

Rediscovering Neuromarketing for Sustainable Companies

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Abstract. *The aim of the paper is to emphasize neuromarketing's (NM) utility for developing sustainable organizations by analyzing how the eye tracking (ET) measurement helps to understand the consumer's behavior on a tourism website in the process of searching for the most required information, and how the results provide strategic and operational choices for the organization. The research questions refer both to the interest of the participants regarding the information they need and to the time they spend till they click for the first time on the webpage. What have the consumers looked at on the website? What kind of information were the consumers looking for? What pages on the website were visited for finding the information? How long did the participants look at an area until they clicked for the first time? A review of NM concept and a literature analysis to get acquainted with the relevance of the methods' used were made. These measurements were made using an eye tracker that records the position of the eyes and the movements they make. The experiment based on ET emphasized the mistakes and errors made in information placement and conduces to a better understanding of the consumers' behavior, of the usability of a website, of how users are surfing the website, identifies what types of images and content are preferred by the tourists, offers directions to redesign the website. In addition, a qualitative research to collect information about customers' needs and about search patterns on the website was made. The results of the research offer real time information about the cognitive engagement of customers. Issues of the tourism websites design are not widely discussed in the scientific literature. This research helps the tourism company to develop the website, to increase the customer engagement, and to drive sales.*

Keywords: *neuromarketing; eye tracking; consumers; technology; companies; sustainability.*

Introduction

Although marketing technologies have increased the ability of marketers and business professionals to measure the effectiveness of their marketing, we claim that they cannot understand the customer's brain as NM (neuromarketing) does through its technologies because marketers never truly know how customers make purchasing decisions. In fact, many customers might not know either. The goal of NM is to understand how consumers' brain works and what affects the marketing process. Understanding the most basic roots of human emotion is vital in comprehending a consumer's purchasing behavior. The global market for NM technology reached \$21 million in 2015 (www.wordpress.com; www.america-retail.com). The market is expected to reach \$22 million by 2021 from \$50.3 million in 2016, increasing at a compound annual growth rate (CAGR) of 18% from 2016 to 2021. The American market is expected to grow from \$10.6 million in 2016 to \$24.6 million in 2021 at a CAGR of 18.3% for the period 2016-2021. The EMEA (Europe, Middle East and Africa) market will grow from \$10.2 million in 2016 to \$23.1 million in 2021 at a CAGR of 17.8% for the period 2016-2021 (www.america-retail.com). Emerging market growth is currently estimated at 4.9% in 2018, and is forecast to reach 5% for 2019 (Bloomberg, IMF Data Mapper). Using NM technologies is essential in an emerging market to help organizations maintain, develop and gain competitive advantage.

The manuscript emphasizes the NM's utility on the market and identifies the consumers' behavior and their feedback regarding a tourism website of a company from Romania named in the paper Alpha (α). The aim of the paper is to emphasize the NM utility for developing sustainable organizations by analyzing how the

ET measurement as a NM technique helps to understand the consumer's behavior on a tourism website in the process of searching for the most required information, how the results provide strategic and operational choices for the organization. Also, the study used a qualitative research to collect information about customers' needs and searching patterns on the company's website. Is eye tracking nowadays an instrument that helps organization to be sustainable or is it an obsolete one? The research questions refer both to the interest of the participants regarding the information they need and to the time they spend until they click for the first time on the webpage. What have the consumers looked at on the website? What kind of information were the consumers looking for? What pages on the website were visited for finding the information? How long did the participants look at an area until they clicked for the first time? The research questions for the qualitative research are: Which are the tours preferred by the site's visitors/tourists? Is it easy to navigate on the company's website? Is there a correlation between the subject's age and the type of the preferred experiences? Issues of the tourism websites design are not widely discussed the scientific literature. In Romania, eye-tracking measurements on tourism websites were not carried out. In addition, the results may contribute to the interface improvement and to a better information representation for websites in tourism, as well as in other fields.

