

Connected!

A paper about the disabled and the use of social media.

Published by: Morten Tollefsen, Øystein Dale, Mosken Berg, Roar Nordby and 101 people who answered the survey

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Translation (from Norwegian): Catherine Kalvenes

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1. Background

The use of Facebook, Twitter, YouTube and other social services is widespread in private, public and commercial communication. It is therefore important that these services take into account that people have different assumptions and needs. In the project "Web Citizens" [16], we focus on how this type of technology can be designed in a universal way. The main objective of the project is to: "Develop a solution that demonstrates how social media can be used to promote community participation for all". Four milestones have been set up in the project:

1. Identify the key challenges of user interface accessibility in social media: We know that the challenges are considerable, among other things connected to the use of computer assistive devices in relation to social media and other rich applications. There is however limited knowledge about which challenges there are and how these challenges can be solved. Contact with users, standardization work and user-centered design will be the means, not only to identify the problems, but also to find innovative solutions.
2. Develop methods to ensure universal design in social media: Present knowledge of universal design and technology has its limitations. In the project existing methodologies are considered, and methodologies will be developed that to a greater degree ensure universal design as a process.
3. Develop, user test and evaluate a demonstrator: The demonstrator will serve as a pilot for both user interface and method development. R & D challenges in this process will be to take into consideration people's different backgrounds and needs, support for standards in existing technology, and implementation of distributed tests / feedback from disabled people.
4. Dissemination, publication, distribution of results and application of findings.

We hope that the project will help to develop new skills in a field where there is little systematic knowledge in Norway and elsewhere in the world. The aim is that the results of the project will lead to a social media communications strategy that can be used by businesses and organizations to reach everyone. This will be of great importance in many social arenas; people's democratic rights, commercial opportunities for businesses to reach more customers, and better opportunities for people with disabilities to participate in social networks.

The paper discusses universal design and social media as they exist at the close of 2010. The subject matter is very extensive, and there are certainly many other topics that could have been included.

The most interesting information in this paper is based on an open questionnaire survey conducted in November 2010. The project "Web Citizens" continues until March 2012.

1.1 Summary of the various chapters

Introduction: This chapter presents a review of some research activity. So much is happening in social media and related areas that a thorough review cannot be given in a paper of this type. Nevertheless, the chapter gives an overall understanding of important research relating to social media, both nationally and internationally.

Survey of disabled people and social media: In November 2010, the persons with disabilities were invited to share their experiences using various social media. The survey was stopped when 101 responses had been received. The results are primarily qualitative, and a series of quotations from participants' responses are included in this paper.

Other accessibility evaluations: We have not found many other relevant surveys and / or recent expert assessments that directly relate to disabled people using social media. The most relevant studies are reviewed in this chapter.

Alternative user interfaces and APIs: There are alternative user interfaces for some sites, especially for large sites such as Facebook and Twitter. These alternative user interfaces can be very useful for some disabled people.

Online Communities for the Disabled: This is a brief review of social media where the Disabled are the target group.

Summary / Conclusion: Some key points from the paper.

Questionnaire: The form used to collect experiences.

Facebook accessibility assistance: A copy of what Facebook writes about accessibility.

References: We have wherever possible, linked to articles that can be read free of charge online. The links were tested on the date given.

2. Introduction

Social media are used both for recruitment of employees [63], contact with customers / users [12] and private communication and entertainment. A presentation of the most commonly used services can be found in [2].

Social media can be defined in various ways, for example:

- “Social media” is the generic term for any site where the users themselves create the content. [4]
- “Social media” is user-generated video, audio, text or multimedia that is published and shared in a social environment as blog, wiki or a site for storage of video.
- ...

Exactly how the term is defined / delimited is not problematized in this paper. The services included in this paper are however widespread and / or designed for specific user groups.

Our use of Internet and mobile based services is increasing [18]. Social networking sites are widespread, and in [19] it is estimated that approximately 1.5 million Norwegians have a profile on Facebook. 39% of the population has visited a social networking site like Facebook or MySpace [20]. In [62] the following figures are given for various social media:

- Facebook has 2,568,460 Norwegian members
- Norwegian Nettby has 772,080 members
- Biip.no has 439,780 Norwegian members
- Norwegian Origo has 159,420 members
- Twitter has 128,550 Norwegian members

