonapat, Haryana

**Abstract**—In today's generation, most people are using technology for leading their lives and fulfilling their daily needs. In this generation most of us using E-commerce websites for shopping for clothes, groceries, and electronics. Most people in this generation shop for clothing, groceries, and electronics via E-commerce websites. We created an e-commerce online application with MERNstack technology, which includes MongoDB, the Express.JS framework, the React.JS library, and the Node.JS platform. This application is completely functioning, with multiple views for users and administrators, as well as a payment gateway integration for checkout. We may purchase many types of t-shirts and select various styles of t-shirts depending on consumer preferences by using this website. We can add new goods to this project as well as delete existing ones. Create a product, create categories, Admin dashboard, Manage products, Manage categories are some of the administrative functions we designed for the website. Customers can quickly add products to their shopping cart. The bill is generated based on the items in the basket, and the customer can pay using Stripe.

**Index Terms**—JavaScript, MERN Stack, Framework, Library, React.js, MongoDB, Node.js, Express.js

### I. INTRODUCTION

Technology is advancing at a breakneck pace nowadays. Software technologies progress at the same rate as hardware devices, and outdated technologies are gradually phased out. Web development has traditionally been done using technologies like JAVA servlets, ASP.NET, and PHP. While those technologies are widely used, have outstanding features, and are backed by a huge community, they still have certain limits in terms of today's demand for performance. The MERN stack (MongoDB, Express, React, and Node) has recently been developed as a better solution for this performance issue because of its simplicity and consistency.

The objectives of this thesis were to illustrate and understand the fundamental concepts and usage of each technology in the MERN stack, as well as their compatibilities and advantages as a complete stack in web application development. This web application was created to support a startup operated by the author's parents who chose to build a bookstore. By conducting research, the author discovered how e-commerce – a massive platform – has grown at an incredible rate over the previous few decades all over the world, delivering more benefits and conveniences than physical stores.

Ecommerce has permanently altered the way businesses and consumers engage, allowing users to connect with their favourite stores and brands whenever and wherever they choose, as well as assisting retailers in approaching customers

more actively. With the introduction of current technologies, it is expected that e-commerce would increase at an exponential rate in the future years. In order for the startup to build its business plan, the author's idea was to create an e-commerce web application as an online bookshop.

### II. PROBLEM STATEMENT

The goal of this project is to create a web application that will make it easier to find and sell fascinating clothes. The administrator of this E-commerce web application can add categories such as summer sales, winter festivals, and other events that will attract clients. Customers can also simply find their favourite products. They can also quickly purchase them by just adding them to their cart, which they can then raise or decrease by clicking on the "+" and "-" signs. They can check the total amount of the items they've added to the cart after they've finished adding them.

### III. E-COMMERCE

E-commerce is also known as electronic commerce, it is the process of buying and selling products through the internet, and also the transfer of money and the data to complete the process of buying or selling a product. The term "e-commerce" was coined in the 1960s. After years of development, social media further underlined the strength and explosion of the webpage as mobile devices grew more prevalent. The rapid development of commerce is aided by launchers (E-commerce).

- B2B (Business to Business): is a trade between companies, businesses and organizations. About 80% of e-commerce today falls into this category.
- B2C (Business to Consumer): is an Internet-based business to directly exchange the goods and services it creates or distributes to consumers.
- C2B (Consumer to Business): is a consumer who sells their products or services to a business or organization.
- C2C (Consumer to Consumer): is when a consumer sells his goods or services to another consumer.

There are also G2C, G2B, etc., but used less often than these four basic forms.

#### A. Advantages

- Global Reach: Obviously, if you open a physical business, you will only be able to supply your goods and services to a small geographic area. This problem will be solved with the help of e-commerce. E-commerce allows you to access a bigger market faster than direct sales by allowing products and services to be easily introduced, purchased, and sold through stores.

- Always open: Running an online business is considerably easier in e-commerce because it is always open 24 hours a day, seven days a week, 365 days a year. For

businesses, it's a terrific way to constantly improve sales opportunities.

- Accurate customer marketing: E-commerce enterprises can swiftly find and sell items and services thanks to access to client data and the ability to follow customers' purchasing behaviour. service. Consumers will benefit the most from this service.

B. Disadvantages

- Security: Despite the fact that E-commerce offers more benefits to customers. People are wary of disclosing personal information to website owners, resulting in security concerns when shopping on e-commerce platforms.

- Delivery: When we order something online, it may or may not arrive on time; this is one of the most common e-commerce concerns, it will take time depending on the distance between you and the company you ordered from.

- Technology Costs: To start an e-commerce website, you'll need to invest a lot of money because you'll need to check all of the options and set up a good security system.

IV. RESEARCH AND DEVELOPMENT

There are many applications for constructing a web application, and we used MERN technologies to develop a web application in this study. The MERN stack is a JavaScript-based stack that was created to streamline the development process. MERN is made up of four opensource components: a MongoDB database, an Express server framework, a React.js client library, and a Node.js server environment. These technologies give web developers an end-to-end web stack to work with when creating websites.

