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Using an eye tracker to optimise career websites as a communication channel with Generation Y

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ABSTRACT

This paper presents a research study detailing the procedure and results of experimental eye-tracking research to evaluate employers' career websites. The objective of this research was to gain an insight into Generation Y's perspective on the career websites of prospective employers. The objective was developed into several research questions and hypotheses. The eye-tracking research method was used to test the websites. The eye-tracking tests were supplemented by an in-depth interview and a standardised questionnaire with the aim of acquiring the respondents' subjective views and preferences. The research study contributes to an understanding of how prospective employees from Generation Y view the career websites of employers and the importance of the elements presented on them; it allowed factors that affect the perceived attractiveness of career websites to be identified and provided information as to what Millennials liked the most/least about the organisations' career websites and what would be advisable to change in order for the career websites to better serve their purpose. Based on the research findings, recommendations were made for creating attractive career websites for job seekers from Generation Y.

1. Introduction

A number of studies (e.g., Ehrhart et al., 2012; Kissel & Büttgen, 2015; Williamson et al., 2010) have shown that career websites have a significant effect on drawing the attention of prospective employees, increase the employer's appeal and thus support the hiring process. Another distinctive feature of career websites is their ability to build a strong brand for the employer and convey a large amount of information about the organisation to prospective employees (Allen et al., 2007; Baum & Kabst, 2014). Despite the number of studies on Internet recruiting, there has been little debate regarding career websites as a communication channel with Generation Y, also called Millennials.

As a result, to address this gap, this study investigates career websites as a communication channel with Generation Y and uses an eye tracker to optimise them for communication with the target group of potential employees.

The process of optimising career websites is closely connected with improving their ability to mediate and present important information and display it in such a way that will result in the active involvement of their users on the career websites (Loyola et al., 2015; Velásquez & Rebolledo, 2010). This means that the accessibility and visibility of information play a crucial role in the process of career website optimisation (West & Leskovec, 2012). Career websites must be rich in information to attract the attention of prospective employees and increase the attractiveness of the employer. For a career website to serve its purpose, it is crucial that visitors can find all the relevant information they are looking for. It can be assumed that if the information on the employer or vacant job is not relevant for prospective employees, or if the information presented can be misinterpreted by them, this will result in a less favourable perception of the employer (Birgelen et al., 2008). Apart from the quality and sense of the information content for prospective employees, this information needs to be presented in such a way that visitors to the website can easily find it. Ease of use is therefore an important element of a career website (Williamson et al., 2003).

The objective of this study was to explore the importance of factors that influence career websites' attractiveness and to discover the main factors for Millennials' decision-making concerning their future employers in order to optimise career websites for the target group of Millennials.

To test and optimise websites, the eye-tracking method, a method of usability testing in laboratory conditions, was used (Barnum, 2011). The eye-tracking study is based on a scenario, i.e., a series of real-life situations that a typical visitor to the website can encounter (Tan et al., 2009). To ensure the test results were comprehensive, the eye-tracking test was supplemented by an in-depth interview using a standardised questionnaire, the aim of which was to ascertain the respondents' subjective positions, views and preferences (Nielsen & Pernice, 2009; Sauro, 2015).

This paper has the following structure. In the second section of this paper, literature on career website optimisation using an eye-tracking method is presented. Section 3 presents the research methodology, including the central research question (CRQ), subquestions (SQ) and hypotheses. Section 4 presents the research results. Section 5 contains a discussion. Finally, Section 6 sets out the conclusions and limitations.

2. Optimising career websites using eye-tracking

Eye-tracking is a modern research method used for both academic and commercial purposes (Duchowski, 2002; Nielsen & Pernice, 2009). Using an eye-tracking device, a researcher can analyse the respondent's eye movements and know exactly which area the respondent is focusing his or her visual attention on at any given moment. The results of the eye movement analysis, gained based on the user's interaction with a computer, can help to understand the respondent's cognitive processes – what

stimuli captured the user's attention, in what order, how much time was devoted to them and whether or not the user returned to them (Nisiforou & Laghos, 2013; Velásquez, 2013). Using an eye-tracking device can reveal even the subtle phases of the cognitive process, which are difficult to track in other types of research studies (Vila & Gomez, 2016).

Eye-tracking is considered to be an objective data source for evaluating user interfaces, and it can provide information to improve their design (Nielsen & Pernice, 2009; Poole & Ball, 2005). Objectivity is regarded as being the biggest advantage of using an eye-tracking device (Djamasbi et al., 2010; Nielsen & Pernice, 2009; Wang, Yang, Liu, et al., 2014). Data obtained using an eye-tracker are rid of the respondents' subjectivity, as eye movement can hardly be manipulated. Another advantage of eye-tracking is the ability to gain accurate data on what and for how long the respondents devoted their attention to. This allows the researcher to ascertain what the respondent finds interesting (Velásquez, 2013).

The disadvantage of gaining information using this unobtrusive and sophisticated method is the inability to conduct research with a large number of respondents. This phenomenon concerns not only eye-tracking, but all neuroscience experiments, which are characterised by their complexity and time-consuming data collection (Goldberg & Helfman, 2011; Vila & Gomez, 2016).

The typical tasks for which the eye-tracking method is used can be divided into the following (Duchowski, 2002):

This study uses the eye tracker for its diagnostic function. Within the diagnostic methods, we distinguish between two research goals – to analyse the attractiveness of the stimulus for the respondent or to analyse the respondent's performance (Bojko, 2009). The data used for the aforementioned analyses are the respondents' fixations and pupil diameter in response to the stimuli during set tasks (Allen et al., 2013; Jacob & Karn, 2003; Loyola et al., 2015).

