OOP Project Report – Group LXVII

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1 INTRODUCTION

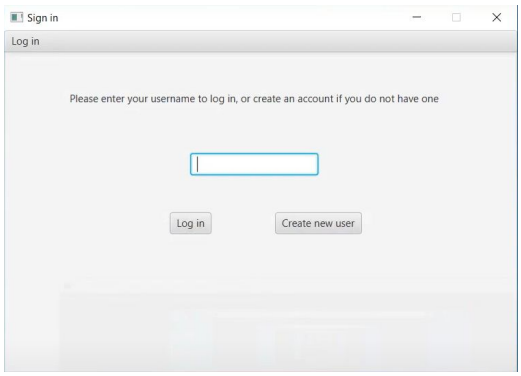
Motivation and objective

Due to the prevalence of desktop applications in these times, the appearance and ease-of-use of a product are crucial features for first-time users. Therefore, the analysis of the design and human-computer interface is an essential step in the development of any application. The aim of the evaluation is improving our program's design and usability.

Our prototype

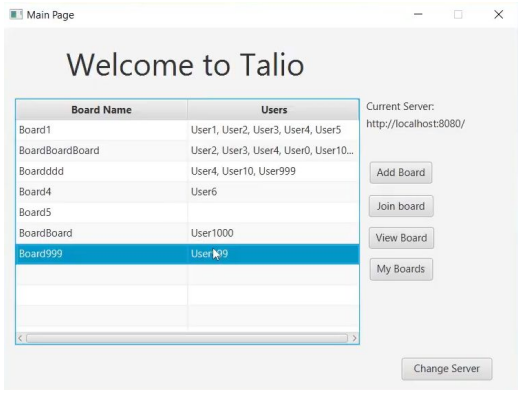
The prototype used for the evaluation is a walk-through video of our application. It is a very crude version of our app which contains most of the basic features and some of the multi-board ones. In this version, users are only able to create, edit and delete boards, lists and cards. Moreover, the transitions can be seen in the video [1].

Figure 1: Main Page/ Login Page



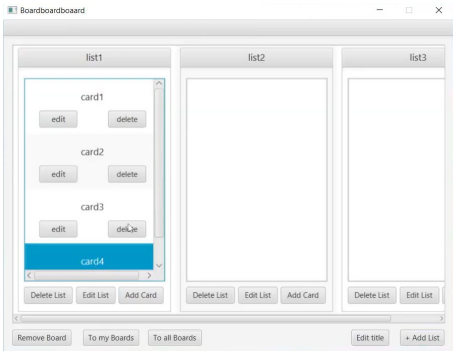
Users can log in or create a new username

Figure 2: Board Overview



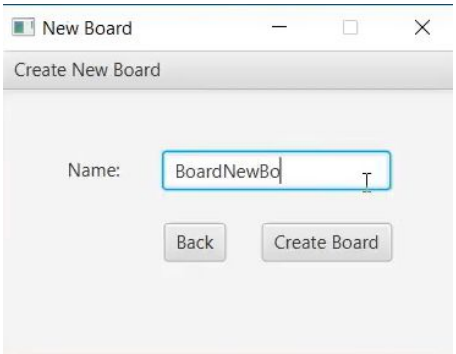
Users can join an already existing board or create a new one.

Figure 3: Board page



The users can organize their tasks, they can create lists and cards whose name represents the task

Figure 4: Board page



Typical dialog page for creating or editing objects

2 METHODS

Experts

The recruited experts are 6 students that are familiar with the requirements of the application since they are developing a Talio app of their own in the OOP Project. Their level is slightly above average, since they have been instructed about the procedure and heuristics, and had the opportunity to perform an evaluation during the HCI lecture.

Procedure

The evaluation procedure took place according to Nielsen's "How to conduct a Heuristic Evaluation" [3]. The experts need to watch a video of our prototype application and they were sent the steps of the procedure via text messages.

