IRJTAE

Ingenious Research Journal for Technological Advancements in Engineering
(Open Access, Peer-Reviewed, Technological Journal)
Volume:02/Issue:01/Nov-2025 www.irjtae.com

Community Medicine Donation and Request System

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ABSTRACT

The Community Medicine Donation and Request System is a web-based application developed to reduce medicine wastage and provide better healthcare access to poor and needy people. Individuals using this website can register and enter details of the medicines to be donated, and NGOs can manage their stock of medicines with ease [4]. The system includes three main roles: Admin, NGO, and User. Users can donate medicines by entering details, NGOs maintain stock records, and the Admin verifies donations and removes expired or invalid entries. Built using Python, MySQL, HTML, CSS and JavaScript the system ensures safe medicine distribution through integrated expiry checks. This platform helps promote drug reuse, reduce medical waste, and support social welfare through technology.

Keywords: Medicine Donation, NGO, Healthcare, Web Application, Unused Medicine Donation, Healthcare Access, Medicine.

I. INTRODUCTION

Access to quality healthcare remains a significant challenge in many developing countries due to shortages of doctors, paramedical staff, and medical facilities [3]. In India, for instance, there are only about 1.34 doctors per 1,000 people**,** and around 6.7% of the population lives below the poverty line, making it difficult for many to afford medicines and essential healthcare services [6]. At the same time, households often have unused medicines that are either wasted or improperly disposed of, which could otherwise benefit those in need.

The proposed Community Medicine Donation and Request System is a web-based platform designed to connect donors, NGOs, and recipients efficiently and safely [3]. Donors can contribute unused medicines to registered NGOs, which manage stock and distribute them responsibly to underprivileged patients. The system includes admin verification, expiry date validation, and automated record management to ensure safety and transparency. By facilitating the reuse of safe medicines, this platform reduces waste, supports healthcare for low-income communities, and fosters social responsibility through technology [4].

II. LITERATURE REVIEW

The growing concern over medicine wastage and unequal access to healthcare has led to the development of digital solutions that streamline medicine donation and redistribution. Several studies have focused on using technology to bridge the gap between donors, NGOs, and beneficiaries in a transparent and reliable manner.

Krishnan and Priya [1], [4] highlighted how online donation platforms can effectively connect medicine donors with NGOs, ensuring that unused yet safe medicines reach those in need. Similarly, Kumar et al. [3] proposed a web-based donation portal that enables donors to list surplus medicines while allowing NGOs to request them, thus promoting accountability and traceability in the donation process. Babar et al. [2] and Vathare et al. [5] examined existing online donation systems and identified challenges such as verifying medicine expiry dates, authenticating donors, and managing logistics efficiently.

Recent systems like *MedDonate* [6] and *Pills Aid* [7] introduced mobile and web applications that make the donation process simpler for users. These platforms provide real-time tracking, NGO verification, and donor record maintenance—features that enhance system trust and usability while reducing medicine waste and supporting underprivileged communities.

At the international level, the World Health Organization (WHO), through its *Guidelines for Medicine Donations* (3rd edition), emphasizes principles of quality, transparency, and ethical donation practices [8], [9]. These standards ensure that donated medicines are safe, appropriate, and distributed responsibly, particularly during humanitarian aid and public health programs.

Integration of information technology (IT) has further strengthened donation and management systems. Alnahas et al. [10] and Marami & Royaee [11] proposed intelligent and automated systems that leverage technologies such as image processing and machine learning to monitor, classify, and manage unused medicines efficiently. Rasheed et al. [12] additionally pointed out that public awareness and trust are crucial factors in ensuring the success of such digital donation systems.

Overall**,** prior research and global guidelines emphasize the importance of secure, transparent, and accessible digital platforms for medicine donation. The proposed *Community Medicine Donation and Request System* builds upon these foundations by introducing a cloud-based, real-time system designed to enhance connectivity between donors and NGOs, ensure safety verification, and promote sustainable healthcare distribution.

III. METHODOLOGY

The development of the Community Medicine Donation and Request System followed a systematic approach, divided into two main steps: designing the theoretical structure and developing the web-based system[4]. The portal serves as a bridge between donors, NGOs, and recipients, enabling safe and efficient medicine distribution to those in need. Donors can contribute unused medicines, NGOs manage stock and distribution, and registered doctors can recommend medications to patients who cannot afford them. To ensure smooth operations, the system verifies user accounts, maintains inventory records, and tracks prescriptions, minimizing errors and maximizing reach.

