# Heuristic Usability Evaluation

Maria Tudor, Yuliia Shkekina,
Teun Klaassens, Stoyan Markov,
Gerrit Croes, Diego Becerra Merodio

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**Abstract**

Heuristic usability evaluation is a method of evaluating the usability of a system or interface using a set of heuristics, or guidelines, that are based on established principles of good design. The purpose of this heuristic evaluation is to identify potential usability problems and provide recommendations for improving the user experience.

# 1 Introduction

1. Briefly describe the objective of your evaluation.

   The objective of our evaluation is to assess the effectiveness and efficiency of our web application. This evaluation aims to provide valuable insights into the implementation, to inform decision-making and improve performance. For example we will identify strengths and weaknesses and find opportunities for improvement and optimization. Based on these results, we aim to adjust the user interface of our application in order to minimize, or ideally fully solve, the problems previously identified by our experts in order to have an application that better satisfies the user.

2. Describe/show the prototype you are evaluating.

   The prototype that is being evaluated contains the current state of our application. It is still under development, therefore some functionality is still not present in the prototype. Nevertheless, it is sufficient for the purpose of this evaluation to provide valuable insight into the areas of opportunity of our project.

   The prototype contains the overview of our application which includes the selected board and displays the contents of said board as lists. These lists are populated by the tasks corresponding to themselves which is currently what could be considered the main page of our application. From these page, there are various views that can be accessed for different actions inside the application. These include a window that allows for the creation of a new list, a similar window utilized for the creation a new task, one more window which has the purpose of modifying a previously created task and finally a pop up which confirms the deletion of a table.

# 2 Methods

## 2.1 Experts

How many experts did you recruit? What is their level of expertise?

We chose an accomplished team of teen computer scientists which consists of 6 members. They have worked on such projects before, so they have the necessary expertise regarding such matters and will provide the insight required for us to improve our User Interface.

## 2.2 Procedure

Describe, in detail, what experts needed to do. Someone reading this section should be able to replicate what they did. This should include:

1. How are you instructing experts on what to do?.

   We made an elaborate plan about how the evaluation should be realized and used it to instruct our team of experts. We firstly contacted one of the evaluators that is working in a similar project which gives him the required knowledge to do an effective evaluation. He later contacted his team about the possibility of collaborating with us and only after them agreeing to form part of our team of evaluators, we presented them with the mock and the instructions for the evaluation. We created a form that was to be filled by each of the evaluators after having utilized the application for some moments. In this form, we asked the evaluators to select a heuristic which broadly described what the issue they found related with, as well as information on the issue such as specific contexts when the issue might show up, why the issue is there among others. Finally and most importantly the evaluators were asked to give a value from 1 to 5 on to how frequently was the issue encountered and how impactful said issue was on the usage of the application. We presented the evaluators with more context on the solutions our application aims to provide and who will be using the product.

2. What are the experts seeing? A prototype, application, design?

   The chosen team of experts are looking at a prototype that reflects the current state of our application. It contains a view of the current board: the button which allows the user to add a new list, the actual lists containing tasks, the progress bar which reflects whether the task is completed or not, the deleting tasks or lists buttons, the adding tasks feature and the editing tasks functionality by clicking the three-dots-button. There are also frames for creating a list or a card, editing a task and a pop-up which appears when deleting elements. This mock up was created using *Figma* which also allowed for a dynamic flow between the pages using buttons as our real application would.

   As for the design choice of our application, we were aiming for a minimalist approach, but, unfortunately, our project is still under development and therefore the design work is planned for a later stage of the process. Thus, the experts were instructed to give meaningful suggestions about the design as it is still to be taken care of.

3. What do they need to do step by step?

   The experts need to analyze the functionality and efficiency of our prototype. Therefore, they have to explore the application and its features and give us feedback on it, including what is missing, what can be improved or what is redundant. The suggested time for reviewing the application is one hour and a form especially made for it should be concomitantly filled out. Subsequently, the form should be submitted and, after every expert sent theirs, charts should be automatically generated and we should be able to see the evaluation that was provided.

