What are the Differences? A Comparison of the Regular and Mobile Websites of Online Social Networks

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ABSTRACT

This study explores differences in structure and functionality of the regular and mobile websites of four different Online Social Networks (OSN) with regard to blind users. OSN help connecting people from various ages, cultures and social backgrounds worldwide. But since the regular websites of OSN are very complex, blind users rely on the mobile website which has a simpler, clearer and more straightforward structure and thus is much more suitable for screen readers. Besides, there are more and more sighted mobile-only users who also access their OSN via the mobile website. Due to the nature of the mobile website – to conform to the requirements of mobile devices – there will be structural differences. Therefore, this study's main goal is to figure out whether mobile-only users might miss important functions. The results of the study show that there are reduced and omitted functions that limit the user, especially for privacy issues, so that the regular website of OSN is indispensable for certain settings. As the results also show structural differences that are not only due to the requirements of mobile devices, switching back and forth between the mobile and regular website, e.g. for those certain settings, raises difficulties.

1. INTRODUCTION

Online Social Networks (OSN) are widely used by people of various ages and cultures all around the world. They make it possible to keep in touch, they allow self-presentation and they convey a sense of togetherness by being part of a huge (online-) community. While OSN are successfully established in private settings, they gain currency in business contexts as well. On the one hand companies are using public OSN to bind and acquire customers, to ask costumer's opinion about new products as well as looking for applicants. On the other hand companies are increasingly using internal OSN for knowledge management.

As can be seen OSN are widely used in several contexts therefore accessibility and usability are relevant

to all users including people with special needs. This paper focusses on blind users since the Internet is a highly visual medium and thus those users are probably the most affected ones. The facts that there are about 39 million blind people[1] and that blindness as well as other visual impairments will rise within the next years, as people are getting older and their eyesight is bound to decrease with age [1, 2], make this a pivotal subject.

In this paper we will call those websites complex, that provide as much information as possible in one single page. Blind users face enormous difficulties with those websites when trying to gain an overview and to find certain information. Even though blind people feel less isolated [3] when using OSN, if the website is too complex and features are not accessible blind users avoid visiting them [4]. Navigating OSN is not easy for blind people [5]. Great accessibility and usability barriers prevent their effective usage [6].

Blind people want to feel part of OSN communities, consequently they are looking for workarounds. One way to access OSN is to rely on the correlated mobile website, despite using a desktop computer [3]. Mobile websites, however, are designed as supplements for their regular websites when visiting those using a smartphone or any other portable devices. Due to the smaller display and special system requirements of mobile devices the structure and design are held simple and features are limited. This makes them much more accessible and much better suited for assistive technology.

However, this is not just a matter of blind people. More and more people are surfing the Internet using their mobile devices only. Indeed, about a third of 945 million monthly active users worldwide are mobile-only users [7]. More than half of U.S. adults (55%) who own a cell phone (88%) go online using their phone. Main reasons for this development are availability and convenience of cell phones, as they fit people's usage habits and close access gaps [8].

Against this background we are raising the question what do users miss out on when accessing OSN such as Facebook, Xing, Twitter or studiVZ via thier mobile websites only. Are there features that are only available on the regular website? How difficult is it to find certain features in the mobile versions due to their different design and structure?

To answer these questions a comparing investigation of three OSN main features was conducted, namely the Timeline, Messages and Privacy Settings. The intention

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[1] http://www.who.int/mediacentre/factsheets/fs282/en/

was to find differences in design, interaction styles, and menu structures as well as in offered functionalities of those three features. In order to generalize those findings the investigation included the four most popular OSN in Germany all of which offer a mobile website in addition to their regular website – Facebook, Xing, Twitter, and studiVZ.

