**User research hypotheses**

1. Attitude

We believe that users want to preview the text after editing because they want to be able to confirm that some of the image links and formatting are as they expect. [unproved]

We believe that users want to see the corresponding help tips next to some buttons because they don't want to jump to the home page notes to see the help documentation every time. [unknown]

We believe that users want to search within the note title and note content based on the keywords entered because they don't want to remember the full name of each note. [proved]

We believe that users can sort by the most recent updated date because they want to know which notes have been recently modified. [unproved]

We believe that users want to see an aesthetic interface because they do not want to view an ugly, color-monotone interface that affects vision. [proved]

We believe that users would like to have more export formats as options because they want to export notes in a format that better suits their needs. [proved]

1. Behavior

We believe that users rely on the undo function to remove previous errors because they will always create some misbehavior or modify previous versions. [unknown]

We believe that users are more comfortable taking notes by handwriting mode because they can do so more efficiently and accurately. [proved]

We believe that users can rely on the tagging feature to tag and categorize some special notes because they have to manage multiple notes at the same time. [unproven]

We believe that users prefer to use a swipe on the left side to get the sidebar instead of reaching for the hamburger menu because they are more accustomed to using one-handed operations to accomplish simple tasks. [unknown]

We believe users will be more comfortable editing where they are just viewing rather than editing from the end because they don't want to spend more time comparing and finding the place they just want to edit. [proved]

We believe that users will rely on the drag-and-drop operation to sort their notes because they need to organize each notebook according to their own preferences and habits. [proved]

1. Feature

We believe that not allowing users to have the same name for different notes will make it easier for users to manipulate them because they don't need to click on the notes one by one to confirm them. [unknown]

We believe that allowing users to adjust the speed at which they scroll can make browsing more efficient because they can read more efficiently according to their preferences. [proved]

We believe that adding a progress bar after clicking the sync button will allow users to not have to worry about previous actions for unresponsive screens because they can more visually understand the status of the system from the sync progress. [proved]

We believe that allowing users to encrypt specific files will protect their privacy because they need to keep some files from being publicly displayed to others. [unknown]

We believe allowing users to set alarms in their to-do lists will better remind them of what they need to do because the alarms will be more efficient than forcing them to open the app to check. [unproven]

We believe that adding a view-only mode for users will increase the efficiency of user review because users will not be forced to jump to some URLs by mistakenly clicking on some hyperlinks. [unknown]

**User Interview Analysis**

Themes:

* Product situation
* Usability
* Individuation
* Optimization
* Compatibility

Product situation:

* Most users are satisfied with Joplin and they generally find it a very convenient and fast open source note taking application. it is privacy-focused, stable and powerful search feature (End to End encrypted)
* The spell check feature of the desktop application has been mentioned several times and is considered a great addition.
* Supporting cloud sync which prevents loss of notes (One drive, Next cloud, WebDAV, Dropbox, S3(beta), Joplin Server(beta), Joplin Cloud).
* Excellent free note sharing app with cross compatibility which is able to go back and forth among notes using shortcut keys.

Usability:

* Compared to the PC version, most users feel that there are many new features that need to be built into the mobile version to help users take notes or manage them better
* Need to add a few actions that users are used to (or frequently repeat), and for to-do lists, it's better to automatically generate a few verbose prefixes than to force users to type. For the import image button, it would be better if you didn't have to click it repeatedly (Multiple chosen images).
* The synchronization operation has many loopholes. The operation of locking the screen and cutting off the power will interrupt the synchronization progress unexpectedly. Synchronization data may be lost when it is synchronized to different clouds.
* Add the type of synchronous drive, which can accept other synchronous drives, increasing the user's optional.
* Improve the effectiveness of the search function. The partial note name can be searched and the search range should cover note title and note content.
* Most users believe that the addition of handwriting input increases user efficiency and enhances the user experience. More importantly, it can follow the mainstream notebook style and give users more maneuverability.

