

How to Improve User Experience in Mobile Social Networking: A User-Centered Study with Turkish Mobile Social Network Site Users^{*}

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Abstract. This study evaluated the hypothesis that design aspects of the user interface of the applications and the capabilities and constraints of different mobile devices could affect mobile user experience in social network sites (SNS). For this purpose a qualitative mobile usability test, based on a multi-method approach, was carried out with a sample of 25 Turkish university students who were experienced mobile SNS users. The tests were conducted with two different smartphones: Iphone and Blackberry. The participants were observed during the task executions and additional data was collected by the “think aloud” procedure, eye-tracking and video recording of the participants. A short debriefing interview was also made to gain a detailed insight into the user experience. The findings revealed significant mobile usability problems caused specifically by the user interface features of the applications and limitations of each device and enable to propose guidelines to improve user experience in mobile SNS.

Keywords: User Experience, Mobile, Social Networking.

1 Introduction

With the evolution of the mobile platform and the rapid adoption of mobile devices such as smart phones, social networks, which began as web-based applications, have migrated onto the mobile platform [1]. As social networking sites (SNS) can easily provide a base for self-expression and positive experiences of social pleasure, they are widely used on both platforms. Although, social networking ranks as the fastest-growing mobile content category with huge numbers of users, user-centered studies contrarily showed that SNS mostly failed to improve user experience in both platforms. The studies point out the need for employing diverse methods of evaluation in further studies to understand the holistic user experience in SNS [2].

The purpose of this study is to explore the Turkish user experience in mobile SNS and generate guidelines to improve mobile usability in SNS. With a young population and a high rank in both mobile device ownership and SNS usage, Turkey is an important case for user-centered studies on mobile usability in social networking.

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This study, which is part of a larger holistic study on social networking among university students in Turkey, evaluated the hypothesis that the interface design aspects of the applications and characteristics of the mobile devices could affect mobile usability in SNS. For this purpose a qualitative mobile usability test on Facebook, based on a multi-method approach, was carried out with a sample of 25 Turkish university students who are experienced mobile SNS users.

2 Theoretical Background

Social networking sites (SNS) are one of the major phenomena of Web in recent years. Boyd and Ellison [3] define SNS 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. 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 [4].

Mobile social network sites (MSNS) enable groups of friends to be accessed and engaged with from one's mobile phone. Much like social network sites on the Internet [5], [6]; these services may help users to build valuable networks through which to share information and resources [7]. Mobile social networks are the impetus for the creation of an entirely new sub-industry in the wireless sector, thus representing a new aspect of wireless innovation, and increasingly are providing a platform for content and technological innovation in the business environment [1].

Only a limited number of studies investigate how people integrate MSNS in their daily lives. Humphreys [7] examined the social and behavioral norms of Dodgeball, which is a MSNS that sought to facilitate social connection and coordination among friends in urban public spaces. The findings of that study suggested that Dodgeball use could influence the way that informants experience public space and social relations therein.

User experience in mobile platforms appears to be one of the most promising topics of research in the area of human-computer interaction, as people suffer from usability issues caused by the design of mobile interfaces and limitations of the mobile devices.

Forrester report [8] showed that Internet on mobiles suffered from three major problems today: 1) Mobile tailored content (mobile versions of the web sites that are accessed by a browser on a mobile device) is hard to find. 2) Usability is poor: Typing with mobiles is difficult, mobile tailored sites are not properly designed for mobile use, but rather modified slightly from Internet offering. There is also lack of consistency between the sites and within the site. The downloadable applications provide better usability, but the applications are hard to find. 3) Access to Internet on mobiles costs a lot and users do not understand how the cost is generated. Steven Browne's (2007 in [8]) findings overlapped with those of Forrester report. His findings supported the notion that Internet on mobiles suffered from three major barriers in user friendliness: Mobile search is inaccurate, carrier / operator portals are ambiguous and input is cumbersome.

