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Crowdsourcing Platforms: Users' Experience Exposed

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Abstract

Crowdsourcing is one of many ways that companies use to access a wide and varied range of resources that combined can generate superior performance. Our exploration tries to answer the question of how can a platform be effectively designed to attract and stimulate participant's engagement. To address this inquiry, we selected two crowdsourcing platforms and compared the users' experience from six perspectives: attractiveness, usability, accuracy, conversion, interaction and copyright protection. The subjects were asked to perform some predefined tasks on the selected platforms. Their behavior was recorded using an eye-tracking device, which offered information about eye positions and movements during tasks. Visual behavior records were enriched with talk aloud protocols. This additional research method was used to understand subjects' expectations, feelings and reasoning while executing the required tasks. After analyzing users' experience from proposed perspectives, what seems to matter mostly when choosing a crowdsourcing platform, is – first of all - the platform's design and secondly their own website navigation skills. Crowdsourcing platforms may attract or lose potential contributors with different capabilities just by modifying their website templates, by means of how information is presented. Nevertheless, a single website template could not satisfy all needs. Therefore, different abilities a user might have will influence him to select a crowdsourcing platform that match their way of thinking.

Keywords: Eye-tracking, crowdsourcing, talk aloud, design, neuromarketing.

JEL classification: M31, C91, D83, O31.

1. Introduction

Over the last thirty years, the companies source of sustainable competitive advantage were considered to be the resources it had. To guarantee success, these resources had to be valuable, rare, imperfectly imitable and non-substitutable (Barney, 1991). Unfortunately, the acquisition of such resources is extremely expensive, so competing with ordinary resources is still a viable strategy. But how can ordinary resources provide a sustainable competitive advantage? The emergence of new business models that leverage a vast pool of ordinary resources is the answer (Fréry et al., 2015). For instance, crowdsourcing is one of the ways that companies can use to access a wide and varied range of resources that combined can generate superior performance. Therefore, it is important to understand how this process works, what the critical elements of this system are and how it can be improved.

The term crowdsourcing was for the first time used ten years ago and defined as "the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call" (Howe, 2006).

Crowdsourcing is a process that must be planned, organized and coordinated in order to work (Lee et al., 2015). To organize and manage it, we must understand which are the system's components and their main features influencing the final outcome. The four elements of crowdsourcing are: (1) the organization/crowdsourcer that initiates the process, (2) the crowd,

(3) the task and (4) the platform (Hosseini et al., 2015). The platform is a key element of this process. Choosing an appropriate IT structure that will stimulate and facilitate crowd engagement is of major interest (Prpić et al., 2015). Special attention should be paid to this component because experience shows that technical implementation of a platform to derive useful output is challenging (Bojin et al., 2011). It was proven that if the platform can improve usability, sociability and enhance user's experience, individuals are more motivated to participate (Zhao and Zhu, 2014).

Our research seeks to answer this question: how can a platform be effectively designed to attract and stimulate participants' engagement? To address this question, we focused on two crowdsourcing platforms and compared the users' experience with both of them.

2. Literature review

Crowdsourcing platforms connect creative people with entrepreneurs, businesses and anyone who needs great work to be done in a timely manner (Green et al., 2014). As more and more companies are choosing to solve their current problems by turning to people outside the firm, a new intermediation market emerged, formed by crowdsourcing platforms (Franklin and Higgins, 2014).

Because it needs to integrate all the elements of crowdsourcing – the crowdsourcer, the task and the crowd – platform's design must contain four types of functionalities: crowdsourcer related interactions (provide enrolment, authentication, task broadcast, assistance, time negotiation, price negotiation, result verification, feedback loops), task-related facilities (aggregate results, hide results from others, store history of completed tasks, provide quality/quantity threshold), crowd-related interactions (provide enrolment, authentication, skill declaration, task assignment, assistance, result submission, feedback loops) and platform related facilities (manage platform misuse, provide ease of use, attraction, interaction and payment mechanism) (Hosseini et al., 2015).

