

Blind People Interacting with Mobile Social Applications: Open Challenges

João Guerreiro

Technical University of Lisbon / INESC-ID

Rua Alves Redol, 9

1000-029, Lisboa, Portugal

joao.p.guerreiro@ist.utl.pt

Daniel Gonçalves

Technical University of Lisbon / INESC-ID

Rua Alves Redol, 9

1000-029, Lisboa, Portugal

daniel.goncalves@inesc-id.pt

ABSTRACT

Mobile devices are very important to blind people's autonomy and social life. Likewise, Social Networking Sites (SNS) promote social inclusion and are widely used by blind people. Previous research already focused on the accessibility of mobile devices and SNS in separate; however, little effort has been made to understand the barriers that blind people face when interacting with mobile social applications. This paper describes two exploratory case studies, resorting to *Technology Biographies*, where two blind people demonstrated their usual interaction with social applications and stressed their difficulties and strategies. More than looking at the accessibility problems of a particular platform, we give a preliminary insight about the limitations and open research challenges that are transversal to these social applications.

Categories and Subject Descriptors

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Keywords

Blind people; mobile accessibility; web accessibility; social networking sites; technology biographies; case study.

1. INTRODUCTION

Mobile devices are very important to blind people's autonomy and social life. Besides basic communication features, they are able to provide most of the functions that desktop computers do. Moreover, the overlapping concerns between mobile and accessible web domains [7] lead to more accessible mobile applications.

In addition to accessibility and usability issues, the demands related with web information overload are exacerbated for blind people as they rely mostly on the auditory channel to consume information through screen readers. Thus, they end-up developing their own ad-hoc browsing strategies (e.g. navigate through headings) to find the information of interest faster [2].

Social Networking Sites (SNS) fit in this kind of applications that contain a large amount of information, but still widely used by blind people [4]. Yet, little efforts have been made to understand the challenges that blind people face as well as the opportunities for improving their interaction with such applications. The exception are studies on blind people's usage of SNS, by the means of surveys, to find out the main uses and accessibility barriers (e.g. dynamic web pages) of specific desktop sites (e.g. [4]). Even those that actually evaluate the interfaces, resort to specific SNS and tasks (e.g. [3]). Wentz and Lazar [6] stand out

by identifying the prevalence of mobile *Facebook*'s accessibility over its desktop application. Despite these efforts, an understanding of blind people's difficulties in SNS and the opportunities to enhance their experience is lacking, particularly in mobile devices.

In this paper, we give a preliminary insight about the limitations and open research challenges of blind people's interaction with mobile social applications. More than looking at the accessibility problems of a particular platform, we identify the difficulties and opportunities that are transversal to these social applications (and some to the web in general). We conducted an exploratory case study, where a blind person demonstrated her usual interaction with mobile social applications and stressed her difficulties, strategies and comparisons with desktop usage.

The mobile-desktop comparison was reinforced with an observation of a second blind user interacting with SNS using his desktop computer. It allowed us to establish the relation between the contexts themselves and identify device-independent limitations. All in all, it provided us insights about open research challenges in both mobile and desktop applications.

2. METHOD AND ANALYSIS

We carried out two exploratory case studies to understand the limitations and gaps that blind people face in desktop and (mainly) mobile social applications. Firstly, we observed Sara, a blind proficient *iPhone* user, demonstrating her usage of mobile social applications where she has expertise on (mainly *Facebook* and *Twitter*). Afterwards, we observed Carlos, a blind user of *JAWS*¹, doing the same for desktop applications. Each case study comprised one session of approximately 2 hours and took place in a foundation that promotes the professional training for blind people.

We adapted Blythe et al *Technology Biographies* [1] similarly to Shinohara and Tenenberg in their case study with a blind person interacting with home technologies [5]. During these biographies, Sara and Carlos were encouraged to demonstrate and discuss the tasks that they usually perform. We prepared a set of questions (adapted from [5]) about how each task is performed in each application (*Technology Tours*), their progress over time (*Personal History*) and expectations for future improvements (*Guided Speculation*) (Figure 1). In addition, we asked questions related with the tasks' observation. In Sara's case study, we also promoted the comparison between mobile and desktop options.

