

# OOP Project Report – Group 29

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## 1 INTRODUCTION

This report documents the process of utilizing Jakob Nielsen's usability heuristics to evaluate and improve the user interface of the Talio application prototype, an initial iteration of a to-do list management tool designed for task distribution within organizations. Our goal is to expose usability challenges and establish clear improvement actions to refine user experience.

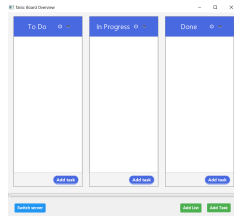


Figure 1: The overview of the board

Managing duties effectively and remaining organized is more important than ever in the fast-paced world of today. Our team developed Talio, a to-do list management solution, to help businesses streamline task distribution and increase productivity. Using Jakob Nielsen's usability heuristics, we set out to evaluate and enhance the Talio application prototype's user interface in this study. The goal is to pinpoint usability issues, design specific improvement strategies, and eventually improve the application's user experience based on evaluation results.

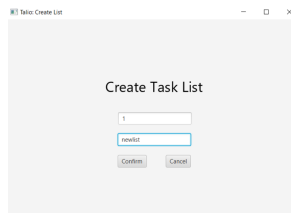


Figure 2: The old scene for creating lists

It is crucial to describe the prototype before starting the evaluation process. The client-server architecture of the Talio application is currently created utilizing Spring/JavaFX. A single board may be hosted by the server and used concurrently by all clients that are connected. The application has a single scene that displays a summary of all lists and the tasks assigned to them, this scene is seen in figure 1. Users may add, update, and remove lists, tasks, and labels from this overview. You can see the design of the scene for creating lists in figure 2. They can also drag and drop tasks to reorder them or transfer them across lists that already exist.

For addressing issues like timeouts, incorrect server addresses, or unexpected errors, there are various screens provided. The primary

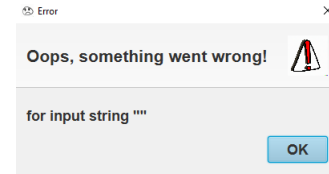


Figure 3: The old error message

scene, which is the board overview, is displayed to the user after they have successfully connected to the server. Three to-do lists—to-do, in progress, and done—are first added to the board. At the bottom of each list is a "Add Task" button, which takes the user to a screen where they may enter the task's title, description, and labels. Each list also has a settings wheel at the top where users may rename or delete lists. The buttons to create a list or add a task are located at the bottom of the board and direct the user to the appropriate screens. The design of the lists is shown in figure 4 and the design for error messages is shown in figure 3.



Figure 4: The design of the lists shown to the experts

## 2 METHODS

We have recruited Mikołaj Gazeel, Vlad Dragutoiu, Matīss Bērziņš, and Bogdan Micu from group 22. They are a team of 4 experts for our Heuristic Usability Evaluation that we have carefully selected based on their compatibility with our team's standards, commitment levels, and goals. They are experts by their formal education in heuristics which includes studying the videos and articles provided by the OOPP teaching staff as well as participation in a heuristics lecture where participants were told to complete their heuristic evaluation by applying the concepts that they learnt. This in combination with the fact that they are working on an application similar to ours ensures that we will get high-quality feedback that follows Jakob Nielsen's usability heuristics principles.

The experts are evaluating a prototype of our application individually to ensure an independent and unbiased assessment and we have instructed them to use the prototype as if they were new, yet

technically competent, users who are completely unfamiliar with the project. To prevent redundant feedback, we also communicated the limitations of our project such as the lack of certain otherwise expected features to the experts. To open the application and gain full access to our prototype, they first needed to run the project and the server locally on their machine. This would grant them access to the server page, and they would be able to connect to their server by entering the machine's loopback IP address. Once these steps are complete the experts have unrestricted access to our prototype.

To ensure a smooth evaluation process, each time an expert is using the prototype, there will be an observer present from our team. This observer will be there to take verbal feedback from the expert if they wish to express their feedback in that manner as well as be there to assist the expert in case of a prototype malfunction or if something is unclear and prevents the expert from accessing a feature. Once the experts have gained full access to the prototype, they each look at the interface of the application and note down or talk about the issues they spot as they use the application, sorted by feature/scene as instructed by our team. The fact that there are multiple experts is crucial as it will allow them to find the greatest number of issues that others may have missed. Furthermore, each expert will evaluate the prototype 3 times to further ensure that we maximize the quality of feedback we receive. The experts use the Nielsen heuristics evaluation method to find potential problems with our user interface and app design that they can give us feedback on. These heuristics include ensuring visibility of system status, using language that matches the user's understanding of the real world, providing user control and freedom, following consistency and standards, preventing errors, minimizing the need for user recall, providing flexibility and efficiency of use, using a minimalist design, helping users recognize and recover from errors, and providing helpful documentation. By applying these heuristics, designers can identify and improve usability issues and enhance user experience.