2. STATE OF THE ART

2.1 Online Social Networks

As with many phenomena related to the Web 2.0 there is no well-established definition of OSN [9]. In fact many different types of OSN exist. Distinctions, as shown in Table 1, can be drawn according to the main purpose, the target group, the access [10], and whether an OSN is user-oriented or content-oriented [9]. The main purpose refers to whether the OSN is for private or business use. While Xing[2] and LinkedIn[3] are used to maintain business contacts, Facebook[4] and Google+[5] are mainly used in privat contexts. The latter two are also general networks, whereas NetMoms[6] and Foursquare[7] are examples for special interest networks as they each focus on a special issue. The difference between user-oriented and content-oriented refers to the sharing content. YouTube[8] and Instagram[9] e.g. give priority to sharing videos and photographs and can be classified as rather content-oriented whereas Facebook and Google+ are examples for rather user-oriented OSN since they prioritize keeping in touch and therefore mainly focus on the users. Distinction of whether an OSN is open or closed depends on who is allowed to register. Open OSN have no or just little restriction of who has access, whereas closed OSN only have selected members. They can often be found within companies.

Distinction of Online Social Networks		
main purpose	private	business
target group	general social network	special interest network
Access	open	close
Object	user-oriented	content-oriented

Table 1. Distinctions of Online Social Networks

Even though there is no well-established definition of OSN, Heidemann [10] tries to generalize OSN as special types of communities whose members' interaction and communication is supported by the technical platform and infrastructure of the Internet. A common aim, interest, or need provides a sense of togetherness without being physically at one place.

As Boyd and Ellsion [11] point out, OSN have some common core features. First of all, every OSN provides a user profile with personal information such as name, age, location, and interests. Some OSN allow enhancements by adding multimedia content, apps, or modifying the look and feel. Since a user profile contains very personal data visibility and access control also belong to the core features of OSN. And of course, as the most important function of OSN is to keep in touch messaging in terms of private and (semi-) public messages as well as searching for people are features that are always available. They conclude in a rather feature based definition describing OSN as a web-based service with the following characteristics: (1) a public or semi-public profile within a bounded system for every user, (2) a list of users that are part of this system with whom somebody shares a connection, and (3) view and traverse such lists [11].

Another approach to defining OSN is to generalize features that apply to any OSN. Therefore, Richter and Koch [12] define the six basic functions of OSN:

Identitiy Management: refers to how much information a user wants to provide. With that goes the user profile, group memberships as well as other activities on the OSN, that allow drawing inferences on the identity, attidudes and character of a person. Furthermore, it includes the privacy settings that set the visibility of the personal information.

(Expert-) Search: refers to the search functions of an OSN as well as recommendations made in terms of the user's activities and contacts.

Context Awareness: refers to a common context between users of an OSN that fosters trust and therefore collaboration, e.g. common contacts, common interests, same attended school, university or company.

Network Awareness: refers to the awareness of the contacts' activities and status as well as profile changes through newsfeeds on the timeline.

Contact Management: refers to the functionalities that allow maintaining the personal network.

Exchange (Communication): refers to the functionalities that enable direct communication via messages and indirect communication via status updates and sharing.

2.2 Mobile Access

Due to the rapid growth of web-enabled mobile devices over the last decade, numerous complex websites such as OSN, news portals, or shopping sites offer a mobile version, e.g. a mobile website and/or an app. Those mobile versions are specially designed for mobile devices, which typically have a small display and limited means for input and interaction. Therefore, structure and design are held simple, clear and straightforward – usually limited to only one column. Other requirements are short loading time and a simplified navigation with a flat menu style that leads the user step by step to the desired information.

While mobile websites work in any web browser regardless whether on a mobile device or desktop computer, apps only work on the mobile device with the

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[2] http://www.xing.com/
[3] https://de.linkedin.com/
[4] https://www.facebook.com/
[5] https://plus.google.com
[6] http://www.netmoms.de/
[7] https://de.foursquare.com/
[8] https://www.youtube.com/
[9] http://instagram.com/

underlying operating system they have been developed for.

3. STUDY

There are some studies investigating blind users in terms of OSN usage. A large-scale empirical study on visually impaired users conducted by Facebook [13] reveals that blind users participate just like sighted users but also show that dynamic elements make it difficult to navigate with screen reader and keyboard. In fact, another study exploring navigation barriers in OSN found that blind users avoid using OSN when the web interface and features are inaccessible [4]. The qualitative study [6] on Facebook investigating interaction challenges of blind users show that accessibility and usability barriers even prevent blind users from using OSN effectively.