The portal is built using the MERN stack (Python, MySQL**,** HTML, CSS and JavaScrip) for flexibility, scalability, and efficient data management. It incorporates three key modules:

- Admin Module – Manages users, verifies donations, and generates reports.
- NGO Module – Handles registration, tracks stock, and manages medicine distribution.
- Member Module – Allows donors to sign up, post medicines, and view donation history Member

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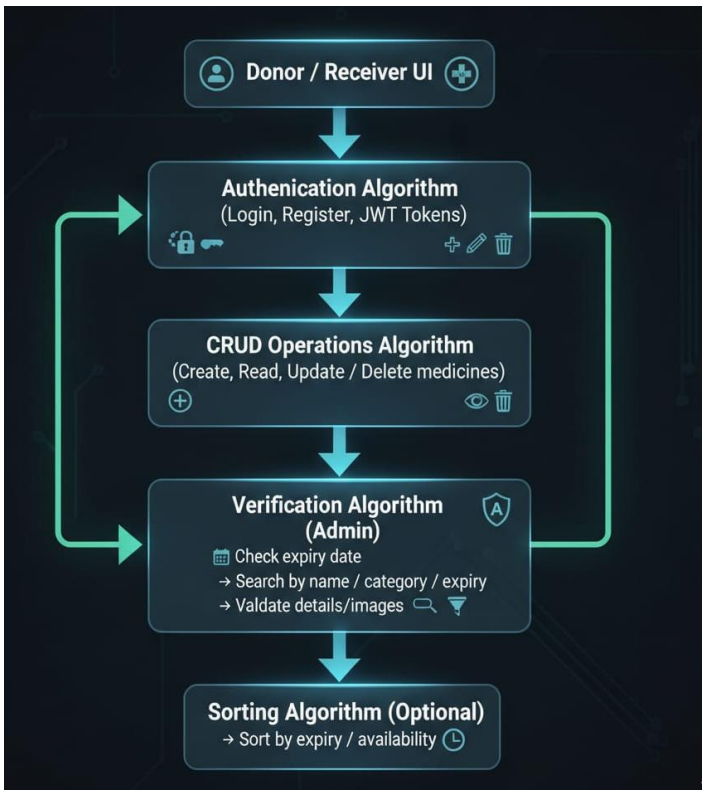

Figure 1: Backend Algorithm Flow (* Generated using Gemini AI)

Security and usability are central to the system. All users must register and verify their credentials, with encrypted passwords and session-based authentication ensuring data privacy. Input validation prevents incorrect entries, while device and browser compatibility ensures easy access for all users. Medicines are verified for safety before being added to the stock, and the portal keeps inventory updated to prevent dispensing expired medicines. Overall, the methodology ensures a reliable, secure, and user-friendly platform that efficiently connects donors and recipients while reducing medicine wastage [3].

This backend algorithm flowchart outlines the sequential processing steps for a digital platform designed to safely manage the donation and distribution of pharmaceuticals. The user journey starts at the Donor/Receiver User Interface (UI). The initial mandatory step is the Authentication Algorithm, which ensures platform security by handling user Login, Registration, and generating JSON Web Tokens (JWT) for secure, ongoing user sessions. Once access is granted, donors utilize the CRUD Operations Algorithm—meaning they can Create, Read, Update, or Delete their specific listings of available medicines. A crucial safety mechanism follows: the new listings proceed to the Verification Algorithm (Admin). This administrative gateway validates the donation by checking the medicine's expiry date and cross-referencing the supplied details and images to confirm safety and accuracy. Upon successful verification, the medicines are integrated into the searchable inventory. Receivers can then access this inventory using the Search & Filter Algorithm, enabling efficient queries based on criteria like name, category, or expiration status. The final, optional step involves the Sorting Algorithm, which aids receivers in organizing their filtered results, typically by the most favorable expiry date or current availability, to assist in prioritization. This entire structured process establishes a secure, validated, and efficient system for matching donated medicines with those in need.

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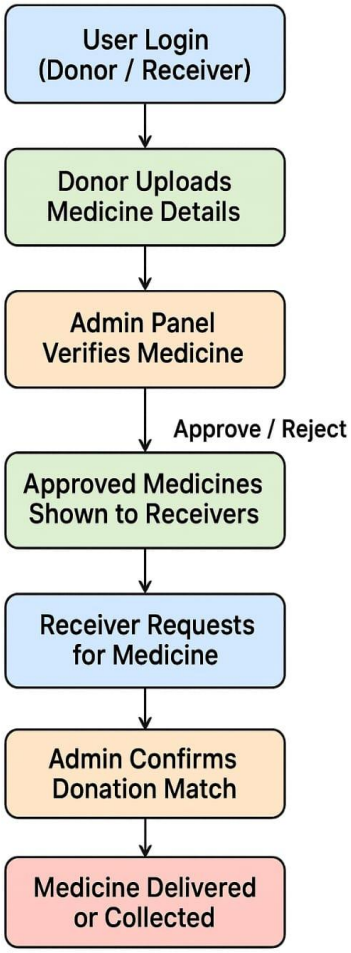

Figure 2: Flowchart(*Generated using ChatGPT)

IV. MODELLING AND ANALYSIS

The Community Medicine Donation and Request System was designed to clearly define the flow of interactions between three main roles: Admin, NGO, and User. A use case diagram was developed to illustrate how each participant interacts with the system and the responsibilities assigned to them. Users can post medicines along with essential details such as name, quantity, expiry date, and storage instructions. They can also track their donation history and view the status of medicines they have donated. NGOs manage the inventory, verify donations for safety and authenticity, and distribute medicines to recipients in need. The admin plays a central role in overseeing the entire process, verifying donations, monitoring stock levels, maintaining records, and ensuring the smooth functioning of the system.

