MediTrack: Adherence Aid

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***Abstract*—Self-care is given precedence over therapy in comprehensive healthcare, which acknowledges the need of drug therapy, particularly in the field of medicine. The annual financial expenditures associated with prescription administration errors led to the creation of the Iranian medication reminder app, "Seeb," locally. In addition, "Medi-Track" functions as a mobile application with Firebase support for backend operations, leveraging the Flutter framework for cross-platform development. Medi-Track makes medication management easier by enabling users to add medications, set reminders, and keep track of their health information. In addition to managing appointments and renewals, it serves as a health journal where users can record important medical information. The Main Objectives of Medi-Track is to use technology to turn innovative healthcare concepts into workable realities while maximizing efficiency and helping individuals.**

Keywords—*Medication Management, Mobile Health Application, Digital Health, Health Tracking, Patient Empowerment, Medication Reminder, Health Informatics.*

I. INTRODUCTION

The widespread use of mobile technology has transformed many facets of our lives in recent years, including healthcare. Mobile health apps have become increasingly effective instruments for giving people the freedom to take charge of their health and wellbeing. Medication management apps are essential for encouraging users to follow their prescription schedules and efficiently manage their health issues. The Android software Medi Track sticks out as a potential way to make medication tracking and management easier in this digital age when cell phones are commonplace.

Strict adherence to medication schedules is frequently necessary for the management of long-term diseases and medical conditions. Studies have revealed that pharmaceutical non-adherence is still a major problem, with negative consequences for health and higher medical expenses.

We will examine the usefulness and efficiency of the Medi Track Android application for tracking and managing medications in this review study. By means of an extensive examination of extant literature, user input, and comparative evaluations with analogous applications, our objective is to furnish significant discernments about the function of Medi Track in enhancing medication compliance and health-related consequences. We will also point out the app's shortcomings and difficulties and make suggestions for future. developments and lines of inquiry for the field of mobile health applications.

The overall goal of this review paper is to highlight the potential of the Medi Track app to enable users to properly manage their medication regimens, leading to improved health outcomes and a higher standard of living.

II. LITERATURE SURVEY

One of the most well-liked stochastic optimization techniques based on swarm intelligence algorithms is particle swarm optimization (PSO). There are uses for this straightforward and exciting approach in numerous scientific domains [6]. Each particle in PSO has the ability to modify its "flying" in accordance with both its own and its companions' flying experiences. This study presents a novel PSO version, termed the statistically tracked PSO, that updates the particle's velocity after a set number of iterations based on group statistical characteristics, thereby avoiding local minima, and assisting particles in exploring global optimum with improved convergence [8]. Positive findings are obtained when the suggested algorithm's performance is evaluated on a deregulated automatic generation control problem in power systems.

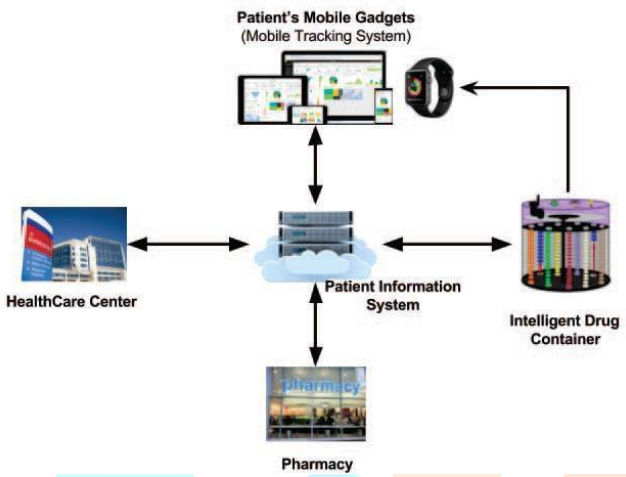
Among actuator nonlinearities, saturation emerges as a prominent challenge. Integrating controllers for systems grappling with both time delays and actuator saturation often yields conservative architectures with limited stability margins [1]. Addressing this conservatism involves broadening the stability domain, which remains a daunting task. Building a robust state feedback control system hinge on a comprehensive understanding of system states [7]. In scenarios where certain states are unmeasurable, they are typically inferred from available measurements and the system's physical understanding, owing to practical limitations in direct measurement [5]. Developing stable adaptive observers capable of estimating unmeasurable states and unknown system dynamics poses a significant challenge, particularly for nonlinear systems susceptible to actuator saturation and/or time-delayed inputs [3].