A. Application Architecture

BACKEND DEVELOPMENT

The first step is to generate an app.js file, which is the project's primary file and contains some of the essential middlewares and node packages. The app variable identifies

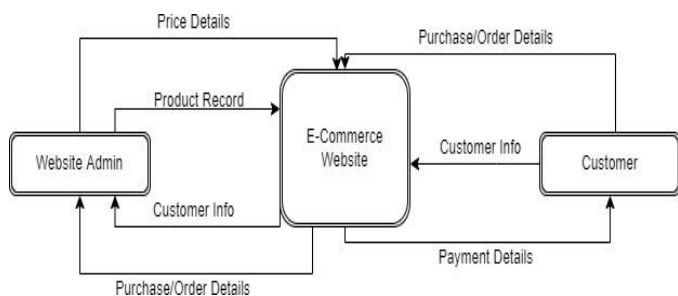


Fig. 1. Data Flow Diagram of Application

the Express instance. The next step is to establish a database connection. The MongoDB Atlas is chosen because of the numerous benefits it provides to the project. There are four schemas in this application: category, order, product, and user. Each mongoose schema represents a document structure. The user schema is built first because the user model is required for authentication and permission. JWT is the most often used authentication method. The application gives authorization and generates a JWT after a user logs in, which is then returned to the user. The most extensively used web service technology is known as "Representational State Transfer." REST is an HTTP protocol that lets two computers communicate in the same way as web browsers and servers

do. It is a collection of guidelines that must be followed by developers while establishing an API.

Method	Route path	Description
GET	/api/products	Returns a product list in json format
GET	/api/products/:id	Returns a product by id
DELETE	/api/products/:id	Deletes the product from DB
POST	/api/products	Creates a sample product in DB
PUT	/api/products/:id	Updates a product in DB
POST	/api/products/:id/reviews	Adds a review to the product in DB
POST	/api/users/login	Signs the user in
GET	/api/users/profile	Returns the profile details (if logged in)
POST	/api/users	Create a new user
PUT	/api/users/profile	Updates user profile (if logged in)
GET	/api/users	Returns all the users (if Admin)
DELETE	/api/users/:id	Removes a user by id (if Admin)
DELETE	/api/users/:id	Removes a user by id (if Admin)
GET	/api/orders/myorders	Returns orders by a user (if logged in)
GET	/api/order/:id	Returns order details by id

TABLE I  
 TABLE FOR ALL REQUESTS.

FRONTEND DEVELOPMENT

Unlike back-end development, which uses a variety of technologies, front-end development uses solely React.js. Following the command 'npx create-react-app' to create a template, the author includes bootstrap – the most popular CSS framework – to reduce styling chores from scratch, since the author chooses to concentrate on the MERN stack development element. Then, with the help of the react-router-dom package, a Routes.js file is created with the sole purpose of containing all of the route paths and their associated components. The Route component is subsequently rendered as the application's root component by ReactDOM. User information can be kept and accessed from local storage. JSON.parse() converts user data from a json string to a JavaScript object, which can be used to establish the user role (user or admin). As a result, the user is automatically logged into the proper dashboard. The Home component displays the main page of this programme, which is the Home page. A public empty URL is used to access this component. In an e-commerce application, it is quite significant. Search component on top of the page right below the shared layout. Here user can search product based on category and by text in name.

V. CONCLUSION

The goal of this thesis was to look into the unique aspects of each technology in the MERN stack and use them to create a full-stack e-commerce web application. This web application is fully working, with login authentication, admin authorization, and the ability to add items to a shopping cart. It can be applied to any textile industry, whether small or large. They can utilise the online application with ease, and they can

easily create categories and add products. Customers will find viewing products enticing whether they are at home or at work. It will be tremendously useful to small businesses since they will be able to sell directly to clients instead of going through wholesalers or large retail intermediaries, saving both time and money.

#### REFERENCES

- [1] Chanana, N., Goele, S. (2012). Future of e-commerce in India. *International Journal of Computing Business Research*, 8.
- [2] King, D. N., King, D. N. (2004). *Introduction to e-commerce*. Prentice Hall.
- [3] Nemat, R. (2011). Taking a look at different types of e-commerce. *World Applied Programming*, 1(2), 100-104.
- [4] Hyperion Development (2018). Everything you need to know about the MERN stack. Available at: [blog.hyperiondev.co](http://blog.hyperiondev.co).
- [5] Mai, N. (2020). E-commerce Application using MERN stack.
- [6] ]Niranjanamurthy, M., Kavyashree, N., Jagannath, S., Chahar, D. (2013). Analysis of e-commerce and m-commerce: advantages, limitations and security issues. *International Journal of Advanced Research in Computer and Communication Engineering*.