

MECHANISM TO SAVE MEDICINES FROM GETTING WASTED

A PROJECT REPORT

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Under the guidance of,

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in partial fulfillment for the award of the

degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

At



PRESIDENCY UNIVERSITY

BENGALURU

JANUARY 2024

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CERTIFICATE

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We hereby declare that the work, which is being presented in the project report entitled **MECHANISM TO SAVE MEDICINES FROM GETTING WASTED** in partial fulfillment for the award of Degree of **Bachelor of Technology in Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Mr. AMARNATH J L, Assistant Professor , School of Computer Science Engineering & Information Science, Presidency University, Bengaluru.**

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ABSTRACT

In the current landscape of global healthcare, the issue of unused medicine wastage has emerged as a pervasive and often overlooked challenge. The consequences of this phenomenon reverberate through both healthcare systems and the environment, as valuable medications frequently go untouched in households and healthcare facilities around the world. This dual impact results in unnecessary costs incurred by healthcare systems and a growing environmental footprint attributed to the disposal of pharmaceutical waste.

At the heart of our proposal is the development of a revolutionary application designed to serve as a crucial intermediary, effectively connecting surplus medicines with individuals in need. This innovative approach not only directly tackles the immediate problem of medicine wastage but also aims to instigate a paradigm shift in how we conceive and implement medicine distribution and accessibility. The central objective is to optimize medicine utilization by fostering efficiency, reducing costs, and promoting environmental responsibility.

Our proposal advocates for a conscientious and streamlined approach to medicine distribution, harnessing the transformative potential of technology in healthcare. The envisioned application acts as a bridge, facilitating the efficient redistribution of surplus medications to those who require them. This not only alleviates the economic burden associated with unused medicines but also contributes to the creation of a more sustainable and responsible healthcare ecosystem.

Beyond the immediate benefits of cost reduction and environmental conservation, the impact of our proposed solution extends to a broader movement. It signifies a shift towards cultivating an environmentally conscious healthcare system for the future. Through the integration of technology to address medicine wastage, we aspire to set a precedent for a more efficient and equitable distribution of healthcare resources. This, in turn, enhances accessibility and works towards reducing disparities in medical care.

In conclusion, our proposal envisions a transformative application that not only addresses the pressing challenge of medicine wastage but also reimagines the fundamental approach to medicine distribution. By leveraging technology, we seek to

create a healthcare system that is not only economically efficient but also environmentally responsible, laying the groundwork for a more sustainable and equitable future in global healthcare.

ACKNOWLEDGEMENT

First of all, we are indebted to the **GOD ALMIGHTY** for giving me an opportunity to excel in our efforts to complete this project on time.

We express our sincere thanks to our respected dean **Dr. Md. Sameeruddin Khan**, Dean, School of Computer Science Engineering & Information Science, Presidency University for getting us permission to undergo the project.

We record our heartfelt gratitude to our beloved Associate Deans **Dr. C. Kalaiarasan and Dr. Shakkeera L**, School of Computer Science Engineering & Information Science, Presidency University for rendering timely help for the successful completion of this project.

We would like to convey our gratitude and heartfelt thanks to the University Project-II Coordinators **Dr. Sanjeev P Kaulgud, Dr. Mrutyunjaya MS** and also the department Project Coordinators.

We are greatly indebted to our guide **Mr. Amarnath J L, Assistant Professor**, School of Computer Science Engineering & Information Science, Presidency University for his inspirational guidance, valuable suggestions and providing us a chance to express our technical capabilities in every respect for the completion of the project work.

We thank our family and friends for the strong support and inspiration they have provided us in bringing out this project.

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CHAPTER 1

INTRODUCTION

1.1 Background

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

Consider the scenario where medications, intended to alleviate ailments and improve health, languish unused within households and healthcare facilities. This not only signifies a squandering of valuable resources but also triggers unnecessary financial burdens on healthcare systems and individuals alike. Moreover, the environmental repercussions stemming from the improper disposal of pharmaceuticals add an additional layer of complexity to this critical challenge, further underscoring the urgency of finding innovative solutions.

At the heart of our proposal lies 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 carries the potential to redefine our understanding of medicine distribution and accessibility. Through a user-friendly interface, individuals can input information about their unused medicines into a centralized database. This database, in turn, serves as a dynamic platform, facilitating the matching of surplus medicines with the specific needs of others.

In essence, our proposed interface takes a proactive approach to addressing the issue. It not only helps in redirecting unused medicines to those who can benefit from them but also provides guidance for responsible disposal in cases where medications have expired or are

no longer suitable for use. By offering a comprehensive solution, our application seeks to minimize the environmental impact associated with pharmaceutical waste while simultaneously optimizing the use of valuable healthcare resources.

In conclusion, our proposed application offers a multifaceted solution to the challenge of medicine wastage, aiming to bridge the gap between surplus medications and individuals in need. Through innovative technology and user-friendly features, we aspire to foster a more efficient, equitable, and environmentally responsible approach to medicine distribution, thereby contributing to a sustainable future for global healthcare.

1.2 Research Motivation and Problem Statement

1.2.1 Research Motivation

In the landscape of global healthcare, the wastage of unused medicines represents a pervasive and frequently overlooked challenge. The consequences of improper disposal of medications, often through means that harm the environment, can have far-reaching effects on both public health and ecological sustainability. Recognizing this issue, our proposed initiative aims to actively engage people in the responsible management of unused medicines, fostering awareness about the environmental impact and consequences associated with improper disposal methods.

The central idea revolves around creating a platform that encourages individuals to actively participate in mitigating medicine wastage. By exchanging unused medicines among themselves, people not only contribute to maximizing the utilization of medications but also play a crucial role in reducing the overall environmental footprint associated with pharmaceutical waste. This collaborative approach not only addresses the issue at its root but also promotes a sense of community responsibility towards sustainable healthcare practices.

To facilitate this exchange effectively, our proposed platform incorporates a robust system for tabulating information about medicines, including their expiry dates. This feature serves a dual purpose – it allows individuals to keep track of the medicines they possess, ensuring they are used before expiration, and it provides distributors with a comprehensive overview of the medicines circulating in the community. Distributors can use this centralized database to monitor their inventory, identify approaching expiry dates, and take timely actions, such

as redistributing or safely disposing of expired medicines.

Furthermore, the platform encourages distributors to filter out expired medicines from the inventory table, streamlining the management process. This not only ensures the safety and efficacy of medicines but also aids in maintaining a transparent and accountable system. In essence, the proposed initiative not only addresses the challenge of medicine wastage by promoting responsible exchange but also incorporates a systematic approach to tracking and managing medication inventory for distributors, contributing to a more sustainable and efficient healthcare ecosystem.

In conclusion, our proposed initiative seeks to tackle the pervasive issue of medicine wastage by actively engaging individuals in responsible practices. By fostering awareness, encouraging collaborative exchanges, and implementing a robust information management system, we aspire to create a community-driven solution that not only maximizes the utility of medicines but also promotes environmental consciousness and responsible healthcare practices.

1.2.2 Problem Statement

In the current global healthcare landscape, the pervasive and often underestimated challenge of wastage in unused medicines stands as a significant threat to both public health and environmental sustainability. The improper disposal of medications, frequently executed through methods harmful to the environment, carries far-reaching consequences that demand immediate attention. This research aims to address the critical need for an initiative that actively engages individuals in the responsible management of unused medicines, fostering awareness about the environmental impact and consequences associated with improper disposal methods.

The central problem at hand is the lack of an efficient and community-driven solution to tackle the issue of medicine wastage. Current practices often lead to the improper disposal of medications, contributing not only to an unnecessary burden on the environment but also posing a potential threat to public health. The absence of a systematic approach to managing unused medicines exacerbates the problem, perpetuating wasteful practices that could otherwise be prevented with a more informed and responsible approach.

One key aspect of this problem is the insufficient awareness among individuals about the consequences of improper disposal and the environmental impact of pharmaceutical waste^[1]. This knowledge gap further complicates the challenge, necessitating the development of an initiative that not only encourages responsible practices among individuals but also facilitates the exchange of unused medicines in a community-driven manner.

The proposed research recognizes the urgency to develop and implement an initiative that encourages responsible practices, particularly by fostering the exchange of unused medicines among individuals. By creating a community-driven platform, the research aims to instill a sense of responsibility and awareness regarding the environmental consequences of improper medicine disposal. Additionally, the initiative will incorporate a robust information management system designed to track and manage medication inventory for distributors, thereby addressing the systemic issues contributing to medicine wastage.

In conclusion, this research endeavors to bridge existing gaps in healthcare practices by addressing the pervasive issue of medicine wastage. By emphasizing responsible practices, fostering awareness, and implementing a community-driven exchange platform with a robust information management system, the research aims to promote sustainable healthcare practices at both individual and community levels. Through these comprehensive efforts, the proposed initiative seeks to mitigate the threats posed by medicine wastage to both public health and environmental sustainability.

1.3 Research objectives

1. Develop a Community-Driven Initiative: The community-driven initiative we propose represents a holistic and innovative strategy to combat the challenge of unused medicine wastage. At its core, this initiative is designed to actively engage individuals in the responsible management of their unused medicines, fostering awareness and cultivating a shared responsibility for sustainable healthcare practices. The initiative's foundation lies in a dual-pronged approach: first, through targeted awareness campaigns and educational programs that enlighten community members about the environmental and public health consequences of improper medicine disposal, thereby instigating a paradigm shift in their behavior and mindset. Second, the initiative involves the creation of a user-friendly digital

platform, functioning as a virtual marketplace where community members can seamlessly input details about their unused medicines and coordinate exchanges. Emphasizing accessibility, the platform ensures diverse community participation, facilitating a culture of shared responsibility. Safety measures and verification processes embedded within the platform not only build trust among users but also ensure responsible exchanges, mitigating the risk of distributing expired or unsafe medications. This community-driven initiative aims to redefine how individuals perceive and manage their unused medicines, creating a collaborative ecosystem where active community participation contributes to the reduction of medicine wastage and fosters a more environmentally conscious and responsible approach to healthcare practices.

