

## THE USE OF EYE TRACKING TO ASSESS THE USABILITY OF UNIVERSITY WEBSITE

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**Abstract:** Websites, nowadays, are used not only as a sales method and information tool, but also as a communication tool. Almost every company has a website. Universities and colleges understand their strength, too. In this article, we describe theory of usability of university website and one of the usability testing methods—eye tracking. We use eye tracking to assess the usability of University of Žilina website. We present and use different analysis: Scan Path and Focus map. We identify many usability problems whose removal will help to create new pages and, thus, increasing their effectiveness.

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### Introduction

According the latest statistics (Miniwatts Marketing Group, 2015) from June 2014, more than 70% of the population in Europe are Internet users. The higher percentage of internet users is in North America (87,7%). Oceania and Australia are in the second place with 72,9%. These statistics show us that our life is moving from a real world to a virtual world. An older study, G2 (2012), suggested that European Internet users spent three billion hours online a day (average number of hours which EU respondents spent online in year 2012 was 4 billion). One-third of European Internet users access internet via smart phones. The Internet is becoming a more central part of everyday lives with one in every 25 EU users claiming to have spent over 10 hours a day engaging in online activity. Yet, despite this fact, two-thirds of the people surveyed in Europe state that being constantly connected is not essential for them. Time spent online is dominated by various life management activities rather than entertainment. E-mail is the most common practice, with 92% using it as a daily tool (G2, 2012).

Websites are new communication tool. Almost every company has a website, and universities and colleges understand their advantages as well. Universities that offer the best user experience have a competitive advantage. For college students, especially, usability plays an important role in communicating brand and credibility. By writing and presenting information effectively, universities can impress and engage students and visitors (Sherwin, 2015).

### Usability

Nielson (1993) first defined *usability* as a quality attribute—something that is easy to use. More particularly, it relates to how quickly a person can learn to use something effectively, such as the use of memory, which is prone to making mistakes but gives a happy feeling as a user (Nielson & Loranger, 2006). Krug (2006), as a basic rule for creating web pages, considers that the creators of pages do not force users to think. The web interface is, therefore, necessary to provide the user with an environment with which they do not have to learn. Thus, developers should propose a usable website. So, it is necessary to measure usability. There are many methods for testing usability; an overview is presented below:

- Temperature maps “clicks.”
- Eye tracking - eye camera.
- AB test.

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- Heuristic evaluation.
- Questionnaire.
- Interview.
- User testing.

In this article, we pay particular attention to eye tracking and briefly describe eye tracking and the possibilities of visualizing the results.

### ***Eye tracking***

Eye tracking is the process of tracking eye movement. It allows us to monitor what the person looks at. By observing what is being seen, we can find the sources of information which are perceived. Tracking eye movement is used in psychology, marketing, and industrial engineering, in particular, to better understand human behavior, optimize equipment, and improve safety.

Eye tracking is simply following the trail of where a person is looking (Nielsen & Pernice, 2010). Eye tracking equipment is built into the computer monitor (eye tracker), and eye tracking software keeps track of what is displayed on the screen while the user is looking at it.

### ***Visualizing Eye tracking Results***

There are six main ways of visualizing eye tracking results (SMI, 2009):

- Areas of Interest (AOI) - in the AOL editor, we can define the AOLs that should be evaluated for the stimulus.
- Gaze Replay - the Gaze Replay displays a quick overview of all stimuli associated to a subject, with a visualization similar to the scan path one.
- Scan Path - the Scan Path displays a gaze data (raw or eye events) overlay over the stimulus image/stimulus video. Scan Path report is also referred to as “Gaze plot report.” It is made of a series of short stops (called “fixations”) and fast movements of an eye (called “saccades”). The size of each dot represents the duration of that fixation, with bigger dots indicating longer looks (Nielsen & Pernice, 2010).
- Focus map - the focus map shows gaze patterns over the stimulus image visualized as a transparent map.
- Heat map - the heat map shows gaze pattern over the stimulus image visualized as a color map. The red areas are where users looked the most; yellow areas indicate fewer fixations; and, the blue areas indicate the least-viewed areas. If an area is gray, it does not attract any fixations. Heat maps are the best-known visualization technique (Nielsen & Pernice, 2010).
- Bee swarm - the Bee Swarm displays raw gaze data overlay over the stimulus image/stimulus video.