4. What heuristics are they using?

   A heuristic is a strategy derived from a process of trial and error which enables one to solve a given problem by making use of previous experiences. Keeping that in mind, we made sure that the team of experts we chose is using the following heuristics:

   - Visibility of system status: This heuristic is about the system's ability on keeping the users informed about what is going on, with appropriate feedback in a timely fashion.
   - Match between the system and the real world: This heuristic is for evaluating a system's usage of language. The system should speak the users language, with words, phrases and concepts familiar for the user and keep technical terms to a minimum.
   - User control and freedom: This heuristic is about the forgiveness of a system. System functions may be chosen by the user by mistake, so they need a clear way of cancelling their action(s) without having too many difficulties.
   - Consistency and standards: This heuristic is about the consistency/uniformity of a system. For example: Users should not have to wonder whether different words, situations or actions mean the same thing.
   - Error prevention: This heuristic is about how apt a system is in preventing errors. For example a system that prevents an error from occurring in the first place is better than a system that just displays an error message.
   - Recognition rather than recall: This evaluates how well a system displays information/possible instructions. The user should not have to constantly remember information to take it to another part of the system. The instruction for using the system should be visible or easily retrievable whenever needed.

- Flexibility and efficiency of use: This evaluates how user-friendly the system is. Things like macros may often speed up the interaction for both novice and expert users alike. This makes it possible for the system to cater to both inexperienced and experienced users.
- Aesthetic and minimalist design: This evaluates the visual clutter of the system. Interface items should only contain information that is relevant. Only relevant information should be on screen for the user.
- Help user recognize, diagnose, and recover from errors: This evaluates the helpfulness of a system whenever a user encounters a problem. The system should help the user with things such as error messages with the problem expressed in a clear a

*, help and documentation.* Each one of them is crucial in the process of improving our product.

### 2.3 Measures (Data collection)

What are you measuring? Describe what the experts need to report, and how you record this. Someone reading this section should know the format of your raw results.

For each heuristic we want to measure how frequent a certain issue related to said heuristic appears in our interface and how severe the issue is. The frequency of each issue is measured from 1 to 5, from very rare to very common. The severity/impact of the issue is also measured from 1 to 5, from very minor to very severe. Every expert gives us a maximum of 10 evaluations/issues about the provided interface. For every evaluation the expert does the following:

- A summary description of the evaluation (optional)
- Determining in what heuristic the evaluation belongs to.
- A description of the issue.
- The likely difficulties for the user if they encounter the issue.
- The specific context in which the issue may occur.
- The assumed cause(s) of the issue.
- How frequent the issue appears in the interface.
- How much of an impact the issue has if left unresolved.

The experts give all of their evaluations via a Google Forms document where we group them all up and give them visualizations like pie charts.

