

CHAPTER. 1

INTRODUCTION

1.1 NOOTIFICATION READER BOT

The goal of Notification reader bot is to read the incoming notification on the form the other sources, or push action performed by the default phones app. It accesses all the apps by default or can be manually changed, to access the particular apps for reading the notification. Selecting the apps make it accessible to link through the “Google-text-to-speech” that enables it to convert the text incoming notification to a voice notification.

Tap the **Voice notifications** switch to toggle it On or Off. Turning this feature on allows your phone to announce incoming call and message events automatically. Tap **Voice notifications** to access its settings including checkboxes for call readout, message sender readout, and message content readout, as well as text-to-speech output settings Notification Reader Bot (NORAB) does pretty much what the app name says it does. It reads out your notifications for you so you don’t have to read them yourself and it comes with some extra features. Which majorly helps visually challenged people. Some of the customization features include the ability to set it so that the app name is announced with reading the whole notification, adding prefixes to various things, disable messages from unknown numbers, enable announcements only when headphones are plugged in, and the option to repeat announcements if need be.

1.2 TYPES OF NOTIFICATION TO BE READED

- 1.Social media notification.
- 2.Mail notification.
- 3.Calls alert notification

1.Social media notification:

The Social media notification includes the daily day to day used social chatting apps, messaging apps. Such as the user receives the message from the sender the name of sender the name of the application as well as the content of the message is spoken aloud along with services provided by the NORAB app. It covers not just texts but also incoming call details and other notifications from the likes of Hangouts, WhatsApp, and Telegram

2.Mail notification:

As the services are enabled of the NORAB, when the mails are received the Reads the name of the Sender the, as the sender of the mail is authorized user of the mail. He or she has provided a valid detail for his account according to that he or she may be provided a unique id according to that unique id the app speaks the notification sender name and the content of the mail.

3.Calls alert notification:

When a call is received on the device if the phone is silent and app is accessing the media volume then it speaks the caller name and says theirs a incoming call the caller. It speaks aloud the caller name.

CHAPTER 2.

Requirements Analysis

2.1 Requirements Analysis

In system engineering and software engineering, requirement analysis encompasses those task that go into determining the need or condition to meet for a new or altered product or project, taking account of the possibly conflicting requirement of the various stakeholders, analyzing, documenting, validating, and managing software or system requirements.

Requirement analysis is critical to the success or failure of a system or software project. The requirements should be documented, actionable, measurable, testable, traceable related to identify business need or opportunities, and defined to a level of a detail sufficient for System design.

1.3.1 Technologies used.

- Android
- Java
- XML
- SQL-Lite

1.4 Software Specifications

1.4.1 Android Studio

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, MAC-OS and Linux based operating systems. It is a replacement for the Eclipse Android Development Tools (ADT) as the primary IDE for native Android application development.

1.4.2 SQL-Lite

SQLite is a relational database management system contained in a C programming library. In contrast to many other database management systems, SQLite is not a client–server database engine. Rather, it is embedded into the end program

SQLite stores the entire database (definitions, tables, indices, and the data itself) as a single cross-platform file on a host machine. It implements this simple design by locking the

entire database file during writing. SQLite read operations can be multitasked, though writes can only be performed sequentially.

2.3. Hardware Specifications

2.3.1 Android Phone (API 21+)

Any Android Phone with version 5.1 Lollipop (API 21+) would be required to test or deploy the application as API 21 is the minimum targeted API of the application. Android is an Operating System Designed for mobile devices managed and supported by the Google Inc.

2.3.2 Development Workstation

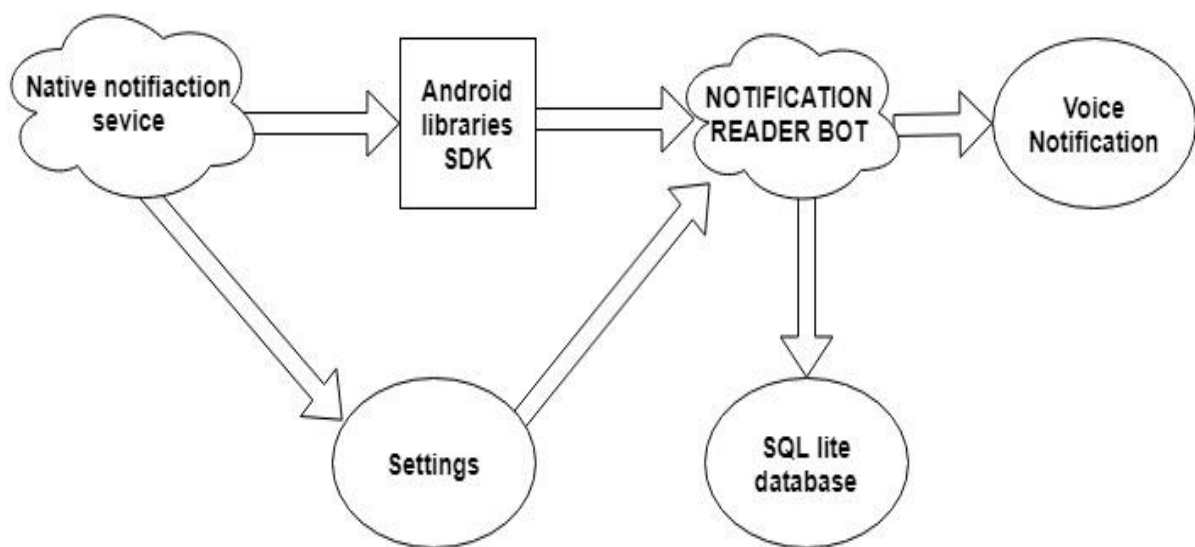
A workstation supporting all the above software is needed for the development of this project. Minimum requirements would be: Intel i3, 8GB Ram, 50 GB Storage, 2mb up and down DSL or Broadband Connection (For Android Studio Updates and downloading dependencies).

CHAPTER. 3

System Design

3.1 System Design Structure

The system to be designed consists of the above shown sections/modules.



System Working Diagram

Fig.3.1 Diagram of System Design

3.2 Propose System Explanation: -

The System Design is divided into various sections. The System Design helps us clearly understand the structure or model of the software that is to be developed.

The. Social media notification: The Social media notification includes the daily day to day used social chatting apps, messaging apps. Such as the user receives the message from the sender the name of sender the name of the application as well as the content of the message is spoken aloud along with services provided by the NORAB app. It covers not just texts but also incoming call details and other notifications from the likes of Hangouts, WhatsApp, and Telegram

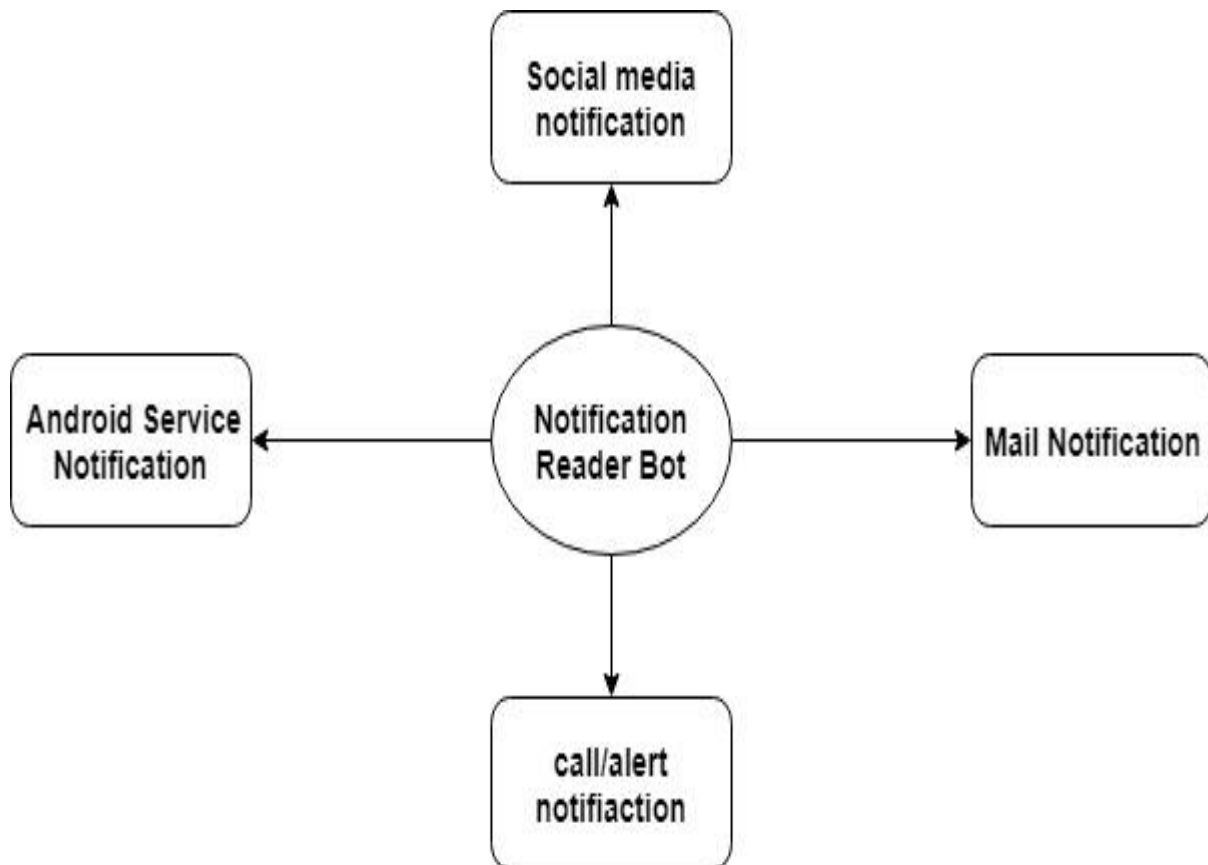
The Mail notification: As the services are enabled of the NORAB, when the mails are received the Reads the name of the Sender the, as the sender of the mail is authorized user of the mail. He or she has provided a valid detail for his account according to that he or she may be provided a unique id according to that unique id the app speaks the notification sender name and the content of the mail.

The Calls alert notification: When a call is received on the device if the phone is silent and app is accessing the media volume then it speaks the caller name and says theirs a incoming call the caller. It speaks aloud the caller name.

