OOP Project Heuristic Usability Evaluation Report – Group 12

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1 INTRODUCTION

1.1 Aim of the report

The goal of heuristic evaluation is to find usability problems in an existing design (so that they can be fixed). This can be viewed as a method of visual "debugging" for user interfaces[1]. Participation of multiple evaluators and their expertise in the user interface analysis lead to the nearly certain identification of most of the issues, even when they appear infrequently or hard to detect. After all identified problems are resolved, the proposed final design, in section 2.5, is easier to perceive and use.

1.2 Initial prototype

The server connection screen is the first page that shows up on startup. Connect as admin is a checkbox that changes the scene into a server connection screen for admins if checked. If the address does not exist a red border appears on the address field and the user is not redirected. If the address is valid the main page is shown. If the combination of password and server is correct the admin is connected. Else a red border appears on those fields. The admin has the same client but all boards that exist on the server are shown and there are no modification restrictions.

Figure 1: Server connection screen

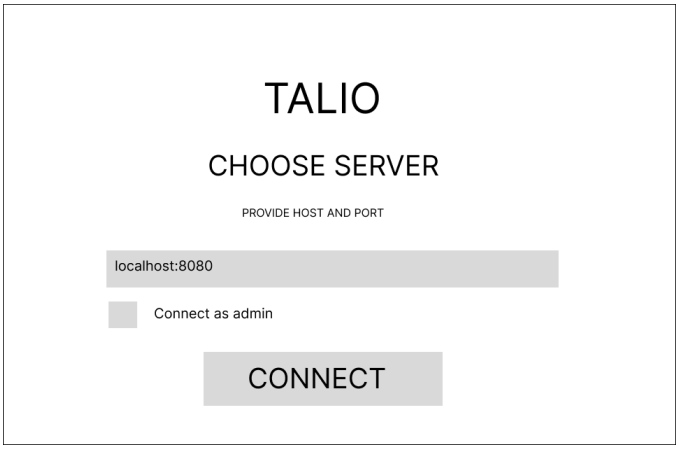
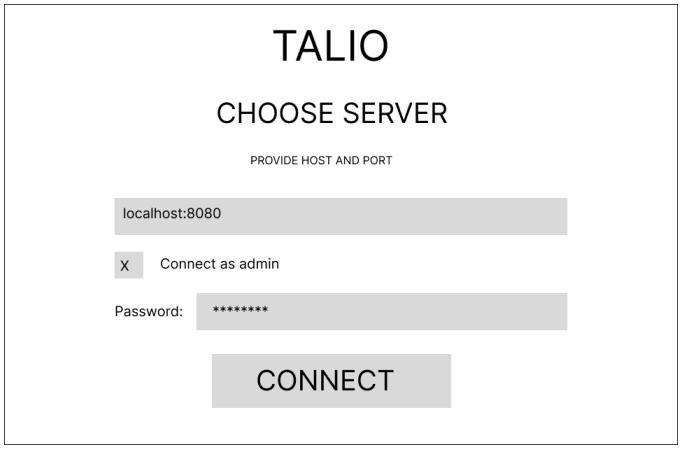


Figure 2: Server connection screen for admins



On the main page, the default board is loaded first. To share the board click on the top right button to get the sharing code, which appears in a bar at the top of the overview. The bar on the top disappears if the share button is clicked again or the board is changed. To delete the current board click the top left button. To change the title click on the title on the title bar and modify it. All joined or created boards are on the left bar. Change boards by clicking on their name. To add a board click the add board button. This will give you options to join an existing board by id or create a new one.

Figure 3: The main page (default view)

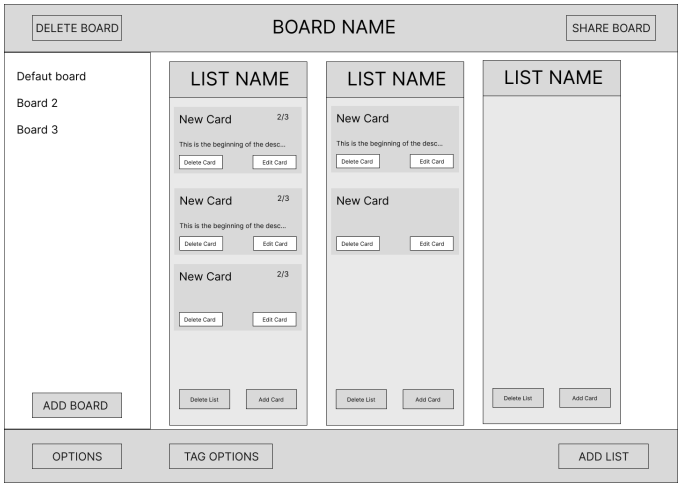


Figure 4: The main page (after share button is clicked)

