

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Information Engineering



Bachelor Thesis

**UI Specification of League of Legends spectator mode for
Smart TV**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

BACHELOR THESIS ASSIGNMENT

Konstantin Mikheev

Informatics

Thesis title

UI Specification of League of Legends spectator mode for Smart TV

Objectives of thesis

UI Specification of League of Legends spectator mode for Smart TV will solve:

- To develop an adaptive user interface system of "spectator mode in the game League of Legends"
- It will be focused on Smart TV according to the client's version platform for personal computers.

Methodology

To make research of:

- League of legends spectator modes needs
- Smart TV control possibilities
- Research of other Smart TV games

To make the results from that. After this research implement UI Specification. Test this UI Specification in Usability Study (10 participants). Define the results from the test. Recommend gained knowledge and update UI Specification according to the results.

The proposed extent of the thesis

43

Keywords

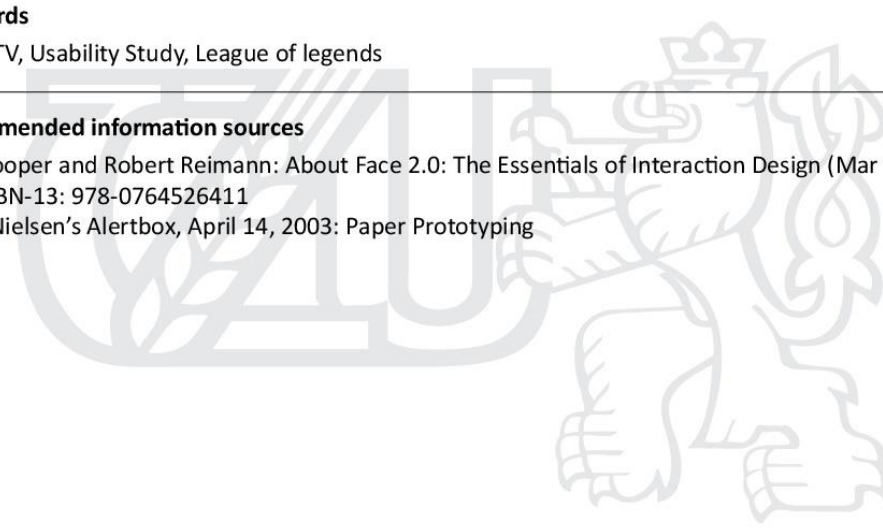
Smart TV, Usability Study, League of legends

Recommended information sources

Alan Cooper and Robert Reimann: About Face 2.0: The Essentials of Interaction Design (Mar 17, 2003),

ISBN-13: 978-0764526411

Jakob Nielsen's Alertbox, April 14, 2003: Paper Prototyping



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Declaration

I declare that I have worked on my bachelor thesis titled "UI Specification of League of Legends spectator mode for Smart TV" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on November 15, 2018

Mikheev Konstantin

Acknowledgment

I would like to thank Ing. Josef Pavlíček, Ph.D., for his advice and support during my work on this Thesis.

UI Specification of League of Legends spectator mode for Smart TV

Abstract:

The main purpose of my bachelor's degree work is to research and implement UI Specification of League of Legends spectator mode for Smart TV.

The object of research Smart TV and spectator mode in League of Legends game needs. Theoretical and information research was the work of Russian and foreign authors on smart TV, spectator mode, user interface specification.

The thesis consists of introduction, six chapters, conclusion and bibliography.

Keywords: UI Specification, Smart TV, League of Legends

UI Specifikace League of Legends režimu diváckého pro Smart TV

Abstrakt:

Hlavním cílem mé bakalářské práce je výzkum a implementaci UI Specifikace League of Legends mód diváka pro Smart TV.

Předmětem výzkumu Smart TV a diváckou režimu v League of Legends potřebám hry. Teoretický a informace výzkumu bylo dílem ruských a zahraničních autorů na smart TV, mód diváka, specifikace uživatelského rozhraní.

Práce se skládá ze úvod, šest kapitol, závěr a bibliografii.

Klíčová slova: UI specifikace, Smart TV, League of Legends

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Introduction

Development of Internet technologies continues to be introduced and developed in modern society. Internet has become a fundamental part of life, which helps to gain knowledge in any direction.

Development of graphical interface began in the 60's with research at Stanford; Xerox continued its implementation and development within the company. Later on, Apple began commercial implementation of the graphic interface and its subsequent development. (9)

Today, there are professions such as UI designer / UX specialist, where people work every day to improve the user interface for various programs and applications, so that each user which working with particular product can comfortably and conveniently interact.

The company RIOT GAMES, which developed and released in 2009 a game that called League of Legends, every day, collects data to improve the interface, both in the client and in the game, without changing the game itself. It was in 2016 that the Riot's released a completely updated client-side interface. In addition, monthly they make changes to the game interface. In testing, they are helped by a huge audience of players. According to the latest available data, more than 100 million people play in League of Legends every month.¹

It was such a popularity of this computer game that gave impetus for development of cyber sport all over the world, which later served as an even greater development and popularity of the League of Legends. The first World championship, which was held by the Riot's in 2011, was conducted using a spectator mode. And year later they developed something that allows not only to follow the game of a friend, but also for professional players to disassemble their game process and analyze every moment, namely the spectator mode is available for everyone. Now you can see even the professional players who plays in real time.

The only thing that from my point of view is not user-friendly is the ability to use the spectator mod only on computer or laptop where the game must be installed. Development of the

¹ <http://mmo13.ru/news/post-1941>

application interface, including the possibility to use the spectator mode for Smart TV will serve as the first step towards to creation of a new generation application.

1. Goals of Bachelor Thesis

UI Specification of League of Legends spectator mode for Smart TV will solves:

- To develop adaptive user interface system of “spectator mode in the game League of Legends”
- It will be focused for Smart TV according to client’s version platform for personal computers.

2. Methodology

To make research of:

- League of legends spectator modes needs
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To make the results from that.

After this research implement UI Specification. Test this UI Specification in Usability Study (10 participants). Define results from the test. Recommend gained knowledge and update UI Specification according to the results.

3. Research, theory

3.1 League of Legends spectator mode

3.1.1 Definition

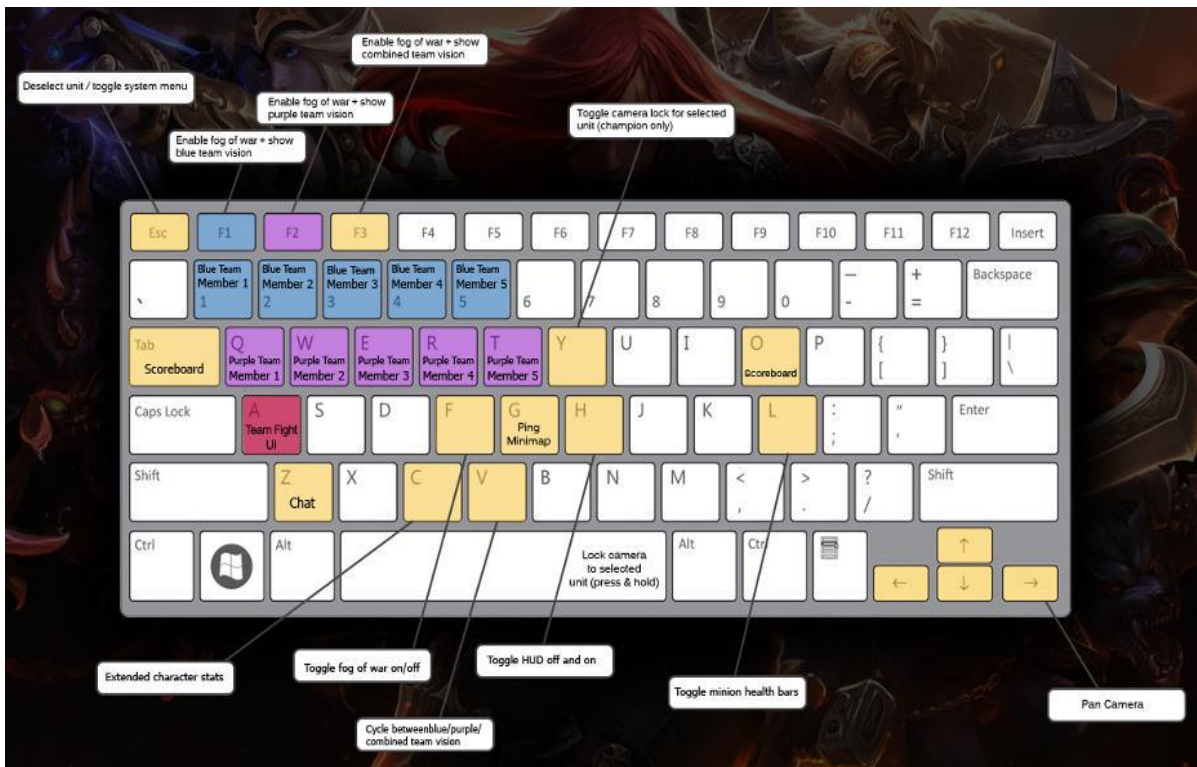
League of Legends enables players to observe games in progress in spectator mode. Spectator Mode is different from a normal player’s perspective in several ways. For starters, a spectating player has no champion to command or team affiliation. Instead, he can jump to the perspective of either team, following the action as they see it. A spectator can even opt to remove the fog of war altogether for a truly global view of the battlefield. Additionally, the spectator will be able to quickly and easily reference information on either team such as in-game stats, item builds, gold totals, and ability cooldowns.

Spectator mode can be excellent tool for those players interested in learning more of the nuances of League of Legends gameplay, or for shoutcasters interested in commentating on competitive play. (1)

3.1.2 Spectator mode operations

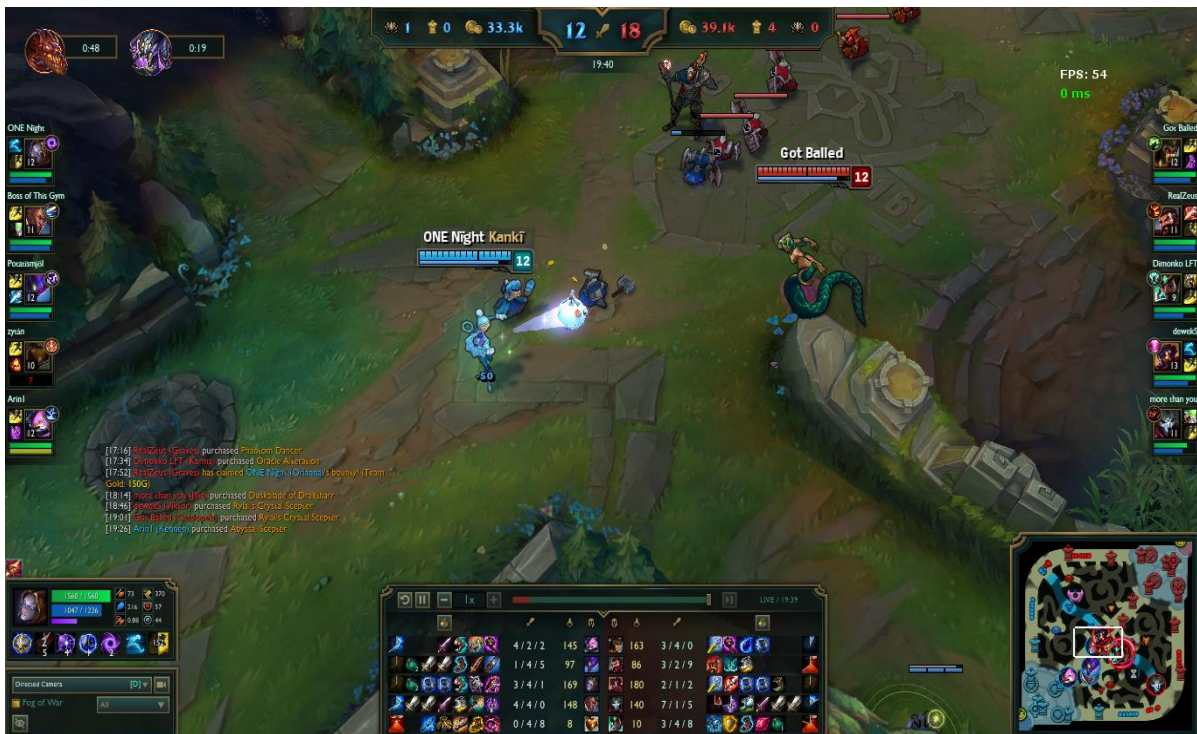
- A. Individual player's items and statistics.
- B. Individual stats of all players on each team.
- C. Lock the camera on current target.
- D. Easily jump from observing one player to another.
- E. View the game from either team's perspective or from both teams.
- F. Remove fog of war completely.
- G. User can view chat that was sent to "all" by the players.
- H. User may also ping the map, but their pings are intended as a tool for shoutcasting and will not be viewable by the other players in the game.
- I. Possible to join a game already in progress as a spectator of a player in your friend list.
- J. Three-minute delay.
- K. User will see the players' choices in Champion Select for both Blind Pick and Draft Mode.
- L. Toggle minion health bars.
- M. Extended champion stats.
- N. Special Team Fight UI (see Picture 3).
- O. Toggle HUD².

² Hide all user interface from the screen.