In the end, all 4 experts will have performed this evaluation 3 separate times and the experts will submit their report in the form of text feedback which will ideally subdivide their evaluation by different scenes/features in our project. For example, there may be a section for the login screen and a different section for the task creation screen. Under both sections, they will indicate usability problems which they have encountered, both aesthetic and functional. We as a team will then combine these findings with the findings of the observer to obtain results.

### 3 RESULTS

For the "match between system and the real world" category, the experts would like some clearer ways to display error messages to users as they could find it difficult to find out what's wrong when it just displays 'Error, For input string: ""' when no list name is given. Therefore it will be useful to either not allow empty names or display an error saying the name can't be empty. Furthermore, not giving the user an idea of what sort of address format is needed can also confuse so perhaps adding a default address already provided in the input field will make it easier for users.

Regarding "user control and freedom", the experts felt that the user is limited in terms of what is possible in the application's home

screen as renaming and deleting lists, reordering the tasks in a list, and editing tasks weren't functional. Furthermore, in the create task window, adding labels also didn't work. This meant that some of the core features of the application weren't functional, significantly hindering user experience.

In the "error prevention" category, an issue pointed out by the experts was that the app was prone to errors occurring due to missing information such as the board id which is required to create a list. However, the board id wasn't displayed anywhere so the user couldn't know what the board id was. Without the board id, the user can't use the create list functionality but we are already working on removing the need for a board id input on list creation. Finally, title fields for tasks or task lists can be left empty which may confuse users as well as issues in code.

In the "recognition rather than recall" category there was only one issue found by Matiss. He noticed that the description of the task is no longer visible after the task's creation.

Regarding the "flexibility and efficiency of use", the app has several issues. The first one, according to Matiss, Vlad, and Bogdan, is that on the login screen, when focused on the input and pressing enter, it doesn't automatically submit. Another issue discovered by Matiss is that dragging and dropping tasks works but it's overwritten by the old state (before the drag and drop). This has been fixed in the meantime. The final issue in this category is that, currently, to rename a list, a user has to use a drop-down menu, then click on rename. Mikołaj thinks that being able to rename the lists straight from the board screen would improve user experience.

The app has several issues regarding the "aesthetic and minimalist design" category. One important issue is that it doesn't resize properly on any of the scenes, which has been reported by everyone. On a Linux system, the connect screen has a problem with the text not being displayed correctly, as noted by Matiss, Vlad, and Bogdan. Additionally, when creating a tasklist with a name that is too long, the TaskList itself becomes bigger, making a vertical scroll bar causing it to not be aligned with the others anymore, which has been pointed out by Matiss and Mikołaj. Similarly, according to Matiss and Mikołaj when making a task with a long task name, it overflows the card. Matiss has also noticed that the green "Add Task" button in the board overview scene is redundant. In the login scene, the bottom margin is too big according to Mikołaj. Moreover, Mikołaj suggests that the create buttons would look nicer as plus icons, while the settings icon and down arrow look like two separate buttons, but they are only one, this could be the cause of confusion to the user.

In the category of "help users recognize, diagnose, and recover from errors" during the heuristic usability evaluation, the following issue was found: the error message when a wrong board id was given for creating a list was unhelpful and outright confusing (the message received was «for input string ""»).

Furthermore, there were no issues found by experts in the "help and documentation" or "visibility of system status" category. However, we think that we should add a help button that shows a pop-up with instructions or FAQs to help the user navigate and use the app and that we should have some confirmation popups after certain events such as renaming or deleting.

In terms of how we are going to prioritize the fixes suggested, we will first make sure to fix the issues related to editing tasks and

lists as these are essential for the user to apply this application and these sorts of comments were made very frequently by the experts. Our second priority is fixing the points made in terms of error prevention. Although they were not very frequently mentioned, we believe that these are issues of high severity and should be prioritized over “high-frequency low severity” issues such as issues with styling and resizing of the window.

