A Close Look at the Phenomenon: An Eye Tracking Study on the Usability of the Profile Pages in Social Networking Sites

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Abstract:
Social networking sites (SNS) are one of the major phenomena of Web in recent years as they can easily provide a base for self-expression and positive experiences of social pleasure. Although, they constitute one of most popular categories of Web with millions of dedicated users, user-centered studies contrarily showed that SNS performed poorly in terms of traditional web usability. However, failing in terms of usability did not seem to result in the rejection of these websites. Recent studies demonstrated that the only negative experience felt by users in SNS is frustration, which is mainly gained from the abundance of applications embedded in pages, but this is easily outweighed by the positive user experiences that the SNS facilitate. The studies point out the need for employing diverse methods of evaluation to encompass the holistic user experience in SNS. The purpose of this study is to explore the usability of the profile pages of the SNS through the analysis of behavioral user data. This study specifically aims to focus on the perception of the profile pages of 5 popular SNS through an eye-tracking study conducted with 24 university students. Eye movement data including eye fixation counts, durations, revisits and non-attention points on the profile pages are analyzed. The findings reveal that vivid visual design isn’t really useful on SNS and simplicity should be favoured in order to improve usability in profile pages. Only relevant information should be presented in profile pages and content blocks need to be visually separated in order to make the content readable, scannable and easy to perceive. Findings also show that users mostly pay attention to the “profile picture” and list of “recent activities” in the profile pages. These results supported the notion that one-column layout appeared to be an effective layout for accurately scanning such lists and users preferred to see faces of their friends around content in profile pages.

1. INTRODUCTION
Social networking sites (SNS) are one of the major phenomena of Web in recent years. Boyd and Ellison (2007) define SNSs as web-based services that allow users to share a public or private profile with common users and explore connections with others within the site. Using the Internet to chat with friends or meet new people is nothing new. The unique contribution of SNSs is the ability to see others social networks, which can serve as a way to extend one's own social network. SNS can easily provide a base for self-expression and positive experiences of social pleasure. Although, they constitute one of most popular categories of Web with millions of dedicated users, user-centered studies contrarily showed that SNS performed poorly in terms of traditional web usability. However, failing in terms of usability did not seem to result in the rejection of these websites. Recent studies demonstrated that the only negative experience felt by users in SNS is frustration, which is mainly gained from the abundance of applications embedded in pages, but this is easily outweighed by the positive user experiences that the SNS facilitate. The studies point out the need for employing diverse methods of evaluation to encompass the holistic user experience.
The purpose of this study is to explore the usability of the profile pages of the SNS through the analysis of behavioral user data. This study specifically aims to focus on the perception of the profile pages of 5 popular SNS through an eye-tracking study conducted with 24 university students. Eye movement data including eye fixation counts, durations, revisits and non-attention points on the profile pages are analyzed. The findings enable to generate some suggestions to improve usability in the profile pages of the SNS.

The remainder of this paper includes the literature review and methodology sections followed by results and conclusion.

2. LITERATURE REVIEW

In the last few years, the immense interest of the users towards the SNS brought the emergence of various studies on the usability of this phenomenon. In this section, an overview of the relevant literature in field of human-computer interaction will be provided in certain categories.

Some studies investigated the applications of usability principles on social network sites and tried to generate new guidelines for SNS usability. In this context, Ho (2009) emphasized that social networks differed from regular websites in 3 fundamental ways: Activities and content are fully (or at least mostly) driven by the users, users are expected to do things on the website – interact, post, vote, etc. and users are expected to come back to the website periodically and continue to do things. Cronin (2009) also explored the crucial user interface features of social media and networking sites. Both studies proposed guidelines, which overlap with each other. Proposed guidelines focus on the need for a simple interface design, which show only relevant information and important actions with visual feedback.

The second category in the relevant literature focused on the user experience in the SNSs and defined relevant usability problems. In this context, Temkin et al. (2007) investigated the site experiences at five major social networking sites: MySpace, Facebook, Tagged, Friendster, and hi5. They looked at how well each site supports young adults trying to create new profiles. Their findings showed that none of the five sites received a passing score. Some of the major problems were as follows: A lack of privacy information, poor text legibility, and inefficient task flows. However, they also emphasized some good practices like Facebook's single page sign-up process. The researchers stated that social networking sites needed to focus on improving usability for these types of transactional processes. Fox and Naidu (2009) also focused on user experience in three popular SNS by adopting traditional usability test instruments such as background questionnaire and task-based observation. They evaluated first-time users’ satisfaction, navigational efficiency and general preferences. Their findings revealed issues related to confusing terminology, inadequate feedback and error messages and showed that improper link location impacted user performance and satisfaction. In this category, there are also studies, which assert that traditional usability methods are not adequate to explain the diverse aspects of user experience in SNS and call out for a more holistic method of evaluation to encompass the usability issues in SNS. Ali (2010) emphasized the challenge of usability evaluation of online social networks with a focus on Facebook. In this sense, Hart’s research (2008) can also be given as a significant example. Hart (2008) investigated user experience in Facebook, and exposed that Facebook performed poorly with regards to traditional usability guidelines. However, she also found out that Facebook was also very successful in creating positive experiences of social pleasure and a base for self-expression. Hart (2008) proposed that traditional
usability methods do not consider how users ‘feel’ when interacting with these new technologies. Therefore, she claimed that users’ desire for fun and pleasure while navigating through web should be captured for a better understanding of usability in SNS.