Most crowdsourcing platforms are designed for specific areas (Green et al., 2013) and the ways in which tasks are selected or rewarded are similar (Wu et al., 2015). Therefore, the question is how these platforms are chosen and used by the crowd.

Methods to analyze websites attractiveness and design have been developed since the advent of the Internet. These methods range from simple to ones that are far more complex. For instance, such an investigation can start with analytical data provided by services like Google Analytics (Google, 2016), which evaluate the number of page visits, the bounce rate, session duration, links to the most frequently accessed information, etc.

Then there are software that monitor the cursor movements on the screen and the time spent on specific elements of website (Hotjar, 2014). The assumption is that users watch the cursor on screen, or in other words, where the cursor is placed at that point the users are looking on. Although in general users eye are following the cursor, there are times - and not few – when the cursor is positioned on a particular item and the users are looking at a completely different part of the website.

The heat maps generated by these types of software applications are intensely colored on the menu area or the links on a page. This is because users position the cursor on the menu while reading the page. After reading the information on that page, users choose either to click on that menu and go further or to perform another action as a result of processing and understanding the text on that page. Thus, the maps generated by such applications have a high degree of bias.

A more advanced method of analysis, which is used by neurosciences (Venkatraman et al., 2015) and neuromarketing, is following and monitoring the actual eye movements on a web page (Duchowski, 2007).

To analyze accurately the eye movements, eye-tracking devices were developed in early 90s, when such studies were initiated (Benel et al., 1991). Experts have continuously improved the algorithms, methods of image processing and analysis methods (Talukder et al., 2004, Feusner and Lukoff, 2008, Chynal and Sobecki, 2010, Murawski, 2010, Murawski and Ieee, 2010, Pelz et al., 2011, Nauge et al., 2012, Seix et al., 2012, Hua et al., 2014, Hessels et al., 2015). With the advance of technology, eye-tracking data were more accurately collected and this method began to be used in various area such as: **IT** (Gajewski et al., 2005, t Hart et al., 2009); **education and training** (Le Meur et al., 2004, Chen et al., 2015, Georges et al., 2015); **medicine** (Talukder et al., 2004, van Reekum et al., 2006, Timberlake et al., 2008, Bradley et al., 2016); **linguistics** (Sedivy, 2010, Stites et al., 2010); **consumer behavior** (Basep and Banep, 2010); **marketing research** (Constantinescu, 2016, Daugherty and Hoffman, 2017) and **economics** (Lahey and Oxley, 2016).

Eye-tracking devices help us do more complex and accurate analyses, due to their capability of measuring eye movements, blinking, fixations, saccadations and pupil dilatations. Fixations are times when the eyes are standing still and closely monitor a specific area, while saccadations are rapid movements between fixations.

It is known that eye movement (Pelz et al., 2011) is influenced by the emotions associated with cognitive processes. Thus, the blinking counts and the degree of pupil dilation are associated with a high emotional intensity experienced by a subject. Experts interpret in different ways, the variation of number of fixations, fixation time and the distance between successive fixations.

For instance, some evidence suggests that while taking a glance at a website page, a higher number of fixations demonstrate the need for more processing time or troubles in understanding the content (Poole and Ball, 2006). If users are spending a long time looking at a particular area before making an action, maybe the information in that area is confounding.

On the other hand, longer fixation interval, or groups of fixations, may show more prominent interest and engagement with the objective (Poole and Ball, 2006, Galesic et al., 2008). The number of fixations is also used to find out if a design is more efficient than the other (Bojko, 2006). A recent research focused on websites design revealed that the sections most intensely observed are search tools area, the main menus area and home page (Weichbroth et al., 2016). Backward saccades, when eyes are returning to the previous point, may signal misunderstanding or a more elevated information processing (Mitzner et al., 2010, Olmsted-Hawala et al., 2013). Regression can be utilized to assess the level of clarity: if the text is more intelligible, fewer reversions there will be (Poole and Ball, 2006). A good user experience is encountered when a user does not invest a lot of energy in searching, finding, assessing, and utilizing the needed information.

