

# The Effect of Banner Location on Banner Recognition in a Turkish Government Website: An Eye Tracking Study

Hacer Güner and Yavuz İnal<sup>(✉)</sup>

TÜBİTAK BİLGEM Software Technologies Research Institute, Istanbul, Turkey  
{hacer.guner,yavuz.inal}@tubitak.gov.tr

**Abstract.** This study aims to examine users' eye movement patterns and their attention to the banner of a Turkish government website. The website was redesigned as two versions in a way that the banner was located on the left (the original site) in one version and on the right in the other version. 14 university students with 9 male and 5 female participated to the study. The heat maps were examined as well as eye movement patterns while performing the given tasks. Results of the study revealed that the banner (including a picture of the head of a public institution) was not directly focused in both groups during the task completion process. Although nearly half of the participants recalled the place of the banner correctly, none of the participants remembered any information about the institution head such as name, picture or social media information.

**Keywords:** Banner blindness · Eye-Tracking · E-Government · Government website · Usability

## 1 Introduction

The creation of a website has become essential to communicate with citizens for public institutions [1, 2] in a more effective, efficient and economical way [3]. Public institutions convey information via websites in shorter time without spending extensive effort comparing with the traditional methods [4]. Government websites are mainly visited to access information about the services [5, 6], to facilitate government related transactions, and to involve in government decision making processes [6].

Government websites contain thousands of pages which enhance the interaction between citizens and the government [7] because of variety and complexity of the available public services and information [8]. Therefore, simplicity [8] and usability [9] of government websites becomes important. They have great impact on the website performance [4] and attitudes of citizens toward public institutions [1, 10].

In Turkey, e-government studies started in late 1990 s, and gained momentum with the “e-Transformation Turkey Project” which was carried out in 2003 [11]. In 2008, with the implementation of e-Government Gateway, all of the government services were standardized and centralized [11]. Nowadays, all of the public institutions in the country have their own websites providing public services and information. However, the research showed that most of these websites have serious problems on usability

[12–14]. Due to the poor design and lack of standards on website development, users of the government websites reported to have difficulty to access information they need [15]. Therefore, government websites are supposed to meet demands and expectations of the citizens. User-centered design approach for government websites is required to be in the top priority for government agencies [16].

Considering the usability issues of websites, one of the most common problems is the redundant use of graphical elements such as pictures, photos or illustrations [17, 18]. Design of these elements are significantly influence usability of websites [19]. It is claimed that majority of the web users scan the web page without attentively reading the content and examining the images [20]). For this reason, the most of the elements in a website (i.e., images, pictures) are usually ignored by the users. Previous studies showed that while web users are seeking for specific information or performing a specific task, they generally have a tendency to skip the elements that are irrelevant to their tasks (e.g., [21, 22]). This phenomenon is called as “banner blindness”; that is, people usually tend to ignore web page elements that look like a banner or advertisement [23, 24].

Numerous studies have attempted to explain banner blindness phenomenon focusing on the advertising effect of banners and user recognition of advertisements (e.g. [22, 25–28]). However, even if graphical elements of a website are not related to advertising, users are still observed that they neglect those salient items [21]. This might be because of the fact that users ignore items which are irrelevant or less important because their main purpose on the website is to access necessary information as quickly as possible [22].

People are more interested in web page elements if they are consisting of text, faces or body parts [24]. However, previous studies about banner blindness phenomena imply that users often ignore irrelevant pictures and graphics especially when they are performing a specific task [23, 24].

Home page of most Turkish government websites consists of a picture of heads of public institutions. Those pictures generally resemble banner advertisements including the name of the heads with a link directing detailed personal information or autobiography and are one of the mostly used design components in Turkish government websites. It might be better to understand whether people perceive location and content of banners in a website. Therefore, in this study, we aimed to examine users’ eye movement patterns and their attention to the banner (including a picture of the head of a public institution) of a government website in Turkey.

## 2 Method

### 2.1 Participants

14 university students participated to the study. 9 participants were male and 5 were female. The ages of the participants varied between 23 and 29. The computer use of the participants differed as 4–7 years (2 participants) and 7 years or more (12 participants). Moreover, the daily internet use of participants ranged as 1–3 h (1 participant), 4–7 h (6 participants) and 7 h or more (7 participants).

## 2.2 Design

The website of a Turkish Ministry was downloaded to local folder to manipulate the location of the banner corresponding to the picture of the Minister. The website is redesigned as two versions in a way that the banner was located on the left (the original website) in one version and on the right in the other version. Participants were randomly assigned into two groups (7 participants per group), each group was exposed to one of the versions. Each participant performed two tasks. The first task was to find information about a funding program for graduate students. The second task was to find the biography of a former minister on the website.