There are also online surveys, which focus on usability issues in SNSs. As a significant example, user experience consultancy, Webcredible (2010) carried out a social network usability poll. The research polled more than 1,100 online users between December 2009 and March 2010 on which social networking site they find easiest to use. The study revealed that Facebook and Twitter are considered the easiest to use social networking sites but a substantial number of Internet users feel that no social networking sites are easy to use.

Departing from a universal usability approach, SNSs are also subject of studies concerning the user experience of diverse users groups like children and disabled users. State of the eNation Reports published by AbilityNet (2008) demonstrated that many SNSs are effectively ‘locking out’ disabled visitors, the majority of whom can’t even register and let alone participate in the online communities they wish to join. The investigation by web usability consultants at User Vision (2007) also found that most of the SNSs lacked targeted, clear information about online security for under 18s.

Lastly, there is a limited number of usability studies which adopt eye-tracking methodology. The study of CatalystGroup (2009) can be given as a significant example in this category. This study exposed that the page that provides the list of friends or connections is a crucial step in the usage of SNSs. Despite the broad relevance and significance of the “friends list”, there does not yet seem to be complete agreement in the design community regarding this feature. Although the 1-Column layout is a simpler design that requires more scrolling and in general took more time to review, the study indicated that this is a much more effective layout for accurately accomplishing the key networking goals of scanning a list for people you know or want to meet (CatalystGroup, 2009: 12).

3. METHODOLOGY

The purpose of this study is to investigate the usability of the profile pages in the SNS through an eye-tracking study with 24 university students. Eye-tracking technique, which is a popular methodological approach in the area of HCI, is employed to gather behavioral data.

Eye movement research and eye tracking flourished in the 1970s, with great advances in both eye tracking technology and psychological theory to link eye tracking data to cognitive processes. In more recent times, eye tracking in HCI has shown modest growth both as a means of studying the usability of computer interfaces and as a means of interacting with the computer (Jacob and Karn, 2003).

Recent studies showed that eye tracking gives the researchers valuable insights into how users perceive online content (Duchowski, 2007). Incorporating an eye tracker in a usability test gives researchers more precise information about how discoverable or attention-grabbing visual elements such as navigation structures, screen graphics, links, text, multimedia content, or promotions are to study participants.
3.1 Research Questions

By investigating individual and common user gaze patterns and eye movements when viewing social networking sites’ profile pages, the addressed research questions in this study are as follows:

- What do users look at first on the profile page?
- How do they spend their time on page elements?
- Is there a difference between genders’ viewing pattern?

3.2 Sampling and Procedure

In choosing the participants, it was thought important to attempt to control individual differences like computer experience and education level. The sample consists of 24 undergraduate students, who study at the 3rd grade of the Faculty of Communication in Galatasaray University, Istanbul. The sample includes 12 men and 12 women aged 23 with an average Internet and SNS experience.

Five popular SNS with significantly high traffic were chosen for the study: “Facebook”, “Myspace”, “Twitter”, “Friendfeed”, and “Lastfm”. The screenshots of the profile pages of each SNS were shown to each participant for 8 seconds and eye movement data collected. Considering the opportunity to create diverse profiles, only in Facebook, two different profile pages were included in the study: A personal profile page and a fan page. An exposure period of 8 seconds was thought to be adequate, as web usability studies showed that users spent an average of 8-10 seconds at the homepage or landing page for making a decision about using a website (Nielsen, 2009). The eye-tracking test was conducted with “Tobii Eye Tracker” and the data was analyzed by a software named “Emotion Tool”.

3.3 Data Analysis

The data analysis provided spotlight images, which show attention points that present data on fixation counts and durations. The “spotlight image” shows the distribution of attention with the help of a semi-transparent layer superimposed on the stimulus. Areas, which attracted much attention, are more transparent than those, which attracted little attention. The areas, which attracted the most attention, are classified as Attention Points. Each Attention Point contains a red circle in its 'center of attention' (where the most attention was focused) with a number inside. This number indicates the sequence in which the Attention Point was visited based on the Hit Time. The first area the respondents visited first (the one with the lowest Hit Time) is given the number 1; the second is given number 2, etc. Results calculated for each Attention Point are shown on little yellow 'sticky' notes. “Hit time” represents the average time at which the respondents looked at an Attention Point for the first time. “Time spent” is the overall time spent in an Attention Point out of the exposure time. “Ratio” is the number of respondents who at least glanced at the Attention Point out of the total number of respondents. “Revisitors” is the number of respondents who visited an Attention Point visited more than once, out of those who had at least one visit (a visit is defined as spending at least 100 ms in the Attention Point). “Revisits” signifies how many times the respondents revisited an Attention Point on average. “Non-attention” represents the time the respondents spent looking elsewhere than the Attention Points. This is located in the lower right corner of the image.