Luke Wroblevski [9] is a pioneer of "MobileFirst" paradigm and believes that designing for mobile first can open up new opportunities for growth and lead to a better overall user experience. In this context, he identified the constraints and

capabilities of mobile devices. According to Wroblevski [9], the constraints are screen size, slow connections and context of use whereas mobile device capabilities are multi-touch input from one or more simultaneous gestures; precise location information from GPS / cell towers / Wi-Fi; user orientation from a digital compass; device positioning from an accelerometer; and integrated audio, video and photo input.

Nielsen was one of the experts, which insistently emphasized the need to improve mobile user experience. Nielsen [10] claimed that -in terms of user experience quality- mobile web could only provide an experience that was observed in desktop web environments back in 1998. Norman and Nielsen [11] also focused on the mobile user experience through devices that provide gestural interfaces. Norman and Nielsen [11] investigated the user experience problems in gestural interfaces by referring to fundamental principles of interaction design and claimed that these interfaces revealed a step backward in usability. They proposed several reasons for this assumption: The lack of established guidelines for gestural control, the misguided insistence by companies to ignore established conventions and to establish ill-conceived new ones and finally the developer community's apparent ignorance of the long history and many findings of HCI research.

3 Methodology

The purpose of this study is to explore the Turkish user experience in mobile SNS and generate guidelines to improve mobile usability in SNS. Below are the two research questions of the study:

Research Question 1: How do design aspects of the graphical user interface of mobile SNS applications affect mobile user experience in SNS?

Research Question 2: How do capabilities and constraints of different mobile devices affect mobile user experience in SNS?

This qualitative study was based on a multi-method approach, which consisted of a background questionnaire, task observation and a structured debriefing interview. The background questionnaire provided information on demographics, mobile web and mobile social networking experience of the participants. The study also employed observation methods of data collection in order to gain better insight in mobile social networking. The tests were conducted with two different smartphones which constituted the most popular platforms in Turkey: Iphone and Blackberry. The most popular SNS in Turkey, which is Facebook, was chosen for the study and two different tasks were designed for the users to perform with Facebook applications peculiar to each device. The users were asked to terminate each task in 6 minutes. First task was to "log in Facebook, update the status and send a message to a friend". The second task was to "upload a specific picture in the gallery, tag it and write a comment on it". All the participants who finished these tasks were asked to "log out". In this context, a sample of 25 Turkish university students who were experienced mobile SNS users were involved in the study. The sample included 13 Iphone users (7 male, 6 female) and 12 Blackberry users (6 female, 6 male).

The tests were conducted in "7th Sense Customer Insights Lab" which is a full-equipped usability laboratory established by Turkcell in İstanbul. The navigation was

directly observed and recorded on a structured observation sheet by the researchers. Besides the observation, additional data was collected through a head-mounted eye-tracker and video recording of the participants. Final structured debriefing interview provided complementary findings.

The analysis framework was derived from the study of Wroblevski [9] and Nielsen and Norman [11]. For the discussion addressing the first research question, the capabilities and constraints of mobile devices in [9] were referred. These were integrated with the fundamental principles of interaction design –that are completely independent of technology- mentioned in Nielsen and Norman’s [11] study. The analysis framework that was derived from these two studies include the following parameters: Visibility and Scalability, Consistency and Standards, Discoverability and Feedback, Reliability, User Diversity, Bandwidth and Speed in Mobile Network Performance, Awareness and Use of the Capabilities in Mobile Phones.

4 Results and Discussion

The findings from the background questionnaire confirmed that participants were experienced users of mobile SNS. At the task-observation stage, it was observed that most of the participants achieved to execute all the tasks. As an exception, most of the Blackberry users failed to “log out”. From 12 participants using Blackberry, the number of participants who failed to execute specific tasks is as follows: Status update (n=3), tagging (n=2), log out (n=10). From 13 participants using Iphone, the number of participants who failed to execute specific tasks is as follows: Status update (n=2), tagging (n=2), log out (n=2). Task execution periods were close for each group. Blackberry users finished the first task in an average of 3,6 min and the second task in average of 5,5 minutes. Iphone users finished the first task in an average of 3,7 min and the second task in average of 4,8 minutes.

