A PROJECT SYNOPSIS

On Medicine Reminder App

Submitted By

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Under the Guidance of

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Department of Computer Science and Engineering In

Data Science

Saraswati Education Society's

SARASWATI COLLEGE OF ENGINEERING

Kharghar, Navi Mumbai

(Affiliated to University of Mumbai)

Academic Year:-2022-23

Saraswati College of Engineering, Kharghar

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"To develop a core of eminency in Engineering Education and Research "

Mission

"To educate Students to become quality techno-crafts for taking up challenges in all facets of life "

Department of Computer Science and Engineering In Data Science

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"To be among renowned institution in Computer Science Engineering (CSE) education and research by developing globally competent graduates."

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CERTIFICATE

This is to certify that the requirements for the synopsis entitled,"Medicine Reminder App" have been successfully completed by the following students:

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In partial fulfillment of Sem –V **Bachelor of Engineering of Mumbai University, CSE-DS** of Saraswati College of Engineering, Kharghar during the academic year 2022-23.

Internal Guide

Prof. Shital Ajagekar

External Examiner

Project coordinator

Prof. Shital Ajagekar

Head of Department

Prof. Shraddha Subhedar

Program Educational Objectives (PEO)

1. To apply statistical data analysis and other data science techniques to effectively solve real-world problems.
2. To motivate & prepare students for lifelong learning and research to manifest global competitiveness.
3. To equip students with communication, team work and leadership skills to accept challenges in all facets of life ethically.

Program Outcomes (PO)

At the end of the program, a student will be able to:

1. Apply the knowledge of Mathematics, Science and Engineering Fundamentals to solve complex Data Science Problems.
2. Identify, formulate and analyze Data analysis Problems and derive conclusion using First Principle of Mathematics, Engineering Science and Computer Science.
3. Investigate Complex Data Science problems to find appropriate solution leading to valid conclusion.
4. Design a data science model, process to meet specified needs with appropriate attention to health and Safety Standards, Environmental and Societal Considerations.
5. Create, select and apply appropriate techniques, resources and advance Engineering software to analyze tools and design for Data Science Problems.
6. Understand the Impact of Data Science solution on society and environment for Sustainable development. 7. Understand Societal, health, Safety, cultural, Legal issues and Responsibilities relevant to Engineering Profession.
8. Apply Professional ethics, accountability and equity in Engineering Profession.
9. Work Effectively as a member and leader in multidisciplinary team for a common goal.
10. Communicate Effectively within a Profession and Society at large.
11. Appropriately incorporate principles of Management and Finance in one's own Work.
12. Identify educational needs and engage in lifelong learning in a Changing World of Technology.

Program Specific Objectives (PSO)

1. Identify, understand, formulate and analyse complex engineering problems in the field of Data Analysis, Big Data, Database Management, Predictive Analysis, Trends Identification and Identifying Business Insights.

2. Acquire, Store, Retrieve, Process and finally convert data into knowledge in the field of artificial intelligence, data mining, network management and security, and Internet of Things applications through use of secure, reliable and cost effective state of art Analysis tools efficiently

Lab Objectives:

Students will try to:

1. To acquaint with the process of identifying the needs and converting it into the problem.
2. To familiarize the process of solving the problem in a group.
3. To acquaint with the process of applying basic engineering fundamentals to attempt solutions to the problems.
4. To inculcate the process of self-learning and research.

Lab Outcomes:

Student will be able to:

1. Identify problems based on societal /research needs.
2. Apply Knowledge and skill to solve societal problems in a group.
3. Develop interpersonal skills to work as member of a group or leader.
4. Draw the proper inferences from available results through theoretical/ experimental/simulations.
5. Analyse the impact of solutions in societal and environmental context for sustainable development.
6. Use standard norms of engineering practices
7. Excel in written and oral communication.
8. Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.
9. Demonstrate project management principles during project work.

Acknowledgement

A project is something that could not have been materialized without cooperation of many people. This project shall be incomplete if I do not convey my heartfelt gratitude to those people from whom I have got considerable support and encouragement.