2.Raise Awareness and Foster Responsible Practices: To bridge the knowledge gap surrounding the environmental consequences of improper medicine disposal, targeted awareness campaigns are essential. These multifaceted initiatives utilize diverse channels, including social media, community workshops, and informational pamphlets, to reach a broad audience. The primary objective is to educate individuals about the potential harms associated with incorrect medicine disposal, such as water contamination, soil pollution, and the development of antibiotic-resistant bacteria. By highlighting the interconnectedness of individual actions with broader environmental consequences, these campaigns aim to elevate awareness and instill a sense of responsibility regarding the environmental repercussions stemming from improper medicine disposal practices. Following the implementation of these campaigns, it is crucial to rigorously evaluate their effectiveness in influencing responsible practices among individuals. This involves assessing changes in knowledge, attitudes, and behaviors related to medicine disposal through surveys and feedback mechanisms. The iterative nature of ongoing monitoring and collaboration with healthcare professionals and community leaders allows for the refinement and optimization of awareness campaigns, fostering a collective effort to instigate responsible practices and address the broader issue of medicine wastage. In conclusion, this comprehensive strategy contributes to building a more informed and environmentally conscious community, aligning with the overarching goal of reducing pharmaceutical waste and promoting a sustainable healthcare ecosystem.

3.Implement a Robust Information Management System: The implementation of a robust information management system represents a transformative leap in optimizing

medicine utilization and minimizing wastage within the healthcare landscape. This comprehensive system serves as a user-friendly platform for individuals to input detailed information about their unused medicines, emphasizing crucial data such as medication names, quantities, and expiry dates. This real-time inventory management fosters responsible practices by ensuring timely usage before medications expire. Simultaneously, the system caters to the needs of distributors, offering tools for efficient inventory monitoring, strategic distribution optimization, and proactive identification of medicines nearing expiry. Advanced filtering mechanisms empower distributors to swiftly isolate and remove expired medicines, ensuring a transparent and accountable supply chain. This integration goes beyond technological advancement; it signifies a strategic shift toward a more conscientious and streamlined approach to medicine distribution, addressing the dual challenge of minimizing wastage and enhancing efficiency. Ultimately, the implementation of this system contributes significantly to creating a sustainable, environmentally responsible healthcare ecosystem.

4. Evaluate the Impact on Medicine Wastage: A comprehensive assessment of the proposed initiative is imperative to gauge its impact on reducing medicine wastage across multiple dimensions. At the individual level, the evaluation will scrutinize the efficacy of the community-driven platform in instigating responsible medicine disposal and facilitating exchanges. Key metrics such as the frequency of exchanges, the percentage of prevented expired medicines through the platform, and user satisfaction will unveil insights into the initiative's success in encouraging active participation and minimizing wastage on a personal level. Extending the evaluation to the community level involves analyzing the aggregate reduction in medicine wastage, tracking changes in the volume of properly disposed or exchanged unused medicines. Additionally, assessing community awareness and engagement, influenced by educational components, will provide a holistic understanding of the initiative's impact. The evaluation will also focus on the information management system's effectiveness in optimizing medicine utilization and mitigating environmental consequences, gauged through distributor efficiency metrics, removal of expired medicines from channels, and environmental waste trends. Employing surveys, interviews, and data analysis will facilitate a thorough evaluation, guiding potential.

CHAPTER 2

LITERATURE SURVEY

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 public, healthcare providers, and governments all contribute to medication wastage through different practices, requiring targeted interventions. The prevalence of unused medications is noted to be high in numerous countries, with non-steroidal anti-inflammatory drugs being frequently discarded. Common disposal methods involve disposing of expired medications in the trash or toilet. Non-adherence, death, and medication changes are identified as major contributors to medication accumulation and subsequent wastage.

From an economic and environmental perspective, it is evident that drug waste has certain negative effects. The intricate procedures involved in expertly preparing, storing, and delivering these drugs to patients result in underutilized end products, which makes the drug supply chain economically unprofitable. From an environmental perspective, if leftover pharmaceuticals are not disposed of properly, they have a negative impact on people, animals, and plants.

One of the strategies to reduce the medicinal waste is to double-check the expiration dates to make sure the medications are used before it's too late. A study conducted in Florida, USA, revealed that the primary reason for prescription waste and subsequent disposal was the expiration of medications ^[2]. Medication waste could be decreased by managing the planned removal of almost-expiry pharmaceuticals from pharmacies and long-term care facilities.

Unwanted prescription returns can be caused by a number of problems, including a lack of policies, public ignorance, negligence, or illiteracy. These problems can have detrimental

effects on the environment and the economy. In order to successfully address the pervasive problem of prescription waste, the conclusion highlights the need for cooperative efforts among the general public, healthcare providers, and governmental and corporate groups.

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] Patients' decisions regarding taking prescribed medications are influenced by a variety of factors, including their opinions about drugs, their perception of their own sensitivity to their effects, and their ideas about the potential benefits and drawbacks of the drugs. Thus, rather than taking prescription drugs from their doctors, individuals may opt complementary and alternative therapies like herbal remedies.

A cross-sectional descriptive study with a community focus that involved 350 families was carried out using a questionnaire-based methodology. According to the findings, 49.7% of people have diabetes, hypertension, osteoarthritis, thyroid conditions, and other chronic illnesses that call for the use of long-term drugs. Compared to 31% of the families that took two doses, 69% of the families abandoned the drug when it was missed. Medical professionals' homes reported fewer instances of wasted medications, and their associated costs were likewise lower than those of non-medical professionals.

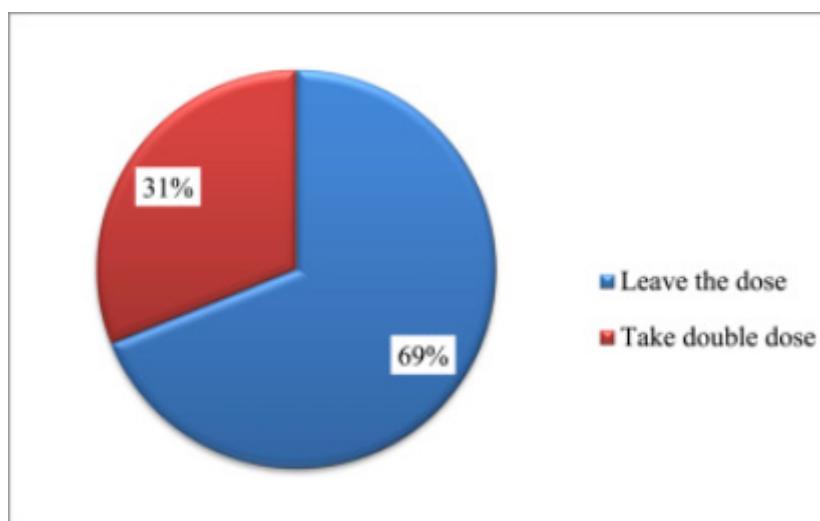


Fig 2.1 :Public notion on missing a drug dose ^[3]

A study of total 160 reveals a gap between awareness and practice, with a significant proportion of consumers expressing the need for facilities or programs to collect unused medicines (76%) and increased awareness regarding hazards and disposal methods (77%). The bulk of the consumers had unused medications at home, according to additional research. The reasons included drastic prescription changes by doctors , prescribing more drugs than necessary , consumer purchases of additional medications for potential future use, discontinuing treatment for symptomatic relief, and noncompliance with therapy.

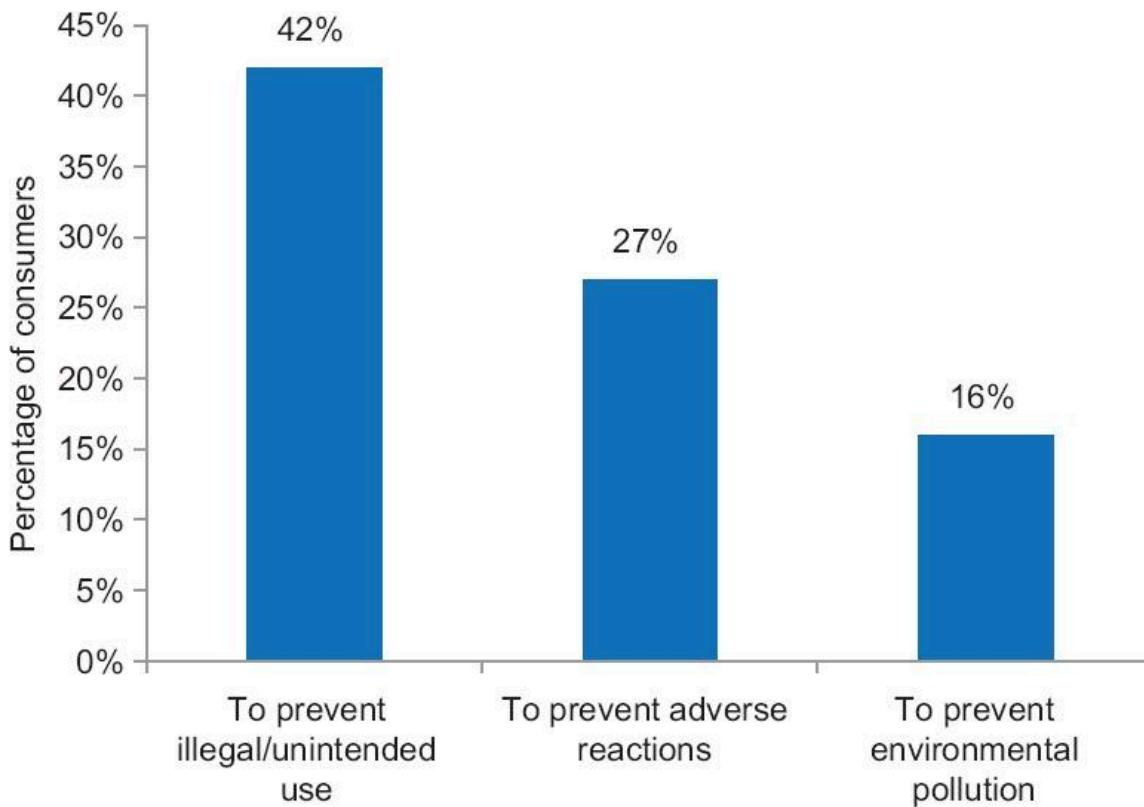


Fig 2.2 : “Why is safe disposal of medicines necessary ?” [4]

Check the FDA's (Food and Drug Administration) flush list to see if the medication is included if there isn't a drug takeback station in your area. The medications on the flush list are those that can (1) be fatally overdosed from a single dosage if taken improperly, or (2) be sought after for their potential for abuse and/or misuse.

