



College of Software
Masters in Software Engineering
Intelligent Mobile Development
Practical Report
Note Sharing App - Android

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1 Introduction

Note Sharing App (NShare) will enable its users to write notes and save them locally on their devices. Thereafter, if user wants to share notes with his family or friends, he or she can do so inside the App. NShare has capabilities to share notes stored inside it via different communication channels such as Bluetooth, social media apps(WeChat, WhatsApp), cloud drive apps(OneDrive, Google Drive) and so many Apps which are installed on user's device [1].

NShare is simple to use and all features are easily accessible. Considering material design by Google, NShare is running smoothly and very responsive also good quality design of colors and widgets makes it a must to have App for daily usage.

Unlike other notes apps, NShare requires user to sign-in using their Google accounts. This is to ensure privacy of notes written inside the App.

The main flow of NShare is as follows;

1. User sign-in using Google account.
2. User write a note and save it.
3. User share the note.

2 Solutions

Tools used to develop NShare are;

1. Android Studio 4.1.1
2. SQLite database.
3. Firebase realtime database.

Android studio is configured with minimum software development kit(SDK) 16 and set target SDK to 30, which is the maximum SDK available in time of development.

NShare uses SQLite database to store data locally, and firebase real-time database to store/authenticate user's login credentials. NShare will ask only once, the user to sign-in and then automatically sign-in a user next time he/she opens it, unless the user decided to sign-out.

Material design is used as the theme, hence the interactions and operations are smooth and easy to operate.

3 Details

The design and implementation of NShare is broken down into three parts;

1. User Interface
2. User Experience
3. Database Interactions

3.1 User Interface

User Interface(UI) is well designed and users of NShare will not have hard time interacting with. UI is based on material design by Google. The icons, buttons and all other widgets are clearly visible and easy to access.

The homepage of NShare has app logo, welcome text and a single button for sign-in. The main page after successful sign-in consists of floating button at bottom right of the page and App bar menus are located at top right.

Notes are shown in form of card view and each note has;

1. Title
2. Descriptions
3. Edit button
4. Share button

Note are ordered vertically and there is a tiny space between one card and the other.

3.2 User Experience

Also known as UX, it is sometimes confused to UI. UX of App refers to the way users interact with features inside the App and how features respond to user interactions. It is related to UI because, most of times, the experience is measured or observed on top of UI.

NShare follows Google Material design theme and it has good UX. The alignment of buttons, text and other widgets are as expected by users and their response is common. For example the floating button for adding new note it's aligned at bottom right and when clicked, user expects a pop-up window which it is indeed given to him/her. The pop-up window has widget to enable user to enter details(title and description of note). When user click on text input widget, for example text widget for title, the keyboard shows up. User has no need to click on text widget for description, lather he/she will click 'next' button on keyboard and the cursor will shift to description widget.

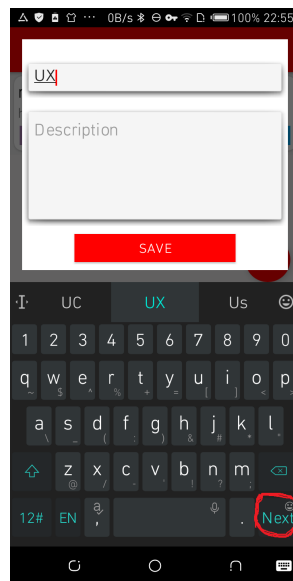


Figure 1: UX feature ('Next' appears on keyboard)

To avoid accidental saving of note when entering description, the 'next' button on keyboard is no longer visible and it is replaced with return functionality. The return functionality will enable user to enter note's description in lines. When user has done entering description, he/she can click save button to save the note or back button on the device controls to quit note saving operations. This operation is same when user wants to edit the note.

Most mobile devices nowadays have large displays, ranging from 5inch display to more than 6inch, hence to use on one hand is becoming difficult. If App doesn't consider good alignment of widget and operations, users are likely to stop using the App. By considering this fact, NShare has aligned right the menu widget and floating button to give user ease of use even by one hand [2]. The settings menu is starts below App bar to enable user to reach to menus by one hand.

Top edge Apps have many cool features and one of them is ability to delete item by sliding it either left or right side of screen. NShare has that too. By following [3] guide, this feature adds good experience to users.

