

PILL REMAINDER AND MEDICATION TRACKER USING OCR

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Abstract—An electronic medical assistant for the older population, the pill reminder and medication tracker using OCR. Medication reminders, comprising the colour, name, and quantity of the tablet as well as the advised time to take it, may be provided by the user or anybody acting on their behalf. The reminder helps the user check up the precise tablets they need to take while also speaking out loud what they must take. This state-of-the-art tool allows a doctor to enter patient information, which will aid with memory. The system also gives the user the option to photograph their medications or use OCR, which prints out text on the screen for them to tap and store using their camera.

The system makes advantage of Mobile Vision API to implement OCR. By using OCR, this can also save a significant amount of time by eliminating the need to input the name of a drug. This system might be useful if someone needs to take a lot of tablets.

I.Introduction(HEADING 1)

Any living thing has the potential to become a patient, including people, animals, and other pets. Politicians, merchants, social workers, teachers, and other professions may all fall under the group of patients that make up the human race. These individuals have hectic lifestyles on a daily basis. If they have any form of illness or condition, it is their obligation to take the proper meds in the proper dosage at the proper time. Family members can look after the patient at home and make sure they remember to take their prescription. Yet, whether the patient is not in the city or at home, their family members are unable to contact them and remind them.

Patients ought to have access to a location that can quickly remind them of the name and dosage of their drugs for this reason. Many people now use mobile or smart phones all across the world. The variety of applications available on smartphones makes living luxurious.

a) When mobile phone providers provide their consumers with such great applications that may be

used in so many helpful ways, the question of why not use those programmes because the company is offering them emerges.

b) Of these applications, the Reminder feature is the one that is most frequently utilised to avoid forgetting even the minute facts.

c) Patients who bought their prescription medications from many pharmacies and used them at home unattended were to blame for the majority of out-patient medication errors.

Common causes of these errors include:

- a) Inconsistent medication intake because of the patient's busy schedule,
- b) Complex intake schedules brought on by the patient's extensive medication regimen,
- c) Hazardous medication responses brought on by inconsistent prescriptions from several sources,
- d) Lack of understanding regarding the appropriate usage of medications.

In this paper, we describe a patient-facing Android application that will set up reminders on users' phones to remind them to take the appropriate prescriptions at the appropriate times.

You will be automatically reminded to take the prescribed medication by these notifications.

II. Related works(HEADING 2)

[1] Discuss the strategy behind the "Wedjat" smart phone application, which aims to assist patients in avoiding the aforementioned medication administration mistakes(common causes).

Wedjat can perform three primary functions:

- a) Issue medicine in-take reminders
- b) Provide medicine identification and in-take directions
- c) Maintain medicine in-take records.

Similarly, [2] talks about **Medication Reminder Pro's** strategy, which is built on recalling medication regimens.

This free application may support up to 15 reminders. The user can select a recurrent or one-time alarm pattern.

With a minimum of one hour, you can specify any hourly time interval between notifications. At the specified time, the application will provide a notification via an alarm, vibration, or LED indication.

Furthermore, [3] offers the Med Minder method, which is advertised as a simple, free, fully functional pill and medicine planner and medication reminder tool.

However, this approach requires a great deal of physical labour and takes a long time.

OCR technology is used by a number of existing Android apps for tracking medications and setting pill reminders. These are a few instances:

Medisafe:

With the Medisafe app, users may schedule medication reminders and monitor their medicine usage. Medication information, including dosage and frequency, is automatically filled in after a medication label is scanned using OCR technology.

MyTherapy:

This app assists users in scheduling and monitoring their adherence to their drug regimens. Medication information is entered into the app by scanning pharmaceutical labels using OCR technology.

Mango Health:

This app tracks medication adherence and sends out reminders for taking medications. OCR technology is also used to scan drug labels and enter medication data into the app.

MediSafe Meds & Pill Reminder:

This app lets users track their medicine usage and offers medication reminders. It scans prescription drug labels using OCR technology and enters the data into the app.

HealthTap:

This app reminds users to take their medications and lets users keep track of their drug schedules. Medication information is entered into the app by scanning pharmaceutical labels using OCR technology.

These apps use OCR technology to make it simpler for users to input pharmaceutical information, lowering the possibility of mistakes and guaranteeing the accuracy of drug schedules. In order to support customers in sticking to their drug schedules, they also offer tracking and reminder functions for medications.

Disadvantages :

The first pill-reminder and medication-tracking programme, Med Minder, has several limitations when compared to more recent apps that make use of cutting-edge OCR technology. Several of the significant downsides include the following:

Manual input of medication information:

Users of the app Med Minder had to manually enter information about their medications, which might be time-consuming and error-prone. This made it less useful and accurate than more recent apps that use OCR technology to automatically input pharmacological information.

Limited features:

For instance, Med Minder is less functional than more recent programmes. It lacked sophisticated features like the ability to scan medication labels, prescription tracking, and automated refill reminders.