Individuation:

* Personalized customized scroll bar, users can adjust the speed of scrolling page according to their browsing speed in order to improve the user's browsing experience
* Allows users to set their own font sizes to enhance the browsing experience and ensure that users can see text without having to adjust to the default font size.
* Customize the color of the interface so that users can change their favorite color to meet their vision and improve the visual experience of users when using the Joplin.

Optimization:

* Optimize the latency problem when notes occupy large memory. When users enter long notes (> 30 lines), resulting in a very poor experience. The running memory of the software needs to be reduced to achieve control fluency
* Optimize the lagging problem that occurs when notes are automatically saved/synchronized for operation, and the need to ensure that user-entered data is not lost without affecting the user's use.
* Increasing the size of the attachment can make the content of the attachment richer and less limited to meet the needs of users

Compatibility:

* There is an urgent need to optimize compatibility issues for Android devices. The main problem is that the sync notes for Android will encounter permissions that can't be lifted, resulting in users not being able to use them properly
* Optimized for compatibility with multiple file formats, allows users to have more options depending on their needs.
* Need optimized sharing with other applications in order to share Joplin notes from other applications, improving sharing and compatibility with users using Joplin.

**Problem statements**

1. Dhritiman Ray, a meeting note-taker, needs to maintain a high level of fluency when notes reach a certain length in order to be able to quickly and accurately record every important piece of information during every meeting.
2. Monte Webster, a user of sync notes, needs to add some visual elements (such as a sync progress bar) to show the completion of the sync operation in order to let the user know about the system status more visually and without wasting their time.
3. χ̶я̶ι̶̶м̶ѕ̶σ̶η̶, a user attempting to edit a long note, who needs a faster scrollbar plugin to navigate the note page in order to spend less time getting to the location where he wants to view the note
4. Foxpaws Studios, an office employee, needed to export notes to txt and pdf format files on her cell phone in order to ensure that export files could be opened with a compatible editor without having to spend time converting file formats.
5. Valdemar T. Carlsen, a user of Android 11 who was trying to sync with his local system, needed to sync his notes on his Android 11 device in order to be able to sync and backup the notes on this device without losing them.
6. Casey Strouse, a user of Google Drive, needs to be able to sync his notes to Google Drive in order to better organize all his notes without having to create a new sync drive and then migrate them.
7. Nadine Custos, a college student, needs to be able to jump to the location where she is currently reading in order to avoid spending a lot of time comparing and finding the place she just wants to edit.
8. Sergei Aleinikov, a Joplin user as well as a university student, needed to be able to adjust the font size of note contents according to his needs in order to be able to read them more clearly without being touched by mistake while using the notes.

**Appendix**

25 Jan 2021Kevin Sonney (Correspondent) Feed52up1 comment, (Correspondent), K. S., Nesbitt, S., & Cozic, L. (n.d.). *Use Joplin to find your notes faster*. Opensource.com. Retrieved February 27, 2022, from <https://opensource.com/article/21/1/notes-joplin>

*R/opensource - a review of Joplin, an open-source note-taking application.* reddit. (n.d.). Retrieved February 27, 2022, from <https://www.reddit.com/r/opensource/comments/k6v0cb/a_review_of_joplin_an_opensource_notetaking/>

World Leaders in Research-Based User Experience. (n.d.). *User need statements*. Nielsen Norman Group. Retrieved February 27, 2022, from <https://www.nngroup.com/articles/user-need-statements/>

Google. (n.d.). *Joplin – Apps on Google Play*. Google. Retrieved February 27, 2022, from <https://play.google.com/store/apps/details?id=net.cozic.joplin&hl=en_CA&gl=US&showAllReviews=true>

Sherwin, D., About The Author David Sherwin is Director of User Experience for lynda.com at LinkedIn, & Author, A. T. (2013, September 23). *A 5-step process for conducting User Research*. Smashing Magazine. Retrieved February 27, 2022, from <https://www.smashingmagazine.com/2013/09/5-step-process-conducting-user-research/>