CHAPTER 4

System Architecture Design

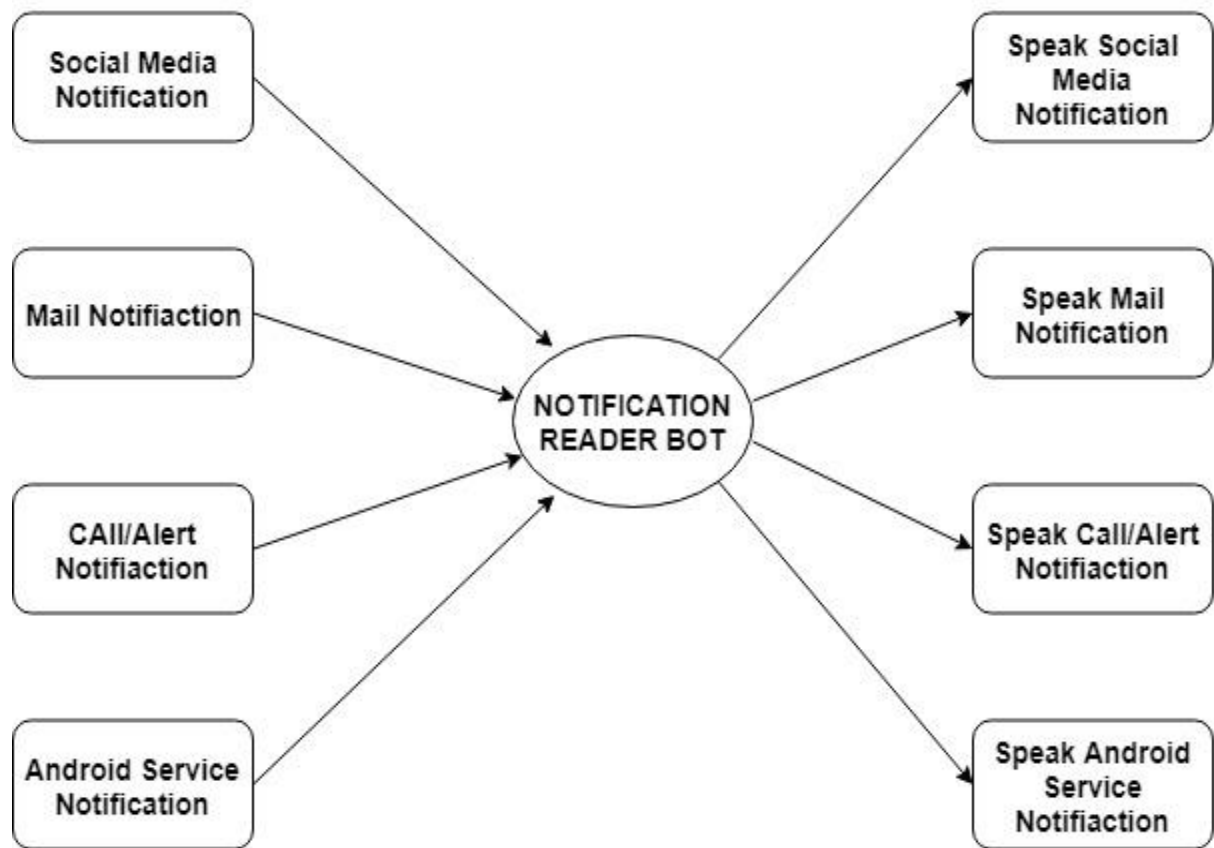
4.1. Data Flow Diagrams



Text

Fig.4.1.1.DFD level 0

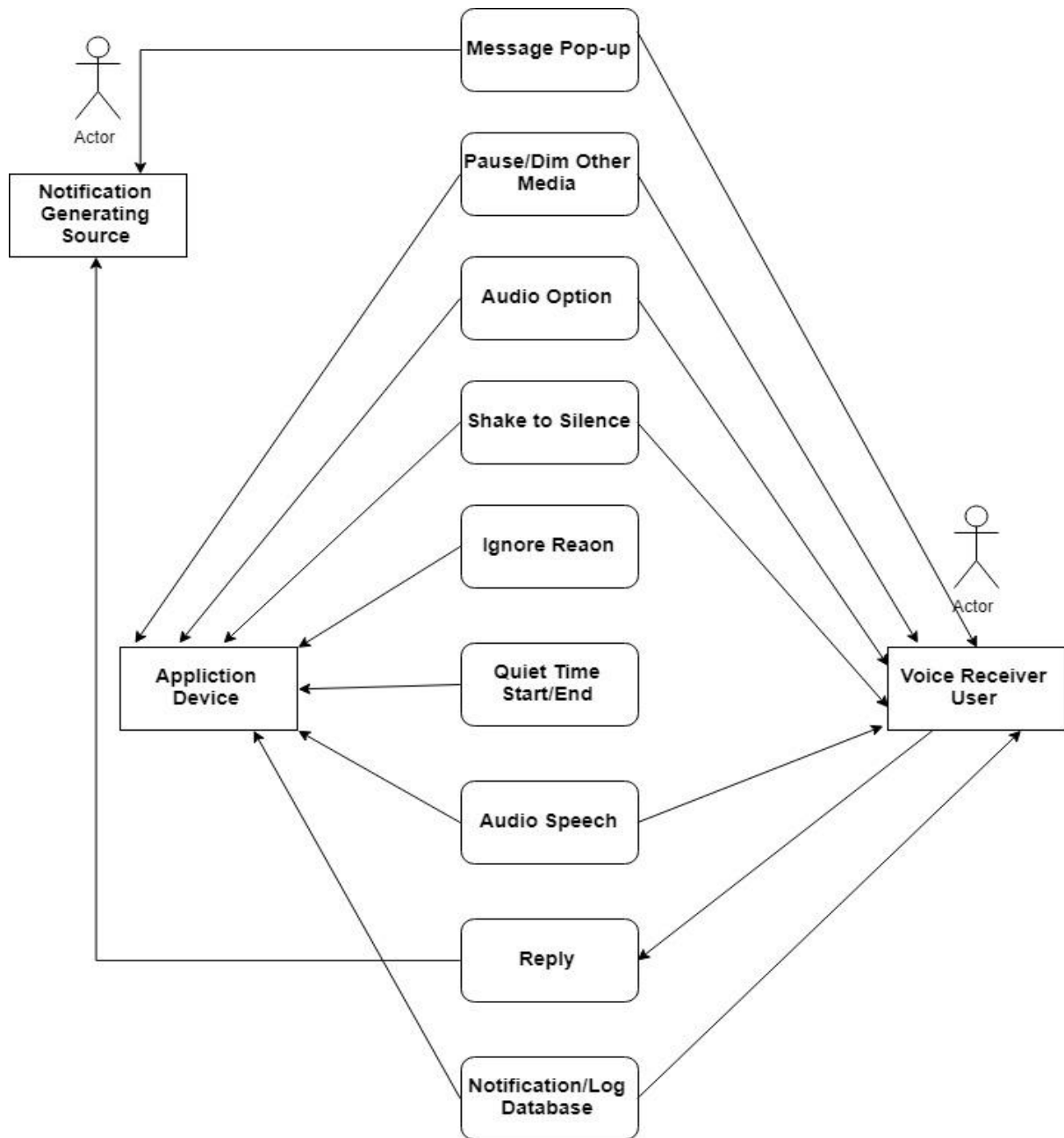
3.2.2 Data Flow Diagram Level 1



Text

Fig.4.1.2.DFD level 1

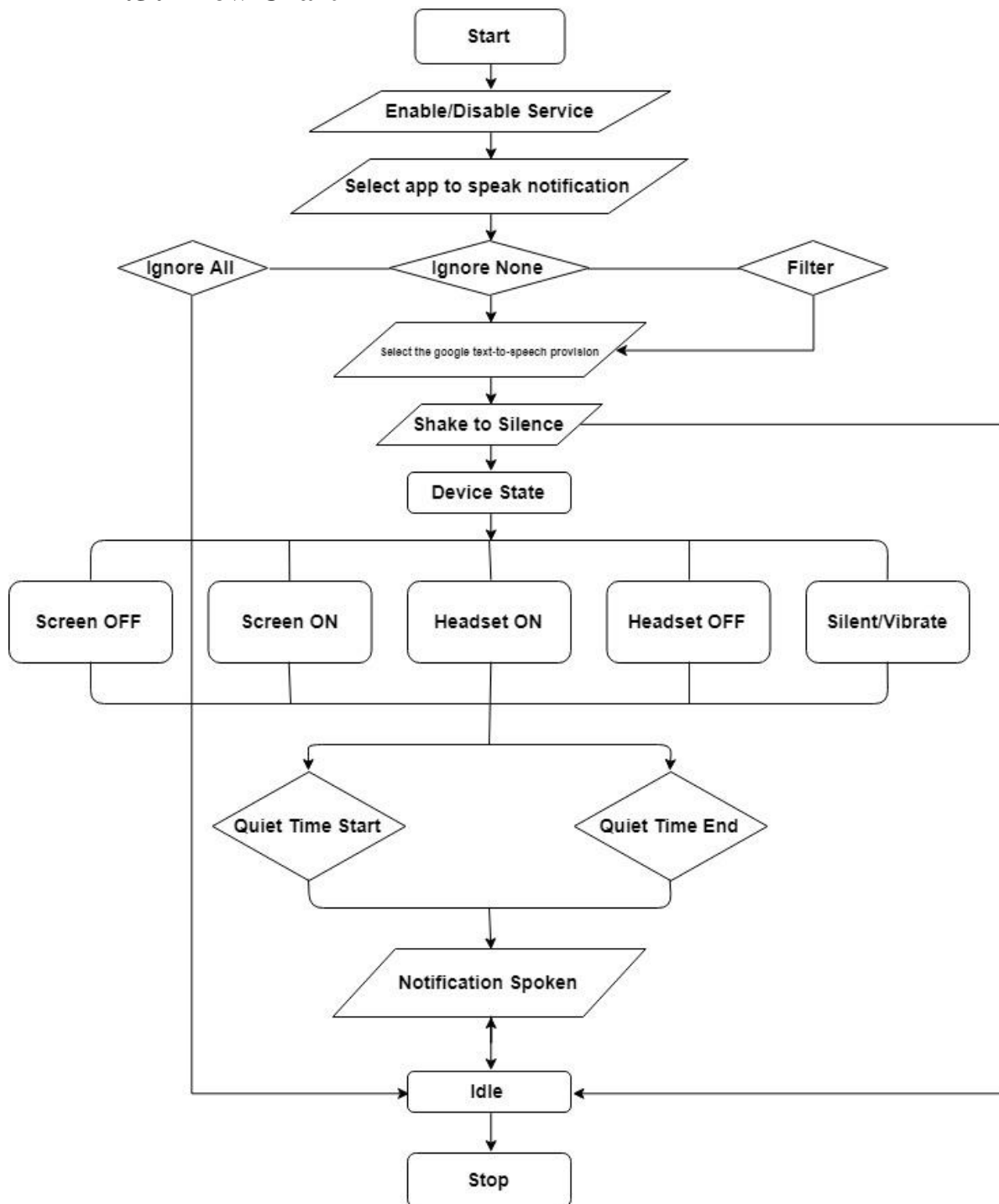
4.2. Use Case Diagrams



USE CASE DIAGRAM

Fig.4.1.3 Use Case Diagram

4.3. Flow Chart



Flowchart

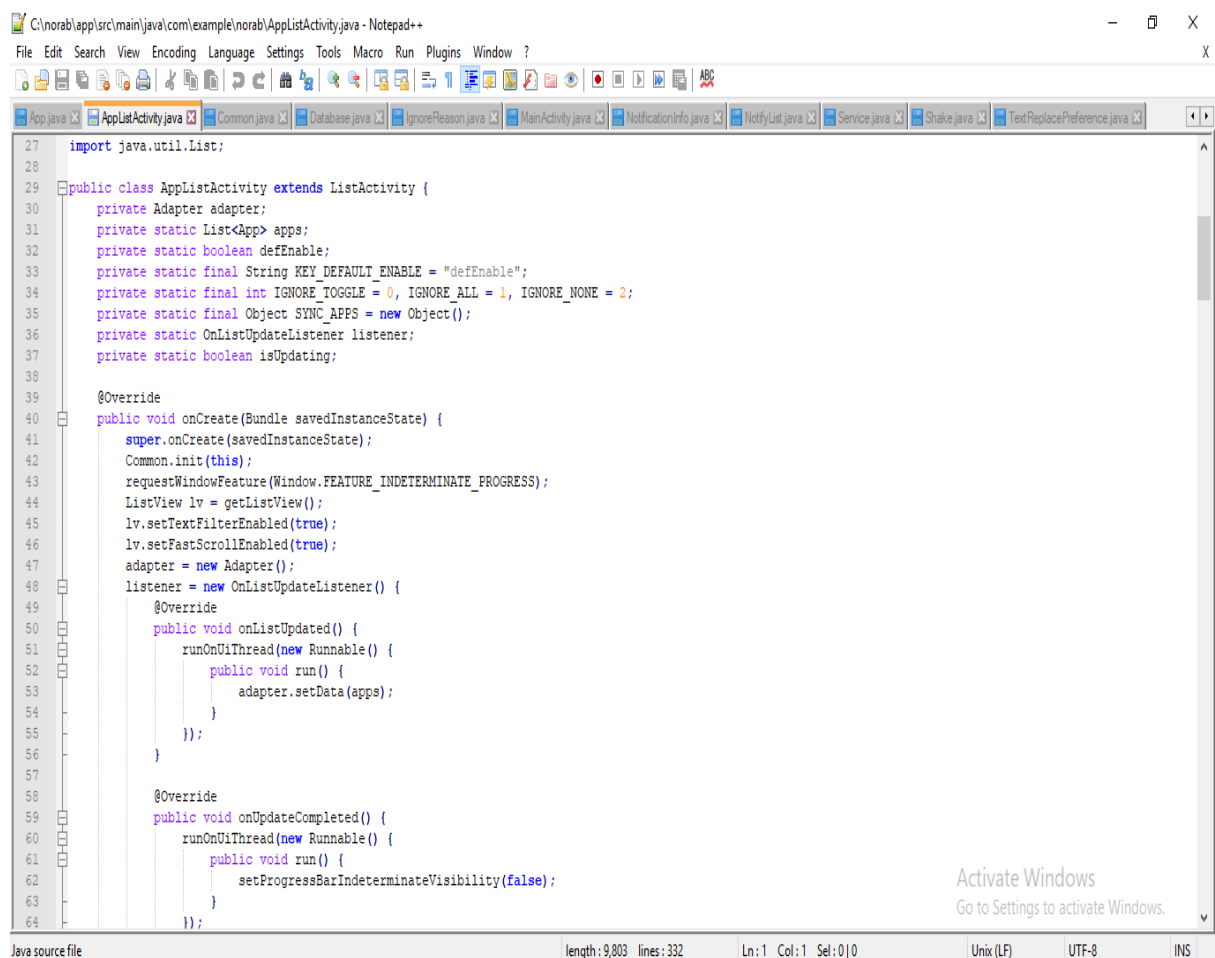
Fig.4.3 Flow Chart

CHAPTER. 5

Implementation

5.1 AppList Module:

Here user can select/deselect the apps for the which they want the notification to be spoken or not or for the purpose of the notification for the selected app there are the following choices Ignore all, Ignore None or Filter.

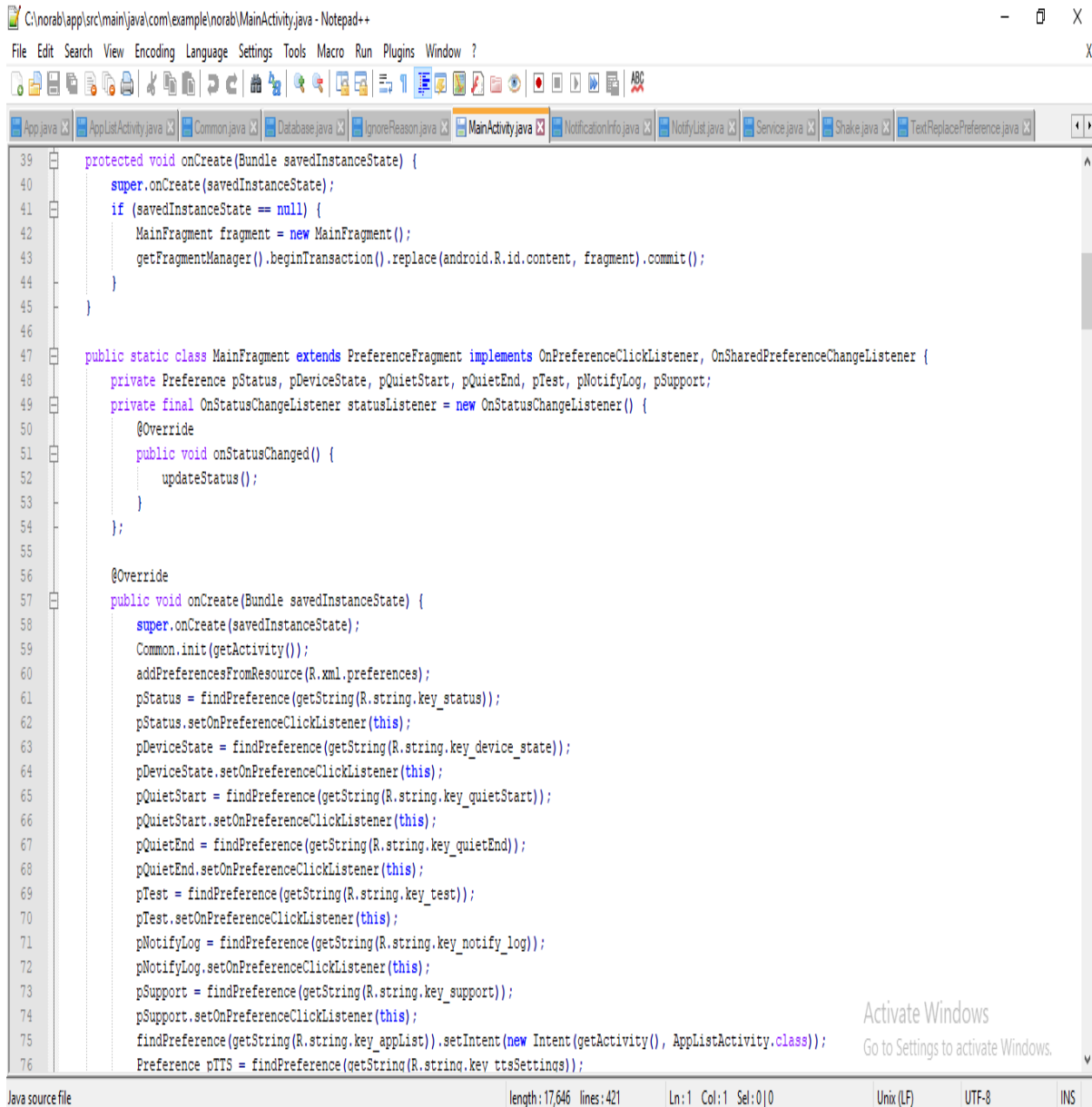


```
27 import java.util.List;
28
29 public class AppListActivity extends ListActivity {
30     private Adapter adapter;
31     private static List<App> apps;
32     private static boolean defEnable;
33     private static final String KEY_DEFAULT_ENABLE = "defEnable";
34     private static final int IGNORE_TOGGLE = 0, IGNORE_ALL = 1, IGNORE_NONE = 2;
35     private static final Object SYNC_APPS = new Object();
36     private static OnListUpdateListener listener;
37     private static boolean isUpdating;
38
39     @Override
40     public void onCreate(Bundle savedInstanceState) {
41         super.onCreate(savedInstanceState);
42         Common.init(this);
43         requestWindowFeature(Window.FEATURE_INDETERMINATE_PROGRESS);
44         ListView lv = getListView();
45         lv.setTextFilterEnabled(true);
46         lv.setFastScrollEnabled(true);
47         adapter = new Adapter();
48         listener = new OnListUpdateListener() {
49             @Override
50             public void onListUpdated() {
51                 runOnUiThread(new Runnable() {
52                     public void run() {
53                         adapter.setData(apps);
54                     }
55                 });
56             }
57
58             @Override
59             public void onUpdateCompleted() {
60                 runOnUiThread(new Runnable() {
61                     public void run() {
62                         setProgressBarIndeterminateVisibility(false);
63                     }
64                 });
65             }
66         };
67     }
68 }
```