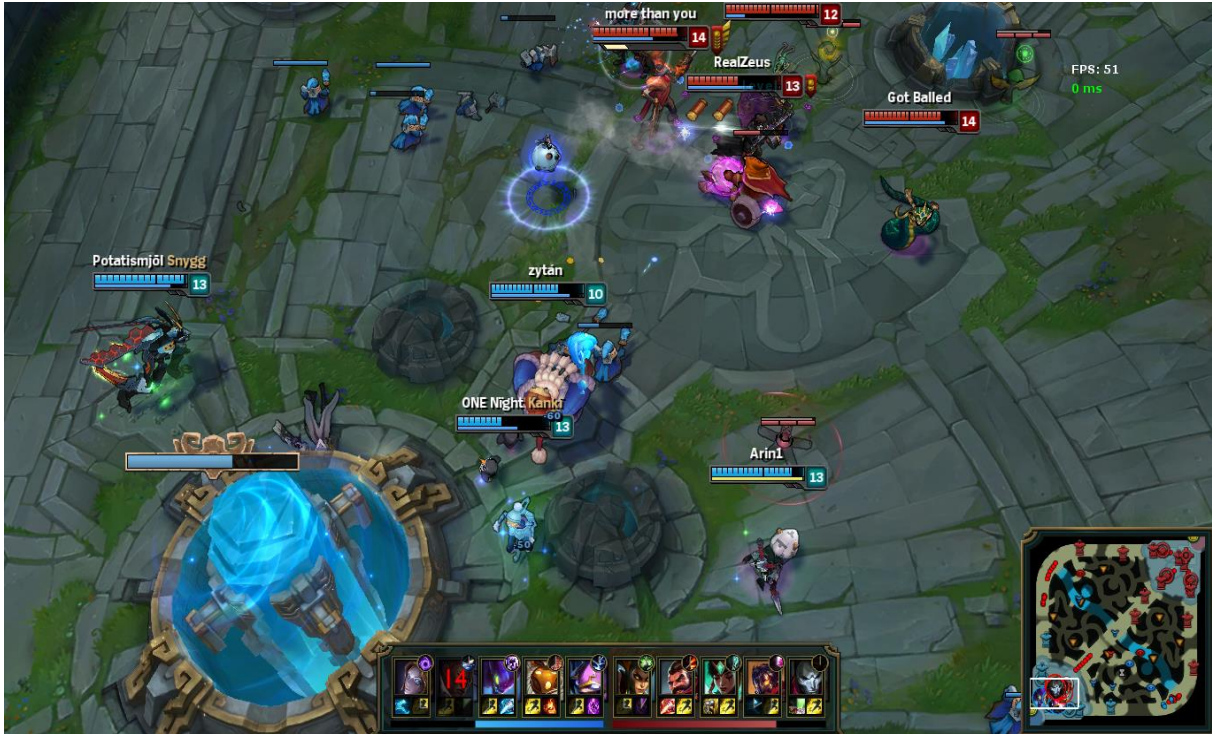
Picture 1. – Controls of spectator mode for personal computers.

Source: <http://na.leagueoflegends.com/en/spectator-faq>



Picture 2. – Client’s version platform of spectator mode for personal computers.

Source: Print screen of League of Legends game, <http://na.leagueoflegends.com/>.



Picture 3. – Special Team Fight User Interface.

Source: Print screen of League of Legends game, <http://na.leagueoflegends.com/>.

3.1.3 Disadvantage of spectator mode for personal computers.

The main disadvantage of spectator mode is necessary to have a computer or a laptop to run it, in addition to have an installed game League of Legends.

Moreover, the observation function is hidden in the game itself. For those who are little familiar with all functions and capabilities of the user interface of League of Legends game, it will be difficult to find how to start spectator mode for a particular game.

3.2 Smart TV

3.2.1 Definition

Smart TV - is a technology implementation of the operating system and various Internet services in a modern television to extend its functionality. TVs, which have the support of Smart TV turn into a real multimedia center that can play video, is not only a media player, but also the largest Internet video resources, as well as to support the installation of additional programs and applications to enhance the functionality of your TV for smartphone or tablet. Currently, almost all TVs (LG, Philips, Sony and Samsung) are endowed with integrated Wi-Fi module, or can connect Wi-Fi adapter into the USB port. The most famous platforms: LG Smart TV, Panasonic Smart Viera, Samsung Smart Hub, Sony Entertainment Network, Toshiba Cloud, Philips Smart TV. (2)

With the help of the platform Smart TV - your TV is transformed into a home multimedia center based on the operating system with the ability to play streaming video, it supports installation of additional applications of the special OS store (Tizen - Samsung, WebOS – LG, and Android TV - Sony, Philips) for the expansion of Smart TV functionality. Modern Smart TVs gradually relieve users from thinking about how to connect your computer to TV. (2)

3.2.2 Technology Hybrid broadcast broadband TV (HbbTV)

HbbTV is an advanced teletext feature, through which channels are provided Internet additional content - information about the title or description of films. HbbTV standard is not supported by all devices, but also the proper implementation of this technology was succeeded not for everyone (this feature was implemented in Philips TVs). Due to the fact, that the modern TV has a CPU, RAM, the USB-drive and programmable interfaces, functionality can be experienced in working with applications (better than any other online store for applications implemented in Panasonic's TVs, and LG TVs offer the most convenient navigation for applications in the menu). Sufficient comfort will give access to online video library, and a large video sharing. On the line of mid-range models from Samsung and Sony companies can install Skype for a comfortable communicating on a big screen, in addition using a webcam. Also, popular integrated application of social networks in television will not be redundant for user. (2)

3.2.3 Voice control on Smart TV

Depending on the model, Smart TV, a place to be a different set of voice commands. Basically, these functions use for switching channels, increase or decrease the volume of search requests, and so on. (2)

3.2.4 Control system gestures on Smart TV

In addition to Voice Control, Samsung has integrated control-camera on top side, which gives the opportunity to interact with a TV by gestures. This function is activated by a short wave of the hand. Gesture control system allows to move the cursor to the desired point on the screen by the movement of the palm, and the menu items are activated by hand grip into a fist.

List of commands:

- **WAVING A HAND GESTURE** - This is the initial recognition gesture for using gestures to control the TV.
- **FLIP TO LEFT GESTURE** - user can skip 10 seconds forward while watching videos, user can move to the next page in Smart Hub, user can flip to the next photo in the gallery.
- **FLIP TO RIGHT GESTURE** - user can skip 10 seconds backward while watching videos, user can move to the previous page in Smart Hub, user can flip to the previous photo in the gallery.
- **MOVE GESTURE** - Move user's hands freely and move the focus to the content that user wants to see. Using user's hand gesture, just like you would use a mouse pointer, you can conveniently enjoy your TV.
- **THUMB UP GESTURE** - If you see content on Facebook that you like and put your thumb up it will automatically be a "Liked", making it easier to follow and share contents.
- **GRAB GESTURE** - You can select, enter, or move to the focused contents.
- **LONG GRAB GESTURE** - You can use the long grab gesture with watching TV to quickly surf through channels or control the volume.
- **GRAB & MOVE GESTURE** - You can drag webpages, maps, pictures and more, or use it to scroll up and down pages.

- CCW ROTATION GESTURE - This gesture is used when moving to the previous menu.
- WAIVING TWO HANDS GESTURE - This is the initial recognition gesture for using Two Hands gestures to control the TV.
- GRAB & WIDENING GESTURE - When viewing photos or images, and when viewing webpages, clench both your hands and widen your hands to zoom in.
- GRAB & NARROWING GESTURE - When viewing photos or images, and when viewing webpages, clench both your hands and shorten your hands to zoom out.
- GRAB & ROTATING GESTURE - Use both hands to rotate photos and images by 90 degrees.

(3)

3.2.5 Others control systems

Most models of smart TVs in the scope of supply include an additional remote control with a gyroscope for easy navigation: "air" mouse. A certain analogue controller for Wii game console. As soon as you take it in your hands, a pointer appears on the screen that you can move by wrist and thus choose and open menus, change channels and to browse the websites. The buttons control basic functions: volume control, channel selection, the remote control can be easily detected by touch and have strategically placed. (2)

3.2.6 Operating system on Smart TV

Choosing Smart TV, the user is faced with a problem: which OS gives preference in the selection of TV. Today, the market leaders are using in their smart TVs 4 types of operating system: Tizen from Samsung, WebOS 2.0 from LG or Android from Sony and Philips and Firefox OS for Panasonic. (4)

3.2.6.1 Tizen OS

The latest models of Samsung TVs have equipped with Tizen OS, which shows a simple and intuitive interface, as well as the opportunities of its settings. All modern TVs have an electronic on-line user manual in which user can find the answer to any question without reference to the paper instructions, which is very convenient.

All remote controls of new Samsung TV models can be used as a digital pointer - integrated gyroscope allows user to control the cursor not by buttons, but by the movement of hand in appropriate direction. For standard commands, user can use voice control: channel switch, volume control and a sleep timer. To enable the microphone, just press the corresponding button on the remote control.

Tizen OS menu appears on the bottom of the screen, without closing the current image and does not interfere with viewing. Feed menu contains a list of 2 applications: the most popular and recently used. A variety of pre-installed applications is quite extensive and is focused on Russian-speaking users, including popular applications IVI online cinemas, Amediateka, Tvigle, Zoomby, Megogo, Online video sharing - YouTube and Rutube.

Besides capability to play video and watching TV, Tizen OS allows user to install from the Tizen Store app store various games. To install games there is a separate access panel to Game Library. Tizen occurs the ability to switch between multiple applications without returning to home page, and the newest models have multitasking - support multi-windows mode: watching videos while surfing the web, etc. Screen activation of this function is divided, and its size can be customized by choosing border image for themselves.

The OS can send a picture of TV to your smartphone, as well as streaming images from mobile devices to TV by Miracast technology. Plus, you can get access to content from all devices are connected to TV. (4)



Picture 4. – Tizen OS.

Source: <https://mediapure.ru/domashnij-kinoteatr-komponenty/smart-tv-vybor-operacionnoj-sistemy-umnogo-televizora/>

3.2.6.2 WebOS

The operating system WebOS, designed for LG Smart TVs is similar to Tizen, but with a different design: similar Feed menu appears at the bottom of the screen; voice control with the same remote control and even multitasking are there. The WebOS also provides a "Setup Wizard" with an interactive interface.

WebOS provides access to a variety of online services - IVI, Okko, Megogo, Amediateka, as well as access to games and other applications made possible by LG Store.

WebOS also has a multi-windows interface and allows user to access several simultaneous processes without returning to main menu. WebOS from LG allows user to access content from all devices connected to the TV using the SmartShare function, and of course to transferring of images from mobile devices (via Miracast) is also supported by the operating system. In general, WebOS - is a full analogue Tizen with a modified interface.

LG introduced webOS 3.0 in the beginning of 2016. WebOS 3.0 offers new smart functions: Magic Zoom, Magic Mobile Connection and updated control Magic Remote. Magic Zoom allows the viewer to increase the objects on the screen without losing the image quality. Magic Mobile Connection feature will help users to connect their mobile phones to Smart-TVs from LG through the app TV Plus, thus providing access to mobile apps on TV screen. Updated control Magic Remote has received additional buttons for easy control of external consoles. Screen remote control function “Screen Remote” has also been improved for greater ease of use.

(4)



Picture 5. – WebOS.

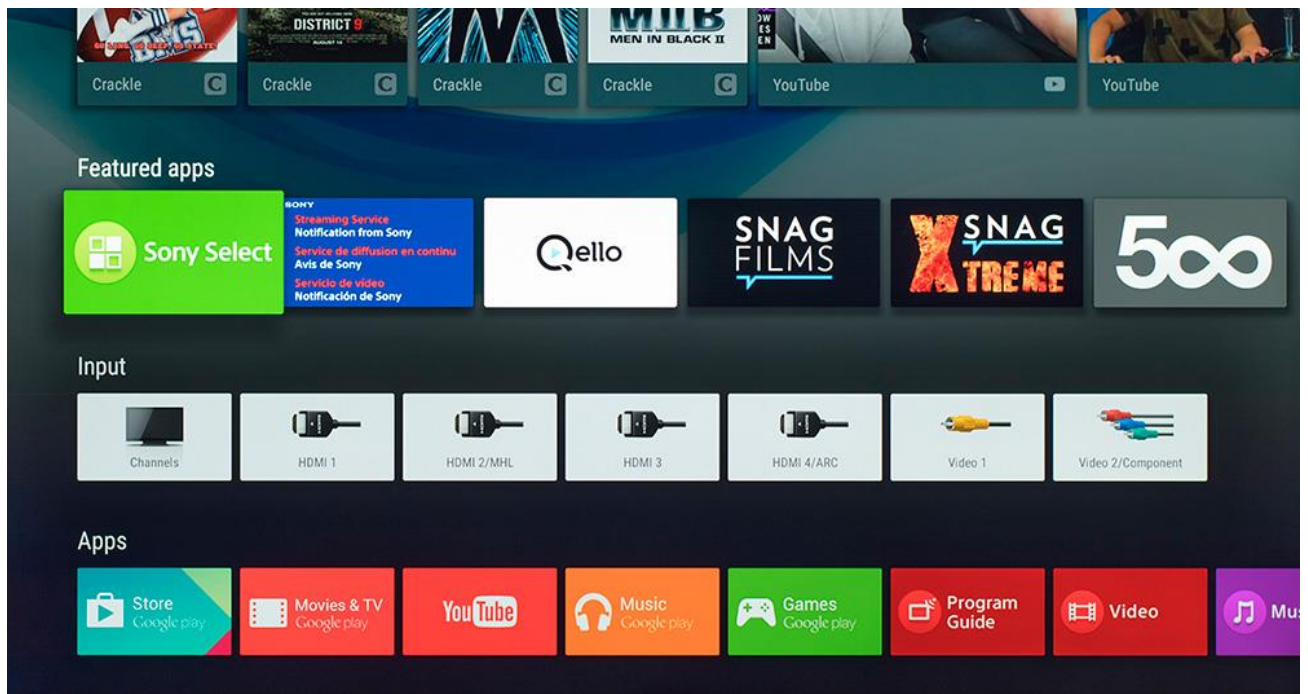
Source: <http://4pda.ru/2015/12/28/266854/>

3.2.6.3 Android TV

Smart TV on Android TV platform is very user friendly and easy to use. Home screen is a horizontal list of applications sorted by category. The first column displays a list of recently viewed videos, the second - includes all installed Smart TV applications, and the third - a list of

games. The lowest column service provides access to the settings menu. From the interface shortcomings: the call start-up screen while playing a video or watching TV covers the entire image.

