AfterHeal: A Smart Healthcare System for Managing Digital Records and Improving Post-Treatment Adherence

Vallari Patkar
Department of Computer Engineering
Fr. Conceicao Rodrigues Institute of Technology
Vashi, Navi Mumbai, India
1024230@comp.fcrit.ac.in

Aryan Patil
Department of Computer Engineering
Fr. Conceicao Rodrigues Institute of Technology
Vashi, Navi Mumbai, India
1024228@comp.fcrit.ac.in

Johann Lobo
Department of Computer Engineering
Fr. Conceicao Rodrigues Institute of Technology
Vashi, Navi Mumbai, India
1024208@comp.fcrit.ac.in

Malsawmsanga
Department of Computer Engineering
Fr. Conceicao Rodrigues Institute of Technology
Vashi, Navi Mumbai, India
1024211@comp.fcrit.ac.in

Dr. Neelam Joshi
Department of Computer Engineering
Fr. Conceicao Rodrigues Institute of Technology
Vashi, Navi Mumbai, India
neelam.joshi@fcrit.ac.in

Abstract—Post-consultation care is very important for a patient's recovery, but traditional healthcare systems often don't pay enough attention to it. Many patients have trouble following their prescribed treatments because they forget to take their medications, don't keep track of them properly, and don't talk to their healthcare providers enough after their appointments. Current solutions either provide only basic reminders or are not organized well enough to handle patient data well, which makes the time between diagnosis and recovery longer.

This study introduces AfterHeal, a digital healthcare platform aimed at enhancing post-consultation patient care via an integrated and user-friendly system. The platform's main goals are to manage digital health records, keep an eye on patients' activities, and help them stick to their treatment plans. The system makes it easy for patients to get to and follow their treatment plans by giving them a central place to keep their prescriptions and schedule their medications.

Furthermore, the platform offers insightful analytics and reporting features that allow caregivers and physicians to monitor adherence trends over time. This data-driven visibility helps in making informed decisions about treatment adjustments during follow-up consultations. With cross-platform synchronization, users can seamlessly manage their health routines across mobile, tablet, and desktop devices without interruption. Ultimately, AfterHeal transforms the complex nature of long-term recovery into a manageable and stress-free daily routine.

The proposed system offers a practical and cost-effective solution for improving patient discipline and healthcare outcomes. By bridging the gap between consultation and recovery, AfterHeal enhances communication, reduces the chances of missed treatments, and supports better health management. This approach demonstrates how digital platforms can contribute to more efficient and reliable post-consultation care in modern healthcare systems.

I. INTRODUCTION

The healthcare process does not end with diagnosis and prescription; in many cases, the real challenge begins after the patient leaves the doctor’s clinic. Post-consultation care is a critical phase that directly affects recovery, yet it is often overlooked. Patients are expected to follow medication schedules, maintain proper routines, and monitor their health, but in reality, many fail to do so consistently. Forgetting medicines, misunderstanding instructions, or simply neglecting follow-ups can lead to slower recovery and, in some cases, worsening of the condition.

One of the major reasons behind this issue is the lack of a structured system to support patients after consultation. Traditional methods rely heavily on handwritten prescriptions and verbal instructions, which are not always reliable or easy to manage. While some digital solutions provide basic reminder features, they often fail to offer a complete system that includes record management, progress tracking, and meaningful support. This creates a gap between healthcare providers and patients, where continuous monitoring and guidance are missing.

To address these challenges, AfterHeal is proposed as an integrated digital platform that focuses on improving post-consultation care. The system is designed to help patients manage their digital health records, follow medication schedules, and track their recovery in a simple and organized way. By combining reminders, monitoring tools, and structured data management into a single platform, AfterHeal aims to make healthcare more continuous and effective. This approach not only supports patients in maintaining discipline but also contributes to better treatment outcomes and overall healthcare efficiency.

II.LITERATUREREVIEW

In recent years, digital healthcare systems have become increasingly popular as a way to improve patient care and simplify medical processes. Various applications have been developed to help patients manage appointments, store medical records, and receive medication reminders. These systems have made healthcare more accessible and organized, reducing dependence on manual methods such as paper prescriptions and physical follow-ups. However, most of these solutions focus on specific features rather than providing a complete and continuous care system.

Despite these advancements, post-consultation care still remains a major challenge. Many patients fail to follow their prescribed treatments due to a lack of proper tracking, timely reminders, and continuous support. Existing systems either provide limited functionality or are too complex for everyday use. As a result, there is a need for a simple, integrated platform that can assist patients in managing their treatment effectively and support them throughout their recovery process.

