Heuristic Evaluation of Pensieve

Problem/Prototype

In this write-up, we evaluated "Pensieve", which is a prototype that lets users record memories using various forms (text, image, audio, etc.) and organize them as collections. The purpose of the app is to empower people to consistently record and reflect on their memories. The 3 main tasks of this prototype, as reported by the team are, (1) Creating mementos at the time of/day of (simple), (2) Reflecting about specific memories (moderate), (3) Mapping mementos by creating relational associations (complex).

Violations Found

1. H7: Flexibility & Efficiency of Use / Severity: 3 / Found by A, D

It's weird that when the user wants to input a reflection, the keyboard is the first one to come up and all the other mediums are accessible via tiny icons. It's worth thinking about the implications of having your app default to the text medium and having the other medium options be more "hidden". You may be diminishing the value of the audio recs, drawing and picture mediums by putting them above the keyboard and making them seem less important.

> **Fix**: I know that you considered having a menu in your low-fi prototype and took it out for your med-fi. However, I think it's worth re-evaluating this since you don't want your app to simply be used like a journal (which would happen if users only write).

2. H3: User Control & Freedom / Severity: 2 / Found by A, C, D

Unclear how the drawing is exactly going to happen. Where is the stylus size and eraser? How can users undo their mistakes? Users will want to draw small details and also large things. They might also want to erase a mark they made. Right now it's very hard for the user to do this.

> **Fix**: In drawing mode it would be nice to have a color slider on the side, or some of the features that Snapchat and Instagram have in drawing mode to give the user more freedom. Also an eraser and/or undo button would be helpful.

3. H3: User Control & Freedom / Severity: 2 / Found by A, C, D

No way to pause voice recording or cancel it. Seems to begin recording automatically. It's good to have a way to pause a recording (what if the user gets interrupted mid way through a reflection) or cancel a recording (what if the user didn't mean to start a recording in the first place).

> **Fix**: Simply add a pause button and an "x" button. Make sure to prompt the user with a warning message when they click on "x" to prevent them from accidentally deleting a voice message they didn't mean to delete.

4. H8: Aesthetic & Minimalist Design / Severity: 1 / Found by A, D

Keyboard transparency is distracting. Although the keyboard transparency goes well with the whole passive theme and neutral colors, the viewers eyes could sometimes get a little distracted by this. For me, this was especially the case when I was editing a tag name to be called "fun times". Since the "+" button is under the keyboard, it is distracting for the user and kind of makes the user go "wow, wait, what's happening here... why is there a '+' on my keyboard".

> **Fix**: Take away the keyboard transparency.

5. H7: Flexibility & Efficiency of Use / Severity: 2 / Found by A, D

The location of the icon that takes you back to the library is in a non-intuitive, non-parallel place. Why does the keyboard have to come up for you to access your memories library? Try to preserve some parallelism. Right now it seems a little dissonant that all but one of the buttons that are above the keyboard, are related to other user input mediums. It doesn't make sense that to exit the memory the user needs to pull up the keyboard. It's kind of awkward.

> **Fix**: Put the library icon on the top right corner of the screen so that it's always accessible. Maybe make it light pink so that you obtain the balance of both making it visible while not drawing too much attention to it.

6. H3: User Control & Freedom / Severity: 3 / Found by C, D

If the user clicks on the camera to upload a photo, the user cannot cancel it. User is forced to select a photo because there is no cancel button. Users might mistakenly click on the camera icon. If they do that, there's no way to exit. The only way to exit without permanently modifying their memory would be to post a photo and then delete it.

> **Fix**: Add a cancel button on top right corner of the camera screen.

7. H5: Error Prevention / Severity: 2 / Found by B, C, D

You allow for deletion of memories and deletion of elements within memories, but these deletions don't have any additional warning messages. With a single click on the trash icon, the object goes away forever. Since this functionality performs a change that's irreversible and could potentially be regretted by the user, it's important to call out the users attention and make sure they don't delete something that they didn't intend on deleting. Especially if it is a drawing that the user spent a lot of time on, they won't bother doing the same again.