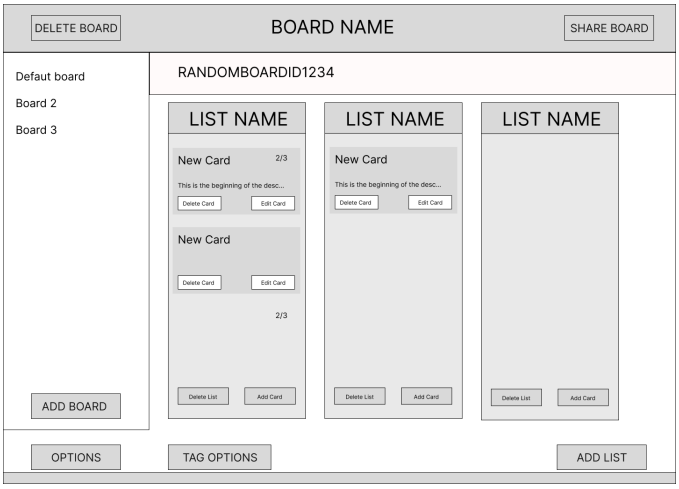
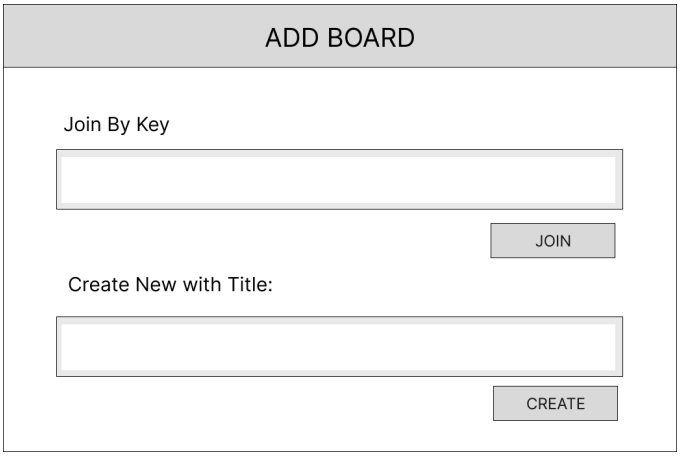


Figure 5: The pop-up menu for adding boards



When in the main page, to add lists click the bottom-right button. If the lists don't fit in the assigned space you can scroll horizontally. To change the name of a list click on its title and modify it. To delete it you have a button on the list. To add a card to a list you have a button on the list. If the cards don't fit in the list you can scroll vertically inside the list. To delete cards you can press the button on the card. To edit cards double click the card to open a card editing menu. If the description or sub-tasks exist, the cards add distinctive details. The options button has a menu with options for servers and customization. The change server option sends you back to the first page (server connection page). The customization option opens the customization menu.

The card editing menu has options to change title, description, tasks, tags. To save changes and close the menu there is a "Done" button.

From the customization menu the user can change the background color of the board, cards, or lists. The color is saved on the client and is loaded when the board is loaded. Changes are applied automatically when selected. Pressing on the colored squares leads to opening a color picker menu from which colors can be changed.

Figure 6: The main page (horizontal scroll bar is showcased)

