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e-Me

Universal Authentication on Mobile Devices

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Introduction

We are working within the research project e-Me, which started in 2010 and will last until 2013. Their project goal is “to obtain new knowledge about inclusive identification and authentication mechanisms in the new social media” (e-Me, 2011). Their focus is primarily on the use of computers, while we want to see what opportunities are available through the use of mobile technologies.

In our wonder-document we planned to look at several disabilities to cover the field of universal design, but to limit the workload and getting feedback from the lecturer we decided to mainly focus on blind and visual impaired. Both the fields of universal design and blind/visually-impaired people were unknown for us when we started this project. Therefore we did some general research about universal design to understand what the concept was all about. Then we tried to map out what kind of technology were available for blind people today and what limitations they have. Along our initial research some questions came up. Are they substantial mobile users? Do they use screen-based technology? Are they active in social media? And how do they do that? These are some questions we will try answer in this report.

Findings

We were about to contact the Norwegian Association of the Blind and Partially Sighted, NABP (Blindforbundet) to plan a survey about their member’s use of social media and mobile devices. To conduct this survey we would have to get permissions from the Norwegian Social Science Data Services (Datatilsynet). It was therefore very convenient that a survey had already been conducted last year. Through the e-me project we got in contact with the Norwegian Computing Center (Norsk Regnesentral) and they were kind enough to send us the notes from this survey.

The survey contains answer from 150 blind and visually impaired. Because of the low number of participants the survey does not give us enough data to generalize, but it can give us an impression of the trends among this user group in Norway today. Central questions we had when we started this project were if blind and visually impaired people are mobile users, and if they used screen based technology.

Following are some of the numbers from the survey “The use of social media among blind and visually impaired in Norway 2010”.

Facebook statistics:

Year	Daily	Weekly	Monthly/seldom	Not using
16-24	80%	5%	5%	10%
25-39	45%	15%	12,5%	27,5%
40-59	26%	8%	30%	36%
60-75	0%	3%	13%	30%

(Tjøstheim and Solheim, 2010)

122 of 150 of the people asked answered that they were using a computer. From these numbers we can see that people in this survey are heavy users of screen-based technology and social media. Those who answered that they did not use Facebook got the opportunity to answer some questions to clarify why that is. These are some of the answers:

“I have tried, but was not able to use Facebook” 36% (18 of 50)

“I would like to use Facebook, but no one can help me getting started” 52% (26 of 50)

This reveals that the interface of Facebook probably could be improved in terms of adapting to users with these kinds of disabilities. And the reason that many people don't use Facebook is not that they don't want to, but that they find it too hard to access and use.

Mobile usage among members of NABP:

Year	Text-messaging	Mobile Internet	Apps	Text to speech program
16-24	90%	65%	45%	--
25-39	95%	44%	41%	38%
40-59	92%	27%	42%	60%
60-75	44%	3%	9%	2%

(Tjøstheim and Solheim, 2010)

These numbers answer our question connected to the users interaction with mobile technology. From all of the persons asked, except a couple, were using mobiles. This was not unexpected, but what we did not expect was that so many of them also used mobile Internet and apps. Smartphones have become a success over the last few

years, and we can see that it is more common to use mobile Internet and apps among younger people.

If we look at the numbers from the two tables we have reason to believe that people also access their social media accounts from their phones, as we also wanted to focus on in this assignment.

In November 2010 MediaLT invited disabled to share their experiences using social media. This was done on behalf of the Nettborger project, which focuses on how social media can be designed universal. The report from this survey tells us that there are existing social networks that are mainly focusing on people with disabilities, but that most people prefer to use Facebook and similar networks and be where everyone else are (MediaLT, 2010).

Universal design

Universal design is the overarching theme for this project. The aim is to make technology available, usable by all people whatever their abilities, age, economic situation, education, geographic location, language, etc.



