Medishare-E pharma recirculation nexus

Harshada thoke, Payal thakare, Ritesh tayade, Sheezan quazi,

Prof. Harshalkumar Ramdas Khairnar

MET' BKC IOE Nashik, Savitribai Phule Pune University, Pune, India.

harshalkumark_ioe@bkc.met edu, harshadathoke55@gmail.com, payalthakare67@gmail.com, Riteshtayade0123@gmail.com, sheezanquazi@gmail.com

Abstract - The Medishare – E-Pharma Recirculation Nexus project introduces a digital, IT-enabled Solution aimed at bridging the gap between unused, unexpired medicines and patients in Need. It establishes a secure and verified web-based platform connecting medicine donors(households, hospitals, pharmacies) with NGOs and beneficiaries to ensure equitable Medicine distribution.The system integrates pharmacist-approved verification, QR/barcode tracking, and Transparent logistics to ensure safety and traceability of every donated medicine. Through Its structured workflow—covering donor registration, medicine verification, NGO requests, And distribution tracking—Medishare reduces pharmaceutical waste and increases healthcare Affordability. By leveraging technologies such as web development frameworks, secure databases, and Automation protocols, this system promotes sustainability, healthcare transparency, and Social responsibility, ensuring that essential medicines reach the underprivileged rather than Being discarded.

Keywords – Medishare, E-pharma, nexus.

1. Introduction

In today's healthcare landscape, medicine wastage and unequal access remain among the Most pressing global challenges. Each year, millions of rupees worth of unexpired yet unused Medicines are discarded by households, hospitals, and pharmacies. At the same time, Countless underprivileged patients are deprived of essential, life-saving drugs due to their High cost or unavailability. This imbalance between surplus and scarcity highlights a severe Inefficiency in the medical supply chain, calling for an innovative, technology-driven Solution. To address these issues, this project proposes Medishare – EPharma Recirculation Nexus, a Web-based digital platform designed to facilitate the secure and transparent redistribution of Unused, unexpired medicines from donors to verified NGOs and patients in need. The system Bridges the gap between medicine donors, such as households, hospitals, and pharmacies, and Beneficiaries, ensuring that every donation is validated, traceable, and compliant with safety Regulations. It incorporates advanced verification workflows, barcode/QR tracking, and a Real-time database to maintain authenticity and transparency throughout the donation cycle. By leveraging information technology and secure data management, the system ensures that Only safe, quality-checked medicines are circulated, reducing both pharmaceutical waste and Healthcare expenses. The platform introduces a structured verification hierarchy, where Authorized pharmacists and administrators validate donated medicines before approval. Once Verified, medicines are listed on the system for NGOs or charitable clinics to request and Distribute, promoting a sustainable and equitable healthcare model.Beyond medicine exchange, Medishare fosters environmental and social impact by Minimizing chemical waste, promoting recycling ethics, and improving accessibility for Economically weaker sections. The initiative not only contributes to sustainable healthcare Practices but also aligns with national programs like Digital India and Ayushman Bharat, Emphasizing the role of technology in inclusive health reform.Thus, this project represents a significant step toward building a smart, ethical, and Community-driven pharmaceutical network, using digital innovation to transform how surplus Medical resources are utilized. It offers an efficient solution that benefits all stakeholders —Donors, NGOs, and recipients — while ensuring regulatory compliance and transparency in Medicine redistribution.

2. Literature Review / Related Work

Digital transformation in the healthcare sector has driven researchers to explore technology-enabled solutions for medicine redistribution, donation tracking, and pharmaceutical waste management. The rising cost of healthcare, combined with the lack of organized medicine recirculation systems, has prompted several studies focusing on secure, transparent, and efficient drug donation networks.This section reviews key research works, frameworks, and implementations relevant to the development of the proposed Medishare – E-Pharma Recirculation Nexus system, highlighting existing gaps, methodologies, and comparative results.

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3. Problem Statement

In the current healthcare ecosystem, a significant portion of medicines dispensed by hospitals, pharmacies, and households remain unused yet unexpired, ultimately being discarded as waste. This widespread pharmaceutical wastage not only leads to economic loss but also contributes to environmental pollution and deprives countless underprivileged patients of essential drugs.Despite the growing awareness of medicine donation, existing systems for redistribution are unstructured, unverified, and inefficient. Donations are often made informally, without any standardized mechanism for authenticity verification or tracking. As a result, several challenges arise — counterfeit medicine risks, expired drug circulation, lack of accountability, and regulatory noncompliance.4. Methodology / System Architecture

4.Project Phases:

- Phase 1: Requirement Analysis and Research The initial phase focused on identifying functional and non-functional requirements through stakeholder consultation and literature review. Technologies were finalized — Node.js, Python, Express.js, MySQL, React.js, and Firebase for notifications.
- Phase 2: System Design and Architecture The system architecture, Data Flow Diagrams (DFD), Entity Relationship (ER) Diagram, and Class Diagram were designed. The architecture defined multi-role access (Donor, Pharmacist, NGO, Admin) and backend APIs for seamless data flow.
- Phase 3: Module Implementation Core modules — Authentication, Medicine Verification, Inventory Management, Request Handling, and Notification — were developed. Parallelly, front-end dashboards for each user type were created using HTML, CSS, and JavaScript frameworks.
- Phase 4: Integration and Testing Integration testing was performed to ensure interaction among backend services, database, and user interfaces. Unit and performance testing validated module reliability and communication stability.
- Phase 5: Analytics, Reporting, and GUI Enhancement Admin dashboard analytics and transaction reporting were integrated. Dynamic dashboards were linked to backend data for real-time visualization.
- Phase 6: Documentation and Deployment Preparation Comprehensive project documentation, report writing, and final deployment setup were carried out. Future scalability and mobile app integration were also planned.