This paper contains the results of the experimental use of an eye-tracking device in research of the optimisation of employers' career websites from the perspective of Generation Y, also known as Millennials. This study is a follow-up to research by Mičík and Mičudová (2018), who studied how selected employers utilise career websites to attract prospective employees from Generation Y. Using heuristic analysis, they identified employers that are most attractive based on criteria according to research conducted around the world. When choosing an employer, potential employees base their decision on information on its career website; however, they must be able to find relevant information there (Niekerk et al., 2019; Tomprou & Nikolaou, 2011). To gain a more comprehensive understanding of employers' career websites, it is necessary to see the issue also from the other side, i.e., the Millennials themselves – and this perspective was the subject matter of this research using an eye-tracking device.

3. Research methodology

Three employers were selected for the purpose of this research, and their career websites were subjected to analysis by the eye tracker (Djamasbi et al., 2010). The selected

Table 1. The most attractive employers based on the evaluation of their career websites.

Organization	Number of points for their career website
Škoda Auto	21
ABB	20
O2	20
Tieto	19
Ikea	19
Lidl	19

Source: Mičík and Mičudová (2018).

employers were those that got the highest score in the evaluation of their career websites in the research carried out by Mičík and Mičudová (2018), see Table 1. These organisations could be considered the most attractive employers from the point of view of Millennials.

Based on the ranking determined by Table 1, the companies Škoda Auto, ABB and O2 were selected for the purpose of career website analysis using the eye tracker. Before the research involving respondents commenced, the career websites of the three selected organisations were checked to verify whether the eye tracker's interaction with the career website presented any obstacles that would either limit or prevent its use. A limiting factor was identified on the career website of Škoda Auto, where the eye tracker did not allow a link on the career website to open in a new window, which would result in the respondents not being able to complete their task.

For this reason, Škoda Auto was removed from the research and replaced with the Lidl Company, which received the highest score in the 'career website quality' category among the companies with the same overall score. Verification of the compatibility of the Lidl Company's career website did not identify any obstacles preventing the use of an eye tracker.

This research utilised the method of eye tracking in respondents from Generation Y using an eye tracker, and to achieve comprehensive results, the research was complemented by a standardised questionnaire and an in-depth interview. Determining the gaze points and what the respondents devoted the most attention to are the main reasons for the popularity of using an eye tracker, and these are also the reasons why an eye tracker was used in our research. The growing popularity of using an eye tracker in the area of research is evidenced by the large number of research studies published in recent years (e.g., Allen et al., 2013; Djamasbi et al., 2010; Navarro et al., 2015; Wang, Yang, Liu, et al., 2014; Wang, Yang, Wang, et al., 2014).

3.1. Research objective

The objective of our research was to explore the importance of factors that influence career websites' attractiveness and to discover the main factors for Millennials' decision-making concerning their future employers in order to optimise career websites for the target group of Millennials. In other words, the CRQ was to determine how Millennials themselves view the career websites of prospective employers. This CRQ is further developed into several research questions and hypotheses (Creswell, 2014). The three employers that received the highest score for their career websites in an

earlier study dedicated to employer brand building were selected for the purpose of this research. Therefore, it can be assumed that prospective employees (in this case, Millennials) can find all the relevant information on the career websites of the selected organisations that will help them decide on their next employer.

Based on research of specialised literature, it was established that the success rate of recruiting an employee through a career website is influenced mainly by three factors (Allen et al., 2013; Dineen et al., 2007; Goldberg & Allen, 2008; Lyons & Marler, 2011; Williamson et al., 2003): the objective characteristics of the jobs themselves and the organisation, subjective characteristics, and the manner of contact and communication.

Based on these three factors, the following CRQ and specific SQ were formulated:

CRQ: How do Millennials themselves view the career websites of prospective employers?

SQ1: Can Millennials find all the relevant information about their prospective employers on the career websites?

SQ2: What level of usability do the tested career websites offer to Millennials?

SQ3: Which career website offers Millennials the best user experience?

SQ4: Which career website success factor has the biggest influence on the evaluation of the attractiveness of career websites?

SQ5: Which factors of the career websites are most important for Millennials?

SQ6: How can the tested websites be improved to increase their attractiveness for Millennials?

For the purpose of a more in-depth examination of the aforementioned success factors, the following seven hypotheses were defined:

H1: There is a correlation between the ability to find relevant information and the attractiveness of a career website.

H2: There is a correlation between the subjective perception of a website and its attractiveness.

H3: There is a correlation between the ease of use of a website and its attractiveness.

H4: The ability to find all the relevant information positively affects a career website's usability.

H5: The time required to find the relevant information plays an important role in the attractiveness of a career website.

H6: The time required to complete the task significantly affects the usability of a career website.

H7: There is a correlation between the time required to complete the tasks and the number of fixations during their completion.

As part of the research, it was determined whether the respondents find the career websites attractive enough to recommend them to others. For a respondent to consider a career website attractive, he or she must be satisfied with the website in general. A higher level of contentment can be expected as a result of a higher degree of the website's perceived quality (Getty & Getty, 2003; Lathiras et al., 2011). A number of research studies have proven the existence of a correlation between contentment

and loyalty (e.g., Bowen & Chen, 2001; Eger & Mičík, 2017; Fernández-Uclés et al., 2019; Hallowell, 1996; Xu & Goedegebuure, 2005).

Due to the nature of the variables and the number of observations, the nonparametric Kendall rank correlation test was used to test hypotheses H1 to H6. Kendall's Tau is suitable for measuring the association between two category variables with no limitations in terms of the number of observations, as is the case of, for example, the Pearson chi-squared test of independence. The coefficient values range between $<-1;1>$. The coefficient calculation depends on the so-called concordant and discordant pairs, expressed by the formula (Hendl, 2009):

$$\tau = \frac{n_c - n_d}{n(n-1)/2} \tag{1}$$

where n_c represents the number of concordant pairs, n_d is the number of discordant pairs and n represents the total number of observations.

To test hypotheses H5 to H7, it was necessary to convert the continuous variable of time into a category variable. According to Sturges' rule (Hendl, 2009):

$$k = 1 + 3.3 \log n \tag{2}$$

where k represents an appropriate number of intervals and log n is the log base 10 of the number of observations.

