GOI ESKOLA
POLITEKNIKOA

ESCUELA
POLITÉCNICA
SUPERIOR

MONDRAGON
UNIBERTSITATEA

LOGLAS, WEB BASED MULTIPLAYER GAMES

DEGREE IN COMPUTER ENGINEERING

HMI

AUTHORS: Loredi Altzibar, Nahia Li Gómara, Aitor Landa, Xabier Landa, Ander Olaso, Ane Sajeras

Tutor: Goiuria Sagardui Mendieta

Arrasate, December 13th, 2019

INDEX

IMAGES TABLE

1. <u>BRIEFING</u>

We are going to design, develop and evaluate an application that will let users play or view different kind of games. These games will be T/F, multiple choice or mixed games. Moreover, the user will have the opportunity to search for different game rooms or keep a session signed in. This application will be used by different roles but is mostly oriented to everyone with informatic knowledges who really like learning new subjects.

This application will be oriented to mobile devices and to web environment. It will be developed for the two main architectures (iOS and Android mobile phones).
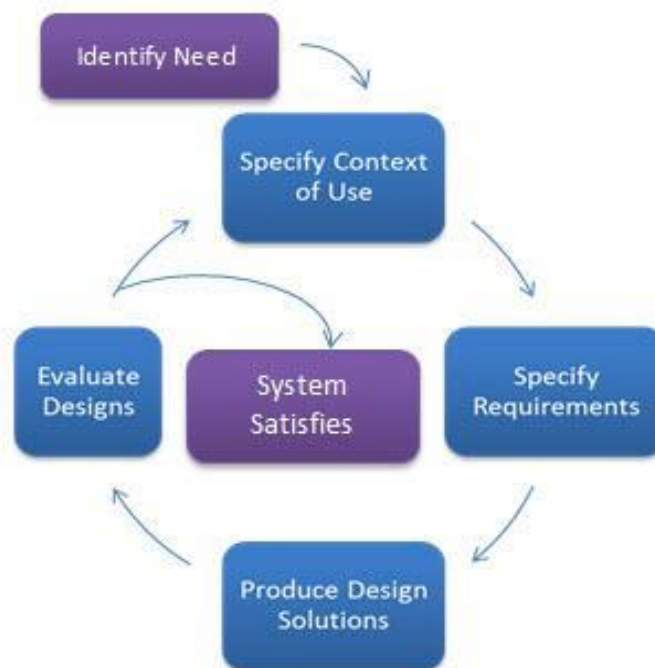
USER-CENTERED DESIGN [1]

We are going to consider the following points during the whole document:

1. Identify the need
2. Specify context of use
    2.1 Application
    2.2 User research
3. Specify the requirements
4. Design solutions
    4.1 Information architecture
    4.2 Navigation flow
    4.3 Interaction diagram
    4.4 Wireframes

2. IDENTIFY THE NEED

New application for mostly teenagers and middle-age people who really like new technologies. In order to use this application, users must be logged into the system. This application must be usable and try to solve some usability problems:

1. Perform the actions with less clicks
2. Reduce number of possible errors
3. Perform the action enhancing user experience (UX)

Identified competitors:

- ***Preguntados*:** Few clicks and no option of searching or filtering.
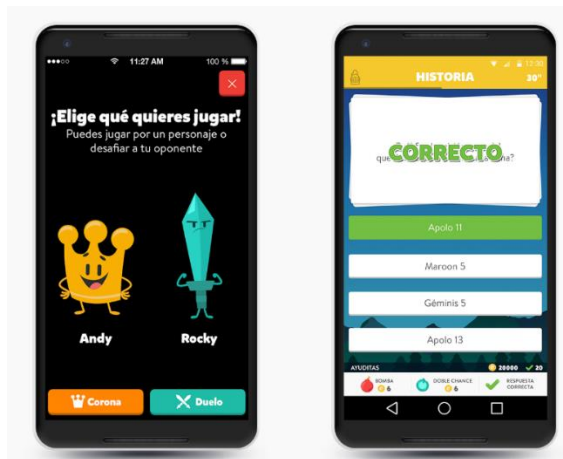
PREGUNTADOS [2]

- ***Kahoot:*** One click for each question answer and option to skip a question.