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5.2 Main Module:

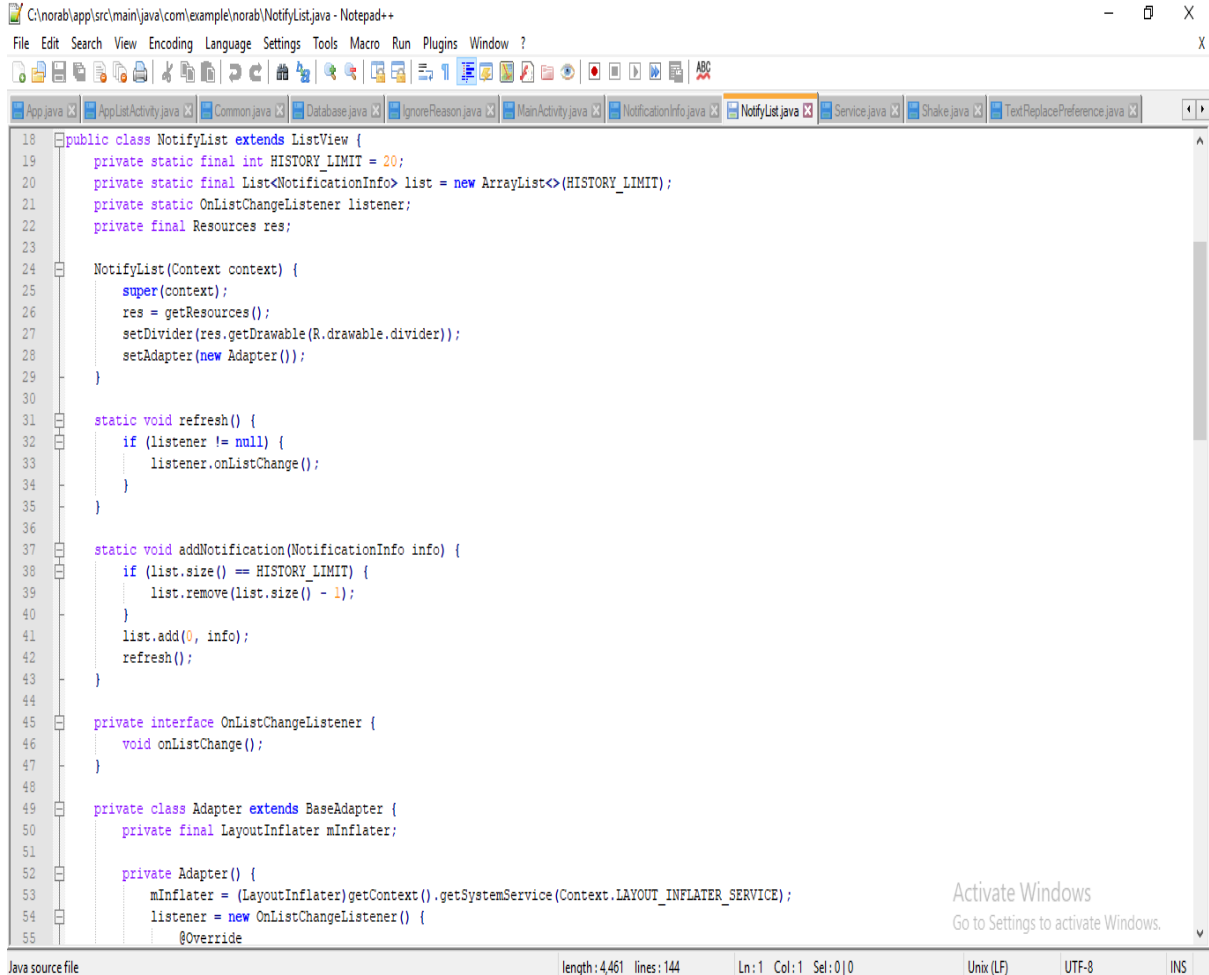
This module is used to show all application which is available in the users mobile. Its allows the users to make allow all the necessary criteria to satisfy and provide conditions and methods references to be easily accessible



```
39 protected void onCreate(Bundle savedInstanceState) {
40     super.onCreate(savedInstanceState);
41     if (savedInstanceState == null) {
42         MainFragment fragment = new MainFragment();
43         getFragmentManager().beginTransaction().replace(android.R.id.content, fragment).commit();
44     }
45 }
46
47 public static class MainFragment extends PreferenceFragment implements OnPreferenceClickListener, OnSharedPreferencesChangeListener {
48     private Preference pStatus, pDeviceState, pQuietStart, pQuietEnd, pTest, pNotifyLog, pSupport;
49     private final OnStatusChangeListener statusListener = new OnStatusChangeListener() {
50         @Override
51         public void onStatusChanged() {
52             updateStatus();
53         }
54     };
55
56     @Override
57     public void onCreate(Bundle savedInstanceState) {
58         super.onCreate(savedInstanceState);
59         Common.init(getActivity());
60         addPreferencesFromResource(R.xml.preferences);
61         pStatus = findPreference(getString(R.string.key_status));
62         pStatus.setOnPreferenceClickListener(this);
63         pDeviceState = findPreference(getString(R.string.key_device_state));
64         pDeviceState.setOnPreferenceClickListener(this);
65         pQuietStart = findPreference(getString(R.string.key_quietStart));
66         pQuietStart.setOnPreferenceClickListener(this);
67         pQuietEnd = findPreference(getString(R.string.key_quietEnd));
68         pQuietEnd.setOnPreferenceClickListener(this);
69         pTest = findPreference(getString(R.string.key_test));
70         pTest.setOnPreferenceClickListener(this);
71         pNotifyLog = findPreference(getString(R.string.key_notify_log));
72         pNotifyLog.setOnPreferenceClickListener(this);
73         pSupport = findPreference(getString(R.string.key_support));
74         pSupport.setOnPreferenceClickListener(this);
75         findPreference(getString(R.string.key_appList)).setIntent(new Intent(getActivity(), AppListActivity.class));
76         Preference pTTS = findPreference(getString(R.string.key ttsSettings));
```

5.3 Notify List Module:

This module will provide all list of notification that is readed by the(NORAB). There



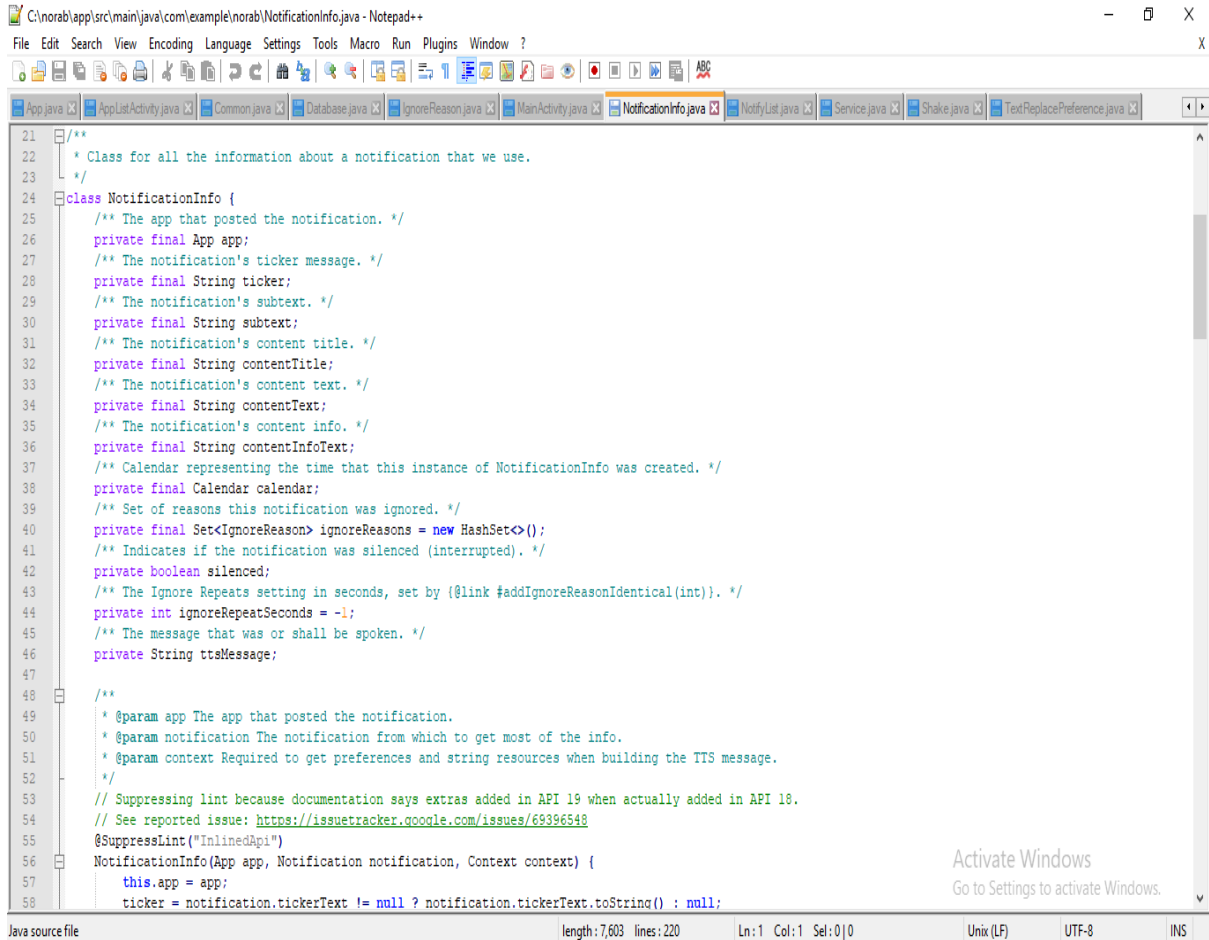
```
18 public class NotifyList extends ListView {
19     private static final int HISTORY_LIMIT = 20;
20     private static final List<NotificationInfo> list = new ArrayList<>(HISTORY_LIMIT);
21     private static OnListChangeListener listener;
22     private final Resources res;
23
24     NotifyList(Context context) {
25         super(context);
26         res = getResources();
27         setDivider(res.getDrawable(R.drawable.divider));
28         setAdapter(new Adapter());
29     }
30
31     static void refresh() {
32         if (listener != null) {
33             listener.onListChange();
34         }
35     }
36
37     static void addNotification(NotificationInfo info) {
38         if (list.size() == HISTORY_LIMIT) {
39             list.remove(list.size() - 1);
40         }
41         list.add(0, info);
42         refresh();
43     }
44
45     private interface OnListChangeListener {
46         void onListChange();
47     }
48
49     private class Adapter extends BaseAdapter {
50         private final LayoutInflater mInflater;
51
52         private Adapter() {
53             mInflater = (LayoutInflater)getContext().getSystemService(Context.LAYOUT_INFLATER_SERVICE);
54             listener = new OnListChangeListener() {
55                 @Override
```

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Go to Settings to activate Windows.

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5.4 Apps Notification Info Module:

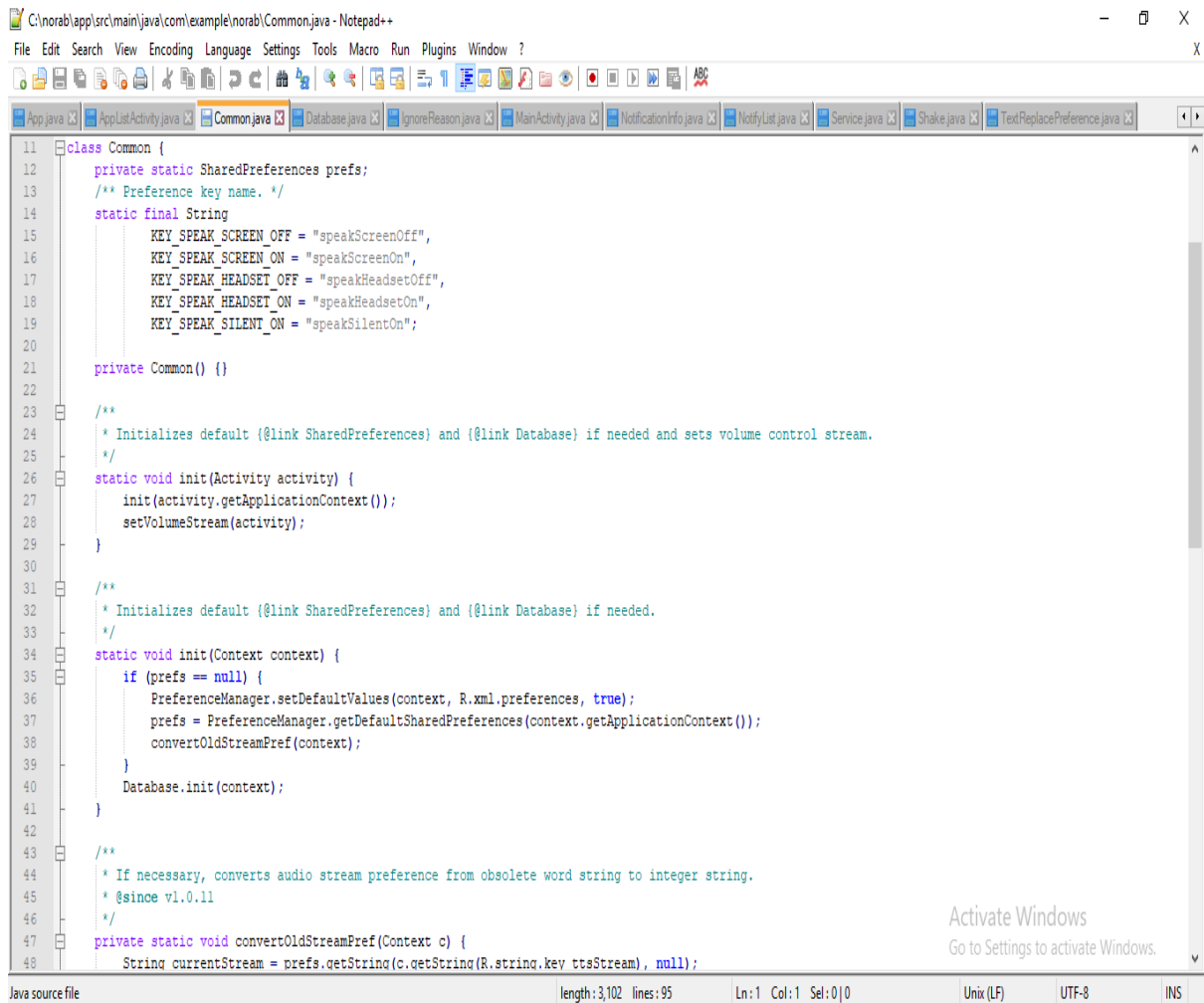
This module provides the content of the notification and the huge Description of the message received by the user on his device or the default action action performed by the android device



```
21 /**
22  * Class for all the information about a notification that we use.
23  */
24 class NotificationInfo {
25     /** The app that posted the notification. */
26     private final App app;
27     /** The notification's ticker message. */
28     private final String ticker;
29     /** The notification's subtext. */
30     private final String subtext;
31     /** The notification's content title. */
32     private final String contentTitle;
33     /** The notification's content text. */
34     private final String contentText;
35     /** The notification's content info. */
36     private final String contentInfoText;
37     /** Calendar representing the time that this instance of NotificationInfo was created. */
38     private final Calendar calendar;
39     /** Set of reasons this notification was ignored. */
40     private final Set<IgnoreReason> ignoreReasons = new HashSet<>();
41     /** Indicates if the notification was silenced (interrupted). */
42     private boolean silenced;
43     /** The Ignore Repeats setting in seconds, set by {@link #addIgnoreReasonIdentical(int)}. */
44     private int ignoreRepeatSeconds = -1;
45     /** The message that was or shall be spoken. */
46     private String ttsMessage;
47
48     /**
49      * @param app The app that posted the notification.
50      * @param notification The notification from which to get most of the info.
51      * @param context Required to get preferences and string resources when building the TTS message.
52      */
53     // Suppressing lint because documentation says extras added in API 19 when actually added in API 18.
54     // See reported issue: https://issuetracker.google.com/issues/69396548
55     @SuppressWarnings("InlinedApi")
56     NotificationInfo(App app, Notification notification, Context context) {
57         this.app = app;
58         ticker = notification.tickerText != null ? notification.tickerText.toString() : null;
```