Literature review

Today, marketing researchers and scholars tend to get a better understanding about what NM is after many studies and research done over time. Since a German professor, Ale Smidts has used the term NM for the first time in 2002, to refer to "the study of the cerebral mechanism to understand the consumer's behavior in order to improve the marketing strategies" (Orzan, Zara, & Purcarea, 2012; Smidts, 2002; Smidts, Hsu, Sanfey, Boksem, Ebstein, & Huettel, 2014), various ways to define NM emerged over time. Some scholars have defined the NM as "a new field of marketing research studying consumers' cognitive and affective responses to different marketing stimuli" (Zurawicki, 2010; Dooley, 2010; Nyoni & Bonga, 2017). According to other scholars, NM is "a subset of the study of neuro-economics, which combines neuroscience, genetics, economics and psychology to understand how specific neuron activation may lead to larger scale market behavior" (Levallois, Clithero, JWouters, Smidts, & Huettel, 2012; Nyoni & Bonga, 2017). Thereby, NM can be defined "as any marketing or market research activity, which uses methods, techniques or insights from the field of brain science" (Genco, Pohlman, & Steidl, 2013). Summing up, NM can be understood "as a way of studying both consumers' preferences and buying patterns by observing automatic neurological responses in relation to brands and advertisements" (Nyoni & Bonga, 2017). Despite the different definitions existing in the literature, in the concept of NM three fields of research and disciplinary areas are integrated: neurology focuses on the study of the human brain; cognitive psychology focuses on the relationship between mind and human behavior; marketing involves the developing of new products and services that satisfy the needs of consumers (Martinez, 2011). Recently, the interest in studying and understanding the potential of NM has increased. NM has gained increasing popularity in companies, as well as in the academic field (Thomas, Pop, Iorga, & Ducu, 2017).

In particular, the goals of NM research are to identify the changes in commercial stimuli that may have impacts on marketing efficacy (Ohme, Reykowska, Weiner, & Choromansk, 2009) and "to explain how changes in the delivery of marketing information affect the manners in which the brain reacts (changes in the brain signals)" (Nyoni & Bonga, 2017, 20). Research has proven that, for marketers, particular emotive responses can be a catalyst for advantageous actions (Du Plessis, 2011). Also, in other studies scholars have discovered that the brain expends only 2% of its energy on conscious activity (Singer, 2010). The rest of its energy is allocated to unconscious processing. In addition, the unconscious processes affect a consumer's decision-making process without its knowledge (Blum, 2016). NM offers results based on the consumers' free will and about their privacy (Wilson, Gaines, & Hill, 2008).

Some critics argue that NM techniques do not measure the actual behavior of a consumer, only the physiological evidence of its behavior. They suggest that it is not possible to find "buy button" since some areas of the brain can only be observed instead of influenced (Kenning & Linzmajer, 2011). Other critics consider that although NM activities invade the customers' privacy, this trend is not going to stop in the future since companies' main goal is to increase their profit, even if there could be interference into privacy and freedom of choice (Dapkevičius & Melnikas, 2011).

Due to the fact that customers are mostly not able, anytime and anywhere, to express their thoughts and feelings in a certain way, marketers can apply different types of instruments. For a long time, methods such

as body language and empathic design were the most used instruments to collect information about the brain. Even though these methods do not regard the inside activities of the brain, they recognize the outside reflexes which have their origin in the brain (Roth, 2013). Since the technology is so advanced, new NM tools such as: Functional Magnetic Resonance Imaging (fMRI), EEG Electroencephalography (EEG), Magnetoencephalography (MEG), Transcranial Magnetic Stimulation (TMS), Facial Action Coding Services (FACS), skin conductance (SC), and eye tracking (ET) tools appeared. In the literature, there are many studies that describe the NM tools (Harmon-Jones, 2003; Huster, Stevens, Gerlach, & Rist, 2008; Ohme, Reykowska, Weiner, & Choromansk, 2009; Ariely & Berns, 2010; Morin, 2011; Sariatli, 2017).