4.1 Visibility and Scalability

One of the fundamental principals of interaction design is visibility. It is also called “perceived affordances” or “signifiers” [11]. It was observed that participants tend to compare their experience in the application with their mobile or desktop browser experience and chose to use the app suboptimally. Thus the major complaint was “*I can not see and control all of the functions in one page, I have to find them and it takes too much time. Applications’ logic is different from Facebook on browser*” (Eİ06). Even if the participants could see the buttons, some couldn’t understand the function of the icons, as there were no labels accompanying them. In order to maximize the number of functions in the user interface, the labels were avoided.

User frustration caused by the violation of the visibility principle was also observed when the participants were asked to “log out” from the app. The navigation strategy was based on browser experience. The participants either attempted to scroll down to the bottom of the profile page, which was the typical location of “log out” of the SNS on mobile browser, or they oriented to the header area in the app, as it was the typical location of “log out” on a desktop browser. In Blackberry SNS app the

“log out” function was hidden deep under the “options” button, which could be accessed through the “menu” button. Inevitably, most of the Blackberry users failed to achieve the task of “log out”.

There is a plethora of screen sizes for cell phones [11] and the visibility in the screens of mobile devices is fairly limited when compared to PCs. There simply isn't room for any interface debris or content of questionable value [9]. It was observed that small targets that work well with QWERTY keyboard and navigation ball in Blackberry were inappropriate for fingers on the touch screen of Iphone. Although larger screen of Iphone provided more visibility, it had its own problems with control sizes, which caused accidental activation of actions. In this context, some of the Iphone users were observed to touch things by mistake or make a gesture that unexpectedly initiated a feature.

4.2 Consistency and Standards

Our findings support the notion that “consistency and standards” appear to be the most problematic issues in mobile Facebook application user experience. User experience on Facebook through desktop browsers is fairly stable. In contrast, applications on each mobile device provided completely varying user experiences.

Firstly, most of the participants complained about the lack of functions, which they regularly used on desktop or mobile browsers. In this context lack of chat and games were mentioned as examples. Unfamiliarity with a browser's user interface limited the user's options. Just because of the familiarity with a desktop browser interface, most of the participants preferred to use mobile browsers for accessing to Facebook. Although on mobile devices, applications are easier to use than websites, the obligation to search, understand and learn the core functions on the apps demotivate and led the users towards mobile browsers. Having difficulty in associating the app interface with that of the website, the participants were not able to find the relevant functions for the execution of some tasks.

Tagging a photo seemed to be a major problem on both devices. On Blackberry, the only way to tag a picture is to do it before the upload. Missing that step results in the failure of the participant. However, desktop browser experience enables tagging after the upload and this standard inevitably contradicts with the interaction proposed on Blackberry app. On the other hand, Iphone users also had troubles in tagging a photo since the gestural interface in Iphone Facebook app also violated consistency and standards of desktop browsing experience. Assuming that clicking on the picture will enable tagging, participants tried that gesture to achieve the task. However, despite the fact that some of the Iphone applications enabled to interact with the picture directly and implied the same opportunity for every app, Iphone Facebook app did not support this interaction. This limitation led the users to a random trial-and-error strategy, which included clicking on any button available. The eye tracking data revealed that most of the users looked at the icon at the bottom left corner of the screen which was actually used to tag and like, but they didn't click it until they tried out all other opportunities, because it was very similar to the ‘share/send picture’ icon of the operating system, a twisted arrow in a square (Fig. 1).



Fig. 1. Although the icons at the bottom left corner have different functions they are identical (Left, camera roll of the device; middle, interface of the application; right, eye-tracking screenshot)

The tendency to scroll down to the bottom of the page for finding a logout option was also determined due to the current mobile browser habits. As a final observation, the similarity of desktop and mobile browsers in terms of consistency and standards also seemed to affect user choices for specific actions such as delete.

4.3 Discoverability and Feedback

The true advantage of the Graphical User Interface (GUI) is that every possible action in the interface could be discovered through systematic exploration of the menus [11]. However, our findings showed that this notion could only be useful if it was supported with feedback. Limitation of the “discoverability” led the participants to the adoption of an unstructured navigation based on a trial-and-error strategy, which resulted in errors and abandoning the task.