> **Fix:**
> 1. Create a recently deleted page where users can restore any of the deletions they have made.
> 2. Add an additional step in the deletion process in which users have to confirm that they want to delete the item and acknowledge that by doing so the item will no longer be available.
> a. Add an undo button to the main screen or on the keyboard so that the user can undo their most recent actions.
> 3. Bonus option is having multiple of the functionalities described above. This will surely prevent any errors the user could ever do with regards to item deletion.

8. H6 Recognition rather than recall / Severity: 2 / Found by A, D

When adding a tag, I can't see what other tags this memory already has. The user doesn't want to duplicate tags, but right at the moment of adding new tags to a memory there's no way of seeing what tags are the memory already has.

> **Fix:** Fortunately, you have a lot blank space on this screen so it's easy to add in a list of the tags that that memory is already linked to. Also make sure you add in error prevention in case the user duplicates a tag (shouldn't be possible).

9. H3: User Control & Freedom / Severity: 2 / Found by A, D

When adding a tag, there doesn't seem to be space to add more than one tag. If the user wants to add multiple tags (which will usually be the case) to one of their memories, they will have to go through the process of clicking on the tag icon, providing a tag name, and saving the tag for each on of the tags that they want to create.

> **Fix:** Make it possible for users to add multiple tags by tokenizing user input with white spaces as delimiters.

10. H7: Flexibility & Efficiency of Use / Severity: 1 / Found by A

Voice recordings don't have captions/titles. If there are many voice recordings within one memory, and the user want to listen to a specific one, how does the user find the right one without having to guess and click through through all of them? When reflecting, users will perusse through the content in their memory. You want to make sure that it's easy for them to find the content in order to reflect on it. Since audio can't be visualized, it's tough to find the correct audio.

> **Fix:** Make users title their audio recordings prior to saving them (maybe with a max character limit to ensure that titles are kept short).

11. H4: Consistency & Standards / Severity: 1 / Found by A

There is an icon with a set of four squares on the top right corner of the keyboard. User can be confused by what this icon represents since this icon is not commonly used. The other icons that you have used are easy for the user to understand because they are commonly used in other apps.

> **Fix**: Consider using a folder icon like <u>this one</u>.

12. H10 Help & Documentation / Severity: 3 / Found by A, D

I am confused by the streaks in the calendar. The two dates that have the cloud seems to be too far away for them to be considered a "streak". If you want to gamify your application, the rules of the game must be made clear. Streak is defined as "a continuous period of specified success or luck". It doesn't seem like the dates with clouds should lead to a streak.

> **Fix**: Make sure it's clear for the user what a streak is an how they can maintain their streak. Maybe add a little icon like <u>this one</u> somewhere on the screen to help clear up some confusion that the user could have.

13. H4: Consistency & Standards / Severity: 4 / Found by A, B

Calendar Cloud icon is cute, but not representative of what clicking on it actually takes you to. (*Side note… what does the number on the cloud represent?)* The cloud itself isn't representative of a calendar. It's confusing that clicking on the cloud would take you to the calendar.

> **Fix:** Use a calendar icon like this one instead of a cloud.

14. H3: User Control & Freedom / Severity: 2 / Found by A

Once search results are displayed, there's no way to exit the search. There is currently no way for the user to go back to the home screen and see the collection of all the memories once they have entered the search. I think the only way for the user to go back to home would be do delete the searched term. However, that seems unintuitive.

> **Fix:** Make a "<" appear on the top left corner or a "x" on the top right corner once the user begins typing in the search field.

15. H7: Flexibility & Efficiency of Use / Severity: 2 / Found by A

There is no default categorization system. What if the user doesn't give tags to any of his/her memories? Will they all me mixed together in a unordered library under "untagged" memories? Users that use the app a lot will have a large quantity of memories. You want to help them stay as organized as possible without putting in that much work into keeping it organized by always having to tag, because otherwise they might lose incentive as a result of the extra work.

> **Fix**: Make the calendar play a more important roll. Maybe the calendar can serve as a visualization tool that helps organize all the memories based on most recent edits. And maybe the "untagged" memories at the bottom of the home screen could be sorted by last modified date (and put the date underneath the memory).