3.3 Database Interactions

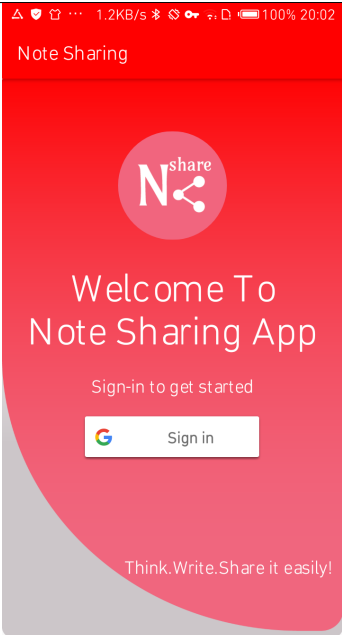
NShare uses two storage techniques;

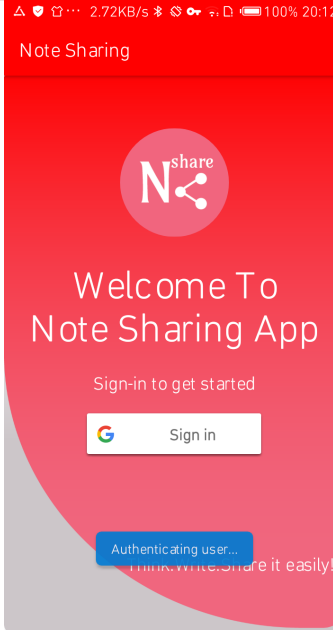
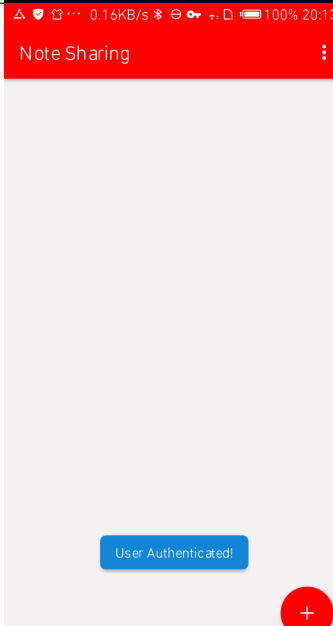
1. Firebase real-time database.
2. SQLite database.

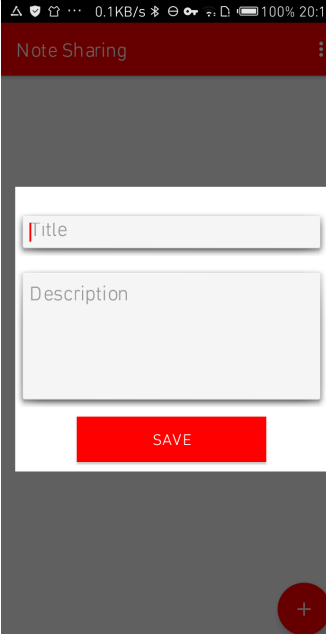
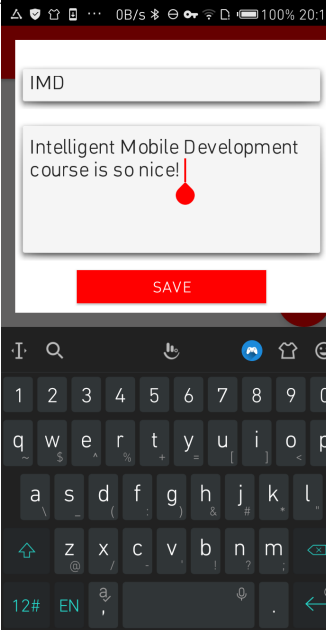
Firebase database is used to authenticate users while SQLite database is used to store notes on user's device. The purpose of using two database technologies is to secure the sign-in operations. Once user has sign-in successfully, he/she can continue to use the App offline without a glitch of performance.