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Abstract

This is an Android-based application in which an automatic alarm ringing system is implemented. It focuses on doctor and patient interaction. Patients need not remember their medicine dosage timings as they can set an alarm on their dosage timings. The alarm can be set for multiple medicines and timings including date, time and medicine description. A notification will be sent to them through email or message inside the system preferably chosen by the patients. They can search doctor disease wise. The patients will get the contact details of doctors as per their availability. Also the users can see different articles related to medical fields and health care tips. The system focuses on easy navigation and good user interface. Many such Medical Reminder Systems have been developed where a new hardware is required but in our work we have made an attempt to develop a system which is economical, time-saving and supports medication adherence.

KEYWORDS

Automatic Alarm, Reminder System, Notification System, Medication Adherence, Medicine Scheduler

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Introduction

The category of patients involve all human beings-teachers, students, businessmen, housewives, children and also all of us have a busy hectic schedule. Today's life is full of responsibilities and stress. So people are prone to diseases of different types and it is our duty to make ourselves stay fit and healthy. If the patient stays at home then he or she might get someone to look after him/her but when one is not at home, is out of the city or state away from home then it is hard for the family members to call them and remind them their dosage timings every time.

In our developing and technology dependent life we totally rely on gadgets especially smart phones. Today everyone has a smart phone. With this we get an opportunity to use technology in a better way so that it can be made useful to us. And it plays an important part in our daily life and helps us staying fit in many ways

So we are introducing an Android application whose objective is to remind the patients of their dosage timings through Alarm Ringing system so that they can stay fit and healthy. Through navigation they can search doctors and hospitals and contact details so that they can easily get proper treatment on time. This application focusses on the people who forget to take medicines on time. It allows users to set an alarm along with the fields of date, time and medicine description which will allow them to set alarm for multiple medicines at different time intervals. The notification system will send a notification after setting an alarm. The user can activate or deactivate the notification accordingly. It will be sent as email or message as selected by the user. The patients can search doctor disease wise and area wise which will provide easy searching facility along with doctor's contact information, visiting place and availability time. Medication reminders help in decreasing medication dispensing errors and wrong dosages.

Literature Survey

Many Medication Systems have been developed based upon different platforms and concepts. Use of healthcare related apps is growing but there are many issues related to their functionality .*" My MediHealth* " in 2008 [1] is a medication reminder system for children. It runs on mobile devices such as smart phones, providing user interfaces for configuring medication schedules and user alerts for reminding users about the time and type of medication according to the configured medication schedule. Some systems use sensors, radio-frequency identification (RFID), or motion detection technologies to ensure that patients actually take their medications [2][3][4].*" Park et al"* in 2018 proposed medication reminder synchronization system based on data synchronization. It transmits OMA (open mobile alliance) DS (data synchronization) based messages containing the patient's medication data and the device configuration data to a remote manager/medical staff. It also synchronizes data (including medication schedules) modified/generated by these personnel in the medication server

Prasad B [5] has discussed the approach of Medicine reminder pro. It is a free application which supports up to 15 reminders. User can select them in either repeating or non-repeating alarm patterns. Any hourly time interval between alarms can be selected, starting from the minimum of 1 hour. At the scheduled time, application will produce a notification with an alarm, vibration or LED indication.

Zao et al have developed Wedjat in 2015 [6]. Smart Phone Application which tries to avoid medicine administration errors

There are many loopholes of existing reminder systems. To list a few:

They do not provide disease wise searching of the Doctors, no optional notification only compulsion, no facility for scheduling of appointments to the doctors. Some of the systems have a default alarm tone so the users cannot change them. The scheduled reminder suggests any kind of medicine, dose of medicine, etc. automatically without doctor's prescription, which can cause harm to the patients. Lastly, many of the systems available require special hardware which need to be purchased.