16. H1: Visibility of System Status / Severity: 2 / Found by B

The current streak count and goals texts are very hidden on the calendar page. Since all of the page and its contents have the same color, and these texts have small font, the user doesn't really pay attention to the texts underneath the calendar. As a result, it is easy to miss these streak-related components.

> **Fix:** Since the most important functionality of this page is to describe the streaks and motivate the user, I would suggest putting the streak information above the calendar view. Moreover, it might be useful to use a different color or bold the text.

17. H3: User Control & Freedom / Severity: 3 / Found by B

It is confusing how the current streak goal is chosen? The prototype doesn't give the user the option to choose it. It is unclear whether the user has chosen this at some point, or whether they have the chance to update it regularly, or whether it is a goal generated by the app randomly?

> **Fix:** Make the streak goal a clickable field, and display the user several options to choose from. If you want to give the user even more freedom, you can even let the user type their own goal. You can always give suggestions.

18. H4: Consistency & Standards / Severity: 3 / Found by B

Once a tag has been typed and the user hits return on the keyboard, the user is taken back into the specific memory, with a upper right corner label saying the tag has been updated successfully. This is confusing because the user expects to be taken back to the collection of notebooks and see the tag edited. Moreover, this information message feels out of place, since this corner is where the app usually displays the auto saving messages.

> **Fix:** The user should be taken back to the collections page once the editing of the tag is done. This is a simple fix to make the task flow much cleaner.

19. H5: Error Prevention / Severity: 2 / Found by B, C

I wish the keyboard top bar items were slightly larger. Since it is a mobile screen, it is hard to precisely click on the drawing or tagging tools. The user can end up accidentally click on the wrong item, and this would create frustration.

> **Fix:** Maybe have larger items that are in a bottom bar. This way (1) the user can precisely click the icon they want, and (2) these items are present without user having to type the screen if they immediately want to navigate to a certain memory.

20. H5: Error Prevention / Severity: 1 / Found by B

Sev 1: One confusing thing I noticed was that the app displays a cursor on the part of the page that the user typed in, even though the user might simply want to make a drawing or add an image. This is configured like this because currently all input modes start at the keyboard and the user can click on the functionalities if they want. This is rather confusing that the user has to go through the motion of starting to type before they can do anything else.

> **Fix:** I would fix this by separating the different actions the user can take. This might involve presenting the user with a set of options before displaying the cursor.

21. H5: Error Prevention / Severity: 3 / Found by B

When the user clicks on one of the existing items on the screen, there are two options: to resize or to delete. These icons are very small and are right next to one another. The user might accidentally tap delete instead of resize.

> **Fix:** Make the icons larger and put them on different corners/sides of the item.

22. H6: Recognition vs. Recall / Severity: 2 / Found by B

When the user clicks the tag icon at the top of the keyboard, they are taken to a page where they can write a new tag. I would imagine that sometimes the user might want to use pre-existing tags, but these might be hard to remember.

> **Fix:** Display a set of options for tags to choose from, but also give the user the freedom to type a new one. This way the user doesn't have to remember all the other tags.

23. H7: Flexibility & Efficiency of Use / Severity: 2 / Found by A, B, D

Power users might want to add colors to their tabula rasas. It might be useful to give power users different methods to color their drawings or the background wallpaper of the notebook. This would add more customizability and flexibility.

Fix: Add colors to drawing tools, as well as different sizes of pens the user can use. Similarly, add a feature to change the color of the background of tabula rasa when the user is editing the page or the tag for example.

24. H8: Aesthetic & Minimalist Design / Severity: 2 / Found by B

There is repetition across "Recent" category and various named categories. Should the user see repeated content across these rows?

Fix: Remove the "Recent" category. Once items have been tagged, move them from untagged to that specific category. Sort items in a specific subsection/category by time. So the user can see their most recent memories by looking at the beginning of the section, which will have the most recent memory.

25. H10: Help & Documentation / Severity: 1 / Found by B

On the main page, when the user makes edits, there is a auto-save message. "Saved..." is slightly confusing since the "..." punctuation is mostly used for ongoing actions.