| Drug Name | Examples of Products on the Flush List ¹ |
|---|--|
| Drugs That Contain Opioids | |
| Any drug that contains the word "buprenorphine" | BELBUCA , BUAVAIL , BUTRANS , SUBOXONE , SUBUTEX , ZUBSOLV |
| Any drug that contains the word "fentanyl" | ABSTRAL , ACTIQ , DURAGESIC , FENTORA , ONSOLIS |
| Any drug that contains the word "hydrocodone" or "benzhydrocodone" | APADAZ , HYSINGLA ER , NORCO , REPREXAIN , VICODIN , VICODIN ES , VICODIN HP , VICOPROFEN , ZOHYDRO ER |
| Any drug that contains the word "hydromorphone" | EXALGO |
| Any drug that contains the word "meperidine" | DEMEROL |
| Any drug that contains the word "methadone" | DOLOPHINE , METHADOSE |
| Any drug that contains the word "morphine" | ARYMO ER , AVINZA , EMBEDA , KADIAN , MORPHABOND ER , MS CONTIN , ORAMORPH SR |
| Any drug that contains the word "oxycodone" | CODOXY , COMBUНОX , OXADYDO (formerly OXECTA) , OXYCET , OXYCONTIN , PERCOCET , PERCODAN , ROXICET , ROXICODONE , ROXILOX , ROXYBOND , TARGINIQ ER , TROXYCA ER , TYLOX , XARTEMIS XR , XTAMPZA ER |
| Any drug that contains the word "oxymorphone" | OPANA , OPANA ER |
| Any drug that contains the word "tapentadol" | NUCYNTA , NUCYNTA FR |
| Drugs That Do Not Contain Opioids | |
| Any drug that contains the term "sodium oxybate" or "sodium oxybates" | XYREM , XYWAV |
| Diazepam rectal gel | DIASTAT , DIASTAT ACUDIAL |
| Methylphenidate transdermal system | DAYTRANA |

Table 2.1 : FDA Flush List

CHAPTER 3

RESEARCH GAPS OF EXISTING METHODS

One of the most important problems facing the worldwide healthcare system is medication waste. Highlighting the pressing nature of this issue, the project statement suggests creating a ground-breaking application as a revolutionary means of bringing about a significant change. But as it becomes clear that more comprehensive solutions are required to connect excess medications with people in need, a critical research gap appears. These solutions must smoothly integrate technology. Although the project presents the idea of this revolutionary application, it prudently points out that additional research and assessment of the condition of current technologies or procedures in the distribution of medication are required, along with a careful consideration of their limitations.

The literature assessment also identifies a potential lack in knowledge on the particular obstacles or difficulties that important stakeholders—people, healthcare facilities, and regulatory agencies—face when embracing and putting into practice technology-driven solutions for pharmaceutical redistribution. Examining these difficulties could provide insightful information about the crucial elements affecting the effective implementation of these applications in practical settings.

Prescription waste is mostly caused by expired prescriptions, according to a study done in Florida, USA, which highlights the importance of double-checking expiration dates as a critical first step in reducing medical waste. The importance of creating focused solutions to deal with this particular problem is highlighted by this study. One significant flaw in the current distribution systems is the absence of modules specifically designed to help distributors keep track of and manage the expiration dates of the medications they stock. The suggested solution takes note of this requirement and integrates an expiry module into the ReMedi webpage. By acting as a proactive tool, this module enables distributors to anticipate expirations and take prompt action to stop the sale of expired drugs.

Beyond only exchanging information, ReMedi does more. It integrates strategies for the conscientious elimination of past-due medications, prioritizing ecological durability. This feature helps to conserve the environment in addition to addressing the problem of medication waste.

In summary, the ReMedi website presents itself as a comprehensive solution that not only closes the gaps in medicine distribution but also actively involves people, integrates eco-friendly practices, and gives distributors the power to make well-informed decisions. This is achieved through a rigorous research-focused approach. ReMedi presents a promising first step toward transforming the distribution of excess medications and reducing pharmaceutical waste globally by filling in the highlighted research gaps.

CHAPTER 4

PROPOSED METHODOLOGY

4.1 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.

4.2 Key Features and Functionalities

4.2.1 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.

4.2.2 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.

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.

4.2.3 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.

4.2.4 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.

CHAPTER 5

OBJECTIVES

5.1 Raise Awareness

The initiative employs a multifaceted awareness strategy, focusing on informative content creation, collaboration with healthcare professionals and organizations, community outreach programs, and leveraging digital platforms. Through the development of articles, and educational materials, the campaign aims to enlighten the public about the environmental impact of improper medicine disposal, emphasizing the urgency of responsible practices. Strategic partnerships with healthcare professionals, clinics, and organizations enhance the campaign's credibility and reach, fostering a network of influencers advocating for responsible medicine management. Community outreach programs and collaborations with educational institutions ensure direct interaction and long-term impact, incorporating awareness into academic curricula for sustained education. The initiative leverages digital platforms, including social media and webinars, to amplify its reach, encouraging discussions and fostering a collective sense of responsibility. Rigorous measurement and adaptation, guided by key performance indicators, ensure ongoing relevance and effectiveness, creating a comprehensive strategy to instill awareness and foster responsible practices in managing and disposing of unused medicines.

5.2 Highlight Economic Impact

The adoption of more efficient medication management practices yields substantial economic benefits across individual, healthcare systems, and overall societal levels. Actively engaging in responsible medicine disposal through platforms like "ReMedi" allows individuals to curtail unnecessary personal healthcare expenses, avoiding the financial strain of acquiring new medications and fostering substantial savings for households. This individual-level prudence ripples into healthcare systems, where the efficient disposal and exchange of unused medicines alleviate the demand for new prescriptions, optimizing resource allocation and reducing costs. This cascading effect extends to the broader economy, contributing to a financially sustainable healthcare ecosystem by minimizing manufacturing and distribution costs associated with excessive pharmaceutical production.

Simultaneously, the reduction in pharmaceutical waste aligns with environmental preservation goals, preventing the substantial economic consequences linked to environmental degradation and pollution-induced health issues.^[5] In summary, responsible medication management practices not only bring about direct individual cost savings but also enhance healthcare system efficiency and fortify the overall economy, creating a symbiotic relationship between financial prudence, environmental sustainability, and public health priorities.

5.3 Emphasize Environmental Consequences

To underscore the severe environmental consequences of improper medication disposal, our initiative adopts a multifaceted strategy, combining compelling visuals, real-world examples, storytelling techniques, and collaborations with environmental organizations. Through visually impactful infographics and educational content, we vividly illustrate the intricate journey of pharmaceutical waste into the environment, emphasizing the risks of water contamination, soil pollution, and antibiotic-resistant bacteria development. Real-world examples provide tangible instances of environmental damage linked to improper disposal, grounding the issue in relatable scenarios. Leveraging interactive platforms such as webinars, we employ storytelling to humanize the environmental impact, sharing narratives from affected communities and experts. Collaborations with environmental organizations enhance the credibility of our campaign, ensuring that the content remains accurate and aligned with current environmental concerns. By measuring awareness and impact through key performance indicators, our initiative strives to instill a profound understanding of the urgent need for responsible medication disposal, inspiring collective action toward a more environmentally conscious future.

5.4 Demonstrate the Application's Functionality

The application stands out with its user-centric design, ensuring a seamless experience for users engaging in the platform's various functions. The contribution process is intuitively crafted, allowing users to effortlessly input details about their unused medicines. Navigating the Medicine Database is user-friendly, enabling swift and informed decision-making. The platform's emphasis on community participation creates a dynamic virtual marketplace, where users actively contribute to the exchange and redistribution of unused medicines, fostering a collaborative ecosystem.^[6] Security is paramount, with robust data storage

Mechanism to save medicines from getting wasted

mechanisms ensuring the confidentiality of user-contributed information through encryption and access controls. Transparent and accountable processes, including verification measures, bolster user confidence, creating a trustworthy space for community-driven interactions. In summary, the application not only simplifies the contribution and retrieval of medicine details but also ensures a secure and collaborative environment, defining it as a robust and user-friendly platform for responsible medicine management.

CHAPTER 6

SYSTEM DESIGN & IMPLEMENTATION

6.1 Technologies Used

6.1.1 Frontend - User Interface

6.1.1.1 ReactJS

A JavaScript package called ReactJS is used to create user interfaces. It enables you to design reusable elements that render HTML and maintain their own state. This facilitates the development of intricate and dynamic web applications.

Key ReactJS features include:

Components are the foundation of ReactJS. Composing logic and state, components are reusable, standalone units of code. Building modular and maintainable user interfaces is facilitated by this.

Virtual DOM(Data Object Model): To update the UI quickly, ReactJS makes use of a virtual DOM. A simplified version of the real DOM is called the virtual DOM. ReactJS determines how to apply changes made to the virtual DOM to the real DOM in the most effective manner when a component's state changes. ReactJS is now considerably faster than conventional web development techniques.

JSX: You can write HTML-like code in your JavaScript files by using the optional JSX syntax extension. This facilitates the writing and comprehension of ReactJS code.

ReactJS employs a unidirectional data flow. It follows that information moves from the parent component to the child components in this way. Preventing unforeseen negative effects and facilitating reasoning about the application's status are two benefits of this.

Huge ecosystem and community: There is a sizable and vibrant developer community for ReactJS. This implies that you can find a wealth of information to assist you in learning and using ReactJS. ReactJS is compatible with a wide range of libraries and technologies.

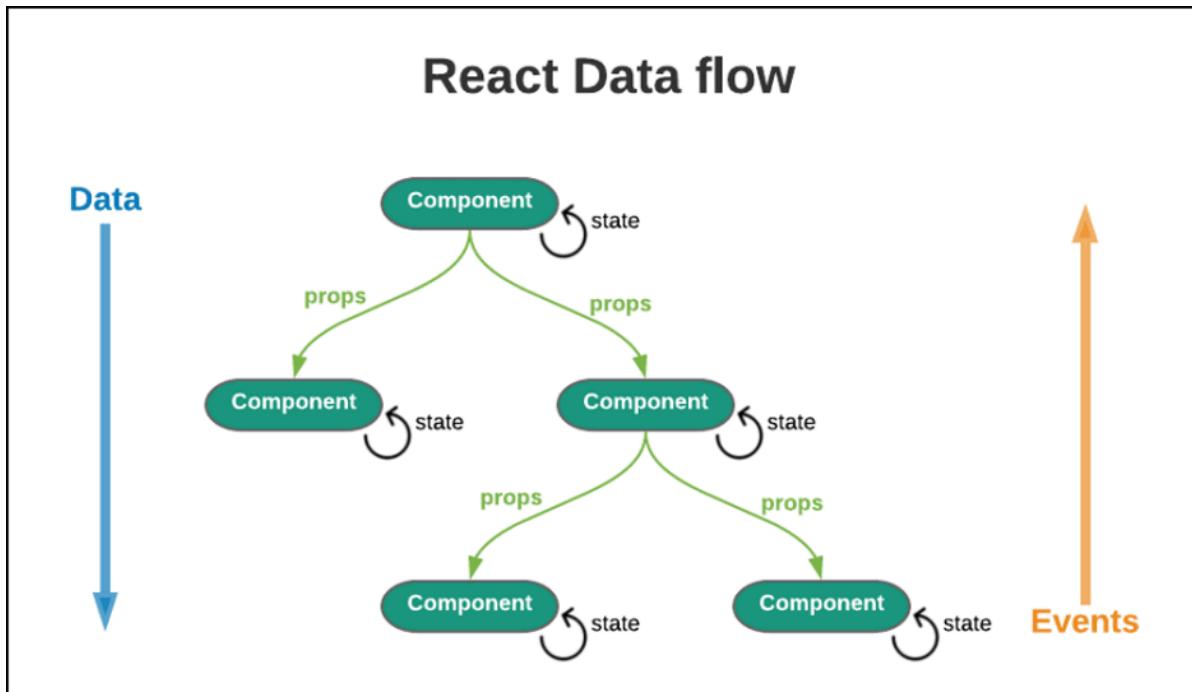


Fig 6.1: React Data Flow [7]

Advantages of using ReactJS:

Quicker development: ReactJS facilitates the quicker development of web applications. This is due to the fact that the virtual DOM and component-based architecture facilitate code reuse and UI updates, respectively.

