1 Big Picture of Omni-Notes

1.1 Stakeholders

The term Stakeholder in Software Engineering field refers to, “a person, group or company that is directly or indirectly involved in the project and who may affect or get affected by the outcome of the project”. It is important to identify stakeholders not only for determining what various stakeholders are expecting from the project outcome but also for determining the best ways to manage their expectations and maximize project benefits.

1.1.1 Developers

Developers perform the actual work of the project including development, testing, etc. The main developer of the Omni-Notes app is *Federico Iosue*, and his github account is @federicoiosue. According to the contributors tab in Github (Fig 1), there were other contributors who had contributed some code to the project before 2018. But since then, the only developer is *Federico Iosue.* So in fact, he is an independent developer and maintains the Omni-Notes by himself.

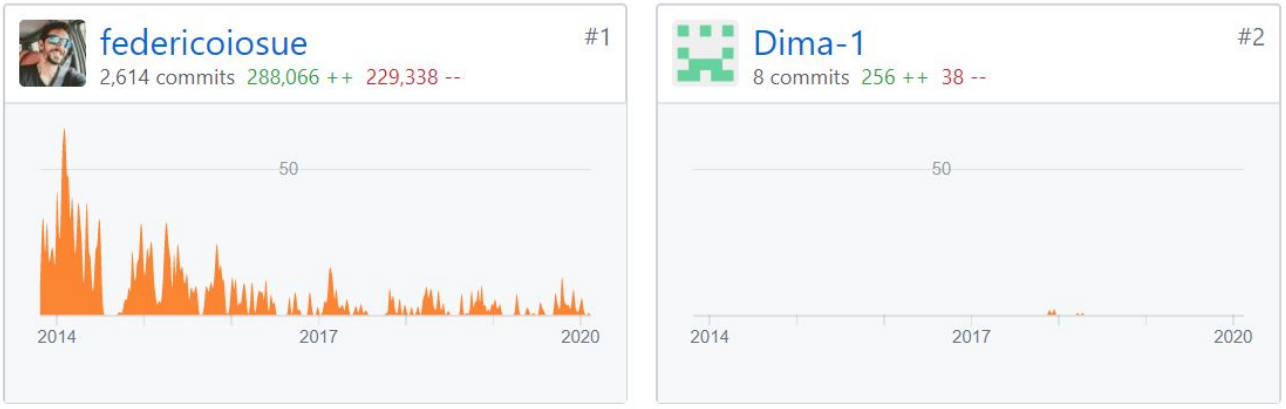

Fig 1 Top two developers of Omni-Notes

1.1.2 Users

Users provide requirements and advice. Users can be individuals and organizations who need to take notes and have an android mobile-phone. *Federico Iosue* published Omni-Notes in Google Market. There are more than 100,000 downloads.

1.1.3 Suppliers

Suppliers supply essential service and equipment. In this project, Google provides the Android Framework.

1.2 Functionality

1.2.1 Overall Functionality

Omni-Notes is a note taking open-source application aimed to have both a simple interface but keeping smart behavior. It can share, merge and search notes. The app supports three types of notes - notes with pictures, checklist notes and text notes, allowing users to edit text and set reminders for notes. On top of that, it offers functions to create to-do lists, add images, audios and generic files as attachments to corresponding types of notes. It also displays up-to-date notes' shortcuts on the home screen where users can manage notes using tags/categories.

1.2.2 Essential Functional Aspects

1.2.2.1 Note Operations & Management

Omni-Notes provides various kinds of basic note operations including creating, modifying and saving notes. Users can freely edit new notes in the note editing interface and save them once they press the back button, or delete them from the note list on the main screen. Users can also add images, audios or other kinds of files as attachments and create to-do lists and set status for each item in checklist notes. It offers note management functions like adding tags to, categorizing and deleting multiple selected notes to improve the efficiency to manage notes as needed.