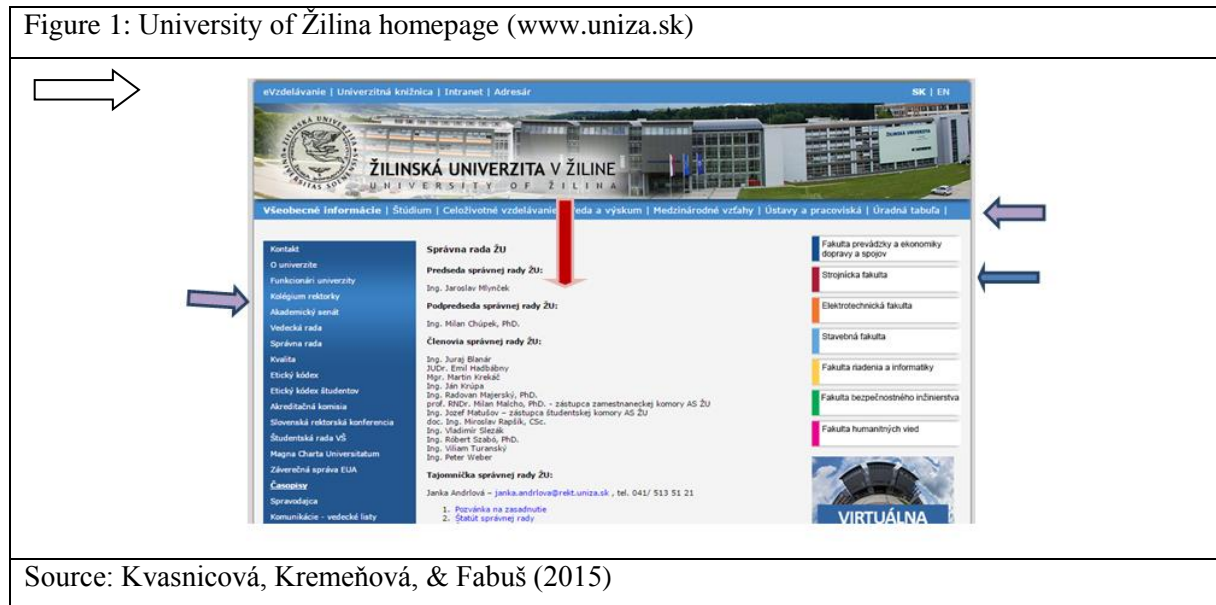
### **Methodology**

We analyzed [www.uniza.sk](http://www.uniza.sk), the official website of University of Žilina in Žilina in Slovakia. University of Žilina was established on September 1, 1953. The University of Žilina has almost 11000 students.

We used static eye tracker from SMI Company, and the results were visualized by using Scan Path and Focus maps. The target group are secondary school students (potential students), current students, and employees. So we asked for help testers from all three groups—secondary school students, students, and employees—with five people from each group, 15 altogether. Each group is assigned different tasks.

The homepage of the University of Žilina is a website that informs about events at the University; it contains links to other external sites and the faculties (blue arrow in Figure 1).

