E-2 Market

Minor Project-II

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Submitted in partial fulfilment of the requirement of the degree of

BACHELOR OF TECHNOLOGY

to

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by

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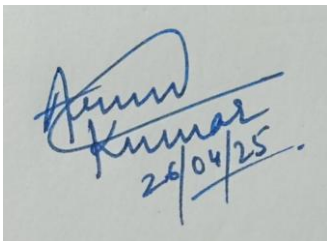
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April 2025

CERTIFICATE

This is to certify that the Project Synopsis entitled, "**E-2 Market**" submitted by "**Anurag Nidhi(2301010174)**" to **K.R Mangalam University, Gurugram, India,** is a record of bonafide project work carried out by them under my supervision and guidance and is worthy of consideration for the partial fulfilment of the degree of **Bachelor of Technology** in **Computer Science and Engineering** of the University.

Type of Project (Tick One Option)

Industry/Research/University Problem

Arun Kumar, New Delhi

Signature of Project Coordinator

Date: 23rd April 2025

INDEX

ABSTRACT

E-2 Market is an innovative web-based platform designed to simplify and promote the buying and selling of pre-owned products. The project aims to create a user-friendly and secure environment where individuals can efficiently exchange used goods, contributing to sustainable consumer practices and cost-effective purchasing. Built using the MERN stack (MongoDB, Express.js, React.js, and Node.js), E-2 Market ensures a seamless and dynamic user experience, enabling intuitive navigation and interaction. The platform allows sellers to list their products with detailed descriptions and images, while buyers can explore a wide range of categories, including electronics, furniture, apparel, and more. Advanced search filters and personalized recommendations enhance the user experience, helping buyers find suitable products quickly and efficiently. The platform also incorporates a review and rating system to ensure transparency and build trust among users

INTRODUCTION

E-2 Market is an innovative online platform designed to revolutionize the buying and selling of used products. With sustainability and affordability at its core, the website serves as a digital marketplace where users can connect to buy pre-owned items or sell products they no longer need. E-2 Market bridges the gap between sellers looking to declutter their spaces and buyers searching for cost-effective and reliable second-hand alternatives.

What sets E-2 Market apart is its seamless user experience, built using the MERN (MongoDB, Express.js, React.js, Node.js) stack. The platform features a modern, intuitive interface that allows users to easily browse listings, post products for sale, and communicate with potential buyers or sellers. Advanced search filters and personalized recommendations ensure that users can quickly find what they need without unnecessary hassle.

E-2 Market is the ultimate destination for those who believe in giving products a second life while making smart, sustainable decisions.

MOTIVATION

The motivation behind creating E-2 Market stems from the growing need for sustainable consumer practices and an efficient platform for affordable product exchange. In today's fast-paced world, people frequently discard functional items in favor of newer products, leading to unnecessary waste and environmental harm. At the same time, many individuals seek affordable alternatives to expensive brand-new items but lack access to a reliable second-hand marketplace.

The decision to develop E-2 Market using the MERN stack reflects the motivation to build a modern, scalable, and efficient platform. The combination of advanced technology and an intuitive user interface ensures a seamless and engaging experience, encouraging more people to embrace second-hand commerce.

Ultimately, E-2 Market is driven by a desire to make a positive impact—both socially and environmentally—by promoting sustainability, affordability, and trust within the growing second-hand marketplace.

LITERATURE REVIEW

Research has explored different aspects of online second-hand marketplaces, highlighting key factors that influence their success. Here's what the studies reveal:

1. **Trust and Transparency:** A 2024 Forbes article highlights the ongoing battle against fake reviews, noting a 20% year-over-year increase in fraudulent reviews between 2021 and 2022. Platforms must combat fake reviews to create more transparent and trustworthy marketplaces.

2. **Secure Transactions:** A 2024 global survey by IDEMIA Secure Transactions reveals that design, convenience, and sustainability are primary factors driving consumer payment trends, with security remaining a significant concern. Consumers seek safe payment methods, prompting platforms to enhance their payment systems.

3. **Personalization:** McKinsey's 2023 Digital Payments Consumer Survey indicates that consumers are increasingly open to new technologies, with convenience and user design advancing adoption. Personalized experiences are becoming essential in meeting consumer expectations.