KAHOOT [3]

3. SPECIFY CONTEXT OF USE

Our application is focused on people who really want to learn new interesting subjects. It will be used in smartphones and on web environment by the users, so we must take care about the screen orientation and how the application is displayed there.

One of the most important goals of this application is to facilitate the user to find and play different kind of games. Moreover, it would be the option to create new games rooms.

The most important actions that we have detected are:
- Search different games by entering the game's name.
- Keep the session signed in.

Users: Every person who wants to learn new things about general knowledge. In order to use this application, there is not a pre-established age, but there are required basic informatics knowledges.

The users will perform the actions by clicking on different parameters and by registering in the application.

3.1. USER RESEARCH

Our focus in this application is that all *personas* enjoy playing and learning new things using this game.

The major user group for our website are going to be the young people with their friends because sometimes we know that is funny to compete with your friends. Although, we think that the application will be orientated for everyone.

We are going to focus on all *personas* doing the application simply and for all, is going to be easy to use, learn and to remember, letting all personas enjoying quickly, because would have a wide range of *personas* and they knowledges are going to be so different between them and the capacity to remember were that *persona* can do the action too.

In the future we will modify the application adapting to the users, seeing the test and how user use the application and if really all *personas* understand the application.

4. **SPECIFY THE REQUIREMENTS**

In this part there are the explained the three different requirements of our applications: business requirements (regarding to application), user requirements (regarding user actions) and functional requirements (how the user interact…). Moreover, there is the data visualization and our game's application requirements.

Business requirements:
- App will let users create a new game room.
- App will let users join to a created game as players.
- App will let users join to T/F, multiple-choice, mixed, drag and drop or Tetris games.
- App will let users to register to the page.
- App will let users to login into the page if it is registered beforehand.
- App will let users see their statistics on the games.
- App will let players in a lobby select for an answer during a timer.

User requirements:
- Users will have a numeric spinner in order to select the maximum number of players that are going to take part in the new game created.
- Registered users will see the games that are already created.
- Users will have different buttons to select the kind of game.

Functional requirements:
- The application will redirect to a list of games if the login is correct.
- The application will redirect to the login page if the sign up is correct.
- The application will redirect to a timer when a room is full.
- The application will redirect to the game once the timer finishes.
- The application will show the quantity of people that is in each lobby.
- The application will set a timer for the duration of each question.

Game requirements
- If in the game, there aren't the maximum players you can only chat with your opponents.
- To start the game in the game room must be 2 players minimum.
- In a game room there can be maximum 6 players.
- If the game room is full the game automatically starts.
- To respond to a question the maximum time is 20 seconds.
- For each correct answer you will win 10 points, but for each bad answer you will lose 3 points.

Data visualization

- We will use different types of graphs so that users can view their statistics:
  - Average of all the games = gauge chart.
  - Win/lose of each type of game = gauge chart.
  - Number of times played each game = bar chart.
  - Percentage of played games by game type = donut.
- The admins can access to the stats in Grafana:
  - Percentage of the most played games = pie chart.
  - Total players = gauge chart.
  - Numbers of players in each lobby = table.
  - Lobby id and the player limit of each lobby = table.

5. <u>DESIGN SOLUTIONS</u>

Our information architecture is organized by different screens where the icons are intuitive for facilitating the user make different actions such as, registering, recovering the password… For that reason, we can say that labeling system despite of other elements like labels or titles, is mostly based on icons to achieve an intuitive way to interact with the interface.

In order to the navigation between the screens, we have used the icons as buttons and normal buttons on the bottom and on the top of the screen to do easier the interaction in a smartphone.

Users look for information with filling the gaps of each screen or selecting an option.

5.1. <u>INFORMATION ARCHITECTURE</u>

In the first part there is the information architecture that was used to make Axure application. These was the first prototype of the application.

