

Usability in Local E-Government: Analysis of Turkish Metropolitan Municipality Facebook Pages

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ABSTRACT

Social media use is on the rise throughout the world. Influenced by this trend, governments of all levels and sizes are establishing their social media (like Facebook) presence due to the communication and interaction capabilities that such a presence brings. This study examines and explains the social media presence of Turkish local governments from a usability perspective. Usability studies provide governments with important empirical data about the citizens'/users' view/perception of the efficiency, effectiveness and satisfaction of web-based content. Consequently, there is a need for usability testing of government social media services. The analysis of local government social media sites through scientific usability methods, such as expert review, guidelines and eye-tracking, reveals the strengths and weaknesses of government social media services in terms of usability. The study concludes with specific recommendations for improvement of government social media presence, which are applicable, to a great extent, to governments of all levels and sizes in Turkey and elsewhere.

KEYWORDS: Ankara, E-Government, Facebook, Istanbul, Izmir, Local Government, Social Media, Turkey, Usability

1. INTRODUCTION

Social media applications are increasingly taking root not only in our personal, but also professional lives. In addition to the private spheres of individuals and groups, public sphere of both public and private sector organizations are adopting social media technologies for such diverse purposes as keeping up with the times, profit maximization, public relations, and promotion of more efficient and participatory government. For example, Mergel (2013) found that the main factors that influence the adoption of social media use in government are, (i) "information about best practices in their informal network of peers, (ii) passive observations of perceived best practices in the public and private sector, and (iii) "market-driven" citizen behavior." Within this broader context, government agencies at all levels throughout the world experiment with various social media applications in order to figure out the best ways to utilize these technologies for their e-government applications (Bertot, Jaeger and Hansen, 2012; Mergel and Greeves, 2013).

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The main questions in this domain emerge as: First, from an administrative perspective to e-government, how can social media applications be used for efficient government information and service delivery? For example, regarding this first question, Picazo-Vela, Gutiérrez-Martínez, and Luna-Reyes (2012: 509) found out that public servants in Mexico worry about inadequate resources and losing control of information while providing information and services via social media.

Second, from a political perspective to e-government, how can social media applications be better utilized for the promotion of participation, transparency, and accountability in government? This article aims to answer both questions from a usability perspective, as both the potential administrative and political gains of merging e-government with social media partially depends on the usability of these applications, among other factors. Regarding the second question, for example, the evidence is mixed. Bonson, Torres, Royo and Flores (2012) studied a sample of 75 EU local governments so as to understand the degree of corporate transparency in these units. They found that while transparency is increasing, dialogue and e-participation is slow to pick up (p. 130). Bertot, Jaeger and Grimes (2010: 269) argue that despite the potential for social and administrative transformation, the change caused by social media will be most likely limited and incremental due to cultural, social and technology access factors.

Usability is about testing and employing standard usability principles and techniques, in this context, related to the management of the quality of users' experiences in government information systems, such as websites and governments' social media presence. Usability studies provide governments with important empirical data about the users' perceptions about the efficiency and effectiveness of, and satisfaction from web-based content (Nielsen, 1993).

The importance of usability testing and evaluation for e-government studies is becoming increasingly evident, and usability analysis of government web sites is taking hold. However, the awareness about the importance of usability analysis for the social media pages of government agencies has only been recently recognized and it is a new venue for e-government research. For example, Picazo-Vela, Gutiérrez-Martínez, and Luna-Reyes (2012: 504), after brainstorming with 250 Mexican local government officials about the risks and benefits of social media use in government, emphasize the lack of a long-term strategy of using social media in government and the risks of employing a trial and error approach, in spite of having scarce organizational resources. Mergel & Bretschneider (2013) identified a similar pattern of trial and error in government social media adoption, namely a first stage of informal experimentation, a second stage of chaotic norm and regulation-drafting and a final stage of formalization of rules and practices.

This article presents one of the first studies that analyze the usability of governments' social media presence, by using multiple methods, such as eye-tracking technology, a pre-test perception and expectation analysis, and post-test in-depth interviews. The study evaluates the usability of three largest Turkish metropolitan municipalities' (Istanbul, Ankara, and Izmir, which in total host more than a quarter of the total population of Turkey) Facebook pages and provides suggestions for the better design of government social media pages in a way that maximizes the public value-added of such undertakings. To this end, in this article, first, the literature on government use of social media and the application of usability analysis in e-government studies are discussed. Then, findings of the usability analysis of the three largest Turkish metropolitan municipalities' Facebook pages are presented. Finally, the significance and the generalizability of these findings are discussed.