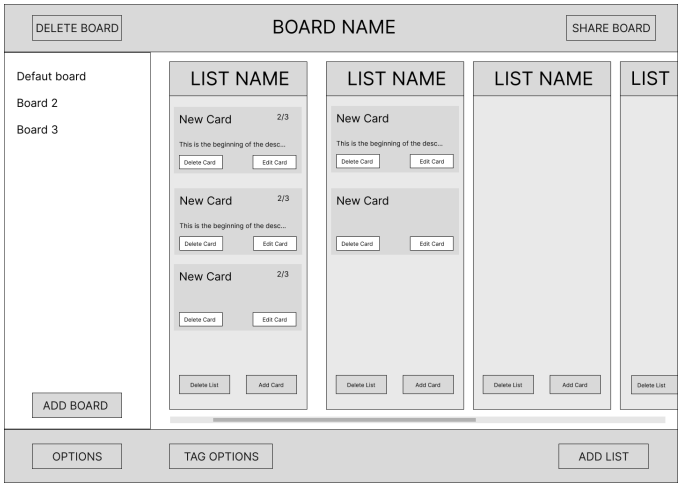


Figure 7: The card editing menu

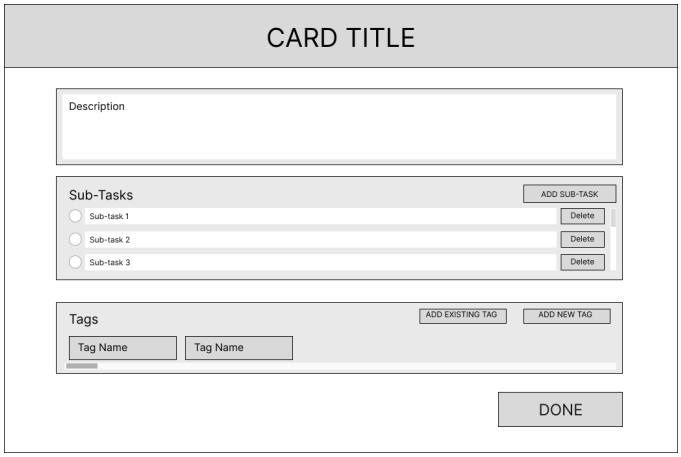


Figure 8: The main page (with options menu showcased)

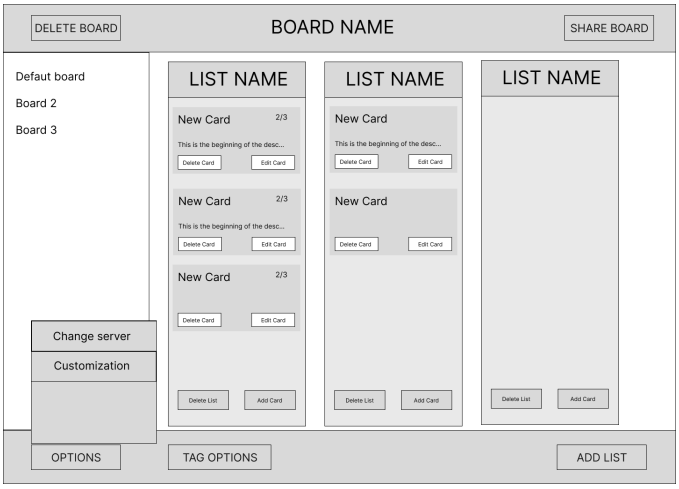


Figure 9: The customization menu

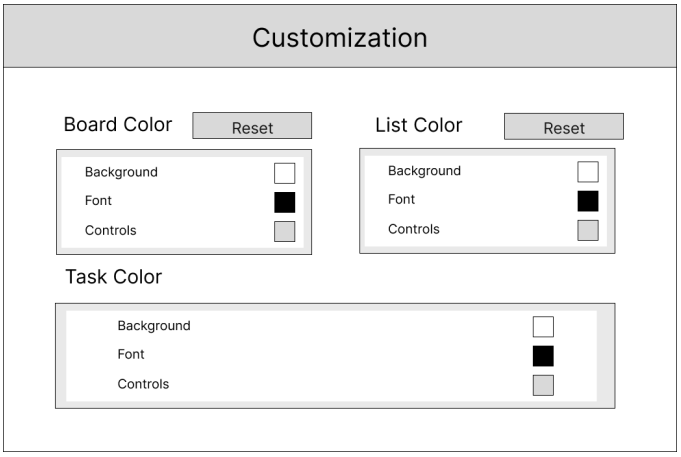
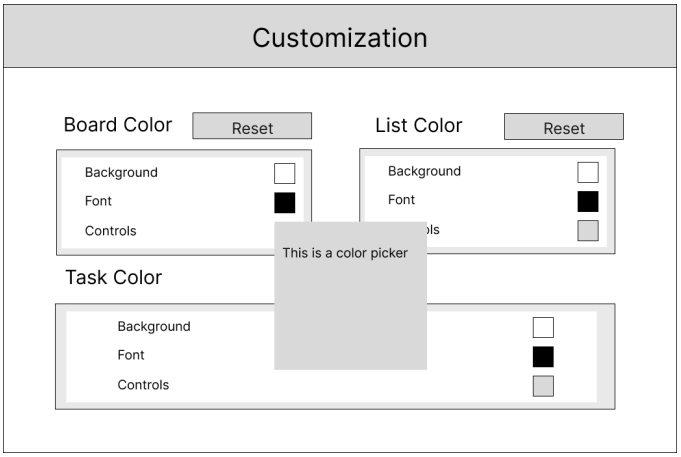


Figure 10: The customization menu (with color picker).