(1) We sent the prototype video to all of them and an overseer was always available in case of any questions or difficulties.
(2) We instructed them to watch the video individually at least three times.

(3) We asked the experts for feedback when they considered having a good grasp of the application and the potential issues.
(4) Each of the experts took notes of their feedback and sent it to us.
(5) Our team then selected, adapted and centralized the experts' responses.

Heuristics

The experts had to follow Nielsen's 10 heuristics [2]. in their evaluation:

(1) Visibility of system status;
(2) Match between system and the real world;
(3) User control and freedom;
(4) Consistency and standards of the design;
(5) Error prevention;
(6) Recognition rather than recall;
(7) Flexibility and efficiency of use;
(8) Aesthetic and minimalist design;
(9) Help users recognize, diagnose, and recover from errors;
(10) Help and documentation.

Measures (Data Collection)

We aim to measure how easy to use and intuitive our application is. In order to do this we are collecting feedback after experts' first interactions with our program. The gathered set of data is reasonably large and should be a good measure of how appealing and easy to use our app is, allowing us to make significant alterations to it.

Data is gathered by recording the experts' first impressions of our application after at least three test runs. The experts watched the video individually as many times as they wanted and then took notes of their feedback. They were instructed to try to be as specific as possible and add a potential solution for every issue. Afterwards the data is sent to us. Our team filters and adapts their feedback such that we can implement the proposed solutions to the issues in our final app. After listing all of the experts' impressions and suggestions, we assign a level of significance (from a scale of one to five) and an adequate heuristic out of the ten. (See *Figure 5*)

3 RESULTS

Upon receiving feedback from the experts' "first impressions", we managed to group all the points in 16 different interface issues that cover 7 out of the 10 Nielsen's heuristics.

The most common categories in which a design problem could have been placed were "Flexibility and efficiency of use" and "Consistency and standards of the design". Contrary, (2) Match between system and the real world, (3) User control and freedom and (9) Help users recognize, diagnose, and recover from errors problems were not found by the experts. The following list contains every point found by the experts, sorted descending by frequency, which is written in parentheses. Some of the items are accompanied by suggestions listed through bullet points:

(1) The design is dull and not informative enough. *#8 Aesthetic and minimalist design* (4)
- The user interface of the "Sign in" page could be subjected to improvement. A thicker font for the text and a placeholder for the username in order to be more clear could be used. The buttons could also be larger since there is a lot of empty space.
- Make fonts bold and buttons bigger and add placeholders for all text fields.
- The font size of editing/adding seems aggressively big.

(2) Users should be able to choose which server they want to join instead of being connected to a server instantly after logging in. *#6 Recognition rather than recall* (3)
(3) In the Board view the board page should be open in the background. All the operations (edit, delete, add) should be pop-ups. *#7 Flexibility and efficiency of use* (3)
- It is confusing as it is unclear as to where and what we are editing.

(4) There is no extra info page. This would help the user understand what the point of the app is and how it works. *#10 Help and documentation* (3)
- Maybe there could be an info box when viewing all boards.

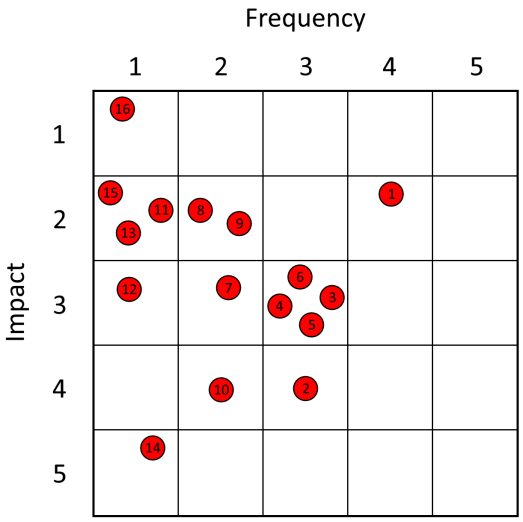
(5) The user has a hard time recognizing individual cards. *#4 Consistency and standards of the design* (3)
(6) There is no warning that a board/list/card will be permanently deleted. *#5 Error prevention* (3)
- Add a second check explaining what will happen.