Fix: Having labels as "Saving..." and "saved." would make more sense. "Saved." label can be displayed once there is no more action happening on the screen. This is similar to the Google Docs auto-saving label convention. This is a pretty quick fix.

26. H10: Help & Documentation / Severity: 2 / Found by B, C

On the tagging page, it is confusing what the text user is typing will be. There is only a brown/orange rectangle in the middle of the page, and there are no instructions.

Fix: It would be helpful to have a label or directions indicating that the user is editing the name of the tag. For example showing a title like: "Edit the tag" would make a lot of sense.

27. H4: Consistency & Standards / Severity: 1 / Found by D

Maybe this was just a thing with the prototype, but I thought it was weird that the user had to press 'return' to escape the text mode and get back to the canvas. Usually, I think of 'return' as adding a new line to the text.

Fix: In your hi-fi prototype, maybe allow the user to press anywhere on the canvas to escape the "memory creation" mode, and allow the return button to go to the next line of text. Or potentially add a "done" button near the bottom.

28. H1: Visibility of system status / Severity: 1 / Found by C

There is no indicator that a page has been saved after an audio memory has been added to the page. This is inconsistent with the drawing- and photo-memory-adding flows, where the app indicates that the page has been saved after a drawing or photo has been added to the page. This inconsistency may be confusing, since users expect a save indicator after media has been added to a page.

Fix: Add an indicator that an audio memory has been saved when it is added to the memory-editing page.

29. H1: Visibility of system status / Severity: 1 / Found by C
Unlike the memory-editing page, there are no "save" indicators in the collections page: when the collections page is edited (e.g. tag changed, memory deleted, etc.), there is no indication that the changes are saved. This inconsistency may be confusing, since users may expect "save" indicators in all parts of the app.
>   **Fix:** Add "save" indicators in the collections page.

30. H10: Help and documentation / Severity: 1 / Found by C
Since the collections page is completely different from the other pages, some functionality may be hard to find (e.g. editing tag name) for first-time users. This may make it difficult for first-time users to fully use the collections page.
>   **Fix:** Include documentation on the functionalities of the collections page, perhaps make it accessible from the app in the form of a help button.

31. H4: Consistency and standards / Severity: 3 / Found by C
When a user tries to add media to a page, the menu at the bottom of the page seems to disappear at inconsistent times. This may be confusing for users who expects to have the options in the menu available to them at all times.
>   **Fix:** Keep the menu up at all times on the main page.

32. H6: Recognition rather than recall / Severity: 2 / Found by C
Besides the string "Tap anywhere to begin," there are never any instructions on how to use the app again. This could be difficult for first-time users who do not yet know how to use the app.
>   **Fix:** Add a small instruction menu of how to use the app for the user to use when they are confused.

33. H7: Flexibility and efficiency of use / Severity: 1 / Found by C
There flow to get to the calendar view is pretty long. This may make it frustrating for frequent users who want to access the calendar view often.
>   **Fix:** Add an accelerator for getting to the calendar view.

34. H7: Flexibility and efficiency of use / Severity: 2 / Found by C, D
Frequent users may want to change tags for a page often. Currently, the flow to get to collections and then edit the tag for a page is long. This may make it frustrating for frequent users who wants to change tags often. Or, even if they don't want to change tag often, it still takes a while for them to get to their collections and see previous memories.
>   **Fix:** Add functionality to the tag button in the main menu, where--rather than just having it add new tags--if a tag for the page already exists, the tag option would allow a user to edit the tag for that page. Also, you could have the home screen open to their collections page, because then it's easy to press the "add" button to start with a new canvas but also gives them easy access to their previous memories.

35. H8: Aesthetic and minimalist design / Severity: 2 / Found by C

As pages are added, the collections screen may start to look busy with the page previews looking cluttered, each one having small icons within themselves. This may make it less aesthetically appealing to users who have added lots of memories.

      Fix: Have a thumbnail for each page rather than a full page preview.