- Most applications focus only on individual features such as reminders or record storage
- Lack of integration between different healthcare functionalities
- Limited support for post-consultation patient care
- Many systems are complex or require additional hardware
- Insufficient tracking of patient progress and treatment adherence

III.SYSTEM OVERVIEW

AfterHeal is designed as a structured and integrated framework that aims to improve post-consultation patient care through a digital approach. The system is organized into multiple modules that work together to provide continuous support to patients after their medical consultation. These modules include the User Interface, Digital Record Management, Medication Scheduling, and Monitoring.. This modular design ensures a smooth flow of information from user input to tracking and notification, allowing patients to manage their treatment effectively. By combining these components into a single platform, the system provides a simple and efficient way to support recovery and improve treatment adherence.

A. User Interface Layer

The user interface serves as the entry point of the AfterHeal system, designed to be simple and easy to use for all types of users.

It allows patients to register, log in, and interact with the platform without any technical difficulty. Through this interface, users can add their prescriptions, view schedules, and track their daily activities. The design focuses on clarity and accessibility, ensuring that even users with minimal digital experience can navigate the system comfortably.

B.Digital Record Management

This module is responsible for storing and managing patient health information in a digital format. Users can upload and access their prescriptions, medical details, and treatment history at any time. Unlike traditional paper-based records, this system keeps all information organized and easily retrievable. It also ensures that the stored data can be used effectively by other modules, making the overall system more connected and efficient.

C. Medication Scheduling

TThe medication scheduling module helps patients plan and manage their medicine intake in a structured way. Users can set specific timings and details for each prescribed medicine, creating a clear schedule to follow. This reduces confusion and helps patients stay consistent with their treatment. The system ensures that all schedules are properly maintained and updated whenever required.

D. Monitoring and Alerts

This module focuses on tracking patient activities and providing timely notifications. It monitors whether users are following their schedules and completing their daily health-related tasks. In case of missed medications or incomplete activities, the system generates alerts to remind the user. This continuous monitoring helps improve treatment adherence and ensures that patients remain consistent throughout their recovery process.

IV.SYSTEMARCHITECTURE

The system architecture of AfterHeal is designed as a modular and well-organized structure that ensures smooth interaction between different components of the application. It follows a client-server model where the user interacts with the frontend interface, while the backend handles data processing, storage, and system logic. The architecture focuses on simplicity and efficiency, allowing users to easily manage their health-related activities without facing technical complexity.

The overall architecture is divided into key layers, including the user interface layer, application logic layer, and database layer. Each layer performs a specific function, such as handling user input, processing requests, managing schedules, and storing digital health records. These components work together to ensure that data flows seamlessly across the system, enabling features like reminders, monitoring, and alerts to function effectively. This structured approach makes the system reliable, scalable, and suitable for practical healthcare use.

The architecture is designed to ensure reliability and ease of use while maintaining data consistency across the system. It supports real-time updates and secure storage of patient information, allowing users to access their data whenever required. By keeping the structure simple yet effective, the system can be easily expanded in the future to include more advanced features without affecting its current performance.

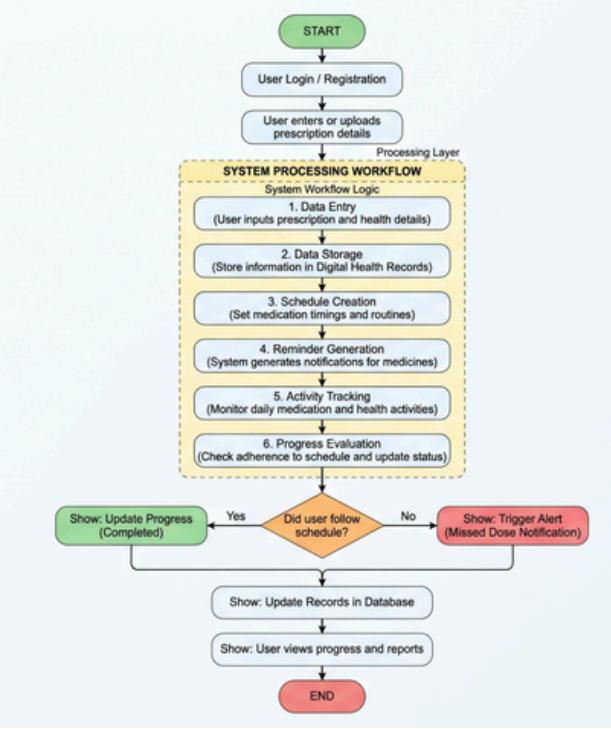


Fig. 1. Operational Flowchart

A. User Interface Layer (Frontend)

The frontend layer acts as the interface between the user and the system. It is responsible for displaying all features of the application in a simple and user-friendly manner. Through this layer, users can register, log in, enter prescription details, set schedules, and view their progress. It is designed using web technologies to ensure smooth navigation and easy accessibility, allowing users to interact with the system without any technical difficulty.

