OOP Project Report – Group 45

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1 INTRODUCTION

With the goal of improving the user interface and experience in a Kanban-board application currently being developed by the authors, we have performed a usability evaluation aided by Nielsen's heuristics [1]. This evaluation highlighted problems with the application's interface early in the development cycle, allowing us to change the application accordingly.

The evaluators had access to a prototype of the application, designed using the Moqup online tool using a mix of screenshots of the current application and additional elements created with the tool. The following is a description of what is shown by this prototype.

When first opening it, the evaluator is shown a screen (the connect screen) with a single text field and button, as shown in Figure 1.

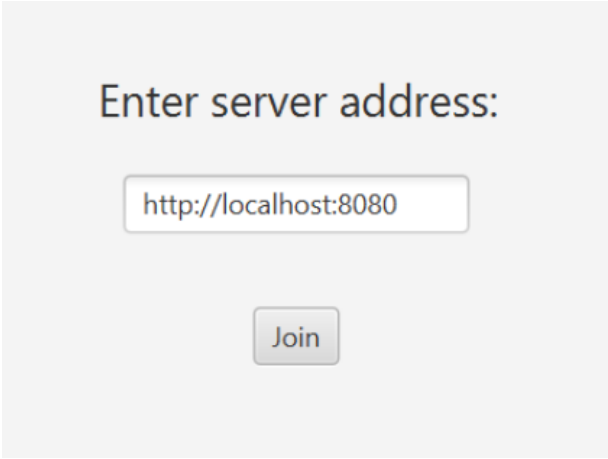

Figure 1: Connect screen

Upon clicking "join" the evaluator is brought to the main application page: A screen with the title "Default Board" centralised on its upper portion, several buttons which allow interacting with the application along its left and right sides, and an empty white box in the middle. This is shown in Figure 2.

Pressing the "New server" button brings the evaluator back to the connect screen. An attempt to delete or rename the board shows a simple error message stating the action is impossible in the default board. Either of the buttons "Add list", "Create board" prompts the evaluator to give their new item a title, as seen in Figure 3, with text reflecting the appropriate action.

Creating a new board will add an entry to list on the left side of the application and change the title to "Board #1" (Figure 4). From here the evaluator can press "Access" on either entry to change the title accordingly. If the evaluator added a list, the middle section of the screen has a blue rectangle added to it; the rectangle contains the text "List 1" on its upper portion as well as buttons labelled "Edit", "X", and "+", as show in Figure 5.

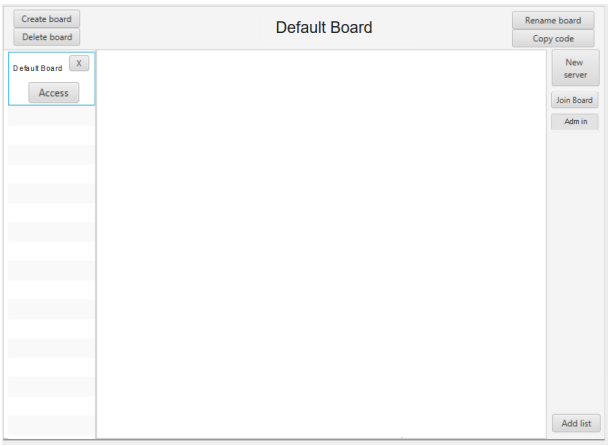

Figure 2: Main page

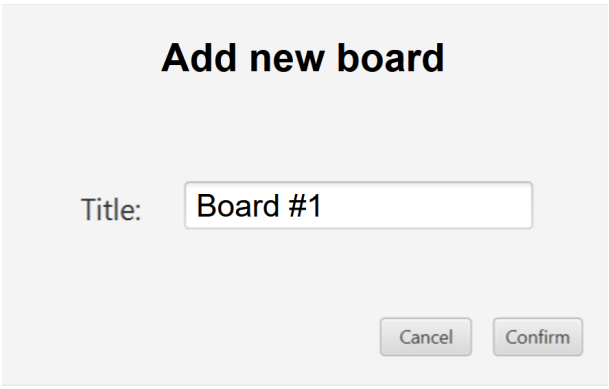

Figure 3: Create board

Finally, pressing "+" will bring up a screen which prompts the user to "Add a new task" (Figure 6). The user must input a title and description for this task and either cancel or confirm the action. After confirmation, a smaller light blue rectangle with the text "Task title 1" appears inside the list rectangle. The screen showing both list and task is shown in Figure 7.