(7) Users do not know that they can drag and drop cards. *#6 Recognition rather than recall* (2)
(8) The users cannot see which username they are currently using. *#1 Visibility of system status* (2)
(9) "View Board" and "Join Board" buttons are confusing and it seems that they have the same function. *#4 Consistency and standards of the design* (2)
(10) When creating a third list a scroll bar appears, so dragging and dropping a card between the first and last list is not possible or it is a challenge for the user. *#7 Flexibility and efficiency of use* (2)
(11) Too many users joining a board can cause an overflow in the user list column in the main page. *#7 Flexibility and efficiency of use* (1)
(12) Dragging a card in the middle of a list does not make it easy to understand where the card is going to be dropped. *#1 Visibility of system status* (1)
- Have the cards move.

(13) The title of the board should be more visible and detached from the window bar. *#1 Visibility of system status* (1)
(14) Dragging cards in the board view has a slight delay, which can cause problems when multiple users would be able to edit a single board. *#1 Visibility of system status* (1)
(15) The placement of the 'cancel' and 'save' buttons is inconsistent between the different windows. *#4 Consistency and standards of the design* (1)
(16) Windows have different sizes, titles and text fields are inconsistent in formatting and sizes between different windows. *#4 Consistency and standards of the design* (1)

To compute a priority matrix, we have identified two crucial factors related to the usability problems mentioned above - frequency and impact - on an integer scale from 1 to 5. The frequency describes the number of experts that spotted a particular issue. The impact is evaluated by the developer team as a mean value of scores provided by the team members on an integer scale from 1 to 5 based on individual assessment of the issue's severity ranging from low (1) to high (5), rounded to the nearest integer. As a result, we managed to compute the matrix in Figure 5.

Figure 5



Priority matrix of the usability problems

The importance of the listed issues was estimated concerning both the recorded frequency and devised Impact, whilst considering the latter parameter minimally superior. Therefore, improvements in the application were prioritized with the use of this matrix in descending order of the sum of the frequency and impact of the corresponding usability problems. In case two issues had an identical sum of the aforementioned parameters, the one with a higher Impact value was considered more imperative.

For instance, following the described principles, the introduction of a help page (problem No. 4) preceded the addition of means of displaying the current username (problem No. 8).

4 CONCLUSIONS AND IMPROVEMENTS

For the most part, evaluators had similar views regarding the design and friendliness of the application. This can be observed in the frequency matrix (see *Figure 5*). A common element in the experts' feedback regarding the design was the dullness of the pages. Most of them do not stand out in any way or are not pleasing to the eye. The main problem being that the proportions of the pages are too small and sometimes information is hard to distinguish. We have fixed these specific issues in the following ways:

Stylizing the pages: The colors of the background and the font aren't white and grey anymore, as shown in Figures 6, 7, 8.