1.2.2.2 Searching and Sorting

Searching and sorting are advanced features for optimizing note management. The importance of them is clearly seen when there are already a huge amount of notes in the app. Searching and sorting work as two efficient ways to find notes. Users are able to search keywords in the title or content to find notes they need and sort any given note list with any one of four different types of ordering - title, creation date, last modification date and reminder date by using database queries.

1.2.3 Other Important Functional Aspects

1.2.3.1 Note Sharing

In Omni-Notes, users can share notes with others in various ways. For example, in order to inform people who do not use Omni-Notes about their agendas, users may click the share icon to choose a proper way to do it. A note can be processed into a formatted block of text. In this case, it's convenient to share it through email and instant messaging apps.

1.2.3.2 Note Locking

Omni-Notes offers a very special and useful feature - lock notes you intend to lock. Users can lock one note at a time with a password and a secure question in case the password is forgotten. Before users unlock this note, others who don't know the password or the secure question are blocked from accessing it. This feature may make its users safely keep their secret in Omni-Notes!

1.2.3.3 Data Persistence

Omni-Notes app applies SQLite to ensure data persistence. All notes are finally stored and processed in the database. It can avoid unexpected changes with notes between uses of the app.

1.2.4 Important Non-Functional Aspects

1.2.4.1 Multi-language Support

Omni-Notes app supports up to 30+ languages. So it can cover the needs of people all around the world. Users can set the language in “Settings -> Interface -> Language”.

1.2.4.2 Compatibility

The application supports many android versions. And it supports a lot of phone types from many manufacturers including Moto, One plus, Xiao mi, Huawei and Nexus.

1.2.4.3 Configurability

Users can configure functional behaviors of the application.

1.2.4.4 Data Integrity and Consistency

The application supports offline operation.

1.2.4.5 Distributability

There are no location limits for the application. It can be used offline. And all the data can be output and imported into the app. It also supports merging data.

1.2.4.6 Usability and User Experience

Omni Notes is lightweight, and has a simple interface but it is smart and easy to use. Its users are wide all over the world. It can be used in mobile devices with different screen sizes. It also supports both horizontal and vertical screens.

1.2.4.7 Accessibility

It integrates Google Now. So it supports people with special needs.

1.2.5 Unique Function

Omni-Notes application supports more than thirty languages in the world. It is an all-in-one app for users to organize their lives. It has a powerful function to store many types of files. For example, users can add images, audios or other kinds of files as attachments and create to-do lists. In addition, it integrates Google Now, just tell "write a note" followed by the content, then the app will automatically create a note with the content.

1.3 Key Developers

• Core maintainers: Federico Iosue
• Team members: N/A
• Developers: Federico Iosue
• Testers: Federico Iosue, beta testers from users

According to section 1.1.1, Federico Iosue is the only developer currently. And on the website of the app, it shows Omni-Notes is maintained by federicoiosue, which indicates he is the only maintainer. So we believe he does testing by himself. But It is worth mentioning that Omni-Notes owns a community on both Google community and Github, where users can give suggestions to help the developer to test and improve the functions of Omni-Notes. Omni-Notes supports more than thirty languages in the world and volunteers in the community help translate (https://plus.google.com/u/0/communities/112276053772152071903). We saw a man called himself a beta tester of this project on Github. It means there are other testers involved in this project other than the main developer. But we are not able to provide a list of all the testers.

2 Open Issues

We identified several open issues in the repository of Omni-Notes on Github that our team would be able to fix.

