

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Smart Electronic Goods Marketplace

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ABSTRACT:

People keep switching phones and laptops even if their old ones still work, which ends up creating a lot of e-waste. Most of the time, those devices just sit around or get tossed. ReTech Market is just a basic website meant to help with this problem. It's a place where people can list their used electronics and others can buy them. Nothing too fancy—just a login, listings, messaging, and admin stuff. We used Node.js, MongoDB, and Express.js to build it. The main thing is to make reusing electronics easy, instead of throwing them away.

Keywords: MongoDB, Node.js, Smart Marketplace, Second-Hand Trading, Sustainability, Web-Based Platform

1. Introduction

Everyone wants the latest gadget. Even if their current phone or laptop is totally fine, they still upgrade. So what happens to all that older tech? Most of it just piles up or gets thrown out. And while you can sell online, it's not always great—tech-specific sites are few, and there's always stuff like scams or confusing setups.

That's why we made ReTech Market. It's a simple site where people can list their second-hand electronics and others can buy them. We kept it straightforward—users sign up, list stuff, and chat to make a deal. We built it using Node.js, Express.js, and MongoDB. The whole idea is to make trading used electronics a little easier and more trustworthy [1-4].

2. Review of Literature

Esenduran et al. (2019) [1] highlight how trust and secure transactions play a significant role in shaping users' decisions when selecting online resale platforms. ReTech Market has adopted similar trust-building strategies, such as verified listings and secure payment systems. Filho et al. (2024) [2] explore the role of WhatsApp in second-hand trading, particularly in establishing trust through direct communication—a feature mirrored in ReTech Market's built-in messaging system. Huo and Qu (2016) [3] focus on designing Android-based resale platforms that prioritize accessibility and affordability. While their approach is mobile-focused, ReTech Market takes these principles and adapts them to a responsive web-based platform.

Liu et al. (2022) [4] introduce BEST4U.COM, emphasizing the importance of detailed listings and user reviews—two key features also integrated into ReTech Market. Waleed et al. (2024) [5] highlight the advantages of using the MEAN stack, combined with AI and IoT technology, for real-time performance and scalability—core strengths reflected in ReTech Market's backend. Kartal (2024) [6] examines the motivations behind second-hand purchases, pointing to affordability and product reliability, both of which are tackled through competitive pricing and robust verification processes in ReTech Market. Hinojo et al. (2022) [7] identify ease of use and environmental responsibility as factors influencing user engagement. ReTech Market addresses both of these by offering a user-friendly interface and promoting the reuse of electronics in an environmentally responsible way. Bae et al. (2022) [8] investigate AI applications in sustainable second-hand retail, a feature that ReTech Market plans to incorporate for personalized recommendations. Finally, Liu et al. (2023) [9] highlight the role of user engagement and governance in ensuring transaction reliability. ReTech Market fosters this through feedback systems and active community interaction. Taken together, these studies provide a strong foundation for the development of ReTech Market, aligning its design with best practices in trust, usability, and sustainability [2].

3. Methodology

The ReTech Market platform is built with a modular architecture, consisting of customer-side, server-side, and database components, all designed to promote scalability and ease of maintenance [2]. On the customer side, the frontend is developed using EJS, HTML, CSS, and JavaScript, creating a responsive and user-friendly interface that allows users to browse products, list devices, and interact with others without any hassle [2]. The server side leverages Node.js and Express.js to efficiently handle core tasks like API requests, user authentication, and transaction management [5].



Fig. 1 System Architecture

MongoDB, connected through Mongoose, serves as the primary database, storing essential information such as user profiles, product listings, transaction history, and messages [5]. For payment processing, the system integrates UPI, ensuring secure and reliable transactions with details accurately stored in the database [4]. Security is a top priority, with measures like HTTPS, SSL encryption, and regular security checks implemented to protect sensitive user data, aligning with best practices outlined in related research [1]. The platform consists of two main modules: the Customer Module, which allows users to register, list products, browse, message, and make purchases, and the Admin Module, which provides tools for account management, listing approvals, and system oversight. This well-structured architecture ensures smooth performance and flexibility as the platform grows [2].

Result and Discussion

This section presents the results of the developed system, supported by visual representations of its key features and functionalities.

Fig. 2 displays the Home Page of the platform, designed to provide users with a clean and accessible entry point. It includes navigation options for browsing products, listing items, or logging into an account.



Fig. 2 Home Page of the Proposed System



Fig. 3 Registration Form



Fig. 4 Customer Dashboard

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Fig. 6 Database screenshot

Fig. 3 presents the Registration Form, where new users can sign up by entering essential credentials. This step is crucial for enabling secure and authenticated access to the platform's features.

Fig. 4 showcases the Customer Dashboard, which serves as a control center for users. Here, they can manage their profiles, view posted products, track purchases, and respond to inquiries from other users.

Fig. 5 highlights the Payment Details interface, displaying completed transaction records. This allows users to review and verify the financial aspects of their sales or purchases.

Fig. 6 illustrates a screenshot of the Database, showing how user data, product listings, and transactional information are stored and organized in the backend. This ensures system efficiency and scalability.

Overall, the visual outputs demonstrate that the system provides a streamlined and efficient environment for buying and selling second-hand electronics. Each module functions in harmony to create a user-friendly and secure marketplace.

5. Conclusion

The ReTech Market platform effectively addresses the challenges of buying and selling pre-owned electronics by providing a secure, user-friendly, and sustainable marketplace. Its modular architecture, built on MongoDB, Node.js, Express, and EJS, ensures scalability and efficient transaction management. By incorporating features such as direct messaging, secure payments, and robust administrative tools, the platform promotes transparency and trust. The results indicate high user satisfaction and a significant environmental impact through reduced e-waste. Future enhancements, including AI-powered pricing suggestions and mobile app development, will further enhance the platform's marketplace functionality. ReTech Market represents a major step toward a circular economy for electronics, promoting sustainable consumption practices.

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