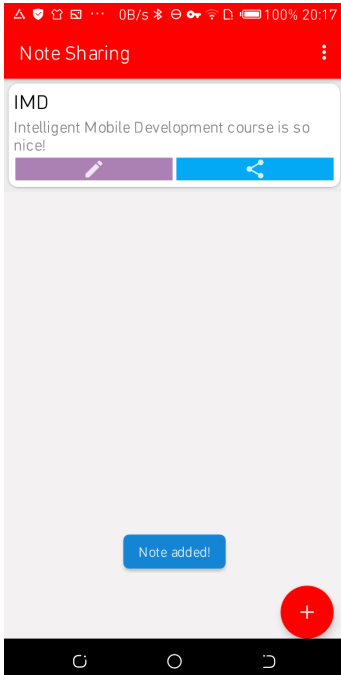
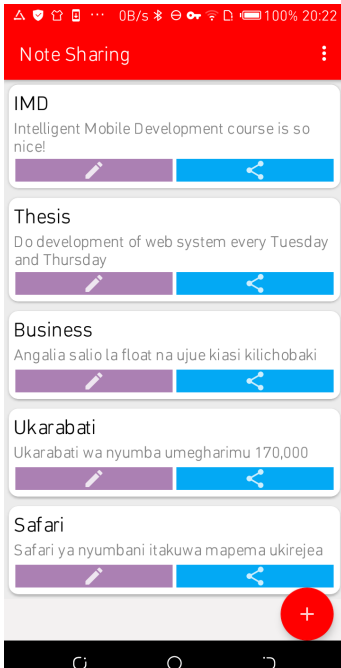
NShare interacts with SQLite database via a helper class which consists of connections to database and several methods containing database operations such as create, read, update and delete. Together with database helper class, a model class defining the structure of data stored in database and adapter class which links database and UI of the App, were used.

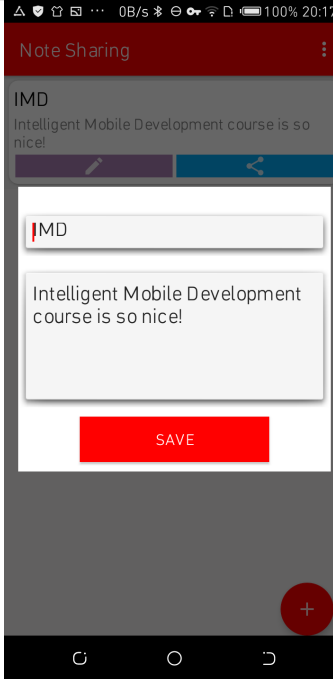
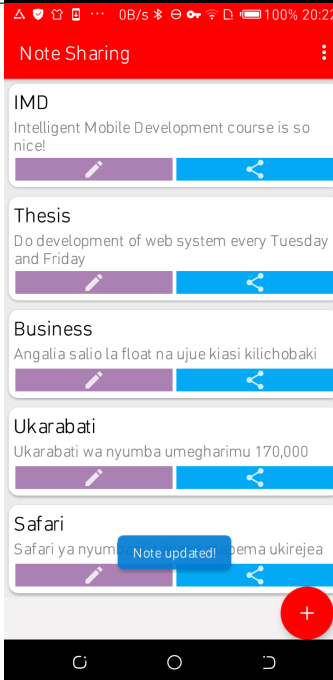
4 Screenshots and Descriptions

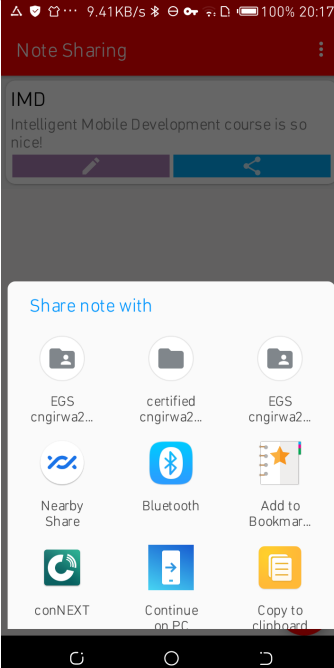
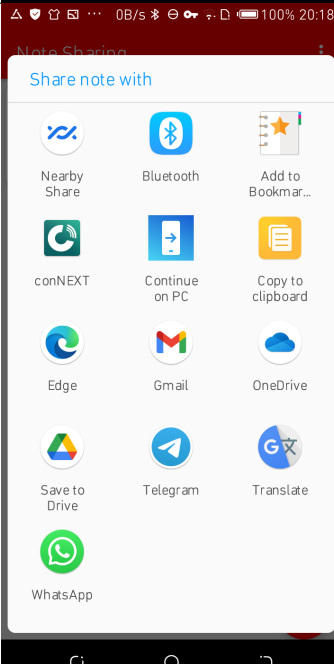
Screenshot	Descriptions
	<p>This is the landing page of NShare. It consists of;</p> <ol style="list-style-type: none"> 1. Logo. 2. Welcome text. 3. Slogan. 4. Sign-in button
	<p>When user clicks Sign-in button from home-page, the dialog appears with previous logged in account at top followed by other accounts or/and option to choose another another account last.</p>

