MECHANISM TO SAVE MEDICINES FROM GETTING WASTED

Arjun R, Riya Mandal, Spoorthi Iyer S, Amarnath J L
Presidency University, Bengaluru, India

Abstract

In the contemporary global healthcare landscape, the underrecognized issue of unused medicine wastage poses significant challenges for healthcare systems and the environment. This journal addresses this problem by proposing an innovative solution leveraging technology. The focal point is a groundbreaking application serving as a crucial intermediary, connecting surplus medicines with individuals in need. The goal is not only to mitigate medicine wastage but also to revolutionize medicine distribution and accessibility. The journal delves into the intricacies of the proposed application, showcasing its functionalities that transcend traditional distribution boundaries. By tackling the issue at its roots, the solution aims to reduce unnecessary costs and contribute to a more environmentally sustainable healthcare system. This research advocates for optimizing medicine utilization through efficiency, cost reduction, and environmental responsibility, promoting a conscientious and streamlined approach to medicine distribution for a future environmentally conscious healthcare system.

Keywords : surplus medicine , medicine wastage,healthcare systems, sustainable

I. INTRODUCTION

In the realm of global healthcare challenges, the widespread wastage of unused medicines stands as a pervasive issue with profound consequences for both individuals and the broader environment. Despite its prevalence, the implications of this problem often escape our immediate attention, impacting the efficiency of healthcare systems and contributing to the growing environmental concerns associated with pharmaceutical waste.

Consider the scenario where medications, meant to alleviate ailments and improve health, remain unused within households and healthcare facilities. This not only represents a squandering of valuable resources but also triggers unnecessary financial burdens. Moreover, the Environmental repercussions arising from the improper disposal of pharmaceuticals add an additional layer of complexity to this critical challenge.

In response to this multifaceted issue, this journal embarks on an exploration of a groundbreaking solution - one that leverages the transformative power of technology. At the heart of our proposal is the envisioning of an application designed to act as a vital intermediary, seamlessly connecting surplus medicines with those who urgently need them. This innovative technological approach not only addresses the immediate concern of medicine wastage but also has the potential to redefine our understanding of medicine distribution and accessibility.

Throughout the upcoming pages, we will delve into the specifics of this pioneering application, examining its functionalities and demonstrating how it offers a comprehensive solution to the identified problem. By doing so, we aim not only to shed light on the magnitude of the medicine wastage issue but also to pave the way for a more sustainable and efficient future in healthcare distribution and accessibility. This journal, therefore, serves as a testament to the transformative capacity of technology in addressing critical global healthcare challenges and shaping the future of medicine management.

II. LITERATURE REVIEW

The build-up of unfinished prescriptions results in drug waste and the ensuing loss of financial resources. In order to provide patients with the highest quality of care, healthcare systems work to minimize any potential financial losses while also making the most use of the resources at their disposal .One definition of waste is, “Any substance or object the holder discards, intends to discard, or is required to discard” . [1] The implications of drug waste are negative from an economic and environmental perspective. Drug supply chains are not profitable due to the complicated procedures required in manufacturing, distributing, and storing medications, which frequently result in unused final products.

The environmental impact is further highlighted by the negative impacts that improper disposal of unused medications can have on people, animals, and plants. One important tactic to deal with this problem is to carefully monitor expiration dates to guarantee that medications are used on time. According to a Florida study, controlling the prompt removal of nearly-expired medications from pharmacies and long-term care institutions might dramatically minimize medication waste. Medication expiry was found to be the leading cause of prescription waste.

The situation with medicine use among Indians is quite different. In India, patients buy medications both with and without a prescription, then store them at home.Numerous possible drug-related issues are made more likely when a big number of medications is stored at home like accidental poisoning ,environmental contamination,drug abuse etc. [2]

A number of factors, including patients' beliefs about drugs, how sensitive they believe they are to the effects of the drugs, and their perceptions of the possible advantages and disadvantages of the drugs, influence patients' decisions about taking prescribed pharmaceuticals. So, instead of using their doctor's prescribed medications, people might choose complementary and alternative therapies like herbal cures.