In addition to that, regardless of the device, most of the participants were not sure about their actions during “photo uploading”, “tagging” and “writing a comment”. They complained about the lack of system feedback while uploading a photo, which resulted mostly in the re-execution of the task. They could only be sure about the procedure when they saw the photo on their wall. After the tagging it was difficult for Iphone users to find the current tags on the picture, as there were no indicators visible. The task of “sending a message to a friend” also revealed the frustration caused by the lack of relevant feedback as the app didn’t provide any notification about the execution of the task. It was clear that the result of an action should be provided as a feedback so that multiple inputs or endless efforts for a “prevented but not indicated” action such as video uploading could be precluded.

4.4 Reliability

A basic foundation of usability is that errors are not the user’s fault; they are the system’s (or designer’s) fault for making it too easy to commit the error [11]. However, lack of “consistency with previous desktop browsing experience”, visibility and feedback also brought reliability of the app into question in mobile social

networking experience. As in the case of “tagging a photo” or “logging out” in BlackBerry Facebook app, by being forced into a random trial-and-error approach rather than an intuitive navigation, the participants lost their sense of controlling the system and did not understand the connection between their actions and results.

4.5 User Diversity

User diversity is one of the core issues that should be considered in designing apps for mobile devices. Especially users from different cultures have specific needs in interacting with user interfaces. Language is one of the key issues in developing localized versions of mobile apps. Our study provided findings to support this statement.

It was observed that the participants didn't understand the “status update” task, which was addressed to them in Turkish with the exact phrase written on Turkish version of Facebook: “*Durum güncelleme*”. However, though it was a direct translation of the English phrase, it did not match the local way of expressing the specific action. It was observed that users generally understood “update” as “refresh” and committed the relevant action. When the users were asked for an alternative term to define this specific task in the debriefing interviews, various suggestions were made: “About yourself”, “What are you thinking now?”, “Share status”, “Share on the wall”, “Write on the wall”, “Share location (with an @)”, “Write a message to yourself”, “Write a comment on the status”, “Update the homepage” and etc. The suggested expressions revealed that the participants found the emphasis “to share” more reasonable to define this action.

The second fundamental problem “lost in translation” was observed during the “log in and out” procedure. Some of the participants had difficulty in writing Turkish characters (*üüöğçş*) for “log in”, although the device had the capability to input these characters. The same confusion and related failure was also observed for the “log out” procedure. Especially in BlackBerry, the menu button led to list of commands concerning the app. The last two commands in this list were related with the activity stacks of the operating system (OS) that was in Turkish. The last command in this list was the Turkish version of the word “close”. Actually this command enabled to exit from the application. The participants who randomly tried to find the “log out” associated this action with this “close” command. It was even observed that although some of the participants viewed the “options” command which actually provided direct access to “log out”, they were attracted by this Turkish command that meant “close” and preferred to use it for the demanded task. It is evident that the language differences between the OS and the app generated a tremendous confusion and failure in user experience.

It was also observed that each cultural group adopts specific strategies and behaviors in mobile social networking. “Messaging” revealed behaviors peculiar to Turkish users. It was observed that Turkish users preferred messaging for various reasons. The most common type of messaging was writing on the wall of a friend where the user expressed his opinion in public space. Although some users preferred direct messages addressing the inbox of the receiver for private purposes, most of the users preferred to send SMS for that case. It was also found out that the users could

employ pragmatic strategies through mobile SNS. If the users could not make direct calls from their phone because of financial reasons, they preferred to send messages by SNS through wireless connection to inform a friend about this situation.