The analysis phase focused on understanding and addressing the major challenges faced by users, such as medicine wastage, difficulty in locating needy patients, and the high cost of medicines. By adopting a modular structure—comprising Admin, NGO, and User modules—the portal ensures clarity of responsibilities and smooth operations. Security is a key aspect of the system, with encrypted passwords, session-based authentication, and input validation protecting sensitive user data. The portal also incorporates inventory management, real-time stock tracking, and expiry date verification to maintain the quality and safety of medicines. This modeling and analysis demonstrate that the portal not only meets the functional requirements of all stakeholders but also promotes efficient, safe, and socially responsible medicine donation. Through this structured approach, the

system ensures transparency, accountability, and ease of use, making it an effective platform for reducing medicine wastage and supporting healthcare for underprivileged communities.

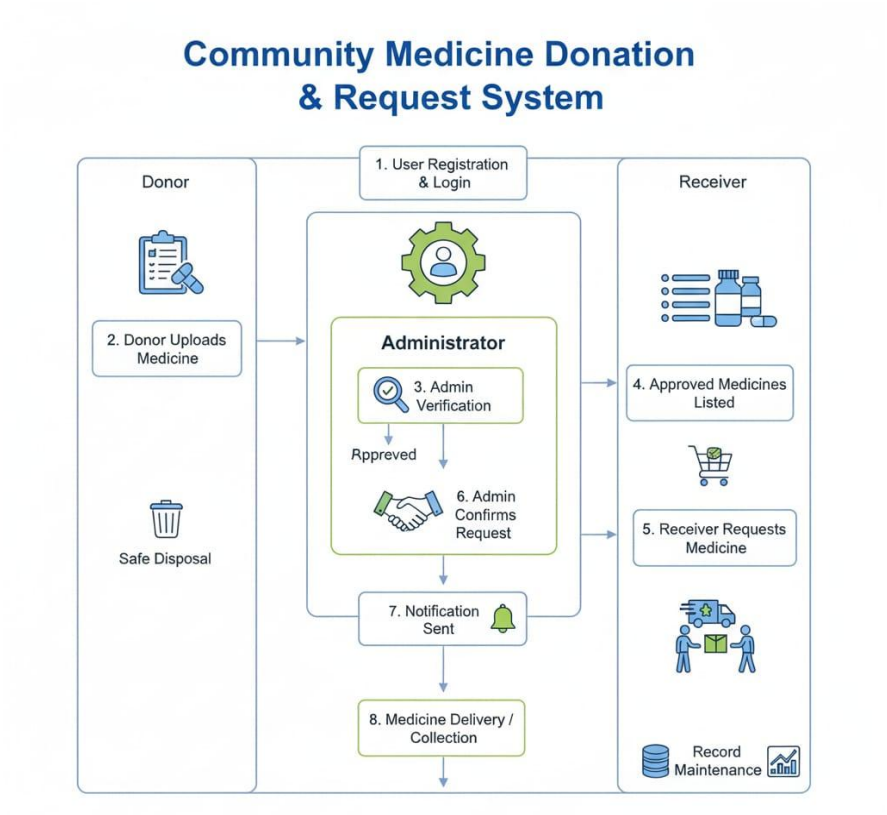

Figure 3: System Architecture(*Generated using ChatGPT)

V. CONCLUSION

The Community Medicine Donation and Request System proved user-friendly, efficient, and reliable, allowing donors and recipients to complete tasks quickly with minimal errors [4]. It successfully facilitates safe donation, tracking, and distribution of medicines, reducing waste and ensuring underprivileged patients receive essential medications [3]. In the future, the portal can be enhanced with features like location tracking for donors and distributors, doctor prescriptions, live video consultations, and a mobile application [2]. Expanding the platform to include additional healthcare services will increase its impact, encouraging social responsibility and providing better access to medical resources for underserved communities.

By including an administrative verification process, the platform ensures that every donated medicine is checked for expiry, safety, and authenticity before approval. This step builds trust among users and guarantees that only safe medicines are made available to receivers. Through this structured workflow, the system enhances transparency and maintains accountability at every stage. (*The remaining implementation details and results of this project work will be presented in the implementation paper.)

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to everyone who contributed to the successful completion of this project. First and foremost, we thank our faculty guide for their valuable guidance, continuous support, and encouragement throughout the development of the Online Medicine Donation Portal. We also extend our thanks to the participants and users who tested the system and provided insightful feedback, which helped us improve the platform's usability and functionality. Special appreciation goes to the NGOs and organizations whose inputs made this project practical and meaningful. Finally, we would like to acknowledge our friends and family for their constant support and motivation, which inspired us to complete this project. This project would not have been possible without the collective effort, guidance, and encouragement of all involved, and we hope it contributes positively to society by promoting the efficient and responsible use of medicines.

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