Mobile websites seem to be a proper alternative for blind users accessing OSN with a screen reader [3, 14]. The clear, simple and straightforward structure of the mobile website is much more suitable for their assistive technologies [13]. Comparing the regular and mobile website of Facebook indicates that for blind users the mobile website is more usable but they are missing some features. Further conclusions of this study are that the interface should be consistent with and up-to-date just as the regular website [14].

When researching on blind users in OSN most studies only consider Facebook. Of course, Facebook is the most popular OSN with the most active user but do those findings also apply to other OSN?

Another aspect this investigation considers is that with intend no task-based study design as in [14] was chosen as research method. This inspection of the regular and its corresponding mobile website tends to find differences in design, interaction styles, and menu structure as well as in offered features by analyzing the browser view of those websites. In order to see whether those differences are a general problem this inspection is made with four OSN. The following questions are investigated in this study:

1. Do structural and functional differences between the regular and mobile website of OSN appear generally?

2. What are the structural differences between the regular and the mobile websites of OSN?

3. What are the functional differences between the regular and the mobile websites of OSN?

4. Are the structural and functional differences between the regular and mobile website similar among OSN?

4. METHOD

Based on the most used OSN by German users [15] those OSN were chosen, that also offer a mobile website. The following Table 2 lists the OSN that are investigated in this study. Initially LinkedIn (linkedin.com) and meinVZ (meinVZ.net) were also included to this study. Since meinVZ and studiVZ totally conform in structure and functionality, it is sufficient to investigate only one of both. LinkedIn was dropped because the mobile website does not work with any web browser on a desktop computer.

The analysis took place in September 2014 and focused on the German version of these OSN. For inspection of the regular and mobile website Firefox 31.0 was used. Indeed, when using the mobile website in a different browser such as Chrome the websites look much more like the conforming app than the mobile website. The difference in appearance depending on the used web browser are shown in Figure 2 and Figure 1.

Social Network	Website	Mobile Website
Facebook	facebook.com	m.facebook.com
XING	xing.com	touch.xing.com
Twitter	twitter.com	m.twitter.com
studiVZ	studiVZ.net	m.studiVZ.net

Table 2. Online Social Networks explored in this study.

First of all, the layout, the appearance, and the interaction styles of both access versions were

Figure 1. Facebook's mobile website opened with the web browser Chrome looks rather app-like. The mobile website opened with the web browser Firefox appears totally different (see Figure 2).

Figure 2. Facebook's mobile website opened with the web browser Firefox. The layout and structure looks totally different than open this website with the web browser Chrome (see Figure 1)

investigated and compared.

As OSN offer a wide range of features this study confines its focus on three of the main features available in every OSN – the timeline, messaging, and privacy settings. The timeline as the starting point of every OSN visit shows the recent news of what is going on in the user's OSN. The messaging function similar to webmail allows communication between users within the OSN. Since keeping in touch is the most important reason why people use OSN [11, 12] those two functions were chosen for an in-depth analysis of the presentation and

functionalities. A personal OSN includes very private data. For that reason privacy settings should be available to the full extent in both, the regular and mobile access versions. That's why those settings were included into the comparison of this investigation.

5. OBJECTS OF THE STUDY

Facebook, the second most frequently visited webpage worldwide[10], is probably the most popular OSN with the most active users. Registration is free and allows to create a personal profile, add contacts, send messages, and share information including photos, videos and links. Facebook offers apps for several operating systems on mobile devices.

XING is an OSN to primarily manage professional contacts. The basic membership is free and apart from the common OSN features offers job vacancies, projects and company profiles. The fee-based premium membership offers further functions including searching for people with certain qualifications and sending messages to non-contacts.

Twitter is a free OSN for microblogging. It allows users to send and read so called tweets – 140 character messages.

studiVZ is a branch of the *VZNetzwerke[11]* – *meinVZ.net*, *studiVz.net* and *schuelerVZ.net* (closed in April 2013). It is a free OSN targeting students and offering common OSN features.

For Facebook and Twitter accessibility seemed to be an important issue. Both OSN organized Accessibility Teams and use their network to capture feedback as well as report available improvements[12]. Facebook e.g. informs via the help page *Accessibility for People with Disabilities[13]* about topics like how to use assistive technologies, ARIA landmarks and keyboard shortcuts. In fact such improvements are positively recognized by the community [16, 17].