Figure 6: Boards Overview Page

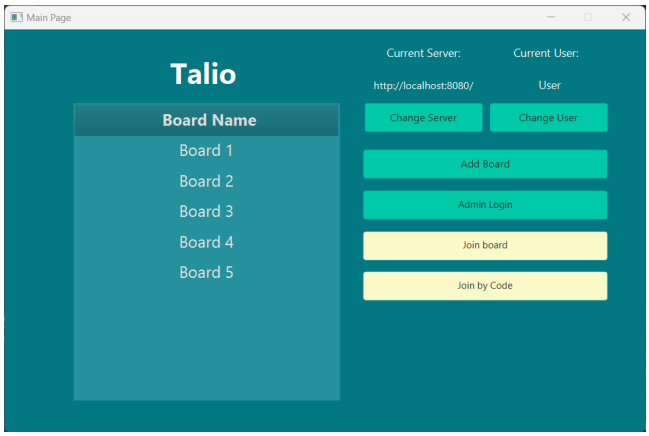


Figure 7: Create Board Page

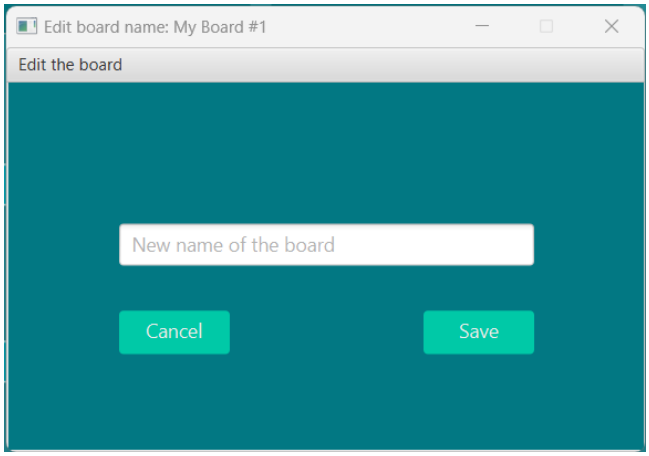
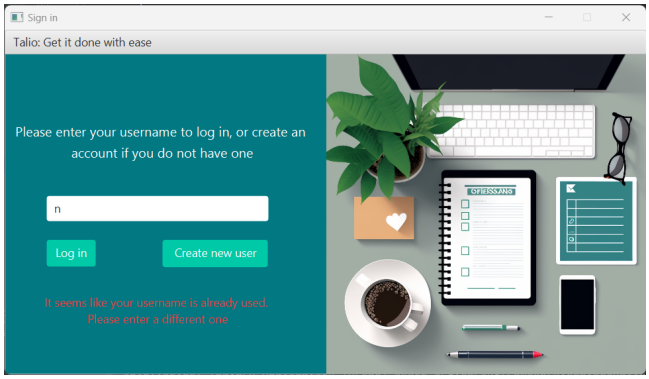


Figure 8: Main Page/ Login Page



Editing the Sign In page: It now includes an image making it stand out. Moreover, the error messages are now in a red font,

which makes them easily distinguishable.(See *Figure 8*)

Board Customization: We have implemented customization features, which allow the users to experiment with different styles, by changing the background and font colors boards, lists and cards. Figures 9 and 11 showcase the same board; the first one is plain, however, in the latter, the colors have been changed by the user by pressing the "Customize" button, which opens a new pop up window providing the user with customization options.

Figure 9: Board View Page

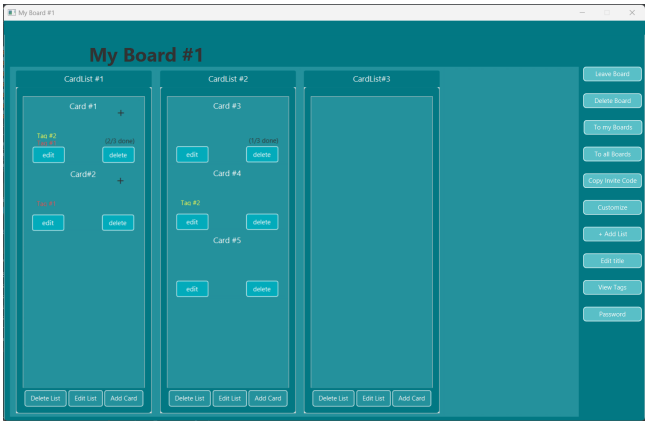
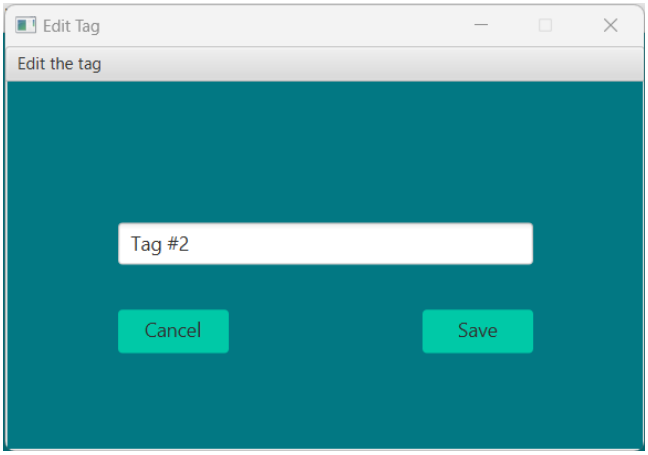