1. Login
    1.1. Sign up
    1.2. Password recovery
2. Home
    2.1. Stats
    2.2. Game
        2.2.1. Lobby
        2.2.2. View
        2.2.3. Play
        2.2.4. Result

In this second part on the contrary there is the information architecture that was used to make the web based multiplayer gaming platform. This second version is the final product.
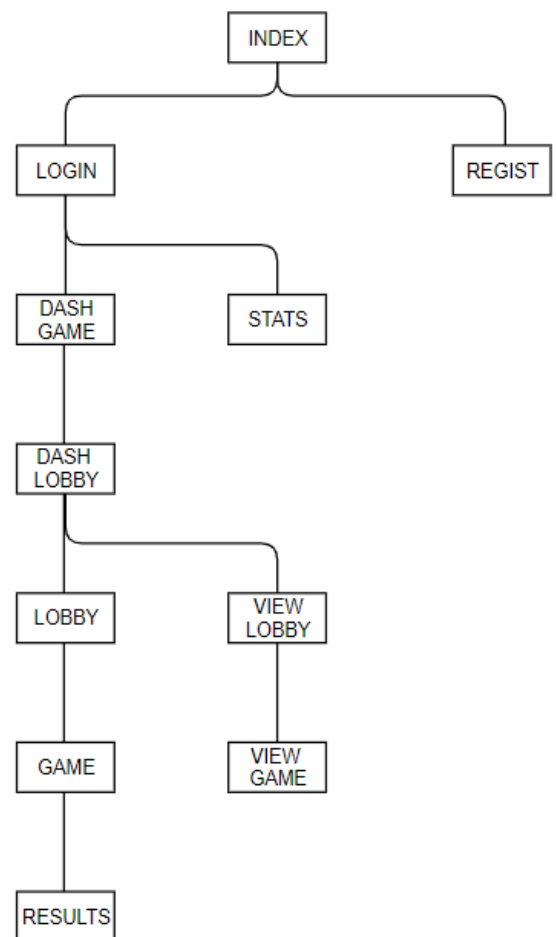
1. Login
    1.1. Sign up
2. Home
    2.1. Stats
    2.2. Game
        2.2.1. Lobby
        2.2.2. View
        2.2.3. Play
        2.2.4. Result

5.1.1 <u>NAVIGATION DIAGRAM</u>

In this part there are the navigation diagrams of Loglas. At the left there is the first prototype made by Axure, whereas on the right there is the navigation diagram of the final version made by a web platform.
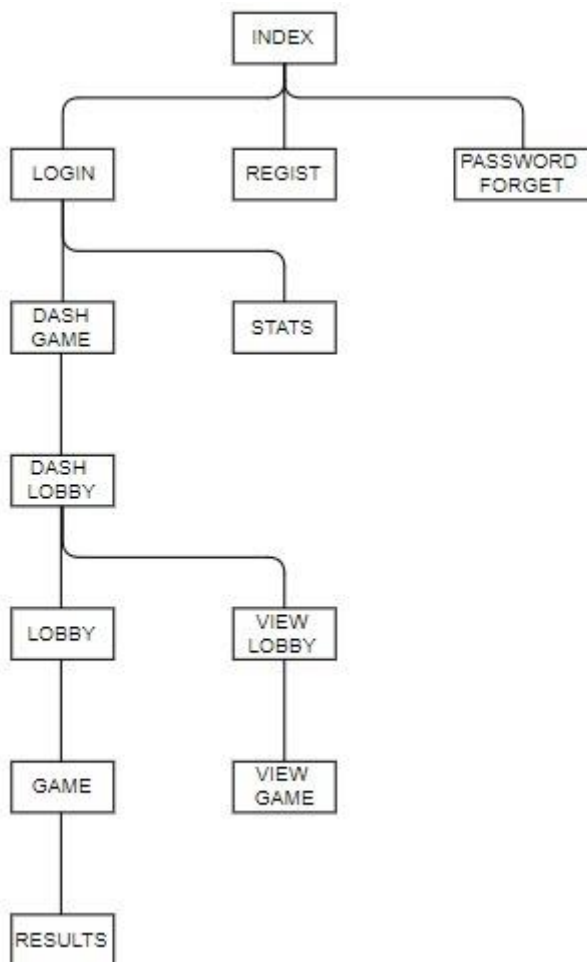
AXURE NAVIGATION DIAGRAM [4]

WEB NAVIGATION DIAGRAM [5]

5.2. <u>INTERACTION DESIGN</u>

This part is focuses on creating engaging interfaces with well thought out behaviors.

This application is based on the mouse interaction, because the most actions are handled by buttons. On mobile design, or in case that the application is being displayed on a smartphone, the mouse events will be replaced by touch events. There are keyboards events too, they are used to introduce the player information, such as username, password, email… In order to navigate through the interface, it will be possible to do scroll if it is need, due to the number of elements displayed on screen.