User interface:

Although simple, Med Minder's user interface lacked some intuitiveness. This may make it difficult for certain users to use the app and plan their medication schedule.

Limited customization:

With Med Minder, only a small amount of customization was possible for medication schedules and reminders. Users had to follow a strict schedule and reminder system that wasn't always practical for them.

Compatibility:

Because of its incompatibility with all Android hardware and operating systems, Med Minder's reach and accessibility were limited.

Notwithstanding these issues, Med Minder was a ground-breaking Android application for tracking medications and pill reminders. It paved the way for more advanced OCR-based apps that offer a wider range of functions to help users better manage their medication schedules and adherence.

EXAMPLES:

For tracking medications and setting pill reminders, there are numerous Android apps already available. Pharmacists, doctors, and patients all gave the free Medisafe app their top rating.

For all medication needs, it includes a pill reminder and alarm, a drug-to-drug interaction checker, family and carer assistance via "Medfriend" capabilities, a medication tracker, refill reminders, a manager for scheduling medical appointments, and a calendar. Reminders and time settings can be changed, and Android Wear is supported by Medisafe. Another app is called RoundHealth, which enables users to set up notification alerts for vitamins, supplements, and both prescription and over-the-counter pharmaceuticals.

III. ANALYSIS:(HEADING 3)

By reading and extracting data from prescription leaflets, pill labels, and other relevant documents, OCR (Optical Character Recognition) technology can be used to evaluate pill leftovers and track medication usage.

OCR technology recognises characters by examining digital or scanned images of text and assessing their size, shape, and other visual characteristics. The data can then be analyzed and transformed into text that can be read by machines and used for more research and tracking.

OCR technology can be used to scan prescription bottle labels, medication instructions, and other associated documents in the context of pill leftovers and drug tracking to extract data like the pharmaceutical name, dosage, frequency of usage, and expiration date. With this data, a medication plan or reminder system can be developed to make sure patients are taking their medications as directed.

By comparing photos of pill bottles taken before and after use, OCR technology can be used to track the amount of medication still in the bottles. Then, using this data, patients or carers can be informed when a prescription needs to be filled or if a dose has been missed.

Overall, OCR technology provides a strong tool for tracking medicine usage and evaluating pill remnants, assisting patients and carers in making sure that prescriptions are taken as directed and lowering the possibility of missed doses of medication errors.

IV. PROPOSED SYSTEM(HEADING 4)

A computer programme that will accomplish a sizable amount of the functional criteria listed in an RFP is referred to as a "proposed system" in this context. It can also be used to describe significant new systems and components that are in the design and implementation stages. The process of replacement presents a chance to increase systems' capacities so they can benefit from new technical advancements or increase their value to management and the workforce. The term "proposed system" can also be used to describe a quick malware detection system that makes use of certificate serial numbers and other creator-related data.

Finally, it can refer to a hypothesized mechanism for human memory control that Atkinson and Shiffrin of Stanford University developed.

FUNCTIONALITIES USED:

The following elements could make up the suggested pill reminder and medication tracking system using OCR technology:

OCR technology:

The system would make use of OCR technology to extract information about medications, such as the medication name, dosage, frequency of use, and expiration date, from digital or scanned images of pill labels and prescription instructions.

Camera functionality:

The software will have a camera feature that users can use to take pictures of the labels on their prescription bottles or other papers. The information about the medication would then be retrieved from the image by the OCR technology.

Reminder feature:

Users of the app would be reminded to take their medications at the appropriate times by a feature on the app. The reminders may be set to sound at specific times during the day or in accordance with the user's medication schedule.

Medication tracking:

Users of the app can monitor their dosage by noting when they take their meds. This would provide healthcare practitioners with crucial information in addition to assisting in the confirmation that patients are taking their prescriptions as prescribed.

Refill alerts:

A refill alert system that tells users when their prescription needs to be refilled may also be included in the app.

Mobile app:

Customers of the system could download it to their Android mobile phones. The app allowed users to enter their prescription regimen and monitor their dosage.

In general, a system that combines OCR technology with a mobile app could offer a strong tool for medication tracking and pill reminders. The system may help to increase medication adherence and lower the risk of missed doses or medication errors by making it simpler for users to input their medication information and by offering practical reminders and tracking tools.