Renee, L. (2018, May 14). *How to run remote user research (like a boss!)*. Medium. Retrieved February 27, 2022, from <https://medium.com/mixed-methods/how-to-run-remote-user-research-like-a-boss-b3729954f03>

Ketterman, S. (2019, July 16). *How to leverage thematic analysis for better UX*. Toptal Design Blog. Retrieved February 27, 2022, from <https://www.toptal.com/designers/ux-research/thematic-analysis-for-ux>

Peterson, J., Brosset, P., Prater, S. V., Wills, M., PenzeyMoog, E., & Greenwood, T. (2017, May 2). *User research when you can't talk to your users*. A List Apart. Retrieved February 27, 2022, from <https://alistapart.com/article/user-research-when-you-cant-talk-to-your-users/>

Ahir, Y. (2019, December 26). *How to define user's needs statement*. Medium. Retrieved February 27, 2022, from <https://medium.com/nextuxdesign/how-to-define-users-needs-statement-ff5ee945fed9>

Eugenio, M. (2016, May 11). *Hypothesis driven design: Be the francis bacon of your product team*. Medium. Retrieved February 27, 2022, from <https://medium.com/whistle-product-engineering-blog/hypothesis-driven-design-be-the-francis-bacon-of-your-product-team-1aef48b8daea>

Code and Theme of [400 app reviews](https://canvas.sfu.ca/courses/67116/files/18054833/download)(Part of them)

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Theme | Code | Theme |
| user experience of app more native | User experience | let us adjust (or disable) the interval for auto-save | useability |
| change size of the font | Customization | Auto save can't be disabled.cant really edit long notes on mobile | User experience |
| To-Do lists is a real pain  have to manually write or paste "- [ ]". | useability | Android app to a read-only client | User experience  useability |
| so lag when i write long notes. | Current Product/fluency | still not supporting create/move subnotebook a couple of years | useability |
| (custom order seems to do nothing) | Customization | Looking forward to a better editor and a way to set its font size. | Customization |
| but this app is lacking some handy functionality I'd say | User experience | the app is a bit bulky and lacks some features | useability |
| This version doesn't support S pen writing! | Current Product/compatibility | Would be better to have it load on its own view. | User experience |
| web clipper on mobile really needed | Current Product | desperately needs the ability to create sub notebooks | useability |
| are too complicated and the language are too technical | User experience | syncing to Android is a nightmare. | useability |
| the fact that you have to learn Markdown to use the | Current Product | added to the view mode | useability |
| the app cannot keep up with the writing | Current Product/compatibility | Missing features like creating sub folders, templates, plug-ins. | useability |
| android app refuses to connect with anything other | Current Product/compatibility | more editing option, just like the desktop version | useability |
| attached video files are showing blank previews/thumbnails? | User experience | no support for Gdrive yet but looking forward to the future. | compatibility |
| Not so much on Android | Current Product/compatibility | This thing I hate most is the interface which is slow, clunky, unintuitive | User experience |
| and add some useability enhancements. | useability | text input in this app is really slow. | User experience |
| takes 10 touches due to the special characters. | useability | HTML and markdown feels such chore | User experience |
| starts to lag the undo button not there. | useability | the mobile app doesn't sync.. | useability |
| much more tedious to write in on mobile. | useability | displaying the markdown code for images when editing isn't very user-friendly. | useability |
| Kindly add this ability! I used this feature quite a lot with Evernote. | User experience | support for tables or spreadsheets. | compatibility |