Xing and studiVZ do not publish any effort in terms of accessibility. An inquiry regarding what they are doing regarding accessibility to both OSN remained unanswered.

6. RESULTS

The in-depth analysis of the OSN's browser views shows that there are structural and functional differences between the regular and mobile website of all investigated OSN. The following section will describe those differences in detail.

6.1 Structure

Due to their purpose, in all inspected OSN the appearance of the regular and mobile website differ in their structure. Since the mobile version is designed for

small displays on mobile devices, it comes along with a clearer, simpler and more straightforward structure than the web versions.

Figure 3. The main menu of the regular website of Twitter partially contains a different menu structure and wording compared to the main menu of the mobile website shown in Figure 4.

Figure 4. Compared to the main menu of the regular website of Twitter (Figure 3) the main menu of the mobile website misses the menu items 'direct messages' (the envelope icon) and 'settings and help' (gear wheel).

6.1.1 Layout

The overall layout of the regular websites of all four OSN basically looks the same. All four investigated OSN are composed of three columns. Only Facebook has an additional optional contacts column on the right side that can be turned on and off as desired. The columns usually consist of the main menu on the left, the main content in the middle, and further information like an event reminder or recommendations in the right column. Besides the three columns the OSN regular websites consist of a header bar with a search box and an additional menu – partially redundant to the main menu on the left side. Twitter is the only one that makes an exception, as it has its main menu on top and just some additional links on the left side.

The mobile website of the inspected OSN generally consists of one column with the main menu on top (Facebook and Twitter) or below the content area (studiVZ).Only Xing appears differently as it is composed of two columns, the main menu on the left and the content on the right side.

Another noticeable difference is the usage of icons. Facebook's mobile website e.g. widely avoids icons and uses only textual links. The regular websites as well as the other mobile websites all use icons for almost every menu item, mostly combined with a textual label.

Furthermore, for some menu items the positioning as well as the wording is different between the regular and mobile website. While, e.g. on the regular website of Facebook, the menu item referring to the settings page is located within the header bar, on the mobile website it is located in the footer. Another noteworthy example is Twitter's main menu that appears slightly differently. For example the menu on Twitter's the regular website as seen in Figure 3 contains a link for *direct messages* (envelope icon) as well as *settings and help* (gear wheel icon). On the mobile website, see Figure 4, both functionalities are located within the content available behind the *Account* item instead of being available on

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[10] http://www.alexa.com/topsites

[11] http://blog.poolworks.de/

[12] https://www.facebook.com/accessibility, https://twitter.com/fbaccess https://twitter.com/a11yteam/

[13] https://www.facebook.com/help/accessibility

the main menu. An example for different, and therefore potentially misleading wording is the second item in the same menus – the item labeled *notification* (Mitteilungen) on the regular website refers to the content identical to that of the item *connect* (Verbinden) on the mobile website.

6.1.2 Menu Interface Styles

A striking difference is found between the menu structures. While mobile websites usually consist of only one menu that is hierarchically structured, regular websites have several menus on one single page. Common menu interface styles on OSN are flat lists, drop-down, pop-up as well as combinations of them. The regular websites of Twitter and studiVZ rarely use styles other than simple pop-up or drop-down, but on Facebook and Xing rather complex ones are used. Xing e.g. opens a pop-up by clicking on any menu item in the left column. This pop-up then again contains its own menu structure. Facebook uses similar nested menu structures e.g. a drop-down menu that again contains other interface styles.

The most common interaction technique on the regular website is point and click. A mouse-click then refreshes the content area, opens a new page, a drop-down menu, or a pop-up. Another very common interaction technique, mainly used by Xing, is a mouse roll over to open a drop down menu. Often found on the OSN's regular websites are hidden menus, that are combinations of mouse-over and mouse-click. Hidden menus only appear as icons when rolling the mouse over. Clicking it usually opens a drop-down menu or sometimes a pop-up.

The mobile websites in general have clearer and simpler interface styles as well as interaction techniques that mainly consist of mouse-clicks to open a new page.

6.2 Functions

The comparison of the timeline, the messaging functions, and the privacy settings of the OSN's regular and mobile website in this study reveal reduced or omitted functions. The differences are shown in detail below.