Android TV will be convenient for users of smartphones with the same operating system, as it allows to setup the same kit of applications that a user uses for smartphone. Firstly, in practice, not all applications are available to use with smart TV, and secondly, it is difficult to find similar programs. The main advantage of Android TV is the ability to install games from the official Google app store. Gamers can easily find a suitable controller for themselves, and it is also supported keyboard. In addition, all TVs on Android TV-based support Chromecast technology with which allows to transfer to TV content from mobile devices. (4)

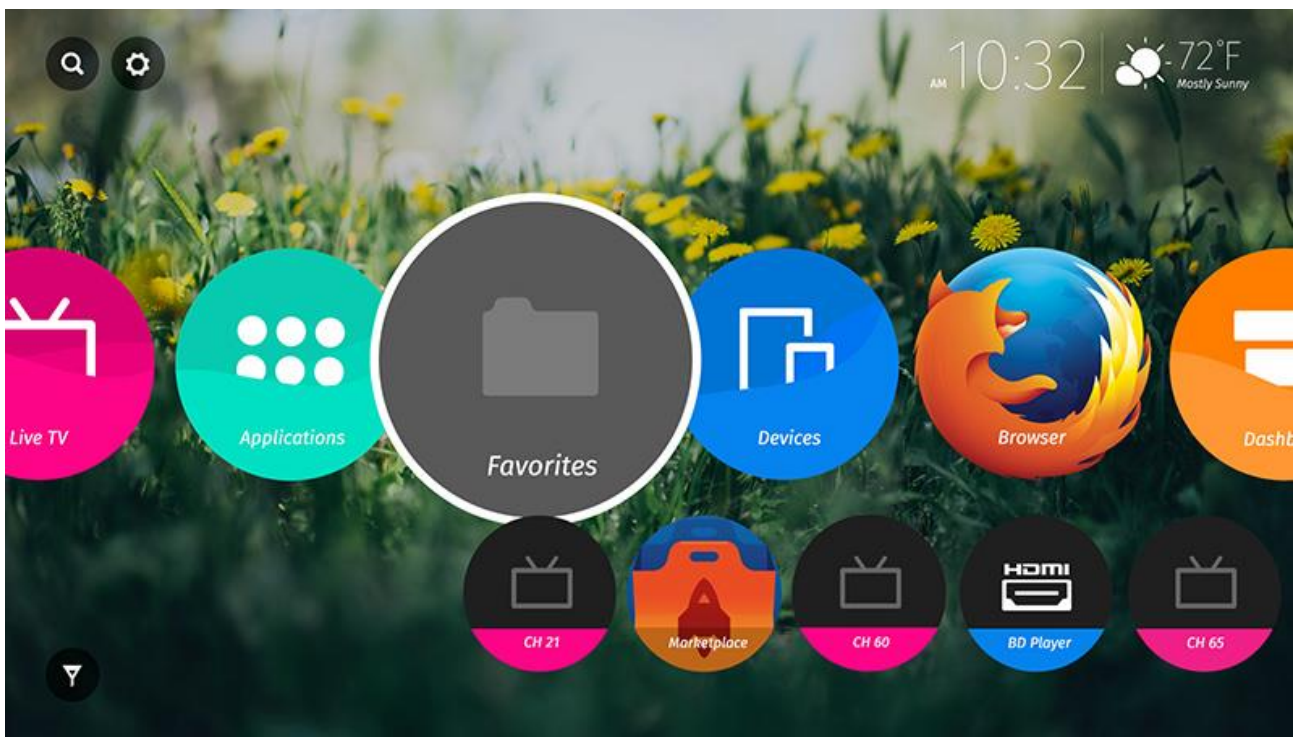


Picture 6. – Android TV.

Source: <https://mediapure.ru/domashnij-kinoteatr-komponenty/smart-tv-vybor-operacionnoj-sistemy-umnogo-televizora/>

3.2.6.3 Firefox TV

Mozilla – the company behind the Firefox Web browser – has released Firefox TV OS. A completely updated of Panasonic’s smart TV interface. New user interface was called My Home Screen 2.0. The interface has pop-up icons, and these colorful, circular and very large items appear stretched across the middle of the screen in a dynamically responsive carousel. It’s simple stuff, with icons for ‘My TV’, apps, devices, inputs and specific TV channels all presented. It’s also by far the easiest smart TV interface to customize, as apps or services can be ‘pinned’ to the carousel in seconds. (5)



Picture 7. – Firefox TV.

Source: <http://mylcd.info/novosti/firefox.html>

3.2.7 Disadvantages of Smart TV

- **Video.** To watch a movie with the extension .mkv appears problems with audio playback and / or video and displays a warning of the form "Video codec not supported". The same could happen with the files with extensions .avi, because encode audio and video codecs can be different;

- **Games.** If user is used to playing on PC or console, the games offered by the store SMART TV applications, you would better pass the party, with the exception of TV is on Android TV;
- **Browser.** Some web-sites are inconvenient to manage, and the same story with video and films: Online watching sometimes impossible due to hardware limitations of user's smart TV, or browser itself.

3.3 Smart TV games

Games for Smart TV have become quite user-friendly for users. Games can be downloaded from a certain game store, and each has its own store.

More details android TV. This is operating system that is practically a full-fledged gaming system. To Smart TV, based on this operating system, you can connect any controller: keyboard and mouse, joysticks and gamepads, various types of rudders, which allows you to immerse yourself in the game.

The newest technologies for image quality allow not only to fully enjoy the game, but also are healthy for eyes, Smart TV screens are more useful due to the curved display, which reduces pressure on the lens of the eye. In addition, there is an opportunity to play at once with the whole family, as a full-fledged game console. (6)

From the point of view of programming, games for Smart TV do not differ from any other games on smartphones based on the android operating system. Applications are written in a high-level Java programming language through android studio.

3.4 Result from research

When I conducted research of smart TV and spectator mode in the game League of Legends, I found the information above. My task is to create the most comfortable interface for the user, which will be provide the most effective and functional interface, and thus will be better interact with the user than the computer version of the spectator mode.

Then I concluded that my project can be implemented on any operating system of the smart TV.

My conclusion is based on the following goals:

1. Log in into application using registered account for game.
2. Log in as a Riot Games worker (for professional shoutcasters).
3. Register without redirecting to official site.
4. List of connected friends.
5. Interactive instructions.
6. Spectating a game of your friends.
7. Choose the server to spectate challenger players (professional players).
8. List of custom games, where user is also able to connect and spectate.
9. Chatting with friends by voice.

The above goals should be implemented for interface to fit into the Smart TV functionality and usability for the user.

4. Implementation

4.1 Goals

1. Log in into application using registered account for game.
2. Log in as a Riot Games worker (for professional shoutcasters).
3. Register without redirecting to official site.
4. List of connected friends.
5. Interactive instructions.
6. Spectating a game of your friends.
7. Choose the server to spectate challenger players (professional players).
8. List of custom games, where user is also able to connect and spectate.
9. Chatting with friends by voice.

4.2 Personas

Czech Republic persona.

Jan Pelikan.

Age: 26

Gender: Male

Hobby: Video-games

Background:

Jan has a Bachelor's Degree and he is the games tester in THQ Company. He does not have any strong career goals, other than to have a job he enjoys to play long gameplay games and spectating games of professional players, mostly in League of Legends via Smart TV. Most of all he prefers to play in The Elder Scrolls V: Skyrim.

A typical Day:

He starts his day making a breakfast or reading a book and always arrives at work at 10 pm. There he is writing the reports of tested games or using new gadgets of virtual reality. When he has a lunch, he has a talk about enjoyable games with his colleagues. At the end of workday, he arrives at home. He spends his time for cooking dinner and testing new games for work. On weekends, Jan visits his friends or looking for a new long gameplay games, playing or spectating League of Legends.

Additional information:

Occupation: Games tester

Marital Status: Single

Family/Pets: no children, no pets

Native language: Czech

Russian persona.

Ivan Rensusov.

Age: 32

Gender: Male

Hobby: Cybersport

Background:

Ivan has a Master's Degree and he is professional swimmer in Russian team. His work is professional career in swimming. He is working every day, twice a day. For him is necessary to come up to the scratch. His career goal is to win in Olympic Games. He is married and has a son. His free time hobby always is playing in computer games with his son, such as League of Legends. Sometimes they prefer to spectate their friends and learn how to play better using a Smart TV.

A typical Day:

He starts his day early in the morning at 6 pm, he goes to the swimming pool and working there for 3 hours and after that, he goes to the gym for an hour. In the pool, he trains very hard and discuss main thing with his coach. After that, he returns at home and playing with his son or playing in computer games. Cooking a quick meal for his family. And again, he goes in the swimming pool at 3 am until 7 am. At the end of workday, he arrives at home. He spends his time with his family. On weekends, Ivan visits his friends or with his family are outdoors and active.

Additional information:

Occupation: Professional swimmer

Marital Status: Married

Family/Pets: 1 children, no pets

Native language: Russian

Aussie persona.

Alia Smith.

Age: 22

Gender: Female

Hobby: Developing hardware

Background:

Alia has not any Degree yet and she is studying at RMIT University. Her freelance work is rarely. Her career goal is to make a super computer and working in Intel company. She is not married yet and has no children. Her hobby is creating intricate hardware and playing in video games. After she suddenly watched a world championship of League of Legends, she started to play and now she imagines to be a first professional girl-player. She prefers to spectate professional players most of the time, instead of playing.

A typical Day:

She starts her day at 8 pm. After a short breakfast, she goes at university and studying there until 3 am. After that, she goes to the gym for an hour. At 5 am, he returns at home cooking a quick meal. Then she starts to play in video game or reading about hardware. When she has a freelance work, she is working until the end of the day. Sometimes it continues the whole night until the freelance work will be finished. On weekends, Alia meets with her friends or spending the day for the games and learning how to perform her skills in League of Legends via spectating professional games on Smart TV.

Additional information:

Occupation: Freelancer

Marital Status: Single

Family/Pets: no children, 1 cat

Native language: English

USA persona.

Trevor Henry.

Age: 22

Gender: Male

Hobby: Shoutcasting professional games

Background:

Trevor has not any Degree yet and he is working at Riot Games as shoutcaster. His work is based on commentation, streaming and analyzing professional games of League of Legends. His career goal is to be the best shoutcaster in company. He is not married yet and has no children. His hobby is oil painting and playing in video games. Most of the time he spends at work and he prefers to spectate professional players, instead of playing.

A typical Day:

He starts a day at 8 pm. After a short breakfast, he goes at work and toils there until 6 am. After that, he goes to the gym for an hour. At 7 am, he returns at home cooking a quick meal. Then he starts to play in video game or make an analysis about professional games. On weekends, Trevor meets with his colleagues or spending the day for the games or learning how to perform his analytical skills in League of Legends via spectating professional games on Smart TV.

Additional Information:

Occupation: Shoutcaster

Marital Status: Single

Native language: English

4.3 Use cases and scenarios

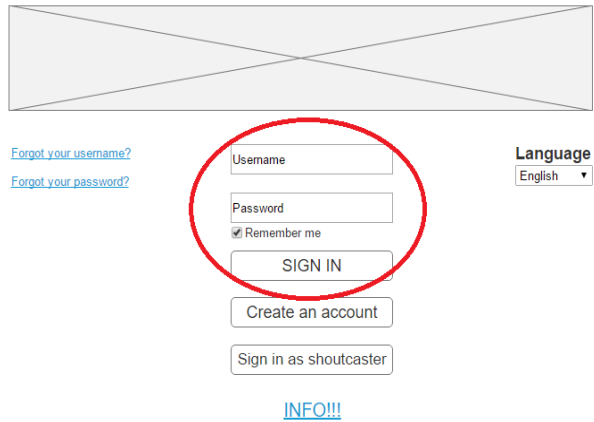
4.3.1 Log in use case

User wants to start making experience with the application. To make this happen, user expects to sign in to the system. This possible to do if user has own personal account. Also, user expects, to log in with existing account from League of Legends database game.

4.3.1.1 Sign in Scenario.

The service allows for user to fill required fields and to sign in to the application. Also, service can save user's username and password to be in the system all the time.