If tags are selected only the cards with those tags are shown on the main page and an overview of the selected tags appears at the bottom of the page as a bar. If no tags are selected the bar on the bottom is not shown and all cards are presented. The tag options button gives a menu for tag settings. This menu gives options to add, delete, and edit tags and pick which tags are allowed to be shown on the board. If no tags are selected, everything is shown on the board. When creating a new tag or when clicking the name of a tag in the tag options menu the tag edit menu appears. The tag edit menu gives options for changing the title and picking the color of the tag.

Figure 11: The main page (with tags overview bar)

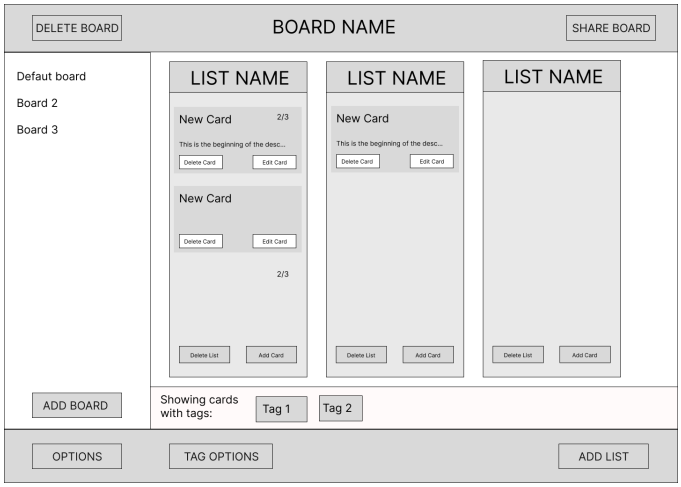


Figure 12: The tag options menu

Figure 13: The tag edit menu

2 METHODS

In this section, the methods used throughout the heuristic usability evaluation are specified and explained.

2.1 Experts

We recruited a team of 6 students in computer science aged 17-25. They do not have previous experience in UI design and we expect their familiarity with digital interfaces to be average. Thus, the evaluators fall in the group of the "novice" evaluators, henceforth, the proportion of issues to be detected is estimated to be 55%[2] by means of graph interpolation.

2.2 Procedure

The team that evaluated was asked to conduct a heuristic usability evaluation of our project prototype according to the rules we sent them.

We provided them with a design prototype of our application in a form of wireframes with detailed explanations of the functionality of every scene and each component on it. In those, we included all the functionality we already implemented in our application as well as the aspects we are planning to implement. The experts are asked to go through the application at least five times and try to simulate its typical usage scenario by supposing that they are using the application to organize their daily tasks as a university student. During that they should find as many problems by looking at any of the following heuristics [3]:

- Visibility of system status
- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Help and documentation

It is important to note that each expert needs to individually look at the materials we have provided and evaluate the product in isolation from other evaluators, since the reviews of different people were shown to be statistically nearly independent, thus leading to a significantly higher proportion of issues found in comparison to the case with single evaluator[1]. Also, while the team was conducting their analysis of our product, we employed one person from our team to play the role of the observer. He was supposed to guide the team while they were conducting the evaluation. He helped them use the application in an expected manner and spot additional details that may have been missed otherwise.

For each problem found, the evaluator should write a short title on what the problem is along with a detailed description of the problem, a description of the difficulties created by the problem, the specific context in which the problem occurs, and suggest possible causes for the occurrence of the problem. Moreover, the estimate of the severity of the problem should be provided, being either a major or minor usability problem.