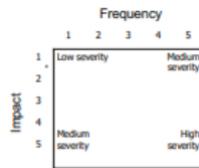


Figure 5: The prioritize matrix

#### 4 CONCLUSIONS AND IMPROVEMENTS

To summarize, the Talio prototype’s heuristic evaluation has led our team to gain a better overview of the application’s usability issues. The primary conclusions from the results suggest that the most important factors for improving the user experience are concerned with error prevention, user control and independence, and aesthetic and minimalist design.

Based on the findings, we will make the following improvements to our application: First, we removed the need for inputting the board id for list creation as we thought that this was both a high-frequency and high-impact issue as many experts needed guidance to create a list which is one of the fundamental features of our app, making it a hindrance to “user control and freedom” as users that can’t figure out the board id cannot use most of the features. This puts it in the high severity section of the prioritization matrix shown in figure 5. We removed the board id input and now creating a list just requires the user to give it a name. The change can be shown between figure 2 and figure 6.

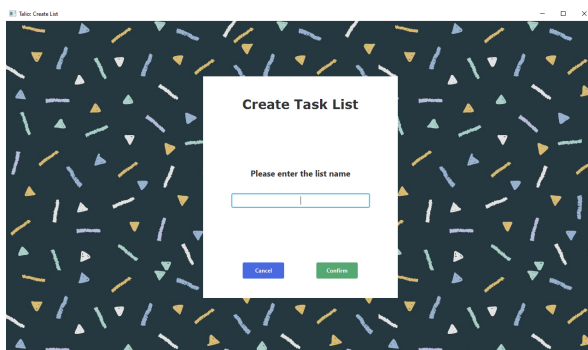


Figure 6: The new scene for creating lists

Secondly, we focused on implementing the remaining missing functionality such as renaming and deleting tasks, deleting lists, reordering tasks as well as editing tasks. These are second to the

board id issue as none of these can be done without a list so we focused on that first, however, these were also of high priority as these were the basic features that the client asked for and the experts felt that this was a real issue regarding “user control and freedom”.

Thirdly, we focused on implementing features to create a better “match between the system and the real world” and error recovery so that end users can understand what is going on while using the app. An issue we specifically fixed was an error message for an empty list name on list creation that could be very uninformative to the average user so we replaced it with a more helpful error message saying the input is invalid. The changes applied to the old error message in figure 3 can be seen in figure 7.

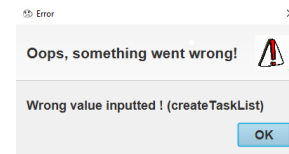


Figure 7: The new error message

Fourthly, we focused on resizing as it was something that was mentioned by all the experts. This issue is related to the “aesthetic and minimalist design” criteria. This puts the issue at a medium severity issue in the prioritization matrix as it was quite low in impact, however, we decided to focus on this as it was the most common piece of feedback we receive from the experts. Thus, its implementation will likely please many end users.



Figure 8: The new design of the lists

Fifthly, we implemented styling changes from feedback that we received from multiple different experts which are also related to both the “aesthetic and minimalist design” as well as “flexibility and efficiency of use” criteria. Notably, improving the buttons for creating tasks with a plus icon, removing the renaming button in the settings and allowing users to edit the name of a list by clicking on the pencil icon and to delete a list by clicking the trash can icon. This was done to make the overall aesthetic look more appealing and to make the buttons more clear to users. This will lead to a smoother user experience and an overall higher satisfaction while using our application. In figure 8 you can see the new design for lists.

At last, we also implemented a keyboard shortcut for the user to see all the keyboard shortcuts for our application. If the user presses the '?', a popup will show all the keyboard shortcuts for our application. This will make sure that the user knows all the features built in our application and isn't lost on any screen. In figure 9, you can see the popup created to guide users.

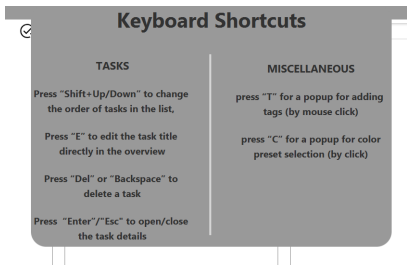


Figure 9: The popup to guide users

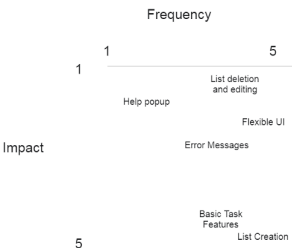


Figure 10: The matrix filled in with our changes