Methodology and methods

Aim of the research/ Research questions

The aim of the research is to elucidate how the eye tracking measurement helps understand the consumer's behavior on a tourism website and provide strategic and operational choices for the organization. Also, the study used a qualitative research to collect information about customers' needs and searching patterns on the company's website.

The research questions refer both to the interest of the participants regarding the information they need and to the time they spend till they click for the first time on the webpage. What are the consumers looking at on the website? What kind of information were the consumers looking for? Which pages were visited for finding the information? How long did the participants look at an area till they clicked for the first time?

The research questions for the qualitative research are: Which are the tours preferred by the visitors of the site/tourists? Is it easy to navigate on the company's website? Is there a correlation between the age of the subject and the type of the experiences preferred?

The sample

The research recruited 103 participants, including males and females. The experiment was based on the 103 subjects which took part and the interviews on 98 of the subjects. The participants were aged between 18 and 54 years. 32 of them wore medical glasses. Most of the participants were right-handed (83 participants), the rest were left-handed (20 participants). Most of them (98%) are accustomed with the use of the Internet. The subjects work in different fields and live in different cities. None of the subjects had neurologic nor psychiatric history.

The company activating in the tourism market, named Alpha (α) in the paper, is a new company organizing tours for people coming from all over the world. The interviewed subjects were only tourists/clients of the Alpha (α) company. The company is specialized in hiking and trekking (nature walks), wildlife observations (bears and birds watching), and special outdoor experiences (night experiences in the mountains). The tours offer packages such as: wildlife detective for a day, woodpeckers' seeker's experience, bear watching in Transylvania, Carpathians in snow experience, and thematic nature walks and thematic night experiences. The first part of the homepage of the website starts with the logo of the company, it continues with the menu (About us, All tours, Bed & breakfast, Photo gallery, Blog, Events, Contact). Under the menu, there is a bar with the tours and their prices and a short description of the company is presented. The second part of the homepage shows the most popular tours with a brief description and the possibility to book one of them. The third part of the homepage resumes the menu and offers the possibility to send a message.

The methods

Eye-Tracking analyses where the subject is looking (gaze or fixation point), the time that the subject spent looking at a particular point, the movement of his eyes correlated to his head, pupil dilation, and the number of blinks (Zurawicki, 2010). The concepts correlated with ET are fixations and saccades (Velásquez, 2013). Fixation represents "the moment when the eyes are fixed on an object and it is possible to enjoy it in detail" (Dos Santos, Caldeira de Oliveira, Bonaretto Rocha, & Giralddi, 2015). Saccades refer to the rapid eye movements between two fixations.

ET helps identify what buyers see and what they miss when they are looking at products because the tool studies the important and effective factors in attracting attention and enhancing sales (Grewal, Ailawadi, Gauri, Hall, Kopalle, & Robertson, 2011). Using graphic elements, customers' clicks, key contents, digital sales techniques and the peripheral vision influence the eye movement and visual attention behavior (Ares, Giménez, Bruzzone, Vidal, Antúnez, & Maiche, 2013). The data collection process involved an eye-tracker system from Tobii technology which identifies the presence, focus, attention, consciousness or other mental states. The research was realized using the Tobii Pro Studio eye tracker, an instrument for the recording, analysis of eye gaze data and interpretation of human behavior, consumer responses and psychology (www.tobii.com). Tobii Studio implies various stimuli and allows both multiple and different stimuli types to be combined into a single recording. A framework of behavior is obtained by integrating the recording of eye tracking data with user video and mouse clicks into a single solution (www.tobii.com).

The data collection was realized in Romania, from February till May 2018. Subjects were instructed regarding the procedure. The participants were placed in front of a laptop with eye tracking equipment at a distance of around 60 to 80 centimeters from the monitor in a special room of the company. They had to navigate on Alpha (α) company's website from tourism field without any temporal restrictions. The ET system was calibrated on each participant to obtain the best results. The session lasted approximately five minutes for each participant, including the calibration of the eye tracker instrument. During each session ET was recorded using Tobii's software.