WELCOME TO LEAGUE OF LEGENDS SPECTATER

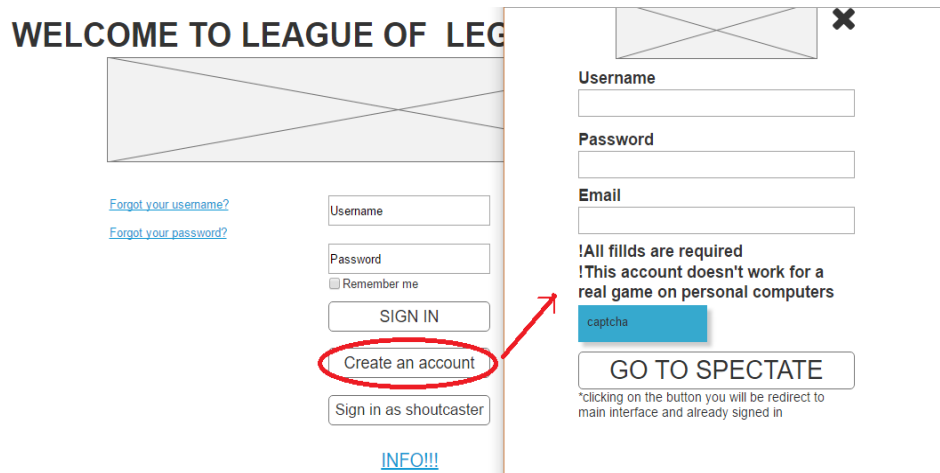


The screenshot shows a sign-in page for 'League of Legends Spectator'. At the top, there is a header 'WELCOME TO LEAGUE OF LEGENDS SPECTATER' and a large greyed-out rectangular area. Below this, there are two links: 'Forgot your username?' and 'Forgot your password?'. To the right, there is a 'Language' dropdown menu set to 'English'. The main sign-in form is circled in red and contains the following elements: a 'Username' input field, a 'Password' input field, a checked 'Remember me' checkbox, a 'SIGN IN' button, a 'Create an account' button, and a 'Sign in as shoutcaster' button. At the bottom of the form area, there is a blue link labeled 'INFO!!!'.

Picture 8. – Sign in scenario.

4.3.1.2 Create an account Scenario.

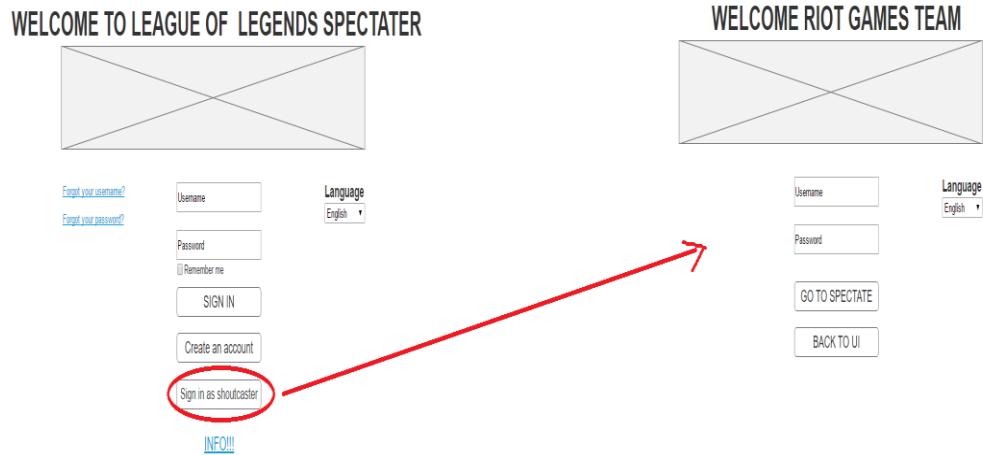
The service allows for user to create an account in case if user doesn't have personal account from League of Legends database game. After submitted registration, service automatically will sign in and redirect to main page.



Picture 9. – Sign up scenario.

4.3.1.3 Sign in as Riot Games Employee Scenario.

The service allows only for employees from Riot Games company to use special interface for signing in to the system.



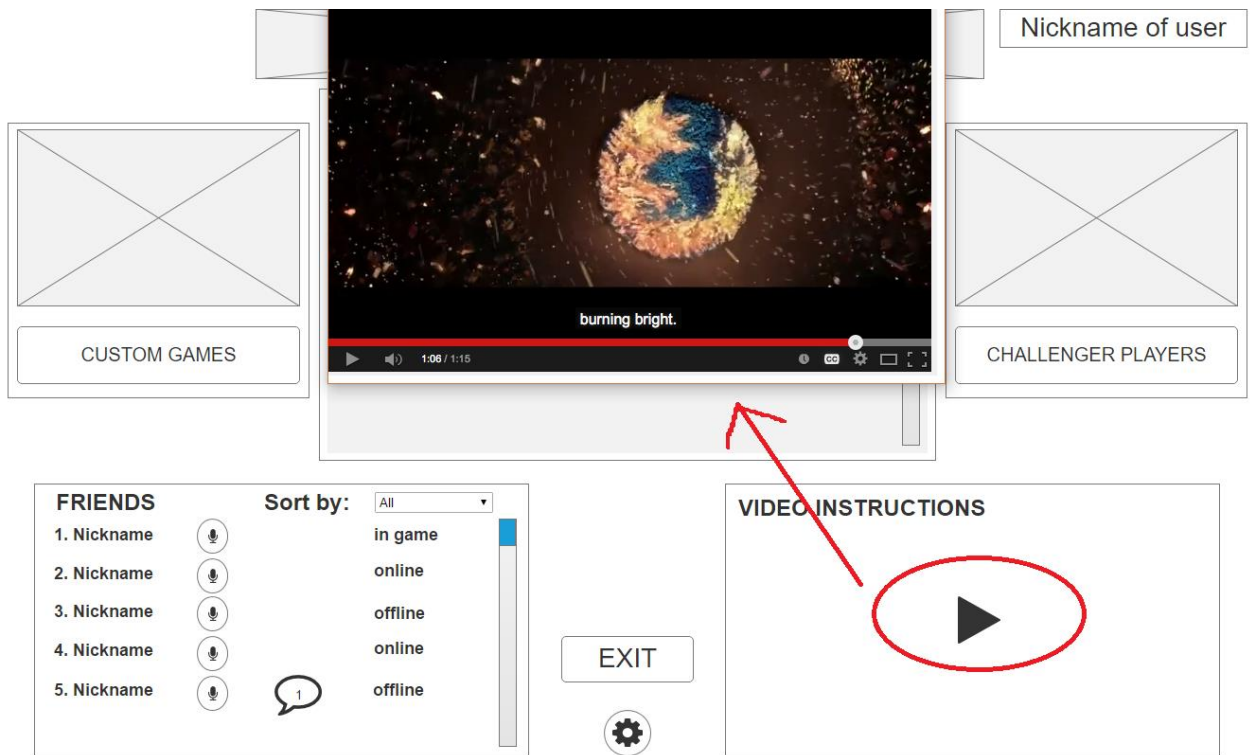
Picture 10. – Sign in as riot games employee scenario.

4.3.2 Interactive instructions use case

User without experience of playing in League of Legends game wants to know how to use this service. He/she expects to watch instructions or to activate tooltips.

4.3.2.1 To watch instructions Scenario.

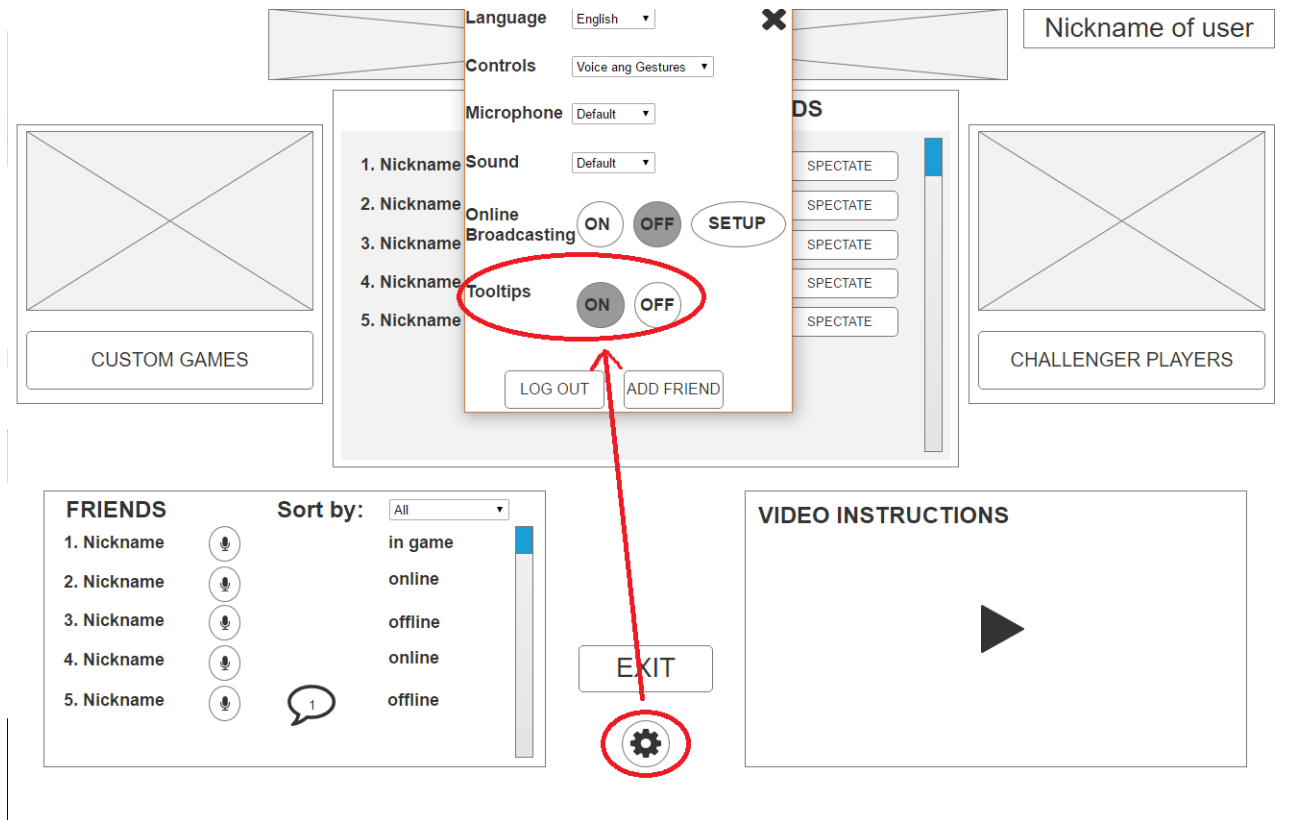
The service allows to watch video about instructions – how to interact with the service on main page.



Picture 11. – Video instructions scenario.

4.3.2.2 Setup tooltips Scenario.

The service allows for user to switch on or off tooltips in the system.



Picture 12. – Setup tooltips scenario.

4.3.3 Friends use case

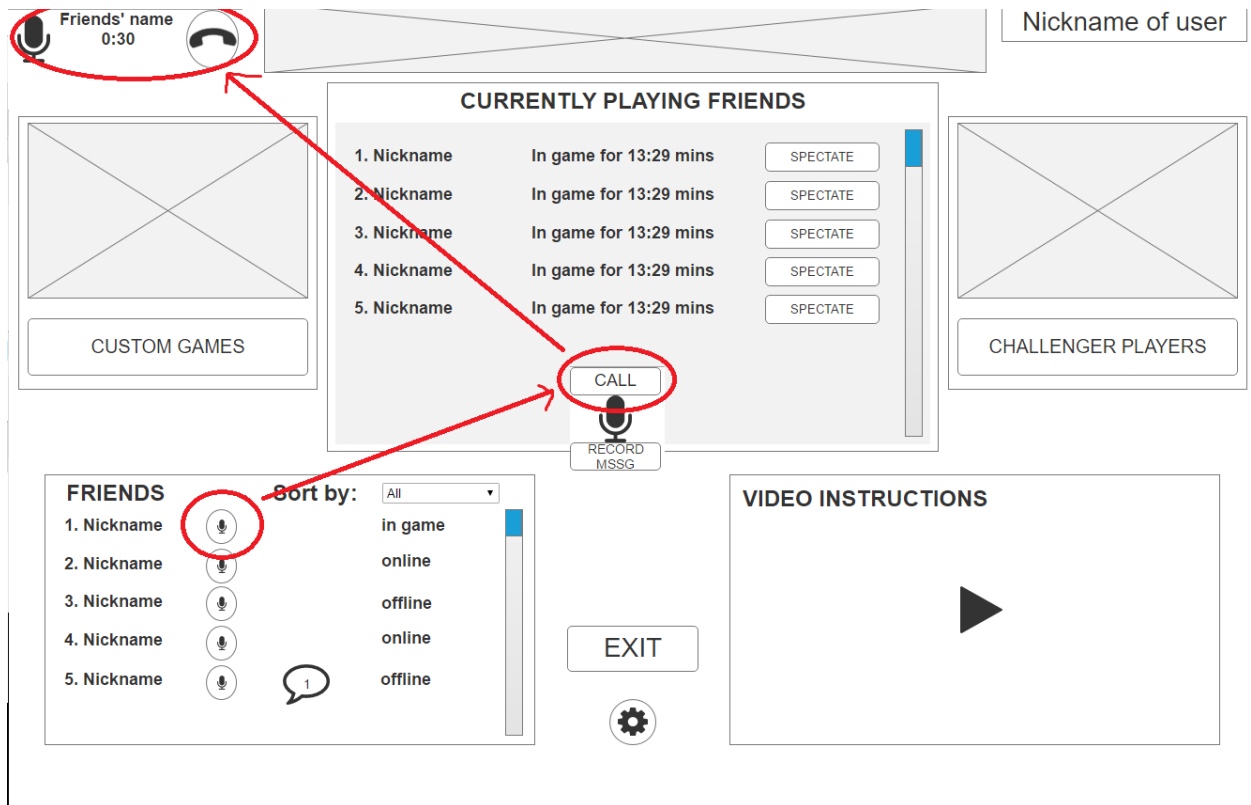
User works with the service. During his/her work, he/she wants to see the list of friends, to spectate playing friends, to call them or to send voice message, to add or delete friends in the list. User expects to see currently playing friends like a main part of the service.