Less complicated to maintain: Compared to conventional web development code, ReactJS code is simpler to maintain. This is so that faults may be found and fixed more easily thanks to the component-based architecture.

Greater scalability: ReactJS apps outperform conventional web development apps in terms of scalability. This is due to the fact that adding new features and functionality is made simpler by the component-based architecture.

Better user experience: Compared to typical web development applications, ReactJS applications may offer a better user experience. This is due to the fact that the virtual DOM

enables the development of UIs that are more responsive and fluid. [7]

How to begin with ReactJS:

JavaScript knowledge is required. ReactJS is a JavaScript library, thus before you begin learning ReactJS, you need to have a solid grasp of JavaScript.

The official ReactJS documentation or any of the numerous online tutorials and courses that are available can help you learn ReactJS.

A few resources, including Create React App, might assist you in getting started with ReactJS. A tool called Create React App makes it simple and quick to set up a new ReactJS project.

6.1.1.2 Bootstrap

A free, open-source, and highly well-liked front-end programming framework for creating mobile-first, responsive websites and online apps is called Bootstrap.

It is an assortment of pre-made HTML, CSS, and JavaScript elements and instruments that offer a strong basis for quickly constructing consistently formatted and useful web pages. It is intended to streamline the development process and facilitate the creation of websites that function and look fantastic across a variety of platforms, including PCs, tablets, and phones.

Important characteristics:

Bootstrap's responsive design ensures that your websites adjust to a variety of screen sizes and devices without sacrificing usability.

Grid system: It offers a strong 12-column grid system to assist you in organizing and structuring your material in a flexible manner.

Pre-built components: You can save time and effort by generating a variety of pre-styled components, such as navigation bars, buttons, forms, typography, tables, alerts, modals, and more, instead of starting from scratch with these elements.

Customization: Although Bootstrap comes with a preset look and feel, you can easily customize it to fit your unique requirements and brand by using Sass variables and JavaScript plugins.

Several **JavaScript plugins** are included, enhancing the functionality of your webpages, such as dropdown menus, carousels, modals, tooltips, and more.

Advantages of using Bootstrap:

Accelerates development: By offering pre-built components and a grid structure, it saves you time and effort and lets you concentrate on content and functionality instead of styling.

Responsiveness: It guarantees that your websites work and look fantastic across a variety of devices, offering a consistent customer experience.

Consistency: It enhances user experience and brand recognition by encouraging a uniform look and feel across your web pages.

Usefulness: Even for those who are new to web development, it is comparatively simple to learn and operate.

Huge community: There are a ton of materials, lessons, and help available in this vibrant and large community.

How to begin with Bootstrap:

Download Bootstrap: Visit the official website at <https://getbootstrap.com/> to obtain the most recent version of Bootstrap.

Add the following Bootstrap files to your project: To the HTML pages of your project, add the Bootstrap CSS and JavaScript scripts.

Employ the Bootstrap classes: To organize and decorate your material, start utilizing the HTML code's Bootstrap grid system and components.

6.1.2 Backend - Database Management and Connections

6.1.2.1 NodeJs

Based on the V8 JavaScript engine found in Chrome, Node.js is an open-source, cross-platform JavaScript runtime environment. It makes it possible to execute JavaScript code outside of a web browser, which facilitates the creation of command-line tools, server-side apps, and other things.

Fundamental Ideas:

Event-driven architecture: Rather of using the conventional blocking I/O operations, Node.js uses an event-driven architecture, which allows it to respond to events like file system changes or user requests. It can handle multiple requests at once with great efficiency and scalability because to this.

Non-blocking I/O: Node.js prevents the main thread from being blocked when doing actions like file reads and network calls by utilizing callbacks and asynchronous operations. As a result, it can manage several requests at once without experiencing performance issues.

Single-threaded: Node.js only uses one thread for operation, even though it can manage several requests at once. While this streamlines the development process, it necessitates using callbacks and event loops carefully to prevent code bottlenecks.

Important characteristics:

JavaScript everywhere: Node.js simplifies development and may eliminate the need to learn additional languages by enabling you to utilize the well-known JavaScript syntax for both front-end and back-end applications.

Rich ecosystem: Node.js has a vast and continuously expanding ecosystem of open-source libraries and modules that provide ready-made solutions for a range of activities, including data processing, web development, database access, and more.

Performance and scalability: Because of its non-blocking I/O and event-driven architecture, Node.js is incredibly scalable and performant, which makes it ideal for developing chat

servers, APIs, and real-time applications.

Cross-platform compatibility: Node.js is easily deployable on a variety of contexts since it runs on a wide range of operating systems, including Windows, Linux, macOS, and more.

Node.js applications include:

Web development: Use frameworks like Express.js to create server-side applications for developing dynamic web pages, real-time apps, and APIs.

Tools for the command line: Make and use command-line tools for automation, data processing, and server administration that are based on JavaScript.

Microservices: Create nimble and light-weight microservices architectures for complicated and sizable applications.

IoT, or the Internet of Things: IoT device and application development can benefit from Node.js's efficiency and real-time capabilities.

Starting a Node.js Project:

Get Node.js and install it: To obtain the compatible version for your operating system, visit the official website at <https://nodejs.org/en>.

Use the REPL for Node.js. To test JavaScript code snippets, open the terminal and type node to launch the REPL (Read-Eval-Print-Loop) environment.

Put packages in place: To install libraries and modules from the extensive npm package registry, use the npm command.

Compose your code: Begin developing your application with JavaScript, making use of the modules, event loops, and asynchronous functions offered by Node.js.

6.1.2.2 MySql

MySQL is a highly popular open-source relational database management system (RDBMS) used for storing, organizing, and accessing data. Its widespread use makes it a valuable tool for developers and database administrators alike.

Fundamental Idea of MySql:

Relational database: MySQL allows relationships to be formed between various data points by storing data in tables with rows and columns. This facilitates sophisticated data analysis and searches.

Structured Query Language (SQL): SQL is a standard language for managing, querying, and modifying data in databases. It is used by users to communicate with MySQL.

Client-server architecture: The client-server architecture is how MySQL functions. SQL commands are used by clients (applications or tools) to communicate with the server, which maintains the database itself.

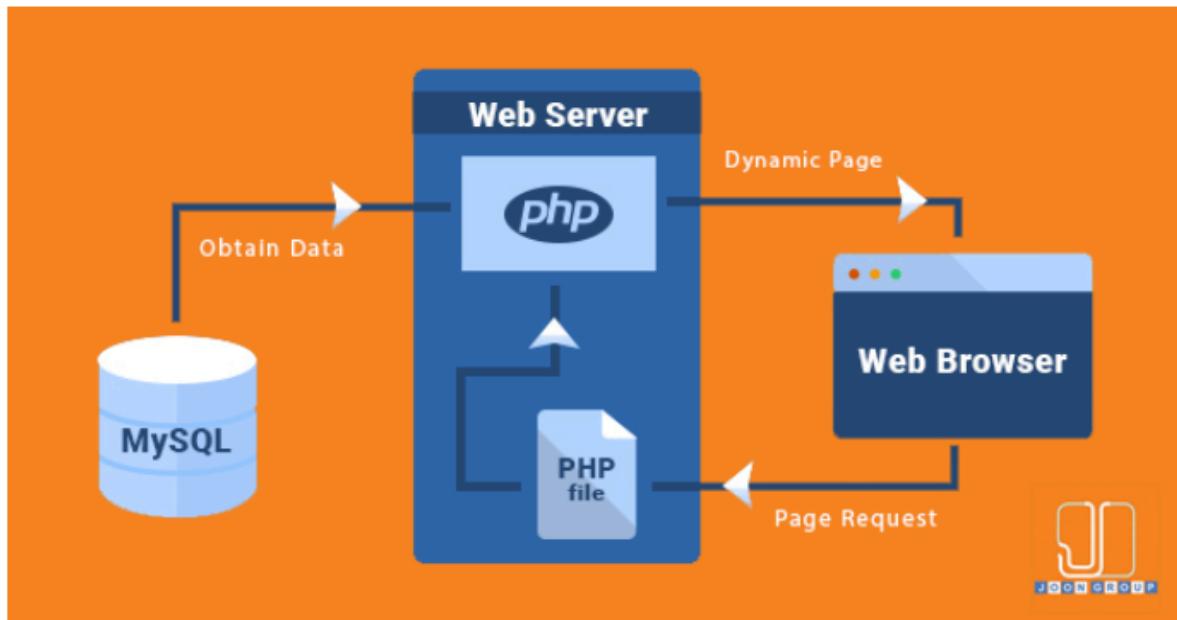


Fig 6.2: MySql Working [8]

Important characteristics:

Free and open-source: MySQL is freely used and modified for both private and business uses under the terms of the GNU General Public License (GPL).

Cross-platform compatibility: MySQL provides great deployment flexibility across a variety of operating systems, including Windows, Linux, macOS, and others.

High performance: MySQL is well-known for its scalable and effective performance, which makes it ideal for managing huge datasets and heavy traffic volumes.

Security features: MySQL protects sensitive data with a number of security features,

including data encryption, access control, and user authentication.

Huge ecosystem: MySQL has an enormous community of add-ons, libraries, and extensions that give it more power and allow it to be integrated with a wide range of apps.

Advantages of MySQL utilization:

Cost-effective: MySQL provides an affordable database management solution since it is open-source and free to use, particularly for smaller projects or individual use.

Usability: MySQL is comparatively simple to understand and operate, especially for those who are already conversant with SQL. It is usable by users of different ability levels thanks to its user-friendly design and abundance of community resources.