2. LITERATURE REVIEW: SOCIAL MEDIA, USABILITY AND E-GOVERNMENT

Social media is the general name given to a wide array of technology-based platforms, which provide different types of fora for people to interact with each other. Keim and Noji (2011, 47) define social media as the "...collaborative, decentralized and community-driven...forms of information and communication technology disseminated through social interaction". Although the social media category includes different technological platforms, such as free encyclopedias, social bookmarking

sites, weblogs, collaborative online games, platforms to share movies, pictures and music; some of the most popular examples of contemporary social media platforms are Facebook, Twitter, and YouTube.

Although social media platforms are initially designed to socialize via technology, as the name suggests, they quickly evolved into meeting other needs of individuals and groups. For example, social media applications are tools for public relations, as they can reach out to mass audiences for administrative, economic and political purposes. They make it much easier, faster and cheaper than before to post content such as text, photos, videos, share personal experiences; and organize online and offline meetings and fundraisers for political campaigns or disaster relief. Foreexample, Gao, Barbier and Goolsby (2011, 10) report that the US Red Cross received a total of 8 million US\$ of donations after the 2010 Haiti Earthquake via SMS, a fundraising activity organized through social media platforms.

Within this context, social media platforms are becoming an increasingly important part of e-government, which in itself is an essential element of government reform efforts worldwide. Social media provides a whole array of opportunities for enriching, widening and deepening the interactions within the political and administrative systems. For example, they can be used for promoting transparency and accountability in a way to curb corruption (Bertot, Jaeger, Munson and Glaisyer, 2009; Bertot, Jaeger and Grimes, 2010). In the same vein, they may be instrumental in promoting participation in public policies.

Davidson (2011), in his study of the US Open Government Initiatives of the Obama Administration, argues that social media is a part of the Open Government reform initiative that would create a small impact on how the government is run in the short-run; but a huge impact on the long-run. The emerging model of social media-enabled e-government, as opposed to the web site-based model of e-government is summarized in Table 1.

Together with the promises of the application of social media in government, however, come the risks: Hellman (2011) for example, list the issues of usability, accessibility, trust and credibility, determination of proper roles for public employees as social media users, document safety and public procurement problems, as potential challenges. Usability, the focus of this study, emerges as one of such critically important issues in e-government studies, as it is considered as a *sine qua non* for the provision of high quality e-government information and services (Garcia, Maciel and Pinto, 2005, 201; Papadomichelaki, Magoutas, Halaris, Apostolou, and Mentzas, 2006; Estes, Schade and Nielsen, 2009).

Being usable is defined as “the absence of frustration” on the part of the user. Usability analyses of many goods and services are increasingly being conducted for informing design, eliminating design problems and designer/user frustration, and when applicable, improving profitability (Rubin and Chisnell, 2008: 4, 21-22). Usability, as applied to the e-government realm, is an important dimension of the design and management of government information systems, such as government web sites. Web site usability is itself a multi-dimensional concept. Under this umbrella concept, one may find

Table 1. Comparison of the web site and social media models of E-Government

Categories	Web Site Model	Social Media Model
People-Content Relationship	Content consumers	Content consumers and producers
Information	Centralized	Decentralized
Information Exchange Direction	Unidirectional (one to many)	-Multi-directional -Many to many -Peer to peer
Design	Professional designer-driven	Community-driven
Viewers/Users	Mostly Passive	Collaborative

issues of accessibility, online services, user-help, information architecture, legitimacy, navigation, etc. (Baker, 2009, 84-87).

Usability of e-government systems so far has been mostly limited to the analysis of government websites at various levels of government. For example, Isa, Suhami, Safie and Semsuddin (2011) analyzed the usability of 155 Malaysian government websites with automatic evaluation tools, identified several usability problems, and provided a number of suggestions for enhancing usability. Selden and Orenstein (2011) analyzed the US state governments' e-recruitment websites from a usability perspective. Asiimwe and Lim (2010) examined the Ugandan government websites from a usability perspective and proposed several changes to make these websites better conform to international website design and usability standards. Youngblood and Mackiewicz (2012) compared the usability scores of municipal government websites in the US state of Alabama to see if there are any correlations between these usability scores and other variables, such as the population and the per capita income of the municipalities. No such correlation was found, but they maintained that usability problems erode the web credibility of governments. Finally, Donker-Kuijjer, de Jong and Lentz (2010) analyzed five e-government heuristics so as to assess their potential value as useful guidelines for usable website design and evaluation.