B. Backend Processing Layer

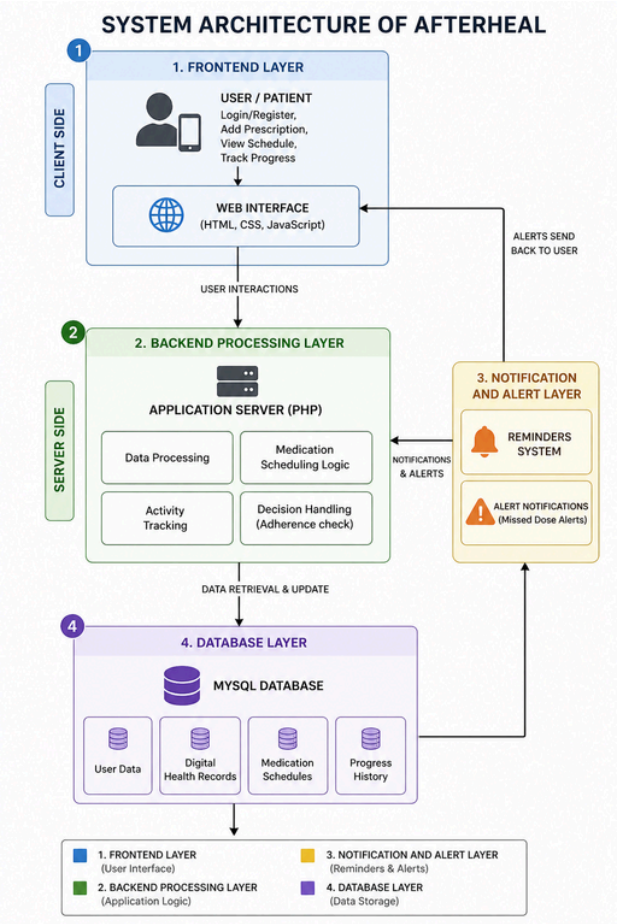
The backend processing layer handles the core functionality and logic of the system. It processes user inputs, manages medication schedules, evaluates user activity, and controls the overall workflow of the application. This layer ensures that all operations, such as generating reminders and tracking adherence, are executed correctly. It also acts as a bridge between the frontend and the database, ensuring proper communication and data handling.

C.Database Layer

The database layer is responsible for storing and managing all user-related data securely. It includes information such as digital health records, prescription details, medication schedules, and progress history. This layer ensures that data is organized, easily retrievable, and consistently updated. By maintaining a centralized storage system, it allows users to access their records anytime and supports the smooth functioning of other components.

D. Notification and Alert Layer

The notification and alert layer focuses on keeping the user informed and consistent with their treatment. It generates reminders for scheduled medications and sends alerts in case of missed doses or incomplete activities. This layer plays a crucial role in improving treatment adherence by ensuring that users receive timely notifications. It works closely with the backend to track user actions and trigger alerts based on their activity.



V. SYSTEM ARCHITECTURE

VI. METHODOLOGY

The methodology used in the development of AfterHeal follows a structured and systematic approach to ensure smooth functioning and reliability of the system. It focuses on simplifying post-consultation care by organizing the process into clear steps, including data entry, scheduling, monitoring, and alert generation. The system is designed using web-based technologies, where user inputs are processed through the backend and stored securely in the database. This approach ensures that all features work together efficiently, providing continuous support to patients and helping them maintain consistency in their treatment.

The system is designed using a web-based architecture where users interact through a responsive frontend interface, while the backend processes requests and manages application logic. Data entered by users, including prescriptions, schedules, and activity logs, is securely stored in a centralized database.

The development process follows an iterative model, allowing continuous improvements based on system testing and feedback. Each module—User Interface, Record Management, Medication Scheduling, Monitoring, and Notifications—is developed and tested independently before integration into the complete system.

Additionally, emphasis is placed on usability and accessibility to ensure that users with minimal technical expertise can easily navigate the platform. Security considerations such as controlled data access and structured storage mechanisms are also incorporated to maintain data integrity and confidentiality.

VII. IMPLEMENTATION

The AfterHeal system is implemented as a web-based application using modern development technologies to ensure scalability, responsiveness, and ease of use.