36. H1: Visibility of System Status / Severity: 4 / Found by B

What is the number in the cloud? There is no explanation for what this number represents? When clicked, it takes the user to the calendar, but none of the calendar entries have the number 2, which is displayed on the cloud.

      Fix: For this fix, I am assuming this number is the current streak count. The user can figure out what this is if the same cloud icon and the number is used in this page. For example, you can insert the cloud with the number in the beginning of the line that writes "streak count:"

Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status	0	2	1	0	1	4
H2: Match Sys & World	0	0	0	0	0	0
H3: User Control	0	0	4	2	0	6
H4: Consistency	0	2	0	2	1	5
H5: Error Prevention	0	1	2	1	0	4
H6: Recognition not Recall	0	0	3	0	0	3
H7: Efficiency of Use	0	2	4	1	0	7
H8: Minimalist Design	0	1	2	0	0	3
H9: Help Users with Errors	0	0	0	0	0	0
H10: Documentation	0	2	1	1	0	4
Total Violations by Severity	**0**	**10**	**17**	**7**	**2**	**36**
Note: check your answer for the green box by making sure the sum of the last column is equal to the sum of the last row (not including the green box)						

Evaluation Statistics

Severity / Evaluator	Evaluator A	Evaluator B	Evaluator C	Evaluator D
sev. 0	0	0	0	0
sev. 1	30% (3/10)	20% (2/10)	40% (4/10)	20% (2/10)

sev. 2	47% (8/17)	41% (7/17)	47% (8/17)	47% (8/17)
sev. 3	43% (3/7)	43% (3/7)	29% (2/7)	43% (3/7)
sev. 4	50% (1/2)	100% (2/2)	0% (0/2)	50% (1/2)
total (sev. 3 & 4)	44% (4/9)	56% (5/9)	22% (2/9)	44% (4/9)
total (all severity levels)	42% (15/36)	39% (14/36)	39% (14/36)	36% (13/36)

*Note that the bottom rows are *not* calculated by adding the numbers above it.

Summary Recommendations

Overall, we really loved your UI. We think most things have been very well thought out. The color selection is perfect because it really helps set the tone of introspection, peace, and self-reflection.

In general, the app is very intuitive and after playing around with it for a few minutes the user should have no problem navigating the app. Nonetheless, we still feel like the location of some of your buttons, and the icons used for those buttons, could be modified so that users have a better sense of how to navigate the app.

Our general recommendation when moving forward with your hi-fi prototype would be to be a little more careful when thinking about the edge-case scenarios and error prevention. Make sure that you cover all of them (we emphasized the edge-cases that we found in the heuristic evaluation list, but we're sure that as you develop other functionalities within your app more edge cases will surface). The biggest issues we found were around having very little room for error because of the ways to undo/redo actions. These issues can be easily resolved with undo/redo buttons and action confirmation popups. Some other issues surround the state of the app not always being clear and long user flows for frequent users, as stated above.

Great job overall! We are really excited to see the final product.

Heuristics

H1: Visibility of System Status
- Keep users informed about what is going on

H2: Match Between System & Real World
- Speak the users' language
- Follow real world conventions

H3: User Control & Freedom
- "Exits" for mistaken choices, undo, redo
- Don't force down fixed paths

H4: Consistency & Standards

H5: Error Prevention

H6: Recognition Rather Than Recall
- Make objects, actions, options, & directions visible or easily retrievable

H7: Flexibility & Efficiency of Use
- Accelerators for experts (e.g., gestures, kb shortcuts)
- Allow users to tailor frequent actions (e.g., macros)

H8: Aesthetic & Minimalist Design
- No irrelevant information in dialogues

H9: Help Users Recognize, Diagnose, & Recover from Errors
- Error messages in plain language
- Precisely indicate the problem
- Constructively suggest a solution

H10: Help & Documentation
- Easy to search
- Focused on the user's task
- List concrete steps to carry out
- Not too large

Severity Ratings
> 0 - don't agree that this is a usability problem
> 1 - cosmetic problem
> 2 - minor usability problem
> 3 - major usability problem; important to fix
> 4 - usability catastrophe; imperative to fix