

Received: 13/02/2026, Accepted: 05/08/2026

# A better digital marketplace system is to encourage students to work together and facilitate sharing of resources

Pranjal Mishra, Priyansu Vashisth, Omji Pathak, Mohd. Wali, Abhishek Tyagi

Department of Computer Science & Information Technology, KIET Group of Institutions (AKTU),  
Ghaziabad, India.

pranjal.2226csit1099@kiet.edu, priyansu.2226csit103@kiet.edu, omji.2226csit1061@kiet.edu,  
mohammad.2226csit108@kiet.edu, abhishek.tyagi@kiet.edu

## Abstract

KIET MART is a web-based application that helps university students trade used equipment within the university. The application will be affordable and easy to use, ensuring that sellers can post listings and buyers can locate items such as textbooks, laptops, and accessories at reduced prices. We store accounts securely using JSON Web Tokens (JWTs) for login, and we encrypt passwords with bcrypt. It also has a real-time chat built with Socket.IO, so shoppers and sellers can discuss the deal and then close it. Technically speaking, our stack consisted of React.js as the frontend, Node.js and Express.js as the backend, and MongoDB Atlas for cloud storage. The combination of the latest web technology, a good security level, and effective data distribution make KIET MART reduce the expenses of students and promote the reuse of things within the campus

**Keywords:** *React.js, Node.js, Express.js, MongoDB Atlas, JWT, Socket.io, MERN Stack, Student Marketplace, Sustainability.*

## 1. Introduction

In our case, balancing tuition with the cost of everyday essentials like books and gadgets could be a real nightmare. At the same time, many of my classmates might have items that they no longer need and that can be used in other places. These interactions do not occur in a formalised, secure system at the university; thus, the majority occur on bulletin boards, through personal contacts, or in noisy chat groups and are unorganised.

KIET MART was established to redeem that. It is an exclusive online marketplace that offers students a reliable, affordable, and secure platform to sell, search for, and purchase second-hand goods. In contrast to large, resistant commercial platforms such as OLX, Quikr, or Facebook Marketplace, KIET MART has campus limits, which means everyone is aware that it is safe and relevant.

Here we can sell things you have grown out of, like books, notes, electronics, accessories, and so on, and another student can be a bargain. The system also protects you through login security, encrypted passwords, and a built-in chat feature to ensure the transaction is secure. In this paper, we have constructed a tool that features a clean design, a user-friendly interface, and real-time communication, making it easier to use.

The principal aims of the given research are:

\*Corresponding author: Pranjal Mishra, Department of Computer Science & Information Technology, KIET Group of Institutions (AKTU), Ghaziabad, India. (pranjal.2226csit1099@kiet.edu)

- i. To conceptualise a student-centred online platform for exchanging used educational and daily needs on campus.
- ii. To offer a secure and trustworthy environment by means of authentication, authorisation, and encryption.
- iii. To facilitate instant communication between buyers and sellers and a built-in chat system.
- iv. To ensure sustainability through reusing resources and reducing unwarranted shopping.
- v. To include a reputation and rating system, inspired by the past research on trust, to decrease fraud and enhance reliability.

Through our analysis of KIET MART's use, we demonstrate that web technology can provide a safe, affordable, and environmentally friendly marketplace that reduces financial burdens and fosters a cooperative campus environment.

## 2. Literature Reviews

Several foreign scholars have researched digital platforms and online markets. E-commerce reduces transaction barriers and offers convenience to both customers and vendors, according to [1]. They emphasized that the type of product and online payments enhance the perception. Gefen and issues of trust on websites and discovered that credibility, transparency, and authenticated interactions are the reasons people get involved [2]. A study [3] discussed digital business models and highlighted that platforms grow through user-centred design, easier navigation, and mobile-friendliness.

Ahmed et al. [4] addressed the issue of technology as an advantage and argued that site-specific platforms could be more engaging than a site that is generic- this can also apply to campus-based marketplaces such as ours.

Yashasvi and Tiwari [5] considered the behavior of consumers in the digital environment and found that they tend to remain loyal to the services or products that are easy to use, trustworthy, and fast to obtain the product or service they require.

Surveying e-marketplaces worldwide, Ismaiel et al. [6] found that peer-to-peer models improve direct user interaction, thereby increasing trust and satisfaction.

Shahab [7] compared campus marketplaces in developed countries, and the findings indicated that online platforms enhance sustainability by facilitating the reuse and resale of products, thereby minimising waste.

Jiao et al. [8] analysed P2P exchanges and observed that integrated communication media such as chats generate a feeling of confidence and reinforce buying/selling.