4. **Sustainability:** A 2024 article from Vogue Business discusses how the resale market is projected to reach $350 billion by 2028, driven by consumer demand for sustainable shopping practices. Second-hand commerce plays a significant role in promoting sustainability.

5. **User-Friendly Design:** The same McKinsey survey emphasizes that convenience and user design are critical in advancing the adoption of digital payment solutions. User-friendly interfaces are crucial for retaining users and enhancing their experience.

E-2 Market addresses these factors by implementing robust review systems, secure payment options, personalized user experiences, promoting sustainable practices, and ensuring an intuitive interface to enhance the second-hand shopping experience.

GAP ANALYSIS

Despite the growing success of second-hand marketplaces, several gaps still exist in the current platforms. One major issue is the lack of personalization, which hinders user engagement and satisfaction. Many platforms also struggle with ensuring consistent product quality and transparency, leading to a lack of trust between buyers and sellers. Additionally, security remains a significant concern, with users often exposed to fraud or unsafe transactions. E-2 Market addresses these gaps by integrating personalized search filters and recommendations to enhance user experience. The platform incorporates a robust rating and review system to foster trust and transparency. Furthermore, E-2 Market prioritizes secure payment gateways and communication channels to mitigate security risks. By focusing on these areas, E-2 Market aims to offer a more reliable, user-friendly, and secure environment for buying and selling used products, ultimately differentiating itself from existing competitors.

PROBLEM STATEMENT

The growing demand for sustainable consumerism and affordable alternatives has led to an increase in the popularity of second-hand marketplaces. However, existing platforms still face significant challenges that hinder their effectiveness. First, many platforms lack personalized search and recommendation features, which can make it difficult for users to find products that match their preferences. Second, trust and transparency issues often arise, with users uncertain about the quality or authenticity of products, leading to hesitation in transactions. Third, security concerns, such as fraud or data breaches, remain a critical issue, as many platforms do not offer secure payment methods or communication channels between buyers and sellers.

These challenges limit the potential of second-hand platforms and deter users from fully engaging in the market. E-2 Market aims to address these issues by providing a user-centric platform with advanced search filters, personalized recommendations, a reliable review system, and secure payment options. By addressing these gaps, E-2 Market seeks to create a trusted, sustainable, and efficient online marketplace where users can confidently buy and sell pre-owned products.

OBJECTIVES

1. To design and develop a user-friendly online marketplace for buying and selling used products, ensuring a seamless and intuitive experience for both buyers and sellers.

2. To integrate advanced search filters, personalized recommendations, and secure access using JWT authentication and bcrypt encryption.

3. To build a scalable platform using the MERN stack (MongoDB, Express.js, React.js, Node.js) that can handle growing user traffic and expanding product listings.

4. To promote sustainability by encouraging the reuse of products and support a circular economy.

TOOLS/TECHNOLOGIES USED

To develop E-2 Market, the following tools and technologies have been utilized:

1. Programming Language:

    o JavaScript (React.js & Node.js) for full-stack development.

2. Frameworks and Libraries:

    o React.js for building a dynamic and responsive UI.

    o Express.js for backend API development and server-side logic.

3. Database:

    o MongoDB for storing product listings and user information.

4. Security:

    o JWT (JSON Web Tokens) for secure user authentication.

    o Bcrypt for password hashing and data encryption.

5. Version Control:

    o Git for tracking changes and collaborative development.

These technologies ensure E-2 Market is scalable, secure, and efficient while delivering a seamless user experience.

METHODOLOGY

E-2 Market will follow a structured approach to ensure efficient development and implementation:

1. **Frontend Development –** The web application will be built using React.js for dynamic rendering and a rich user interface. TypeScript will be used to ensure type safety and minimize development errors.

2. **Backend Development –** The backend will be developed using Node.js with Express.js to handle API requests. MongoDB will be used as the primary database for storing user and product data.

3. **User Authentication & Security –** JWT (JSON Web Token) authentication will be implemented to secure user accounts, ensuring safe login and transactions.

4. **Product Listing & Search Optimization –** Users can list products with images and descriptions, while Elasticsearch or MongoDB indexing will be used for fast and accurate search functionality.

5. **Testing & Debugging** – The system will undergo manual testing (UI/UX validation) and automated testing (API and database performance). Key metrics such as response time, transaction success rate, and user engagement will be tracked.