A problem with eye-tracking devices was - and still is - how to reduce calibration errors (Vaissie et al., 1999, Nystrom et al., 2013), in order to increase the reliability of the results about the visual perception of subjects (Pelz et al., 2000). Calibration depends very much on the points chosen for this operation (Vaissie and Rolland, 2000) and the ratio between the distance and position of the user to these reference points (Goni et al., 2004).

In conclusion, besides providing the information and tools to achieve the task, crowdsourcing platforms should also offer an enjoyable browsing experience. Companies that develop and manage such platforms, hire specialists to create an appealing site design. Some companies have even designed their platforms using the crowdsourcing community. Thus, the users themselves create their work environment suited to their own needs, which will hopefully lead to a higher efficiency.

3. Research methodology

As we have mentioned earlier, our investigation tries to answer the following question: how can a platform be adequately designed to attract and stimulate participant's engagement? To fulfill our purpose, we conducted an experiment in which we used a binocular video-based, head-mounted eye tracker, which recorded participants' eye movements during this research.

The methodology used is summarized as follows:

(1) We searched and identified, using Google search engine, several free access crowdsourcing platforms (no payment fee for registration or access). All those platforms offered similar projects for the crowd such as product and package design, naming and branding, corporate identity design.

(2) Of all platforms found, we chose two platforms. The first platform has the website design done by a specialized agency while the second platform website design was realized by crowdsourcing.

(3) Subjects selected for the experiment were young students aged between 20 and 25 years old. We decided to focus on these respondents, as they should be prepared for the jobs of the future. We are today at the beginning of the Fourth Industrial Revolution and technological changes such as crowdsourcing, the sharing economy and peer-to-peer platforms represent already a reality (World Economic Forum, 2016). During the experiment, we have investigated 29 participants.

(4) We defined six attributes relevant for the assessment and selection of a crowdsourcing platform. These attributes were attractiveness, usability, accuracy, conversion, interaction and copyright protection. Every attribute was transformed into a working task, which must be completed on both platforms. To tackle the learning process, subjects were asked to perform the tasks alternately on the two platforms. The first task on platform A, then on platform B, the second task on platform B, afterwards on platform A, continuing until all the six tasks were finished. There was no time limit for completing the tasks and each participant worked in its own rhythm.

(5) During the experiment, subjects wore a pair of glasses that tracked the eye movements while navigating the crowdsourcing platforms. The system used was the SMI (SensoMotoric Instruments) Eye Tracking Glasses 2, which contain a binocular video-based, head-mounted eye tracker (SMI Eye-Link II System) with two mini cameras that tracked participants' eye movements.

(6) To fully understand subjects experience throughout the experiment, they were asked to say aloud what they are thinking during the execution of tasks. In fact talk aloud protocol is a technique often associated with eye-tracking devices (Cooke et al., 2005). Moreover, at the end of each task participants were asked to briefly comment the actions made on both platforms. Following their comments, both platforms have been evaluated on a 1 to 7 scale for each attribute.

(7) The instruments used in this experiment have the following technical specifications: Eye Tracking Glasses for binocular vision at a Sample Rate of 120 frames per second; Primary Monitor resolution: Full HD 1920 x 1080 at 60 Hz Image Aspect Ratio 16: 9 and 24 inch size monitor. The recorded data were processed with SMI BeGaze ™, behavioral and gaze analysis software for eye tracking data from SensoMotoric Instruments. The Behavioral and Gaze Analysis (SMI BeGaze™) software version used, was SMI BeGaze 3.6.52, IDF Version 10. The operating system of the computer was Windows 10 (x64), and the web browser used was Mozilla Firefox 49.0a1 (x64) version.