Ma et al. [9] emphasised the role of online resale in the circular economy, as these markets help extend product lifespans, reduce waste, and promote eco-friendly lifestyles.

Lastly, in his theory of Diffusion of Innovations, Rodrigues et al. [10] proposed that new platforms prevail when they are user-friendly, visible to communities, and provide tangible benefits. This supports the implementation of localised platforms for students, such as KIET MART.

These researches had a direct influence on KIET MART. They disclosed that we students find it hard to access low-cost resources, lack a safe private area to exchange them, and require easier access to on-campus selling and purchasing opportunities. To address this, we have incorporated

trusted user access, easy navigation, and classified listings to maintain safety, clarity, and ease in transactions.

### 3. Implementation

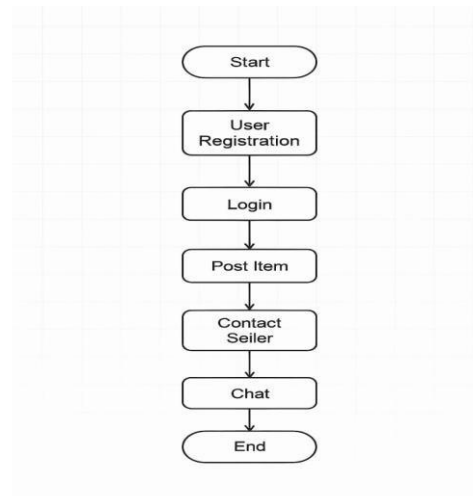


Figure 1: Proposed Architecture

KIET MART uses a simple sign-up process; hence, anyone can create a secure account regardless of whether he/she is a student, faculty member, staff member, or other. After logging in, you can navigate the various product lines on the site. Each step involves authentication in order to secure buyers and sellers.

Once you have logged in, you can find what you want; it could be books, stationery, something you need every day, whatever you want. The platform presents the results cleanly, allowing one to compare and choose the best option. KIET Mart also provides additional information, such as seller details, price transparency, and availability, so you know exactly what you are purchasing.

The project follows a step-by-step implementation to assess the usefulness and effectiveness of KIET Mart. The primary aim is to design a convenient online marketplace that enables the KIET community to facilitate the buying and selling of goods without any hassles, insecurity, and uncertainties. The research design is based on the development of a responsive web application, search filters, order management, and secure payments.

The project also reviews the available e-commerce sites to identify strengths and weaknesses. The insights were integrated into KIET Mart, making it credible, convenient, and student- and staff-specific. The implementation, in general, moves towards a digital, sustainable, and collaborative campus environment.

#### 3.1 System Architecture

The KIET Mart site is built on a powerful full-stack web architecture, ensuring high performance, reliability, and scalability for campus-level e-commerce. The system will be divided into three major parts, including Frontend, Backend, and Database, connected by secure APIs.

- Frontend (HTML, CSS, JS, React.js)
  - User registration/login
  - Browsing, searching, and filtering of products.

- Add to cart, place order
- Responsive UI with a map and the notifications
- Backend (Node.js + Express.js)
  - Makes authentication and authorization.
  - Manages orders, payments, notifications
  - RESTful APIs connect the frontend with the backend
- Database (MongoDB)
  - Stores users, products, orders, and sellers
  - Flexible schema for future updates
- APIs
  - Payment Gateway (Razorpay/PayPal)
  - Authentication (Firebase/Auth0)
  - Custom APIs for search & recommendations

#### 4. Result and Evaluation

- **User Registration and Login:** Users were allowed to access the platform and log in using only an email address and a password. Authentication was a positive experience and it enabled them to use intimate features such as credit points and location history.
- **User registration:** KIET Mart offers a hassle-free, user-friendly registration process. To open an account, all you need to do is enter your name, email, and password, then confirm the password. The low input continues to make onboarding fast and hassle-free while still ensuring password confirmation.
- **Add to Cart:** KIET Mart offers an Add to Cart button, which lets you save several items to your cart as you shop before making a final decision. When you click the Add to Cart button, your item will be placed in a virtual shopping cart where you can add, edit, or delete items without completing your purchase. The cart also provides details such as item name, price, and quantity to ensure full transparency. Such a feature allows you to make the overall shopping experience flexible, convenient, and under your control, resembling contemporary e-commerce platforms and feeling familiar to students.