Figure 10: Edit Tag Page

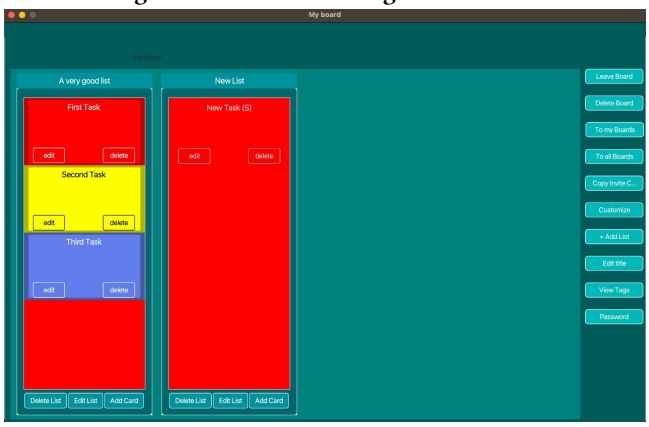


Consistent design: The same terms for editing, deleting, saving or canceling a change are now used throughout the entire application. Figures 7 and 10 showcase two examples of this; they both use the same terms for discarding the change (Cancel) and for confirming it (Save).

Expanding the overview page of a board: the page showcasing all details of a board is now much larger, allowing more content to be displayed. This is made clear in Figures 9 and 11.

Making the cards more distinguishable: The cards names are displayed in a larger font, and each card takes more space in order to display information about subtasks and tags, as shown in Figure 9. In addition, the user is now able to set different colors for each card, to highlight important cards, as shown in Figure 11.

Figure 11: Board View Page customized



Not displaying the list of all users that have joined a board: In the page where the user can see all the boards they have joined, the tables have been altered so they only have one row, including only the name of the board. This way, we prevent an overflow on the list of users that have joined a board. (See *Figure 6*)

Displaying the title of a board in a more visible way: As displayed by Figure 9, the title of the board is now displayed at the top of the page containing details of that specific board.

As for the usability part, the main issues arising in the data are that the user is rarely informed about the current status of the application and assumed (potentially wrongly) to be experienced with similar task-planner applications. As a means to solve these problems we have:

Made all adding and editing pages pop up windows: This way, the flow of the application is not interrupted, and the user does not focus of where they add or edit something. (See *Figures 12, 13*).