(8) For each participant, eye tracking device calibration was done before the start of the experiment. Eye Tracking Glasses system calibration is the process that establishes a link between the position of the eye in the camera and a specific gaze point in space, the so-called

point of regard (POR). The calibration also sets the plane in space where eye movements are focused. On the desktop of the computer used in the experiment, five points of interest were placed: one in the middle of the screen and the others in the four corners of the monitor. Desktop background was set to solid black color and the points of regard was made by colorful red pictograms. During calibration, the participants were asked primarily to look on the centered pictogram and secondly to look subsequently at the pictograms placed on the corners of the screen. The participants fixed these pictograms and the position of the eye was noted by the system. Using these reference points, the system creates a mapping function that relates all eye positions to points in the calibration area (for our experiment, the screen of the computer). The accuracy of gaze data was directly related to the success of the calibration process.
(9) Three participants were used for the preparation and pre-testing of the experiment. Out of the remaining 26 participants, 11 cases (42.3 %) were excluded due to calibration errors or recording problems, and 15 cases (57.7 %) remained for analysis. There were 4 men and 11 women.
(10) The experiments lasted between 20 and 35 minutes with an average time of 25 minutes, and were digitally recorded.
(11) Collected data was analyzed with SMI BeGaze software, which is a qualitative analysis tool. Core functionalities are single video analysis using gaze replay and scan paths as well as support for retrospective think aloud protocol, annotation of important events and export options for video and raw data.

4. Findings

The result showed that platforms web design decisively influence subjects' preferences. Even if some tasks could not be completed on a site, if that site had a more pleasing design it received a higher grade. In most cases, attention has focused more on the aesthetic elements than on the information itself. Subjects were paying more attention to beautiful decor than to synthetic construction or logical display of information. Although it was found that a learning process occurred, and subjects learnt how to accomplish the task when is executed on the second site, still the page layout is heavily influencing the navigation experience and the final evaluation. Moreover, finding relevant information was easier for the website that placed it in the middle of the page, but this did not influence the final score given by respondents. This shows that is not enough for users to easily find and accomplish what they have to do, but such activities should also give them pleasure. Unconsciously they are influenced to pay more attention and give more credibility to information, which is presented in an attractive manner.
The predisposition to look at the central point of a PC screen was noticed by numerous authors. Vision scientists have researched the main fixation disposition impact and have given various explanations, running from the idea that the middle is an accommodating area from which to begin oculomotor investigation, to explanations that individuals tend to recalibrate the eyeballs in their sockets after each upside and downside movement (Tatler, 2007). Our research supports what other studies (Sutcliffe and Namoun, 2012) found, that websites with more sophisticated graphical layouts, animations and images are dominating attention. On the other hand, on austere (without ornaments) and logically structured websites the focus concentrates only on the salient elements.
Participants browsing abilities are also very important in evaluating a website navigation experience. This can be seen from how the six attributes are evaluated (see Figure 1). The first task to accomplish (attractiveness) was first performed on site A and then site B. The order was changed, and the second task (usability) was first performed on site B and then site A. Continuing, the third task (accuracy) was first done on site B and then site A. The fourth task (conversion) was executed on site A and then site B. The fifth one (interaction) was first

performed on site A and site B and finally, the last one, (copyright protection) was done first on site B and then site A.

Changing the order of the sites has been used to avoid the learning process. If the order was fixed (e.g.: always site A, then site B), we assumed that the second site will receive a higher grade for each attribute investigated, because the subjects will learn how to performed the task and could do it more easily on the second site. However, something unexpected happened: the first site evaluated (does not matter if it was A or B) got always a higher score. This could mean that users have set the first assessment, when the attention was at peak, as a standard. The second evaluation was unconsciously conditioned by the first one and each time received a lower score.

Regarding sites assessment, Figure 1 shows the average grades given to each site and the standard deviation from the mean. The results show very small deviations for *conversion* and *interaction*, while the talk aloud activities were more intense on these subjects. Conversely, the highest mean deviations were registered for *accuracy* and *copyright protection* tasks during which shorter talk aloud periods were recorded while browsing the sites.