6.2.1 Timeline

The Timeline is one of the most important functions since it shows what recently happened in one's OSN. Since there might be a lot of information many OSN offer some filter functions to organize those data. The comparison of the regular and mobile website of the investigated OSN reveal that filter functions are only available on the regular websites of OSN. Facebook e.g. offers News Feed functions like *Top Stories* and *Most Recent*, to order the news either by relevance or by time. Another way to filter news on Facebook is to create own friend lists like *Close Friends*, *Acquaintances*, *Family*, or *Colleagues* in order to only see news of contacts organized in those lists. Twitter filters only the local *Trends*, twitter-wide best *Tweets*, and the latest *Activity* of those twitterers followed by the user.

Xing and studiVZ use a different way to filter their news. While the filter functions of Facebook refer to the contacts of the OSN, Xing and studiVZ filter by categories of news like *Status updates*, *Groups*, *Profile updates*, *Events*, *Links*, *Contacts*, and *Jobs* on Xing and *status updates*, *photos*, *friends*, *games* and *apps* on studiVZ.

Except Twitter the mobile websites of the investigated OSN provide no filter functions at all. They usually only offer a chronologically ordered list of news. It is striking that studiVZ does not even show any recent news.

6.2.2 Messages

Keeping in touch is one of the most important features of OSN, therefore as expected all inspected OSN offer a
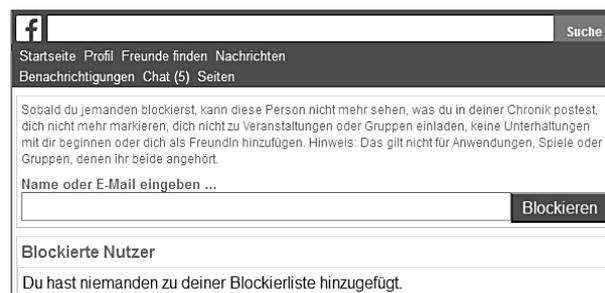
Figure 5. The settings page of Facebook's mobile website for the blocking features. As can be seen the only available blocking option is to block a user by entering a name or email.

messaging function similar to webmail.

All regular websites offer sending *new messages*, an *inbox* as well as filter functions like *read/unread* and *spam*. Some OSN offer further folders for *archived* and *sent* messages. Actions on messages are generally *marking as read/unread*, *delete* and *archive.* Against expectation *searching* for messages is only available on Facebook and Xing. Both provide searching for sender. Only Facebook also offers searching for certain words, even within a conversation. Other actions like group messages or deleting certain messages within a conversation are offered only by some OSN. A common feature of webmail is adding files to an outgoing message. This feature is available in most OSN, only Xing makes an exception as for basic member this feature is disabled. On the other hand Xing is the only OSN that allows sending messages to external email addresses.

The mobile websites of all four investigated OSN offer the main functionalities for sending and receiving messages. Some limitations were found such as searching within a certain conversation, attaching a file, archiving, or in some cases deleting messages.

6.2.3 Privacy Settings

OSN provide very private data of their users, therefore it is very important to offer detailed privacy settings. The regular websites of those four OSN offer privacy settings. However, on their mobile websites Xing and

studiVZ do not offer any privacy settings at all. The mobile websites of Twitter and Facebook offer those settings, but not to the same extent as the regular website. While the settings pages of Facebook's regular and mobile website look the same for most parts, the structure of twitter's privacy settings appears differently.