Before the experiment, participants were asked to fill out a demographic questionnaire including gender, age, education level, computer experience and daily internet usage, and a list of mostly visited commercial and governmental websites. After completing the eye tracking test, participants were asked to show position of the banner in the website in order to understand their recall performance while performing given tasks.

The study was conducted by utilizing Tobii 1750 eye tracker in a human-computer interaction laboratory in order to capture eye-tracking movements. For the accuracy of the test, participants were instructed to display normal viewing behavior without head rest, to sit up straight and not to look out of the screen. The eye-tracking data was analyzed via Tobii Studio software.

## 3 Results

### 3.1 Task Completion Time

Results of the study revealed that the mean of task completion time of first task for the participants given the banner on the right and left was 2.23 min and 2.37 min, respectively. The mean of task completion time of second task for the participants given the banner on the right and left was 0.50 min and 0.69 min, respectively. Task completion time for both groups were close to each other which might implicate that design differences between two versions of the website had almost no influence participants' task performance.

### 3.2 The Heat Map Visuals

The heat map visuals of home pages for both groups showed that left navigation menu and top navigation menu mostly drew attention of participants comparing the other areas on the page (Fig. 1). Participants highly focused on the navigation menus while they were performing the given tasks.

The banner (including a picture of the head of a public institution) was not directly focused in both groups; that is, the fixation on the pictures was much more scattered. However, it was observed that the amount of fixation increased more in the design involving the banner in left-hand side. This might be stemmed from its nearby location to the left and top navigation menus.



Fig. 1. The heat maps of the home pages for right aligned group and left aligned group

**Task 1: Finding the information about given funding program.** The first task ideally consisted of 3 steps excluding the home page. During the entire steps of the first task, no fixation was recorded upon the banner which was located on right-hand side (Figs. 2 and 3). In the first step of Task 1, there were three banner-like images at the center of the page. Each image consisted a link directing to a sub-page in the website. The first image from the left was the one that participants needed to click for the next step. As seen in the heat map visuals, although the amount of fixation decreased from unrelated image to the related one, all three images at the center of the page attracted the most attention of the participants.



Fig. 2. The heat maps of the Task 1 (Group 1)

In the second step of the Task 1, the list of the services were provided. The name of the service that participants were looking for was in the area consisting bright red spots on the heat map. In the third step, participants found easily name of the service and clicked the link directing to the related page. Red spots on the heat map visual are seen to be clustered around that link.



**Fig. 3.** The heat maps of the Task 1 (Group 2)

Examining the first two steps of the task, heat map visuals indicate that the institution head didn't take attention of the participants even though there were fixations upon other banner-like images. However, at the last step in Group 2, some fixation were appeared around the picture. Participants seemed to pay attention on upper left of the web page consisting institution logo, picture of the institution head and top navigation menu. This might be caused form the fact that all participants were asked to return home page by clicking the Home button located upper left side at the end of the task.

**Task 2: Finding the biography of the given former minister.** Like the first task, second task ideally consisted of 3 steps excluding home page. In the second task, finding the biography of a former minister, similar fixation patterns was recorded in both groups (Figs. 4 and 5). In the first step, participants were mainly focused on the left navigation menu and menu items at the center of the page. The right-hand side menu item below the image is the one directing to the page consisting the list of all former ministers. In the second step of the task, pictures of the former ministers were listed at the center of the page. The location with the bright red spots is the target picture and highest fixation was received on that location.



**Fig. 4.** The heat maps of the Task 2 (Group 1)

Third step of the task involved the biography of the minister that participants were looking for. In both groups, the picture and the name of the former minister involved red spots and most of the attention of participants. No fixation appeared upon the banner. Although the task was searching for a minister-related information, none of the participants directly looked at current institution head.