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Theme | Code | Theme |
| why after 300-500 characters does the app start lagging behind | Current Product/fluency | feel more fluid in the future updates | Optimization |
| whatever that bar of buttons atop your keyboard that type in symbols or \t for you renders this unusable. | useability | is a revamp to the ui to be a bit more pleasant and user friendly! | User experience |
| it makes editing notes really laggy and sometimes some data gets lost | Optimization | It doesn't run smoothly on Android and syncing is kind of slow but overall an awesome software. | Optimization |
| weird android bug, when you use backspace to delete words, then it would shut down. | Optimization | So, you synchronise, and it looks as though it's working, BUT IT ISN'T | useability |
| the keyboard can't follow my typing,  A minor issue for me is that it always opens up notes for editing at the bottom and in long notes it takes ages to move back to the top | User experience | Joplin does not keep the file structure I may have already: it uses undecypherable file names  it does not allow me to share the Joplin app folder it created between multiple Dropbox account | useability |
| Currently grinds to almost a standstill as note length becomes more than a few paragraphs. | Optimization | Android versions are a bit slow for me but I have used it on occasion. | Optimization |
| 1. Themes 2. Exporting notes as pdf (other markdown editors like NeutriNote can do this, why can't Joplin?). | useability | the editor/cursor starts lagging immensely. Exiting and entering the editor again seems to resolve for a little while.. | Optimization |
| 1. It is impossible to disable annoying autosave. 2. It doesn't remember the last used position in editor. | User experience | Though the mobile version still lacks certain features like a dedicated search function in individual notes | User experience |
| Sync is a pain.deleted all traces of anything with the word Joplin in it, | Optimization | Tried it from both tablet (Samsung s5e) and phone (pixel 3 xl) | Compatibility |
| No import function. | useability | The only negative point is that the menu button (top left) is difficult to tap with one hand. | User experience |
| Startup time is 5 seconds, | Optimization | A better theme, a better interface for to do lists. | Customization |
| I wrote about 18 lines of text the process of writing became very laggy and uncomfortable | Optimization | but until they support WYSIWYG on Windows and Android that's all it is for the average schmuck. | compatibility |
| Sometimes when writing 5+ rows of text in a session, the app freezes or extremely lags. | Current Product/fluency | The only current downside is that editing becomes slow for long notes. | Optimization |
| Needs better search tools, currently it only allows searching of all notes from the notebook overview | Useability | except it's very slow to startup which is a pretty big issue when you just want to save a bit of text | Optimization |
| This deleted all my notes. I clicked off the failsafe as suggested by the sync message that kept popping up. | Useability | Would like U2F to be added for extra security. | security |
| it would be cool to add a little toolbar to mobile for nice functionality on the go | Useability | but there is no WYSIWYG editor both in mobile and desktop versions | User experience |
| I can't find a way to create sub-folders or export as | Useability | Most of all: search. It will not find incomplete words. You need to type it out or else it won't find anything. | User experience |
| Please make a proper and good looking real dark theme | Customization | Please remove the Welcome screen when pressing the back button while in notebook. | Useability |
| Why doesn't it use swipes, material design and seems to have custom menus that emulate IOS design? | User experience | App can't synchronize when the battery saver is on. | Useability |
| Sync is not user friendly.If you move your folder in Nextcloud it deletes all your notes | Optimization | mobile version could do with more QOL/accessibility features like scalable UI and plugins | User experience |
| It crashes periodically and makes my phone overheat. | compatibility | poor performance On OnePlus 5 (Android 9). Even with just the default notes the app notably lags | Optimization |
| 1. Lags. Optimization needed. | Optimization | syncing isn't working properly | User experience |
| but on android I see only error "permission denied: cannot create folder". | Useability | MARKDOWN is too basic and feels limited. | User experience |
| Please fix the positioning of Arabic script. | User experience | Can be flicked to scroll faster or if that's too complicated, add a "scroll bar". | Customization |
| One thing is that the background of the diagram will show as white even in dark mode | User experience | Please add google notes style tick boxes where lists of multiple tick boxes | User experience |
| for example the todo lists, you have to write - [ ] wich is hard in the phone. | useability | it doesn't support handwritten notes | User experience |