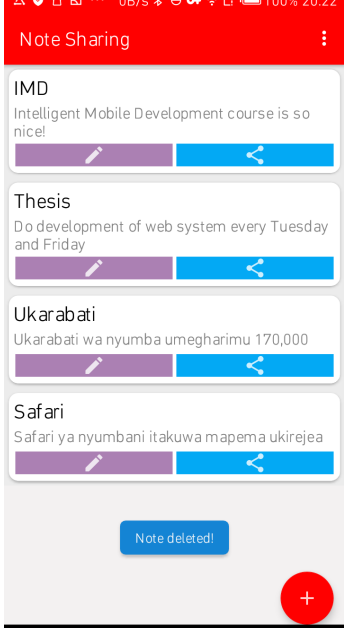
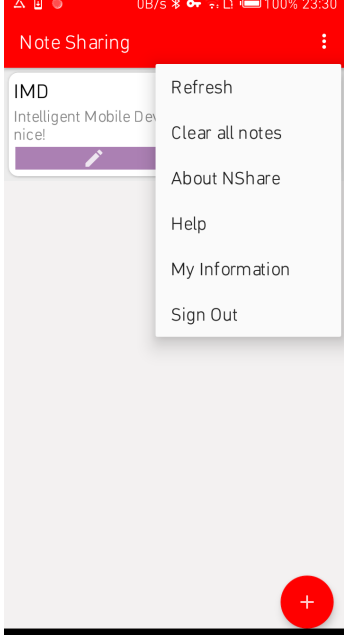
Screenshot	Descriptions
	<p>After user chose the account to use and grant permission for NShare to use that account, the authentication process starts.</p>
	<p>Upon success authentication, a main page for writing and managing notes is displayed.</p>

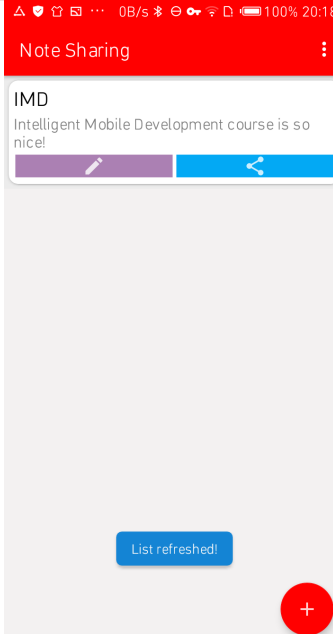
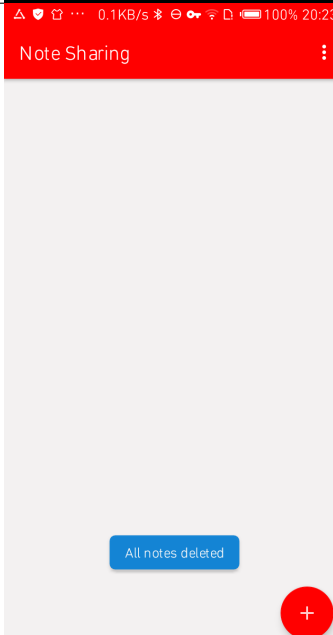
Screenshot	Descriptions
	<p>User starts by clicking floating icon. The dialog asking for title and description of note appears.</p>
	<p>User enters title and description of note then clicks save.</p>