¹ <http://www.freedomscientific.com/products/fs/jaws-product-page.asp>

<p>Technology Tours</p> <ul style="list-style-type: none"> • Describe this item in detail? • Did you find difficulties using this feature? • How is this feature used at different times? • If it differs from intended use, why? <p>Personal History</p> <ul style="list-style-type: none"> • What do you like/dislike about this feature? • What do you think about this item's usability? • What features evolved over time? How? <p>Guided Speculation</p> <ul style="list-style-type: none"> • What do you think should happen to this item in the future? <p>Observation</p> <ul style="list-style-type: none"> • Are there other sequences of commands to perform this task? • How did you learn this? • Can you describe in detail what you are doing?

Figure 1. Examples of Technology Biography Questions

3. INSIGHTS

Herein, we describe the limitations gathered from the *Technology Biographies* and present recommendations to enhance blind people's experience with SNS in particular and the web in general.

3.1 Loading Useless Data

"Facebook is very slow loading the news feed (in the mobile device). I do not wait anymore." – Sara. In fact, such problems may affect us all when browsing the web. However, blind people cannot take advantage of some of the data displayed on screen (e.g. photos). As SNS like Facebook are flooded with such data, the time wasted to load it prevents delivering information in time, fact that is aggravated in mobile devices.

3.2 Applications Consistency

Carlos reduced his Facebook use due to its "increasing complexity over time". Sara faces these changes positively, but criticizes the mobile-desktop SNS inconsistencies. Wentz and Lazar [6] already stated that Facebook's mobile version is more accessible and usable, but more limited in functionality. This fact precludes resorting to mobile devices to interact with these applications' full capabilities. Herein, Sara complained mostly about the absence of the "share" button on Facebook, but referred other differences such as the absence of options to create lists in Facebook and Twitter mobile versions.

3.3 Affordability

Carlos has access to JAWS at home and at the foundation. Although he claims it is worth it, he is using versions 9 and 11 whilst JAWS is currently on 14. The additional costs are hindering

the use of more capable and recent technologies, as previous versions are "good enough". Although JAWS is still the most popular screen reader, in the last few years the competition increased thanks to screen readers that are free (e.g. NDVA²) or included in the OS (e.g. VoiceOver). In particular, current mobile OS (iOS and Android) provide now accessibility features (including screen readers).

3.4 Motivation to Learn

The motivation to learn a new skill has a big influence on the expertise acquired. Sara is a proficient user of her iPhone and of the social applications therein (e.g. Facebook, twitter, e-mail), due to her motivation to maintain frequent contact with her friends and establish new connections. In contrast, Carlos uses JAWS frequently but at a more basic level. He claimed: "I know there may be better ways to navigate herein with JAWS, but since my work does not depend on it and I am used to these strategies, I do not feel the need to learn more." Although SNS can be motivating by themselves, finding new ways to prompt blind people to learn technologies that they use frequently may increase their effectiveness interacting with them.

3.5 Writing and Reading

Text-entry in touch-screens is a demanding task for blind people. Indeed, Sara identified it as the main barrier when she first got her iPhone. Yet, both Sara and Carlos' current complaints are more related with information consumption. Although they use strategies to browse more rapidly [2], they still regret what they have to read and the time they take to reach their information of interest. This fact is exacerbated in SNS due to the extensive list of information items (e.g. posts, tweets) that they have to traverse. In this context, even summarization techniques seem to be insufficient as most posts are already small.

3.6 Personalization

It is hard to perceive where a sighted user's attention is when looking at the screen. In contrast, blind users are constantly providing feedback about their personal interests via screen reader. Although Facebook already personalizes the news feed, it is limited to the previous actions therein. Screen readers have means to collect more hints about users' interests. Listening or not to the entire content is a precious feedback about what information each user prefers and actually consumes. Sara stated that when browsing the news feed, she usually "moves to the next post just by listening to the person's name or the beginning of a post". This explicit feedback does not require further user effort and should be used to personalize the information read.

4. CONCLUSION

The results described in this paper present difficulties that blind people face when interacting with social applications, such as the inconsistencies between their mobile and desktop versions. Moreover, they depict opportunities to enrich the interaction with SNS (and the web in general), such as to take advantage of the interaction with the screen reader to personalize the data to transmit and to avoid loading data that is not used by blind people.

² <http://www.nvda-project.org/>

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