Performance and scalability: MySQL scales effectively to meet growing user traffic and data volume, and it can manage datasets of any size.

Security and dependability: MySQL is a reliable option for managing sensitive data since it has strong security features and a solid track record of dependability.

MySQL applications:

Web development: MySQL is frequently used to store user information, website content, and other application data in web applications.

E-commerce: MySQL is used by online retailers to handle transaction data, customer information, and product information.

Content management systems: MySQL is used by many CMS platforms, such as WordPress, to store user information and content for websites.

Data analysis: MySQL is suited for data analysis and reporting due to its effective data querying features.

Starting a MySQL Database:

Install and download: Get the right MySQL version for your operating system at <https://www.mysql.com/>, the official website.

Study SQL To interact with the database, you must be familiar with SQL. You can master the fundamentals with the aid of several online tutorials and tools.

Employ tools: There are numerous tools available for managing and interacting with

MySQL databases, such as phpMyAdmin and MySQL Workbench.

Begin constructing: Create your database, tables, and relationships first, then learn how to manipulate data using SQL commands.

6.1.2.3 Axios

A popular JavaScript package called Axios is used to send HTTP requests from Node.js environments as well as browsers. With an emphasis on usability and a clear, consistent API, it seeks to streamline the process of making API calls and managing answers.

Important characteristics:

Promise-based: Unlike conventional callbacks, Axios handles asynchronous requests using Promises, which makes code easier to comprehend and maintain.

Clear API: With functions like axios.get, axios.post, axios.put, and axios.delete, it offers a straightforward and user-friendly interface for submitting requests.

Interceptors: These tools let you listen in on requests and replies for applications such as error handling, authentication, and logging.

For ease of use, automatic JSON parsing parses JSON answers.

Both client-side and server-side: Operates in Node.js and browser environments.

Compatibility with a broad variety of browsers: even some outdated ones.

Cancellation of requests: This feature lets you use Cancel Tokens to cease pending requests.

Progress tracking: Allows event listeners to track the status of requests.

Advantages of using Axios:

Usability: An easy-to-use API with uncomplicated instructions.

Promise-based: Improves error handling and readability of code.

Flexibility: Customization is possible with interceptors, progress tracking, and other features.

Compatibility across platforms: Operates with Node.js and all browsers.

Basic Usage Example:

JavaScript

```
axios.get('https://api.example.com/users')  
.then(response => {  
    console.log(response.data); // Access the JSON response data  
})  
.catch(error => {  
    console.error(error);  
});
```

Key Methods:

axios.get(url, config): Retrieves data from a specified URL.

axios.post(url, data, config): Sends data to a server to create a new resource.

axios.put(url, data, config): Updates an existing resource on a server.

axios.delete(url, config): Deletes a resource from a server.

withCredentials: Includes cookies in cross-origin requests.

Getting Started with Axios:

Install Axios: Use npm or yarn: npm install axios

Import Axios: import axios from 'axios';

Make requests: Use the methods like axios.get, axios.post, etc.

6.1.2.4 Xampp

XAMPP is an open-source, free web server stack software that simplifies the process of configuring a development environment on your PC. It includes the Apache HTTP Server, PHP, Perl, MariaDB (a derivative of MySQL), and a few other well-known programs like phpMyAdmin and FileZilla. Because of this, developers can test and publish web applications with it without having to install each component separately, making it a flexible tool. [8]

Components:

The web server that provides web pages to your browser is called Apache HTTP Server. Numerous big websites use it, making it one of the most widely used web servers worldwide.

The database management system used to store the data for your web application is called MariaDB. It is an easy-to-use database that is strong and trustworthy.

PHP is a scripting language used for building dynamic websites. Numerous well-known websites, like Facebook and WordPress, use this widely used language.

One scripting language that's useful for many things, including web development, is called Perl. Though not as well-known as PHP, this language is nevertheless rather strong.

You can upload and retrieve files from your web server using FileZilla, an FTP client.

phpMyAdmin: You may administer your MariaDB database with this web-based application.

Advantages of XAMPP usage:

Simple to install and operate: Even for newcomers, XAMPP is incredibly simple to install and operate. It may be downloaded from the official website, and you can start using it right now.

Cross-platform: You can use XAMPP on any operating system because it is available for Windows, macOS, and Linux.

Free and open-source: You may customize XAMPP to meet your needs because it is both free and open-source.

Versatile: Testing and deploying web apps are only two of the many web development jobs that XAMPP can do.

Who is eligible to use XAMPP?

Anybody interested in learning web development should definitely check out XAMPP. Developers that wish to test and implement web apps should also consider it. Because it is not as secure as a dedicated web server, it is not advised for usage in production environments.

How to begin using XAMPP:

Visit the official website to obtain XAMPP: <https://www.apachefriends.org/download.html>

Set up XAMPP on your system.

Open the XAMPP control panel, then start Apache and MySQL.

Launch your browser and navigate to <http://localhost/> to view the welcome page for XAMPP.



How to use XAMPP?



Fig 6.3 : Xampp operating process [9]

6.1.3 APIs Used

6.1.3.1 NewsAPI

With NewsAPI, you can search and retrieve live articles from all across the internet via an intuitive and straightforward REST API. It gives users access to millions of articles covering School of Computer Science Engineering & Information Science, Presidency University

a wide range of subjects and categories that have been published by more than 80,000 global sources.

Important characteristics:

Robust search: Look up articles using terms, phrases, sources, language, date, and additional criteria. Even more search parameter combinations are possible for extremely focused results.

Global coverage: Get news in more than 60 languages from all across the world. It is therefore beneficial for global research and projects.

Many endpoints: NewsAPI provides a variety of endpoints for a range of uses, including sentiment analysis, sources, top headlines, and all content pertaining to a particular subject.

JSON response: Since the results are returned in JSON format, integrating them with a variety of applications and computer languages is simple.

Friendly to developers: NewsAPI offers thorough instructions, code samples, and documentation to assist developers in getting up and running fast.

Benefits of NewsAPI Utilization:

Avoid spending a lot of time and energy manually looking through numerous websites and news sources. You can access a vast news database with effective search capabilities by using NewsAPI.

Improve the projects you work on: Incorporate real-time changes, user involvement, and insights into your applications, websites, or research initiatives by integrating news data.

Remain educated: Gain access to a variety of pertinent and varied news from international sources to stay up to date on newsworthy events and popular subjects.

Simple to use: NewsAPI is very easy to use and doesn't require a lot of technical expertise to get going. Both novice and seasoned developers can easily understand it because to its well-written documentation and provided code examples.

How to begin using NewsAPI:

Make an account for free: Visit the NewsAPI website to register for a free plan with a restricted number of requests. This URL: newsapi.org

Obtain your API key here. After creating an account, you will be given an API key that you can use to send queries to the NewsAPI endpoints.

Select the destination: Select the desired search strategy and the desired endpoint (e.g., top headlines, everything).

Construct your request: Build your request URL and narrow your search parameters using the available parameters.

Make the inquiry: With your API key in hand, submit the request to the NewsAPI endpoint using your preferred tool or programming language.

Parse the response: According on your request, appropriate articles will be included in the JSON response. This data can be parsed and used in your application or project.

6.2 User Interface

6.2.1 Design

The user interface of the ReMedi web page has been meticulously designed to provide an intuitive and engaging experience for users. Upon entering the site, users are greeted with a clean and informative homepage. Here, they can access essential information about ReMedi and find a prominent sign-in option, inviting them to engage more actively with the platform. The user-friendly design ensures that users can easily navigate the site and access the functionalities they need. [9]

The sign-in option is a key feature that enables users to create and use their personal accounts. This personalized approach enhances user interaction by allowing them to upload details of unused medicines and view listings contributed by other users. The design focuses on simplicity, ensuring that users, regardless of their technological proficiency, can comfortably utilize the platform.

6.2.2 Implementation

The implementation of the ReMedi web page involves various components aimed at delivering a seamless user experience. The homepage serves as the gateway, offering an overview of ReMedi's purpose and functionality. Additionally, a blog section has been integrated, leveraging NewsAPI to provide users with the latest news related to medicine distribution and healthcare. This dynamic feature not only enhances user engagement but also keeps them informed about relevant developments.

The registration and login system is a crucial aspect of user interaction. Forms have been created and seamlessly connected to the database, allowing users to register and log in securely. The registered users' information is stored systematically in the database, ensuring data integrity and security.

To facilitate the contribution of users to the platform, a form-based system has been implemented. Through the 'sell' page, users can input details of unused medicines, which are then stored in the MySQL database. This information becomes accessible to other users through the 'buy' page, creating a virtual marketplace for surplus medicines. The design and implementation of this system prioritize user convenience, streamlining the process of both contributing and accessing information.

6.2 Database Management

6.2.1 Design

The User Details Table comprises fields such as Email ID, and Password. The primary purpose of this table is to securely store vital user information, ensuring a foundation for secure authentication and personalized account management. User credentials, specifically email IDs and passwords, play a crucial role in the login process, safeguarding user accounts and maintaining data security throughout the platform. [10]

The Medicine Listings Table is designed with fields like Medicine Name, Manufacturer Name, Expiry Date and Quantity. This table serves as a repository for details pertaining to medicines that users intend to sell. Each entry in this table includes specific information such

as the medicine's name, expiry date, quantity, and additional descriptions. This comprehensive dataset forms the basis for establishing a dynamic marketplace within ReMedi, where surplus medicines are cataloged and made accessible to those in need.

The Distributor Inventory Table in the ReMedi database plays a pivotal role in efficiently managing and displaying medicines contributed by distributors. This table encompasses essential fields such as Medicine Name, Expiry Date, Quantity and Price, providing a comprehensive snapshot of the medicines available for distribution. To enhance accountability and ensure the responsible redistribution of medicines, the platform utilizes this table to dynamically display medicines nearing expiration within a month. This feature not only promotes proactive inventory management but also safeguards against the distribution of medicines with imminent expiration, aligning with ReMedi's objective to reduce medicine wastage.

6.2.2 Implementation

In the implementation phase of the ReMedi database management system, a robust connection has been established between the Xampp server and the React frontend to seamlessly integrate data flow. This integration ensures that user inputs from the forms are efficiently processed, stored, and retrieved from the MySQL database. The core database, appropriately named "ReMedi," is central to this process, incorporating distinct tables to organize and manage various aspects of the platform.

The first set of tables within the ReMedi database is dedicated to user details. This includes essential information such as Email ID, and Password. These details are crucial for secure authentication and personalized account management, allowing users to log in securely and engage with the ReMedi platform using their unique credentials.