According to ease to understand how the web pages works the current tab is displayed in order color and with a similar but no equal button. Icons are used to make more visual and to improve the understandability of the screen, every button, have a label as a help. For the inputs which the user must introduce a test, it is implemented a placeholder which specify what it is expected to introduce in these inputs.

5.2.1 NAVIGATION FLOW
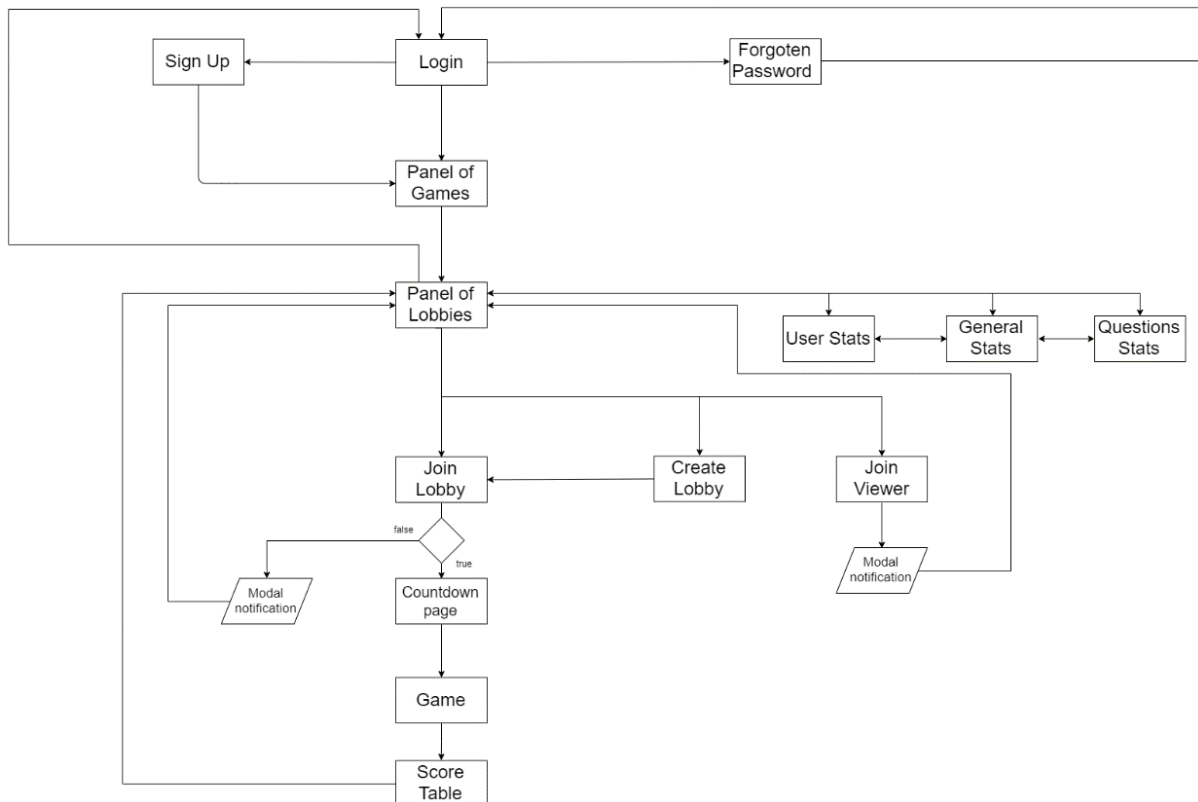
NAVIGATION FLOW [6]

5.2.2 INTERACTION DIAGRAM
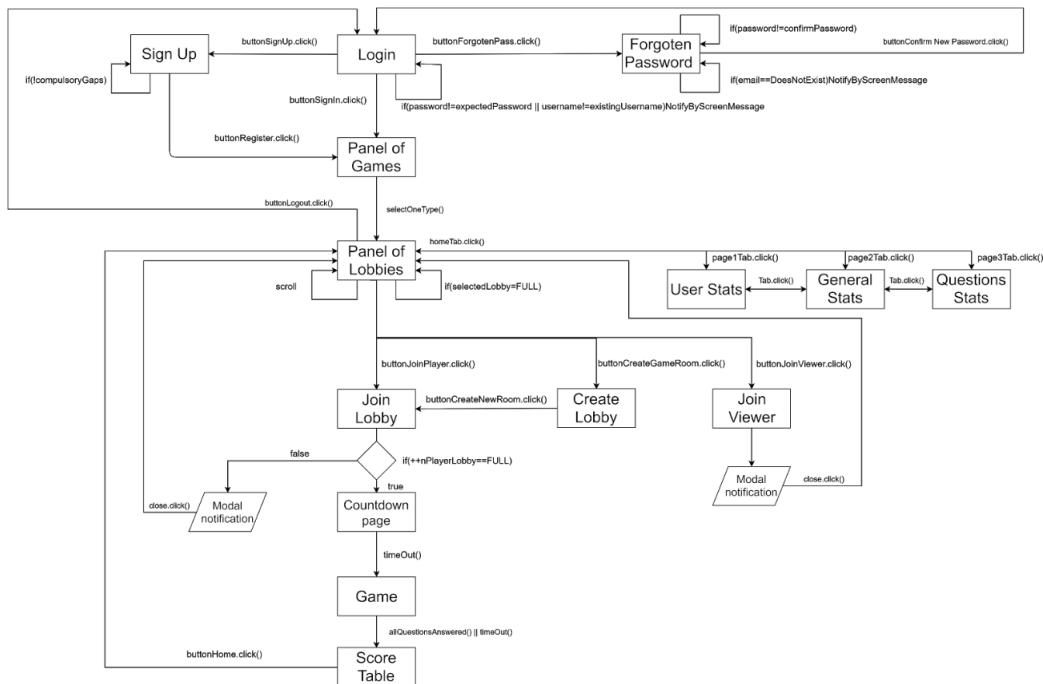
INTERACTION DIAGRAM [7]

Note: The interaction and flow diagrams are added outside this document as attached images.

6. <u>USABILITY TEST</u>

In this part there is the usability test we have used to test our application.

6.1. <u>ANALYZING THE PRODUCT</u>

In our web based multiplayer game application we have tested the facility the user has to join and play the chosen game. According to the application test, it will cover the navigation experience of the user. In order to make our usability test we have made different questions and joining/playing a game as we can see in the attached.

This application has been checked by our other classmates considering different factors such as the facility of registering, joining to a game, playing the game, the time spent, the number of clicks to go the games results page….

6.2. <u>JOINING/PLAYING SIMULATION</u>

According to the joining/playing games simulation we have made three different scenarios:

- Create a new user, login with the user, choose multiple choice questions, create a new game room, join to a game, play the game, see the results and go again to main page.
- Create a new user, recovery the password, login with the new password, choose T/F questions, join to a game, create a new game room.