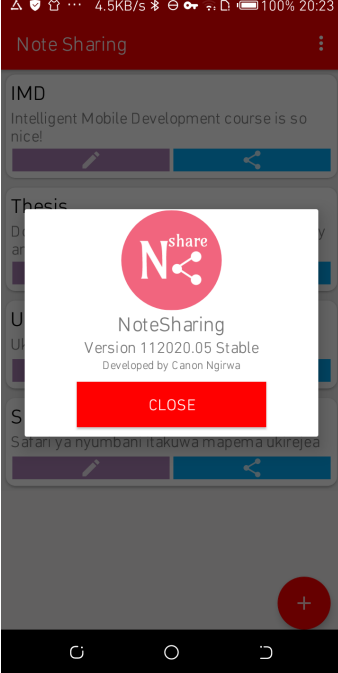
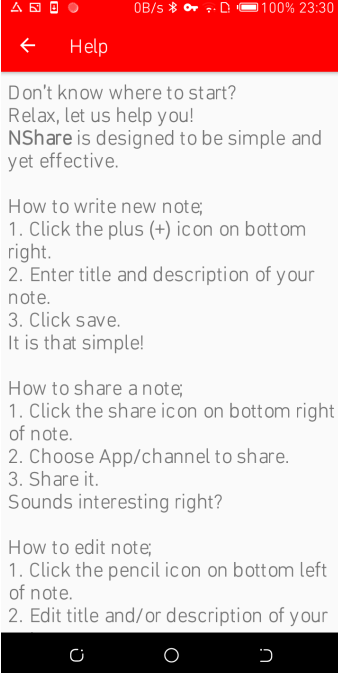
Screenshot	Descriptions
	<p>Upon success saving of note, the toast notification appears.</p>
	<p>Users can store as many notes as they want.</p>

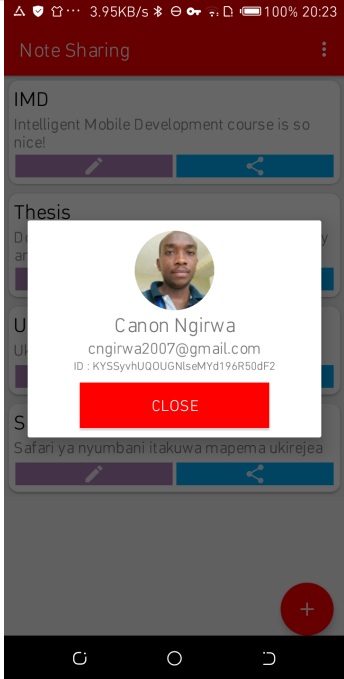
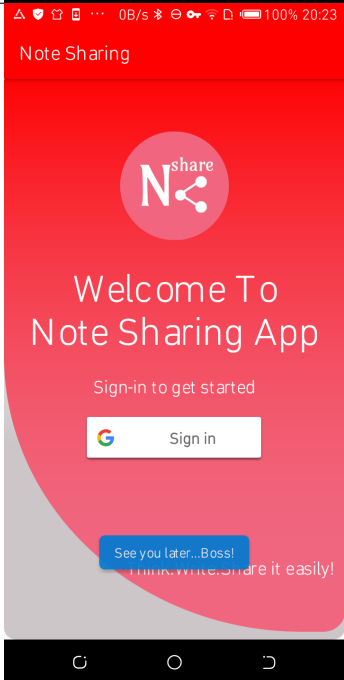
Screenshot	Descriptions
	<p>When user clicks edit button, a dialog appears with details of note. User can then make modifications and click save.</p>
	<p>When update operation succeeds, user is notified with a toast.</p>

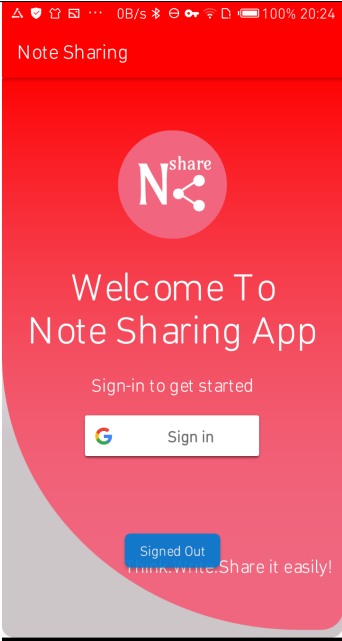
Screenshot	Descriptions
 <p>The screenshot shows a mobile application interface for sharing a note. At the top, the status bar displays '9.41KB/s', signal strength, and battery level at 100% with the time 20:17. The app's title bar is red and says 'Note Sharing'. Below it, the note content is 'IMD Intelligent Mobile Development course is so nice!'. A share button is visible, and a list of compatible apps is displayed below it.</p>	<p>When user clicks share button, a list of compatible Apps appears.</p>
 <p>This screenshot shows the same 'Note Sharing' screen as the previous one, but with a larger list of compatible apps displayed below the share button. The list includes various social media and communication apps like WhatsApp, Telegram, and Gmail, as well as productivity apps like OneDrive and Edge.</p>	<p>More Apps to share note</p>