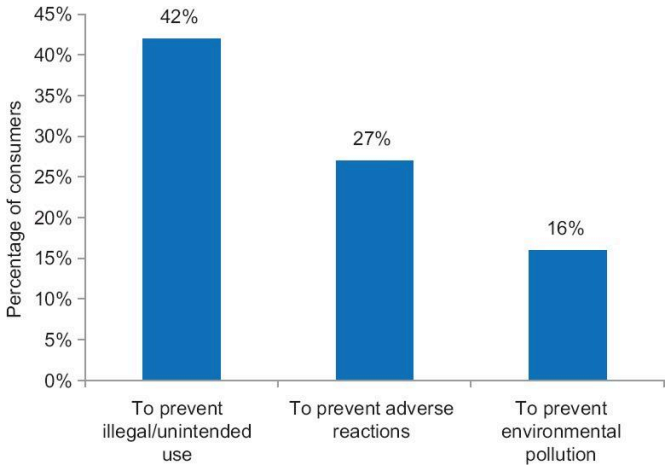

Fig II.1 : "Why is safe disposal of medicines necessary ?" [3]

III. EXPERIMENT

Introduction

ReMedi emerges as a groundbreaking web platform with a comprehensive mission to revolutionize the management of medicines. Unlike traditional platforms that focus solely on information provision, ReMedi is a multifaceted solution that addresses various critical aspects of medication management. Its primary objectives span from offering detailed insights into different medications to actively facilitating the responsible and environmentally conscious disposal of expired medicines. In essence, ReMedi seeks to redefine how individuals interact with and manage their medications, promoting health literacy, sustainability, and community-driven responsibility.

Key Features and Functionalities

1) Medicine Database

The Medicine Database, at the heart of our web platform, stands as a centralized and extensive resource, offering users a wealth of information crucial for informed decision-making regarding their medications. Providing comprehensive details such as medicine names, pack sizes, manufacturer information, and contact details of sellers, and expiry dates. This database aims to empower users with the knowledge necessary for responsible medicine management. With a user-friendly interface and personalized account management, the platform streamlines interactions, allowing individuals to list medicines for selling directly into the database. This dynamic, community-driven approach encourages active user contributions, creating an evolving repository that adapts to changing needs. Beyond its informational role, the Medicine Database actively promotes sustainable healthcare practices by facilitating the exchange of unused medicines, reducing wastage, and contributing to a more environmentally conscious approach to healthcare. In conclusion, the Medicine Database serves as a transformative and collaborative hub, enriching user experiences while championing responsible practices and sustainability in the healthcare ecosystem.

2) User Interaction

The platform is designed to actively engage users, transforming them into not only consumers but also contributors to the expansive database. This dual role encourages active participation, with consumers having the capability to upload details of unused medicines they possess. By doing so, users become integral contributors, playing a vital part in building a comprehensive repository of information on unused medicines. This collaborative approach leverages the collective knowledge and contributions of the user community, creating a dynamic and evolving resource that reflects the diversity of available medications.

For distributors, the platform offers a valuable feature by providing access to the expiry dates of medicines. This functionality is crucial for distributors to take prompt actions, preventing the distribution of expired medicines to consumers. Armed with real-time information about expiry dates, distributors can implement efficient inventory management practices, ensuring that only non-expired medicines reach end-users. Moreover, the platform facilitates responsible disposal practices by enabling distributors to return expired medicines to manufacturers or

relevant organizations. This not only contributes to consumer safety but also enhances the overall efficiency of the pharmaceutical supply chain.