Usability of government information systems is critical especially from a digital divide perspective, and thus for disadvantaged groups, such as the elderly, the poor, people with disabilities, etc. Enhanced usability is one of the factors that may promote increasing technology access, use and benefit for these groups. For example, Becker (2005) emphasizes the importance of usability of e-government applications for older adults in the US, who constitute a growing segment of online users of government information and services. Jaeger (2006) performed a similar analysis of e-government website accessibility and usability for persons with disabilities in the US. In another example, this time from Portugal, Aleixo, Nunes and Isaias (2012) discussed local government website usability issues as they relate to concerns about digital exclusion based on the lack of digital competence, information literacy and accessibility standards. Finally, Ide-Smith (2011) argued that usability problems go hand in hand with digital exclusion issues in the UK local e-government applications.

Many usability studies employ the content-analysis methodology to assess the performance of government information systems from a usability perspective. Baker (2009) supports such a choice, especially when Guttman-type scales are utilized, wherever possible. He contends that the use of content-analysis methodology advances e-government performance via creating enhanced usability benchmarks. This study, however, uses content analysis methodology only for constructing the categories for usability analysis. For data collection and analysis, a combination of eye-tracking technology, a pre-test perception and expectation analysis, and post-test in-depth interviews were used for purposes of triangulation.

There are a number of usability methods in order to evaluate the usability of products varying from end user usability tests to desirability studies used to measure aesthetic appeal (Nielsen, 2008). In this study, the two most widely used methods for evaluating the usability of interfaces which are "end user usability tests" and "survey methods" were used.

End user usability test is a method for collecting data from reliable users by asking them to use the product and meanwhile monitoring their actions when they are performing given tasks (Rubin, 1994). Real users must be subjected in usability tests who are the target group in that specific product (Dumas & Redis, 1993). Furthermore, the participants must perform real tasks during tests. Nielsen (2012) states that the user-based usability testing method is the most basic and useful method since, with the help of this method, it is possible to directly collect data from real users about how they use the system. There are six steps that should be followed in order to perform a usability test, which are listed as: planning the test, defining test tasks, recruiting test users, conducting tests with users, analyzing the results, and writing the report. Nielsen (1998) reports that 39 hours are required for completing these steps. End user usability tests may be conducted in usability laboratory or in the field. In usability laboratories, users try to accomplish the given tasks on the interface being tested

and usability specialists observe what users do while doing tasks and note the steps and behaviors of users; concurrently comments of the users are recorded while performing the tasks. Nielsen (2005) states, despite the fact that a usability laboratory is an artificial environment, users are strongly engaged in the given tasks and get into the scenario quickly as if they perform the tasks at their home, or in their office and as a result, realistic data are captured.

Moreover, survey method is another beneficial research method for collecting quantitative data about users' opinions regarding software or website being tested in usability studies. Because of the fact that data is collected directly from users, survey method reveals users' preferences, satisfaction level and possible anxieties (Holzinger, 2005). Another surpassing feature of survey method is the ability to collect data from a large number of users (Nielsen, 2004).

3. CONTEXT: INTERNET AND SOCIAL MEDIA USE IN TURKEY

In Turkey, the first Internet connection was established in 1993 (Wolcott and Cagiltay, 2001). Since then, both Internet connection rates and the number of e-government applications have risen. Although both computer and Internet penetration are barely somewhere between 50 and 60% of the population, as presented in Figure 1, social media uptake has been much more rapid, as presented in Table 2.

Social media tools, such as Facebook, Twitter, Google+, Instagram and Linked In are very popular in Turkey, as can be seen in Table 2. With 47% of the population as active social media users, the social media penetration rates are much higher than the global social media penetration levels.

Within this context, usability analysis of e-government applications has become a new area of interest in the academic circles. For example, Durmus and Cagiltay (2012) analyzed and ranked the web sites of 33 Turkish government agencies from a usability perspective by using content analysis and in-depth interviews with government web site designers. Their findings indicate that there is considerable variation among government websites in terms of usability and there are widespread usability problems in many of these websites. Usability analysis of Turkish government social

Figure 1. Basic indicators of household internet and computer use, 2007-2012. Source: Turkish Statistical Institute (2014). Survey of Household Technology Use, retrieved from <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=16198>, January 30, 2015.