The time for a participant to the first mouse click on a specific area of interest (AOI) was analyzed; more precisely, the duration till the subject's first mouse click on the interested area of the webpage. The time to the first mouse click is a variable counted in milliseconds. The analysis was based on gaze plots and heat maps. A gaze plot is "a representation of user's eye movement across the screen, fixation by fixation; the size of the gaze plot dot relates to how long a user has fixated on the specific plot" (Šuminas & Gudiniavičius, 2015). A heat map is "a representation of the different areas of the screen where the user has spent most time looking; green color represents least time focused on an area and red color represents the most time focused on an area" (Šuminas & Gudiniavičius, 2015). This data is used to extrapolate the rotation of the eye and ultimately the direction of gaze. Attention synchrony represents a behavior that happens during the investigation of dynamic stimulus content. It defines timespans when the majority of participants spent their attention on a particular area till their first mouse click (Kurzahls, Burch, Blascheck, Andrienko, Andrienko, & Weiskopf, 2017).

Qualitative research based on the method of semi-structured in-depth interviews was conducted after the experiment. This method allows through face-to face discussion, to obtain a greater amount of information (Bratucu et al, 2017). The aim of the interview was to collect information about customers' needs and searching patterns on the company's website. The interviews were conducted by the authors. The duration of each interview being between 40 and 60 min. The same interview guide was used for interviewing all the participants. The guided sampling was chosen using the allowance quota sampling method. The interviews were recorded. The authors transcript each record, have processed, and analyzed the collected information.

Results

The results identified are significant for emphasizing the tourists' behavior and help organization to develop competitive strategies.



Figure 1. Gaze plot analysis

Gaze plot analysis shows where the pupils of the participants were fixed on a particular point and where they were moving through the website. The analysis offers information regarding the parts of the webpages that are most attractive to participants and the directions the participants' eyes travelled, emphasizing the manner they moved around the webpage.



Figure 2. Heat map analysis

The heat map analysis exposes the areas of the webpage where the participants have spent most time by searching for the information they needed. As shown in figure 2, the most viewed areas of the heat map are colored in red and in yellow. The green areas show the decreasingly viewed areas. The research shows where the consumers looked at on the website and what kind of information they were looking for. Most of the participants first looked at the images before they read the descriptions or the menu. The most points of attention were accorded to the tours, their price, the periods in which they take place, their difficulty degree, and the presentation images of the tours from the central area of the webpage. Also, the “Bed & breakfast” section was interesting for the participants from other cities. The area of interest is the central zone of the webpage. As a consequence, the key elements that influence the consumer should be placed in the center of the webpage. The pages on the website visited by most of the participants to search for information are “All tours”, “Bed & breakfast” and “Blog”. The participants were interested in the most popular tours and in the short description of the company. The research brought tourists for the company because there were participants who booked tours; the most booked tour was the thematic nature walk.

Correlations between data dimensions are analyzed statistically too. The results show how long the participants look at an area till they clicked for the first time. For this example, the mean of the time to first mouse click was analyzed. This indicates how adequate the design of the webpage is, by measuring the accuracy with which the consumers locate the buttons and/or links they need to click on to find the needed information. A well-organized, well-designed website should be characterized by short times to first click, indicating the users can easily identify the actions they should perform next in surfing the webpage. The results provided the manager of Alpha (α) company with objective, statistically-valid evidence.

