

Sports Tech Using MERN

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Project Guide

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Abstract — The main objective of making this E-commerce website is that: E-commerce website are nowadays most important aspect for various kind of business and normal business plan. The benefits that E-commerce website provides i.e cost savings, efficiency while selling and purchasing and the increased profit can be seen clearly at every stage. E-business these days should not be considered as competitive platform but a normal business process, without which any business is unlikely to survive in this modern economy.

In this E-commerce website, we have basically 2 modules i.e a customer module and a module for admin to control over the products and can manage and handle the enquiries raised by the customers. The customer module will have the functionality of buying the products irrespective of time (24x7) and irrespective of place where they are buying from. Customers can pay and can easily avail home delivery. The second module that is for Admin, it will contain the admin access page and also, it will have various functionalities such as changing any particular content present on the website. The admin can add, update, delete the content or products and set the stocks if they are available or not.

I. INTRODUCTION

The purpose of this project is to provide a platform where users can search for variety of sports item and can easily buy from anywhere around the country without any hassle in terms of payment and buying. This E-commerce website is centred only on sports related items which has its own advantage i.e users need not to search for sports items at different websites for purchasing but they can easily grab items according to their needs from our SportsTech. Users can pay online from their credit/debit and various online payment methods.

II. PRE-REQUISITE

A. Selecting a technical stack

We are using MERN stack for our project. MERN is an acronym for MongoDB, Express, React, Node. These database and backend tech builds up and form a MERN stack.

- MongoDB – cross platform database
- Express – open-source web app framework for Node.js
- React.js – open-source component based front-end library of JavaScript.

- Node.js – open-source JavaScript runtime environment used in backend.

B. How does the MERN stack work?

The MERN stack allows developers to develop 3-tiers that is, [frontend, backend and database connectivity] using JavaScript and JSON.

- React.js (Used in front-end development)

The first stair of development in MERN stack is React.JS, efficient and very useful JavaScript library. The main objective of using React while developing front end is that it helps making User Interfaces (UI) that improves the speed and performance of the apps.

React has made creating dynamic web applications easier. Creating dynamic web app was earlier a bit difficult and tricky because of complex coding but after React.JS came into picture which is component based, the whole scenario changed.

- Express.js and Node.js (Used in back-end development)

The next stair of MERN development is the Express.js server-side framework, running inside a Node.js server. Express.js is used for designing and building web apps. It is a framework of Node.js. The best advantage of using Express is that a developer can use JS as single language for developing front end and back end as well.

By making XML HTTP Requests (XHRs) or GETs or POSTs from our React.js front-end, we can connect to Express.js functions. After that, these functions use MongoDB Node.js drivers. These drivers helps in accessing and updating data in our MongoDB database.

- MongoDB Database (Used for storing data of Users)

Since we have lots of data (user profiles, content, description and product details and images), we will need a database which is easy to manage and can work with our technical stack that is React, Express and Node. That's where MongoDB comes in. MongoDB is a NoSQL database. MongoDB is scalable as it handles from small to large amount of data. MongoDB also provides flexibility, built in replication and fast performance. In MongoDB the documents are formatted in binary JSON and it helps developers who program in JS.

III. COMPARATIVE STUDY

If we compare SportsTech with any other E-commerce websites, it is completely a different platform which enables user to buy specific items i.e sports item at one place, our users do not need to wander around different e-comm websites searching for their required sports item. Also as we can see that E-commerce websites doesn't sell sports product in particular. If you try to buy any sports product like tread-mill, it is not available on similar ecommerce websites. Other E-commerce websites also take delivery charges that we will not be taking while delivering our products. So the conclusion is this app completely different from other apps in every aspect.

SportsTech: Problem Formulation

The purpose of any e-commerce website is to help their customers to make them choose easily from the various products that are being sold on their E-commerce website. [1] There is also a hurdle which a E-business website owner needs to keep a track of, that is each category will also have different set of facets. For example, searching for sports equipment it should display their format, as in paper pack or hardcover, company name, model number and other facets related to sports. It is true that there is lot of competition among different E-commerce websites but their main motive should be focused on customer on how to make them comfortable and choose from various products from their website. After this one thing that can be kept in mind is that categorization and feature listing of products should be taken care of. Any misrepresentation on the E-commerce website can lead to false results.