6. **Deployment & Maintenance** – The application will be deployed using AWS or Vercel for hosting, with a CI/CD pipeline to ensure continuous updates and improvements.

Implementation

1. Detailed Explanation of How the Project Was Implemented

The E-2 Market project was implemented using the MERN stack, which consists of MongoDB, Express.js, React.js, and Node.js.
The development process was divided into two major parts: frontend and backend.

- Frontend (Client Side):
  Built using React.js to create a dynamic and responsive user interface. Key components like Home, Login, Register, Profile, Product Upload, and Product Listings were created. Form validations were added to ensure proper user input.
- Backend (Server Side):
  Created using Node.js and Express.js to build a RESTful API. The server handles user authentication (signup/login), product management (add, edit, delete, view products), and user profile updates.
- Database:
  MongoDB was used to store users' data, product listings, and other information. Mongoose was used for object modeling and schema design.
- Authentication:
  User authentication was implemented using JWT (JSON Web Tokens) to secure user sessions.
- Email Feature:
  A "Forgot Password" feature was implemented where users receive a password reset link or their password through their registered email.
- Deployment:
  The project was deployed on Render for backend and Vercel for frontend hosting.

2. Description of Algorithms, Code Snippets, or Design Diagrams

- Authentication Algorithm:
    - During login, the user provides email and password.
    - Server checks credentials by comparing hashed passwords using bcrypt.
    - If correct, a JWT token is generated and sent to the frontend for secure access.
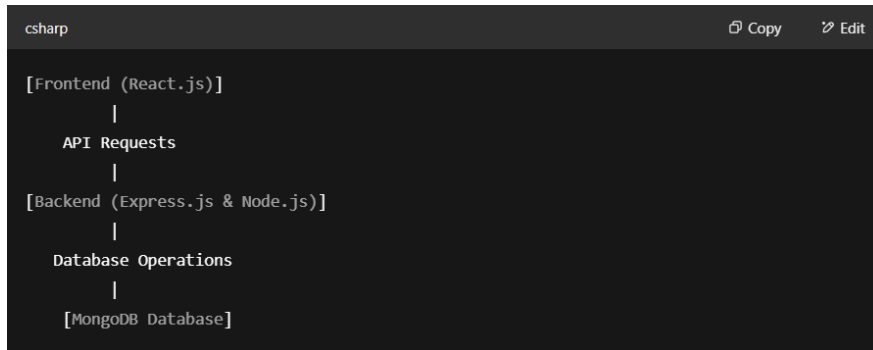
```javascript
const token = jwt.sign({ id: user._id }, process.env.JWT_SECRET, { expiresIn: "1d" });
res.json({ token, user });
```

- **Product Upload Algorithm**:
    - Users fill a form with product details
    - The form data is sent via API to the server, which validates and stores it in MongoDB.

```javascript
const newProduct = new Product({
  title,
  description,
  price,
  image,
  seller: userId
});
await newProduct.save();
```

- **Design Diagram (Simplified)**:

```csharp
[Frontend (React.js)]
         |
    API Requests
         |
[Backend (Express.js & Node.js)]
         |
    Database Operations
         |
    [MongoDB Database]
```

3. Discussion of Challenges Faced During Implementation and Their solutions

Challenges	Solutions
Authentication Handling	Initially struggled with securing APIs and managing sessions, later solved using JWT tokens with proper middleware authentication checks.
Image Uploading	Faced issues with storing product images. Decided to store images as base64 strings or URLs rather than saving actual files.
Forgot Password Feature	Setting up Nodemailer and Gmail SMTP took time due to security policies. Solved it by enabling "Less secure apps" and setting up App Passwords for production.
Frontend State Management	Handling user login state across different pages was challenging. Used React Context API to manage authentication states effectively.