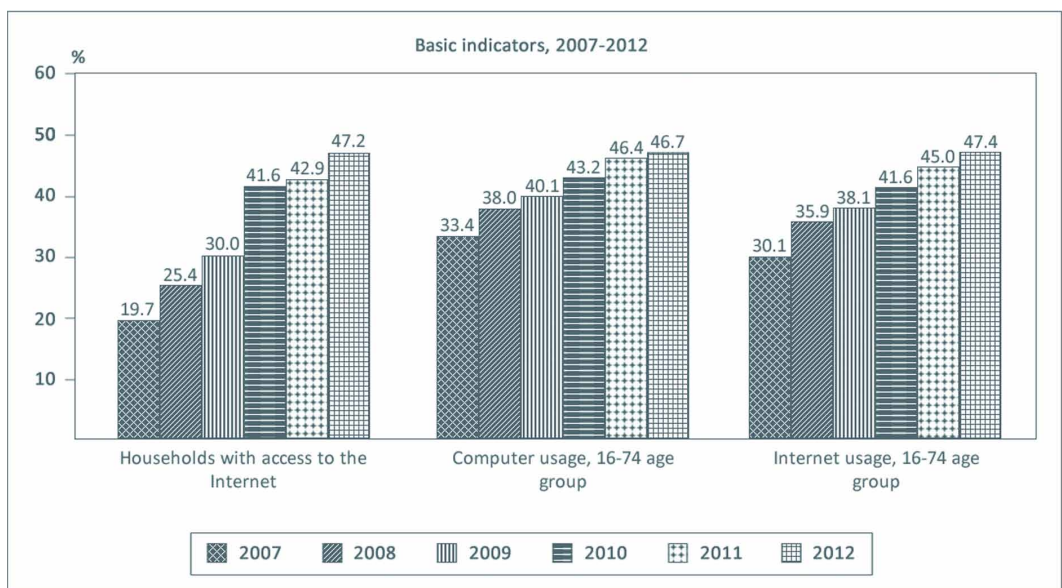


Table 2. Numbers and percentages of social media users in turkey and in the world

Social Media	Total Users in the World (Million)	Penetration Rate (%)	Total Users in Turkey (Million)	Penetration Rate (%)
Facebook	974	14	32	41
Twitter	500	7.2	18.7	25
YouTube	500	7.2	24.4	33

Source: New Media Trends Watch, Retrieved from <http://www.newmediatrendwatch.com/markets-by-country/10-europe/87-turkey>

media pages, however, is an understudied subset of e-government studies. In fact, to the best of our knowledge, this study is a first.

4. METHODOLOGY

In order to test the usability of municipality Facebook pages, the three largest metropolitan municipalities in Turkey, with a total population of approximately 22.5 million people corresponding to 27.1% of the total population of Turkey (around 75 million people as of 2012) were selected for analysis (see Table 3).

As it is explained in detail below, 13 participants tested the usability of these three metropolitan municipalities' Facebook pages, with the help of eye-tracking technology, supported by observation of the participants, a pre-test questionnaire, which was used to assess participants' previous experience with and expectations from the municipalities' Facebook pages, and at the end of the tests, semi-structured interviews for collecting qualitative data about the participants' perceptions.

4.1. Participants

Considering the fact that university students are avid adopters and users of social media, especially Facebook, (Hargittai, 2007; Jones & Fox, 2009), and that the use of e-government services by Turkish people is increasing as the level of education is increasing (Akman, Yazici, Mishra, & Arifoglu, 2005), a convenience sample of university students was selected for the present study. The participants were 17 university students (aged 22-29; 6 female and 11 male). 14 of the participants were undergraduate students and the remaining three participants were Master's students. Of all the 17 participants, 4 participants' recordings were eliminated because of the accuracy problems in the eye tracking data, leading to a number of 13 participants in the data analysis. According to Nielsen (1994), more than 75% of the usability problems can be found with five participants. As this number approaches 15, almost all of the usability problems can be identified (Nielsen and Landauer, 1993, 208). Therefore, 13 participants are sufficient to identify the major usability problems on the municipalities' Facebook pages. As for the participants' experience with Facebook, all of them can be considered to be active Facebook users. 53% of them use Facebook several times a day. However, they have never used municipalities' pages on Facebook.

Table 3. Population of the biggest three Turkish metropolitan municipalities

City			Total Population of Turkey
Istanbul	Ankara	Izmir	
13,624,240 (18.2%)	4,890,893 (6.6%)	3,965,232 (5.3%)	74,724,269

Source: Turkish Statistical Institute (2011). Results of the Address-Based Population Registration System as of 12.31.2011, Retrieved from <http://tuikapp.tuik.gov.tr/>

4.2. Task Analysis

For this study, the municipalities of the largest three cities in Turkey, namely Istanbul, Ankara, and Izmir, were chosen to be evaluated in terms of the usability of their Facebook pages. Initially, two usability practitioners working in the lab, where this study was conducted examined these municipalities' Facebook pages by following standard usability task analysis methodologies in order to identify the most critical tasks (Hackos and Redish, 1998). The initial task analysis resulted in a list of 11 tasks covering the most crucial operations that could be performed on the Facebook pages of these municipalities. Afterwards, the list of 11 tasks was reviewed by two academicians experienced in e-government research and usability research, respectively. Based on their feedback, the tasks were revised, and a list of six major tasks to be performed for each municipality's page was devised. The same tasks were assigned to each municipality in random orders so that the participants would not get used to the order of the tasks.