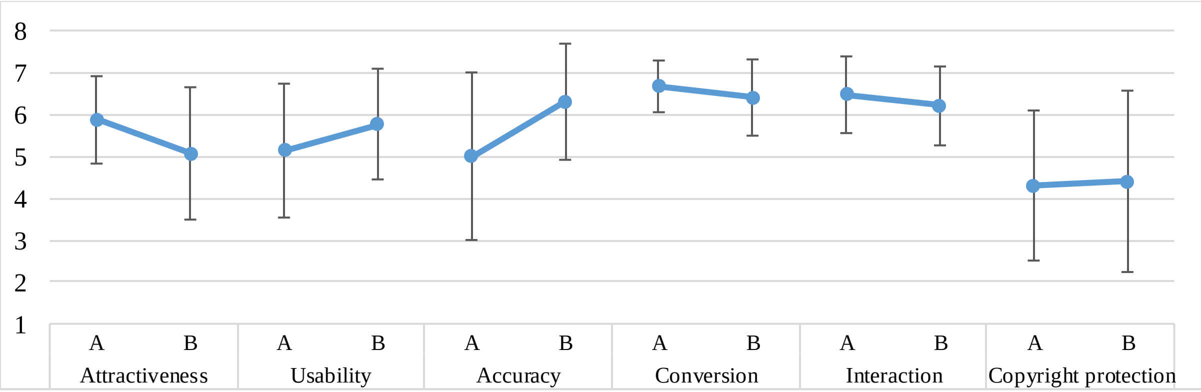

Figure1: Assessment of the six attributes transformed to working tasks.

Besides subjective evaluations, our research used more objective indicators such as number of fixations, saccades and blinks. Considering the number of fixations, some tasks generated more fixations than others did, this variable being correlated with task difficulty. Besides that, more fixations are recorded at first site examined, which confirms that the users - when they do not know what to expect- look more closely and often on the material investigated to see all the details. When examining the second site, already knowing what to do/find based on the learning effect, attention is not directed so much to all the details, but only to essential elements that can lead to solving the task received. Focus increases with practice and ability to identify what is needed to complete the assigned task.

Table 1 summarizes the results - with a 97.3% tracking ratio (degree to which the device correctly recorded eye movement) – for all participants. On average, there were 4491 fixations, 4116 saccades and 330 blinks within 25.4 minutes.

Observing how the tasks were performed, we identified significant differences between subjects in terms of Internet navigation skills and approaches. For instance, some of them focused mainly on images, graphs and flowcharts (arrows, wizards or small presentation aids such as "how to") while others insisted more on the descriptive parts of the websites (text instructions, details). Based on this, we can divide the participants into two groups: design oriented („classical”) users and purpose oriented („modern”) users. The first group prefers to find the necessary information in a classical way, using menus and links available on pages, while the second group prefer to use dynamic site search options.

Participant	Gender	Tracking ratio (%)	Duration (min)	Fixation count	Saccade count	Blink count	User type
Participant 1	Female	98.6	33.4	6427	6101	319	classical
Participant 2	Female	98.8	24.5	4868	4590	267	classical
Participant 3	Female	98.6	24.2	4177	3861	252	classical
Participant 4	Female	94.0	20.5	2220	1728	484	modern
Participant 5	Female	92.4	31.1	4421	3504	729	modern
Participant 6	Female	99.9	29.1	5835	5605	209	classical
Participant 7	Male	95.4	21.2	3589	3169	364	classical
Participant 8	Female	98.7	23.0	4602	4356	245	classical
Participant 9	Female	90.2	21.0	3476	3119	339	classical
Participant 10	Female	98.5	20.4	4127	3836	280	modern
Participant 11	Female	98.6	21.4	3252	2889	314	classical
Participant 12	Female	99.2	22.0	3863	3515	333	classical
Participant 13	Male	100.0	29.5	5114	4996	103	modern
Participant 14	Male	99.3	35.1	6120	5557	419	modern
Participant 15	Male	98.4	31.2	5287	4924	299	modern
Global (average)	**-**	**97.3**	**25.4**	**4491**	**4116**	**330**	**-**

Table 1: Globally eye-tracking metrics for all of the participants.