To test hypothesis H7, Pearson's correlation coefficient, which belongs to parametric tests used for determining the correlation between two continuous variables, x and y, was used (Agresti, 2013):

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}. \tag{3}$$

The metrics chosen for this research to answer the research questions and verify/disprove the hypotheses were the number of fixations, the task completion time, the results of the standardised test SUPR-Q (see further in the text) and the results of the qualitative in-depth semi-structured interview.

Eye fixations are one of the classic metrics of eye-tracking studies (e.g., Allen et al., 2013; Poole & Ball, 2005; Velásquez, 2013), and they are proven to be linked to intensive cognitive processing (Jacob & Karn, 2003; Pan et al., 2004; Wang, Yang, Liu, et al. 2014). Based on this, eye fixations are considered to be a reliable indicator of attention (Poole & Ball, 2005; Wang, Yang, Liu, et al., 2014). Opinions on how long a fixation lasts vary among authors. Some authors state the range of 150–600 ms (Duchowski, 2002; Velásquez, 2013), while others are more specific and use the range of 200–300 ms (Allen et al., 2013; Djamasbi et al., 2010; Purucker et al., 2013; Slykhuis et al., 2005).

Compared to the newly created questionnaires, standardised questionnaires generate more reliable data and the ability to compare the results with other competitors (Hornbaek, 2006). One of the most frequently used standardised questionnaires is the System Usability Scale (SUS) (Brooke, 1996); however, it only evaluates the usability

of websites. Although this parameter is a crucial characteristic of websites, it is not the only important characteristic. Apart from evaluating websites' usability, SUPR-Q also evaluates their credibility, appearance and the aspect of building loyalty. The goal of the SUPR-Q questionnaire is to provide a comprehensive evaluation of one's user experience with a website (Sauro, 2015). A SUPR-Q score is suitable to be used for comparing websites with websites with a similar focus. The output score indicates whether the examined website is better or worse compared to relevant websites.

It is recommended to conduct research using the SUPR-Q repeatedly and thus indirectly follow one's competitors and trends in this dynamically developing area, with the result representing important feedback from users–customers.

The number of items in the questionnaire was increased from the basic set of $7 + 1$ to $9 + 1$ as per Sauro (2015). Items 1 to 9 of the questionnaire are evaluated on a five-point scale (from I strongly disagree = 1 to I strongly agree = 5), while the 10th item is derived from NPS and uses the scale of 0 to 10 (not at all likely = 0, extremely likely = 10). To determine the overall score, the points from the first nine questions are added up, to which $\frac{1}{2}$ of the value of the 10th item is added (i.e., the score values can range between 9 and 50). This score then needs to be compared to the industry score, i.e., that of competitors' websites. When the value exceeds 75%, the website ranks among the best compared to other websites from the same industry, and reaching a median score puts the website half way through the quartile containing 50% of the examined industry websites. If the website finds itself in the lowest quartile, it ranks among the worst 25% of websites of the particular industry. Therefore, the output can be used as a benchmarking tool to compare websites with the best (Sauro, 2015).

3.2. Research participants and testing lab

In the case of quantitative studies, the recommended number of respondents is between 30 and 39, mainly to generate a robust and representative heat map (Nielsen, 2012; Nielsen & Pernice, 2009). In their conclusion, these authors add that data from 10 respondents are sufficient to gain a satisfactory heat map. A heat map created based on data from 10 participants brings virtually the same results as a heat map created using 30 or more research study participants.

The total number of respondents who took part in this research study was 18, of which 11 were women and 7 men aged between 21 and 24. All the participants were university students (master's degree program) from Generation Y. Due to the time-intensive nature of the research and the need to motivate respondents to take part in this type of study, all participants were given a café voucher for refreshments in the value of EUR 5 as an incentive.

It took approximately 45 minutes to test one respondent (three tasks, each of which took approx. 15 minutes to complete). A total of 54 measurements (3×18) were conducted within the study. At the beginning, the respondents received information about the study and its goals and were acquainted with the eye tracker and the testing procedure.

The research was conducted in laboratory conditions. The room was modified to meet the requirements for eye-tracking testing (Nielsen, 2012; Nielsen & Pernice, 2009). The testing was carried out using the VT 3 mini Eye Tracker manufactured by Mangold International (Arnstorf, Germany). This device belongs to unobtrusive research tools (Djamasbi et al., 2010; Schiessl et al., 2010; Vila & Gomez, 2016) that do not distract the respondent or cause them discomfort, and thus do not negatively affect the testing procedure.

3.3. Research design

Eye-tracking research meets the essence of an experiment, which is why many authors consider it to be experimental research (e.g., Djamasbi et al., 2010; Duchowski, 2002; Eger, 2018; Wang, Yang, Liu, et al., 2014; Wang, Yang, Wang, et al., 2014). However, this research study uses only one group of respondents who were selected based on certain attributes and characteristics (Millennials about to graduate and actively search for employment). For this reason, it is the so-called quasi-experiment (Gray, 2009). Experimental methods always study the correlation between two variables, one of which is dependent (in this case, it is the eye fixation and pupil diameter) and one independent (in this case, the career websites). The purpose of the experiment is to test the impact of a certain factor (independent variable) on another factor (dependent variable). The results of the experiment can be distorted as a result of the effect of the surrounding environment; therefore, it is important that the researcher tries to eliminate this effect and ensure the validity of the results (Kozel, 2006). One thing that typically influences this type of experiment is the order in which individual tasks are completed. This influence can be avoided by the so-called balancing, i.e., different respondents completing the tasks in a different order (Walker, 2013). To further reduce the influence of random aspects and increase the validity of the experiment, this research study used repeated measurements (Hendl, 2014). Repeated measurements means that all the respondents complete the same tasks on the same websites, i.e., all the respondents follow the same scenario. Unlike aimless browsing of a website, the scenario-based method is more effective, as in real life, a website user always aims to complete a certain task (Nielsen & Pernice, 2009). This eye-tracking research study utilised the pre-experimental design (Creswell, 2014). Although all the respondents were exposed to the same scenario, in order to increase the validity of the measurements, the respondents experienced different treatment during the experiment. In order not to give one organisation an advantage over the others by following the same scenario (e.g., following the identical instructions procedure in the A-B-C sequence, etc., and the experience gained by respondents during the testing) and to avoid any reduction in the reliability of data, the following six groups of testing options were created by on varying the sequence of the three companies:

Group 1:   XA – O XB – O XC – O
Group 2:   XA – O XC – O XB – O
Group 3:   XB – O XA – O XC – O
Group 4:   XB – O XC – O XA – O

Group 5:   XC – O XA – O XB – O
Group 6:   XC – O XB – O XA – O

X represents the exposure of the group to the variable (in this case, the career website of an organisation), and O represents the results measured by the eye tracker. Each group consisted of three respondents.