Problem Statement

The remarkable problem is that patients forget to take the proper medicines in proper proportion and in proper time. Medication adherence, which refers to the degree or extent to which a patient takes the right medication at the right time according to a doctor's prescription, has recently emerged as a serious issue because many studies have reported that non-adherence may critically affect the patient, thereby raising medical costs [1]. Medication nonadherence is a common, complex, and costly problem that contributes to poor treatment outcomes and consumes health care resources

The application is designed on Android Studio. It can be helpful in defence sector and emergency conditions (accidents) and can spread health care awareness. It is life-saving, money saving and time saving application which is easy to use and provides a good user interface.

Proposed System

The proposed system is based on Android Operating system which will remind the users to take medicines on time through notification and automatic alarm ringing system. Android is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers, developed by Google in conjunction with the Open Handset Alliance. Android was built from the ground-up to enable developers to create compelling mobile applications that take full advantage of all a handset has to offer. The system is specified on android operating system only because the market share of Android is high. [9] Android also comes with an application development framework (ADF), which provides an API for application development and includes services for building GUI applications, data access, and other component types. The framework is designed to simplify the reuse and integration of components. Android apps are built using a mandatory XML manifest file. The manifest file values are bound to the application at compile time. This file provides essential information to an Android platform for managing the life cycle of an application. Examples of the kinds of information included in a manifest file are descriptions of the app's components among other architectural and configuration properties. Components can be one of the following types: Activities, Services, Broadcast Receivers, and Content Providers

the patient login module. After login the patient will be able to view the list of all the registered doctors with their names , contact information , phone numbers , hospital/clinic address , the availability of doctor accordingly and all other information which the Doctor registers at the time of Signing into the system. They can see the dropdown view of the diseases and can directly navigate to the list of Doctors. It also shows the next appointment with the Doctor. This helps the patients to find the Doctors disease wise. The services help them to understand the system properly so that it becomes useful and productive. Medication reminders help in decreasing medication dispensing errors and wrong dosages. The Reminder system consists of two parts –setting Alarm and getting notification.

Set Alarm module- It helps in reminding about the medicines. User can add details of his dosage schedules. Using the date field one can enter the starting and ending dates between which he has to take medicines. The time field shows the time of dosage and on that time the alarm will get rung. The user can add the description of the medicine, including name, purpose and other related description. All the information will be saved in the database. This makes any time availability of the patients' records. They can change the ringtone of the alarm from the ringtones stored in the devices.

Algorithm

Step 1: - Start

Step 2: - Open Home Activity If User Click On Widget Then Open Widget

Else Return Home Activity

If User Click on Add activity Then Add Description Open

Else Return Home activity

Step 3: - If User add Reminder then Datastore in Database and Home Activity receive fragment