5.5 Common Services Module:

This module provides the user has advantages of making the device to make it speak out under the given conditions for their usability purpose. It speaks during this condition of the user's device.



```
11 class Common {
12     private static SharedPreferences prefs;
13     /** Preference key name. */
14     static final String
15         KEY_SPEAK_SCREEN_OFF = "speakScreenOff",
16         KEY_SPEAK_SCREEN_ON = "speakScreenOn",
17         KEY_SPEAK_HEADSET_OFF = "speakHeadsetOff",
18         KEY_SPEAK_HEADSET_ON = "speakHeadsetOn",
19         KEY_SPEAK_SILENT_ON = "speakSilentOn";
20
21     private Common() {}
22
23     /**
24      * Initializes default {@link SharedPreferences} and {@link Database} if needed and sets volume control stream.
25      */
26     static void init(Activity activity) {
27         init(activity.getApplicationContext());
28         setVolumeStream(activity);
29     }
30
31     /**
32      * Initializes default {@link SharedPreferences} and {@link Database} if needed.
33      */
34     static void init(Context context) {
35         if (prefs == null) {
36             PreferenceManager.setDefaultValues(context, R.xml.preferences, true);
37             prefs = PreferenceManager.getDefaultSharedPreferences(context.getApplicationContext());
38             convertOldStreamPref(context);
39         }
40         Database.init(context);
41     }
42
43     /**
44      * If necessary, converts audio stream preference from obsolete word string to integer string.
45      * @since v1.0.11
46      */
47     private static void convertOldStreamPref(Context c) {
48         String currentStream = prefs.getString(c.getString(R.string.key ttsStream), null);
```

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Go to Settings to activate Windows.

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CHAPTER. 6

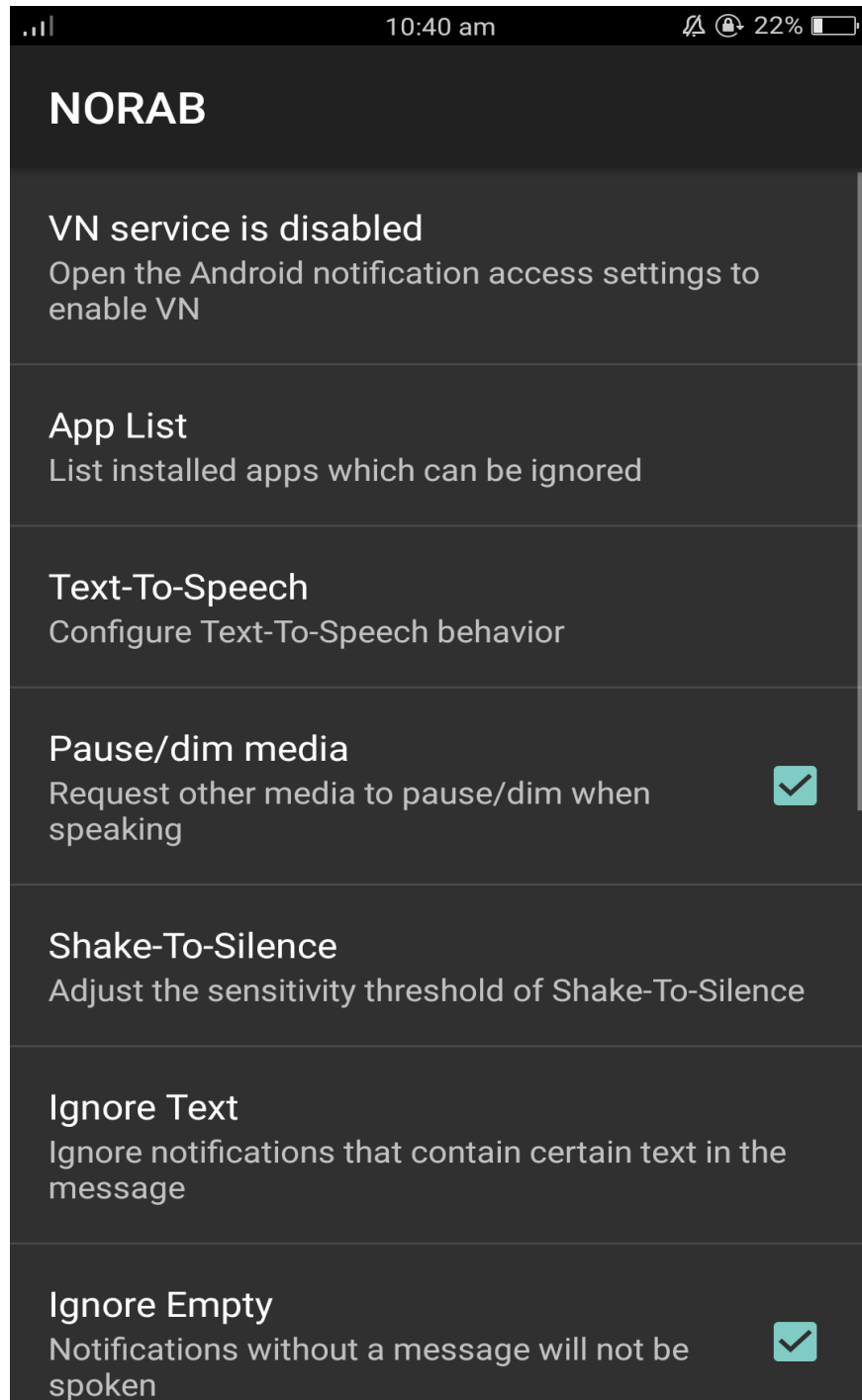
RESULT

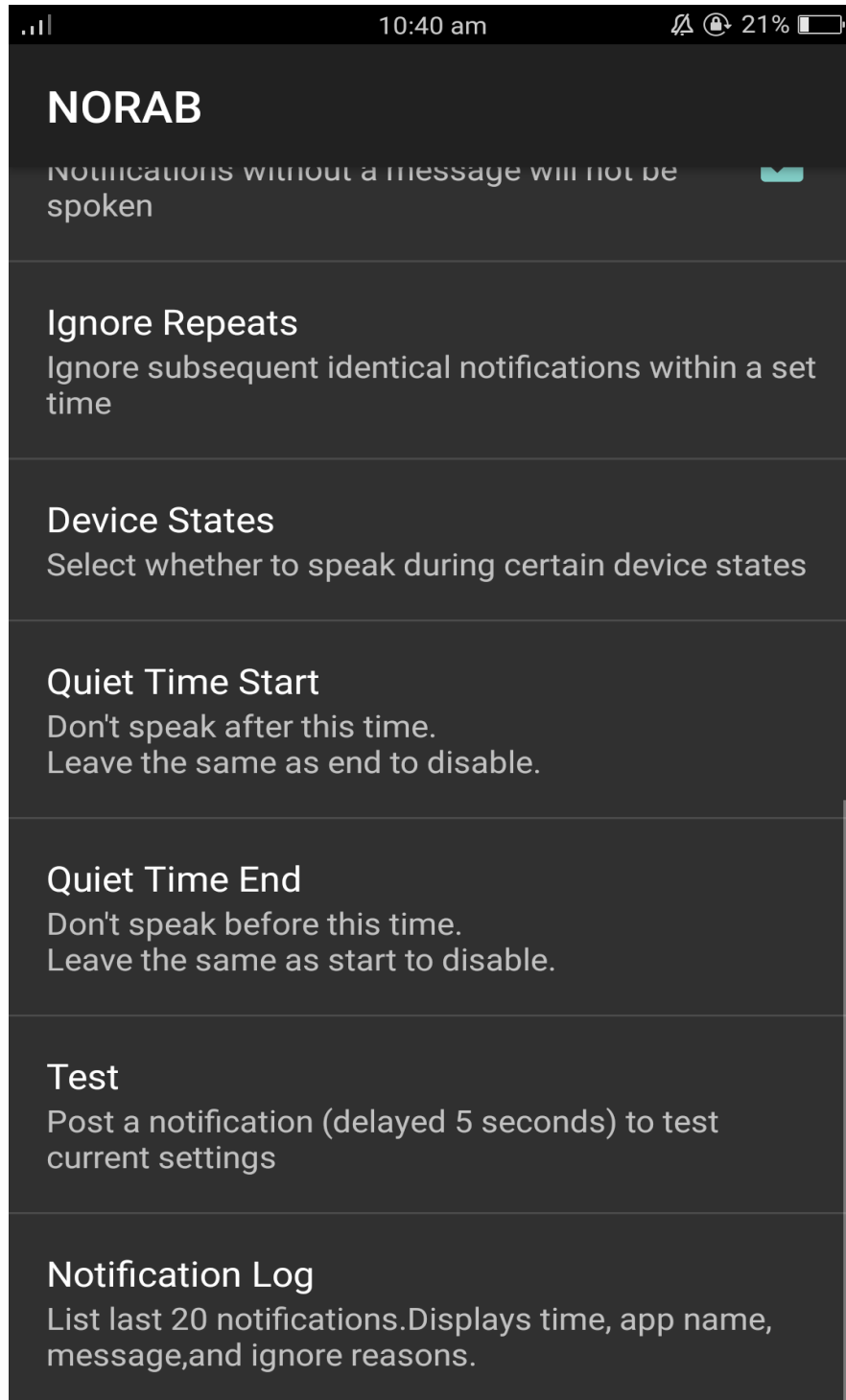
➤ The user is able to achieve the following access of notification reader bot functionalities:

- Customizable TTS message
- Limit length of spoken message
- Replace text to be spoken
- Ignore specific apps or notifications containing defined text
- Choice of TTS audio stream
- Choice of speaking when screen or headset is on or off, or while in silent/vibrate mode
- Quiet Time
- Shake-to-silence
- Custom delay of TTS after notification
- Repeat notifications at custom interval while screen off
- Notification log
- Post a test notification

6.1 The user interface of the Application:

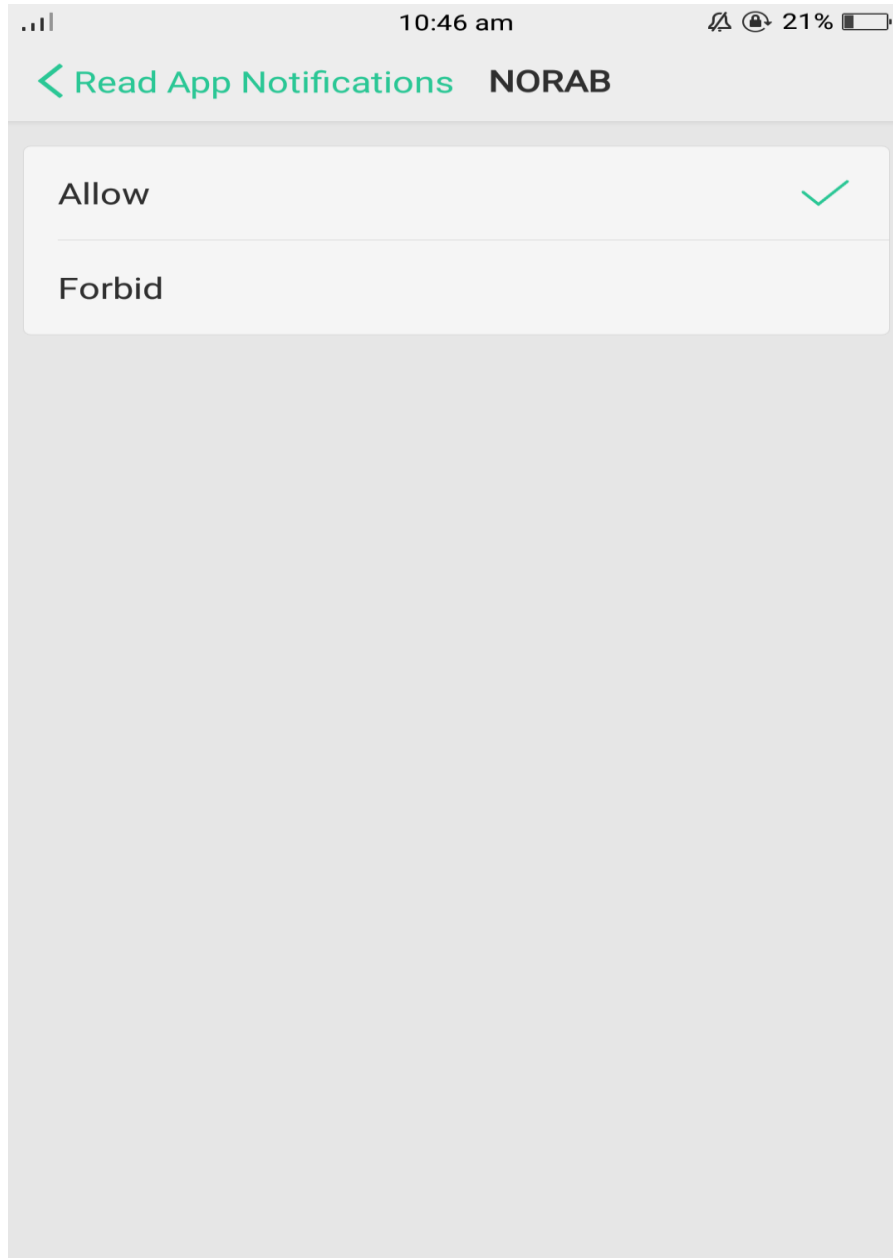
The following preference is shown to user after opening the app. The first lectical will be app name, followed by the preference one after the other divided by height of 1pixels.The topmost preference is “Enable or Disable” service of app.