A number of authors recommend using some of the conventional methods of usability testing in combination with the eye tracker in order to increase the validity of the research (López-Gil et al., 2010; Nielsen & Pernice, 2009; Schiessl et al., 2003). Therefore, following the completion of the scenario, the respondents were given a SUPR-Q standardised questionnaire related to the just-finished eye-tracking test.

Once the questionnaire had been filled out, the respondents were asked a series of qualitative questions as part of a semi-structured interview, which is a common component of eye-tracking research. This retrospective interview, which took place after the completion of the scenario and questionnaire, was chosen instead of the classic think-aloud protocol (e.g., Elling et al., 2012; López-Gil et al., 2010; Van Waes, 2000), which is administered during the completion of the scenario. Verbalising one's thoughts, assumptions and opinions during a think-aloud protocol, the respondents may be distracted, which would result in distortion of the experiment's results. As the description of the research study design suggests, the entire research utilised a mixed research design (Walker, 2013).

3.4. Test preparations

Prior to the execution of the eye-tracking research study, a questionnaire pilot study and pre-research were carried out (Disman, 2000). The questionnaire pilot study was conducted by two experts and professionals in the area of online marketing. Based on this pilot phase, only minor modifications were made to some of the questionnaire items. The pre-research represents a test of the tools that are to be used in the research itself. The goal is to identify any problems that could arise in other research phases, or to identify any potential problems related to data collection (Baker, 1994; Chráska, 2016; Chromý, 2014; Gray, 2009). As part of the pre-research, the functionality of the selected websites was tested, as well as the intelligibility of the eye-tracking scenario, the users' ability to work with the eye tracker, and the interaction between the eye tracker, user and the websites. This was followed by a test of the intelligibility and unambiguity of the questions in the questionnaire and the semi-structured interview. The pre-research was carried out with four respondents from the target group.

3.5. Testing procedure

The eye-tracking study was conducted in the form of a quasi-experiment, with the independent variable being the individual websites and the dependent variable represented by the data measured, such as the length of fixation, the number of fixations and the amount of time required to complete the tasks. To reduce any risk of the experiment being distorted by any effects of the environment, the methods of balancing and repeated measurements were used. The participants were informed about the purpose of the study,

and its procedure was explained to them. They were acquainted with the eye tracker and its capabilities. This was followed by calibration of the eye tracker for the particular respondent, which on average took one minute. All calibrations were successful. The respondents then proceeded according to the scenario. Each participant tested all three websites one at a time. Following the completion of all three scenarios, the participants were asked to fill out a standardised questionnaire and subsequently underwent a semi-structured interview. The qualitative interview did not take place during the eye-tracking test itself to avoid any distraction. If during the interview a respondent could not remember a particular detail, they were shown recorded footage of them browsing the specific website. Following the completion of all three parts of the experiment (eye-tracking, questionnaire and interview), each participant was thanked for taking part in the survey and given a voucher for refreshments at the café.

4. Research results

The time required to complete the various tasks and the number of fixations related to individual tasks are shown in Tables 2 and 3.

Table 2 shows that the study participants spent between 0.73 and 2.58 minutes completing the various tasks. The average task completion time was 1.92 minutes in variant A, 1.73 minutes in variant B and 1.36 minutes in variant C. The overall

**Table 2.** The time required to complete the various test variants.

Variant A					Variant B					Variant C				
Average time to complete this variant (min)					Average time to complete this variant (min)					Average time to complete this variant (min)				
9.63					8.65					6.82				
Average time to complete individual tasks within this variant (min)					Average time to complete individual tasks within this variant (min)					Average time to complete individual tasks within this variant (min)				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
2.58	1.75	2.00	1.44	1.86	1.93	1.53	2.26	1.28	1.65	1.89	1.23	1.34	1.63	0.73
Average task completion time within this variant (min)					Average task completion time within this variant (min)					Average task completion time within this variant (min)				
1.92					1.73					1.36				

Source: Authors.

Table 3. The number of fixations in the individual test variants.

Variant A					Variant B					Variant C				
Average number of fixations during the variant					Average number of fixations during the variant					Average number of fixations during the variant				
446					352					359				
Average number of fixations during the completion of individual tasks within the variant					Average number of fixations during the completion of individual tasks within the variant					Average number of fixations during the completion of individual tasks within the variant				
1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
110	88	98	62	88	71	70	92	55	64	83	69	81	85	41
Average number of fixations per task					Average number of fixations per task					Average number of fixations per task				
89					70					72				