settings options. In contrast, the mobile version provides only a tiny fraction of those setting options on every single webpage. In fact, on the mobile website only about one third of those setting options offered in the regular website are available. Settings that are not provided on the mobile versions referring to at least
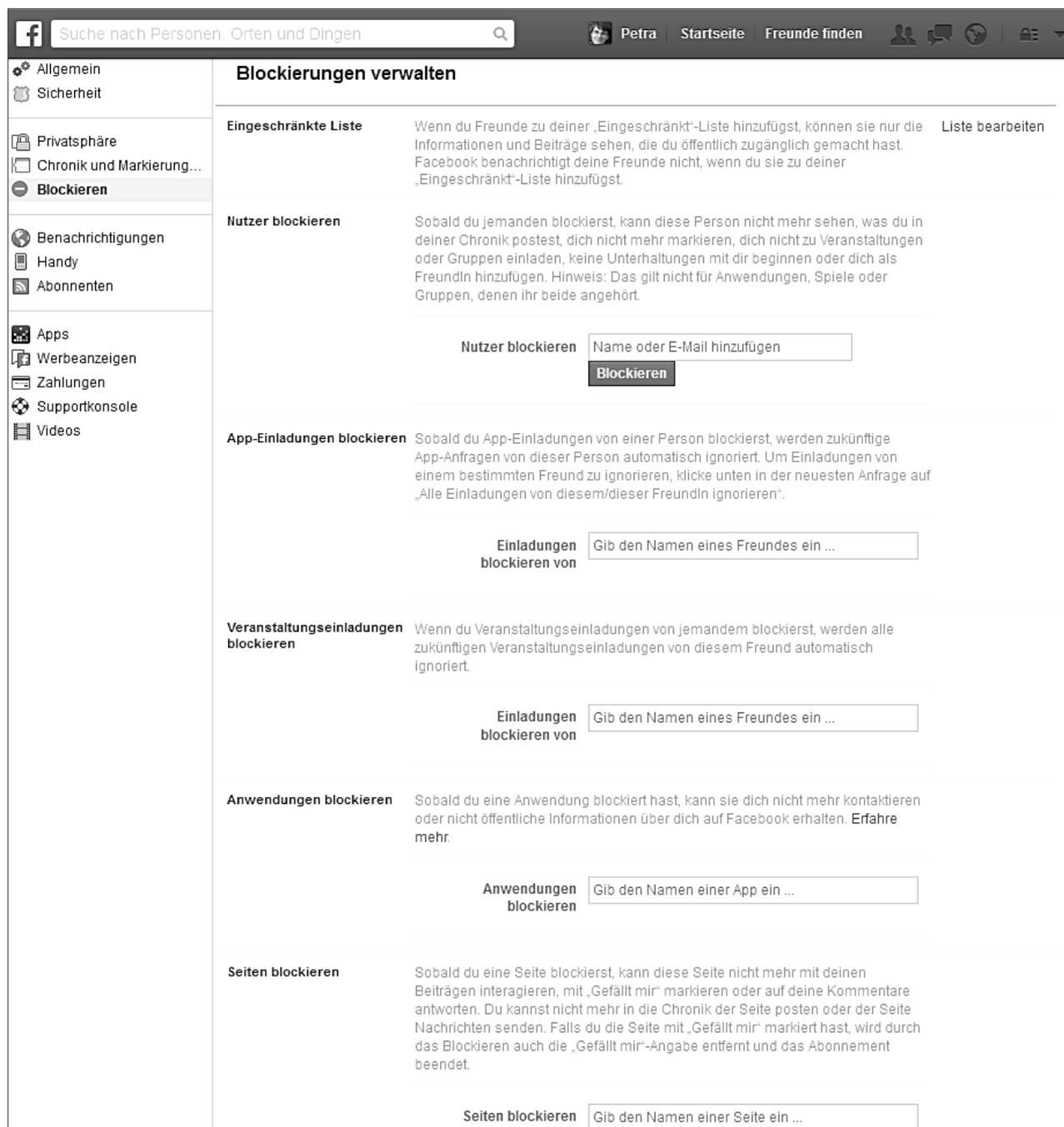

Figure 6. The settings page of Facebook's regular website for the blocking features. Compared to Figure 5 which shows the blocking features on its mobile website the regular one offers many more options.

The settings on Twitter's regular website are strucured into the following categories: *Account*, *Security and privacy*, *Password*, *Payments and orders*, *Mobile*, *Email notification*, *Web notification*, *Muted accounts*, *Profile*, *Design*, *Apps*, *Widgets*. Each of those categories consists of its own webpage with several

partially all categories including: *language settings*, *password reset*, *payment*, *order history*, *design settings*, and *the control of apps accessing Twitter*.

Even though Facebook's regular and mobile setting pages look similar at the first glance, a closer look detects differences in the number of available settings

options. On Facebook the setting options are categorized as follows: *General*, *Security*, *Privacy*, *Timeline and Tagging*, *Blocking*, *Notification*, *Mobile*, *Followers*, *Apps*, *Ads*, *Payments*, *Support Dashboard*, and *Videos*.