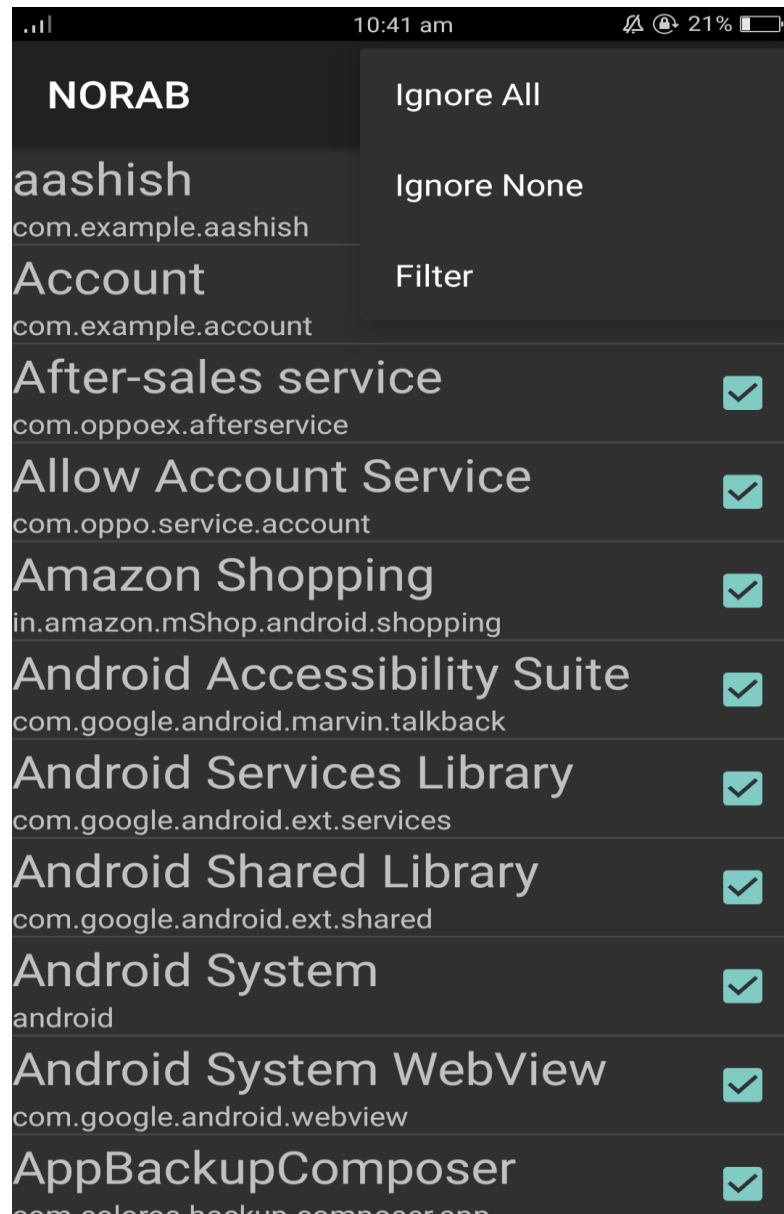
6.2 To Enable or Disable the (NORAB):

Here we can “Allow” or “Forbid” the (NORAB) service to make sure the app will access all the notification coming in will be readed aloud or not.



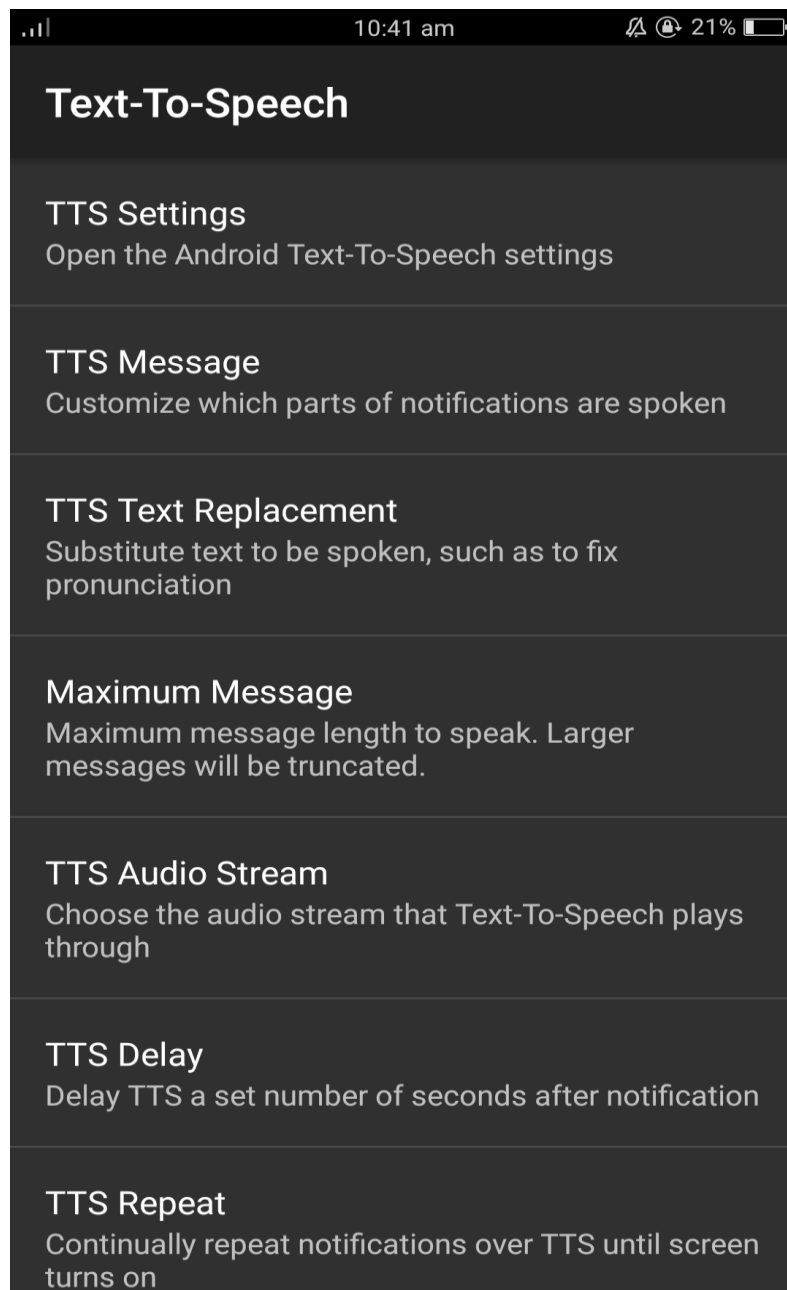
6.3 To select choice able apps

Here user can select/deselect the apps for the which they want the notification to be spoken or not or for the purpose of the notification for the selected app there are the following choices Ignore all, Ignore None or Filter.



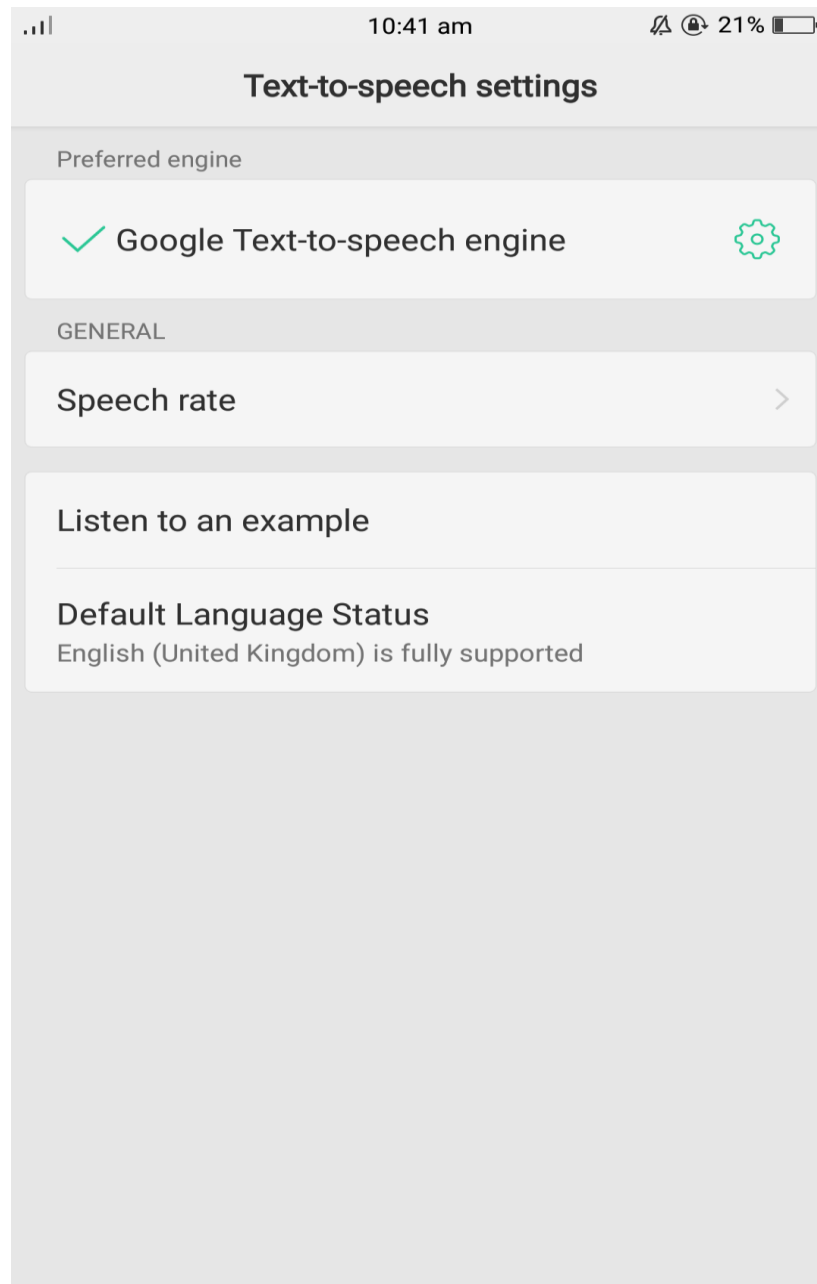
6.4 Text-to-speech customization screen:

This Is First Option Of The Hand Burger Menu. In This You Will Be Able To App Impose Restriction On Apps. The Steps of Adding Restriction Are Shown In The Screen Short Bellow.

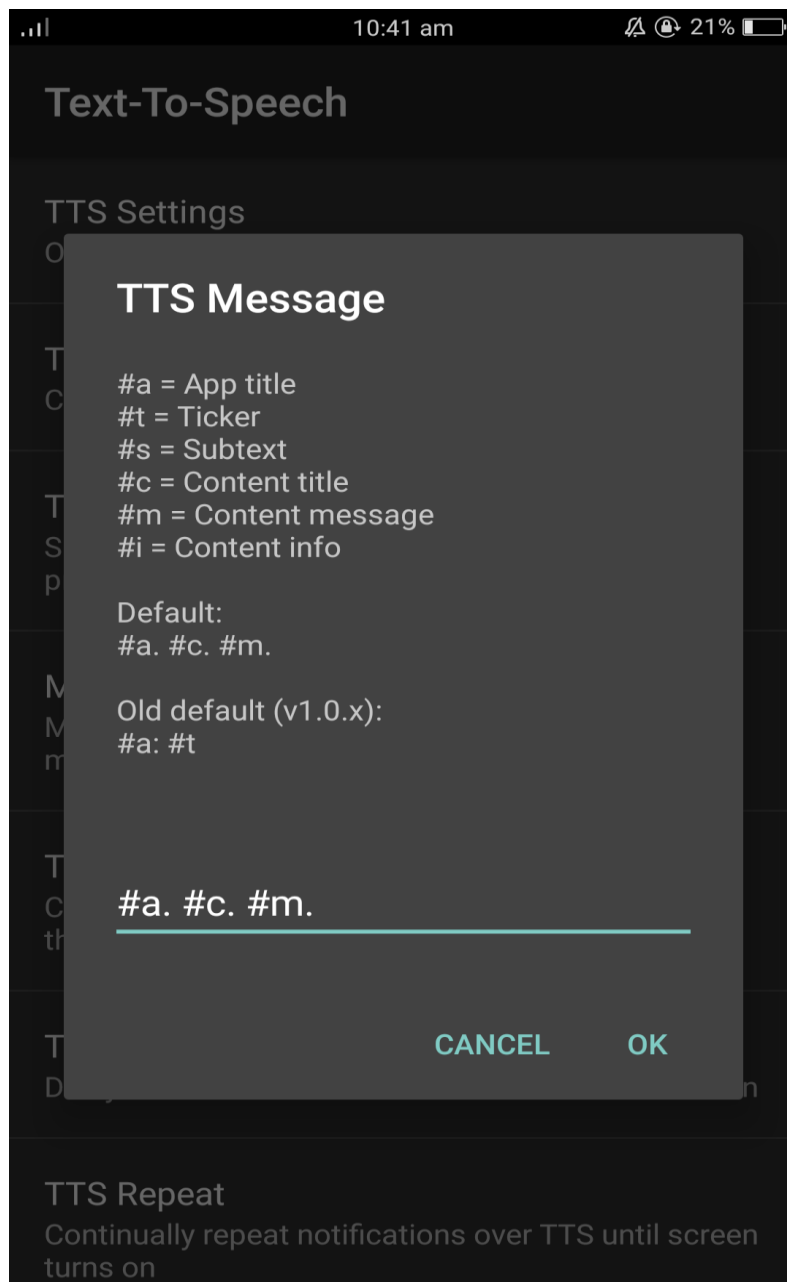


- Text-to-speech: It will contain all the TTS component of google such as Text-to-speech engine.
- TTS Message: Customize which part of the notification are spoken.
- TTS Text Replacement: Substitute text to be spoken, such as to fix the pronunciation.
- Maximum Message: NO larger message to be spoken and it can be truncated.
- TTS Audio Stream: Choose the audio stream that Text-to-speech plays through.
- TTS Delay: Delay TTS a set number of seconds after notification
- TTS Repeat: Notification are repeated at the defined interval until the screen is turned on. Notification created while the screen is on or not repeated. The value should be in minutes.