The remainder of this report details the methodology used in the evaluation (Section 2), explains the results obtained through it (Section 3) and finally considers the improvements that will be made to the application in light of the evaluation (Section 4).

2 METHODS

In order for us to be able to accurately analyse the compliance to the heuristic principles of our task-organising application "Talio", we based this heuristic evaluation on the results of a form containing a number of significant questions, which has been sent to a number of evaluators in order to receive the feedback given on our

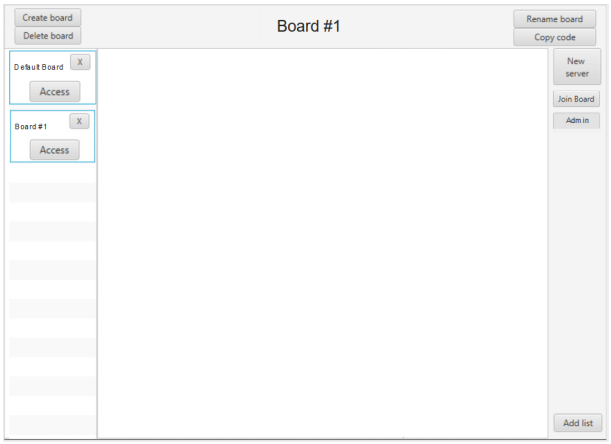

Figure 4: In Board #1

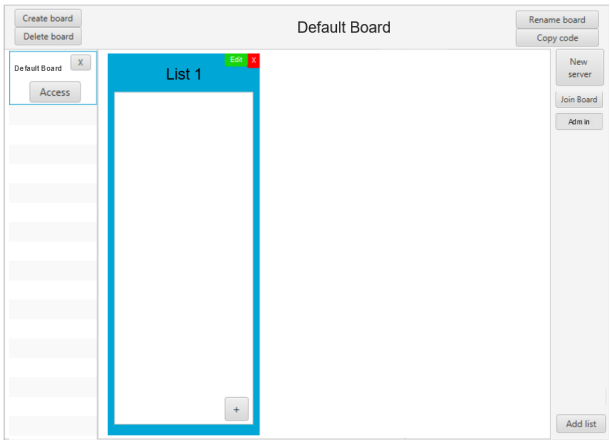

Figure 5: Board with a list

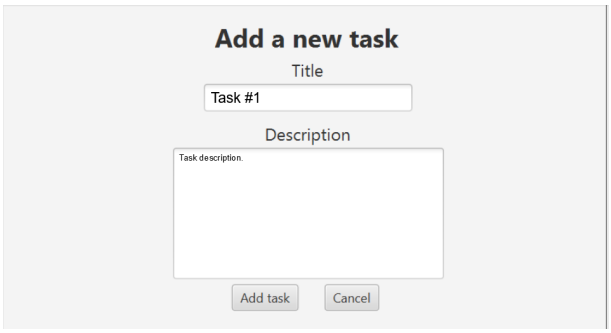

Figure 6: Add new task

user interface by a potential user of the application. The results collected by this form have eventually been used to identify flaws in the design of our application's interface and improve the user experience.