Social networks like Facebook and Twitter are being utilized in new and innovative ways. Barack Obama's mobilization of potential voters is a good example [21]. Social media are used across the generations. One in five of those over 70 use Facebook, Twitter or YouTube (one in three over 50). Just as many over 80 are using social media [13]. Different equipment is being used to access the various services. Mobile phones are for example increasingly connected to the Internet [23]. This also applies to access to social media [24]. As more functionality is built into mobile phones many of us

use them in new ways replacing computer use. In 2008, 30% of the 2.3 million mobile phones sold in Norway were so-called smart phones [25].

e-Government has received much attention both in Europe and elsewhere in the world [32]. Norway came third in the UN's barometer for "e-Government readiness" in 2008, and sixteenth in "e-Participation" in the same survey [33].

e-Participation can be defined as the use of ICT to extend and deepen political participation by placing people in a position to connect with each other and their elected representatives [34]. In other words, Norway has the infrastructure and capabilities of e-Government, but has not been able to put this into practice. In Norway e-Government and e-Participation are discussed in the documents eNorway 2009 and eKommune 2012 [35, 36]. The latter refers to the vision that "Norwegian municipalities and counties will be among world leaders in electronic citizen dialogue, digital services and effective email management." Against this background it is natural to expect that public authorities will increasingly make use of new communication opportunities. Only one in four Norwegian municipalities has begun to use social media to inform its citizens [15]. The figures appear in a survey conducted by Norstat IT company ErgoGroup and show that 17 percent of Norwegian municipalities have an official Facebook page, 15 percent are on Twitter, and 13 percent have a blog. Trondheim municipality, on the other hand, runs an online chat service with up to 150 external calls in a week. The municipality believes that this is an important communication strategy [12]. There are of course other Norwegian government agencies - both local and national - that are also trying to offer services oriented towards the opportunities that today's Internet provides [49]. An indicator for the development of public use of electronic interaction over time is DIFI's annual "Quality on the Web" survey of public web sites [49]. Sites are evaluated according to accessibility and useful content of information and services. The evaluation of services covers interactivity for and with citizens. Examples of criteria used are the extent to which sites offer the opportunity for two-way communication, digital participation and the use of web technologies to create useful solutions. On average, all public sites (50% municipal, 48% state) scored 49 percent in 2008. An example of a public website, that to a great degree allows user participation in a social media format, is NRKBeta (<http://nrkbeta.no>). Although increased use of social media is encouraged, access is restricted in certain schools and places of employment because of skepticism that these services will occupy too much time. Specific solutions have been developed to ensure such restrictions [11].

Many European projects have looked at e-Participation. In [39] 255 projects / initiatives were identified from 18 countries. Most initiatives were oriented towards local and national participation, and projects focused on the provision of information, opportunity for discussion, consultation and conversation / dialogue between citizens and elected representatives. There is nothing mentioned about localized projects concerning participation for all or accessibility [39]. [40] focuses specifically on accessibility in connection with e-Participation. In [40] an Internet platform is established that will contribute to dialogue between citizens at the local and EU level: the design consists of interactive processes and solutions which focus on usability and user interaction, and accessibility of solutions is an important aspect. A model from a project in New Zealand [41] resulted in a guide for the public on how ICT should be used so that citizens can be more involved in policy development, service design

and delivery. The solutions for e-Government are changing. [22] describes a number of international trends in e-Government, including increased user participation, user-generated content, sharing culture among citizens, decentralization of information and services, hyper-local services, transparency, accessible information and direct communication between politicians and citizens. One in five have gained access to Government information or services in user-generated forums, for example blogs, online communities or discussion forums, and 30% believe that access to public information on social networking sites is useful [22]. [22] recommends the promotion of political ideas and policies using mobile, easy and cheap consumer technology. There are several studies from other countries pointing in the same direction. [42] discusses how Government in the UK can adapt to and utilize the Internet in the country's and its citizens' best interests. This led to the creation of a working group to improve public information through social media [43]. [44] points out that Web 2.0 is already in use in many areas of public activity, but often without the permission or knowledge of the Government and urges authorities to begin experimenting with such solutions. Also in the recently published OECD report authorities are urged to use online participation and citizen involvement through Internet-based and mobile solutions which are user-centered [45, 46]. Furthermore, we see that social networking is a current topic in larger e-Government projects. For example, at the 2009 e-Government conference in Linz, Web 2.0 and social networking were highlighted as an important policy and development area in many lectures [32]. There are a number of practical examples of how local forces have initiated social media-oriented services to address local challenges and increase opportunities for participation [47, 48].