The nonadherence of patients to prescribed medications stems from various factors, including hectic schedules, forgetfulness, and complacency. Discontinuing medication use can impede or halt patients' healing processes, with far-reaching repercussions for both individuals and society [9]. Prolonged recovery periods may lead to enduring psychological and physical consequences for patients, disrupting the patient-physician relationship built on trust.

III. METHODOLOGY

By tracking the use of prescription drugs and securely notifying patients on a regular basis, Medi-Track is intended to be the answer to prescription non-adherence.
The core of the offered solution is the HRS. HRS operates out of the Medi-Track center, which houses all patient, physician, healthcare facility, medication, and other.
recordkeeping. There are three subsystems in it. There are three subsystems in it [2].
In addition to managing notifications and keeping an eye on patient information, the HRS stores patient data.

The IDC is a hardware system designed to manage, monitor, and notify patients on their medication dosages. It is made with drug cartridges [10]. The HRS can be viewed as Medi-Track's central system due to the overall structure of the system and its links to the environments [4]. Medi-Track's database and graphical user interface (GUI) are provided by the HRS. Medi-Track's web-based graphical user interface is intended for usage by pharmacies and medical facilities. Physicians, nurses, and other staff members at any healthcare facility can use this tool to generate and maintain patient records pertaining to their conditions, courses of treatment, and medications.



System Architecture

IV. ADVANTAGES AND DISADVANTAGES

Advantages:

Contribution to Knowledge:
You add to the corpus of information already available in the areas of medication management and mobile health apps by doing a review article on the Medi Track app. Researchers, developers, and healthcare professionals can all benefit from the insights you have gained from your synthesis of the literature and study of user feedback.

Practical Utility:
For anyone looking for information regarding medication management apps, such as Medi Track, the review paper can be a useful resource. Your assessment of the app's features, usability, and efficacy can help users who want to better manage their prescription Platform Scalability.

Disadvantages:

Data Availability:
The limited availability of data, particularly from empirical research that concentrates exclusively on the Medi Track app, may limit the scope and depth of your analysis. This might have an effect on how thorough your analysis is and how solid your findings are.

1) Bias in User Feedback:
Since user reviews in app stores and internet forums usually reflect the views of the people who choose to write about the app, they may be prejudiced. This bias may affect how you evaluate the usability and efficacy of the app, which could result in biased.

V. ALGORITHM

Reminder Algorithms:
Adhering to the user's specified dosage schedule, these algorithms are used to schedule and deliver reminders for medications. To satisfy the demands and desires of consumers, they could include features like snooze buttons, frequency modifications, and programmable reminder times.

Medication Recognition Algorithms:
The user's smartphone camera is used by certain medication management apps to recognize pills using image recognition algorithms. Using visual cues including color, shape, and impression markings, these systems compare the collected image to a database of approved drugs.

Algorithms for dosing Calculation:
Algorithms can be used to determine medicine dosages depending on the user's age, weight, and specified dosing schedule, among other variables. These algorithms guarantee precise dosage and can aid in avoiding overdosing or pharmaceutical errors.

Interaction Checking Algorithms:
Certain apps use algorithms to look for possible drug interactions between prescription drugs, over- the-counter medications, and supplements in an effort to improve medication safety. These algorithms search through drug databases to find potential interactions and alert users to them.

VI. FUTURE SCOPE

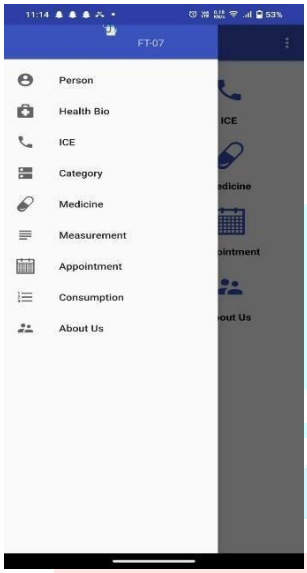
Improved Usability and User Experience: Improving the user interface (UI) and user experience (UX) of the app on a constant basis can assist boost user happiness and engagement. To do this and make the app more intuitive and user- friendly, usability testing, user input, and design revisions may be necessary.