Deployment Issues	Faced CORS errors between frontend and backend. Fixed it by properly setting CORS policies on the backend server.
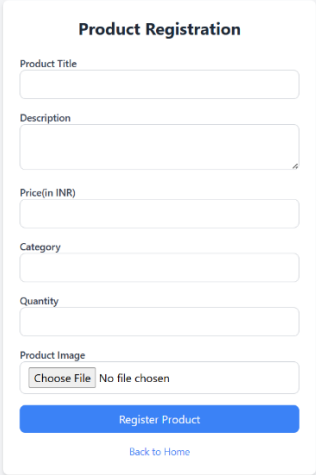
RESULTS AND DISCUSSIONS

THE GUI (Frontend Interface):

The frontend of E-2 Market was successfully developed using React.js. Main highlights of the GUI are:

- A simple and clean homepage displaying available products for users.
- Login and Registration forms with proper input validation and error handling.
- A responsive design that adjusts across mobile, tablet, and desktop devices.
- An easy-to-navigate profile section where users can view and manage their uploaded products.
- Product Upload form with fields like product name, description, price, and image upload.
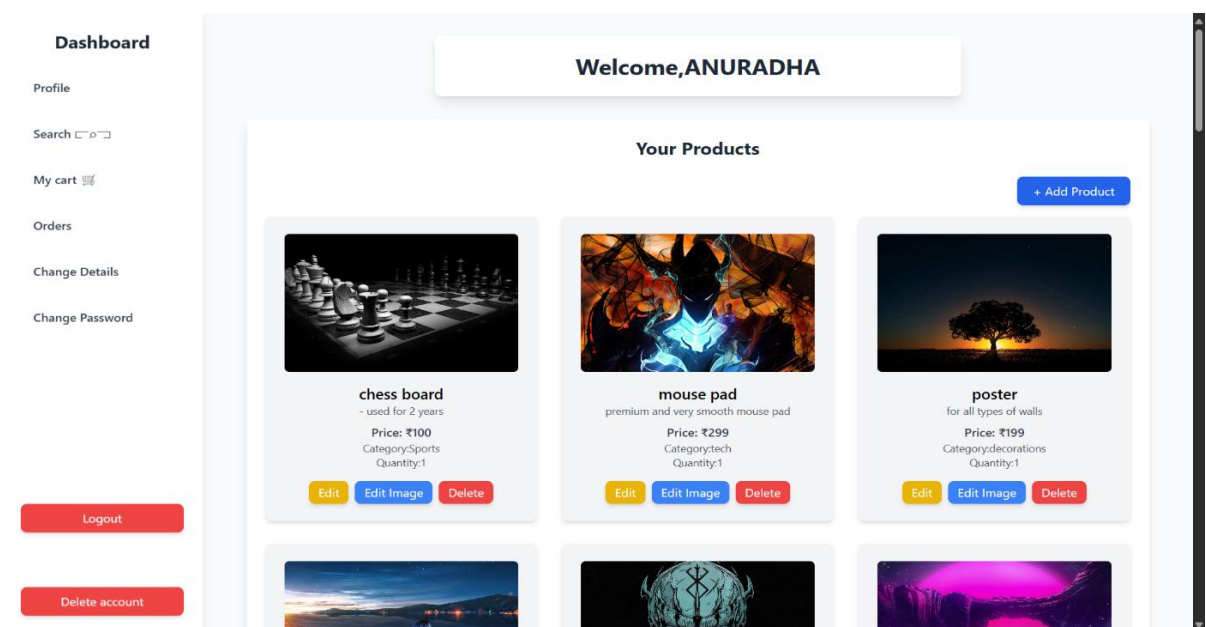
The GUI provides a smooth user experience and minimal loading time, ensuring user engagement.

USER AUTHENTICATION FEATURE:

Authentication was implemented using JWT (JSON Web Tokens).