- Login with the user you've created before, choose mixed questions, join two times to the second game, play the game, go out of the game, create a new game room.

So, considering the results of the questions and the simulations, we have found some improvements, as we can see in a below section, called Loglas improvements.

6.3. <u>SCOPE</u>

The application is called Loglas. The main aim of the test is to collect data concerning mouse clicks, keyboard events, time making the whole simulation… so that we can analyze it and make Loglas application more efficient and easier of use.

6.4. <u>PURPOSE</u>

One of the most important goal of this application is to have a great time, with other people, while you are answering general knowledge questions. Moreover, you would have a chat to speak with other people, while at the same time you are learning new interesting things. Furthermore, the user will have a tab in the home page to navigate faster through different interfaces.

6.5. <u>SCHEDULE & LOCATION</u>

The usability tests are made in class, during PBL class hours. Approximately 5 hours have been used to do the usability test.

6.6. <u>EQUIPMENT</u>

The application has been designed to be ran in a smartphone like an iPhone 8, but for the usability testing, the chosen platform has been a computer. In order to the browser has been preferred to use Google Chrome or Mozilla Firefox with the purpose of minimize errors from the browser compatibility.

In order to make the test we have used the laptop and the mobile phone. In the laptop it was the program while the mobile phone was used to measure the times of making successfully the test. According to the number of clicks and errors they have been counted manually.