ICT is often designed in a way that makes its use difficult for disabled persons [26]. This also applies to the design of social media [1, 27, 28, 29]. Accessible ICT, independent of level of functional ability, is a high priority [30]. In Norway this is legislated for in the Anti-Discrimination and Accessibility Act [31]. The Act requires that all new ICT solutions offered to the public should be universally designed from July 1st 2011 (in practice one year after the necessary regulations are in place) [31]. The Act applies to public websites, and functionality and services related thereto.

3. Survey of disabled people and social media

There is reason to believe that people with disabilities want to use social media in a similar way to everyone else. Some disabled people may experience problems with this because of unsuitable user interfaces. Others may derive extra pleasure from social media since their disability might otherwise lead to greater isolation. This chapter deals with an open web-based survey of disabled people using social media. 101 people have shared their experiences and the responses have in part been far more comprehensive than we had expected

3.1 About the survey

To get an indication of how disabled people use social media we published a questionnaire on the web (cf. Appendix 1). The survey was purposely very free in style, which means that it is almost purely qualitative. The study was stopped when we had received 101 responses. Answers that were obviously spam and double post were removed and are not part of the 101 responses. The survey was carried out between October 19th and November 11th 2010.

The following media were used to inform about the survey:

- Project participants' web pages and mailing lists
- IT Funks newsletter and web pages
- Twitter
- Facebook
- Audio newspapers from the Norwegian Association for the Blind
- ... and of course distribution that we cannot control!

Almost everyone gave a description of his/her disability though this was optional:

| Disability | Number |
|--------------------|---------------|
| Blind | 30 |
| Partially sighted | 39 |
| Mobility Disabled | 24 |
| Hearing Impaired | 9 |
| Other Disabilities | 9 |
| Unknown | 1 |

There is no reason to believe that the distribution of disabilities in the survey is representative. With the methodology used to obtain responses, we have reached just a small group of disabled people. For example people unable to use the web because of disability will not have contacted us in this study. We see that responses are primarily from people with relatively severe disabilities. The reason that numbers do not add up to 100 is that some have combined disabilities: vision / hearing (5), vision / mobility (3), mobility / other (1) and mobility / hearing / other (1). Other disabilities are grouped since we received few responses: mental illness, chronic fatigue syndrome, stroke with physical and cognitive outcomes, dyslexia, arthritis, Down's syndrome, Psoriasis arthritis and laryngotomy.

Age was not asked for in the survey. A few respondents, however, stated their age. This is only included in quotes where age plays a role. Quotations are labeled as "Blind woman," "Hearing impaired man", "Mobility impaired man" etc. There is a preponderance of quotes from visually impaired people in the review below. This is really quite natural. User interfaces for all the major social media are visual and it is not therefore surprising that it is the Blind and severely visually impaired who experience the greatest challenges. Many people with impaired cognitive function probably also face great challenges relating to the use of social media, but our study has to a limited degree reached these people.

To get an indication of how social media work with the various assistive devices we asked about which devices the person uses. Even here, there are combinations (the most common combination is screen reader and screen magnifier). The distinction between screen reader and screen magnifier is not clearly definable as screen magnifiers may have built-in speech. We have chosen to classify Jaws, Window-Eyes, Talks and Blindows as screen readers. Magic and ZoomText are classified as screen magnifiers. In combination products such as Supernova, Orca and VoiceOver, we have classified products according to the remainder of the response i.e. disability, description of problems etc. None of the respondents stated that they use speech recognition, eye control, switch systems or other computer based assistive devices.

| Assistive Device | Number |
|-------------------------|---------------|
| Simple adjustments | 22 |
| Screen Reader | 37 |
| Screen Magnifier | 25 |
| Screen Keyboard | 1 |

Simple adaptations include: large screen, changes in font size and color, and alternative mouse devices (Mousetrapper, Trackball, ...). Many people report that they use devices such as wheelchairs, stair lifts, white cane, crutches, speaking kitchen appliances etc. These are not included in the list since they have little direct relevance to the study.

In the survey we ask specifically about the use of Facebook, Twitter, Live messenger and Skype. However, there is also an opening to describe other services:

| Service | Number |
|----------------|--------|
| Facebook | 72 |
| Twitter | 14 |
| Live messenger | 46 |
| Skype | 49 |
| Other | 28 |

Partially sighted man: e-mail and the Internet are important channels - both to friends and acquaintances, banking, commerce, etc.

Many of the answers quote the telephone and e-mail under "other social media". This is of course quite correct, but we chose not to include these media in the study. Telephone and e-mail work fine for most people and no-one in the survey comments on particular problems with these media.