Source: Authors.
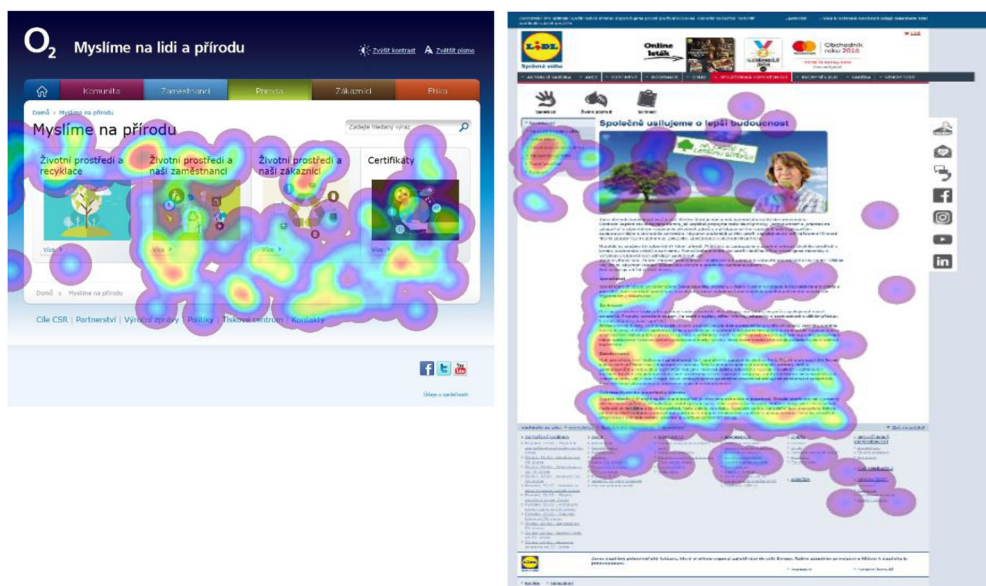
Figures 1 and 2. The heat maps of the O2 and LIDL career websites – CSR. *Source*: Authors.

average variant completion time by respondent was 9.63 minutes for variant A, 8.65 minutes for variant B, and 6.82 minutes for variant C.

Table 3 shows that the number of respondents' fixations ranged between 41 and 110 during the completion of the various tasks. The average number of fixations per task was 89 in variant A, 70 in variant B and 72 in variant C. The total average number of respondents' fixations was 446 during variant A, 352 during variant B and 359 during variant C.

Figures 1 and 2 show heat maps expressing the level of visual attention dedicated to particular objects on a website. A heat map can be interpreted as the degree of visual attention devoted by respondents to certain areas of the website (Djamasbi et al., 2010; Wang, Yang, Liu, et al., 2014). The intensity of attention, expressed by aggregated data on eye fixations, is represented by colours. The darkest colour represents the highest level of attention, while the lightest colour represents the lowest level of attention. In this case, Figures 1 and 2 serve as an example of a heat map.

Figures 1 and 2 indicate what topics in the area of CSR the respondents found most interesting. The darker the colour, the more attention was paid to a particular area. In this case, the respondents were interested in the CSR activities of the companies O2 and Lidl. Table 4 provides an overview of the respondents' answers to questions 1–9 of the SUPR-Q standardised questionnaire.

Table 5 contains responses to question No. 10 in the standardised SUPR-Q questionnaire.

In 10 out of 51 cases of the total number of measurements (19.6%), respondents were unable to find all the information about their prospective employers that they were looking for. These cases concerned the career website of employer B (ABB) and employer C (O2). The respondents were able to find all of the information sought only on the career website of employer A (Lidl). It is important to mention that all

Table 4. Answers to questions 1–9 in the SUPR-Q questionnaire.

Response scale Questionnaire item	1	2	3	4	5
1. I can quickly find what I'm looking for on the website.	1	9	6	25	10
2. I find navigation on the website easy.	1	9	12	17	12
3. The organization's website is easy to use.	0	7	13	22	9
4. The organization's website is credible.	1	0	10	29	11
5. I can count on the information on the website being reliable.	1	0	14	24	12
6. The organization's website made a good impression on me (I find it attractive).	3	9	9	21	9
7. The organization's website presents information in a pleasant and easy-to-understand manner.	2	7	7	28	7
8. I enjoy browsing the organization's website (pleasant, modern and playful environment).	1	9	13	17	11
9. I will probably visit this website again in the future.	2	7	12	16	14

Note: Likert scale of responses 1 = I strongly disagree, 5 = I strongly agree. *Source:* Authors.

Table 5. Responses to question 10 in the SUPR-Q questionnaire – the attractiveness of the career websites.

Response scale values Questionnaire item	0	1	2	3	4	5	6	7	8	9	10
10. How likely is it that you will recommend this website to friends and colleagues?	0	1	3	3	1	8	5	9	9	6	6

Note: scale of responses 0 = highly unlikely, 10 = highly likely. *Source:* Authors.

Table 6. SUPR-Q evaluation Lidl.

	LIDL			
SUPR-Q	Total for all items	Average	Standard deviation	Sauro study average
Usability	228	4.47	0.54	4.06
Credibility	147	4.32	0.72	3.80
Accuracy	152.5	4.49	0.55	3.91
Appearance	227	4.45	0.78	3.80

Source: Authors.

Table 7. SUPR-Q evaluation ABB.

	ABB			
SUPR-Q	Total for all items	Average	Standard deviation	Sauro study average
Usability	170	3.33	0.96	4.06
Credibility	129	3.79	0.68	3.80
Accuracy	89	2.62	0.90	3.91
Appearance	160	3.14	1.14	3.80

Source: Authors.

of the information sought was present on the employers' websites. Thus, it can be said that although the tested websites contained all the relevant information for Millennials, they were able to find it effortlessly only on the career website of Lidl (SQ1).

The results of the career website evaluation for the three companies are shown in Tables 6–8. The tables also contain the average evaluation of the companies' websites from the research study published by Sauro (2015), thanks to which we have an indication of how the evaluated organisations can be compared based on their career websites. However, this is merely an indication, as Sauro's study dealt with the

Table 8. SUPR-Q evaluation O2.

SUPR-Q	O2			
	Total for all items	Average	Standard deviation	Sauro study average
Usability	158	3.10	0.91	4.06
Credibility	125	3.68	0.83	3.80
Accuracy	114	3.35	1.11	3.91
Appearance	163	3.20	1.01	3.80

Source: Authors.

companies' websites in general, while this research study dealt specifically with their career websites.

It is apparent from the tables above that Lidl achieved the best results. These are above-average results even in comparison with a study conducted by Sauro (2015). In each evaluated category, Lidl got more points than an average website in the given study. The other two organisations did not reach the average value in any of the evaluated categories, and from the point of view of SUPR-Q methodology, their evaluation is below-average compared to the values in the study conducted by Sauro (2015).