4.3.3.1 Calling to friend Scenario.

The service allows for user making calls. During the calling service allows for user turn on or turn off microphone, cancel the call:

Button with microphone -> call to particular friend.

Pop-up window of call -> button with phone handset.

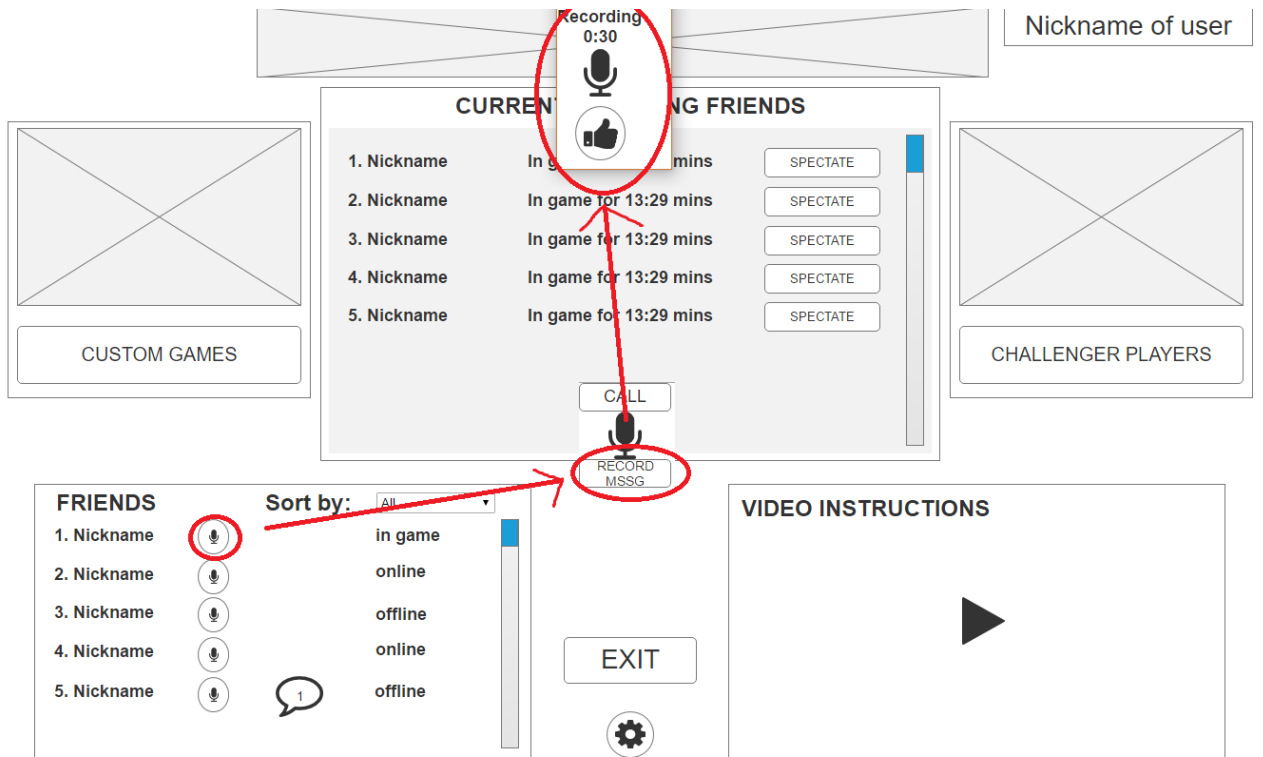


Picture 13. – Make a call scenario.

4.3.3.2 Sending voice message Scenario.

The service allows for user send messages to friends in the list. User can send messages by recording his/her voice.

Button with microphone → record mssg (short form of the word message using in League of Legends community) → thumbs up button (to send the message).

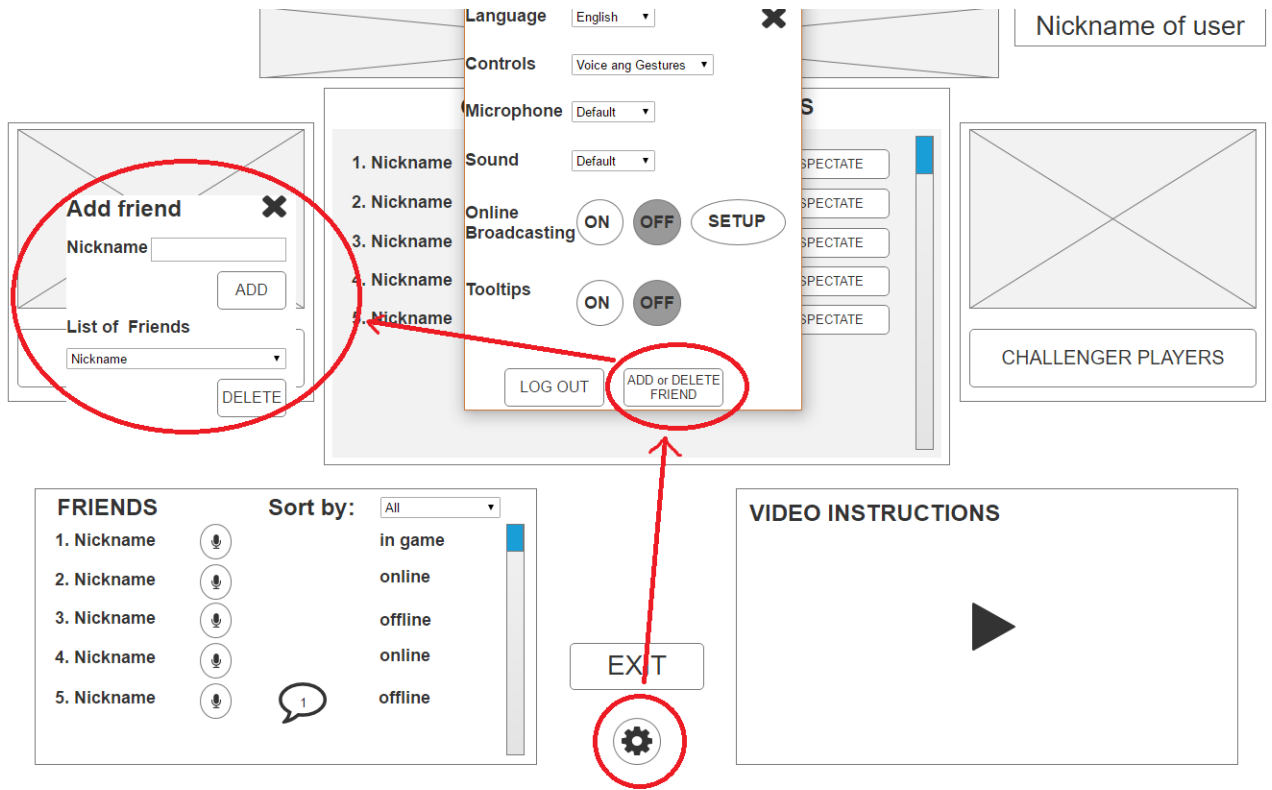


Picture 14. – Voice message scenario.

4.3.3.3 Add or delete friends in the list.

The service allows for user to add or delete his/her friends by using settings.

Settings → add or delete friend → field to add a friend or list box to delete one of friends.

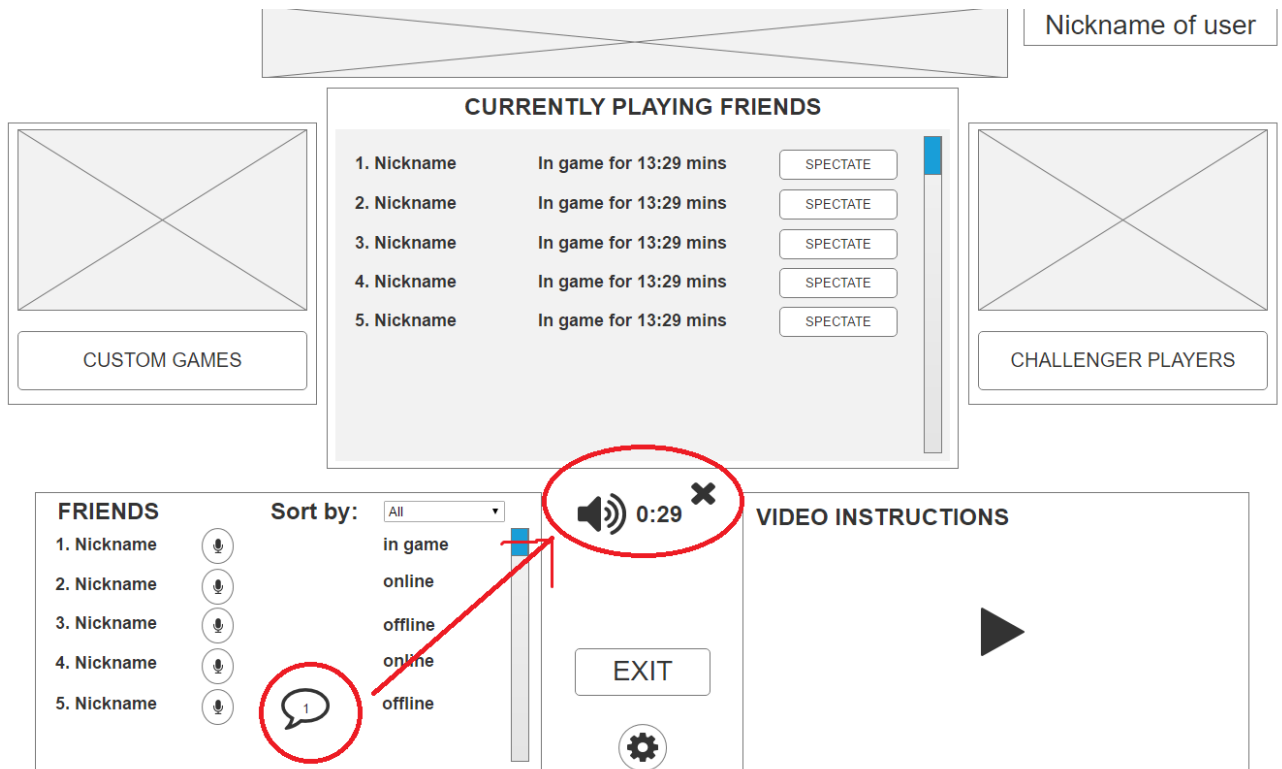


Picture 15. – Add or delete friends scenario.

4.3.3.4 Receive voice message from friend Scenario.

The service allows for user to receive voice message from friend and it represents like a markup balloon and the number inside balloon means number of message received.

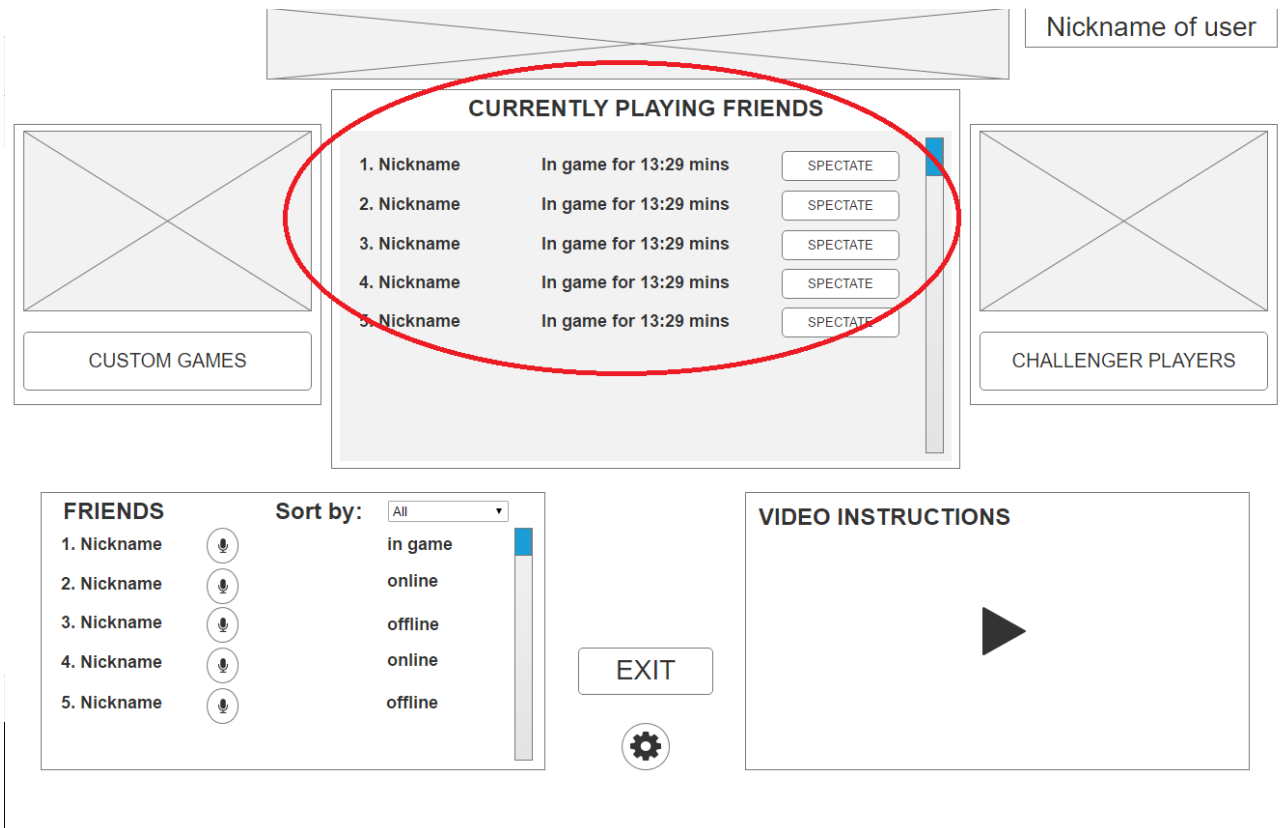
Markup balloon → listen a message



Picture 16. – Receive message scenario.