Illustration by Raymond Biesinger (<http://udeworld.com/news.html>)

Accessibility and technology

Accessibility focuses on people with disabilities such as auditory, cognitive, neurological, physical, speech, and visual impairments (WAI, 2011a). Blind and visually impaired find their way around the web by using well-established technology such as screen-readers, screen-magnifiers, and custom color-schemes. However, if a webpage is badly coded they may encounter difficulties. For instance, a webpage that are mainly made up by pictures, along with wrong use of the html *alt*-tag for describing these pictures, will be unusable for the blind. The World Wide Web Consortium has an initiative to combat such accessibility issues called Web Accessibility Initiative (WAI). They provide international guidelines for the programmers and designers for how a webpage should be build to meet the requirements for universal design. We will look into their guidelines for making a website more accessible, both for people with disabilities and for mobile devices. They write on their page that most mobile don't know about design issues for people with disabilities. Likewise, that most web accessibility specialists don't know mobile web design best practices. WAI (2011b) declare that websites more efficiently can meet both goals when developers understand the significant overlap between making a website accessible for a mobile device and for people with disabilities. In the continuation of our project we will look into these guidelines for mobile devices and aim to design accordingly (see <http://www.w3.org/TR/mobile-bp/>).

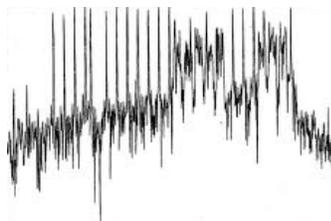
Biometrics on mobile devices

Nowadays our mobile phones contain a lot of personal information; many use it for work, mail and banking services. Mobile devices are also easily lost or stolen and we need the protection against unauthorized access in a great extent. Authentication methods have traditionally in some degree been limited to verification based on identity (e.g. username) and credentials (e.g. password). Yet mobile users require frequent access for brief periods, making repeated password entry inconvenient and time-consuming. For blind/visually impaired password authentication on mobile devices

makes access even more difficult. Therefore we decided to explore some alternative access methods and non-text password technology.

Biometrics is verification of identity using unique bodily characteristics. It is used as a form of identity access management and access control by recognizing humans based upon one or more intrinsic physical or behavioral traits (Biometrics, 2011). When hardware tokens, such as bankid, smartcards etc can be stolen and passwords can be cracked, biometrics relies on your specific bodily characteristics. Biometrics can be divided into two classes, physiological and behavioral. Physiological are related to the shape of the body, for example fingerprints, face recognition, DNA, palm print, hand geometry, iris recognition and odour/scent. Behavioral are related to the behavior of a person. Examples include typing rhythm, gait, and voice (ibid). Biometrics can offer some good alternatives, not depending on traditional password methods. We have decided to look into the following biometrics, to see if they can be useful in an mobile authentication for blind people:

- Fingerprints
- Voice recognition
- Signature (iSingOn)



At this point we have not yet come up with any prototypes. We have only explored some of the existing biometrics in use on mobile devices to learn and get inspired. There were a few iPhone apps for reading fingerprints, but most of it turned out to be scam. iPhone touch-screens is not sensitive enough to get all the details in a fingerprint, but we have yet to look into other phonetypes. iSignOn is also an iPhone app who claims to replace all passwords. You can simply draw your signature on the touchscreen accessing your mail, use online banking and networking services (iSignOn, 2011). Voice Authentication System (VAS) uses spoken words to verify claimed identities over the phone or web. It calculates vocal measurements of an individual's vocal tract. Sophisticated algorithms convert these measurements into a voice print - a unique digital representation of an individual's voice (Voice Authentication, 2011).

Further work

This is a broad topic and we still have some research to do. To choose the technology that is right for this kind of project we have to look further into the existing choices and see how they can be combined. The project is about universal design, but we must not forget to look at the security aspects of biometrics as well. One of our ideas is to create a portal where people would be able to access several social networks from one common portal. OpenID is an interesting technology to look into, as it offers use of an existing account to sign in to multiple web portals, without needing to create new accounts (OpenID, 2011).

Some of our questions have been answered throughout our research, we now know that blind and visually impaired are using both social media and mobile technology, but in order to make a prototype we need to figure out some more about how they actually use touch devices. Therefore we will try to conduct an interview with one or more blind or visually impaired person with experience with this kind of technology. This will hopefully give us the information we need to figure out what limitations and possibilities there are, and from this make a prototype that we can test on people from our target group. The ideal result would be a fully functional product, but we have to take into account that we have limited time to make this, and will therefore start out with a low-fidelity prototype.

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