6.5. TTS Setting:

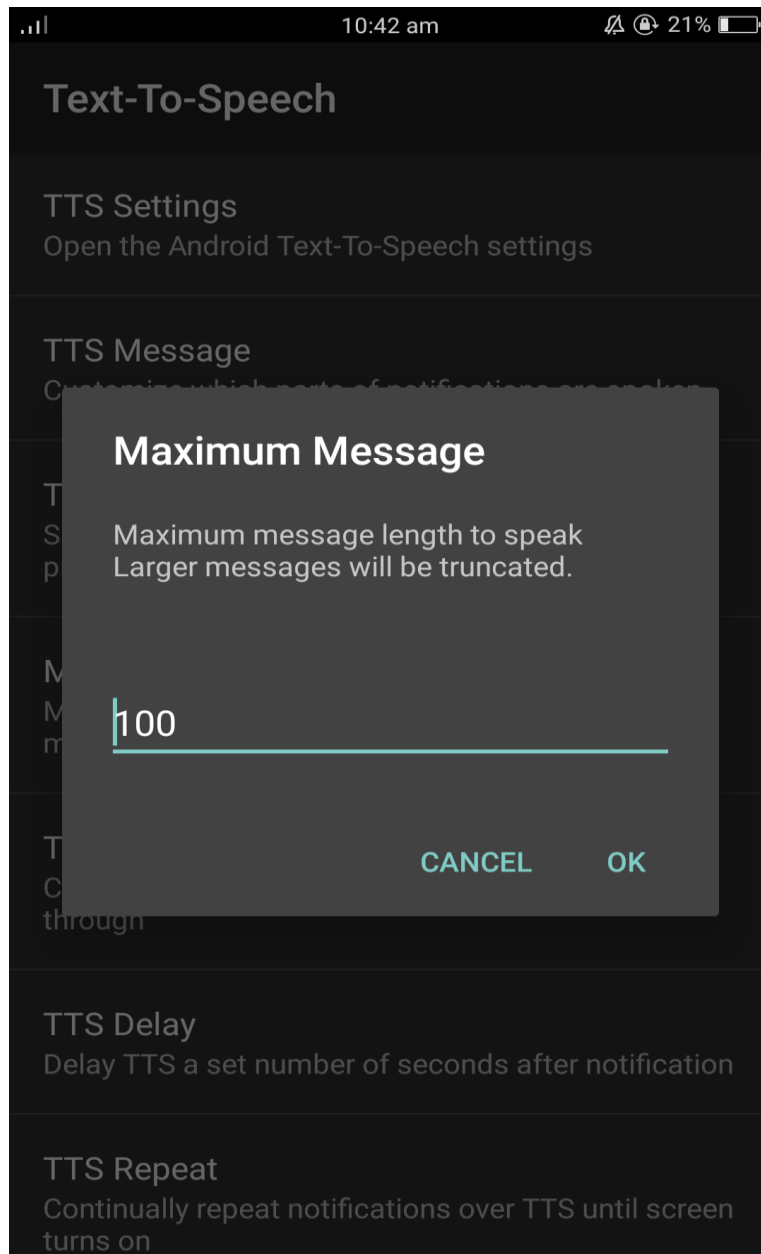


6.6. TTS Messages:



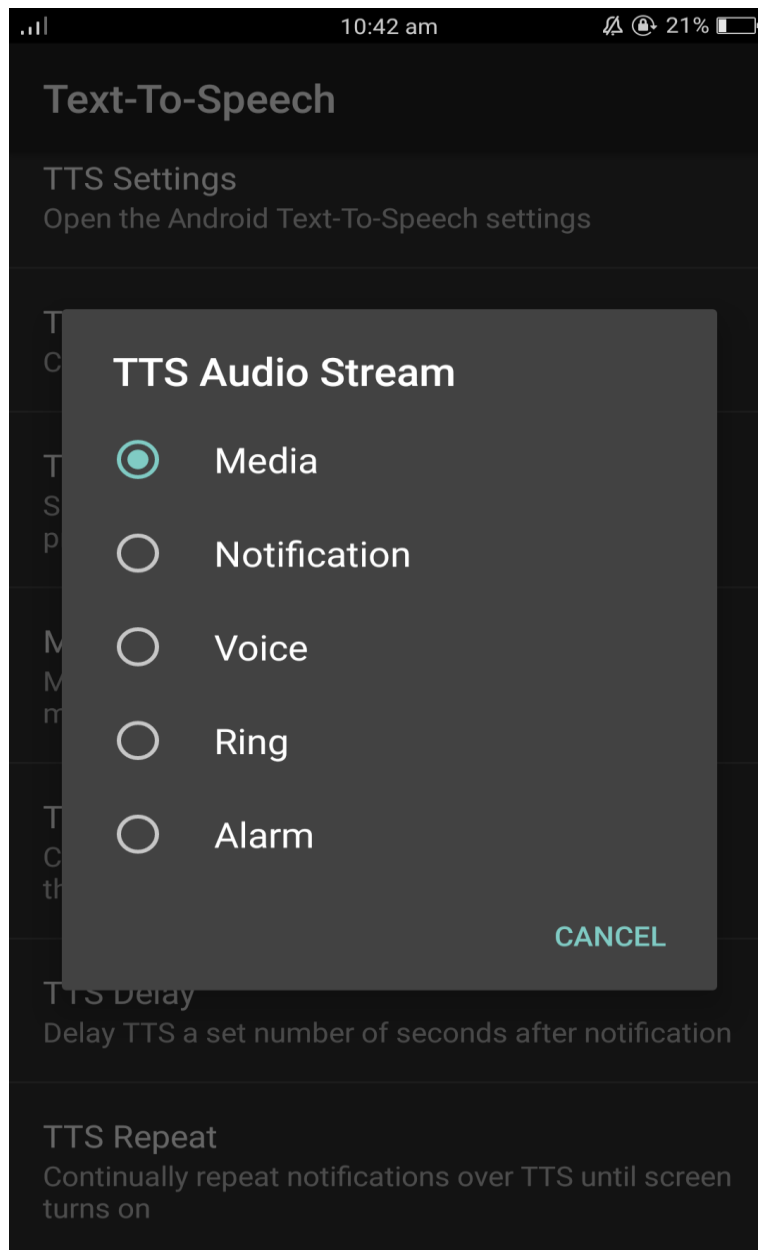
6.7 Maximum Messages:

If you want to limit the length of the messages to spoken out as it is received on the user phone as per the user's choice.



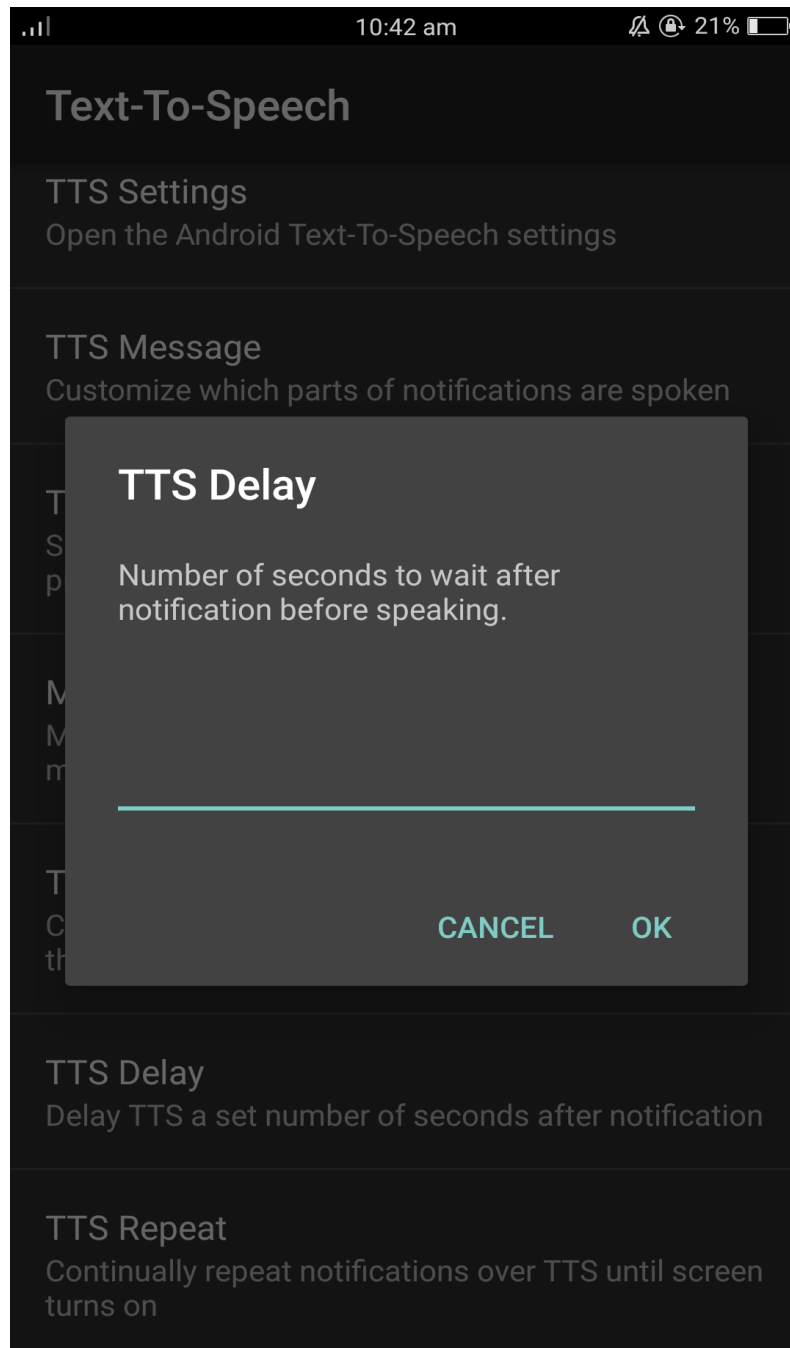
6.8 TTS Audio Stream:

Here the user can make the changes in the sound spoken system of the user device adjustment according to the following provided by the app are media, notification, voice, ring, alarm.



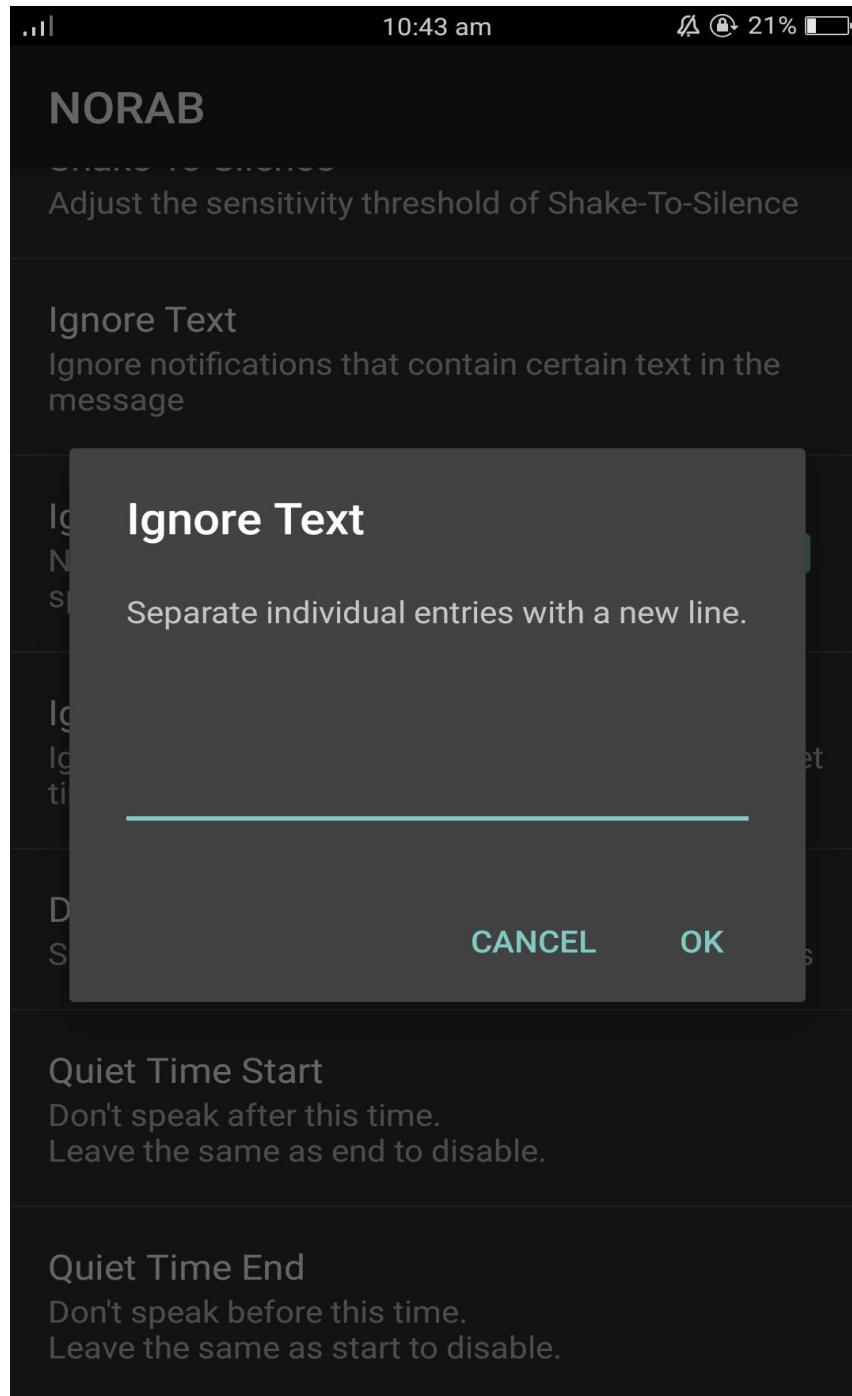
6.9 TTS Delay:

Here the user can limit the notification are repeated at the defined interval until the screen is turned on. Notification created while the screen is on are not repeated. The value should be in the blank or to disable put the value 0.