4.3.3.5 Currently playing friends Scenario.

The service allows for user after successful signed in to see the list of currently playing friends and their duration in the game. Service also allows to spectate the game of only one friend by user.



Picture 17. – Currently playing friends scenario.

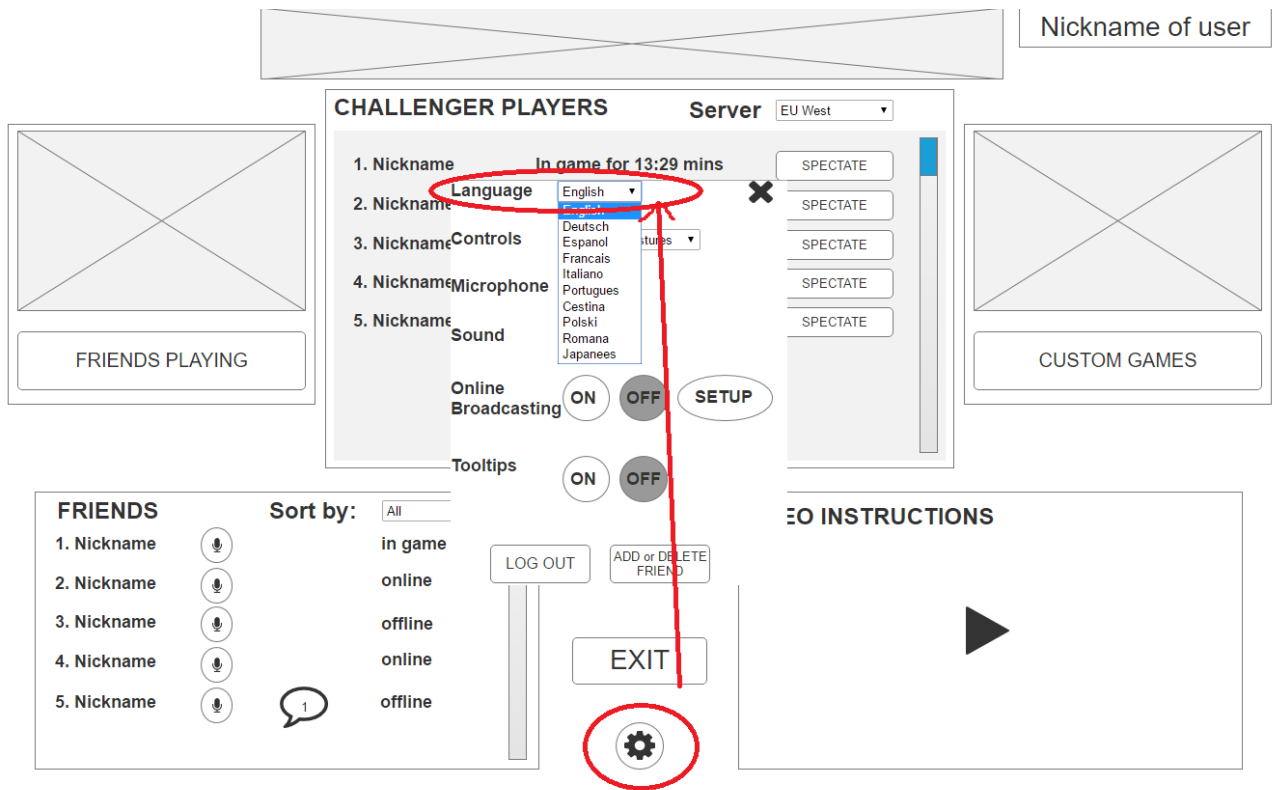
4.3.4 Settings use case

The user wants to simplify work with the service. He/she wants to setup his/her account settings: to change language, to switch control from voice and gestures to keyboard and mouse, to choose microphone and sound devices, to turn on online broadcasting, or to log out from account. User expects to find all settings at one place.

4.3.4.1 Change language Scenario.

The service allows for user change any language. After user selected a desired language, system will automatically apply changes.

Settings -> choose from variants of list box.

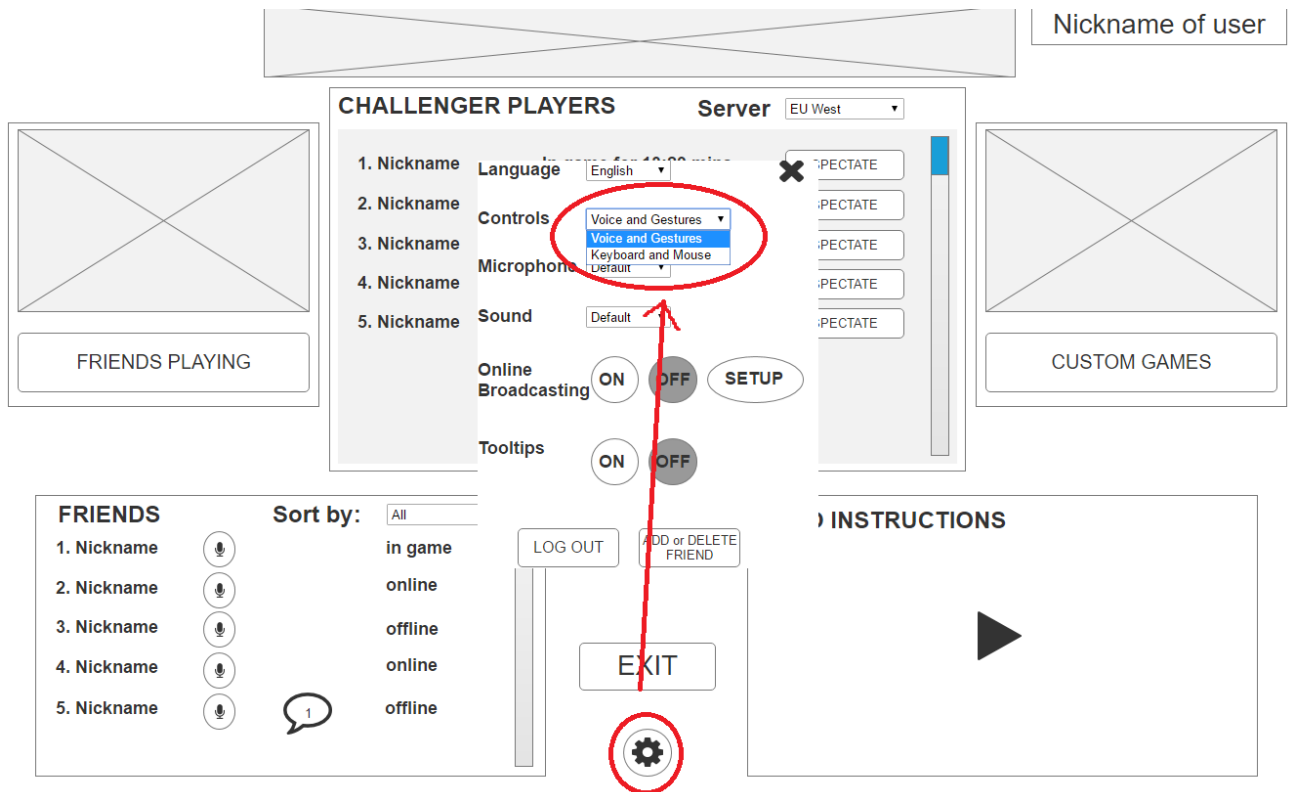


Picture 18. – Change language scenario.

4.3.4.2 Switch controls Scenario.

The service allows for user switch controls from voice and gestures to keyboard and mouse. After user selected desired controls of application, system will automatically apply changes.

Settings → choose from variants of list box.

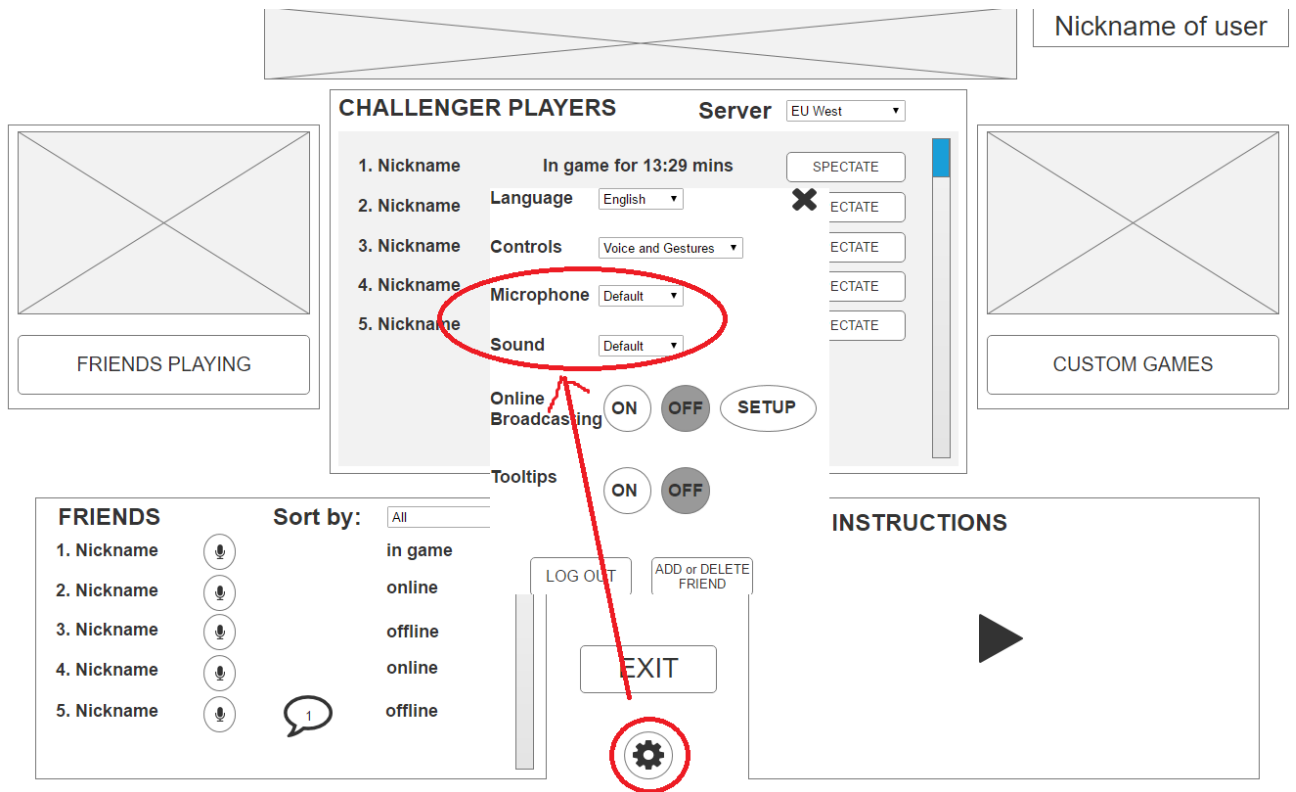


Picture 19. – Switch controls scenario.

4.3.4.3 Choose microphone and sound device Scenario.

The service allows for user to choose microphone and sound device, in case of several connected devices, otherwise sets it as default. After user selected desired devices, system will automatically apply changes.

Settings → choose from variants of list box.