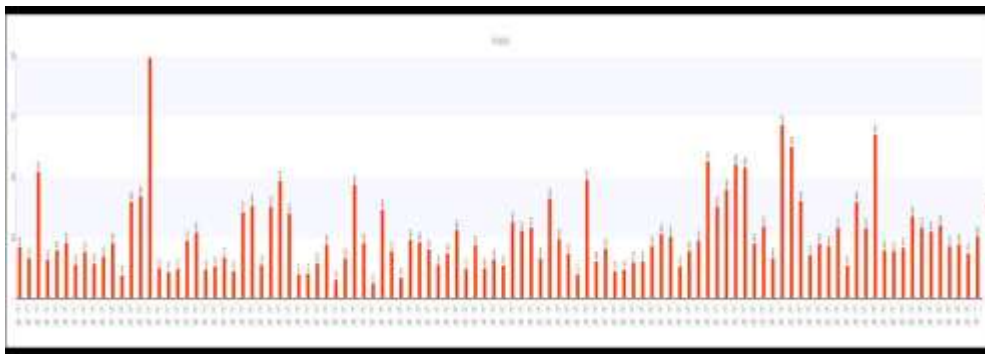


Figure 3. Time to first click mouse mean

The time to first mouse click mean shows all the 103 participants of the research. The highest value is 73.00 seconds and the lowest value is 4.33 seconds. In this context, the company has a short time to capture the consumers' attention. The website should be designed as memorable as possible to quickly satisfy the consumers' needs.

After the eye tracking measurement, the subjects participated in a questionnaire based interview about their own consumer behavior, tour preferences, destinations, prices, types of experiences. After analyzing the answers, the key points of the results are presented. The participants were asked to mention their favorite tour. The results can be synthesized in the following: 21% of the respondents prefer wildlife detective for a day, 18% prefer woodpeckers' seeker's experience, 10% prefer bear watching in Transylvania, 12% prefer Carpathians in snow experience, 23% thematic nature walks, and 16% prefer thematic night experience. There is no connection between the age of the participants and their needs. The younger participants do not prefer night tours rather than wildlife detective for a day or bear watching in Transylvania. The older participants prefer night tours, woodpeckers' seeker's experience, and thematic nature walk. The respondents suggest that website surfing would be more efficient and would reduce search time if tour information would be more accessible and more compact. Currently, information regarding the details of a tour is found in many places and many pages must be accessed until key information is reached. Another suggestion is to introduce more photos and videos on the website and more articles on the blog. The participants mentioned that they use websites as a primary source of information to select and prepare their touristic tours. Also, they mentioned that they value most the experience produced by the tours, the feelings they had, the emotions regarding the tour, the values, the intrinsic benefits.

Discussions

The findings have demonstrated a correlation between the touristic tours and the consumers' emotions. The findings show that there is a high number of mouse clicks on particular areas of the webpage (e.g. the all tours, most popular tours). The heat map and the gaze plot analysis show the user's concentration areas. This may indicate that the participants are interested in those areas. Based on the duration the visitor's eyes spend on a particular part of the website, the company can make decisions regarding resources and features allocation to attract consumers.

Through the processing of a visual webpage, participants move their eyes to relevant characteristics on that webpage. Some of these characteristics are primarily identified by the peripheral zone of the visual field. The peripheral zone is useful to filter the characteristics according to their relevance for the research. It is essential to mention that the ET equipment used in the research emphasizes the areas of the visual webpage that the participants have been fixating at, not the whole visual field. For this reason, it is beneficial to make an interview or a questionnaire to understand why the participants have been fixating and clicked at some areas to the detriment of others.

The research shows that it is not necessarily needed to examine people's brains with complicated equipment to understand their behavior; an eye tracking measurement can be a useful tool for a company because the automated process helps increasing the reliability. Elements such as images, price, name of the tours, difficulty of the tour tend to exert influence on the behavior of the customer. Knowing which elements were clicked first helps the company rethink the design and presentation of the content of webpages, what can be removed or replaced with an incentive that could encourage visitors to spend more time on the website. Designing a clear flow of contents helps improve the website navigation.

The ET analysis offers information regarding the usability of the website. The participants to the study have mentioned that they understand the menu options and they navigate on the website easily, but some changes should be done. In addition, ET analysis gives suggestions on redesigning the website. In the findings it is possible to state that the traditionally vertical website layout is more effective than the horizontal one because reading webpages from the top down stimulates the brain and makes viewers keep on scrolling. Also, the headlines' information from the webpage should be memorable with strong visual elements such as central positioning, strong colors, and spatial organization. The participants scanned the webpage from left to right, in a downwards direction. The ET analysis showed that the subjects follow a second horizontal movement, they return back to the left side of the webpage and they keep scrolling down.