SportsTech: Feasibility Study

This project is very much feasible as it is every start-up company need. Generally, people have to go to various stores to find their desired product but using this website they can find all the required sports equipment and buy the products in real time. No geographic limitations will be there, anyone can buy products from the website and can get free delivery at their homes.

No other famous E-commerce website is selling all the sports product precisely, that's where our website will help the customers.

A. When it can be useful and when its not?

Our website "SportsTech" is useful for every user that uses it. SportsTech provides buying procedure, as well as easy to find products. Users can buy products irrespective of time as they can buy products 24/7. It has more reach to customers and there are no geographic limitations. It provides easy to manage the products and also there is no need of physical company setup. [8] Banking is also easy with our application.

The only con of this E-commerce website is that only sports related equipment are available on this website.

IV. WORK LAYOUT

We have already decided that we will be using MERN stack for our project which is currently very popular and is growing in industry.

A. THE VISUAL FRONTEND

We will use React.js a modern JavaScript framework for designing the website. Also, we will use Material-UI for designing the website and import styles according to our needs. This will reduce the work load and it will make sense on such a large project like this where all location needs to be similarly designed and presented. We create the project using create-react-app.

1) Since React works with components it is easy to handle information and route it through different pages or sections of the pages.

2) We will also use chart.js for visualizing the data for every location. It is also a javascript library which helps in creating amazing graphs.

B. IMAGE PROCESSING

Since our website heavily deals with huge number of images, we need a image processor to reduce the size of images without hindering the visual quality of overall image. We will use Squoosh app for this purpose which is created by google developers to process images extensively at any scale.

[2] This is done because we don't have huge storage on our database to store all the high-quality images. Also, some images may not be useful enough to upload in the database.

C. ReactDOM

React.js provides a package for React DOM which is useful for DOM manipulation. It is helpful because it makes our website very responsive and fast. It only loads the components when required instead of loading the whole page which makes the working faster than other websites.

D. BACKEND

For our backend validation and interaction with the Database we are using Express which is a framework for Node.js, an open source backend JavaScript server environment. Node.js is free and it runs on various platform.

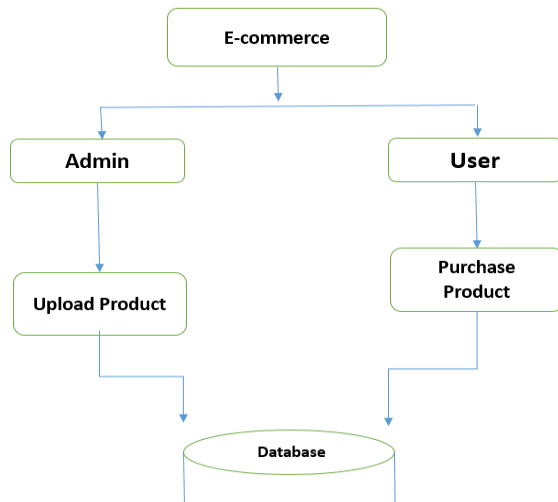
The backend code will check login credentials when the user logs in and retrieves information from the server. It will also check whenever the user wants to upload any information like images and reviews.

E. DATABASE

We will use MongoDB as our database since it works with React and Express. The JSON documents created in our React.js front end can be sent to the Express.js server, where they can be processed and if they are valid they are stored directly in MongoDB for later retrieval.

F. Architecture Diagram

Architecture Diagram



V. ANALYSIS ON INCREASING USER EXPERIENCE

[6] As, we can see there are numerous E-commerce websites available on the internet but we can easily observe that most of them are having really bad user experience in terms of UI , in terms of alignment of components in the e-commerce website, everything that attracts a customer is not taken care of as it should be.

One more reason for bad user experience is that, getting response from the application takes too long. One needs to focus on that as well in order to enhance the user experience. So, in our project we have researched on how to increase user experience while taking care of all the things one will observe when using the application.

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