The evaluation aims to measure and quantify the usability of the user interface of the prototype. The evaluators are instructed to report their findings as a list of usability problems, in the format described above. To elaborate more on these points, the brief description instructs them to explain what the problem is so that we understand where to look for. The specific context where this problem can occur will give us a better idea of the cases we need to consider to approach solving this problem. The likely/actual causes will also indicate to us where our team made a poor choice in our initial design process so that we can rethink our decisions. It also asked them to give us a severity estimation, which will be used by our team to prioritize which issues to solve first. Finally, some suggestions for improvement are requested.

The requirements are specified in such a specific and strict manner, so that not only do we receive an evaluation of high quality, but also so that the procedure can be repeated by other experts and/or teams, thus making our research replicable. In addition, the high level of detail of the identified issues allows for more efficient development of mitigation methods. As the evaluators were also instructed to indicate where the problem is by referencing slides and pictures, these will also be used to better understand the source of the problem. The results will be used to improve our user interface in a way that makes it more convenient to use.

3 RESULTS

Our experts have reported a variety of problems from different aspects of our interface. We will categorize their findings regarding their severity into two categories, minor and major. This will be used to enhance our prioritization process.

3.1 Major severity problems

In this section, the problems that were quantified as "Major" by at least one evaluator are listed.

Problem 1. The card edit menu does not have a cancel button, that allows users to reset the card to the state before the edit. Lacking the option to revert unwanted changes goes against the "User control and freedom" heuristic [3]. A cancel button can be added that allows the restoration of the initial state of the card, discarding any new changes.

Problem 2. Tag edit menu does not have a cancel button. Hence, users are not able to discard their changes or return on creating a

new tag, going against Nielsen's third heuristic [3]. It is quite likely that users will enter the menu to create a new tag automatically, and only after a small delay remember that there already exists the desired tag. The "Cancel" button should be added.

Problem 3. The problem with the current "Task color" label in the customization menu violates the Usability Heuristic of Match between the system and the real world [3]. Users may find it challenging to understand what "Task color" refers to, causing confusion. Although it eventually becomes apparent that this option refers to the background color of the cards, initially it can be frustrating for users. To enhance the usability of the system, we recommend changing the label to "Card color", to keep the naming consistent.

Problem 4. Users face difficulty when trying to edit tags because of the lack of visual aid, which violates Nielsen's visibility of system status heuristic[3]. There is no visible edit button in the tag menu, and clicking on tag names is counter intuitive, causing frustration to users that might be unaware the option to edit exists. To address this issue an edit button could be added for each tag.

3.2 Minor severity problems

In this section, the problems that were quantified as "Minor" by all evaluators are listed.

Problem 5. There is no clear indication of the selected board in the side menu which can cause confusion for users. This issue violates Nielsen's heuristic of visibility of system status [3]. Despite the fact that the board name is prominently displayed on the page, this is not sufficient when trying to identify the current board, especially when there exist boards with similar names. To address this usability concern, it is recommended to implement a feature that highlights the currently edited board in the side menu, thereby providing users with clear system status.

Problem 6. The lack of a reset option for the task color in the customization menu violates Nielsen's heuristic of user control and freedom [3]. There might be cases when users don't remember the exact color that was set for the task before. To address this issue, we recommend adding a reset button, thus giving the user more control to restore the color palette to its original state.

Problem 7. The lack of separation between board names on the sidebar violates the Usability Heuristic of Visibility of system status [3]. Users may accidentally click on the wrong board, causing frustration and requiring additional time to locate the desired board. We recommend adding a border between board names. This solution aligns with the heuristic, making the status of the system more visible and easier to navigate.

Problem 8. The lack of clear indication on how to close the board ID after sharing violates the heuristic of visibility of system status[3]. To address this, we propose changing the "Share board" button to the "Hide ID" button while the ID is shown and automatically hiding it 30 seconds after it appears.

Problem 9. The ease of accidentally deleting boards is a usability issue that violates Nielsen's heuristic of error prevention and recovery[3]. An accidental click on the delete board button leads to the instantaneous deletion of the board, which is an undesired behavior. To address this issue, it is recommended to implement a confirmation prompt that asks users to confirm their intention before proceeding with the board deletion.

3.3 Prioritization of Problems

In our prioritization of the problems, we have decided to address firstly the problems categorized as major, then those categorized as minor. In each category, we first looked at the problems which were found by the largest number of evaluators. If there is a tie between the problems, our team prioritized the problem which could be resolved within a shorter time frame in order to maximize the number of problems solved. Table 1 gives information on the problems found by each evaluator.