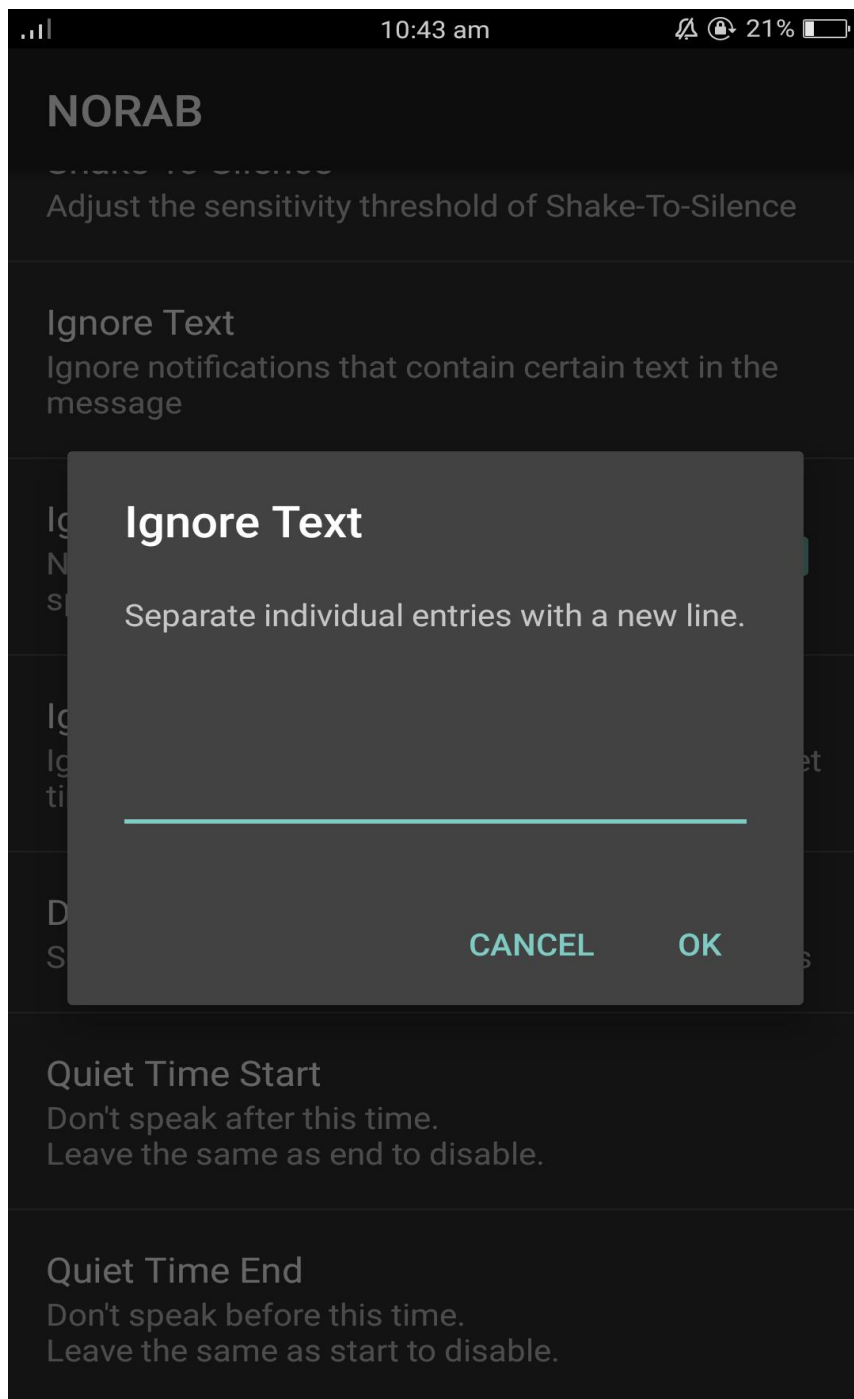
6.10. Shake to silence:

If the user wants to stop reading the message the user can shake the the device multiple times until he or she wants to stop the app to read the message under certain circumstances. To disable this function just put the value equals to zero.



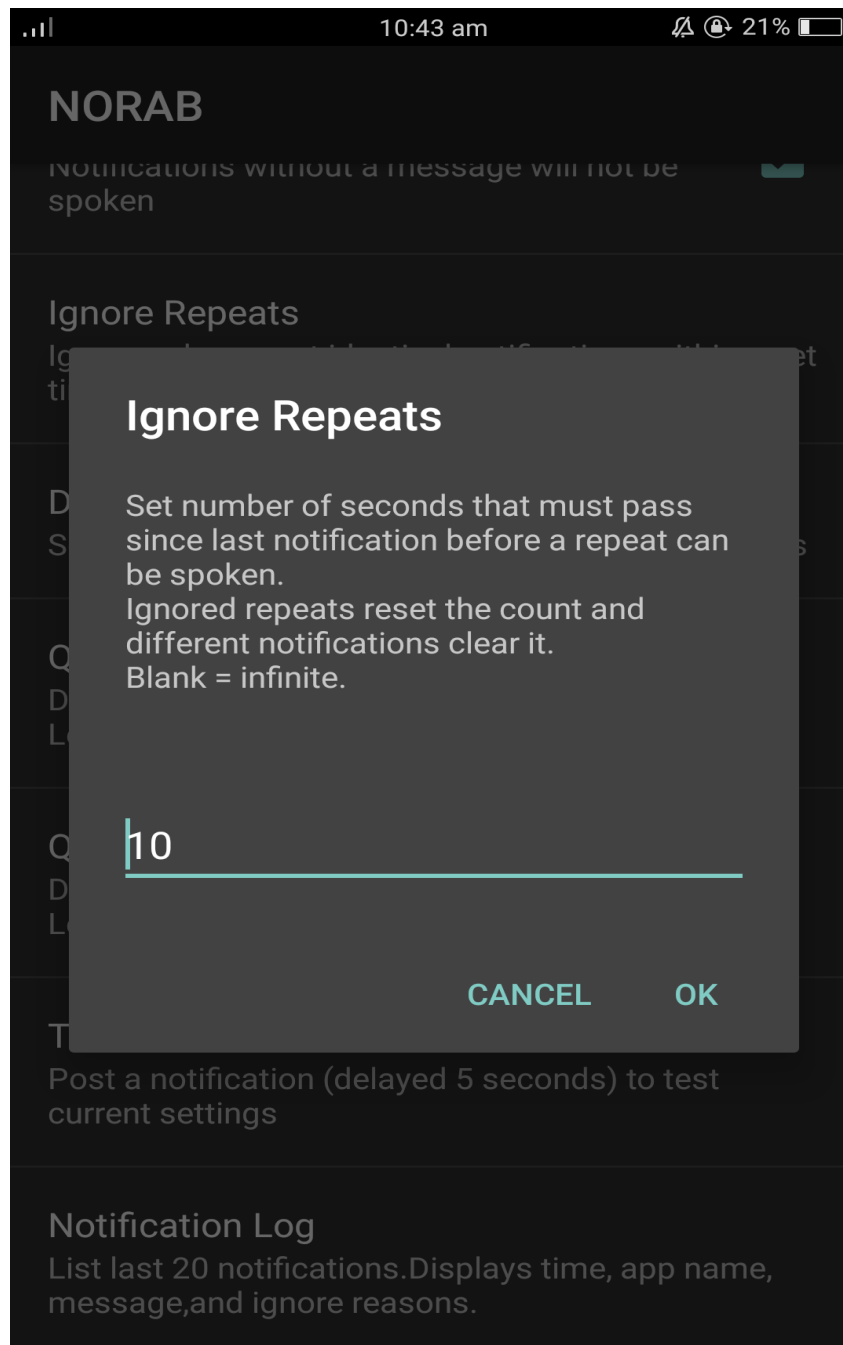
6.11 Ignore Text

This feature allows the user to ignore the certain text as to separate individual entries with a new line.



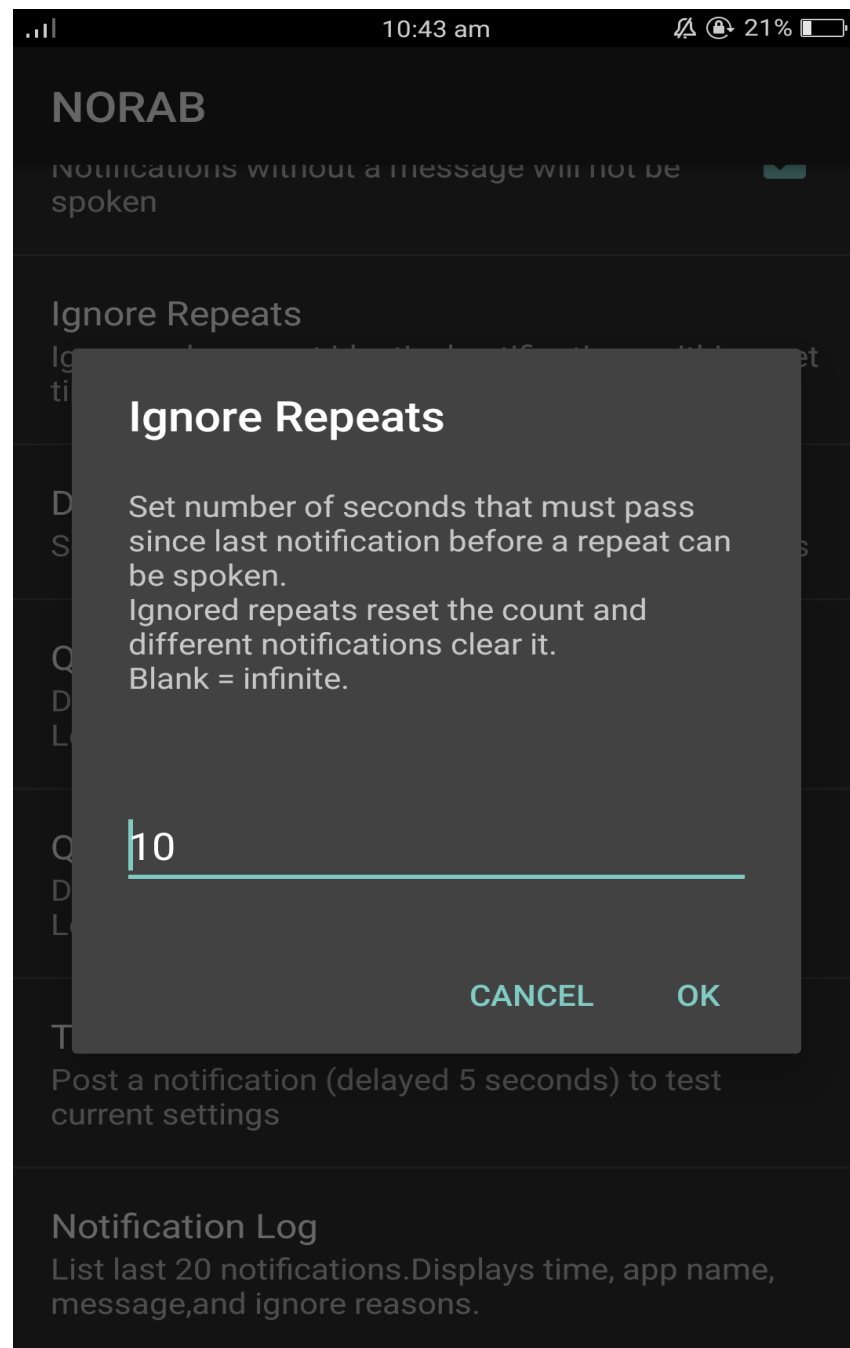
6.12 Ignore Repeats:

This feature enables to set number of seconds that must pass since last notification before a repeat can be spoken. Ignored repeats reset the count and different notifications can be cleared if you will put the value as the blank then it will consider it as infinite.



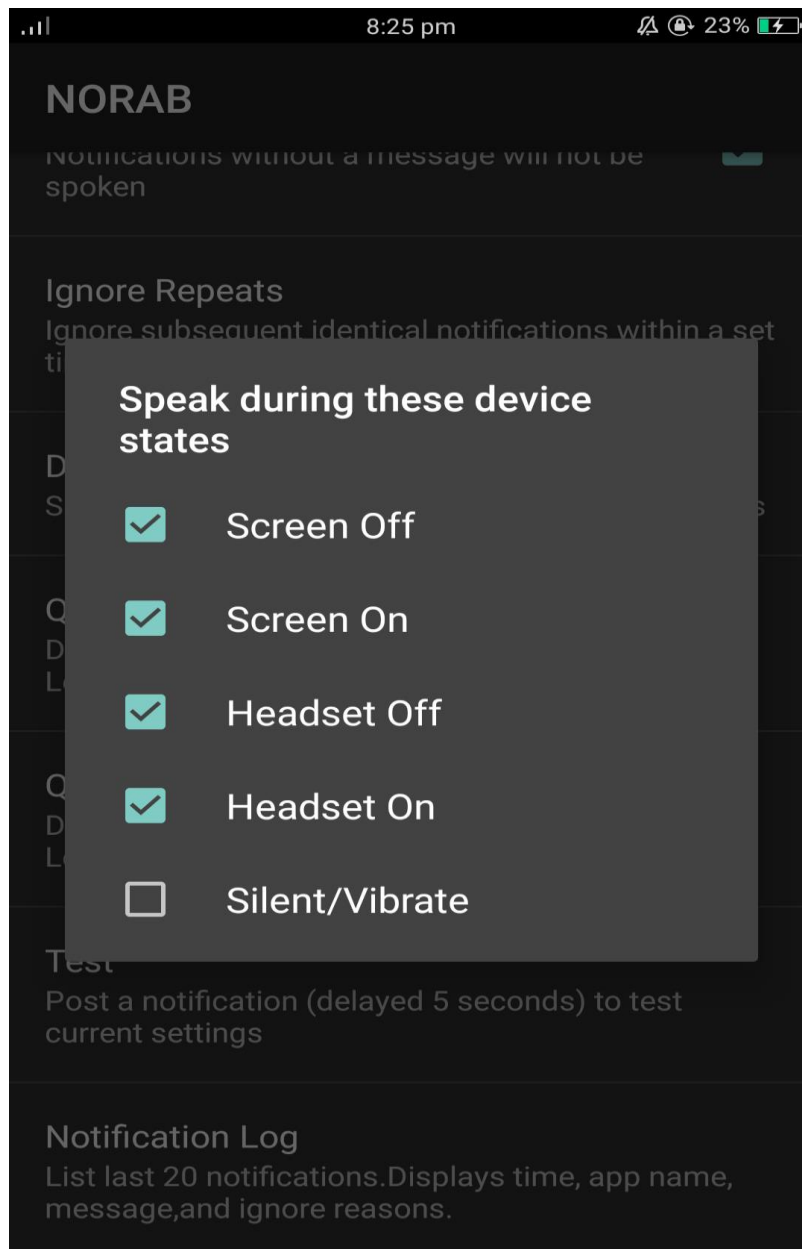
6.13 Ignore Repeats:

This feature enables to set number of seconds that must pass since last notification before a repeat can be spoken. Ignored repeats reset the count and different notifications can be cleared if you will put the value as the blank then it will consider it as infinite.