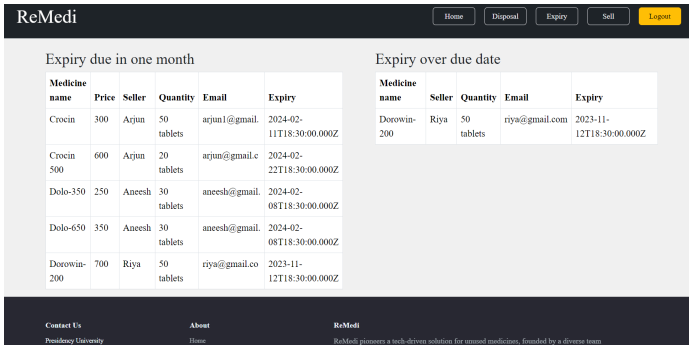

Fig III.1 : Expiry Module

The symbiotic relationship fostered between users and distributors within the platform promotes responsible medicine management. Users benefit from a platform enriched with accurate and timely information about available medicines, and distributors gain insights that empower them to optimize inventory and prevent the circulation of expired products. This collaboration not only enhances the user experience but also contributes to the broader goals of reducing pharmaceutical waste, promoting environmental sustainability, and creating a more efficient and responsible healthcare ecosystem.

3) Medicine Disposal Methods

The commitment to responsible medicine management is at the core of the platform, exemplified by its robust provision of information and guidance on environmentally friendly methods for the disposal of expired or unused medicines. The platform not only offers detailed and user-friendly guidance on various eco-conscious disposal methods, including community drop-off points and take-back programs, but also emphasizes the significance of safe disposal practices. By educating users on avoiding harmful methods such as flushing medicines down the toilet or discarding them in the trash, the platform aligns its guidance with best practices endorsed by environmental and healthcare authorities, contributing to both environmental sustainability and public safety. Additionally, the platform fosters a sense of community engagement by encouraging users to share experiences and knowledge, creating a collaborative environment that enhances collective understanding and promotes responsible medicine management. With a commitment to accessibility, awareness campaigns, and continual updates, the platform serves as a comprehensive resource, actively cultivating a culture of responsibility and environmental awareness among users dedicated to minimizing their impact through responsible medicine disposal.

4) User-Friendly Interface

The user-friendly interface of the "ReMedi" web page is a cornerstone of its design philosophy, prioritizing accessibility and ease of engagement for individuals with varying levels of technical proficiency. The platform's intuitive navigation, marked by a well-organized menu directing users to different sections such as the Medicine Database and disposal guidance, ensures a seamless and straightforward user experience. Accessible features, including clear instructions and visible buttons, are strategically implemented to guide users through listing medicines or exploring the database with clarity. Recognizing the prevalence of mobile devices, the platform's responsiveness across various screen sizes ensures users can effortlessly engage from their preferred devices, be it a desktop, tablet, or smartphone. The streamlined user account management, from uncomplicated registration to easy login and contribution management, adds to the overall simplicity and accessibility. In summary, the user-friendly interface promotes inclusivity, encouraging a broad audience to actively participate in the collaborative ecosystem of "ReMedi," fostering health, safety, and environmental sustainability.

IV. RESULT

The core functionality of ReMedi revolves around a robust database management system designed with precision. This system adeptly handles user details, incorporating secure login processes, and effectively manages the availability of unused medicines listed by users. The inclusion of a separate table dedicated to distributor inventory ensures that data essential to the distribution process can be readily accessed, contributing to the seamless functioning of various interactions within the platform.

The technology stack chosen for the platform underscores a commitment to delivering a smooth and responsive user experience. Leveraging the XAMPP server to establish a connection between the front end and back end, along with the integration of technologies such as React, Node.js, Bootstrap, and MySQL database, ensures the creation of a cohesive and dynamic web platform. This carefully selected technology stack not only meets the current requirements of the platform but also positions it for scalability, allowing for future enhancements and developments.

The information exchange mechanism within the platform serves as a pivotal bridge connecting buyers and sellers. Users can easily peruse each other's listed medicines, fostering a community-driven approach that actively promotes the reuse of unused medicines. Real-time information delivery, including updates on the latest news and effective disposal methods, enriches the platform's offerings, significantly elevating user awareness and education.

