OOP Project Report – Group 75

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1 INTRODUCTION

Heuristic evaluation is a usability inspection technique that involves having evaluators examine a user interface and identify potential usability issues based on a set of predefined heuristics or principles. The objective of our evaluation was to identify usability issues in our application through a heuristic evaluation conducted by a group of evaluators. In this essay, we will discuss the results of the heuristic evaluation and the usability issues identified by the evaluators. We will also provide recommendations for addressing these issues to improve the overall usability of the application. Through this evaluation, we aimed to gain insights into how users interact with our application and to identify areas where we can make improvements to enhance the user experience. Our objective is to improve the overall satisfaction and efficiency of our users when using our application.

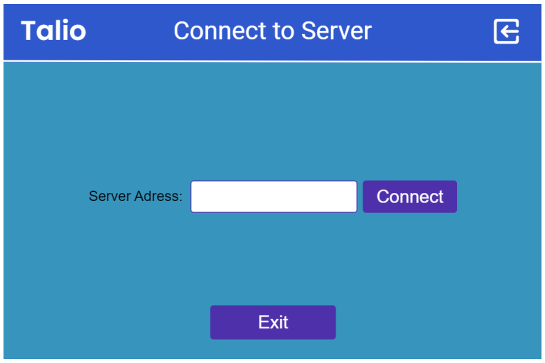

Figure 1: Landing Page

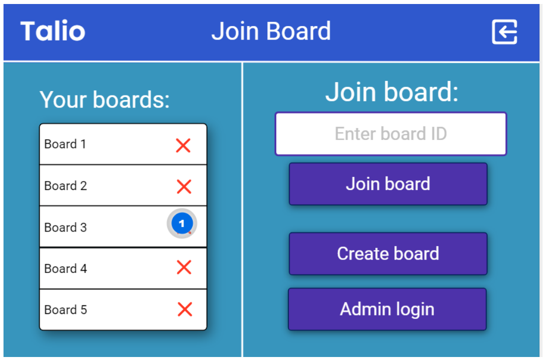

Figure 2: Join Board

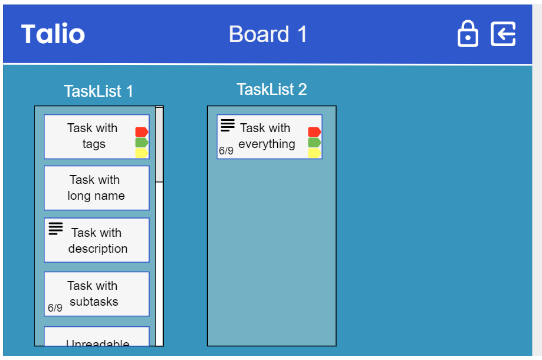

Figure 3: Board Overview

2 METHODOLOGY

Our team has recruited 5 experts to perform the Heuristic Usability Evaluation on the application.We consider this number of experts sufficient, as based on an average of 6 studies on the Heuristic Evaluation, 5 experts can find around 75% all usability issues in a system. [2]The result received from counting that average is not final for any and every Usability Evaluation though. Our team will hereinafter use Nielsen's and Landauer's formula for the percentage of problems found within a Heuristic Usability Evaluation:

f(i) = N(1-(1-li)

Where i is the amount of evaluators and l is the number of problems found by a single evaluator.

The experts have been asked about their previous experience in team projects and programming experience, as it is valuable information during result analysis. From this point onwards the five experts will be called Expert 1, 2, 3, 4 and 5 respectively, as they did not identify themselves by name. Expert 1 and 2 have indicated that they had 1-3 years of programming experience in object-oriented languages, while expert 3, 4 and 5 have said that they did not possess any programming experience prior to enrolling in their Bachelor's Computer Science degree. In addition, all 5 experts have indicated that they do not have any experience with working on a team project.