Another set of tables is designed to manage the medicines contributed by users. The Medicine Listings Table includes fields like Medicine Name, Expiry Date, Quantity, and Price. This table serves as a dynamic marketplace, capturing the details of medicines that users wish to sell. By organizing this information systematically, the platform creates a user-friendly interface for both contributors and potential buyers, fostering efficient medicine redistribution.

For distributors, a separate Medicine Table is implemented within the ReMedi database. This dedicated table includes fields such as Medicine Name, Expiry Date, Quantity and Price. It acts as a centralized repository for distributor-contributed data, enabling efficient upload and management of inventory details. This segregation ensures that distributor data is organized independently, allowing for streamlined access and retrieval.

The implementation process involves leveraging the Xampp server to facilitate communication between the React frontend and the MySQL database. Forms are strategically integrated into the web page, enabling users and distributors to input relevant data. The registration and login forms ensure secure access, and the data collected through these forms is systematically stored in the respective tables within the "ReMedi" database.

In essence, the implementation of the ReMedi database management system combines the power of the Xampp server, React frontend, and MySQL database to create a cohesive and functional platform. The structured organization of tables caters to different aspects of user interactions and contributions, ensuring a seamless and secure experience for users, contributors, and distributors alike.

6.3 Information Exchange

6.3.1 Design

The design of the information exchange system in ReMedi revolves around creating a dynamic marketplace where both buyers and sellers can interact seamlessly. Buyers and sellers have the capability to view each other's listed medicines, fostering a transparent and collaborative environment. The platform is designed to be inclusive, allowing anyone with a login ID and password to take on the roles of either a buyer or a seller. This approach provides users with the flexibility to sell their unused medicines while allowing buyers to easily access information about available medicines when needed. The overarching goal is to create an opportunity for users to actively participate in the responsible redistribution of medicines, reducing wastage and addressing the critical issue of medicine surplus.

6.3.2 Implementation

In the implementation phase of ReMedi's information exchange system, the platform introduces two key pages: Sell and Buy, each serving a distinct purpose in facilitating the exchange of medicines between users.

Sell Page:

The Sell page is designed to empower users who wish to sell their surplus medicines. On this page, a user-friendly form is provided, allowing sellers to input essential details about the medicines they have available. These details include information such as the medicine name, expiry date, quantity, and any additional descriptions. Upon submission of the form, the entered data is processed and stored in the user's personal table within the MySQL database. This personalized table, associated with the specific user, serves as a secure repository for the medicines they have listed for sale. The structured organization of this information ensures that each seller's listed medicines are easily accessible and tied to their unique user account.

Buy Page:

In contrast, the Buy page plays a pivotal role in providing buyers with an overview of all medicines available in the entire market. This page dynamically retrieves details from the MySQL database, offering a comprehensive list of medicines that users can explore and potentially purchase. The Buy page serves as a centralized marketplace, allowing users to search for specific medicines based on their needs. The real-time connection between the React frontend and the MySQL database, facilitated by the Xampp server, ensures that the information displayed on the Buy page is up-to-date and reflects the current state of available medicines in the ReMedi platform.

Database Connectivity:

Connecting the MySQL database with the React frontend involves leveraging the Xampp server as a bridge. The Xampp server facilitates the seamless transfer of data between the React components and the MySQL database, ensuring that information flows efficiently in both directions. This connection is crucial for the real-time synchronization of data, allowing users on both the Sell and Buy pages to interact with the most current information available in the ReMedi platform.

In summary, the implementation strategy of the Sell and Buy pages involves creating

intuitive interfaces for users to input and access information about listed medicines. The dynamic interaction between React and the MySQL database, facilitated by the Xampp server, underpins the responsiveness and effectiveness of ReMedi's information exchange system, creating a user-friendly platform for the responsible redistribution of surplus medicines.

6.4 Expiry Module

6.4.1 Design

The implementation of an expiry module within the ReMedi platform is a proactive measure designed to assist distributors in efficiently managing their inventory and taking timely actions to mitigate medicine wastage. This module is structured to provide distributors with a comprehensive view of medicines that are approaching expiry within the next month, as well as those that have already exceeded their due dates.

This feature allows distributors to take preemptive measures, such as adjusting pricing, prioritizing the distribution of soon-to-expire medicines, or implementing targeted marketing strategies to minimize wastage.

6.3.2 Implementation

The module achieves this by utilizing the Expiry Date field in the Distributor Inventory Table within the MySQL database. By running regular queries or filters, the system identifies medicines with expiry dates falling within the upcoming month, serving as an early warning system for distributors.

The implementation involves real-time connectivity between the React frontend and the MySQL database, facilitated by the Xampp server. The dynamically updated information ensures that distributors are presented with the most current status of their inventory. The user interface of the expiry module is designed to be intuitive, offering clear visuals and alerts that enable distributors to quickly identify medicines nearing expiration or those that have already expired.

CHAPTER 7

OUTCOMES

- **User Interaction:** The platform's design and functionalities are meticulously crafted to facilitate seamless user interaction, encouraging active participation in contributing to the database and accessing relevant information. The user interface is intuitively designed, ensuring that individuals of varying technical proficiency can navigate the platform effortlessly. The contribution process is user-friendly, guiding users through clear and straightforward steps to input detailed information about their unused medicines. This streamlined approach not only simplifies the contribution process but also fosters a sense of community engagement, as users actively participate in building a dynamic repository of medicine details. Simultaneously, accessing relevant information from the platform's comprehensive Medicine Database is made straightforward, with a well-organized menu and intuitive search features. Users can efficiently explore the database, find specific medicine details, and make informed decisions about their medications. The overall design and functionalities create an inclusive and accessible environment, empowering users to play an integral role in the community-driven initiatives for responsible medicine management.
- **Data Management:** The data management system embedded in the platform serves as a fundamental pillar of operational efficiency, orchestrating the seamless authentication of users, organization of medicine listings, and oversight of distributor inventory. ^[11] In managing medicine listings, the system efficiently processes and stores comprehensive details, fostering the creation of an extensive repository encompassing medication names, pack sizes, manufacturer information, seller contacts, and expiry dates. This structured approach not only enables users to effortlessly input information but also provides tools for continuous management and updates, ensuring the accuracy and relevance of the database. For distributors, the system streamlines inventory management, offering real-time tracking and proactive monitoring to prevent the distribution of expired products. The integration of distributor inventory into the broader database promotes synchronized and

centralized medicine tracking, minimizing discrepancies, and enhancing overall distribution efficiency. In essence, the data management system stands as a robust and essential component, collaborative environment that supports responsible medicine management practices within the platform.

- **Information Exchange:** The platform's robust emphasis on information exchange is foundational to cultivating a vibrant ecosystem where buyers and sellers seamlessly connect, providing a fertile ground for the exchange of unused medicines. Purposefully designed information exchange features prioritize user-friendly interactions, ensuring a smooth connection between those wishing to sell unused medications and individuals in need of specific drugs within the platform. Sellers are empowered to comprehensively list details about their surplus medicines, ranging from medication names and quantities to expiration dates and contact information, all presented in a structured and easily accessible format for potential buyers. Functioning as a virtual marketplace, the platform actively involves users in the exchange process, affording sellers the chance to showcase surplus medicines for redistribution and enabling buyers to explore listings, connect with sellers, and procure needed medications at reduced costs. Beyond fostering sustainability by curbing medicine wastage, this exchange model addresses affordability concerns, creating a community-driven approach to accessible healthcare. Transparent processes further bolster user trust, allowing buyers to make informed decisions based on accurate and reliable information provided by sellers. In conclusion, the platform's meticulously crafted information exchange features establish a dynamic virtual marketplace, embodying user-friendly design, transparent processes, fostering active participation in the reduction of medicine wastage, affordable access to medications, and a collective dedication to sustainable and responsible healthcare practices.
- **Usability:** The platform places a paramount emphasis on usability, ensuring users encounter a seamless and intuitive interface for easy navigation, registration, contribution, and access to pertinent information. The design is dedicated to user-friendliness, featuring a clear and straightforward layout that minimizes complexity and enhances accessibility across varying levels of technical proficiency.

Navigating through different sections, including the Medicine Database, user accounts, and disposal guidance, is effortlessly facilitated by a well-organized menu and intuitive features. The streamlined registration process ensures a hassle-free and secure experience, enabling users to swiftly create accounts and actively engage with the platform. Contributing to community-driven initiatives is designed to be user-friendly, guiding users intuitively through the process of inputting detailed information about their unused medicines, thus fostering a dynamic and collaborative repository. Simultaneously, the user-friendly interface ensures efficient access to relevant information within the Medicine Database, accommodating diverse devices and promoting inclusivity, whether accessed from desktop computers, tablets, or smartphones. In conclusion, the platform's unwavering commitment to usability creates a positive and inclusive user experience, fostering widespread engagement in initiatives for responsible medicine management.

- **Real-time Updates:** The incorporation of real-time updates via the dedicated blog section, powered by NewsAPI, significantly enhances the platform's value proposition by offering users a continuous stream of timely information on the pharmaceutical industry. This feature not only keeps users informed about the latest developments, trends, and advancements in medicines and healthcare but also positions the platform as an all-encompassing resource for pharmaceutical knowledge. Through the curated blog section, users gain access to a diverse range of content, including articles, analyses, and reports from reputable sources, fostering a deeper understanding of the industry. The real-time nature of the updates ensures that users stay current with evolving pharmaceutical landscapes, aligning with the platform's commitment to education and awareness. In summary, the integration of NewsAPI-driven real-time updates transforms the platform into a dynamic information hub, empowering users with insights that extend beyond individual medicine details and contribute to a well-informed and engaged user community.

CHAPTER 8

RESULTS AND DISCUSSIONS

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.

CHAPTER 9

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.