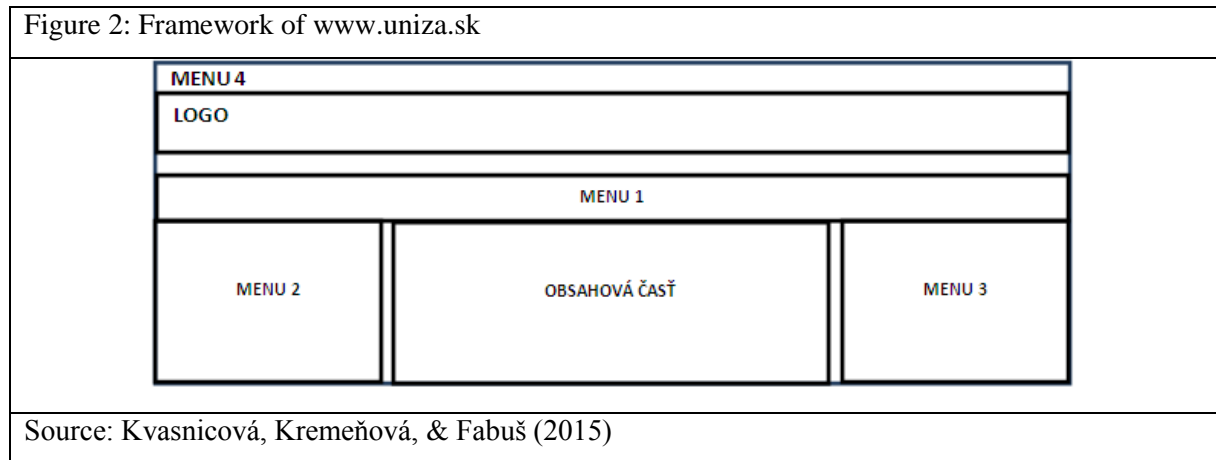
Figure 1: University of Žilina homepage (www.uniza.sk)



Source: Kvasnicová, Kremeňová, & Fabuš (2015)

The site is organized into four navigational areas (Figure 1): Menu 1 – main menu (violet arrow on the right), Menu 2 – submenu (violet arrow on the left), Menu 3 – links to the faculty websites, and Menu 4 – links to Moodle, Library, Intranet, and Directory (white arrow). The middle part of the screen (red arrow) is displayed with a text section (Obsahová časť).

Figure 2: Framework of www.uniza.sk



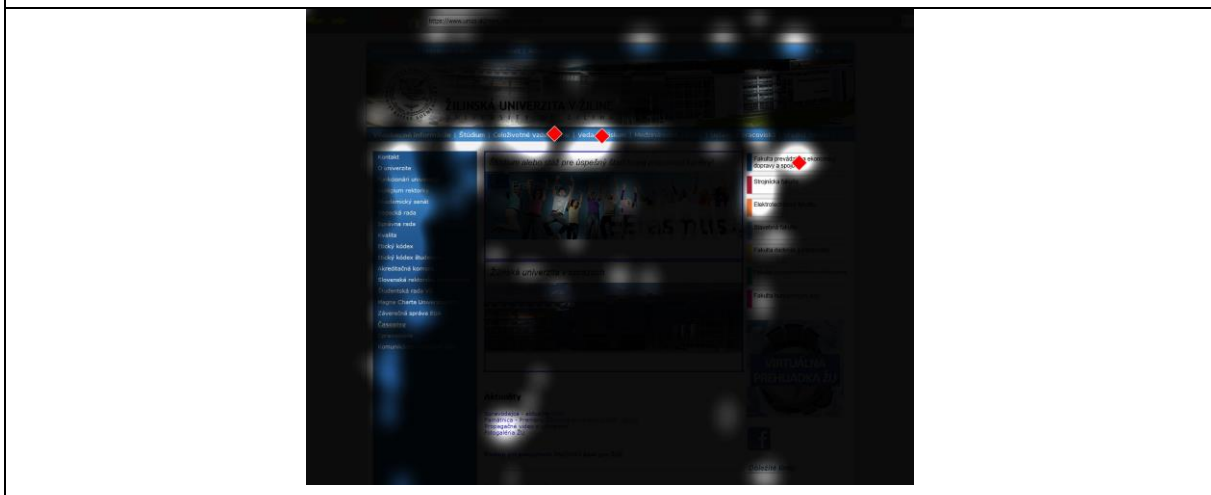
Source: Kvasnicová, Kremeňová, & Fabuš (2015)

## Results

A number of usability mistakes were detected. According to the scope of article, here are just some of the usability mistakes detected. The complete study results will be used as a helpful material for marketing department of the University of Žilina via a proposal for the new website.