Figure 12: Create Board Page as a pop-up

Figure 13: Edit List Page as a pop-up

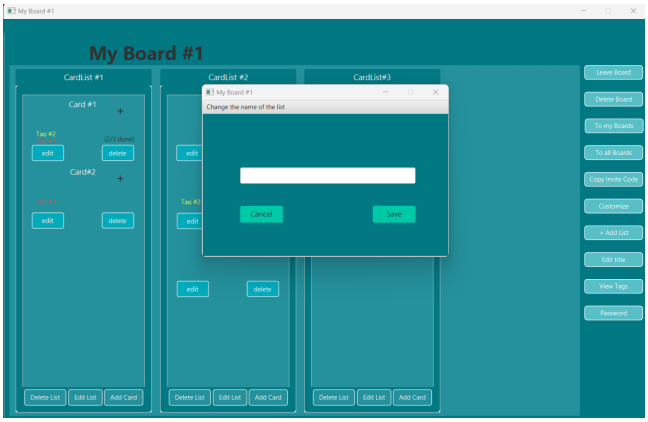
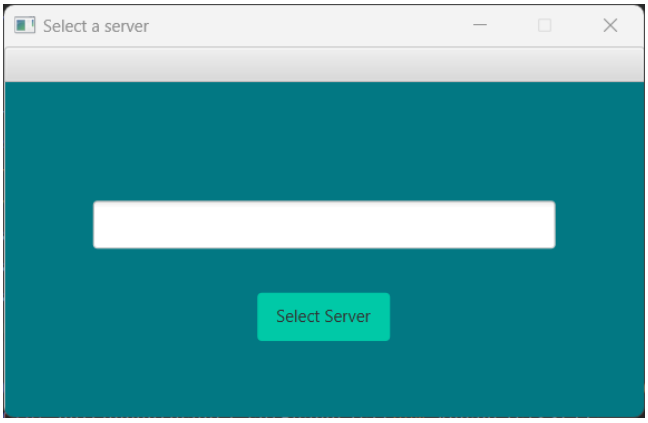
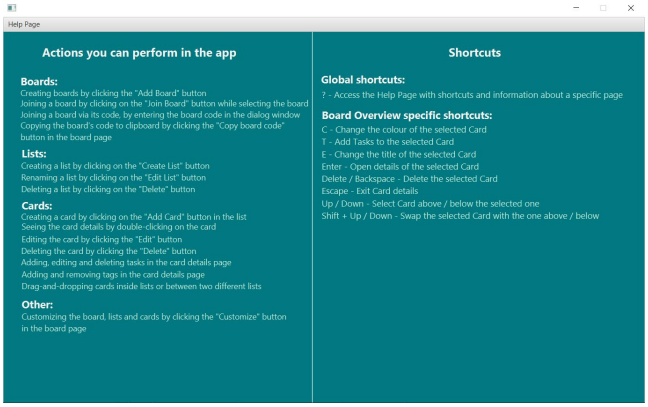


Figure 14: Server selection Page



Made the selection of the server the first action in the application: When the application is ran, the first thing the user will see is the page shown in Figure 14, asking them to select a server. Right after server connection has been achieved, the user is redirected to the Sign In page.

Figure 15: Help Page



Displayed user Information in the main page: As seen in Figure 6, the current user is now visible and the option to log out is also given.

Added a page with useful information: We have created a new page including useful information such as the ability of a user to drag and drop and keyboard shortcuts that allow advanced users to navigate through the application fast. This page can be accessed by pressing the "?" button on the keyboard.(See *Figure 15*)

Concluding, a stable interaction between the human and the computer constructs an important part not only in the highly-paced technological field but also in the well-being of the individual. Through this process of improvement of our application, not only have we managed to find innovative solutions to the problems that were addressed by our selected experts, but also serves as an example of how precise the measurements are in the field of heuristics. This has led to the application becoming simpler and more usable.

More issues are there to be found and we are expecting to encounter even more usability concerns as we continue developing much more complex software. Nonetheless, we remain committed to improving our application and delivering an exceptional user experience that meets the expectations and needs of the target audience.

REFERENCES

[1] 2023. Group 67 Talio prototype. https://www.youtube.com/watch?v=kJYlVztAcGo
[2] Jakob Nielsen. 1994. 10 Usability Heuristics for User Interface Design. NN/g Nielsen Norman Group. https://www.nngroup.com/articles/ten-usability-heuristics/
[3] Jakob Nielsen. 1994. How To Conduct a Heuristic Evaluation. NN/g Nielsen Norman Group. https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/