4. RESULTS and DISCUSSION

During the test, 6 different SNS profile page screenshots were exposed to each participant for 8 seconds. Eye tracking data analysis which provided the spotlight
images, revealing the attention points of all participants for each profile page, are shown in the figures below. By referring to the research questions, the discussion is held in the light of the attention points shown in the spotlight images below.

Figure 1.a: Facebook personal profile page
Figure 1.b: Spotlight image of Facebook personal profile page

Figure 2.a: Facebook fan profile page
Figure 2.b: Spotlight image of Facebook fan profile page

Figure 3.a: Friendfeed profile page
Figure 3.b: Spotlight image of Friendfeed profile page
When the spotlight images were evaluated, it was found out that the spotlight images of most of the SNS revealed same number of attention points which is 5 except Facebook pages (Fig. 7). Especially the fan page of Facebook had the maximum number of attention points. This finding was associated with its monotonous design on recent activities listing (n=13).
In order to compare the data sets among different sites, the page elements were categorized into 6 groups, which are shown below (Fig. 8). ‘Recent activities’ is the part where users can share their recent activities/opinions in textual, pictorial or video formats. ‘Profile information’ includes the name, picture and various details of the profile owner. ‘Friends’ is the part where users’ friends/contacts/followers were listed in textual or pictorial formats. ‘Logo’ indicates the site identity. ‘Banner’ is the advertisement area, which is located on top or right side of the page in this case study. ‘Navigation’ is the area in which navigational tools are located.

When the attention points on the page elements were analyzed it was found out that the number of attention points differed. ‘Profile information’ has the maximum number of attention points (n=16) followed by ‘recent activities’ (n=9). ‘Friends’ and ‘banner’ areas had same number of attention points (n=5) and ‘logo’ and ‘navigation’ had the minimum number of attention points (n=3) (Fig. 9).
Although the number of attention points is important, the time spent on those areas also provide further information. “Time spent” is the overall time spent in an attention point out of the exposure time, measured in seconds. “Non-attention” represents the time (in percentage) the respondents spent looking elsewhere than the attention points. This is located in the lower right corner of the image. The viewing sequence is as follows: ‘Recent activities’, ‘profile information’, ‘friends’, ‘logo’, ‘banner’ and ‘navigation’. The sequence also corresponds to the legend of Figure 10.

It is obvious that the participants first gaze the ‘recent activities’ and spend 25% of their time on this area. It is followed by ‘profile information’ with 21%, ‘friends’ with 5%, ‘logo’ with 2%, ‘banner’ with 2% and ‘navigation’ with 1%. The non-attention score has the maximum percentage of time spent with 44%. This indicates that almost half of the exposure time was spent on else where than the attention points.
The number of attention points is effective on the time spent on page elements but the revisits of the participants on some attention points increase it as well. The average revisits on attention points is 2.1 and the most revisited page element is ‘profile picture’ with 5.9 revisits, which is followed by ‘recent activities’ with 3 revisits. The revisits on other page elements are below the average (Fig. 11).

![Figure 11: Revisits on attention points](image)

4.1 GENDER-BASED DIFFERENCES

The analysis also provided data of male and female participants separately. Male users have more attention points than female users. *Lastfm, Myspace* and *Twitter* have a significant difference on gender-based analysis of attention points. (Fig. 12)

![Figure 12: Number of attention points on web pages due to gender](image)
Although the recent activities of the profile pages captured the first attention in 4 of 6 sites in overall analysis, male participants gazed at the profile information firstly in 3 of the sites. Female contribution is the same as the overall results. Except ‘friends’ and ‘navigation’ blocks, there are similar numbers of attention points on page elements for both genders (Fig. 13).

![Figure 13: Number of attention points on page elements due to gender](image)

According to the time spent on the fixation points it can be stated that there are no gender-based differences (Fig.14).

![Figure 14: Time spent on attention points due to gender](image)

In accordance with the number of attention points, male users revisited ‘friends’ and ‘navigation’ area more than female participants. Female users didn’t revisit the banners at all but male users’ revisit average on banners is 1.7 (Fig. 15).
5. CONCLUSION

The purpose of this study was to investigate the usability of the profile pages in the SNS through an eye-tracking study. Findings of the study were found to be adequate. However, it should also be noted that the generalization of the findings should be made with caution. Findings of this study seemed in line with (and contributed to) previous studies on user experience in SNS. Findings on viewing inconsistencies and perception problems led to following conclusions for the improvement of usability in the SNS profile pages:

- Photos of the profile owners and their friends draw attention in profile pages. In this sense, textual content should be accompanied with avatar pictures.
- An efficient information architecture approach should be adopted for organizing content in an SNS.
- Hierarchy between interface features should be provided in order to support perception and understanding.
- Content blocks need to be visually separated with white space in order to make the content readable, scannable and easy to perceive.
- Simplicity should be favored in order to improve usability in profile pages.
- There are no important differences between genders’ perception of profile pages in SNS.

6. REFERENCES