5. Algorithmic Workflow Algorithm:

- Medishare Workflow Automation Input: Donor medicine details, user authentication tokens, patient/NGO requests

  Output: Verified medicines, updated inventory, approved distribution logs
- Step 1: User Authentication – Verify login credentials and assign roles (Donor, Pharmacist, Admin, Patient).
- Step 2: Medicine Donation – Donor uploads medicine details (name, expiry, quantity). – Data is stored temporarily for pharmacist review.
- Step 3: Verification Process – Pharmacist validates medicine authenticity and expiry. – If approved, item is moved to verified inventory.
- Step 4: Inventory Management – Store verified medicines with location and stock data. – Trigger expiry alerts and availability checks automatically.
- Step 5: Patient/NGO Request Handling – Request is matched with available medicines using query search. – Approved requests move to delivery scheduling.
- Step 6: Payment and Logistics – Handle payment (if applicable) via secure API. – Initiate courier pickup and update delivery status.
- Step 7: Notification and Reporting – Send alerts to donors, patients, and admins. – Generate and store transaction and analytics reports.

6. Software Requirement Specification (SRS)

This Software Requirement Specification (SRS) document defines the functional and non functional requirements for the project titled Medishare – E-Pharma Recirculation Nexus. The purpose of this document is to describe the system's objectives, scope, behavior, and performance expectations in detail, serving as a comprehensive reference for developers, testers, and stakeholders throughout the software development lifecycle. The proposed system is a web-based digital platform designed to securely connect medicine donors, pharmacists, NGOs, and administrators for verified medicine redistribution. It ensures authenticity, traceability, and transparency in the donation and distribution process while minimizing pharmaceutical waste. By integrating secure databases, verification workflows, and barcode/QR tracking, Medishare establishes an intelligent and reliable network that promotes social responsibility, healthcare accessibility, and environmental sustainability.

7.Purpose

The purpose of this SRS document is to:

- Clearly define the features, functionalities, and constraints of the proposed system.
- Provide a shared understanding between developers and end-users regarding system expectations.
- Serve as a technical foundation for system design, implementation, testing, and validation.

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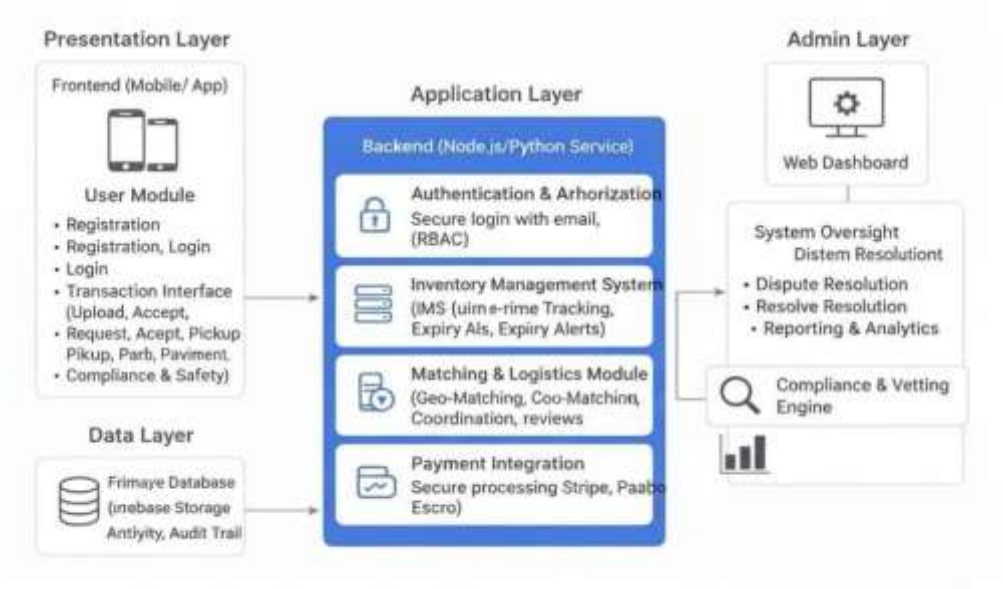
- Ensure the system aligns with ethical, regulatory, and security standards in the healthcare sector.

8. Future Scope

The Medishare – E-Pharma Recirculation Nexus aims to provide a verified digital ecosystem for redistributing unexpired, unused medicines from donors (households, hospitals, pharmacies) to NGOs and beneficiaries through a structured, transparent process. The system will:

- Register and authenticate users (donors, NGOs, pharmacists, admins). • Accept details of unused medicines, including name, batch, and expiry date.
- Verify and approve medicines through pharmacist validation. • Assign a QR/barcode to each approved medicine for end-to-end tracking. • Allow NGOs to request verified medicines based on availability.

9.System architecture



10. Limitations

Despite its successful implementation, the current prototype has a few constraints:

- Limited Real-Time Data Synchronization: Continuous synchronization between donor, NGO, and logistics services needs improvement for high-traffic usage.
- Dependency on Internet Connectivity: Cloud-based processing requires stable network connections.
- Initial Geographic Limitation: The current prototype focuses on specific partner regions; scalability to nationwide operations is planned for future phases.
- Manual Verification Dependency: Some approval steps still require human oversight for legal and medical compliance.

11. Conclusion

The Medishare – E-Pharma Recirculation Nexus project successfully demonstrates how digital technology, cloud integration, and AI-assisted verification can streamline the redistribution of surplus medicines from donors to NGOs and partner pharmacies. The system bridges the gap between medicine availability and accessibility by creating a transparent, traceable, and secure digital ecosystem. It enables donors to upload details of unused medicines, ensures NGO verification through an automated approval process, and facilitates logistics coordination for safe delivery and redistribution.

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