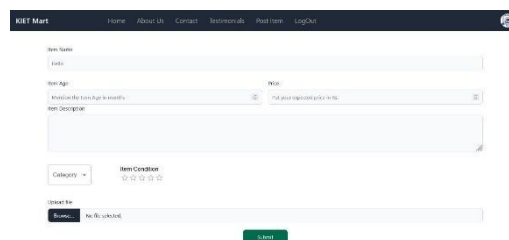


Figure 2: Item Added to Cart

- **Category-based Items Listing:** KIET Mart uses a category-based system to list products, making the shopping process easier. There is a filter panel on the left that

allows one to select items based on their buying requirements. The categories include:

- Stationary (Notebooks, pens, study materials, etc.)
  - Sports (Sports equipment and accessories)
  - Clothing Essentials (Basic wearable items)
  - Daily-use (Items like bottles, tiffins, etc.)
  - Books (Textbooks, reference materials, novels)
- **Other (Other items that do not belong to other categories)**

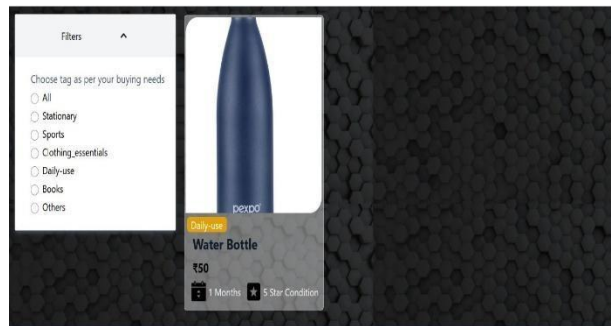


Figure 3: Item Categories

- **User Profile Dashboard:** The application offers an individual user profile dashboard to every registered student. The following section shows vital information, including Profile Details: the user's name, gender, state, nationality, college, and email address. Status: This value indicates whether the user is an active student. My Listings: Displays all products the user has posted for sale, along with information (e.g., name, condition, image).

**Activity Summary:** It shows the quantity of items that have been listed in order to monitor selling activity and is also managed by the user themselves.

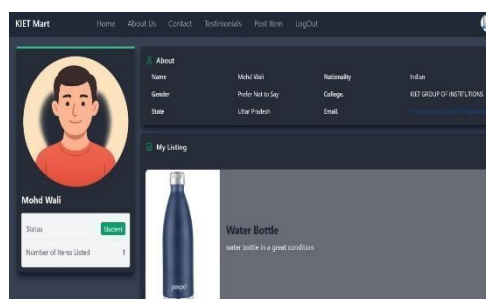


Figure 4: User Dashboard

## 5. Challenges and Improvements

It was hard to build a secure, smooth login/signup system, and we had to implement strong password requirements and ensure data privacy was not compromised. The database design for storing user profiles and listing items had to be well planned. It was not easy to add image upload and display without dragging down the platform.

Developing a user-friendly, responsive interface for both desktop and mobile required additional effort. It was also difficult to navigate easily between sections such as Home, Post item, and Profile. We encountered problems with testing, debugging, alignment glitches, and session errors in other browsers. Ensuring user data security was also a major challenge, and maintaining performance across low-end and high-end devices was a challenge.

The KIET Mart project might be rocked in several ways. Multilingual support is beneficial because students in different regions can use the platform in their own language. Online payment facilities would be secure and would ease the transactions. A specific mobile application would enhance accessibility. Trust and improved communication would be established through a review and rating system and real-time chat. AI suggestions can be offered, proposing options based on the individualised experience's preferences. Additional options such as a coupon option, the discount option, reward points, or a donation option of books and other necessary materials would increase the interaction and encourage sustainability

## 6. Conclusion and Future Scope

KIET Mart demonstrates that technology can indeed make our lives on campus easier. A product line with smooth products, a simple sign-in, and a digital cart where orders are processed makes the buying and selling process significantly simpler. It is all about bringing the campus closer together and making it more independent. The interface remains minimal and engaging, so it doesn't require one to be a tech genius or a mere phone-scrolling user to navigate it. All in all, the project provides us with a powerful digital tool that will help us connect students and faculty, enhancing convenience, trust, and digital literacy levels in the entire campus.

In the future, it is possible to upgrade KIET Mart to support real-time stock checks, price checks, and live order tracking. On top of that, AI and data analytics may suggest the most appropriate offers, trending products, or personal choices based on what we have already purchased. Collaborating with local stores, startups, and companies would expand the product assortment and lend them credibility. Incorporating safe payment methods and reward systems, along with discounts and special offers, would encourage further interaction. Finally, KIET Mart has the potential to become the go-to place for online shopping in our neighbourhood, fostering innovation, entrepreneurship, and a simpler way to acquire goods on campus.

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