## 3 Results

1. What are your results? Report on your findings.

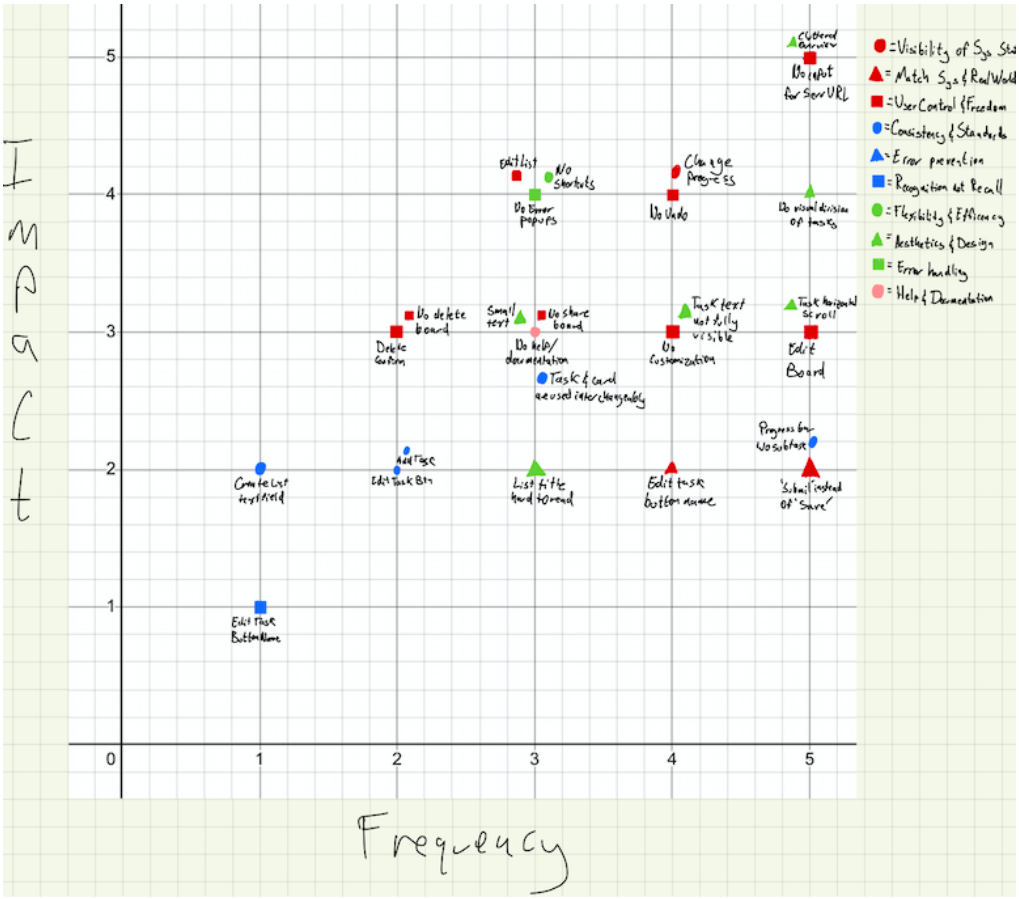
   By involving the the correct number of evaluators, we were able to gather very valuable insight on the main weaknesses on the current state of our application which will modify our course of action moving forward as we try to finish and improve our application. Some issues were pointed out several times by different evaluators such as that of the edit button in our task being not clear enough. More value came out of those issues that were pointed out only once as these are harder to find, a clear example being the lack of a visual division between the tasks which can lead to a confusion as to which button corresponds to which task. Most of the issues pointed towards the functionality in some of the buttons not being clear enough. Some other issues were pointed out due to the current state of the application which is still missing some more functionality but overall we found various areas of improvement in the views we have already implemented which we would likely not have found if it was not by this group of evaluators.

2. If you make any adjustments (averages, etc.) report what you have done! You will probably not be able to just show all your raw results, so let the reader know how you got from the raw results to what you are reporting.

As previously mentioned, some issues were pointed out several times by different evaluators with different heuristics in mind as well as different values for the frequency as well as the impact of said issue. In order to avoid redundancy, we averaged the frequency and impact of the issues that were recurrently mentioned and selected the heuristic which was most commonly associated to said issue.

3. If you prioritize the list of problems (for instance with the matrix used in the lecture), show how you have prioritized your problems.

   In order to prioritize the issues that were pointed out, we utilized a Cartesian plane that takes the values given for frequency and impact for each issue and placed each problem accordingly inside of the plane. After all issues had been places, we prioritized those further from the origin first. We also took into account how often issues with the same weight were pointed out as a tiebreaker.




# 4 Conclusions & Improvements

We learned that the most pressing problems come from the missing functionality that still needs to be implemented but that the most commonly spotted ones are those related to the intuitive use of the buttons. This shows that the biggest area of opportunity is related to the overall structure of the application to make the buttons functions more clear.

Taking into account the conclusions stated above, we decided to make a decisive move and improve our product, so that the user has a better overall experience while using our application.

In order to improve our application based on the evaluations give by our experts, we will redesign our User Interface to minimize and hopefully solve the problems they found.

Firstly we will add the functionalities that they pointed out are still missing such as the edit list, edit board, enter a URL to select which server to connect to among others. Alongside this, we are adding more clear text inside of the different buttons to indicate their functions as well as relocating them to positions in which is more easily recognized to which

attribute in the page are they connected to.

Lastly we also will modify the aesthetics of the interface to make the pages more visually appealing to the users, these changes include resizing the lists so that the tasks can properly fit inside of the lists and removing the shadow from the text in the list's title to name a few.

After these changes have been realized, we expect the application's User Interface to improve from how it was originally presented to our experts in order to better satisfy the users of our application.