4.3. Data Collection

All tests were conducted in the Human-Computer Interaction Application and Research Laboratory at Middle East Technical University. The Tobii T120 eye tracker, which records gaze locations at the rate of 120 MHz, was used to capture eye movements of the participants. A usability test was prepared using Tobii Studio. The test was composed of the final list of six tasks and prompted the participants to perform them one by one. Tobii Studio software was used to analyze the results. In addition to the eye tracker data, the participants were observed by two usability practitioners while they were working on the tasks. The practitioners took notes regarding the major problems the participants experienced, and their reactions to the tasks.

Having signed a consent form, all participants completed a pre-questionnaire, which was used to assess participants' previous experience with the municipalities' Facebook pages and to figure out their expectations from these pages. Later, the participants were informed about the test and the eye tracking procedure. A brief explanation of how the participants were expected to complete the tasks was given to the participants. They were encouraged to take as much as time they needed to do the tasks. During the tests, think-aloud protocol was employed, and the participants' performance was observed and recorded by experimenters. At the end of the tests, qualitative data about the participants' perceptions were collected through semi-structured interviews. The participants were asked what problems they experienced while completing the assigned tasks on each municipality's Facebook page, in what ways these problems could be mitigated, and what they wished to see more of on the municipalities' Facebook pages.

5. RESULTS

5.1. Pre-Questionnaire Data Analysis

The pre-questionnaire used for this study was aimed at learning about what the participants expected to find on the municipalities' Facebook page. For this purpose, a 5-point Likert scale was used and the answers were grouped into three categories: positive, neutral and negative attitudes. The results of the pre-questionnaire are summarized in Table 4.

There were 8 items which were expected to be on the municipalities' Facebook page by all the participants (100%). These were Item 3, Item 4, Item 5, Item 9, Item 10, Item 11 and Item 17. As can be seen from the task list, the majority of the tasks that the participants were asked to complete are among the tasks that all of the participants wanted to find on the municipalities' Facebook page.

5.2. Performance Test Data Analysis

In order to analyze the participants' performance in the tasks, step count and success rate were used. Since the participants tended to expect that every mouse click would make a change on the page,

Table 4. The summary of the results of the pre-questionnaire

Expectations	Positive	Neutral	Negative
1. Information about the Mayor	70%	18%	12%
2. Information about the political party with which the Mayor is affiliated and/or about the leader of that party	47%	18%	36%
3. The municipality's mission and vision	100%		
4. The municipality's contact information (phone, e-mail, fax, etc.)	100%		
5. Direct link to the official website of the municipality	100%		
6. The municipality's address	94%	6%	
7. Direct link to the municipality's districts	82%	18%	
8. The municipality's profile on other social media platforms (e.g. Twitter)	88%	6%	6%
9. News about the municipality	100%		
10. Information about the activities organized by the municipality	100%		
11. Announcements for the citizens	100%		
12. Access to the municipalities' annual reports	59%	29%	12%
13. Complaints and suggestions section	100%		
14. Information about the municipality's budget	64%	12%	24%
15. Information about the municipal council's meetings and the minutes of these meetings	47%	29%	24%
16. The municipalities' videos and photos	88%	12%	
17. Information about the services provided by the municipality	100%		
18. Direct link to municipality's payment system	70%	12%	18%
19. Quick links (e.g. pharmacies)	76%	12%	12%
20. Information about public transportation	88%	6%	6%
21. Complaint form	88%	6%	6%

mouse click count was evaluated as the number of steps which the participants performed so as to complete the assigned task. Success rate was calculated as the ratio of the number of participants who completed the task to the number of the participants who did not complete the task. Table 5 shows the average step count and the success rate for each task.

Upon examining the table, it is obvious that the Facebook page of Izmir Metropolitan Municipality is the most problematic one. The average step count for completing the tasks on this page is generally higher than other two pages. Also, the success rate for the tasks is lower on Izmir Metropolitan Municipality's Facebook page when compared to the other two pages.

Based on the table, Task 3, finding information about the Mayor on the Municipality's Facebook page, was the only one that none of the participants completed. The Facebook pages of the three metropolitan municipalities did not have any information about the Mayor. In the pre-questionnaire, however, 70% of the participants indicated that they wanted to have this information on the municipality's Facebook page.