6.14 Device State:

Here the user has advantages of making the device to make it speak out under the given conditions for their usability purpose. It speaks during this condition of the user's device.

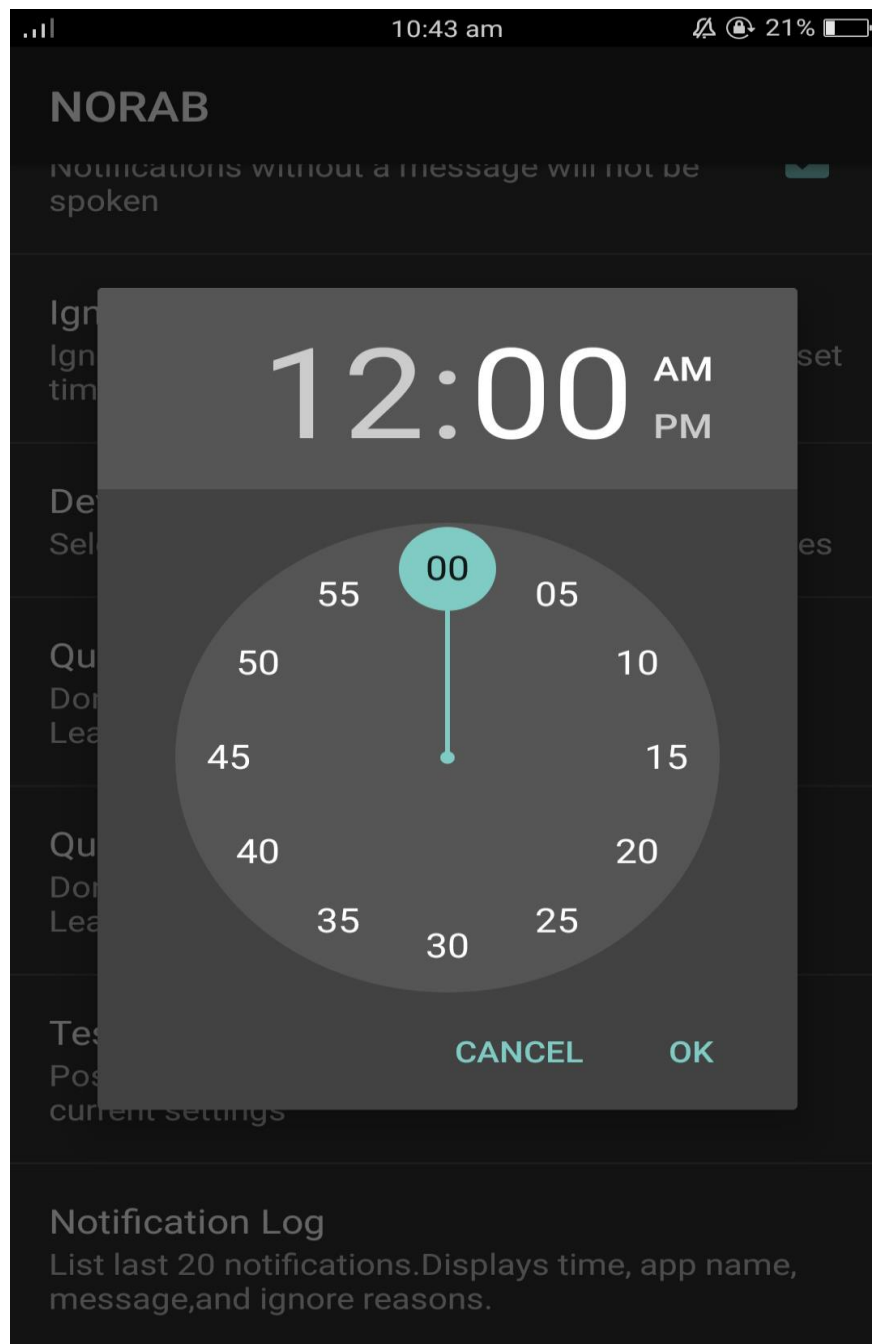


The following conditions are as follows with their use and description:

- Screen Off: If the user as set the screen off check box tick then the app will read the message when the device screen is off.
- Screen on: If the user as set the screen on check box tick then the app will read the message when the device screen is off.
- Headset Off: If the user as set the Headset check off box tick then the app will read the message when the device headset is connected to device mobile so that to read the notification.
- Headset On: If the user as set the Headset on check box tick then the app will read the message when the device headset is connected to device mobile so that to read the notification.
- Silent/vibrate: If the phone default sound is shifted from accessing the media volume then it will check the condition when to read the message if it is set on the silent vibrate or not.

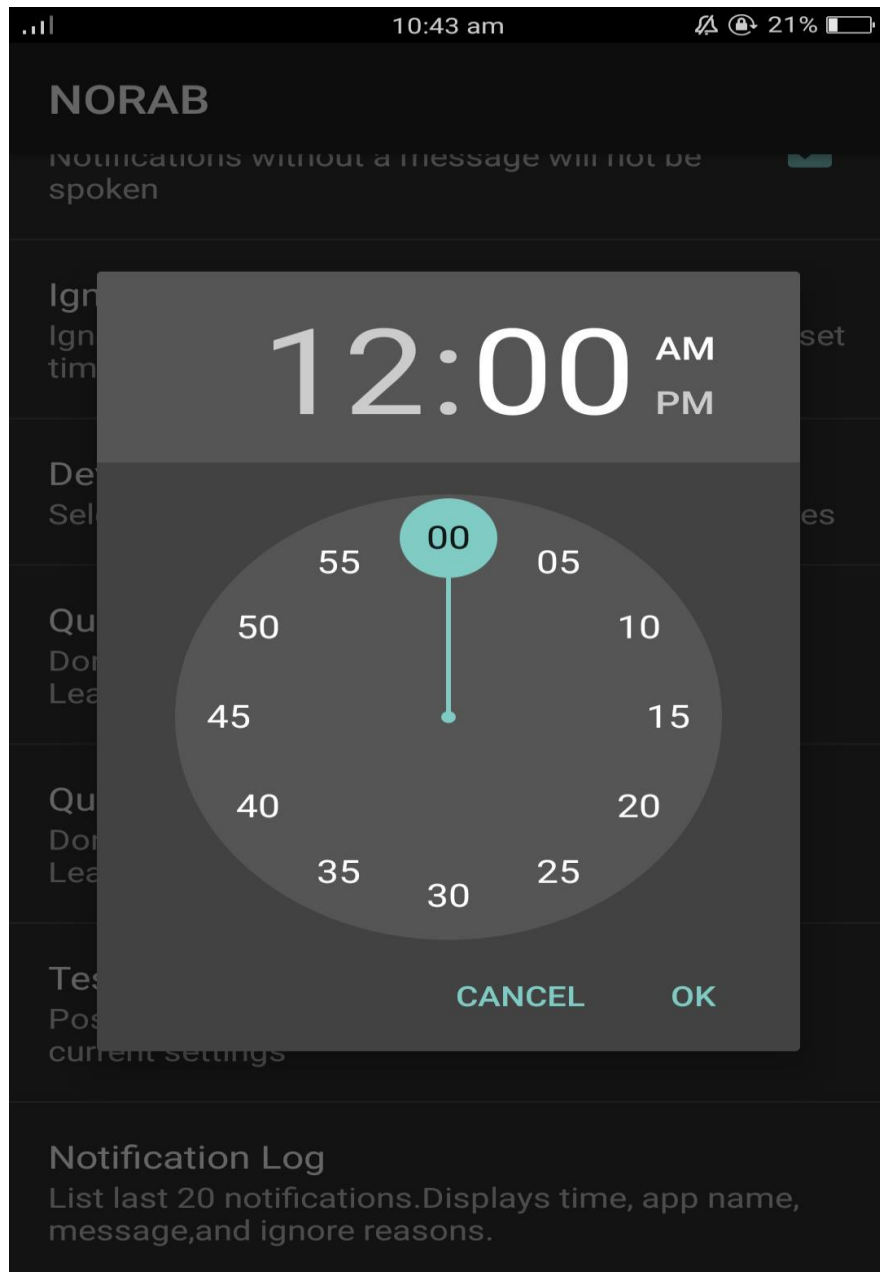
6.15 Quiet Time Start:

The user can set the time from when the notification should start reading with providing accurate time and with attributes such as hour, minute and the duration of morning or night such as am or pm.



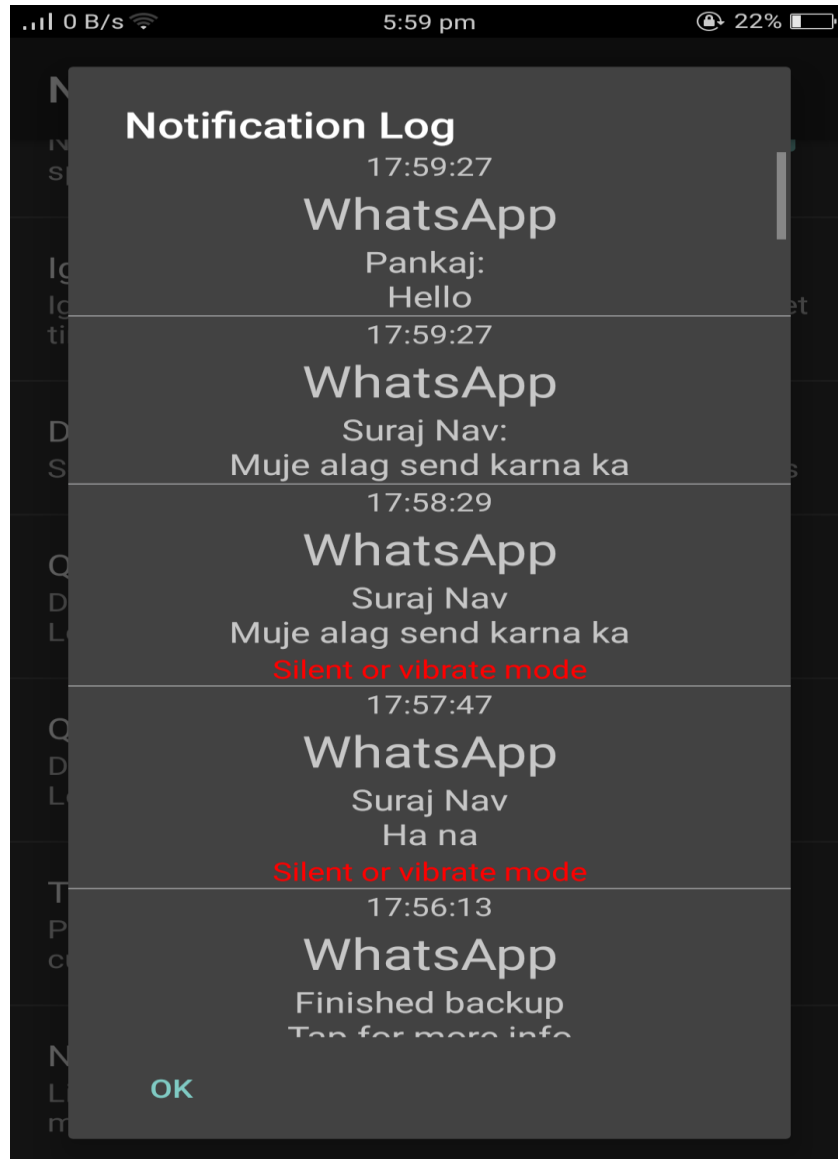
6.16 Quiet Time End:

The user can set the time from when the notification should start reading with providing accurate time and with attributes such as hour, minute and the duration of morning or night such as am or pm.



6.17 Notification Log:

In the notification log section, the user can view the list of notification that are readed by the NORAB app as it saves the notification with all its information such as date, state of device, name of application, name or number of sender, state that the notification is backed up or not and also the content of the message that is received by the user.



The “Notification log ” provides the following attribute of the notifications:

- Time: The time when the notification is spoken out aloud and saves it to the database using the sqlite open helper.
- Name of Application: The application on which the user received the notification or the default system app action notification performed by the android device.
- Name or Number of Person: If the user has saved the number and the name of the sender then it will save the name of person that sends the notification to the user of NORAB application or it speaks the number of the person that sends notification also it can speak the certain actions.
- State of The Device: The state of device when the notification is spoken to the user such as the device is silent, kept on vibrate, screen on, screen off, headset off, headset on etc.
- Content of The Message: Actual content of message will be spoken out or any action that is performed by the android device such as searching the GPS and the actual content if any restriction is not imposed on the device.

CHAPTER. 7

Applications

- The user of the app can enable the services and can drive safely as the incoming notification's will be automatically readed by the user without picking up the phone.
- The user can add restrictions to the app as when and what to speak at a instance of time.
- They can simply plug in the headphones continuously and travel without touching the phone.
- As the Earphones are plunged so they are friendly the device and won't find any difficulties to read the notifications.

CHAPTER. 8

Advantages and Disadvantages

8.1 Advantages

- Its free of cost.
- Easy to accessible.
- Saves time.
- As people are driving car and suddenly, they receive some messages, they pick their phone to see what is the message is that can cause distraction while driving and cause fatal to some ones life, this application helps in reading the notification aloud to the user.
- User Friendly.
- Compatible.
- Reliable.
- Can help visually impaired people to read out the notifications aloud

8.2 Disadvantages.

- You cannot control it through your voice.
- You will require to plug the headset while travelling because of privacy purpose.
- Notification in notification log is not permanently saved once the user checks the notification log it is cleared from the log.
- Person needs to be friendly nature of android device for visually paired peoples to read and access the device and the app.

CHAPTER. 9

Enhancements and Conclusions

Enhancements:

Upgrade option: The future functionalities may change as the user will be able to coordinate with voice of app. There will be an option such as when the notification is received it will ask the user whether to read the notification from this user or not, he or she says yes or no it will read the message if he says yes and ignore the message if the user says no. Cost Prediction: This type of app is mainly not available on the play store to download I have made it easy to access the notification free of cost without any money probing in a least helpful manner in order to help the surrounding people and ease of access to the blind's people.

9.2 Conclusion

- Hand free access to E-mails, text messages and other notification for visually challenged.
- New approach to handle the notification in an advanced manner.
- Rather than after a tone sound picking up our mobile and seeing the pop-up list containing some message and the opening that certain app to view the notification is a time-consuming process it is a modern approach to access the notification by speaking the notification as it directly arrives from the sender.
- Visually impaired people who are using android mobile with all features that a blind person needed are provided by the mobile devices itself so for reading aloud the messages and text messages this app can be used as a helping hand to the visually impaired people.
- The further tactics and techniques can be used to make more useful app for visually impaired people.

CHAPTER. 10

Bibliography

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10.2 Links

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