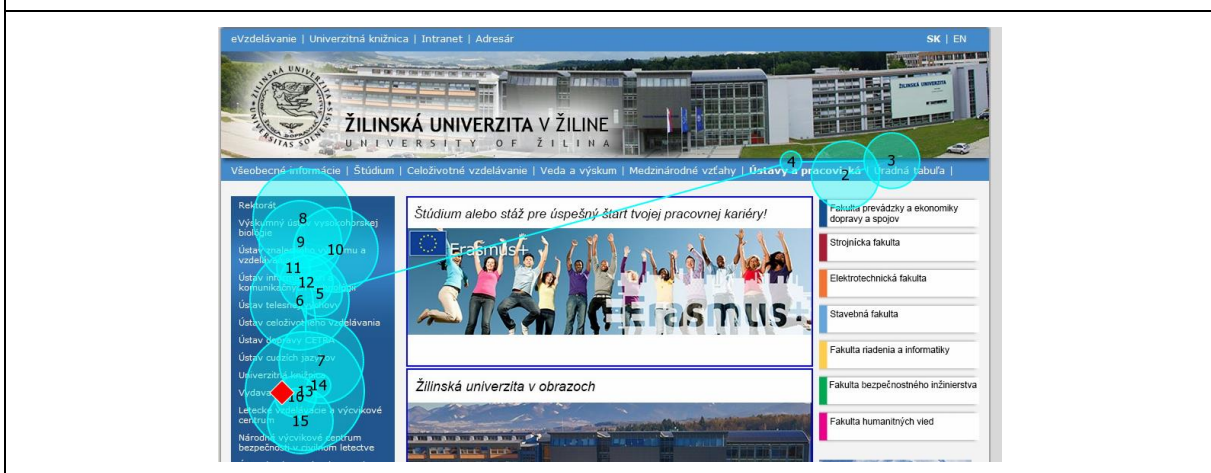
When we click on Menu 1, the Text section in the center of the screen does not change; only the links in Menu 2 would change. Some testers were unaware of this fact and assumed that the website contained an error. However, some other testers were aware and simply did not use the Text section. Instead they went straight for Menu 2, which contained a lot of links. We have a lot of free space in the middle of the screen and a lot of crowded information in Menu 2 (Figure 3).

Figure 3: Focus map – home page



Source: Authors

Figure 4: Scan Path – “Vydavateľstvo” (Publisher)



Source: Authors

This publisher is called EDIS—the link is missing the publisher’s name; it is written only as “Publisher.” Testers spent a lot of time searching for it, and some of them did not find it in many cases (Figure 4).

There is a title “Časopisy” (Journals) written as an underlined word (Figure 5). Testers tried to click on this word, but nothing happened. So, they thought that the website was faulty again. Underlined text usually indicates a hyperlink.

### Conclusion

In the article, we describe website usability and one of the usability measurement methods – eye tracking. We used eye tracking in testing the website usability for the University of Žilina. We identified many usability problems; some of them are shown in the Results of this study. Furthermore, it is necessary to conduct further research in this area and analyze website usability with the use of others methods.

The marketing department of the University of Žilina in Žilina is working on a proposal for a new university website. The current web page contains a number of usability mistakes, and, thanks to the current detection, their re-occurrence of the new site can be prevented. The results of our analysis will be recommended to the development team.

Figure 5: Scan Path – “Časopisy” (Journals)



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