Issue1 Crash on note swiping

- Location: https://github.com/federicoiosue/Omni-Notes/issues/740
- Describe the bug: The application would crash and show an error message toast “Something went wrong in Omni-Notes\n A report has been sent to the developer!” when users swipe a note.
- Context (Where the issue is confirmed by our group):
    - Device: Nexus 5X
    - OS version: Android 7.1.1
    - App version: 25
- How to reproduce: Swipe any note (to the left or right) in the note list on the main screen. The application would crash followed by a toast described above.
- Expected behavior: The swipe motion is supposed to work like a normal delete operation. The note gets swiped should be moved to trash.
- How to resolve the issue: The error message shows that “NoClassDefFoundError for it.feio.android.omninotes.alpha java.lang.NoClassDefFoundError: Failed resolution of: Lcom/nineoldandroids/view/ViewHelper;”. It’s probably an issue resulting from using an out-of-date library named NineOldAndroid. It has been deprecated in recent Android versions. It’s better to use another library like SmartSwipe, which is compatible with new Android versions, to realize the swiping feature.

Issue2 Unexpected behavior on tag assignment

- Location: https://github.com/federicoiosue/Omni-Notes/issues/517
- Describe the bug: When users try to add new tags to a selection of multiple notes, the operation would remove all old tags that are already assigned but not among these new tags.
- Context (Where the issue is confirmed by our group):
    - Device: Nexus 5X
    - OS version: Android 7.1.1
    - App version: 25
- How to reproduce: Long click on the main screen to select a single note or multiple notes. Choose the tag icon to add tags for selected note(s). Old tags are not in newly assigned tags will be removed from them.
- Expected behavior: Simply add new tags that have never been assigned to selected notes while their old tags should be kept.
- How to resolve the issue: According to the source code in *TagsHelper.java,* the issue lies in the implementation of the method **addTagToNote()**. It can be fixed by removing the inner if block in the piece of code below:

Issue3 Notification without sound and vibration

- Location: https://github.com/federicoiosue/Omni-Notes/issues/706
- Describe the bug: notes' notification without sound and vibration
- Context
    - Device: OnePlus 5T, Xiaomi Mi a2 lite
    - OS version: Android 8.1.1, Android 9
    - App version: N/A
- How to reproduce: Set an alert with a specific time. It will happen when the time comes.
- Expected behavior: Make notification with sound and vibration on time.
- How to resolve the issue: First when users want to use the app properly, they need to check the corresponding system configurations, making sure they enable notification sound & vibration. If the issue still exists, we may look at *NotificationsHelper.java.* It implements

setRingtone() and **setVibration()** to set sound and vibration for a notification. **setRingtone()** takes an URI string as a parameter and the sound resource may no longer exist or it simply can't be loaded when the app can not be correctly connected to the source. We may change the ringtone source to a local sound file or any valid sound resource.

Issue4 RTL mode does not work

- Location: https://github.com/federicoiosue/Omni-Notes/issues/635
- Describe the bug: When using the app in RTL mode, a user was not able to see translations. Sometimes it was jumping into RTL/Persian and then jumping back to LTR/English.
- Context
    - Device: Moto G 5s plus
    - OS version: Android 8.1.1
    - App version: 5.5.2
- How to reproduce: It only happens when the user imports notes. There is no problem when making new notes.
- Expected behavior: The app interface to be indifferent to the content. Specifically, the app can use Persian when the android default language is Persian.
- How to resolve the issue: The app may not be able to identify the language setting of the user, but try to use the default language of android operating system. We can look into the files related to setting Persian. And compare it with the setting file for English.

Issue5 Crash while choosing category

- Location: https://github.com/federicoiosue/Omni-Notes/issues/741
- Describe the bug: Null pointer exception appears while choosing a category to display.
- Context: N/A
- How to reproduce:
    - Fresh install of ON
    - Create a new note, add category --> All OK. (New category is created)
    - Current editing note is still open... Now tap again on the category icon in menu bar --> app crash
- Expected behavior: make category choosing work
- How to resolve the issue: According to the user, the problem is in CategoryRecyclerViewAdapter.java --> .txtTitle. is NULL. So we can look at this file first. In the file, we found CategoryViewHolder and CategoryViewHolder related to category choosing. So next step, we could look into this method, and figure out a solution. Specifically, one aspect we should do is to check if the UI components such txtTitle are bound with code in the file.