5.3. Eye Tracker Data Analysis

During the study, fixation counts, visit durations (sec) and mouse click numbers data of the participants on each Metropolitan Municipality's Facebook page were collected by eye tracker and examined separately. Fixation count metric gives the number of times the participant fixates on the related page

Table 5. The result of the performance test analysis

Tasks	Izmir Metropolitan Municipality		Istanbul Metropolitan Municipality		Ankara Metropolitan Municipality	
	Step Count	Success Rate (%)	Step Count	Success Rate (%)	Step Count	Success Rate (%)
Task1 - Find Izmir/Ankara / Istanbul Metropolitan Municipality's page on Facebook.	5.62	84.62	5.54	100	3.77	100
Task2 - Suppose that you want to go to the Municipality. Find the address of the Municipality building on the Municipality's Facebook page.	8.23	0	1.85	100	2.46	100
Task3 - Find information about the Mayor on the Municipality's Facebook page.	11.08	0	6.92	0	11.54	0
Task4 - Find the URL for the Municipality's official website on the Municipality's Facebook page.	6.23	23.08	2.54	100	1.33	100
Task5 - Find the most recent news about the Municipality on the Municipality's Facebook page.	4.92	53.85	7.11	84.62	4.77	100
Task6 - Find the most recent activity organized by the Municipality on the Municipality's Facebook page.	10.17	23.08	5	69.23	4.15	92.31
Average	7.71	30.77	4.83	75.64	4.67	82.05

and it is negatively correlated with search efficiency; that is, a large numbers of fixation count may indicate a poor or complex interface design that decreases the efficiency of search. Also, visit duration metric, which measures the duration of all visits during the assigned task within related page, was used to define the total time the participants spent in order to perform each task, as seen in Table 6.

According to the data collected by the eye tracker, in order to complete the assigned tasks, the participants spent more time on Izmir Metropolitan Municipality’s Facebook page than they did on the other two pages. Visit duration metric indicates that participants spent twice as much time on Izmir Metropolitan Municipality’s Facebook page as they spent on the other two pages. The reason for this long duration is that Izmir Metropolitan Municipality’s Facebook page contains only a limited portion of the information participants are asked to access. Besides, while the average number of fixations has its maximum value for Izmir Metropolitan Municipality’s Facebook page, this value is also high in Istanbul Metropolitan Municipality’s Facebook page. It can be interpreted that the participants searched on the pages while performing the assigned tasks. Higher fixation count value can be regarded as less search efficiency on the page. Although Facebook has its own standard design for all three Metropolitan Municipality’s page, each one has the opportunity to organize some part of its Facebook page. By organizing some part of their Facebook pages, municipalities affect their users’ performance. As shown in Table 6, Ankara Metropolitan Municipality’s page has the least fixation counts. As a result, it can be said that Ankara Metropolitan Municipality’s Facebook page is the best in terms of search efficiency perhaps due to its Facebook page’s organization.

When each task value is analyzed, it can be seen that the participants had the most difficulty in the third task, which is finding information about the Mayor on the Municipality’s Facebook page. In this task, participants spent 52.72 seconds in average but no one could access the information. The

Table 6. Fixation counts and visit durations for 13 participants in Izmir/Ankara/Istanbul Metropolitan Municipality’s Facebook pages

Tasks	Izmir Metropolitan Municipality		Istanbul Metropolitan Municipality		Ankara Metropolitan Municipality	
	Visit Duration	Fixation Counts	Visit Duration	Fixation Counts	Visit Duration	Fixation Counts
Task1 - Find Izmir/Ankara / Istanbul Metropolitan Municipality’s page on Facebook.	42.77	101	41.24	113.38	30.81	77.38
Task2 - Suppose that you want to go to the Municipality. Find the address of the Municipality building on the Municipality’s Facebook page.	66.71	204	11.61	37.69	17.7	43.92
Task3 - Find information about the Mayor on the Municipality’s Facebook page.	68.28	209	32.95	168.85	56.93	163.77
Task4 - Find the URL for the Municipality’s official website on the Municipality’s Facebook page.	50.01	152	17.23	56.92	6.66	15.85
Task5 - Find the most recent news about the Municipality on the Municipality’s Facebook page.	60.99	182	26.44	125.08	35.55	105.31
Task6 - Find the most recent activity organized by the Municipality on the Municipality’s Facebook page.	60.79	190	27.55	111.69	31.19	92.00
Average	58.26	173.00	26.17	102.27	29.81	83.04

higher number of task completion time means that the participants expect to find the asked information on the Facebook page of the Municipalities; therefore, they keep searching for the asked information on the pages. They even examine the same part of the pages over and over again.