4.6 Bandwidth and Speed in Mobile Network Performance

In the context of bandwidth, there seemed to be both positive and negative aspects that affected the mobile user experience on SNS. “Sharing instantly” was evaluated as one of the most popular peculiarities of the mobile devices and an integrated camera enabled users to share pictures anywhere, any time. The photo upload speed of the application was also considered to be faster than the mobile browser. However, the application is not capable of uploading multiple photos whereas the mobile or desktop browser is. Besides, though it is possible to take videos with a mobile phone, it is not possible to upload them through mobile connection. The participants declared that the streaming or downloading speed of a video, which was fairly low, could easily cause frustration, which resulted in the rejection of watching video on mobile. It was evident that the participants didn’t even tolerate small delays and always chose the shortest path in executing a particular task. When they were asked to “write a message to a friend”, instead of finding them from a list, most of them preferred either to reply someone from the inbox or write someone whom they could see his activities on their wall / newsfeed.

In the context of bandwidth and speed in mobile network performance, the findings showed that users preferred desktop networking to mobile browser. The application appeared to be the last choice compared to the latter.

4.7 Awareness and Use of the Capabilities in Mobile Phones

Although mobile capabilities could open up different ways of thinking about interactions between people, data and their immediate surroundings [9], our findings showed that the participants were neither aware of them nor preferred to use them as they weren’t satisfied with the quality of services these functions provide.

Certain number of users stated that the specifications of the device camera were not sufficient so they didn’t use it for taking pictures unless it was very urgent. Even in that case some tend to transfer the picture onto a PC, edit it first and then upload it.

Although there is a function called ‘Places’ in Facebook that is based on location-awareness capability of the device and enables the share of the location information, it came out that none of the participants have ever used it and most of them even didn’t know what it was for. However, for location input they had their own strategies. They just put an “@” sign and wrote the name of the location after it on their wall as a status update.

Even if Iphone allows multiple orientation and gestural controls; only two users used horizontal orientation during text input and stated that the touch targets were small for their fingers in vertical position. It was observed that the participants were experienced users of other gestural controls like pinching, double clicking and sliding, but the application didn’t offer these novel interactions to support mobile user experience in SNS.

5 Conclusion

Mobile social networking sites are the fastest growing mobile content with huge numbers of users, but they fail in improving user experience. This study supported the notion that the design aspects of the user interface of the applications and the capabilities and constraints of different mobile devices may affect mobile user experience in SNS. Considering the problems observed through user experience in Facebook applications of two major smartphones (Blackberry and Iphone) by referring to the analysis framework, the study provided the following implications for the improvement of user experience in MSNS:

- Value visibility. Prioritize the most important set of features for your application, determine the key tasks and locate them with a visual hierarchy such that they provide enough scalability for various screen sizes in mobile phones. Provoke predictability with clear graphics and do not avoid labels for a clearer layout.
- Enable systematic exploration of user interface features and increase discoverability through perceived affordances. Do not hide important functions deep within the menus without signifiers.
- Stick to consistency and solid standards derived from basics of interaction design before the specific interface guidelines provided by different OS developers. Lean on the familiarity with the desktop browser, start with a mobile companion and head for a unique and better mobile user experience. The combination of mobile and desktop experiences could result in more engaged users across both sets of devices [9].
- Provide reliability in mobile user experience based on an intuitive navigation. Prevent accidental activation and triggering of actions through touchscreens in gestural interfaces by providing optimal target sizes. Employ gestures consistently across apps and rely on generic commands [11]. Support sense of control and awareness about the connection between the actions and results of the users by visible signifiers.
- Know your users. Step out of the designer's mental model and be aware of the needs of the target users such as language. Prioritize localization and do not limit it with plain translation. Speak the users' language and provide consistency for language at both the OS and the application.
- Consider the bandwidth of your target users and support technologies that provide a faster mobile network experience anytime, anywhere.
- Develop applications that fully benefit from novel interactions enabled by various mobile capabilities like multi-touch input, location awareness, etc. However, do not forget that these interaction styles are still in their infancy, so it is only natural to expect that a great deal of exploration and study still needs to be done [11].

Considering the lack of user-centered studies on MSNS experience specifically in Turkey, this study contributed to the relevant literature by providing findings to improve user experience in mobile applications. In order to a gain more insight on various aspects of mobile user experience, further empirical studies with divers users in larger groups are needed to be conducted.

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