6.7. <u>METRICS</u>

There are different types of questions that will be asked during the usability test. To start with, they will be asked some questions prior to the session, then after each task is completed and finally overall ease questions. These questions are in the table that is below. Moreover, there will be asked more questions that there are in the usability test document.

PRIOR TO THE SESSION	• What do you expect about our Loglas application? • Have you ever played a game online?
AFTER EACH TASK SCENARIO IS COMPLETED	• Give a mark about how easy have been understand the scenario.
OVERALL EASE	• What do you have liked/disliked more about the application? • Would you recommend it to another one? Would you use the application? • Did you have facility to go to the result page? • Did you find the images/icons useful? • Did you have facility to play the game?
EXTRA QUESTIONS	• Number of clicks • Number of errors • Time spend doing the simulation • Have the user need help during the simulation? How many times? What was the user asking?

6.8. <u>SCENARIOS</u>

The user must navigate through different pages. In some of the pages the user must fill some gaps as for example to register or to login to Loglas application. In case the user wants to make a more precise search it would have the option to use the search bar, so that she could find easiest the lobby.

In another case that user want to create more lobbies it has to fill specifying the players can enter in the room and the name.

6.9. <u>PARTICIPANTS</u>

Loglas application will be checked by our other classmates. While they are checking it, they will simulate registering to the application, joining to a game room and playing the chosen game. In this process, they will take care of the facilities they have to do it, the time spending doing it, the number of click they've made to go to the game results page, the facility to arrive to the game results page….

6.10. <u>QUANTITATIVE METRICS</u>

In the test we will consider different quantitative data such as successful completion rates, error rates or time on task.

6.11. <u>ROLES</u>

In the usability testing there will participate different persons with different roles, such as other teammates, people with a lot of/middle/few knowledge about informatics...

7. LOGLAS IMPROVEMENTS FOR AXURE

Our usability test has been made to 18 different people. The first 9 people have done the application simulation with the first version and the other ones with the second version.

7.1. FIRST SIMULATION

According to our usability test results, we have deduced that users have made more clicks than we had previously expected. So, in order to improve it, we have improved the tab because it didn't work correctly, and consequently the users were making more clicks than the needed. Moreover, we had some misunderstanding with the login and the sign up because, the initial names we had used they were not the correct ones. In order to solve it we have had more significant names to the variables. With this small changes, we hope that the users will have more facility of going to the result page and make less clicks.

Focusing on the time, we should take into consideration the dialog that opens when a user joins as a new player or as a viewer to a game, because some testers didn't take into consideration the number of gamers that were in a room, so they waste a lot of time waiting to start the game. In order to correct this mistake users should read the dialog instead of closing it, to know exactly what they must do. In this way they would spend less time reading the short message dialog, rather than been waiting for a game that it won't start until the room has the maximum number of players.

According Loglas application improvements some testers have made us some suggestions to make the application better. Such suggestions have been the following ones:

- They would like to invite their friends when they have created a lobby.
- They would like to know who is inside a lobby.
- They would like to change the way you join to a lobby (for example: the information of that lobby as the players name that are in the lobby, link to join to the lobby…).
- They would like a chat to communicate with different users that are in the game.
- They would like to be able to create/edit users' profiles (for example: add personal info, images…).

Another aspect to consider for some users, was the bad distribution of the application. This was because some aspects of the home windows were mess, such as the way where the users join to a game as a player or as a viewer.

Despite our application faults, the results were different considering each users experience. For most of them it was easy to play a game, but they were some users that they had some problems related mainly with the home page. Although we also had positive comments such as: for all the users the images/icons we used were intuitive and representative, so they facilitate a lot to play a game. With hat even though not knowing what you had to do, seen the pictures was helpful. Moreover, in some windows they were some facilitates as when you register to Loglas, you didn't have to login with your password and username, the application started working with the recent created user.

To sum up, we hope that after correcting all the faults that the testers have found we would reduce the number of clicks and time spent per user.

7.2. <u>**SECOND SIMULATION**</u>

In the second version the changes that have been made have been the following ones:

- Tab correction in different pages.
- Resolve the misunderstanding between the login and the sign-up buttons.

In this second simulation we have notice that the people spend less time playing a game and in overall doing all the testing. Although we have found other different mistakes such as the enter in some windows or misunderstandings because not reading properly the gaps that they were supposed to read.