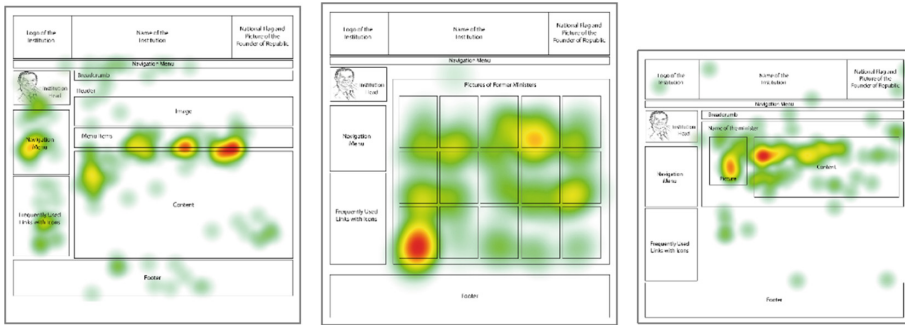


Fig. 5. The heat maps of the Task 2 (Group 2)

### 3.3 Recall Performance

In the first group who are given the banner on the right, 3 participants (42.86 %) recalled the place of the banner correctly, 1 participant (14.28 %) recalled the position incorrectly and 3 participants (42.86 %) were reported that they did not remember whether there was a banner or not. Similarly, in the second group who are given the banner on the left, 3 participants recalled (42.86 %) the place of the banner correctly, 3 participants (42.86 %) recalled the position incorrectly and 1 participant (14.28 %) were reported that they did not remember whether there was a banner or not. That is, the correct recall rates of the participants were the same in both groups while the incorrect recall rate was higher in the group with the banner on the left. Participants were also asked whether they remember the content of the banner. None of the participants reported that they remembered any information about the institution head such as name, picture or social media information.

## 4 Discussion

Government websites has become the virtual storefronts of the public institutions. Design and location of each component in government websites might need to specific attention to increase the efficiency and effectiveness of online public services. All public institutions have their own websites which consist of a picture of heads of the institution resembling banner advertisements as one of the mostly used design components in Turkish government websites. Therefore, it might be better to figure out whether people perceive location and content of such banners examining their eye movement patterns.

Results of the study showed that participants focused on the items such as menu items, which are related to given tasks at the center of the page during the task

completion process. Even though participants looked at and clicked the banner-like images which might be relevant to given tasks, none of the participants paid attention on the banner including the picture of institution head. These results were congruent with the argument that [17] proposed to avoid redundant use of the graphical images at home pages because it might reduce the impact of other important components.

Institutional logo and main navigation menu were main website components that users mostly spent time and focused on [29]. Similarly, in this study, results of heat maps of home pages showed that participants mainly focused on top and left navigational menus rather than other areas on the page. This might be due to the fact that participants were motivated to complete given tasks and they were prone to neglect the irrelevant items on the page.

Eye movement patterns of participants during task completion process showed that participants didn't directly look at the banner because they might assume that the banner was irrelevant or less important. These results were consistent with the previous studies that people have a general tendency to ignore the items that are not directly related to their interest or motivation in websites [23, 24]. However, when participants were asked about the location of the banner, nearly half of the participants in both groups recall the location correctly. It might be resulted from the participants' previous experiences that most of the public institutions have websites consisting the picture of the institution head at the homepage. These results suggest that participants might remember the location of the banner although they were not directly focus on it since banner was located within their sight. However, they didn't remember any information about the institution head such as name, picture or social media information.

Findings of this study were congruent with the banner-blindness phenomena which implies that users are usually ignore the irrelevant graphical items on a web page. In order to make a deeper analysis, various types of banners may be used in government websites with large sample size for further studies.

## References

1. West, D.M.: *Improving Technology Utilization in Electronic Government around the World. Governance Studies at Brookings.* Brookings Institution, Washington, D.C. (2008)
2. Karkin, N., Janssen, M.: Evaluating websites from a public value perspective: a review of turkish local government websites. *Int. J. Inf. Manage.* **34**(3), 351–363 (2013)
3. Yang, K., Rho, S.Y.: E-Government for better performance: promises, realities, and challenges. *Int. J. Public Adm.* **30**(11), 1197–1217 (2007)
4. Huang, C.J., Chao, M.H.: Managing WWW in public administration: uses and misuses. *Gov. Inf. Quart.* **18**, 357–373 (2001)
5. Thomas, J.C., Streib, G.: The new face of government: citizen-initiated contacts in the era of e-government. *J. Public Adm. Res. Theor.* **13**(1), 83–102 (2003)
6. Thompson, D.V., Rust, R.T., Rhoda, J.: The business value of e-government to small firms. *Int. J. Serv. Ind. Manag.* **16**(3), 385–407 (2005)
7. Reddick, C.G.: Citizen interaction with e-government: from the streets to servers? *Gov. Inf. Quart.* **22**(1), 38–57 (2005)
8. Donker-Kuijjer, M.W., de Jong, M., Lentz, L.: Usable guidelines for usable websites? an analysis of five e-government heuristics. *Gov. Inf. Quart.* **27**(3), 254–263 (2010)