Else Return Add Description

Step 4: - If the Time is Correct Then Notify Else Wait

Step 5: - If Notify Then Medicine Is Taken else Datastore In Data database

Step 6: - If Medicine Is Taken Then Receive A Dialog box else Task Pending

Step 7: - If Dialog Box Receive then History will clear And Go To Home Activity

Else Task Pending

Step 8: - Exit

Flowchart

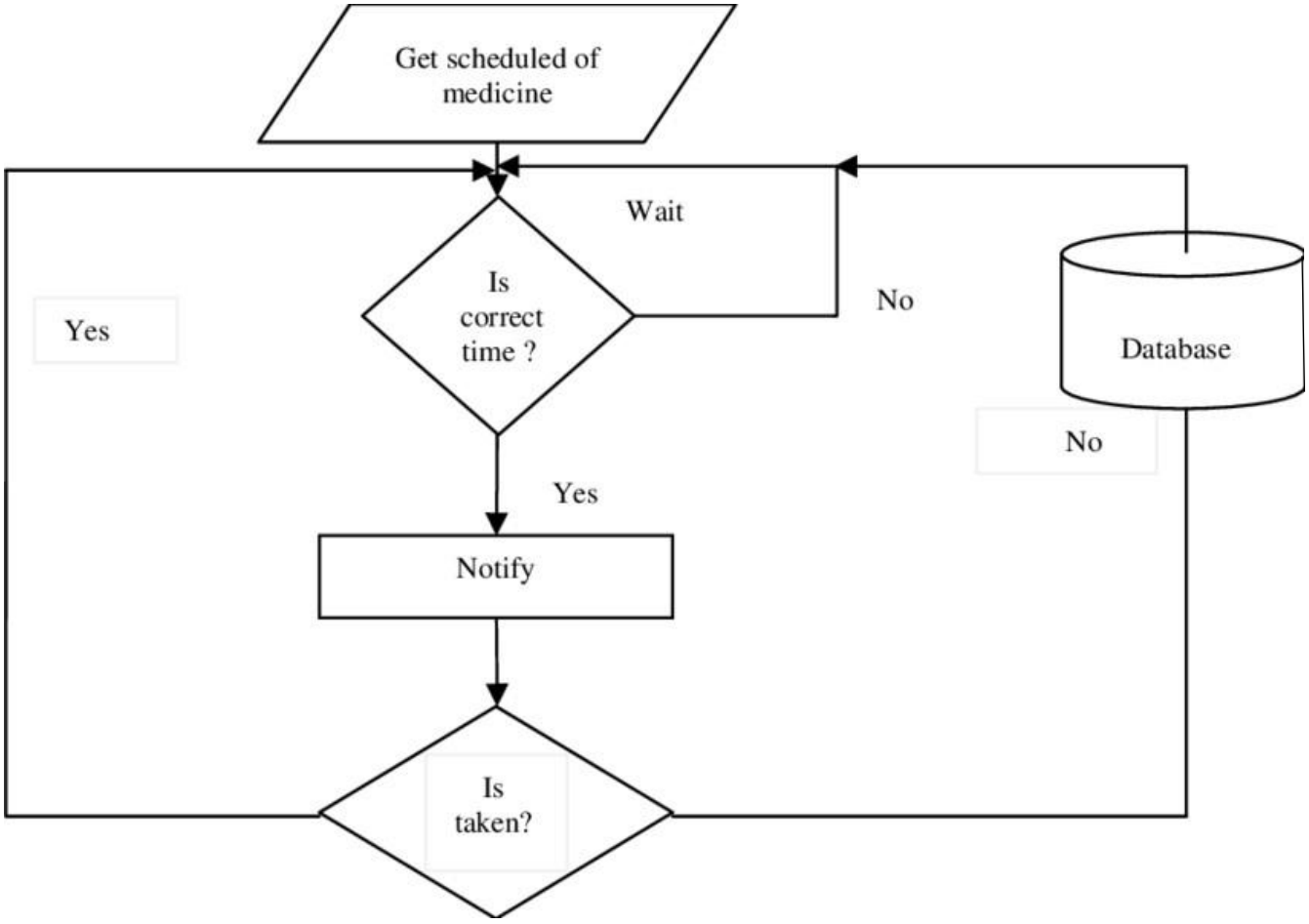

Fig 4.2 Flowchart of Medicine Reminder App

Code

1) Main Activity

```
package com.pratik.medicinereminder.activity;

import android.content.ComponentName;
import android.content.pm.PackageManager;
import android.os.AsyncTask; import
android.os.Bundle; import
android.view.View; import
android.view.WindowManager; import
android.widget.ImageView;
import android.widget.TextView;

import androidx.recyclerview.widget.LinearLayoutManager; import
androidx.recyclerview.widget.RecyclerView;

import com.bumptech.glide.Glide; import
com.pratik.medicinereminder.R;
import com.pratik.medicinereminder.adapter.TaskAdapter; import
com.pratik.medicinereminder.bottomSheetFragment.CreateTaskBottomSheetFragment; import
com.pratik.medicinereminder.bottomSheetFragment.ShowCalendarViewBottomSheet; import
com.pratik.medicinereminder.broadcastReceiver.AlarmBroadcastReceiver; import
com.pratik.medicinereminder.database.DatabaseClient; import
com.pratik.medicinereminder.model.Task;

import java.util.ArrayList; import
java.util.List;

import butterknife.BindView;
import butterknife.ButterKnife;

public class MainActivity extends BaseActivity implements
CreateTaskBottomSheetFragment.setRefreshListener {

    @BindView(R.id.taskRecycler)
    RecyclerView taskRecycler;
    @BindView(R.id.addTask)
    TextView addTask;
    TaskAdapter taskAdapter;
    List<Task> tasks = new ArrayList<>();
```

```
    @BindView(R.id.noDataImage)
    ImageView noDataImage;
    @BindView(R.id.calendar)
    ImageView calendar;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);         setContentView(R.layout.activity_main);
        ButterKnife.bind(this);
setUpAdapter();
        getWindow().addFlags(WindowManager.LayoutParams.FLAG_KEEP_SCREEN_ON);
        ComponentName receiver = new ComponentName(this, AlarmBroadcastReceiver.class);
        PackageManager pm = getPackageManager();
        pm.setComponentEnabledSetting(receiver,
PackageManager.COMPONENT_ENABLED_STATE_ENABLED,
PackageManager.DONT_KILL_APP);
        Glide.with(getApplicationContext()).load(R.drawable.first_note).into(noDataImage);

        addTask.setOnClickListener(view -> {
            CreateTaskBottomSheetFragment createTaskBottomSheetFragment = new