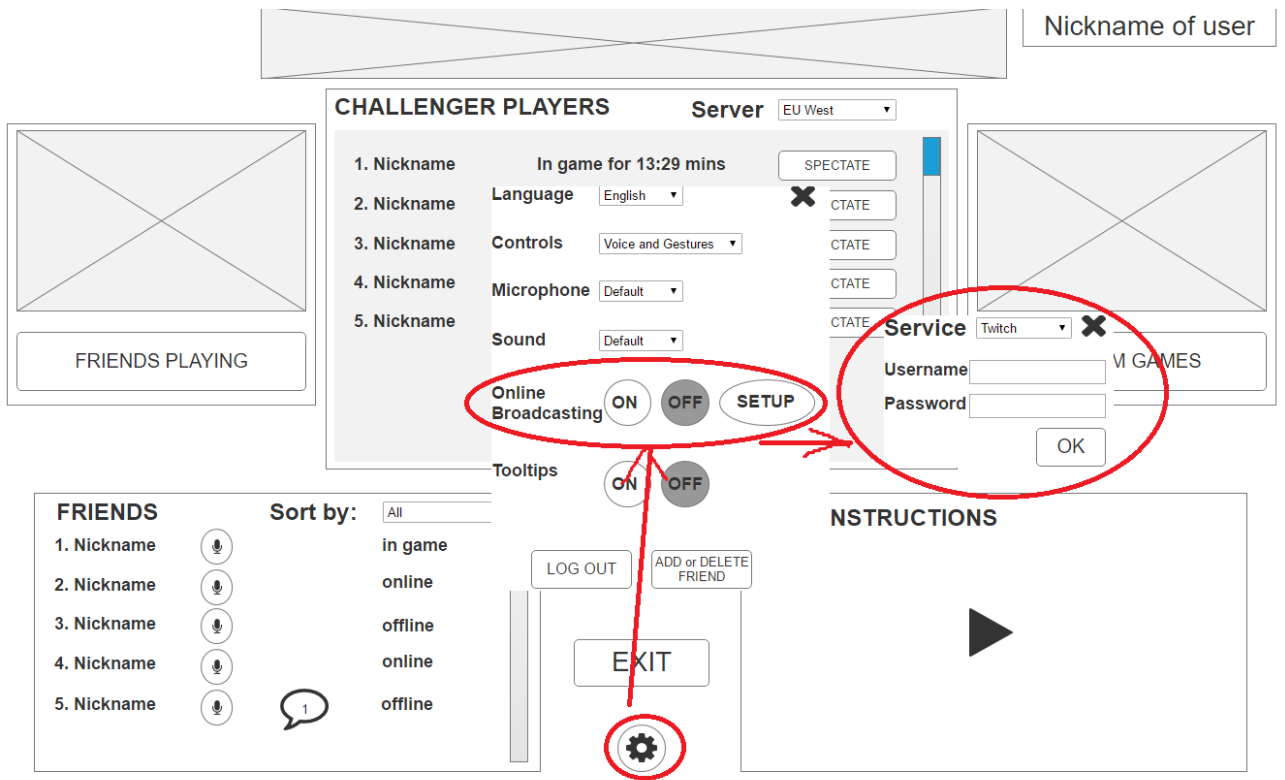


Picture 20. – Choose microphone and sound device scenario.

4.3.4.4 Turn on online broadcasting Scenario.

The service allows for user to setup stream service. By using existing account from stream service such as twitch.tv, youtube.com, or goodgame.ru user can log in and turn on online broadcasting. After user turned on stream, system will automatically capture the whole screen.

Settings → online broadcasting → setup → choose stream service → sign in and turn on online broadcasting.

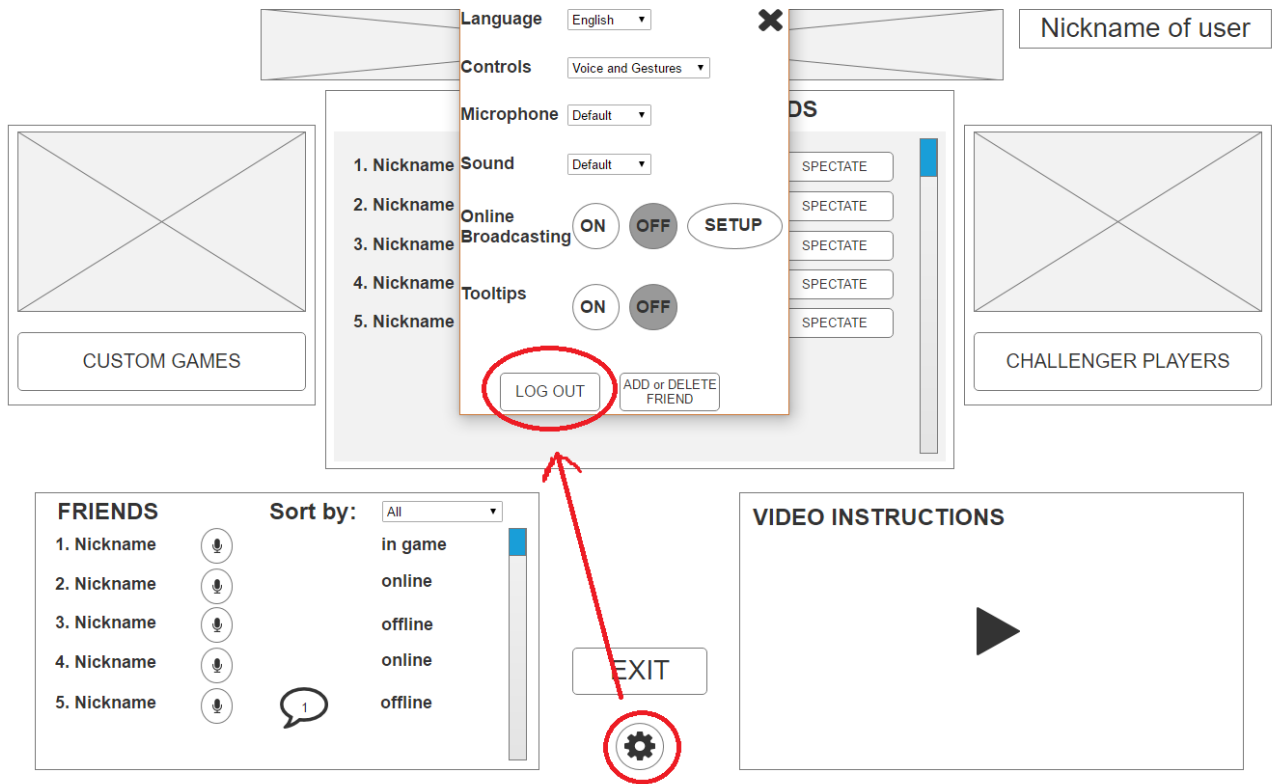


Picture 21. – Stream scenario.

4.3.4.5 Log out Scenario.

The service allows for user to log out from application. System redirects user to starting interface, where user can sign in.

Settings → Log out.



Picture 22. – Log out scenario.

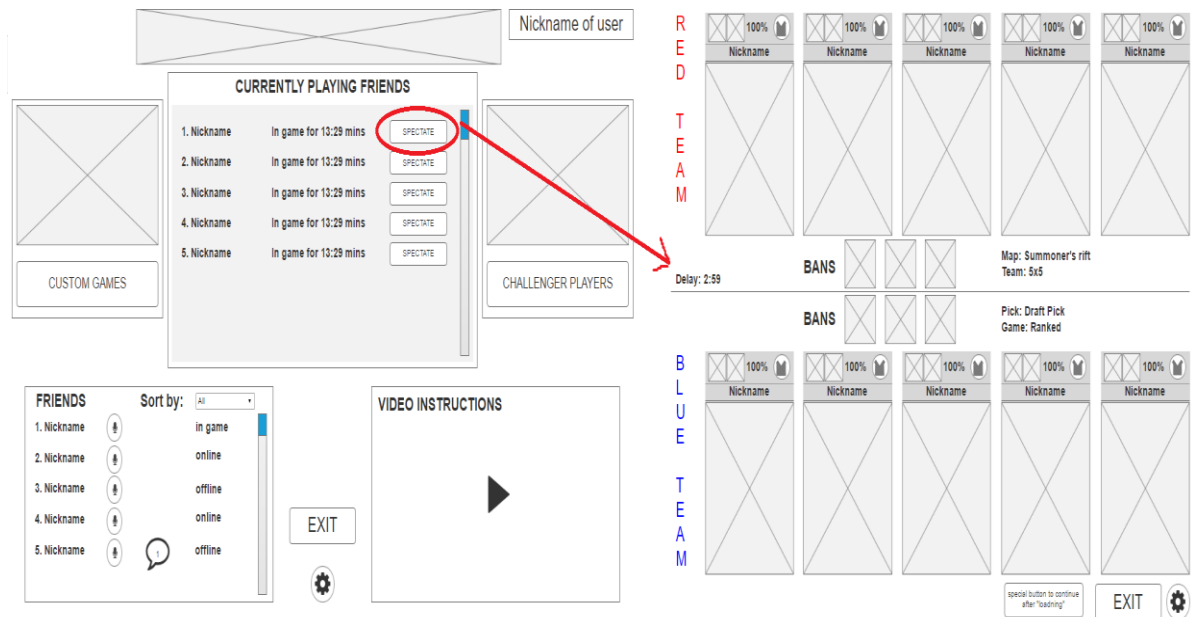
4.3.5 Spectate a game use case

The main reason, why user makes use of service, is to spectate a game of his/her friend, or to spectate challenger players, or to be a part of custom games as a spectator. User expects to see runes and masteries of each player when delay is not over, before the currently watch a game. Also, user wants to see the list of challenger players and to have possibility to change the server. After the game is over user expects to see the table and diagram of game statistics.

4.3.5.1 Spectate game of a friend Scenario.

The service allows for user to choose a game from the list of currently playing friends and to be a spectator.

Choose a friend → spectate → waiting the delay time (in case a game even started).



Picture 23. – Spectate game of a friend scenario.

4.3.5.2 Choose type of game and server to spectate Scenario.

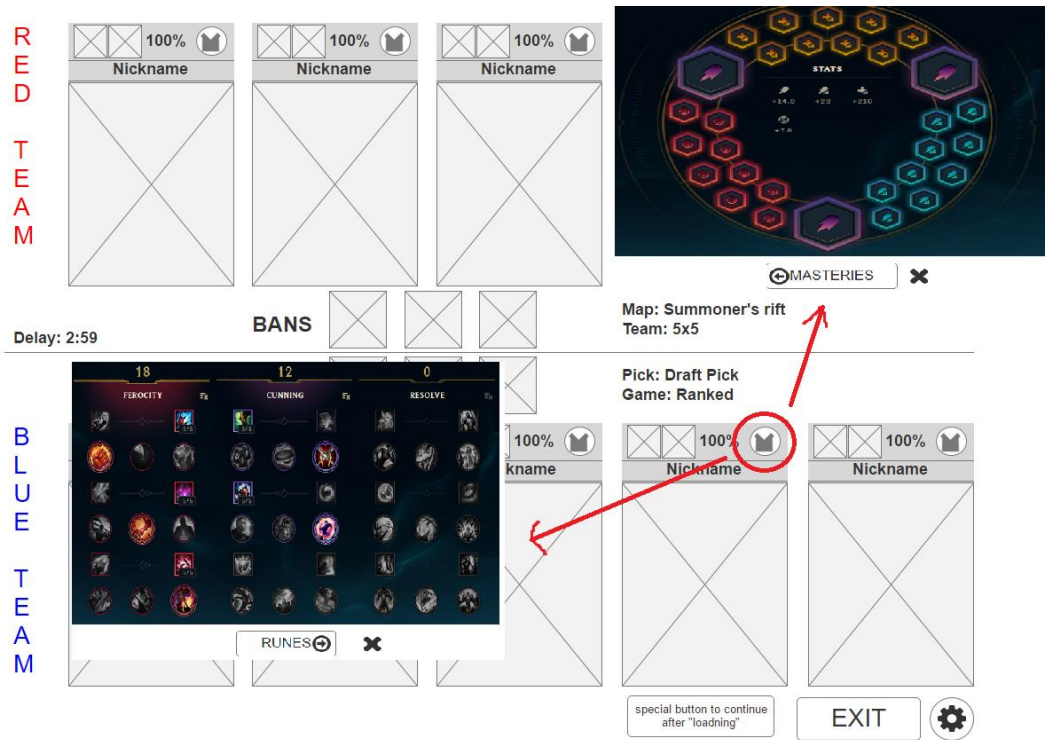
Service allows for user to choose a type of game and to spectate one from challenger players, or to be a spectator of custom game.



Picture 24. – Choose what to spectate scenario.

4.3.5.3 Check runes and masteries Scenario.

The service allows for user to check runes and masteries of each player before the game started.



Picture 25. – Check runes and masteries scenario.

4.3.5.4 Observe statistics after game is finished Scenario.

The service allows for user to be a spectator of currently chosen game, and when the game is finished user can observe the whole statistic in table or diagram form.



Picture 26. – Observe statistics scenario.

5. Test in Usability Study

Two types of testing are used to test the user interface: Heuristic or Cognitive.

Heuristic – is a usability inspection method for computer software that helps to identify usability problems in the user interface design. (7)

Cognitive – is a method for testing the usability of interface, with a bias on how it is clear for new users to perform tasks with the new system. Cognitive testing is focused on specific tasks. (8)

To better identify the pros and cons of the developed interface, it is necessary to conduct a Cognitive test in Usability Study, with participation of 5 to 10 people, who will first meet with the interface and its capabilities.

5.1 Use case test

1. Login or register in application.
2. Listen a message.
3. Spectate a game.
4. Observe statistics after a game.
5. Log out from the application.

5.2 Process of testing and results

After testing, the following questions were asked to define and to identify the results:

- A. Have you ever played in League of Legends?
- B. What is your Likes?
- C. What is your Dislikes?
- D. What is your Recommendations?