Looking at the results of the tested career websites, we can formulate answers to SQ2 and SQ3. When evaluating the level of usability, it very much depends on what we define as the standard evaluation. If we consider as standard the results of the study carried out by Sauro (2015), the usability of the career websites (SQ2) of ABB and O2 would be evaluated as below-average and the usability of Lidl's career website as above-average. However, it would be advisable to create a new standard for such specifically focused websites to serve the specific purpose of evaluating career websites. When comparing the usability of the three tested career websites, it can be said that the usability of Lidl's career website is much higher than that of ABB's and O2's career websites.

The overall evaluation of the user experience can be based on the overall absolute SUPR-Q evaluation of the individual career websites. Lidl achieved the highest score (43.9), followed by O2 (32.9) and ABB (32.2). Just as in the previous case, it can be said that the best user experience (SQ3) for prospective employees is offered by the career website of the Lidl Company.

The identification of factors that have the biggest effect on the evaluation of the attractiveness of the career websites (SQ4) was based on the theory stated in the Introduction, based on which hypotheses H1 to H3 were formulated. Hypothesis H4 is based on the assumption that if a prospective employee cannot find specific information, even though that information is available on the website, the prospective employee's decision is based on incomplete information that he or she has found (Turban, 2001), which reduces the website's usability. Other variables whose influence is often examined in similar types of studies (e.g., Djamasbi et al., 2010; Nisiforou & Laghos, 2013) are time and fixation. If time has an influence on attractiveness, it should also have an influence on the usability of career websites. Hypotheses H5 and H6 were formulated based on these assumptions. Researchers dealing with eye tracking often focus their research on the correlation between the number of fixations and the complexity of websites (e.g., Chassy et al., 2015; Wang, Yang, Wang et al., 2014). For this reason, we used the H7 hypothesis to verify the assumption that there is a

Table 9. The results of tests of the formulated hypotheses.

Examined factor	The ability to find relevant information	The subjective perception of the career website	The ease of use of the career website	The time required to find the relevant information
The attractiveness of the career website	0.688 (H1) p-value 0.00001	0.645 (H2) p-value 0.00001	0.611 (H3) p-value 0.00001	−0.112 (H5) p-value 0.227
The usability of the career website	0.698 (H4) p-value 0.00001	X	X	−0.139 (H6) p-value 0.136
The number of fixations	X	X	X	0.793 (H8) p-value 0.00001

Note: H1 to H6 represent the results of the tests of the hypotheses using Kendall's Tau. H7 represents the result of testing using the Pearson correlation coefficient. The correlation between the two values, expressed by X, was not determined. *Source*: Authors.

correlation between the number of fixations and the attractiveness of the website. This hypothesis is based on the idea that if a respondent is not only browsing, i.e., scanning a particular website, but deliberately fixes his/her visual attention on a specific piece of information in order to learn more details, this indicates that the respondent finds the given website interesting (Jacob & Karn, 2003; Pan et al., 2004; Wang, Yang, Liu et al., 2014).

Table 9 contains the results of tests of the formulated hypotheses, with the results calculated using the Statistica software application.

Table 9 clearly suggests that there is a mutual correlation between the attractiveness of a career website and the ability to find relevant information (H1), the attractiveness of a career website and the subjective perception thereof (H2), and the attractiveness of a career website and its ease of use (H3). The p-value of these correlations indicates a statistically significant association. The τ coefficient reached values of over 0.6, which signifies a strong correlation. The strongest association was identified between the attractiveness of the career websites and the ability to find relevant information on them. Of the three factors tested, this factor has the greatest effect on the evaluation of the attractiveness of the career websites (SQ4). The test results corroborate the validity of the formulated hypotheses H1 to H3.

A statistically significant correlation was identified between the ability to find all the relevant information and the usability of the career websites. The correlation strength of 0.793 indicates a very strong association between the variables. Hypothesis H4 is thus corroborated.

The high p-value and the low value of the association test for hypotheses H5 and H6 indicate that there is no significant statistical association between the tested variables. Based on the test results, the effect of time on the attractiveness and usability of the career websites is thus insignificant.

A very high statistical dependence was identified between the number of fixations during the completion of individual tasks and the time required to look up relevant information while completing those tasks (H7). During the tests, only situations when respondents fixed their gaze on a particular area for at least 300 ms were taken into consideration. A longer duration of browsing the website thus suggests a heightened interest on the part of the respondent in information on the particular website.

Answers to the research questions SQ5 and SQ6 come from a semi-structured in-depth interview. In this interview, the respondents were asked the following questions:

- which factors of an organisation's career website are most important for them when searching for employment (Q1),
- whether while browsing the career website they encountered any problematic areas that would be worth improving to better capture the attention of prospective employees (Q2),
- which information they would have liked to have found on the career website (Q3),
- what, from their point of view, they liked the least/most about the career website (Q4).

The first question (Q1) is a general question aimed at identifying the main factors that prospective employees pay attention to when choosing an employer through its career website. The most frequently mentioned factors are as follows:

- corporate culture (corporate social responsibility being the most frequently mentioned one),
- financial compensation and fringe benefits,
- sufficient amount of information about the company,
- sufficient amount of information about the vacant positions,
- personal and professional development, and
- work/life balance.

This list of factors is the answer to SQ5. The list of factors important for making a decision about one's employer contains factors that employers should utilise on their career websites in order to attract the attention of prospective employees from Generation Y.

Others concerned only the career website of a particular organisation. The following text summarises the key answers to questions Q2 to Q4. The answers are listed in the order assigned to the individual organisations, from A to C.

4.1. Lidl career website

When browsing the career website of Lidl, respondents did not come across any problematic areas and found all the information about the employer they were looking for. Respondents most appreciated the fact that the website was well-organised, clear, intuitive, interactive and, most of all, highly informative. The fact that there were no problems identified and the very good evaluation of the website corresponds with the overall evaluation of the career website mentioned above, according to which Lidl achieved the highest score of all the organisations tested.