Analyzing the talk aloud records, we found the following:
For the first activity (**attractiveness**), subjects had to identify what jobs/projects are offered by the two sites and to make a first impression about how the information is presented. Both sites were previously unknown to participants. The overall conclusion is that all participants were able to realize what is going on each site and identify the main categories of jobs that were offered to contributors. The general impression was that a website was more attractive (from an aesthetic point of view) while the other one was better structured. Classical users stayed more on images and menus, while modern users looked mainly on search areas and information filtering zones. Among the ideas arising during the discussion are worth noting:

- *„Website A has a better presentation (with pictures) while on website B information is more synthetically";*
- *"Site B is simpler and more structured, but I like website A";*
- *"Site A, from my point of view, is more friendly and site B is more compact, with a simpler interface";*
- *"Site B is more organized, although site A is more attractive";*
- *"It's hard to find something on site A. It is built in a modern style; the white background creates the illusion that is it made on the whole screen, even if it is not. In contrast, site B is smaller, the information is presented only in the middle";*
- *"Site A had suggestive texts";*
- *"Site B is more restrictive in terms of projects, site A has a wider range of jobs";*
- *"Site B is very ugly and very crowded and very mixed and I can't find what I need";*
- *"On website B, I cannot realized what it is about as easy as I can on site A. I like more site A. Site B is more professional / business while site A is more creative";*
- *"Site A is very well arranged and it's interactive, it's well organized, although I had some difficulties to understand how I should navigate. Site B is very well organized; you can find immediately what you need".*

For the second activity (**usability**) participants had to search for more details on the websites and to choose an open job/project, according to their own skills. Thus, we have tested how easy it is to use the navigation tools and to make a selection. During this task, both classical and modern users looked more on the descriptive text and taglines. When images popped-up, there were many fixations with a longer fixation time on logos and frequent comebacks on titles. Site

A, which has a more attractive design as previously seen, captured the attention of the participants more time, since they were distracted by the decor. On site B, which is more schematic, the activity was carried out in a much shorter time and site B was therefore awarded with a higher score. The following comments are relevant:

- *"Site A is more suited to companies and not to the crowd";*
- *"Site B is more accessible. You can realize how desirable a project is, based on the number of participants and the number of loaded versions";*
- *"Here (Site A) are more interesting ideas than the other side (Site B)";*
- *"Site A is better divided into areas";*
- *"I saw the description and I liked it. I want to learn to make info graphics. Site B is ok as brief and all the rest, while site A does not give you many details ...there are more images";*
- *"I struggled a bit to figure out [how to navigate]on site A";*
- *"On-site A, which is nicer, I had to scroll down the page to see the offers, which is not very good ... and I don't think either I can use criteria to filter offers".*

For the third activity (**accuracy**), participants were asked to find out how much money they will gain if they choose to perform one of the projects available. It was tested the level of accuracy, fairness and transparency of the information provided by the two crowdsourcing platforms, but also how motivating the reward is, based on remuneration-workload ratio. During this task the participants had to navigate deeper on each site, searching for additional information and clicking more links and menus. They did not focus on any particular item. The following ideas were revealed during discussions:

- *"When you look for more information is easier to find them in a tabular format (site B)... beyond (site A) is nicer, but you easily forget what you saw";*
- *"One site offers specific information (site B) while the other one (site A) ... it's useless to have better IT if you can't provide easily the desired information";*
- *"On site B, I immediately found the information";*
- *"It's good to be transparent - no login information required ... on the other hand if you are a member, it's better for reticent people, it offers them a higher sense of security".*