According to questions above, the following answers were received:

- A. Nobody has ever played in League of Legends.
- B. User-friendly interface. Large buttons and icons. The worked out functional. Easy-to-perceive in terms of cognitive testing.
- C. A difficult understanding of how to exit from the program.
- D. Make the button log out closer, in terms of intuitively clear, to user.

For testing in Usability Study Laboratory, the program was used – Axure RP 8³, which allows to make clickable logical design interface in HTML format⁴ (see Annex 1).

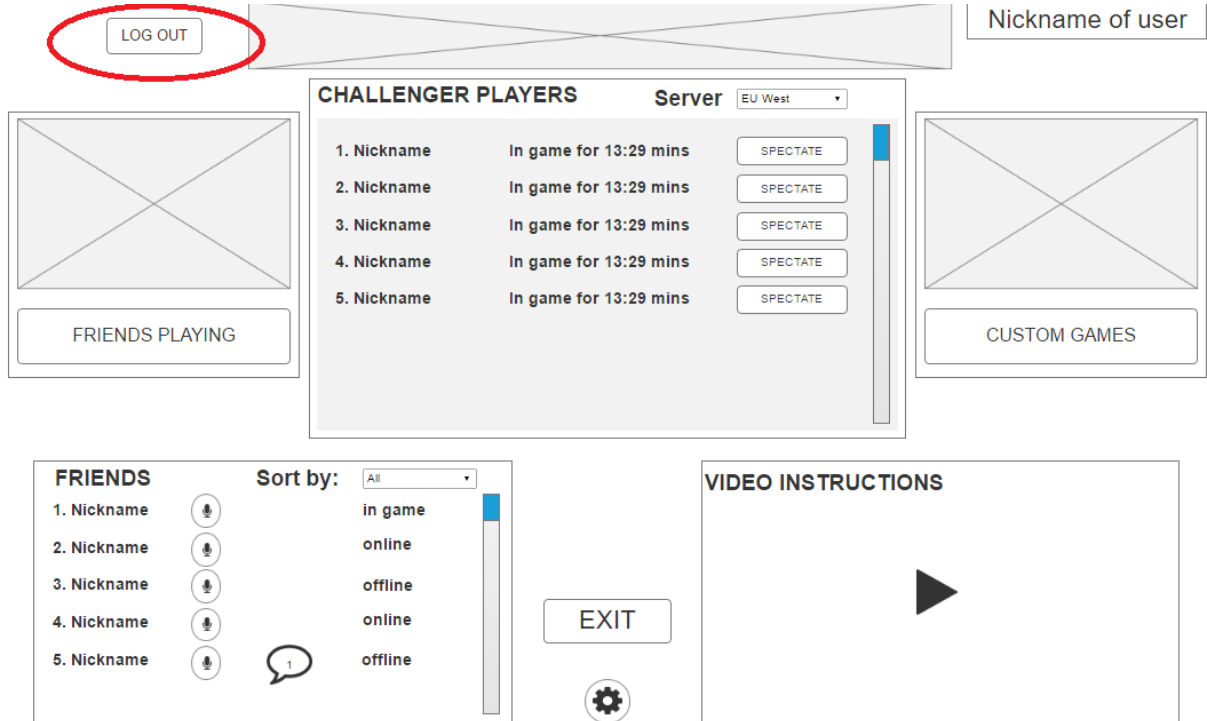
The overall result of testing the developed interface of application for Smart TV – testing was carried out in laboratory for testing interfaces, which involved 5 testers who never met or somehow interacted with the League of Legends game and its interface. After testing, a survey was conducted, with the above questions, and the following answers were received, listed above. Based on which I can conclude that the development of interface spectator mode of League of Legends for Smart TV was successful and for the user completely unfamiliar with the application it is intuitively clear how to interact with this logical design. In addition, several changes are required, based on recommendations from testers.

³ <https://www.axure.com/>

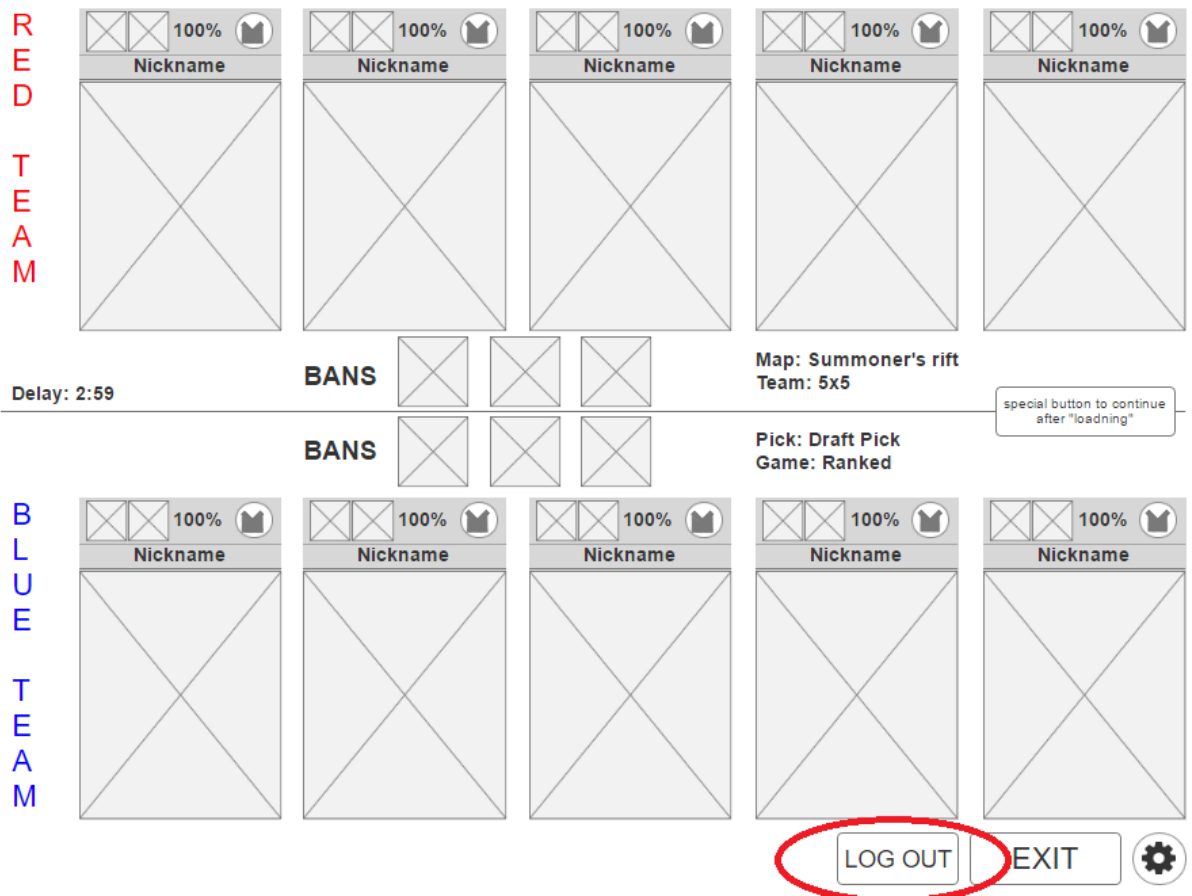
⁴ Hypertext Markup Language - markup languages for creating web-pages and web-applications. <https://en.wikipedia.org/wiki/HTML>

6. Changes at UI Specification

6.1 Changing of log out button



Picture 27. – Main screen changes of log out button.



Picture 28. – Waiting for delay time screen changes of log out button.

BLUE TEAM WON

Time: 29:26 Score: 32/28/49 vs 28/34/49

Champion	Nickname	Champion name	12/5/8	Summons	Items	Gold	Minions
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270
X	X	X	X	X	X	15,6k	270

MAIN MENU

LOG OUT EXIT

	9/5/12	9/5/8	1/4/18	18/3/5	5/4/11	0/6/8	6/7/4	5/8/4	2/7/9	8/9/3
KDA	2	3	1	11	2	0	2	2	2	4
Largest Killing Spree	1	1	1	3	1	0	1	1	1	1
Largest Multi Kill	0	0	0	0	0	0	0	0	0	0
First Blood										
Damage Dealt										
Total Damage to Champions	31.7k	17.7k	18.4k	29.1k	22.0k	1.6k	21.4k	17.0k	9.6k	12.1k
Physical Damage to Champions	24.8k	2.4k	1.5k	24.0k	1.2k	0.8k	16.4k	0.2k	4.1k	10.8k
Magic Damage to Champions	6.8k	13.8k	17.8k	4.7k	15.1k	0.9k	1.0k	16.7k	4.2k	1.2k
True Damage to Champions	0.0k	1.5k	0.3k	0.4k	5.7k	0.0k	4.0k	0.0k	1.2k	0.0k
Damage Dealt	95.8k	127.1k	89.4k	132.4k	150.6k	4.1k	127.1k	165.7k	97.7k	84.1k
Physical Damage Dealt	86.7k	28.6k	13.5k	124.0k	17.7k	1.9k	91.1k	9.7k	50.4k	73.3k
Magic Damage Dealt	8.9k	98.6k	54.8k	7.0k	82.1k	2.2k	25.0k	155.5k	38.2k	10.8k
True Damage Dealt	0.2k	6.7k	1.1k	1.4k	30.8k	0.0k	11.1k	0.5k	8.0k	0.0k
Largest Critical Strike	-	470	-	866	-	-	737	-	-	-
Damage Taken & Healed										
Damage Healed	2.0k	12.1k	2.4k	1.4k	3.1k	5.3k	2.4k	2.7k	6.7k	2.8k
Damage Taken	14.7k	31.8k	11.8k	21.1k	17.0k	20.3k	21.8k	23.7k	42.2k	31.5k
Physical Damage Taken	10.8k	23.8k	8.1k	15.9k	8.6k	7.2k	11.2k	9.7k	28.4k	18.0k
Magic Damage Taken	3.0k	5.4k	3.4k	4.3k	7.8k	12.0k	9.6k	12.1k	13.8k	10.7k
True Damage Taken	1.0k	2.6k	0.3k	0.9k	0.6k	1.0k	0.9k	1.9k	2.0k	1.8k
Wards										
Wards Placed	5	3	22	6	7	15	10	12	7	14
Wards Destroyed	2	2	3	2	1	1	-	-	-	2
Stealth Wards Purchased	-	-	-	-	-	-	-	-	-	-
Vision Wards Purchased	1	-	1	-	1	1	-	-	-	4
Income										
Gold Earned	11.3k	12.7k	11.5k	15.1k	11.8k	7.8k	11.3k	11.0k	9.0k	10.3k
Gold Spent	10.4k	10.8k	10.0k	14.9k	10.1k	6.9k	10.7k	10.4k	8.0k	10.7k
Minions Killed	137	41	58	148	168	2	159	184	14	125
Neutral Minions Killed	4	76	-	8	2	-	9	12	72	3
Neutral Minions Killed Team's Jungle	4	70	-	2	1	-	9	10	70	3
Neutral Minions Killed in Enemy Jungle	-	6	-	6	1	-	-	2	2	-

Picture 29. – Statistics after a game screen changes of log out button.

Completely updated logical design of spectator mode of League of Legends for Smart TV (see Annex 2).

7. Conclusion

During my work was made research of: League of Legends spectator mode needs; Smart TV control possibilities; research of other Smart TV games. Also, was implemented complete UI Specification and was tested in Usability Study laboratory.

The main goals of my Bachelor Thesis were to develop adaptive user interface system of “spectator mode in the game League of Legends”, and it would be focused for Smart TV according to client’s version platform for personal computers.

Based on study of Smart TV needs, League of Legends spectator mode needs and controls of Smart TV, one can draw the following conclusion.

The task, to create the most comfortable interface for users, which will be provide the most effective and functional interface, and thus will be better interact with the user than the computer version of the spectator mode, is completed.

Then I concluded that my project can be implemented on any operating system of the smart TV.

My conclusion is based on the following goals:

1. Log in into application using registered account for game.
2. Log in as a Riot Games worker (for professional shoutcasters).
3. Register without redirecting to official site.
4. List of connected friends.
5. Interactive instructions.
6. Spectating a game of your friends.
7. Choose the server to spectate challenger players (professional players).
8. List of custom games, where user is also able to connect and spectate.
9. Chatting with friends by voice.

The above goals were implemented for interface and these goals have already fitted into the Smart TV functionality and usability for the user.

Based on cognitive testing conducted in the lab and results obtained, I concluded that the creation of logical design was successful and it is possible to implement this project as a working application in the high-level Java programming language in the future.

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8.1 Additional references

8.1.1 Picture references

1. Picture 1. – <http://na.leagueoflegends.com/en/spectator-faq>
2. Picture 4. – <https://mediapure.ru/domashnij-kinoteatr-komponenty/smart-tv-vybor-operacionnoj-sistemy-umnogo-televizora/>
3. Picture 5. – <http://4pda.ru/2015/12/28/266854/>
4. Picture 6. – <https://mediapure.ru/domashnij-kinoteatr-komponenty/smart-tv-vybor-operacionnoj-sistemy-umnogo-televizora/>
5. Picture 7. – <http://mylcd.info/novosti/firefox.html>

8.1.2 Others references

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Annex № 1

Available from: <https://drive.google.com/open?id=0B-XcyBV2kzWvSEE3dmhlendwN3M>

Annex № 2

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