We recruited a team of five reviewers with student-level expertise of the domain, who evaluated our application while being guided

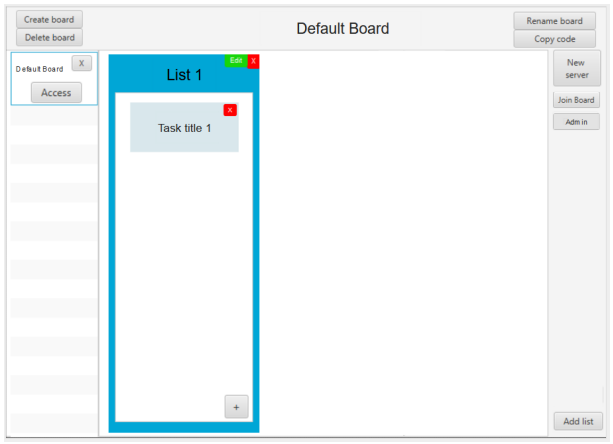

Figure 7: List with a task

by the questions provided in the questionnaire. The results of the question regarding their familiarity with applications that have similar functionality showed that the reviewers have had contact with such applications before, which places them perfectly in the category of the average user.

Upon opening the questionnaire, the reviewers were prompted with a brief description of what they had to do. They were required to open the given link, which led to a functional mock of the user interface design for our application, and try out all the functionalities of the application either by pressing all the given buttons in a trial-and-error fashion or by navigating through the scenes in a slide show. After accustoming themselves with a limited version of our application's functionality through the mock, the reviewers were asked to give answers to ten questions regarding Nielsen's ten usability principles. The reviewers were supposed to grade, on a scale of one to five, how accurately our design complies to the given principle. Then they were asked to give a detailed account of the encountered issues including, but not limited to, a description of the issue, the context in which the issue may occur, the effect it would have on a potential user and how this issue could be avoided.

In order to address the issues in a more efficient manner, we prioritised the issues to be addressed based on their impact on the user experience. Below is the order of the prioritisation of these principles.

(1) Visibility of system status
(2) Match between system and real world
(3) User control and freedom
(4) Consistency and standards
(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

For each of the principles stated above we measure, through the first question, the level of compliance to the given principle which tells us which aspects of our user interface design have to be improved and, through the second question, we collect the issues

found by reviewers, along with their detailed description(when does the error occur, how it affects the user and how it can be resolved), in order to identify and fix flaws in our design which may have been looked over while designing the user interface.

3 RESULTS

Most of the feedback was on the button "copy code", which copies the code of the current board to the user's clipboard; the reviewers mentioned that this button is not clear on what functionality it provides. Upon evaluating our application with this feedback, we have realised that the code of the current board is never shown on the main scene of the application. This can be a problem because the code is what the users have to remember in order to access the board. We identified showing the actual code of the board as a potential fix.

The main feedback that we had received from the reviewers was that there were too many buttons on the screen. This problem was addressed deeply and repeatedly, because they were present in most of the heuristics: because we had too many buttons, the users can be overwhelmed by them, and this has negative impacts for consistency and the aesthetics. As a solution, we decided to group similar buttons, in order to reduce clutter and improve both consistency and the application's minimalist design.

We had also received some positive feedback on our use of colours for certain buttons: that they clearly indicate what functionalities they serve and help the users to recognise them. To improve the consistency of our application further, we decided to utilise colours more extensively. In addition, we replaced some texts with icons in order to improve further on the recognisability of the buttons.

The last improvement that we made on our application was regarding the error prevention. There was a lot of feedback on how easy it is for the users to delete entities accidentally. As a solution, we have added the functionality to display an alert box asking for confirmation of deletion.

4 CONCLUSION & IMPROVEMENTS

These results lead us to believe that, while most aspects of our application are appreciated by our potential users, there is still room for improvement in certain categories.

First of all, the placement of the buttons on our main page seems to generate some confusion; in response to this, we have grouped the buttons in drop-down menus. There is now a single button (Figure 8) on the top left part of the screen that shows a list of all operations the user is able to perform: create board, delete board, rename board, join board and join server. This should make it easier to navigate through the application, and the user should now find the process of using our application much more intuitive. In addition, we also have moved the "Admin" button next to this menu button and replaced it with the Admin icon (Figure 9). We think this will improve the visibility of the buttons and make the scene more coherent by only having buttons in certain spots. We have also added the text "Admin" below the icon in order to address any uncertainties that might arise from what the icon means.