4.2. ABB career website

The most problematic area of the career website of the ABB Company was its language. The career website intended for the Czech Republic contains a number of texts in English, and some hyperlinks (e.g., links to the organisation's corporate culture

and corporate social responsibility) refer to the career website intended for American job seekers. The fact that relevant information in Czech is missing may cause one to question whether the Czech subsidiary of ABB is even engaged in the area of corporate social responsibility or what the organisation's corporate culture is like in the Czech Republic. Respondent No. 7 made an interesting comment: '*It's good to know that ABB is engaged in corporate social responsibility in the USA, but I would be much more interested in (ABB's) activities in the Czech Republic. After all, I will be working here, not across the ocean*'. Another problematic area of the career website of the ABB Company was, according to respondents, its infrastructure. Some information was difficult to find, as the website is poorly organised and the names of categories were difficult to understand, which reduced the ability to orient oneself on this website. On the ABB career website, respondents missed more detailed information about the company and job opportunities at ABB. Another thing that was missing was more detailed information about the possibility of one's personal development. What the respondents liked the least was the aforementioned switching from Czech to English, the poor organisation and complex structure. What the respondents liked the most was the website's modern design.

4.3. O2 career website

The most problematic area of the career website of the O2 Company was access to it, i.e., the link to the career website from the corporate website. The link to the career website is usually situated in the top or side menu, but in the case of O2, the link was placed at the bottom of the page, and what's more, it was printed in very small letters. If a prospective employee did not know about the existence of a link to the career website, it is quite likely that he or she would give up searching for it after a while. This is reflected in a comment made by respondent No. 9: '*If I hadn't had the information that the website does contain the link, I wouldn't have found it*'. The 'hidden' link also has another negative effect – the respondents felt that the company was not at all interested in hiring employees: '*It appears that selling monthly plans and phones is more important for them than hiring new staff*'.

Figures 3 and 4 show the location of hyperlinks to the career websites analysed in this study and the process of locating the link to the career website by respondents in the case of the O2 corporate website. The generated heat maps are from the first five seconds of browsing in the case of Lidl and ABB. In the case of O2, the heat maps are from the first 5, 15, 25 and 35 s of browsing.

Figure 3 shows that on the corporate websites of Lidl and ABB respondents were able to locate the links to the career websites without any problem in the first five seconds. In both cases, the respondents' attention was mostly focused on the top half of the page, specifically on the top menu. Figure 4 displays the respondents' difficulty in finding the link to the O2 career website from the company's corporate website. Figure 4 clearly shows that respondents expect to find the link to the career website in the upper half of the screen (the darkest colour represents the highest intensity of the respondents' visual attention), which is common with the remaining career websites. Then, they scrolled down and expected to find the link in the bottom navigation

Figure 3. The heat maps of Lidl and ABB websites when locating the link to their career websites. *Source*: Authors.
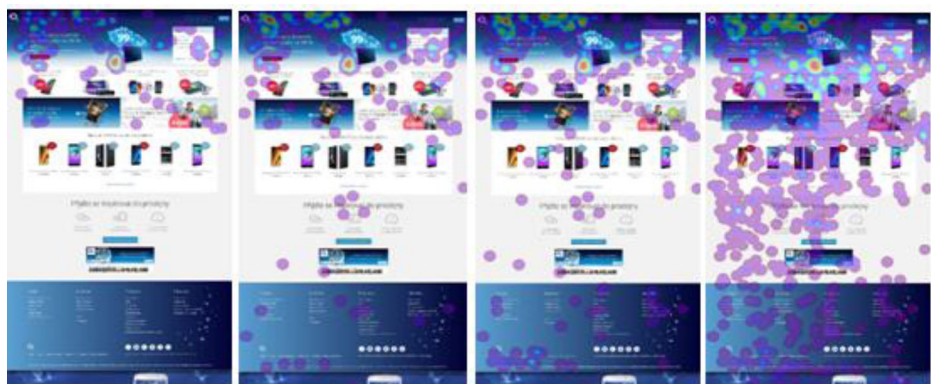

Figure 4. The process of locating the link to the O2 career website in the first 5, 15, 25 and 35 s. *Source*: Authors.

menu, which consists of several lists. However, the menu is located in the page footer, even below the link to social media. Locating this link took respondents an average of 31 s (Figure 4). This represents a serious problem because as several respondents indicated in their answers, they would leave the page thinking that there is not a career website link if they had not been informed about this during the scenario.

After being redirected to the career website, the respondents were able to find all the information they were looking for. Just as in the case of the ABB career website, they did not like the poor organisation and the subjectively perceived complexity of the O2 career website. On the other hand, the respondents appreciated the sophisticated and modern graphic design of the website.

The answer to SQ6, i.e., what modifications to the tested websites would increase their attractiveness for prospective employees, can be found in the text above. In the case of ABB, it would be advisable to make sure that prospective employees can find all the relevant information on the career website intended for the Czech Republic in Czech. It is also necessary for their career website to contain information about the organisation's corporate culture and activities in the area of corporate social responsibility in the Czech Republic. Another thing that the organisation should focus on is making the website better organised. As far as infrastructure is concerned, a suitable tool for improving it is, for example, the card sorting method (Wood & Wood, 2008). It is also crucial that the website contains more detailed information. In the case of the O2 website, first and foremost it is necessary to improve access to the company's career website. Users unfamiliar with the website will most likely not find the link to the career website. That means that prospective employees would not be able to find anything about O2 as an employer and O2 would lose the opportunity to attract prospective employees. Just as in the case of ABB, it would be advisable to make the career website better organised.

5. Discussion

The results show that information availability, subjective perception and ease of use each play an important role in career websites' attractiveness. When determining the effect of various factors on the attractiveness of career websites, the most significant attractiveness factor identified was the ability to find relevant information on the given websites (0.688). Career websites are a public source of information that conveys a lot of information. From a potential employee's point of view, this information can already form part of the basis upon which the future psychological contract may be built. This means that information availability can act as a signal message that determines employer attractiveness to potential employees (Niekerk et al., 2019; Tomprou & Nikolaou, 2011).