ID	M1	M2	M3	M4	m5	m6	m7	m8	m9
#1	x	x	x		x	x		x	
#2	x	x			x				x
#3		x	x			x			
#4	x	x	x	x		x		x	x
#5		x	x	x			x		x
#6	x	x			x			x	

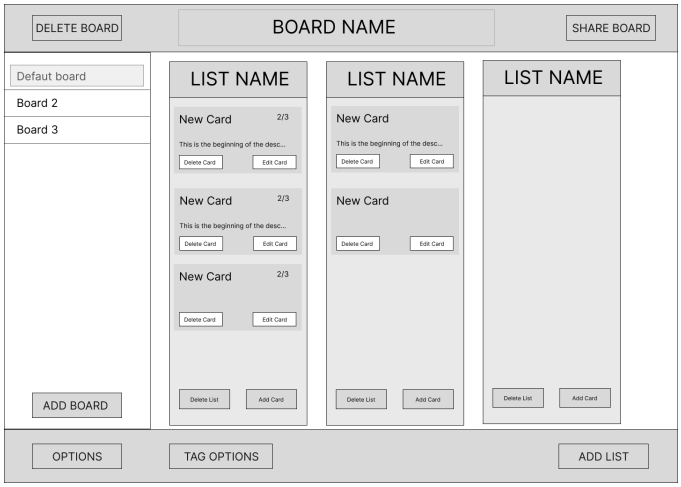
Table 1: Problems and the corresponding evaluators who found them. "M" indicates a major problem and "m" indicates a minor problem.

3.4 Improvements

We have made a series of improvements based on the problems reported. We will illustrate these improvements on the product prototype.

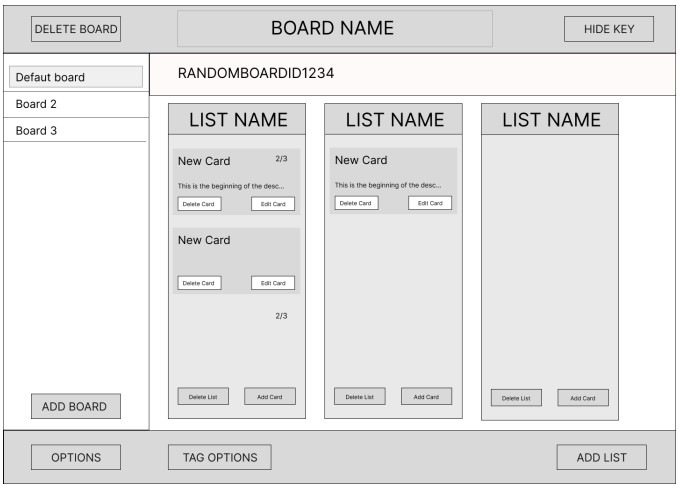
To satisfy the heuristic of visibility of system status [3] we decided to surround the editable titles with borders so that it is clear to distinguish and click on them. We added a highlight for the selected board on the side menu so that users know which board is currently shown and separators between board titles.

Figure 14: Redesigned board view



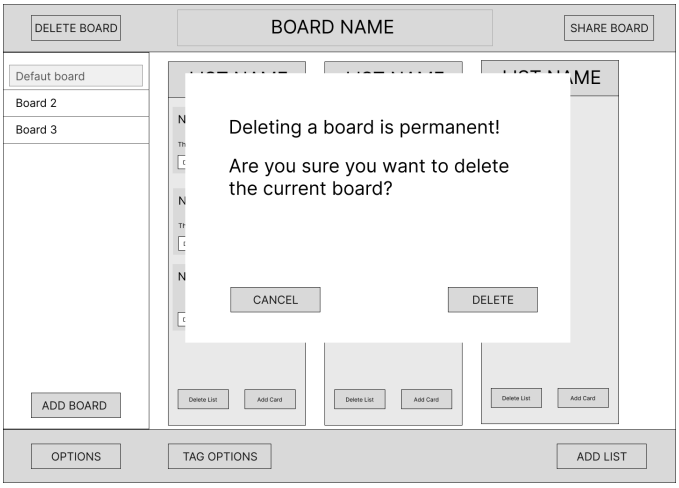
When the user clicks the "Share board" button, the text of that button changes to the “Hide key” so that it is clear how to get back to the default view of the board, which now satisfies Nielsen’s heuristic of visibility of system status [3]