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<https://www.fda.gov/>

APPENDIX-A

PSEUDOCODE

Index.js

```
const router=createBrowserRouter([
  {
    path: "/",
    element:<App/>,
  },
  {
    path: "/components/Home",
    element:<Home/>
  },
  {
    path: "/components/About",
    element:<About/>
  },
  {
    path: "/components/News",
    element:<News/>
  },
  {
    path: "/components/Pages/WhoAreWe",
    element:<WhoAreWe/>,
  },
  {
    path: "/components/Pages/WhyChooseRemedi",
    element:<WhyChooseRemedi/>
  },
  {
    path: "/components/Pages/OurStory",
    element:<OurStory/>
  },
  {
    path: "/components/Pages/OurMission",
    element:<OurMission/>
  },
  {
    path: "/components/Members",
    element:<Members/>
  },
  {
    path: "/components/LogReg",
    element:<LogReg/>
  }
])
```

])

```
const root = ReactDOM.createRoot(document.getElementById('root'));
root.render(
  <React.StrictMode>
    <RouterProvider router={router}/>

  </React.StrictMode>
);

// If you want to start measuring performance in your app, pass a function
// to log results (for example: reportWebVitals(console.log))
// or send to an analytics endpoint. Learn more: https://bit.ly/CRA-vitals
reportWebVitals();
```

App.js

```
function App() {
  return (
    <div className="App">
      <Home/>
    </div>
  );
}

export default App;
```

LogReg.js

```
export default function LogReg(){

  const [users, setUsers] = useState({
    email: '',
    password: ''
  })

  const navigate = useNavigate();
  const handleInput = (e) => {
    e.persist();
    setUsers({...users, [e.target.name]: e.target.value })
  }
  const handleSubmit = (e) => {
    e.preventDefault();

    const data = {
      email: users.email,
      password: users.password
    }
    console.log(data);
    axios.post('http://localhost:8081/login',users).then(res => {
      if(res.data === "Success"){navigate('/components/Home1');}
      else{alert("Not a registered user");}}).catch(error=>alert(error));
  }
}
```

```
}

const Register = (e) => {
  e.preventDefault();

  const data1 = {
    Username: val.Username,
    email: val.email1,
    password: val.password1,
    confirmPassword: val.confirmPassword
  }
  console.log(data1);
  axios.post('http://localhost:8081/remediapp',data1).then(res =>
{navigate('/components/Home1')}).catch(error=>alert(error));
}

return(
  <div>
    <Header/>

    <main>
      <script src="/docs/5.3/dist/js/bootstrap.bundle.min.js"
integrity="sha384-C6RzsynM9kWDrMNeT87bh950GNyZPhcTNXj1NW7RuBCsyN/o0jlpcV8Qyq4
6cDfL" crossorigin="anonymous"></script>
      <div className="container">
        <div className="col-md-3">
          <h2>Login as Consumer</h2>
          <form action="" onSubmit={handleSubmit}>
            <div className="mb-3">
              <label htmlFor="email" className="form-label">Email
address</label>
              <input type="email" onChange={handleInput}
className="form-control" name="email" value={users.email} placeholder="Enter
email"/>
            </div>
            <div className="mb-3">
              <label htmlFor="password"
className="form-label">Password</label>
              <input type="password" onChange={handleInput}
className="form-control" name="password" value={users.password}
placeholder="Enter password"/>
            </div>

            <button type="submit" className="btn
btn-primary">Login</button>
          </form>
        </div> <div className="col-sm-1"></div>
      </div>
      <script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.1.3/dist/js/bootstrap.bundle.mi
n.js"
integrity="sha384-ka7Sk0Gln4gmtz2MlQnikT1wXgYsOg+OMhuP+IlRH9sENB00LRn5q+8nbTo
v4+1p" crossorigin="anonymous"></script>
    </main>

    <Footer/>

```

```
        </div>
    )
}
```

List.js

```
const [meds, setMeds] = useState([]);
useEffect(()=>{
    fetchData();
},[])

const fetchData = async () => {
    try{
        const result = await axios("http://localhost:8081/meds1");
        setMeds(result.data);
    } catch(err) {
        console.log(err);
    }
}
return (
    <div>
        <table className="table table-bordered">
            <thead>
                <tr>
                    <th>Medicine name</th>
                    <th>Price</th>
                    <th>Seller</th>
                    <th>Quantity</th>
                    <th>Email</th>
                    <th>Expiry</th>
                </tr>
            </thead>
            <tbody>
                {
                    meds.map((meds,i)=>{
                        return(
                            <tr key={i}>
                                <td>{meds.Name}</td>
                                <td>{meds.Price}</td>
                                <td>{meds.Manufacturer_name}</td>
                                <td>{meds.Pack_size}</td>
                                <td>{meds.Email}</td>
                                <td>{meds.Expiry_Date}</td>
                            </tr>
                        )
                    })
                }
            </tbody>
        </table>
    </div>
);
}
```

APPENDIX-B

SCREENSHOTS

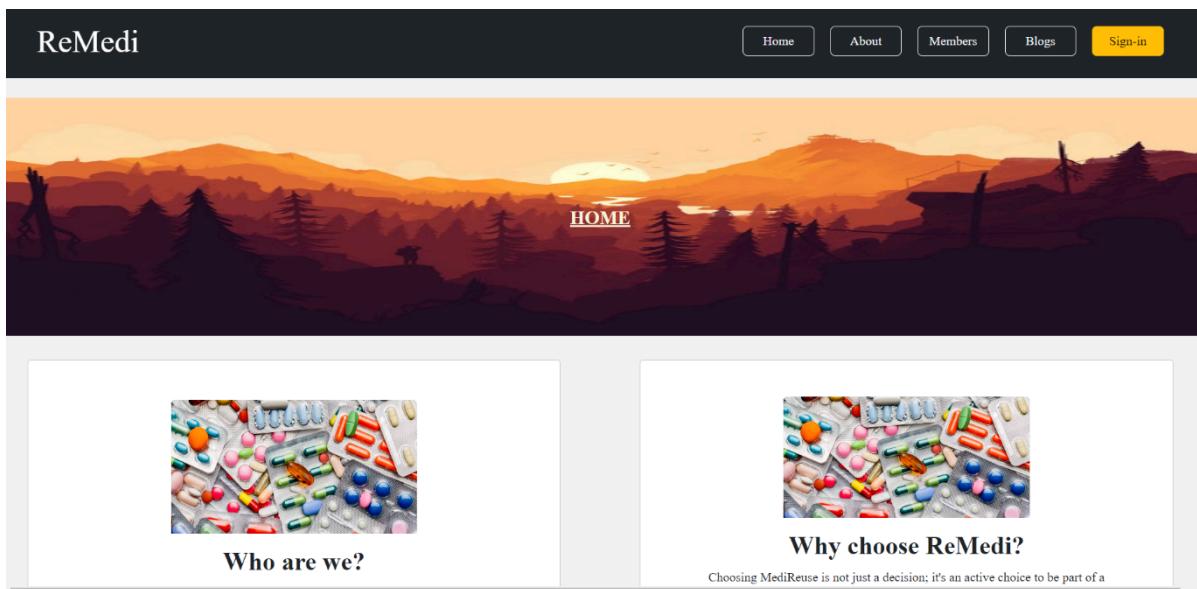


Fig B.1 : HomePage

A screenshot of the "About Us" page. The title "About Us" is at the top. Below it is a large image of a glass sphere containing many colorful pills and capsules. Underneath the image is the heading "Our Story" followed by a paragraph of text: "In a world where the potential for positive change is limitless, our journey began with a simple yet profound realization: medicines, a precious resource for health and well-being, often go unused, resulting in unnecessary waste.....". A blue "More on this..." button is located at the bottom of this section. Below this is another smaller image of a glass sphere.

Fig B.1.1 : About page

BREAKING NEWS



Kyasanur Forest Disease death in 2024 reported in Karnataka - South First

With no vaccines available in the last two years, how has the Karnataka Health Department been fighting against KFD aka Monkey Fever?

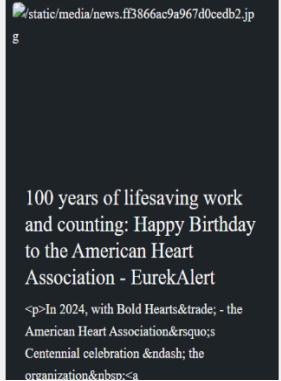
[Read More...](#)



Did You Know About These Surprising Health Boosts Offered By Colocasia Leaves? | TheHealthSite.com - TheHealthSite

Despite their lesser-known status colocasia leaves offer a delightful surprise when it comes to promoting health.

[Read More...](#)



100 years of lifesaving work and counting. Happy Birthday to the American Heart Association - EurekAlert

<p>In 2024, with Bold Hearts® - the American Heart Association's Centennial celebration – the organization ...



What foods help ease bloating and gas? Here are 6 - Deseret News

Foods such as bananas can aid in relieving the uncomfortable symptoms of bloating and gas

[Read More...](#)



Are Raw Hazelnuts Good for You? - Sportskeeda

Raw hazelnuts are small nuts, packed with amusing flavors and it has been appreciated for the longest time because of their delicious taste and various health benefits.

[Read More...](#)



Ghee Goodness: 5 Health-Boosting Benefits To Know - Slurrp

From supporting digestion to providing essential fatty acids, ghee is a nutritious addition to your diet. Explore its potential to boost immunity, enhance nutrient absorption, and so much more with facts backed up with science. Add ghee to your meals for a ta...

[Read More...](#)

Fig B.2 : Fetching news from NewsAPI



Fig B.2.1 : Latest news fetched

Fig B.3 : Login and Registration page

Registration

Name

Email address

Password

Confirm Password

Register and Login

Fig B.3.1 : Registration

Extra options

| username | email | password | confirm password |
|-----------|----------------------|-----------|------------------|
| arjun | arjun@gmail.com | 123123123 | 123123123 |
| arjunxdct | Arjunr3232@gmail.com | 567567567 | 567567567 |
| Priya | Priya123@gmail.com | qwerty | qwerty |

Fig B.3.2 : User registered to database

ReMedi

**Name: Augmentin 625
Duo Tablet**

Price: 223.42

**Manufacturer: Glaxo SmithKline
Pharmaceuticals Ltd**

Pack Size: strip of 10 tablets

Contact: xyz@gmail.com

**Name: Azithral 500
Tablet**

Price: 132.36

**Manufacturer: Alembic
Pharmaceuticals Ltd**

Pack Size: strip of 5 tablets

Contact: xyz@gmail.com

ReMedi

[Home](#)

[Disposal](#)

[Buy](#)

[Sell](#)

[Logout](#)

Sell your medicines

ID

Name

Price

Manufacturer Name

Pack_size

Composition

Email address

Your Medicines for sale

| Medicine name | Price | Seller | Quantity | Email | Expiry |
|---------------|-------|--------|------------|---------------|--------------------------|
| Crocin | 300 | Arjun | 50 tablets | arjun1@gmail. | 2024-02-11T18:30:00.000Z |
| Crocin 500 | 600 | Arjun | 20 tablets | arjun@gmail.c | 2024-02-22T18:30:00.000Z |
| Dolo-350 | 250 | Aneesh | 30 tablets | aneesh@gmail. | 2024-02-08T18:30:00.000Z |
| Dolo-650 | 350 | Aneesh | 30 tablets | aneesh@gmail. | 2024-02-08T18:30:00.000Z |
| Dorowin-200 | 700 | Riya | 50 tablets | riya@gmail.co | 2023-11-12T18:30:00.000Z |

Fig B.4 : Buy and Sell page

What to Do With Unused Medicines?