It was seen from the hotspot data, demonstrated in Figure 2 that the participants focused on some specific areas on the Facebook page of the Ankara Metropolitan Municipality. These areas, including about, photos, activities, etc., are placed right under the cover picture. The owner of the Facebook page has the opportunity to create new areas on the page. This study reveals that users tend to search for information about municipality firstly from these areas. If they cannot find any information, they try to reach information by searching other areas of the page like timeline.

Additionally, it was seen from the hotspot data, shown in Figure 3 that the participants focused on a much wider area on Izmir Metropolitan Municipality's Facebook page. When these data are interpreted by comparing them with other results, it can be concluded that the users searched a much wider area on the Facebook page of Izmir Metropolitan Municipality than the other two cities' pages because it has less information and it does not provide categorized boxes for such areas as photos, activities, etc.

Figure 2. Hotspot data for Ankara Metropolitan Municipality's page



It is shown in Figure 4 that the hotspot data for Istanbul Metropolitan Municipality's Facebook page is similar with that of Izmir. Users have focused distributed areas on the page since they have tried to find related area.

These three figures show that the most focused area on Facebook pages of the municipalities is the "about" section. Thus, it is important to present necessary information about the municipalities in this area of the page. This section might be used to present the municipality's contact information, address, mission, vision and information about the Mayor, etc.

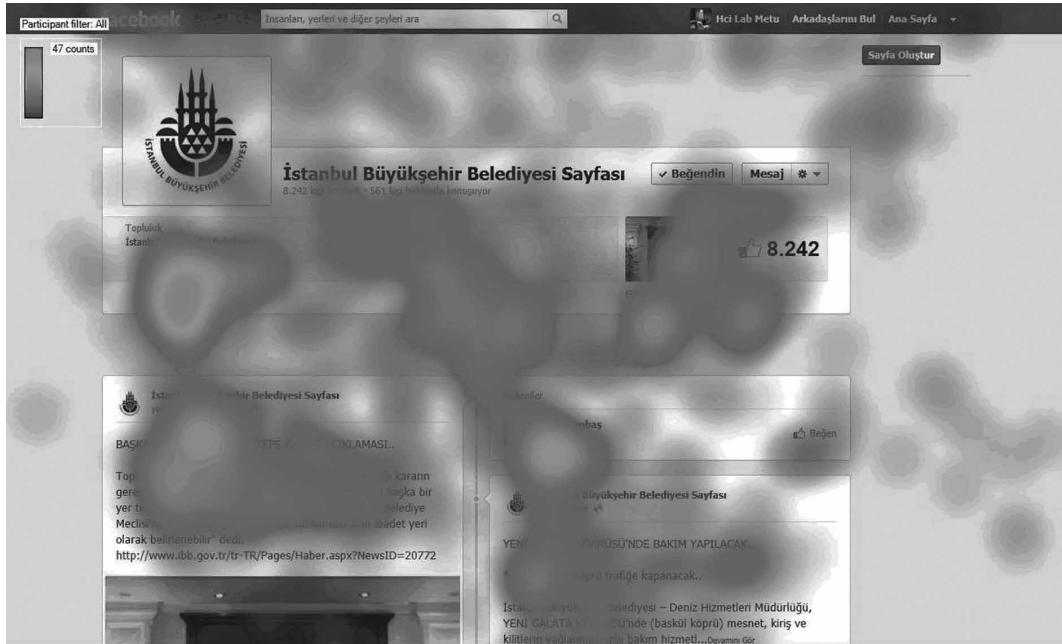
5.4. Semi-Structured Interviews Data Analysis

After each test, the participants' perceptions and opinions about the Facebook pages of the municipalities were collected through semi-structured interviews. The participants mainly pointed out to the inadequacy of the information available on the municipalities' Facebook pages. The participants suggested that the Facebook pages of the municipalities should contain general information about the municipalities such as address, information about the mayor, contact information, link to the official municipality website, etc. In addition, the participants stated that activities and news should be grouped and placed under the cover photo so that they could easily notice and find them. Furthermore, the participants asserted that the municipalities should actively use Facebook to inform the citizens about the news in the city. For instance, one participant stated that he should have the chance to learn about a road construction the municipality is working on so that he can change his return route to his home. Thus, it can be inferred that the participants expected the municipalities to use Facebook as a means of communicating with the citizens.

Figure 3. Hotspot data for Izmir Metropolitan Municipality's page



Figure 4. Hotspot data for İstanbul Metropolitan Municipality's page



5.5. Suggestions

Both the semi-structured interviews and expert evaluations revealed major problems with the municipalities' Facebook pages, pointing out a variety of improvements on the pages. It is possible to give some design suggestions according to problems that users have experienced.