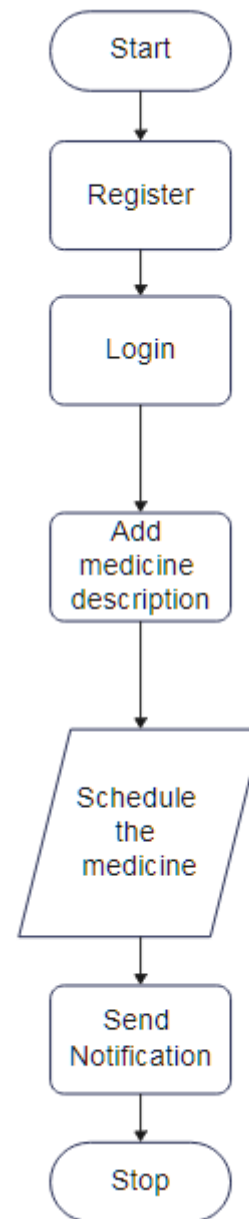
Med Minder, the first Android application for tracking medications and pill reminders, was developed in 2010. Users can use this app to track their drug intake and manage their medication schedule. Medication tracking, alerts for refills, and reminders for taking medications were all aspects of the app.

Users of Med Minder could input their medication schedule and set up reminders for when it was time to take their medications using a user-friendly interface. In order to be sure that they were taking their medication as directed, the app also allowed users to record when they had taken it.

Since OCR technology was not yet commonly used on mobile devices at the time, the app did not use it to automatically input drug information. Users have to manually enter information about their medications onto the programme.

Notwithstanding these drawbacks, Med Minder was a ground-breaking application that set the bar for tracking prescriptions and pill reminders on Android devices. Since its introduction, a tonne of other applications have been created that offer more sophisticated capabilities and utilize OCR technology to input pharmaceutical information automatically. However Med Minder still marks a significant turning point in the evolution of mobile health apps and is proof of the significance of medication adherence in the control of long-term health issues.

Architecture:



Parameters:

Prescription Parameter (PP) :

Medicine Identifier	M
Medicine Dose	g
Medicine Form	Capsule/Tablet/...
Medicine Amount	n
Therapy Duration	T

Dosage Parameter (DP) :

Min. & Max. Dose	[dmin, dmax]
Min. & Max. Separations	[nsmin, nsmax]
Max. Intake B over interval R	(B, R)
Min. Intake L over interval P	(L, P)

Interaction Parameter (IP):

Interferer Identifier	N
Min. separation from M to N	minToInterferer
Min. separation from N to M	minFrInterferer

Prescription parameter:

Prescription parameters are the key information of a medicine prescription. The following characteristics are normal, though they may vary depending on the medication and the healthcare provider administering it: Information on the patient, the drug's name, dosage, frequency, and duration, as well as any further instructions.

Dosage parameter:

The phrase "dosage parameter" describes the exact quantity of medication given to a patient, depending on their age, weight, health, and other personal variables. Given that taking a medication in excess or inadequately can have detrimental impacts on your health, any medicinal prescription must include the dosage.

The unit of measurement, amount, frequency, and duration are typically specified in the dosage parameter.

Interaction parameter:

When a patient takes several medications at once, there may be interactions that could happen. These interactions are referred to as interaction parameters. Drug-drug interactions, food-drug interactions, drug-disease interactions, higher risk of side effects, and a variety of other consequences on the patient's health, ranging from moderate to severe, might result from these interactions.

V. Optical Character Recognition(HEADING 5)

By optical character recognition, computers can interpret handwritten or printed text on pictures and documents (OCR). Before converting text into machine-readable text, OCR technology uses algorithms to analyse the character patterns in the text.

To make it easier to save, find, and access printed materials online, OCR can be used to digitise printed materials like books, newspapers, and magazines. OCR allows for the extraction of text from scanned documents, such as receipts or business cards, and the conversion of that material into editable or comprehensible digital text.

OCR technology is applicable to a number of sectors, including retail, banking, and healthcare. The healthcare industry can use OCR to translate prescriptions, medical records, and other documents related to healthcare into digital formats. Data can be extracted from invoices, receipts, and other financial documents using OCR, a technique utilised in the banking industry. OCR can be utilised in the retail industry to automate inventory management and tracking, as well as to gather information from consumer feedback forms.

OCR technology has come a long way, but there are still certain issues, particularly when trying to interpret handwritten writing or text on grainy or poorly contrasted photos. OCR requires intensive training and calibration to ensure accuracy, and mistakes can occur if the technology is not configured properly. OCR technology, however, is anticipated to improve in the future as artificial intelligence and machine learning continue to advance.

VI. Conclusion(HEADING 6)

The potential for OCR-based pill reminder and medication tracking apps to greatly improve patient outcomes and medication adherence is discussed above. This software provides reminders, dosage information, and drug tracking capabilities to assist patients in staying on top of their prescription schedule and avoiding missed doses or incorrect dosages. With the aid of OCR technology, the data

entry process can be automated, hence reducing the risk of human error.

It is very important to keep in mind that using this programme shouldn't be a substitute for professional medical advice or healthcare services. Always consult with a healthcare practitioner before starting or stopping any medication.

Also, they should inform them of any additional medications they may be taking, unresolved medical issues, and any allergies they may have.

OCR-enabled pill-reminder and medication-tracking apps could help people manage their prescription schedules and improve their overall health and wellbeing. As technology advances, we might expect further developments in both this app and the broader field of healthcare technology.

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