CreateTaskBottomSheetFragment();
            createTaskBottomSheetFragment.setTaskId(0, false, this, MainActivity.this);
createTaskBottomSheetFragment.show(getSupportFragmentManager(),
createTaskBottomSheetFragment.getTag());
        });

        getSavedTasks();

        calendar.setOnClickListener(view -> {
            ShowCalendarViewBottomSheet showCalendarViewBottomSheet = new
ShowCalendarViewBottomSheet();
            showCalendarViewBottomSheet.show(getSupportFragmentManager(),
showCalendarViewBottomSheet.getTag());
        });
    }

    public void setUpAdapter() {
        taskAdapter = new TaskAdapter(this, tasks, this);
        taskRecycler.setLayoutManager(new LinearLayoutManager(getApplicationContext()));
taskRecycler.setAdapter(taskAdapter);
    }
```

```
   private void getSavedTasks() {

      class GetSavedTasks extends AsyncTask<Void, Void, List<Task>> {
         @Override
         protected List<Task> doInBackground(Void... voids) {
tasks = DatabaseClient
                  .getInstance(getApplicationContext())
                  .getAppDatabase()
                  .dataBaseAction()
.getAllTasksList();              return
tasks;
         }

         @Override
         protected void onPostExecute(List<Task> tasks) {
            super.onPostExecute(tasks);
            noDataImage.setVisibility(tasks.isEmpty() ? View.VISIBLE : View.GONE);
setUpAdapter();
         }
      }

      GetSavedTasks savedTasks = new GetSavedTasks();
savedTasks.execute();
   }

   @Override    public
void refresh() {
      getSavedTasks();
   }
}
```

2) Main Activity Layout

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"     android:paddingRight="20dp"
android:orientation="vertical"
android:background="@color/colorPrimary"     android:paddingLeft="20dp"
tools:context=".activity.MainActivity">

   <FrameLayout
android:layout_width="match_parent"
android:layout_height="wrap_content">

      <LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:orientation="vertical">

  <TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Medicine"
```

```
android:layout_marginTop="20dp"
android:textColor="@color/colorAccent"
android:textSize="18sp"/>

  <TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Reminder"
fontPath="fonts/nunito_extra_bold.ttf"
android:textStyle="bold"
android:textColor="@color/colorAccent"
android:textSize="28sp"
tools:ignore="MissingPrefix" />

      </LinearLayout>

      <ImageView
android:layout_width="30dp"
android:layout_height="30dp"
android:layout_gravity="right|center"
android:background="@drawable/calendar"
android:id="@+id/calendar"/>