- Login and Signup work correctly by securely storing user sessions.
- Forgot Password feature successfully sends an email to the registered email address, helping users recover their account access.
- Protected routes such as Profile and Product Upload ensure only logged-in users can access sensitive areas.
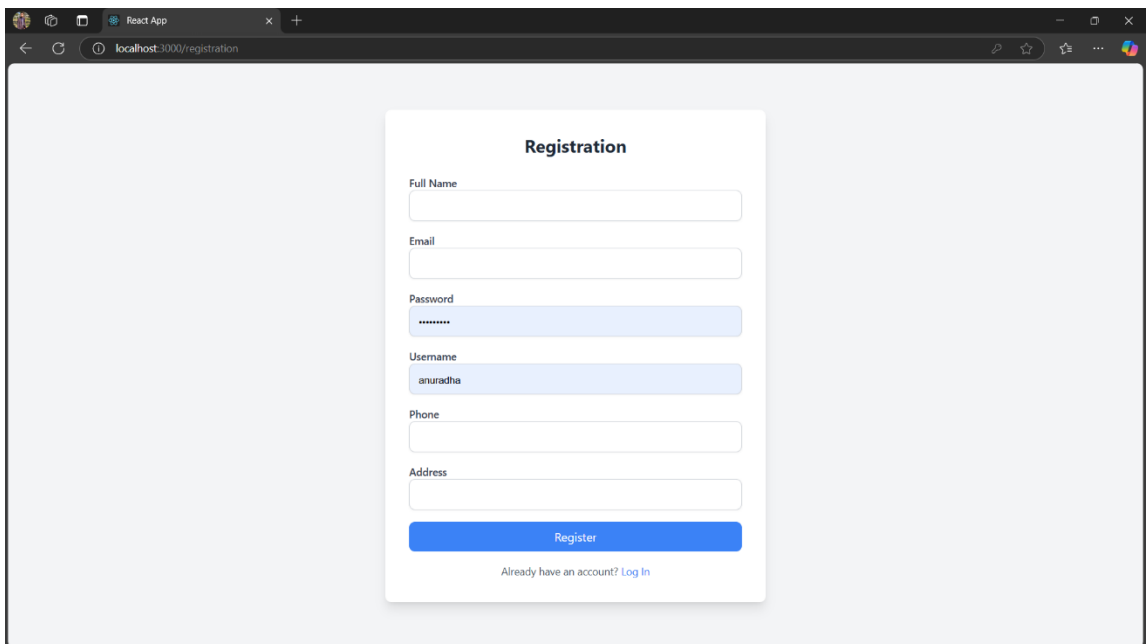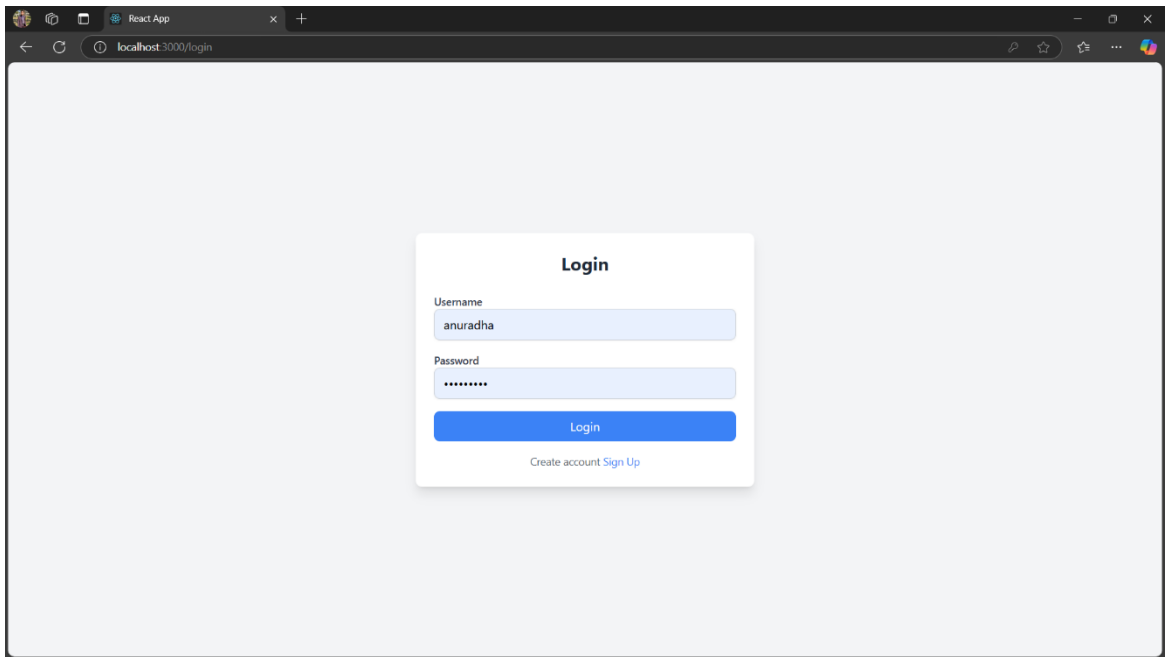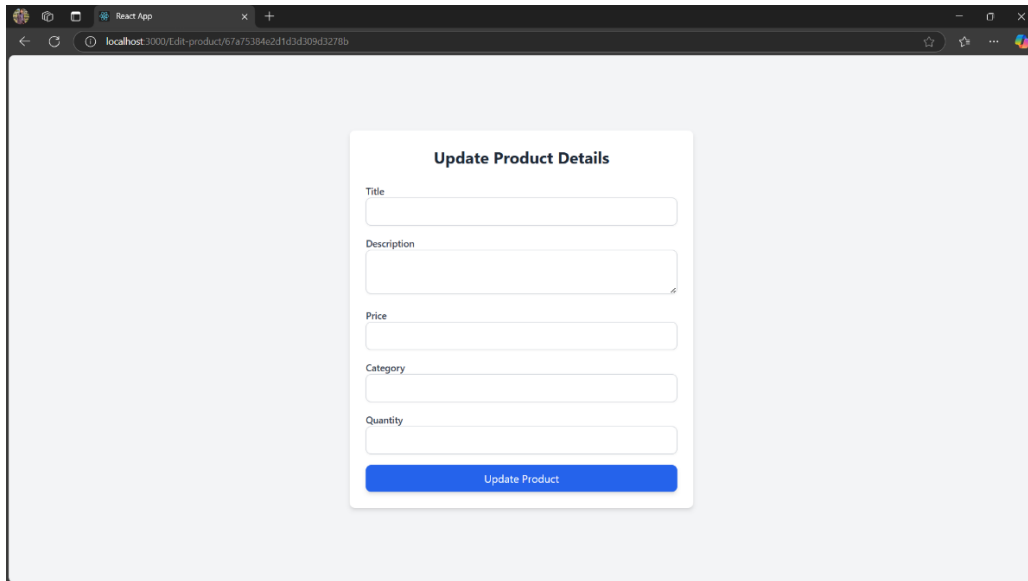
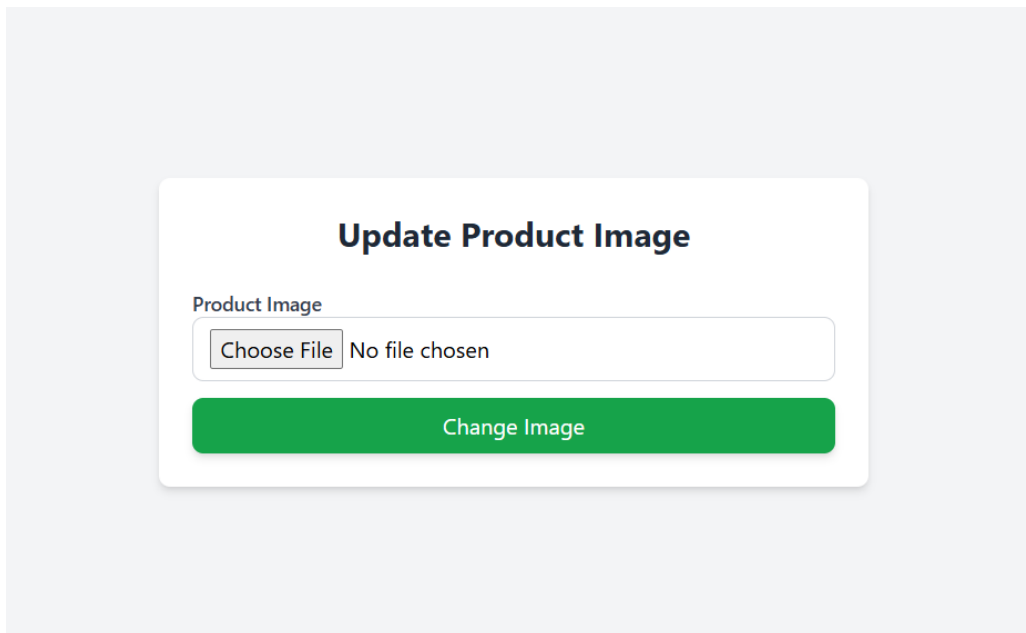## PRODUCT MANAGEMENT FEATURE:

Users can manage products smoothly:

- Uploading new products with title, description, price, and an image.
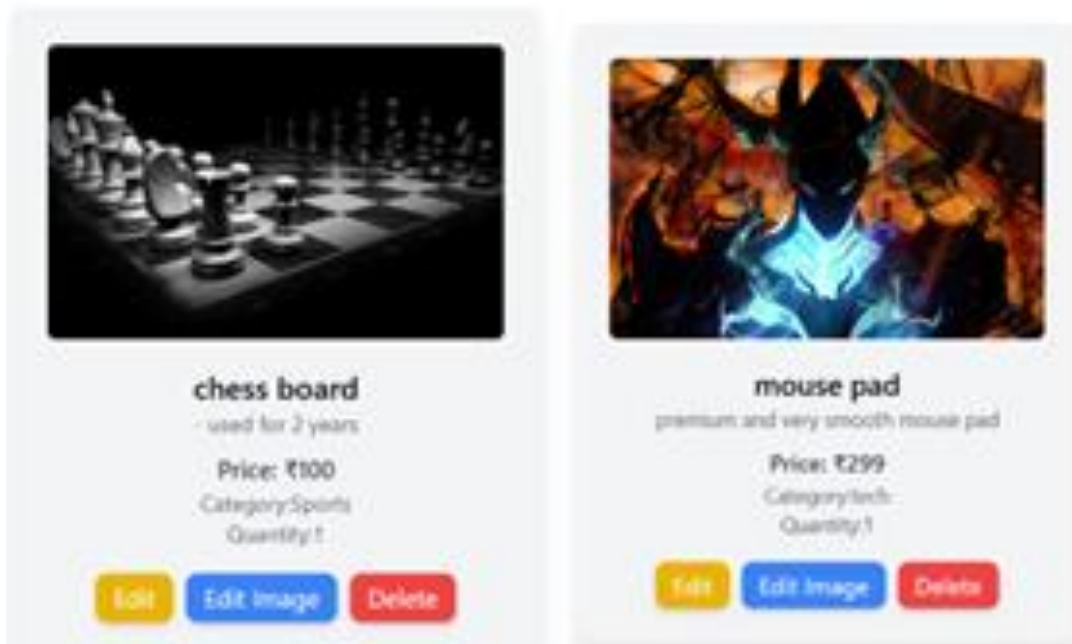- Viewing all uploaded products under the user's profile.

- Deleting or updating product details (this feature can be enhanced further).

Product data is correctly stored and retrieved from the MongoDB database using Node.js and Express.js APIs.

SEARCH AND FILTER FUNCTIONALITY:

The website allows users to browse all listed products with Advanced search/filter based on categories or prices can be added in future updates.
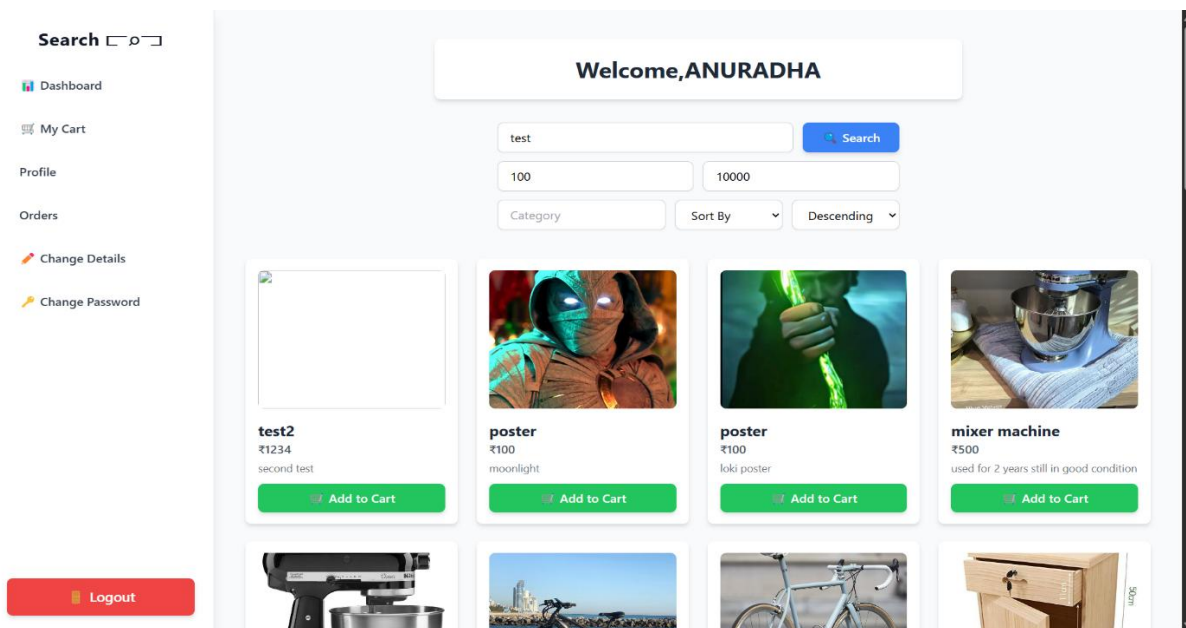
DATABASE AND BACKEND PERFORMANCE:

- User data and product data are efficiently stored in MongoDB Atlas.
- Backend APIs developed with Express.js work smoothly, responding within seconds without noticeable delay.
- All CRUD operations (Create, Read, Update, Delete) on products are functional and stable.

```
_id: ObjectId('679cf1870a29af5a2d6242ce')
Title : "test2"
Description : "second test"
Price : 1234
Image : "https://res.cloudinary.com/dmesfdrze/image/upload/v1738338695/tbuomrpb…"
Category : "test"
Quantity : 1
createdAt : 2025-01-31T15:51:35.725+00:00
updatedAt : 2025-04-19T03:33:00.284+00:00
__v : 0
```

_id: ObjectId('67a737ee876b84f311169ba2')
username : "anuradha"
email : "anuradha@gamil.com"
password : "$2b$10$yxI9DYBWA4Eo2YpbdiOG2eV85KbTLZq/f.nXT8MvhwV3BZ1319X0C"
fullname : "Anuradha Nidhi"
createdAt : 2025-02-08T10:54:38.646+00:00
updatedAt : 2025-04-26T16:36:49.285+00:00
__v : 4
address : "xyz"
phone : 123456789
▾ cart : Array (empty)
▾ orders : Array (3)
    0: ObjectId('67b0cc1e5d087c2b0625░░░░')   Array (empty)
    1: ObjectId('679cf372ddd2ed329ce7b272')
    2: ObjectId('679cf372ddd2ed329ce7b272')
refreshToken : "eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJfaWQiOiI2N2E3MzdlZTg3NmI4NGYzM…"

DEPLOYMENT RESULTS:

- Frontend was successfully deployed on Vercel.
- Backend was successfully deployed on Render.
- CORS policy issues were resolved to ensure smooth communication between frontend and backend servers.

FUTURE WORK

The **E-2 Market** project is working well for all the features including user registration, product upload, profile management, and product browsing. The future work can include:

- **Payment Gateway Integration**: Adding a payment system such as **Razorpay** or **Stripe** to allow users to directly purchase products from the platform. This will bring a full e-commerce experience to the marketplace.

- **Mobile Application**: Developing mobile applications for **Android** and **iOS** to improve accessibility and provide users with a better mobile shopping experience.

- **Chat System Between Buyers and Sellers**: Implementing a real-time chat feature that enables buyers and sellers to communicate directly through the platform, ensuring a seamless transaction process.

- **Performance and Scalability**: Scaling the platform to accommodate more users and larger data volumes. This will involve optimizing the backend and improving database management, potentially integrating cloud-based solutions for better scalability and performance.

CONCLUSION

In today's digital world, the importance of secure, user-friendly online marketplaces has grown tremendously. Rapid urbanization, the increase in e-commerce popularity, and the convenience of online buying and selling have created a huge demand for platforms that allow individuals to trade used products safely and easily.

Traditional offline methods of selling used goods often come with challenges like trust issues, limited audience reach, and inefficient communication between buyers and sellers.

The **E-2 Market** project attempts to solve these problems by offering a **simple**, **efficient**, and **secure** platform where users can register, upload their products, browse available items, and manage their profiles seamlessly.

Key features of the project include:

1. **User Authentication** – Secure login, signup, and password recovery through email.

2. **Product Upload and Management** – Easy listing of used products with descriptions and images.

3. **Profile Handling** – A personal area for users to view and manage their uploads.

4. **Database Management** – Efficient handling of user and product data using MongoDB.

This project not only meets its initial goal of creating a basic online used-product marketplace but also lays the foundation for future expansions into a fully functional e-commerce platform.

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