Figure 8: Menu icon

Figure 9: Admin icon

In addition, the "Add list" button seems to be placed outside the centre of visual focus, which could become a problem for inexperienced users. To address this issue, we have brought the button up, towards the middle of the page, and placed it on the right side of the lists. This causes it to be at eye level and much more easily accessible. With the button being more visible now, we can expect users to recognise this button and its functionality more easily, improving the user control on our application..

Reviewers believed that other buttons should be more clear about the action they perform, especially the "Copy Code" one. To deal with that feedback we have replaced the button with the actual code of the board, and next to it placed a button which shows the copy icon seen in Figure 10. This way, the user is at once informed about the code of the current board and can also easily copy that code.

Figure 10: Copy icon

Another issue we encountered was the layout consistency, which we improved by associating certain colours to actions the user is able to perform. To be more exact, we coloured the 'delete' buttons to red, the 'edit' ones to blue and the 'add' buttons to green. We chose the colours in such a way that the purpose of each button becomes intuitive, eliminating the need of text to describe each action. Also, we have added edit buttons on the cards as well for a more consistent design, and replaced the text "edit" with an edit icon shown in Figure 11. After the change, interacting with this application should become a more pleasant process for the user.

Figure 11: Edit icon

Moreover, the server address is never displayed on our main screen, which depreciates the recognition of our application - of the "New Server" button in particular. One way the application could be improved regarding this aspect would be if the address of the current server would be permanently displayed on the screen, so the user has easy access to this information.

We have improved the error prevention when deleting entities by introducing pop-up alerts that ask users to confirm their choice. This way, they are much less likely to accidentally perform an action that is hard to recover from. To conclude, this report described the usability method of Heuristic Evaluation as well as the findings from a Heuristic Evaluation conducted by a team of five reviewers, with student-level expertise of the domain, on a Kanban-board application currently being developed by the authors. Ultimately, there were six individual usability problems identified. Of the six, one was deemed a "major issue", two a "minor issue" and three a "cosmetic problem". This resulted in seven redesign recommendations:

(1) Group the "Create Board", "Delete Board", "Rename Board", "Join Board" and "Join Server" buttons on the overview page into a drop-down menu.
(2) Position the "Add List" button towards the middle of the page, placed next to the lists.
(3) Replace the "Copy Code" button with the current board's code, along with a small button on the side with the copy icon.
(4) Recolor all the delete, edit, and add buttons to red, blue and green respectively.
(5) Add edit buttons on each card and replace the "Edit" text with an icon.
(6) Place the address of the current server in the overview of the application.
(7) Add pop-up alerts that ask users to confirm their choice when trying to delete either boards, lists, or tasks.

After implementing those changes, we perceived a major improvement in the user experience of our application. For each of Nielsen's heuristics, we observed the following improvements:

- Visibility of system status
  - Board code is now clear to the user.
  - Current server's address is now clear to the user.
- Match between system and real world
  - There are no ambiguities on what actions the buttons perform.
- User control and freedom
  - No improvements were needed for this category.
- Consistency and standards
  - Buttons are consistently coloured according to their functionality.
- Error prevention
  - Destructive actions require user confirmation before being performed.
- Recognition rather than recall
  - Reduced number of buttons shown to the user at once, making the scene more recognisable.
  - Colours for certain buttons reinforce their functionalities.
  - More extensive use of icons improves the minimalistic design and coherence of the whole system.
- Flexibility and efficiency of use
  - No improvements were needed for this category.
- Aesthetic and minimalist design
  - Several text-based buttons were replaced by icons.
  - Buttons were grouped and hidden into drop-down menus.
  - Colours were added to buttons.
- Help users recognize, diagnose, and recover from errors
  - Destructive actions require user confirmation before being performed.
- Help and documentation
  - No improvements were needed for this category.

Given its significant influence in the final design, and the quality improvement it brought, the authors believe the evaluation was successful.

REFERENCES

[1] Jakob Nielsen. 1994. How to Conduct a Heuristic Evaluation. (1994).