   </FrameLayout>
```

```
    <LinearLayout
android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_marginTop="20dp"
android:orientation="vertical">

        <FrameLayout
android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_weight="1">

            <ImageView
android:layout_width="300dp"
android:layout_height="300dp"
android:id="@+id/noDataImage"
android:layout_gravity="center"/>

    <androidx.recyclerview.widget.RecyclerView
android:layout_width="match_parent"
android:layout_height="match_parent"
android:id="@+id/taskRecycler"/>

        </FrameLayout>

   <TextView        android:layout_width="wrap_content"
android:layout_height="70dp"        android:text="Add
```

```
Reminder"        android:drawablePadding="10dp"
android:paddingTop="10dp"
android:id="@+id/addTask"
android:layout_gravity="center"
android:textColor="@color/colorAccent"
android:textSize="20sp"
android:drawableLeft="@drawable/ic_add_black_24dp"
android:textAlignment="center"
android:layout_weight="0.5"
android:layout_marginBottom="20dp"/>

    </LinearLayout>

</LinearLayout>
```

Result

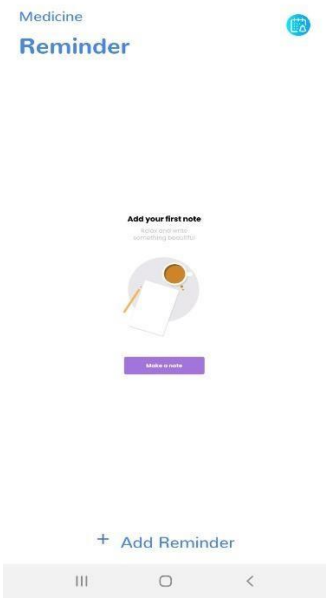

Fig 6.1 Home Screen

Fig 6.1 When Use Will Open Medicine Reminder Application User will get to view this Home Screen , Here user can see the gif image and add reminder button as well as calendar widget on Top of Right Side

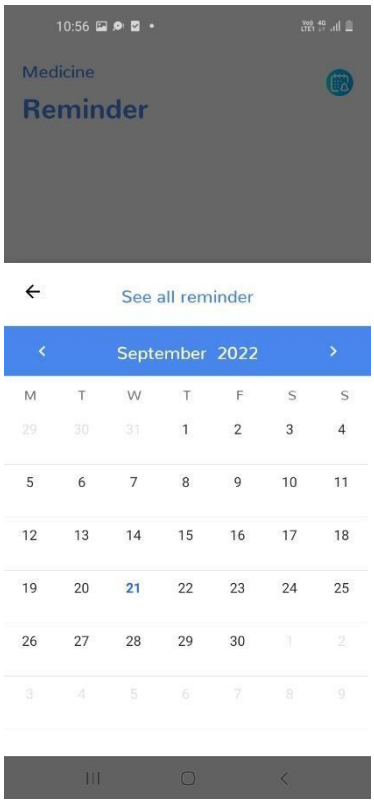

Fig 6.2 Calendar widget

In Fig 6.2 When User Click on Calendar Icon user will Get Calendar Widget From Here User Can Pick Date And Track The Record

Fig 6.3 Add Reminder Screen

In Fig 6.3 When User Click on Add a Reminder Button User Will Receive Textbox Here User Need To Fill The Required Information To Set a Reminder

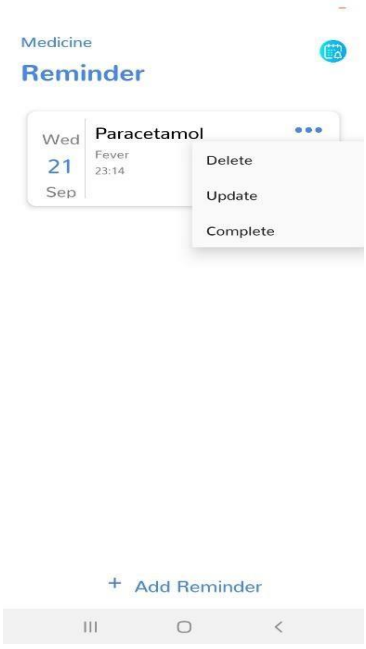

Fig 6.4 Menu Screen

In Fig 6.4 Here User can see Delete Update and Complete Options When user will click on any one Of the option the operation will be perform

Fig 6.5 Reminder Screen

In Fig 6.5 When The User Enter Details and Time Get Match Then Our app will Show Reminder With Vibration And Some Music Sound