For the fourth activity (**conversion**), we analyzed how easy it was to transform an anonymous user into a member of a community. Subjects were thus asked to create a user account on each of the two-crowdsourcing platforms. The task was successfully completed on both sites, users were identifying immediately the menu or links that should be used. Information requested was brief, and the subjects introduced it quickly. It should be noted that the two sites were pretty similar, in terms of positioning (upper right corner) and content (the input fields). Only modern users identified the link to the newly created profile and realized that further details can be filled in to complete the profile. The respondents stated:

- *"It was very easy on site A and also very easy on site B";*
- *"It's very simple, right here in the corner";*
- *"I find it very important your data to be secured";*
- *"Easy for both sites";*
- *"It was not difficult";*
- *"... [the sign in section – a. n.] was more visible on the website A".*

For the fifth activity (**interaction**) subjects had to explore and evaluate the available interaction tools which connect users with companies, users with the crowdsourcing platform administrator, and users between them (forum, blog, FAQ, how-to, additional assistance). For this task, subjects looked for and insisted on two-three options before deciding to click on a link/menu or another one. Classical users immediately identified the icons for links leading to online social platforms (Facebook, Tweeter, etc.), while modern users searched first the links to discussion forums and blogs and then the search box. Among the ideas arising during the discussion are worth mentioning:

- *"It is very interesting to look at what others have done, to see which projects your competitors won";*
- *"On website B you can find information more easily while on website A you can connect more easily with others";*
- *"I found it very quickly on site B and a little harder on site A";*
- *"On website A, I found it faster because it was written upfront, on site B I had to search more";*
- *"It was quite hidden";*
- *"There is a keyword and it's easy to spot";*
- *"On website B, was easy to find. On website A, after that I found it difficult, now I don't remember where it is".*

For the sixth activity (**copyright protection**), subjects were asked to look for information about how their creative work is protected. In completing the last task, participants followed the links at the bottom of each website analyzed. From the opened pages, they read carefully several paragraphs before making the decision which page to access next. The respondents declared:

- *"It tells you clearly what is allowed and what is not";*
- *"I cannot find the section where the information should be. It's hard on site B ... it must be somewhere on website A. Rather difficult ...hard to find on both sites and the names are concealed";*
- *"I do not really figure out where it is, I mean there is a lot of information on site A and pretty similar. Things are very similar but not exactly, what I seek, even on site B... I cannot realize. If I'll spend more than 20-30 minutes I would probably find it";*
- *"It was easy to find, but maybe if they rearrange the titles and subtitles it would be even easier";*
- *"I cannot find on site B. I cannot find on website A either";*
- *"I can't find anything"; "I do not see anything here";*
- *"Very hard to get this information";*
- *"The information was hidden";*
- *"It is hard to find information on both sites";*
- *"This information should be more visible, it should be put upfront".*

Overall, participants ranked website A - which has an attractive design - as the most performant one, based on all attributes. This was quite a surprise because – for instance - out of 15 subjects only 2 people were able to identify the full list of all categories and jobs available, and only one of the two, managed to navigate successfully in this list to finalize the task.

Right from the start, some subjects did not follow the available primary navigation route, and this affected their navigation experience. They tend to ignore the primary menu and the links that lead to the main information needed to explore the site. Moreover, the subjects lose the logic behind the site diagram or the sorts of data and elements that the site is presenting. Investigated participants were not able to comprehend all sorts of data available on the sites.

The subjects' general impression was that both sites were designed for companies (the crowdsourcers) rather than the crowd. Those who manage the crowdsourcing platforms seem to pay more attention on attracting as many companies and put in the second position the needs and desires of the crowd.