The frontend of the system is developed using HTML, CSS, and JavaScript, enabling a responsive and user-friendly interface. JavaScript is used extensively to handle dynamic content, user interactions, and real-time updates within the application. The interface allows users to register, log in, upload prescriptions, schedule medications, and monitor their recovery progress seamlessly.

The backend and database functionalities are managed using Supabase, an open-source Backend-as-a-Service platform. Supabase provides essential features such as authentication, real-time database management, and secure data storage. It ensures reliable and structured handling of patient data, including medical records, medication schedules, and activity logs.

User authentication is handled through Supabase's built-in authentication system, ensuring secure login and access control. This allows only authorized users to view and manage their personal health data, maintaining privacy and data integrity.

The system also utilizes Supabase's real-time capabilities to update user data dynamically, ensuring that any changes in schedules or records are reflected instantly across the application.

The modular implementation approach ensures that each component of the system—frontend interface, backend services, database, and notification system—operates independently while maintaining seamless integration. This design allows for easy scalability and future enhancements without affecting existing functionality.

VIII. PRELIMINARY RESULTS AND DISCUSSION

Initial observations suggest that the platform successfully simplifies post-consultation care by organizing patient-related information into a structured and accessible format. The integration of reminders and monitoring tools demonstrates potential in improving patient adherence to prescribed treatments.

The system interface has been designed to be user-friendly, and early feedback indicates that users can navigate the application with minimal effort. The modular architecture also ensures that additional features can be incorporated seamlessly in future iterations.

Further testing, including user-based evaluations and performance analysis, will be conducted to measure system effectiveness, usability, and impact on treatment adherence.

IX. FUTURE SCOPE

The AfterHeal system has significant potential for further enhancement and expansion. Future developments can focus on integrating advanced technologies to improve system capabilities and user experience.

One possible enhancement is the incorporation of artificial intelligence to provide personalized health recommendations based on patient data and recovery patterns. Machine learning algorithms can also be used to predict potential non-adherence and suggest corrective measures.

Integration with wearable devices and health monitoring systems can enable real-time tracking of patient health metrics such as heart rate, activity levels, and sleep patterns. This would allow more comprehensive monitoring and timely interventions.

Another area of improvement includes developing a mobile application version of the system to increase accessibility and convenience for users. Multilingual support can also be added to make the platform more inclusive.

Additionally, secure integration with hospital databases and healthcare providers can enhance data sharing and improve coordination between patients and medical professionals.

X. CONCLUSION

AfterHeal presents a structured and integrated approach to managing post-consultation healthcare by addressing the challenges associated with treatment adherence and recovery monitoring. The system combines digital record management, medication scheduling, monitoring, and notification features into a single platform, making it easier for patients to manage their recovery process.

ACKNOWLEDGMENT

The authors sincerely thank their project supervisor, Mrs. Neelam Joshi, for her expert guidance and sustained support throughout this work. The authors also thank the Project Coordinator, Mrs. Chetana Badgujar, for her inputs on documentation and project management, the Head of Department, Dr. M. Kiruthika, and the Principal, Dr. S. M. Khot, of Fr. Conceicao Rodrigues Institute of Technology, Vashi, for providing a stimulating research environment.

REFERENCES

[1] N. Mathai, M. F. Shiratudin, and F. Sohel, “Electronic health record management: Expectations, issues, and challenges,” in Proc. IEEE Int. Conf. e-Health Networking, Applications and Services, 2017.

[2] X. Sun, W. Zhou, and Y. Feng, “Mobile healthcare platforms’ sustainability: The perspective of health information quality,” BMC Public Health, vol. 22, p. 153, 2022.

[3] S. D. Fenerty, C. West, S. A. Davis, S. R. Kaplan, and S. R. Feldman, “The effect of reminder systems on patients’ adherence to treatment,” Patient Preference and Adherence, vol. 6, pp. 477–483, 2012.

[4] Z. Shea, A. Bhatt, S. Kim, and A. Bhattacharya, “Carebit: A mobile app for remote informal caregiving,” in Proc. ACM CHI Conf. Human Factors in Computing Systems (CHI ’18), Montreal, QC, Canada, 2018.

[5] D. Biduski, A. D. Bellei, A. R. Rodriguez, E. P. Becker, and C. R. De Marchi, “Assessing a long-term mobile health application for treatment adherence in hypertension: Mixed-methods study with patients and physicians,” PeerJ, vol. 8, p. e9360, 2020.

[6] Practo Technologies Pvt. Ltd., “Practo,” [Online]. Available: https://www.practo.com

[7] Tata 1mg Technologies Pvt. Ltd., “Tata 1mg,” [Online]. Available: https://www.1mg.com [8] mFine, “mFine health,” [Online]. Available: https://www.mfine.co