Still confused with how to dispose your unused medicines? Don't worry here some methodes suggested by Food and Drug Administration .

Flusing Medicines

Depending on the drug we can flush them. Some drugs are advised to immediatly flushed down the sink or toilet when they are no longer in use.In order to do that U.S Food and Drug Administration has recommended list of medicines for disposal by flusing.

| Drug Name | Products On Flush List |
|---|---|
| Drugs That Contain Opioids | |
| 1 Any drug that contains the word "buprenorphine" | BELBUCA, BUAVAIL, BUTRANS, SUBOXONE, SUBUTEX, ZUBSOLV |

Fig B.5 : Disposal Methods

| Expiry due in one month | | | | | |
|-------------------------|-------|--------|------------|---------------|--------------------------|
| Medicine name | Price | Seller | Quantity | Email | Expiry |
| Crocin | 300 | Arjun | 50 tablets | arjun1@gmail. | 2024-02-11T18:30:00.000Z |
| Crocin 500 | 600 | Arjun | 20 tablets | arjun@gmail.c | 2024-02-22T18:30:00.000Z |
| Dolo-350 | 250 | Aneesh | 30 tablets | aneesh@gmail. | 2024-02-08T18:30:00.000Z |
| Dolo-650 | 350 | Aneesh | 30 tablets | aneesh@gmail. | 2024-02-08T18:30:00.000Z |
| Dorowin-200 | 700 | Riya | 50 tablets | riya@gmail.co | 2023-11-12T18:30:00.000Z |

| Expiry over due date | | | | | |
|----------------------|--------|------------|----------------|--------------------------|--|
| Medicine name | Seller | Quantity | Email | Expiry | |
| Dorowin-200 | Riya | 50 tablets | riya@gmail.com | 2023-11-12T18:30:00.000Z | |

Fig B.6 : Display of Expiry Information

| ID | Name | Price | Manufacturer_name | Pack_size | Short_composition1 | Email | Expiry_Date |
|------|--------------------|--------|-------------------------|--------------------------|------------------------------|--------------------|-------------|
| 560 | Zytree Rx Gel | 114.00 | Rapiakos Biret & CO Ltd | tube of 10 ml Dental Gel | Chlorine Salicylate (9% w/v) | xyz@gmail.com | 2023-10-23 |
| 581 | Zenflex-UTI Tablet | 189.90 | Mankind Pharma Ltd | strip of 10 tablets | Ofloxacin (200mg) | xyz@gmail.com | 2025-10-24 |
| NULL | NULL | NULL | NULL | NULL | Griseofulvin (500mg) | NULL | NULL |
| 0 | Cipledine | 160.00 | IGP Medventures Pvt Ltd | 10 packs | Griseofulvin (500mg) | xyz@gmail.com | NULL |
| 1 | Crocin | 160.00 | IGP Medventures Pvt Ltd | 10 packs | Griseofulvin (500mg) | xyz@gmail.com | NULL |
| 2 | Paracetemol | 160.00 | IGP Medventures Pvt Ltd | 10 packs | Griseofulvin (500mg) | xyz@gmail.com | NULL |
| 3 | Crocin | 300.00 | Arjun | 50 tablets | 3 tablets at once | arjun1@gmail.com | 2024-02-12 |
| 4 | Clopitab A-75 | 300.00 | Arjun | 60 tablets | 2 tablets at once | arjun1@gmail.com | 2024-04-12 |
| 4 | Clopitab A-75 | 300.00 | Arjun | 60 tablets | 2 tablets at once | arjun1@gmail.com | 2024-04-12 |
| 12 | Crocin 500 | 600.00 | Arjun | 20 tablets | 2 tablets at once | arjun1@gmail.com | 2024-02-23 |
| 5 | covaccine | 400.00 | Arjun | 3 pack | 4 in a pack | arjun1@gmail.com | 2024-03-13 |
| 5 | Amoxylin | 200.00 | Riya | 30 tablets | 2 tablets at once | riya@gmail.com | 2024-05-23 |
| 7 | Paracetemol 200 | 400.00 | Spoorthi | 50 tablets | 5 tablets | spoorthi@gmail.com | 2024-04-17 |
| 7 | Paracetemol 200 | 400.00 | Spoorthi | 50 tablets | 5 tablets | spoorthi@gmail.com | 2024-04-17 |
| 20 | covaccine-500 | 500.00 | Arjun | 30 packs | 10 in a pack | arjun1@gmail.com | 2024-02-05 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-650 | 350.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 13 | Snigmin | 400.00 | Aneesh | 20 packs | 10 in a pack | aneesh@gmail.com | 2023-12-23 |
| 12 | Dorowin-200 | 700.00 | Riya | 50 tablets | 10 in a pack | riya@gmail.com | 2023-11-13 |

Fig B.7 : Market database

| ID | Name | Price | Seller | Pack_size | Short_composition1 | Email | Expiry_Date |
|----|---------------|--------|--------|------------|--------------------|------------------|-------------|
| 1 | Crocin | 300.00 | Arjun | 50 tablets | 3 tablets at once | arjun@gmail.com | 2024-02-23 |
| 12 | Crocin 500 | 600.00 | Arjun | 20 tablets | 2 tablets at once | arjun@gmail.com | 2024-02-23 |
| 5 | covaccine | 400.00 | Arjun | 3 pack | 4 in a pack | arjun@gmail.com | 2024-03-13 |
| 5 | Amoxylin | 200.00 | Riya | 30 tablets | 2 tablets at once | riya@gmail.com | 2024-05-23 |
| 1 | Crocin | 300.00 | Arjun | 50 tablets | 3 tablets at once | arjun@gmail.com | 2024-02-23 |
| 12 | Crocin 500 | 600.00 | Arjun | 20 tablets | 2 tablets at once | arjun@gmail.com | 2024-02-23 |
| 5 | covaccine | 400.00 | Arjun | 3 pack | 4 in a pack | arjun@gmail.com | 2024-03-13 |
| 5 | Amoxylin | 200.00 | Riya | 30 tablets | 2 tablets at once | riya@gmail.com | 2024-05-23 |
| 20 | covaccine-500 | 500.00 | Arjun | 30 packs | 10 in a pack | arjun@gmail.com | 2024-02-05 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-350 | 250.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 14 | Dolo-650 | 350.00 | Aneesh | 30 tablets | 5 in a pack | aneesh@gmail.com | 2024-02-09 |
| 13 | Snigmin | 400.00 | Aneesh | 20 packs | 10 in a pack | aneesh@gmail.com | 2023-12-23 |
| 12 | Dorowin-200 | 700.00 | Riya | 50 tablets | 10 in a pack | riya@gmail.com | 2023-11-13 |

Fig B.8 : Personal Medicine database

APPENDIX-C

ENCLOSURES

- 1. Conference Paper Presented Certificates of all students.**
- 2. Include certificate(s) of any Achievement/Award won in any project related event.**
- 3. Similarity Index / Plagiarism Check report clearly showing the Percentage (%). No need of page-wise explanation.**

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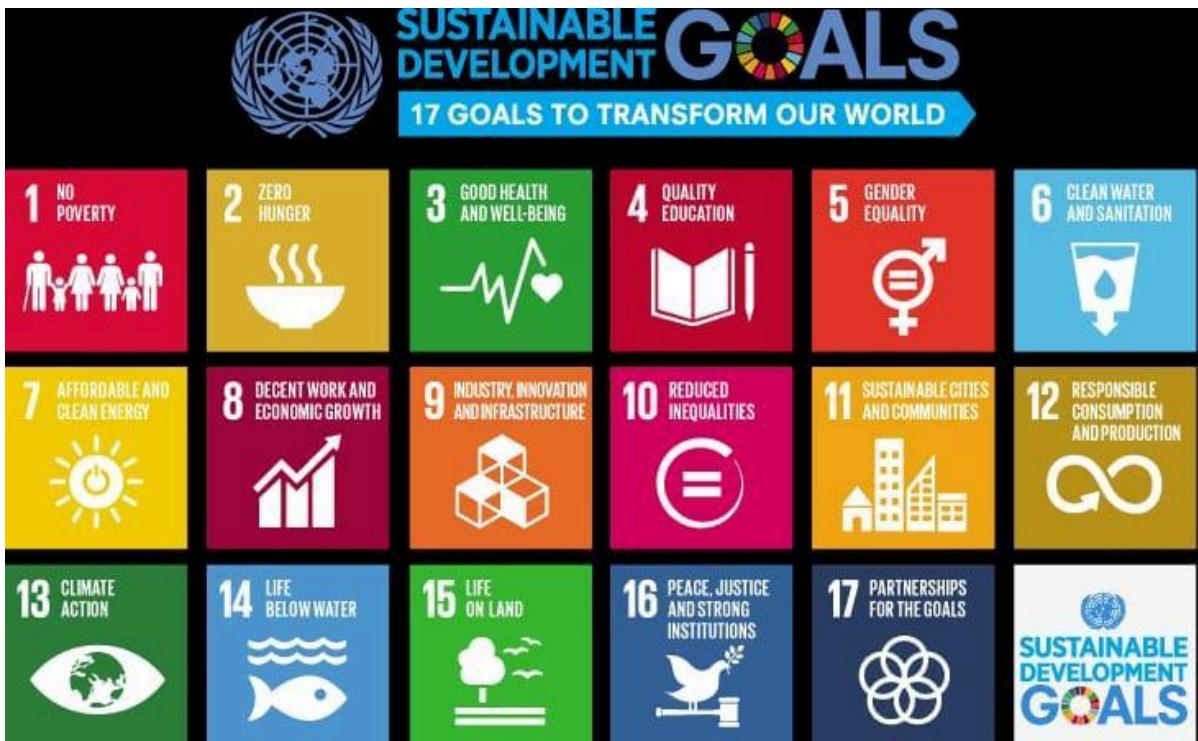
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| 3 | Submitted to M S Ramaiah University of Applied Sciences Student Paper | 1% |
| 4 | gist.github.com Internet Source | <1% |
| 5 | www.mdpi.com Internet Source | <1% |
| 6 | Submitted to University of Central Lancashire Student Paper | <1% |
| 7 | Submitted to University of Hertfordshire Student Paper | <1% |
| 8 | nl.gta5-mods.com Internet Source | <1% |
| Submitted to University of Greenwich | | |



The project work carried out here is mapped to SDG-4 quality education and SDG-15 life on land:

The project work carried here contributes to the quality education by educating people on the right ways of disposing expired medicines.

It also contributes to the life of land by not harming the environment by disposing the expired medicinal waste in the right ways so that no other being is harmed and utilizing the medicine to the best possible extent (Optimized utilization of medicine).