5. Conclusions

Understanding how contributors think and act is the basis for optimizing crowdsourcing platforms, so that they can offer a user-friendly working environment. In our study, we used an eye-tracking device and complemented visual behavior records with talk aloud protocols and a final assessment to fully understand users experience while browsing and working on such platforms. Following the analysis and interpretation of recorded data, we found that some platform's attributes are more important than others are. For instance, attributes that are more important for users, generate more fixations than less important ones. Thus **conversion, interaction and attractiveness** were highly appreciated**,** and these attributes are first to consider in choosing a crowdsourcing platform. **Accuracy, usability and copyright protection**, are less important and are used only to solve ties in cases when the first attributes are having the same rankings. Though it seems surprising this ranking, we must not forget that subjects are part of Generation Y. Even if the results are sometimes contradictory, it is generally considered that members of this generation are hedonistic (Aruna and Santhi, 2015) trustful and tolerant (Furlow, 2011), group oriented and digitally connected (Dawn and Thomas, 2013). Therefore, they seek primarily an attractive design, which will make the experience enjoyable, easy to find, transparent information, and a high degree of interactivity with other participants (contributors, companies, platform administrators). How are they rewarded and if and how their creative work is protected, are secondary concerns.

In addition, a higher number of fixations is recorded for difficult tasks and for the first site examined, when the user had to perform a new task. The novelty or uncertainty makes subjects to examine more carefully the material investigated to identify all relevant elements. Repeating the same task on a new ground (the second site) based on the learning effect decreased alert level and makes attention to no longer be directed towards identifying new elements, but only to retrieve the elements previously found. Thus, by repeating an action, the number of fixations decreases and the exposure time increases.

The analyzed subjects were heavily influenced by platforms design and based on this, they found easier or harder the information needed to accomplish the task. Respondents shifted their attention to the identification of differences between sites regarding the design and not the content.

Although they looked exactly at what was needed to do the task, they were not able to see / understand what they were looking at, because the setting diverted their attention from the information. The main conclusion is that a platform should present the informational content in an attractive way, but without exaggeration, otherwise the users will be attracted and distracted by the beauty of decorative design elements.

On the other hand, since it's easy to ignore information if not presented attractively, we should not oversimplify platform's design. An agreeable websites inspires also a high degree of trust in the services and information available to users.

It seems that finding the right balance between an oversimplified design and a visually appealing one, is the key in attracting and retaining contributors to a crowdsourcing platform.

6. Limitations and future researches

The first limitation consists in the number of indicators evaluated. Besides Fixation count (Visual Intake count), Saccade count and Blink count, presented in Table 1, the eye-tracking device could registers more detailed information such as Visual Intake Frequency (ms); Visual Intake Dispersion (px); Saccade Frequency (ms); Saccade Duration Dispersion (ms), Saccade Amplitude, Saccade Velocity, Saccade Latency (ms), Blink Frequency, Blink Duration (ms) and Scanpath Length (px). These metrics could bring more clarification about users experience and could clearly enhance the analysis. Additional software is needed to do an analysis from which supplementary results may be obtained that can lead to some degree of generalization. Lack of additional software, does not allowed us to analyze the data quantitatively (only qualitatively), and thus we couldn't derived conclusions at group level. For instance, even if we recorded data on each individual respondent, we couldn't aggregate it to generate thermal maps.

The number of subjects studied gives the second limitation. Although other researchers have used a few cases in conducting experiments with eye-tracking equipment - 10 cases (Cooke et al., 2005), 11 cases (Habuchi et al., 2008), or 12 cases (Hughes et al., 2003) - we consider that only 15 cases may lead us to less objective conclusions. In future studies we intend to increase the group of subjects, taking into account the unexpectedly high rate of calibration errors (42.3%).

Another limitation is related to the simultaneous use of eye-tracking and talk aloud method, issue also raised by other researchers (Bergstrom and Schall, 2014). Following the results of our study, a strong recommendation is to refine the conversation guide or to define the tasks to be performed so that subjects will speak more easily while executing the assignments. A minimized interaction with experiment's moderator is advisable, thus limiting the times when the subject shifts it's attention from the task to the moderator which can alter the total number of fixations, saccadations and blinking.

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