Compared to Twitter, Facebook's mobile website offers about two-thirds of those settings available on the regular website. Limited setting features refer to reviewing how others see the user and to blocking options. Examples of review functions not available on the mobile website are *Review what others see on your timeline*, *Review all your posts and things you're tagged in* and *Review what other people see on your timeline*. Examples for blocking functions not available on the mobile website are: *Block app invites*, *Block event invites*, *Block apps*, *Block Pages*. The only blocking option on the mobile website is to block a user. The differences of the blocking options between the regular and mobile website of Facebook is shown in Figure 5 and Figure 6.

7. LIMITATIONS AND FUTURE WORK

At this point it is necessary to point out that this investigation is not an empirical study and therefore provides rather subjective results. The idea of this investigation was to find differences in functionalities and structures by comparing offered features on the regular and mobile website not from the user perspective but from the browser view of their websites. Therefore, it is just a plain comparison of browser views that uncovers differences of the regular and the corresponding mobile website of several OSN. Even though those findings do not provide reliable data for actual limitation blind users are confronted with when using OSN, those differences reveal potential weak spots in accessibility and usability. To corroborate the assumptions of accessibility and usability weak points, of course, user studies are necessary. Based on Wentz and Lazar [14] further qualitative investigations regarding the accessibility of OSN functions for blind screen reader users should be conducted. But instead of using only Facebook other OSN need to be taken into account to generalize those findings.

8. CONCLUSIONS

The regular and mobile website of Facebook, Xing, Twitter, and studiVZ were investigated in detail to uncover structural and functional differences. The aim of this investigation was to find out whether people only using the mobile website, for instance blind users, miss out some significant functions. As expected, there are structural differences and some functions are reduced or even omitted on the mobile website.

Great differences are found on the filter functions for the timeline. Such filter functions help to gain an overview of what is going on in someone's OSN because news are shown in terms of certain groups or categories. Especially with large OSN those filter function help to organize the news since the more people in the OSN the more news one gets. Anyway, as

blind people using a screen reader are facing difficulties in gaining an overview of a website due to the one-dimensional representation such filter function might help to partition the information and therefore help to be aware of what happens.

Altogether, this investigation shows that the regular websites of OSN are indispensable to access certain functions. Mainly for privacy settings a visit to the regular website is unavoidable. Even though Facebook and Twitter provide such settings on their mobile website, they do not offer the same range as the regular website. Admittedly, compared to other OSN Facebook's mobile website contains a large part of these settings, but to control the external view of someone's profile as well as to block undesired contents are not possible.

Xing and studiVZ do not even offer stetting options on the mobile website. This means mobile-only users are limited in their privacy. Often such OSN offer to switch from the mobile website to the regular one, but blind users are then confronted with exactly those barriers wherefore they decided to use the mobile website on a desktop computer. However, even sighted mobile-only users are then facing display problems since the regular website is not developed for small displays and the slim system requirements of mobile devices.

Apart from that, when mobile-only users are changing to the regular website usability problems are sure to follow. Since the mobile website has limited means for input and interaction, the interface styles and menu structures on mobile websites are held clear and simple. To navigate those rather complex menu structures like hidden menus within an also complex structure of the website is difficult, particularly for blind screen reader users.

Moreover, difficulties arise from different wording and positioning of menu items. If functionalities are placed in different menus or if they are named differently on the regular website the user won't easily find them or even won't find them at all, when switching back and forth.

In summary, the overall layout differences between the mobile and regular websites are basically the same for all four investigated OSN. This means those differences obviously refer to the design requirements of mobile devices. As those requirements, including a simple navigation structure and a clear representation of the content, in large parts suit the needs of blind screen reader users they rely on the mobile website instead of the regular one.

Nevertheless, the functional differences are much more extensive. Hence, in particular related to privacy issues it is essential that all users have access to the full range of functionalities of OSN. But also, as mentioned above, filtering the news may help organizing someone's OSN and in particular to get a better overview of whats going on in the OSN. This can be realized either by providing the full range of functionalities on the mobile website or by providing full accessibility in all available access modes of OSN.

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