Being given the application prototype, the Evaluators are given limited choice as to how to navigate the application, caused by the time and technical constraints of our team's mockup.The mockup itself .[1]consists of a few separate mockup windows, namely the ones representing the scenes: server connection , board overview, main menu, board creation,admin control. The evaluators are to navigate through each of those screens by clicking in the appropriate places and read through the developers' comments left on a few features that have not been implemented in the mockup, as we (initially) deemed them not impactful enough to show. When spotting a problem within the currently shown interface, they were to assign it to one of the 10 Usability Heuristics for interface design.[3] The team decided to opt for all 10 of those Heuristics despite the belief that some of them might not be used during the experts' evaluation, as from the result analysis standpoint it is far better to have some additional rubrics that none of the encountered problems fell under than to have problems that could not be classified into any of the given Heuristics, were they to be limited. After determining the Heuristic from the list, they experts would have to follow a specific problem reporting template , providing: - A short description of the problem, in which the evaluator states what the issue is about. Only a title and a Heuristic is not enough to determine the problem's identity, which becomes especially problematic when attempting to determine whether the problems that multiple experts found are distinct. - The location of the problem, specifying on which mockup and where within it the problem was encountered. - The (assumed) cause of the problem, to help our team out with identifying problem equality among evaluators and possibly make the GUI improvement process a tad faster. - The impact and frequency rating of a problem on a scale from 1 to 10, in addition to a description that includes the reasoning for the hereinbefore mentioned rating.Impact and frequency ratings are very important to include as they are of tremendous value when prioritizing the problems found by the experts in terms by which ones to work on first. Each of these subpoints had to be included in each separate problem report, maintaining the order described in points above(description, location, cause, impact, frequency).In addition to sending our team 5 personal report files, we have also asked the experts to send us one team file with all of the problems found by the experts(without any ordering or filtering done, as we consider it to be a part of result analysis that we have to do).

3 RESULTS

In total, the experts have found 23 problems with the GUI prototype. After careful analysis, our team has concluded that 17 of those problems are distinct issues, meaning that out of all found problems around 26 percent were shared between two or more experts. The 17 issues were then divided into 2 categories: those who where actual problems with our application design, and those that have occurred due to inaccurate/bad construction of the mockup that we have provided to the experts. The former features 11 issues, while the latter features 6. Only the former will be considered in the "conclusions and improvements" section, as it will be important for the further development of the application. For this reason, we have also decided to not include the latter (6) problems, such that we can focus on what matters.

Furthermore, each problem that has been found by multiple experts has had its "impact" and "frequency" rating changed to an average of all the ratings the experts have assigned to the corresponding problem. In case of the rating being a fraction, it is rounded up or down using the basic rounding rules(.5 and higher is rounded up, the rest are rounded down).

The table below displays the evaluations we have received from the experts we recruited. The report we received from the evaluators was structured in the format (Problem: Heuristic, Description, Location, Cause, Frequency), therefore we had to delete some duplicate issues from the data and organize it so that we can use it to understand the problems with our design. We just had to construct the table so that it is easily readable.

Table 1: WORK IN PROGRESS

	Problem	Description	Location
1	Accidental deletion	If users are not attentive enough, then they can accidentally delete their board, since the delete option is between the colour view and tags. The user could also accidentally click the delete button of a task list whilst changing the name, or the 'x' in the corner of a card when clicking on it.	The whole application.
2	Only deleting board for the user	The fact that red cross next to a board name on the main page only deletes board for one user is intuitive and potentially needs some explanation. It is somehow similar to delete only for you vs delete for everyone functionality on various message chats	Join board
3	Unclear how to change password of the board	How can admins change the passwords of the boards?	Admin page
4	Previous page button not working	Clicking on the "go to previous page button" from the locked Board 1 does not let you go to the previous page. Why does the go back button sometimes redirect the user to unlocked board? I suppose it's a mock-up issue but what is the meaning of that button? Does it redirect to the main page every time or disconnects completely from server?	The location is in the top right co and the left-pointing arrow in the
5	No confirmation screen	In all instances in which a user (or admin) can delete a board, or a board that they have joined, there is no confirmation screen, which could cause major problems in the event of an error like a mouse slip or an unintended deletion.	In the "Your Boards" section and t
6	Layout of tags and delete button on the card	If the tags are on the same side as the delete button, the button with the red cross, then if users add more than 3 tags, then tags won't be able to fit inside the card.	Any card with the tags, though th in the unlocked board.
7	No undo or redo options	There is no undo or redo buttons in the application. In the event that a user makes a mistake, they should have an "emergency exit" option to quickly leave whatever unwanted situation that they are in.	The whole application.
8	Locking the board after creating it	When creating a new board without password, there is no way to add a password after the creation of the board. Also, the option for locking the board still exists, even though there is no password. It seems like the lock button is making the board password-protected, but the user has to click the lock icon again to get a pop-up telling them to enter a password (which makes it seem like they are entering a password to access/edit the board rather than set a password).	unlocked board page
9	'Colour view' option on the dropdown menu	I think there is an issue with the clarity of options in the dropdown menu on the right. It is not totally clear what 'colour view' means.	Board 1 in the dropdown box on t
10	'Tags' option on the dropdown menu	It is not totally clear what the function of the option 'tags' is. Is it a key for the different colours of tags? Is it a way for the user to create their own custom tags?	Board 1 in the dropdown box on t