Figure 15: Added cancel option when sharing board



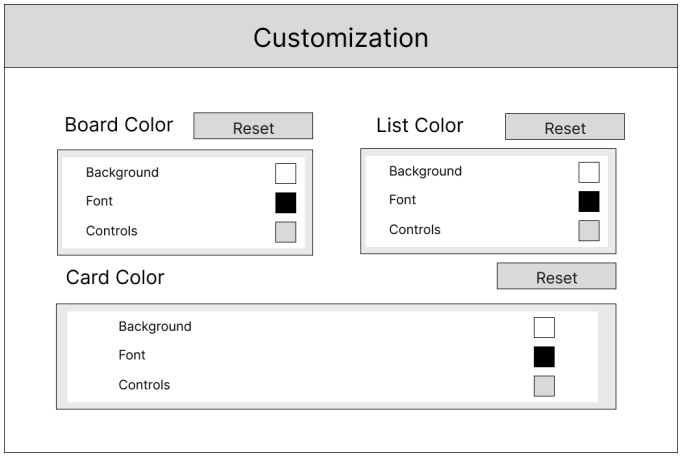
To satisfy Nielsen’s heuristic of error prevention and recovery [3] we added a menu that pops up every time the user click to delete a board and asks them if they are sure that they want to delete the board, together with all its contents.

Figure 16: Display of pop-up for deleting boards



In a customization menu, for a task colour field we added a reset button so that the user can revert the colour changes he made in one click, instead of manually picking the same colour as it was before, improving user control and freedom. Also, the text was changed from “Task color” to “Card color”, now satisfying Nielsen’s second heuristic [3].

Figure 17: Improved customization menu with reset option

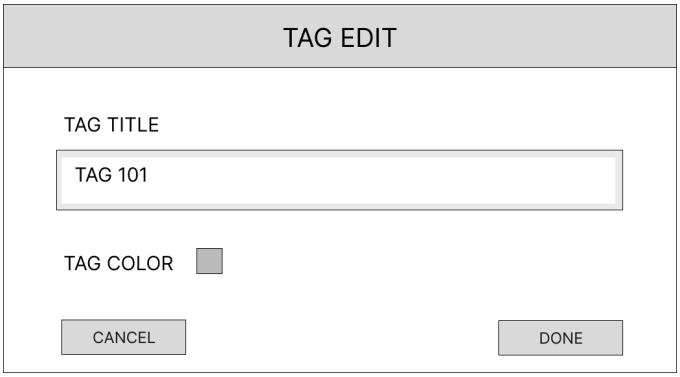


To satisfy Nielsen’s third heuristic [3], in the card editing menu we added a cancel button so that the user can discard the changes he made and restore the previous state of the card

Figure 18: Improved card editing scene with cancel button

To satisfy Nielsen’s third heuristic [3], in a tag editing menu we added a cancel button that discards the changes made to the tags so users can go back to the previous organisation of tags.

Figure 19: Improved tag editing menu with cancel button



In the improved tag options menu an edit button has been added to all tags to better illustrate that they are editable to satisfy Nielsen's visibility of system status heuristic [3].

Figure 20: Improved tag editing menu with edit button

4 CONCLUSION

After receiving the evaluation from the team we saw multiple problems of different severity in our project design that have been spotted by one or more members of the evaluating team. Problems of major significance were violating Nielsen's heuristic about user control, visibility of system status and freedom, and match between the system and the real world [3]. Our major oversight was that we didn't include cancel buttons on the tag and card edit menus. By changing aspects of our application according to the such as adding cancel buttons we improved the overall design of our application so that it is more in line with Nielsen's heuristics.

From the response that we received from the evaluators and the way we changed our design, we can conclude that a heuristic usability evaluation provides valuable information about the design of an interface from multiple perspectives. In future work, we will make sure to spend time on the user interface evaluation using all available techniques.

REFERENCES

[1] Jakob Nielsen. 1992. Finding usability problems through heuristic evaluation. In *Proceedings of the SIGCHI conference on Human factors in computing systems.*
[2] Jakob Nielsen. 1994. Usability inspection methods. In *Conference companion on Human factors in computing systems.*
[3] Jakob Nielsen. 2005. Ten Usability Heuristics.