9. Youngblood, N.E., Mackiewicz, J.: A usability analysis of municipal government website home pages in alabama. *Gov. Inf. Quart.* **29**(4), 582–588 (2012)
10. Tolbert, C.J., Mossberger, K.: The effects of e-government on trust and confidence in government. *Public Adm. Rev.* **66**(3), 354–369 (2006)
11. İskender G.: Turkish e-Government Transformation: A Country Analysis Based on Efforts, Problems and Solutions. Unpublished master's thesis. Massachusetts Institute of Technology, Cambridge, Massachusetts, USA (2012)
12. Akıncı, D., Çağıltay, K.: E-devlet Web Sitelerini Kullanmak ya da Kullanmamak: Vatandaş Açısından Kullanılabilirlik Sorunları ve Önerileri (2004). [www.metu.edu.tr/~kursat/TBD04-edevlet-websiteleri.doc](http://www.metu.edu.tr/~kursat/TBD04-edevlet-websiteleri.doc). Accessed 24 July 2014
13. Sayıştay: Performans Denetimi Raporu: e-Devlete Geçişte Kamu Kurumları İnternet Siteleri. T.C. Sayıştay Başkanlığı, Ankara (2006)
14. İnal, Y., Özen Çınar, N., Çağıltay, K., Güngör, M.K.: Kamu İnternet Sitelerinde Yer Alan Arama Alanlarının Kullanılabilirliğinin Belirlenmesi. 8. Ulusal Yazılım Mühendisliği Sempozyumu, pp. 79–88, Güzelyurt, KKTC (2014)
15. Akman, İ., Yazıcı, A., Mishra, A., Arifoğlu, A.: E-Government: a global view and an empirical evaluation of some attributes of citizens. *Gov. Inf. Quart.* **22**(2), 239–257 (2005)
16. Bertot, J.C., Jaeger, P.T.: User-centered e-government: challenges and benefits for government web sites. *Gov. Inf. Quart.* **23**(2), 163–168 (2006)
17. Nielsen, J.: 113 Design Guidelines for Homepage Usability (2001). <http://www.nngroup.com/articles/113-design-guidelines-homepage-usability/>. Accessed 1 MARCH 2015
18. Rosenfeld, L., Morville, P.: *Information Architecture for the World Wide Web*, 3rd edn. Oreilly, California (2006)
19. Lavie, T., Tractinsky, N.: Assessing dimensions of perceived visual aesthetics of web sites. *Int. J. Hum. Comput. Stud.* **60**(3), 269–298 (2004)
20. Nielsen, J.: How Users Read on the Web (1997). <http://www.nngroup.com/articles/how-users-read-on-the-web/>. Accessed 31 July 2014
21. Benway, J.P., Lane, D.M.: *Banner Blindness: Web Searchers Often Miss “obvious” Links*, Internet Technical Group. Rice University (1998)
22. Hsieh, Y.C., Chen, K.H.: How different information types affect viewer's attention on internet advertising. *Comput. Hum. Behav.* **27**(2), 935–945 (2011)
23. Benway, J.P.: *Banner Blindness: What Searching Users Notice and Do Not Notice on the World Wide Web*. Ph.D. thesis. Rice University, Houston, Texas (1999)
24. Nielsen, J.: *Banner Blindness: Old and New Findings* (2007). <http://www.nngroup.com/articles/banner-blindness-old-and-new-findings/>. Accessed 31 July 2014
25. Burke, M., Hornof, A., Nilsen, E., Gorman, N.: High-cost banner blindness: ads increase perceived workload, hinder visual search, and are forgotten. *ACM Trans. Comput.-Hum. Interact.* **12**(4), 423–445 (2005)
26. Çalışır, F., Karaali, D.: The impacts of banner location, banner content and navigation style on banner recognition. *Comput. Hum. Behav.* **24**(2), 535–543 (2008)
27. Hervet, G., Guerard, C., Tremblay, S., Chtourou, M.-S.: Is banner blindness genuine? eye tracking internet text advertising. *Appl. Cogn. Psychol.* **25**(5), 708–716 (2011)
28. Flores, W., Chen, V., Ross, W.H.: The effect of variations in banner ad, type of product, website context, and language of advertising on internet users' attitudes. *Comput. Hum. Behav.* **31**, 37–47 (2014)
29. Dahal S.: *Eyes Don't Lie: Understanding Users' First Impressions on Website Design Using Eye Tracking*. Master thesis. Missouri University of Science and Technology, Missouri, USA (2011)