According to the new improvements to make in our application they have been the following ones:

- Made the application multilingual.
- The possibility to change the username.
- Make user settings.
- Change the stats tabs.
- Make the main menu buttons more intuitive.
- Change the go out button.
- Make the font smaller.
- Put the text in the same color.

In a nearly future these small changes will be implemented, and testers will spend less time doing the game simulation. Moreover, the application would have better appearance and would avoid misunderstandings.

8. <u>LOGLAS IMPROVEMENTS FOR UX</u>

To improve user experience, we have used a simple tracking method.

Our released product will record user's click habits regarding the navigation (actual), the time lapse and number of clicks.

This information will provide us a general page navigation easiness from the point of view of the client, regarding the elapsed time from click to click.

Apart from that, we can realize if users are visiting all pages of not. This will provide us some information about pages that are not that accessible as most visited pages.

Moreover, we can correct interface elements' positioning for pages such as login or register, where the user is focused in one general task.

At least but not last, we can track if the user has successfully completed the task that was asked for.

8.1. <u>FUTURE TRACKING IMPLEMENTATIONS</u>

Our future implementation is to track user's scrolling activity in most visited pages, along clicked position. If users have a high scrolling activity and click event is mostly in the same area, we can collect some information about our clients habits and likes regarding our product functionalities, such as user stats page, where many data visualization elements are scrambled.

9. <u>ATTACHED</u>

In the attached there are the different test plans that we have used in order to test our application.

9.1. <u>AXURE TEST PLAN</u>

In this first part there is the test plan we have used to test our Axure application.

Different users will have to perform this test (20-30).

Age	Gender	Occupancy

The user will try to perform these actions:

1. Create an account for you.
2. Login with your username and password.
3. Create one Lobby.
4. Play at one Lobby.
5. See how other players play at one Lobby.
6. See your different stats.

The tester to note the following data:

- Number of clicks
- Number of errors (What & why)
- Time spend doing the simulation

	Nº clicks	Number of errors (What & why)	Time
Create an account for you.			
Login with your username and password.			
Create one Lobby.			
Play at one Lobby.			
See how other players play at one Lobby.			

See your different stats.			
Total			

After the user answer these questions:

- What do you have liked/disliked more about the application?

- Would you recommend it to another one? Would you use it?

- Are the images/icons useful?

- Did you have facility to play the game?

- Would you change anything?

- Do you miss any option for users?

- Was the size of the graphs and fonts enough?

- 'Branding' is a term used to describe the illustrations, colors, fonts, and artistic style of a webpage. What was your opinion of the branding of the page you just saw?

9.2. __WEB BASED MULTIPLAYER GAME TEST PLAN__

In this second part there is the test plan we have used to test our Web based multiplayer game application.

Different administrators will have to perform this test (20-30).

Age	Gender	Occupancy

The user will try to perform these actions:

1. Login with admin username and admin password.
2. Logout.
3. Create one Lobby.
4. Talk on chat.
5. Play at one Lobby.
6. See how other players play at one Lobby.
7. See your different stats.
8. Recovery password.
9. See the questions.
10. Create new question.
11. See platform stats.
12. Create one lobby and play.
13. Recovery password and see how play the other players.
14. Logout, login and see your stats.
15. See questions, create new question and see the game stats.

The tester to note the following data:

- Number of clicks
- Number of errors (What & why)
- Time spend doing the simulation

	Nº clicks	Number of errors (What & why)	Time
Logout.			
Login with admin username and admin password.			
Create one Lobby.			
Talk on chat.			
Play at one Lobby.			
See how other players play at one Lobby.			
See your different stats.			
Recovery password.			
See the questions			
Create new question.			
See platform stats.			

Create one lobby and play.			
Recovery password and see how play the other players.			
Logout, login and see your stats.			
See questions, create new question and see the game stats			
Total			

After the user answer these questions:

- What do you have liked/disliked more about the application?

- Would you recommend it to another one? Would you use it?

- Are the images/icons useful?

- Did you have facility to play the game?

- Would you change anything?

- Do you miss any option for users?

- Was the size of the graphs and fonts enough?

- 'Branding' is a term used to describe the illustrations, colors, fonts, and artistic style of a webpage. What was your opinion of the branding of the page you just saw?