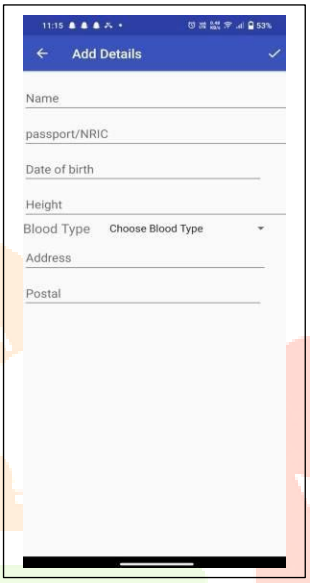
Personalized Health Insights:
The app may evaluate users' medication adherence data and health metrics to deliver personalized insights and suggestions by utilizing artificial intelligence and machine learning techniques. This could entail seeing patterns, forecasting drug adherence, and making customized recommendations for enhancing health outcomes.

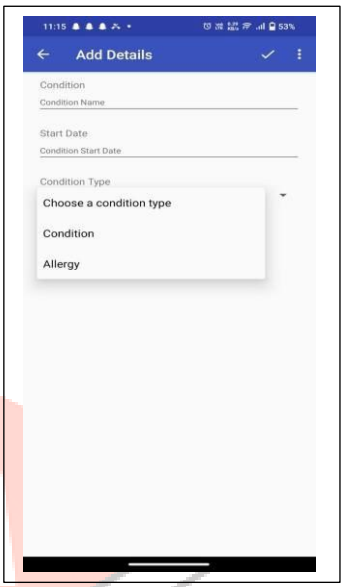
1)Integration with Wearable Devices:

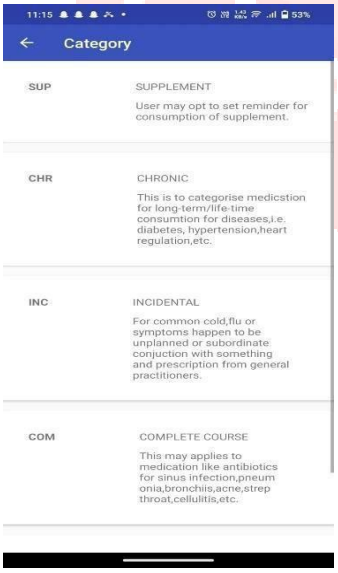
Users may benefit from more functionality and convenience by integrating the Medi Track app with wearables like fitness trackers or smartwatches. The app's entire value proposition can be improved by integrating wearables to offer real-time activity tracking, health monitoring, and prescription reminders. 2)Iterative development and continuous feedback: Putting in place systems for getting feedback from stakeholders and users on a regular basis can help with continuous development and app enhancements. Frequent updates that take into account user feedback, new trends, and technology developments can guarantee that the app stays useful and relevant for a long time.

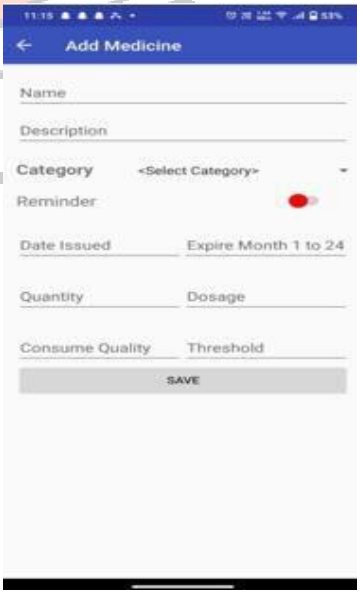
VII. RESULTS











VIII. CONCLUSION

This easy-to-use tool offers a central hub for convenient organization, making monitoring medications and doctor's appointments simpler. Medi-Track guarantees excellent health adherence by automatically reminding patients not to miss medications or visits. The software is not only efficient; it also provides a unique pharmacy directory with affordable drug selections. Medi-Track, your individualized health companion, will help you embrace a more intelligent and approachable approach to healthcare.

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