Firstly, pages should have the exact name of the municipality without the abbreviation in order for users to easily locate the page they are looking for. The avoidance of abbreviations will decrease the cognitive load on users because they do not need to decode information while using the sites.

Also, pages should be defined in the correct category; that is, they should be categorized as a government organization on Facebook, or as the "official" Facebook sites of the organization in question, since there are unofficial pages with the same name created by individual users who had no official link with the municipality in question. In order to differentiate the municipalities' official Facebook pages from the unofficial ones, the profile picture for the page can be chosen as the municipality's official logo.

Since the users tend to assess the credibility of the pages based on the number of people who have liked the pages, municipalities might find it useful to advertise their Facebook page and thus increase the number of likes they have.

The municipalities should effectively utilize the application (app) boxes available on the pages so as to categorize the information they would like to share with the citizens. These boxes might include news about the municipality, events organized by the municipality, and so on. Also, there can be a separate section for the Mayor, about whom none of the participants in the tests could find anything on the three metropolitan municipalities' Facebook pages.

During the test, it was observed that the participants tended to check the "about" section first when trying to find information about the municipality. It looks like this behavior has been developed by all Facebook users while using it in their daily life. Therefore, the about section on the pages should present all the essential information about the municipality, including address, contact information, and the URL of the municipalities' official website.

In order to give the citizens the chance to communicate with the municipality more easily, the pages might provide a contact form through which the citizens can ask questions, and make complaints and suggestions about the services provided by the municipality.

Finally, the cover page choice is also important for the municipalities' Facebook page. The cover photo should not distract the user. It has been seen that users focused on the cover photo if an inappropriate cover photo is used. As seen in Figure 5, in Izmir Metropolitan Municipality's Facebook page, participants first focused on cover page although it is not related with the task assigned to them.

6. CONCLUSION

This study examines the Facebook pages of the three largest metropolitan municipalities in Turkey (Istanbul, Ankara and Izmir) from a usability perspective. More than a quarter (27.1%) of the population of Turkey (22.5 million people out of a total of 75 million) lives within the borders of these three metropolitan municipalities.

Review of the relevant literature shows that usability analyses in the domain of e-government so far has two dominant characteristics: First, most of the analyses were performed by employing content analysis. Second, most usability analyses were performed on government websites. This article departs from the norm on both accounts as it examines and explains usability issues in government social media pages instead of websites, and as it employs a multi-method strategy that includes

Figure 5. Heatmap of participants focusing on cover page



eye-tracking technology use, a pre-test perception and expectation analysis, and post-test in-depth interviews, for triangulation purposes.

The findings of the study suggest that the potential of social media applications in the case of Facebook cannot be fully exploited by these three Turkish metropolitan municipalities from a usability perspective. Several usability problems were found, the remedies of which were listed above in the results section.

One of the most interesting findings is that there are no online services available on these Facebook pages. What is more surprising is that even basic categories of information that were assumed to be present on the Facebook page by the users in pre-test stage could not be found on the actual pages. One remedy to this situation may be to use successful examples in other countries as benchmarks regarding what kinds of information and services need to be provided by government social media pages.

The findings also show that the links between the social media presence and web presence of the municipalities could not be successfully established. Users could not easily navigate from the municipal Facebook page to the website of the municipality as they should have done. Stronger links between these parallel electronic service delivery systems (web-based, mobile, social-media based government applications) need to be established.

One common theme in all these usability problems identified in this study is that e-government in general, and social media-enabled e-government in particular, seems to be based on the supply of the government agencies, rather than the demand of the users. The outcome of this supply-based e-government approach is the oversupply of unused content, and undersupply of the categories that were expected to be on the government Facebook page in the first place. Studies such as this one may help to bridge this gap between e-government demand and supply, in addition to the use of demand-measurement techniques such as surveys and in-depth interviews with users.

The findings of this study should be interpreted in light of the limitations pertinent to the study. To begin with, while local government services are made available to all citizens, this study employed a convenience sample of university students. Future studies testing the usability of local governments' social media pages are imperative to ascertain the applicability of our findings to a broader population and increase the generalizability of our findings. Moreover, this study sought to test the usability of three largest metropolitan municipalities' Facebook pages. Future studies should seek to replicate this study and investigate the usability of social media services offered by a broader group of local governments.

Future studies may also concentrate more on the measurement of demand for e-government information and services, whether provided via websites or social media applications. Comparative usability analysis of social media-enabled e-government applications in different levels of government (federal, state and local levels in federal systems, and national and local governments in unitary systems) in different countries may shed more light on better use of social media for e-government-related purposes.

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