The overarching goal of ReMedi is to deliver a functional and efficient webpage empowering users to play an active role in responsible medicine management. By facilitating the exchange and reuse of unused medicines, the platform not only addresses the critical issue of medicinal wastage but also makes a meaningful contribution to creating a harmless environment. The thoughtful integration of technology, a user-centric design, and community-driven features collectively position ReMedi as a comprehensive and impactful solution, aligning seamlessly with the mission of promoting responsible medicine practices and fostering environmental sustainability.

V. CONCLUSION

In summary, the envisioned implementation plan for "ReMedi" represents a thorough and thoughtful strategy to tackle the pressing issue of medicine wastage through an innovative and user-friendly web platform. The design prioritizes user experience, ensuring intuitive navigation and widespread engagement. The platform's user interface is crafted to seamlessly address the challenges associated with unused medicines.

At the core of the system lies a robust and secure database management structure. This includes organized tables for user details, medicines listed by users, and distributor inventory, forming the backbone for efficient data management and retrieval. The integration of the XAMPP server further solidifies the connection between the React front end and the MySQL database, contributing to the overall reliability and performance of the platform.

An essential feature is the envisioned information exchange mechanism, facilitating interaction between buyers and sellers within a dynamic marketplace. This not only promotes the reuse of unused medicines but also fosters a sense of community and collaboration among users. The platform aspires to empower users to actively participate in responsible medicine management, aligning with sustainability goals for a healthier and environmentally conscious healthcare ecosystem.

Looking ahead, the implementation plan emphasizes the significance of continuous testing, user feedback, and ongoing improvements. This iterative approach positions "ReMedi" to adapt to evolving user needs, address emerging challenges, and optimize its functionality for sustained success. As the platform evolves, its commitment to user engagement and responsible medicine management is poised to have a meaningful impact on reducing medicine wastage and fostering a more sustainable and healthier future.

REFERENCES

Research Papers

1. *"The Prevalence of Unused Medications in Homes"- Mutaseim Makki, Mohamed Azmi Hassali, Ahmed Awaisu, and Furqan Hashmi*
2. *"Economic burden of unused medicines and its causes in households of Perinthalmanna region"- Chandrasekhar Dilip, Mohammed.S. Sayed, P.T. Sameer, P.K. ShesaMajeed, Muhammed Kutty Shahanas*
3. *"A Survey of Knowledge, Attitude, and Practice of Consumers at a Tertiary Care Hospital Regarding the Disposal of Unused Medicines" - Supriya Sonowal, Chetna Desai, Jigar D. Kapadia, and Mira K. Desai*

Books

1. *"The Road to Learn React: Your Journey to Master Plain Yet Pragmatic React. Js"- Robin Wieruch, 2017*
2. *"Learning React: Modern Patterns for Developing React Apps"- Alex banks, 2020*
3. *"MySql Cookbook" - Sveta Smirnova, 2022*
4. *"Learning MySql" - Vinicius S. Grippa, 2021*

Online Resources

1. *Fetch Data from Mongo DB and Show it to React using Node JS*
2. *BootStrap_Examples- https://getbootstrap.com/docs/5.3/examples/*
3. *React js 3: Create components in react project*
4. *Sending JavaScript Http Requests with Axios*
5. *How to Connect React JS With MySQL Database using Node.JS/Express.js*
6. *Magnitude of Medicine Wastage and Perceived Contributing Factors Among Public Health Facilities in Dire-Dawa City Administration, in Mid COVID-19 Pandemic in Ethiopia: Retrospective, Cross-Sectional Study*
7. *Kaggle Dataset - AtoZ Medicines Dataset of India https://www.kaggle.com/datasets/shudhanshusingh/az-medicine-dataset-of-india?resource=download*
8. *Food and Drug Administration - https://www.fda.gov/*