The ability to find relevant information was followed by the subjective perception of the career websites (0.645) and their ease of use (0.611). This is in line with the conclusion made by Williamson et al. (2003), Dineen et al. (2007) and Allen et al. (2013). Potential employees pay attention to the content provided and evaluate it; these evaluations influence the attractiveness of the websites. Our results differ from Lyons and Marler (2011), who on the other hand concluded that aesthetic features of websites are more important for job seekers than the websites' employment content.

The ability to find relevant information also has a major influence on the usability of career websites (0.698). As information channels become more complex, it is increasingly important to understand how people navigate themselves in locating the desired information. We answer to West and Leskovec (2012), which called for

further investigation, which we focused on a specific target group of people. Our result supports the conclusion made by Cober et al. (2004) and Allen et al. (2013). A strong dependence was also identified between the number of fixations during the completion of individual tasks and the time required to find relevant information while completing those tasks (0.793). What that means is the longer the respondents browsed a particular website, the more interesting they found it. This result is in line with Wang, Yang, Liu, et al. (2014). In our case, however, more neuromarketing research would be needed. There was no correlation established between the factor of time and the attractiveness of the career websites (–0.112) and their usability (–0.139). In this case, this finding does not support the assumption made by Nisiforou and Laghos (2013).

This leads to several conclusions:

- the more informative and better organised a career website is, the more attractive it becomes in the eyes of Millennials,
- whether or not Millennials consider a website attractive also depends on their subjective feeling and the ease with which they can find the required information on the website,
- the time required to look up information does not have a significant influence on the attractiveness or usability of a website, as long as Millennials can find the information.

The main factors for Millennials' decision-making concerning their future employers based on their websites were identified in this research. These factors, together with the rich informational value of the career websites, can help achieve the two main goals of career websites – to attract the attention of a prospective employee to the career website for the purpose of evaluation of the provided information about the organisation, and to provide a sufficient amount of information in such a way that it convinces prospective employees to apply for a job at the particular organisation.

The research also identified the main problematic areas of the examined career websites. By eliminating these, employers could make their career websites more attractive for the target group of Millennials. Based on the identified deficiencies in the research presented above, general recommendations can be made for creating attractive career websites for the target group of Generation Y:

- for the purpose of good accessibility, it should be easy to locate the link to the career website, i.e., it should be placed in the main menu,
- a career website should present factors that Millennials find important when making a decision about their prospective employer,
- a career website intended for the recruitment of Czech employees should be in Czech;
- a career website should be sufficiently well-organised so that all the relevant information can be easily found; if a prospective employee cannot find a particular piece of information, even though the website contains this information, the job seeker's decision is based on incomplete information about the employer and the usability and attractiveness of the website is thus reduced,

- a career website should also be sufficiently intuitive and its contents interactive,
- a modern design for career websites is a must these days.

These outcomes are also confirmed by Gunesh and Maheshwari (2019), who conclude that career websites are not sufficiently attractive without interactive content such as videos and animations. The core values and factors that matter to potential employees must be clearly displayed on the career websites and detailed information must be provided. This fact is stressed by several studies (e.g., Williamson et al. [2003], Dineen et al. [2007] and Allen et al. [2013]).

6. Conclusions and limitations

The eye-tracking research into the optimisation of career websites as a communication channel with Generation Y produced knowledge of how prospective employees from Generation Y perceive the career websites of selected employers and the importance of the elements presented on these websites, which factors influence the perceived attractiveness of the career websites, what in their point of view they liked the most/least and how to improve the websites so that they better serve their purpose.

Although all the examined career websites contain all the information that Millennials consider important when deciding on their future employer, it was possible to locate this information without any problems only on the career website of the Lidl Company. The comparison of the websites leads to the conclusion that when it comes to the evaluation of the usability and user experience, the Lidl career website achieved the highest score. This website could thus serve as a benchmarking model for improving the two remaining career websites.

Our findings also provide practical implications for the development and use of Web-based organisational career sites. Job searchers are influenced by information content, perception and ease of use. The study provides a complex eye-tracking methodology to optimise career websites for a specific target group and insights into the perception of career websites by the target group of Millennials. The studies referenced in the paper (Williamson et al., 2003, Backhaus et al. 2004; Ehrhart et al., 2012; Kissel & Büttgen, 2015; Williamson et al., 2010) employed only a quantitative methodological approach which resulted in a dearth of qualitative data. This research attempted to fill this gap by employing a qualitative approach. Also, in contrast to previous studies, this study contributes to e-recruitment literature by providing a target group's perspective of the most important factors of career websites. For practitioners, it can also serve as encouragement to make use of eye-tracking studies to improve the career websites to attract more potential employees from Generation Y. To get more precise results in the future, neuromarketing research would be needed in combination with the eye-tracking method.

This research has several limitations. Firstly, it is focused on the Czech Republic and on a population with a higher education level. Secondly, students from only one faculty were chosen as respondents for this study, as they are attractive in the labour market. Using students as respondents has both advantages and disadvantages; for instance, it can reduce the findings' external validity and generalisability (Berthon

et al., 2005; Sivertzen et al., 2013). This fact reduces the ability to generalise the results for all Millennials in the Czech Republic, or even all Millennials at universities. Another limitation of the research is the limited number of its respondents. This limitation is due to the experimental nature of the research and the demands of working with an eye tracker.

To conclude, it needs to be said that the goal of this research was not to analyse and evaluate in an exhaustive way the career websites of a large number of organisations, but rather to prove in a sample of selected organisations the possibilities of experimental eye-tracking research in combination with a qualitative in-depth semi-structured interview to deliver a comprehensive evaluation that could significantly contribute to the optimisation of companies' career websites.

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No potential conflict of interest was reported by the authors.

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