The company's brand is very important because of the "brand-recall" concept. It refers to the moment when the consumers did not remember a specific content, name, service etc. but a psychological response is generated by a logo, by an image etc. In the paper's case study, the participants did not concentrate on the area where the company's logo is (the top left part of the home page).

The experiment based on Eye Tracking conduces to a better understanding of the tourists' behavior, the usability of a tourism website, how users are surfing on the website (it was difficult for the participants to surf on the website because the webpages do not contain a clear flow of content), identifies what types of images and content are preferred by the tourists, measures the first mouse click duration (the highest value is 73.00 seconds and the lowest value is 4.33 seconds), offers directions to the redesign of the website (vertical website layout is more effective than the horizontal, information placed in the central areas are preferred, information should be memorable with strong visual elements).

In the study, some limitations tend to emerge. Human behavior is not predictable and there is no guarantee that another research will provide the same results even though there are the same participants. Focusing the attention only to one company does not allow to make general propositions but only to formulate hypotheses of behaviors and explanations of the observed phenomena. Research results offer valuable information to provide some elements to orient the decision-makers in the strategy development and in redesigning the website. The research required a long time for the procedure. The research did not receive any grant from funding agencies in the public or commercial sectors.

Conclusions

NM, as a science, evolved very much over time being in a continuous development to understand human brain and its mechanisms. Neuroscientists discovered that approximately 80% of the human emotions related to the approximately 3×10^{11} neurons in the brain are in the unconscious, which makes them inaccessible to the direct and conscious introspection (www.wordpress.com). NM is based on modern techniques that involve special equipment (e.g. fMRI, EEG, ET etc.) which can find what the conscious mind of the customer misses out. NM instruments give insights regarding what the consumers are thinking about and how they are reacting subconsciously to a specific situation. NM has the potential to influence organizations and customer loyalty by measuring consumer behavior in real time regarding new products, advertisements promotions, pricing, web sites, etc.

The paper offers a detailed overview of what NM is, explains its technologies, its importance as an instrument to gain competitive advantage, and its influence on marketing elements. The heat map and the gaze analysis indicate that the most important content that achieves the goals of the company should be on the top of a webpage. Customers buy what they see easy; visual salience grabs attention. Consumers react better at images of real people and good tours' photos. Blogs are important and they should focus on summaries rather than full articles to capture consumers' attention. The ET analysis brings benefits for the company. It measures the mouse clicks on the webpages, records the total time it takes a visitor to perform a task, understands the clickstream of the website, shows how users are surfing on the website, emphasizes what types of images are preferred by the visitors, identifies whether the visitors read or scan the content, understands user behavior, helps to redesign the website, and improves website's navigation. Even if the paper presents a case study in the tourism field, ET can be used in e-commerce, psychology, computer sciences, engineering, and many other fields. Future research will concentrate on using fMRI method and extend the research on other fields.

Most of the human behavior is leaded by the unconscious part of the brain. Consequently, NM represents an important instrument to have a better comprehension of consumer behavior. It is a key instrument for organizations to know better the consumer, to gain competitive advantage, to develop themselves, but it is also a tool that helps consumers understand better their own buying decisions and behaviors. In the future, even if NM is seen as "the art of measuring consumers' emotions, or a science in measuring marketing effectiveness, all the marketers will want the unbeatable truth of the subconscious mind regardless of what emotion, sentiment or engagement consumers are feeling" (Arthmann & Ping Li, 2017).

Implications of the study focus on psychology of customers. In addition, they focus on how companies should invest in training employees in dealing with emotional intelligence, in emphasizing contents to educate and attract customers too. The study, theoretically, embed neuroscience more and more in strategic organizational decisions not only for marketing but also in terms of internal marketing and communication with personnel and customers.

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