Screenshot	Descriptions
	<p>When user slides the card (with note inside it) either left or right, a note is immediately deleted.</p> <p>This operation is not reversible, users are advised to proceed with caution.</p>
	<p>When clicks three vertically aligned dots on top right, the menu appears.</p>

Screenshot	Descriptions
	<p>When user clicks 'Refresh', NShare will fetch for all notes in database and display them.</p>
	<p>When user clicks 'Clear all notes', NShare will delete all notes in the database and inform user upon success. This operation is not reversible, users are advised to proceed with caution.</p>

Screenshot	Descriptions
	<p>When user clicks 'About NShare', information about the App appears.</p> <ol style="list-style-type: none"> 1. App name 2. App version 3. App developer
	<p>When user clicks 'Help', the help page which explains how to use NShare appears.</p>

Screenshot	Descriptions
	<p>When user clicks 'My Information', his/her informations stored in Firebase database appears.</p> <ol style="list-style-type: none"> 1. Display name. 2. Email address. 3. ID.
	<p>When user clicks 'Sign Out', a notification to inform user about the sign-out operation appears.</p>

Screenshot	Descriptions
	<p>Upon success sign-out, a notification to inform user appears.</p>

5 Conclusion

Though NShare is running well and perform as intended, there are some advances needed to enhance its usability.

5.1 Advanced UI

The UI for NShare is good but more graphics are needed. Example the icons for menus and ability for user to change theme or even add custom theme.

5.2 Custom card design

NShare should have ability to change the look and feel of card. For example add colors to card with important notes.

5.3 Note sorting

Currently, NShare sorts notes by order of their ID. More sorting capabilities are needed.

5.4 Note searching

Since NShare users can store more than one note, it might be difficult for them to find a note. For this, search functionality is needed.

5.5 Improved security

NShare has only Google sign-in option, but it would be better to support other types of Sign-in (such as Facebook, Skype, WeChat) and notify users when account is used to sign-in on different device.

Nowadays, most advanced Apps uses two factor authentication during sign-in operations also some uses biometric scanning such as facial recognition or fingerprint scanning. It will be better if NShare could include these functionalities as well.

The cards (cardview) holding notes are also not secured, means if user accidentally swipe left or right the card will be deleted. Therefore, a lock of cards is needed to prevent this scenarios.

5.6 More notes details

Currently, NShare only stores title and description of note which are in format of text. It would be better to support other types of data such as images. Images can be directly taken from camera or gallery. Also NShare should support usage of hand written notes using pen(if device support) or draw on screen using fingers.

5.7 Cloud backup

NShare lacks backup functionality. This means user has no means to backup/restore his/her notes and App data. To solve this, cloud backup and restore are suggested. Backup can include both user data and App data such as settings.

5.8 Collaborative notes sharing

NShare has only single user interactions. It could be nice if it could incorporate multi-user note writing and sharing.

5.9 Confirm before delete

NShare doesn't ask user for confirmation of operation. Since this operation is irreversible, it was worthy to ask for user's confirmation rather than executing directly. This applies also to clear all notes feature.

5.10 Improved settings menu

NShare has no settings panel for user to customize the App. The panel can contain some settings such as;

1. User profile management.
2. History of notes and interactions of user on the App.
3. Theme management.
4. Account deletion.

That been said, NShare is important App for daily usage and yet reliable and cost-effective.

References

- [1] <https://developer.android.com/codelabs/android-training-activity-with-implicit-intent>
- [2] <https://developer.android.com/codelabs/android-training-adding-settings-to-app#1>
- [3] <https://developer.android.com/codelabs/android-training-room-delete-data#6>