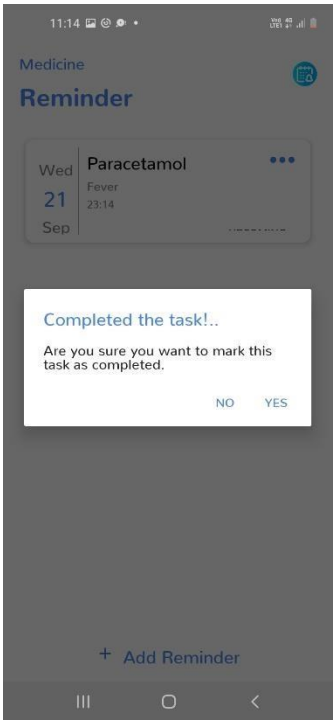

Fig 6.6 Complete Option

When User Has Already the Medicine Due to Warning Bell then user have the option to Mark The Task As Complete And Cancel reminder In Fig 6.6

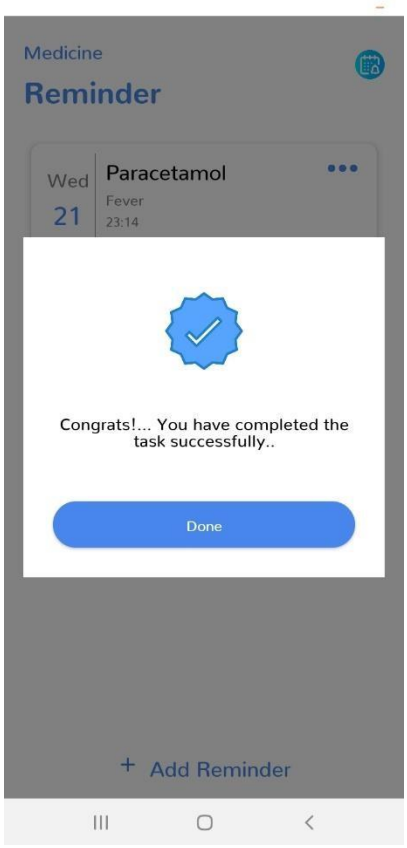

Fig 6.7 Dialog Box Screen

In Fig 6.7 When User will click on complete option from menu then User Will Receive The Dialog box Fragment Which Shows The message of Congratulation

Conclusion

Many Medication Reminder Systems have been developed on different platforms. Many of these systems require special hardware devices to remind the patients about the medicine in-take timings. Purchasing new hardware devices becomes costly and more time and money consuming. So in the given work an attempt has been made to implement a system which is economical, easily accessible and improves medication adherence.

Medication non-adherence reduces the effectiveness of a treatment and imposes a financial burden on health care systems The patients will get the schedule of medicine in-take time with medicine description, starting and ending date of medicine, notification through message or email, automatic alarm ringing system and navigation system. The scheduled reminder will not suggest any kind of medicine which is not prescribed by the doctor that will assure the safety of the patient and also will avoid wrong dosages. The patients can also search doctors disease wise (depending upon the specialization of the doctor), which provides easy searching facility to the users and saves the time.

Doctors can view all the fixed appointments along with date and time, which he fixed and through this he can make new appointment schedules. We plan to focus on improving the overall performance of the system. Also, interaction between patients and doctors through video calling and secure prescription will be focused upon. Some more ways to achieve medication adherence will be focused

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