These problems have been mapped to Nielsen's Heuristics by the experts in the following way:

Table 2: Second table

#	**Heuristic**
1	Error prevention
2	Match between system and the real world
3	Help and Documentations
4	Error prevention / Visibility of system status
5	Error prevention
6	Aesthetic and minimalist design
7	User control and freedom
8	User control and freedom / Match between system and real world
9	Match between system and real world / help and documentation
10	Match between system and real world / help and documentation
11	Aesthetic and minimalist design

As shown in the table the problems are from multiple heuristics with the majority being from types "Match between system and the real world" , "Error prevention" and "Help and documentation". From these problems we prioritized problem #1 because in case of a mistake by the user which happens all the time there will be no way to restore the deleted item which can be really annoying for the client. Another issue that is critical is #2 which may lead to confusion. It should be clear for the user what are the consequences of clicking the red button.Aside from those, problem number 5, 7 and 8 are also the ones we consider worthy to prioritize.

Table 3: Heuristic evaluation results

Freq.\Imp.	1	2	3	4	5	6	7	8	9	10
1										
2			#9	#10						
3										
4								#4, #5		#2
5					#7					#1
6					#8				#3	
7		#11								
8					#6					
9										
10										

Before creating a table based on the impact and frequency ratings, and after reading through the found issue list, our team has considered issues number 8, 7, 5 ,2 and 1 the most crucial ones to work on.The table that sorts the problems by their impact and frequency ratings does not reflect that opinion at all though.only problems 1,2 and 5 are among the most impactful and problem 8 among the most frequent.However, we consider the gaps in rating among most problems not high enough to change our priority based on problem description,with the exception of problems 9 and 10 which are both related to the dropdown menu and are neither significant nor frequent. Based on the aforementioned analyses of evaluation data we have decided to change our UI to fix the found problems in a manner that we will discuss in the following section.

4 CONCLUSIONS & IMPROVEMENTS

Expert evaluations have pinpointed 11 relevant problems with the GUI prototype, that suggest that the present design might not satisfy our users' requirements and expectations. Our team's objective is to resolve these problems and develop a more accessible and user-friendly GUI prototype, improving the overall user experience. The modifications we make will enhance the system's alignment with real-world expectations, improve error prevention and user autonomy, and guarantee that labels are easily understood. These improvements will make the app more intuitive and user-friendly, resulting in a more engaging and enjoyable user experience.

4.1 Main Conclusion

Our team will prioritize resolving the most critical issues, such as the inability to backtrack after accidental deletions. We will also work on enhancing the system's alignment with real-world expectations, error prevention and user autonomy. Furthermore, we will involve a broader range of users in the evaluation process to guarantee the system's accessibility and usability across various user groups.

4.2 Improvements

The most critical issue is the inability to backtrack after accidentally deleting something, which presents a significant problem that could lead to the loss of crucial data. To address this, we will introduce a confirmation pop-up that asks users if they're sure they want to delete the card before it's removed.

We will also tackle the counterintuitive functionality of the delete button in the user's board list, which only deletes the board for the user, by incorporating an informational pop-up.

We will add a button on the admin page that lets the admin change the board's password, and we will include clear instructions on how to modify the password in the documentation.

We will correct the previous page button by removing it from the landing page and making it go back one step on all subsequent pages.

We will revamp the design to prevent tags from being truncated when more than three are added, to enhance the layout of tags and the delete button on cards. We will also incorporate undo/redo buttons in the UI to grant users more control and freedom within the application.

We will change the 'Colour view' option to a more descriptive label that indicates its functionality.

We will rework the 'Tags' option to provide additional information and clarify its purpose. We will also eliminate any bounding boxes or impediments that prevent users from dragging the landing page to the corner of their screen.

In summary, our team is dedicated to implementing these enhancements to create a more user-friendly and intuitive UI. We will persist in collecting feedback and making improvements to ensure our UI fulfills the needs and expectations of our users.

[screenshots of improved mockups and their description]

REFERENCES

[1] Our group. 2023. prototype of Talio application. https://app.moqups.com/ERBWy1VMVrbIzkza1b7MVkdHuJPppSru/view/. [Online; accessed 24-March-2023].

[2] NNGRoup. 1994. How To Conduct A Heuristic Evaluation. https://www.nngroup.com/articles/how-to-conduct-a-heuristic-evaluation/. [Online; accessed 24-March-2023].

[3] NNGRoup. 1994. Ten Usability Heuristics. https://www.nngroup.com/articles/ten-usability-heuristics/. [Online; accessed 24-March-2023].