Other social media include: YouTube, Diskusjonsforum, Enjoydiary.net, Bofh Net IRC, Blogger, Fanfiction, Megavideo, Arcadetown, Yahoo Messenger, Nonoh, Myspace, e-buddy, Nettby, Aim, Nettlogg, Gaysir, Linkedin, Origo, Flickr, Coveritlive and Ping. These other services are not however much used, apart from YouTube and MySpace, which seem to be used more widely among those who have answered (because of typing errors and small ambiguities it is difficult to know the exact number, but approximately five people use each of these). We have not determined whether every service reported as "social media" should actually be regarded as such.

3.2 Motivation is the same as everyone else's.

Disabled people use social media in the way the media are meant to be used. Answers concerning what is good about the various media probably compare well with responses people without reduced functional ability would have given. Some examples:

- Blind man: Facebook is good for finding old friends and making new friends, keeping in touch with people, exchanging information and maintaining a social network.
- Partially sighted man: Facebook is useful for contacting old and new friends, and to exchange and post points of view.
- Partially sighted woman: Facebook is useful for making contact quickly.

- Partially sighted woman: With MSN it's easy to keep in touch with friends. It's possible to determine the font size etc. yourself.
- Mobility impaired woman: Facebook is a good "job medium" for disseminating information, and for getting in touch with new contacts, and old contacts.
- Mobility impaired man: I keep updated on Facebook.
- Blind woman: Facebook can be very social.
- Blind woman: It's nice to read messages and news from friends and acquaintances on Facebook.
- Hearing impaired man: A relatively large number of people use Facebook. I can get information about different events; participate in various groups which provide information and share information with others. It's good to have contact and contact friends.
- Partially sighted boy aged 11: On Facebook it's easy to meet with others in my class and learn about what they are doing and what they are interested in.
- Mobility impaired woman: Facebook is good for keeping in touch with friends and using games that are entertaining.
- Partially sighted woman: MSN is good to keep in touch with family and friends.
- Mobility impaired woman: MSN is a good chatting tool.
- Mobility impaired man: With MSN you can reach all your friends and classmates in the afternoon and evening.
- Woman with Chronic Fatigue Syndrome: Twitter is an easy way to share comments, links and give feedback. It's easy to get in touch with people you otherwise might not meet: you usually get a response when you ask about something or post something; you are able to access knowledge and experience from many different sources. There is a low threshold for communication.
- Mobility impaired woman: On Skype I can speak and in addition write messages to those unable to understand me. I can also meet with friends and family I do not see on a daily basis.
- Partially sighted man: Skype is brilliant, especially if you are in countries where it is expensive to phone, for example in New York. I used Skype frequently when I was there.
- Partially sighted: Skype is good because it is cheaper than other subscriptions
- Mobility impaired women: Skype is great for meetings when several people want to talk, and very nice for chatting.
- Partially sighted woman: I use Skype most in a work context when it acts as an "extended" phone call. It's nice to be able to see the other person. And it's free. We have also used Skype as a replacement for both telephone meetings and ordinary meetings (up to 4 persons). Only audio works then. Skype saves a lot of time. I've also used it for reading assistance. This is great because we don't want to spend working hours doing this and it's easier to use half hour an hour here and there. I have a problem with Internet at home; otherwise I would have used it a lot more, especially with people who are abroad. Low cost is important.
- Mobility impaired woman: We used Skype for Board meetings at the Association I am a member of. Skype worked very well for communication with other board members in different areas of Trøndelag which meant fewer trips to attend meetings.
- Mobility impaired woman: What's great about Skype is that it's cheap to use, it's a small program stealing only a small amount of resources from your PC and it's fairly intuitive. It's possible to have several participants in the conversation, to record conversations, and there is opportunity for live images.

Some have expressed skepticism in relation to social media:

- Partially sighted woman: Social media do not have top priority for me. I'm not interested in posting too much information about myself and see that it can soon steal a lot of time. The PC is first and foremost a tool and an Internet information channel. Part of the reason is that I have difficulty connecting to Internet at home, but in any case I would probably only use it to a limited degree. This may have more to do with age than disability.
- Partially sighted woman: There is too much gossip on Facebook.
- Hearing impaired woman: I've been reserved in relation to all these media. I think they might steal a lot of time. I see now that I might be forced to start using them to keep up with the times.
- Mobility impaired woman: A lot of virus are spread through the functions they use.

3.3 Added value

I am a 14 year old girl and have the muscle disease Nemaline Myopathy. I'm sitting in an electric wheelchair and am a hundred percent dependent on care. I am connected to a respirator all day, have had a tracheostomy, and take food through a tube. MSN and Facebook are social, and I can feel like everyone else. People get to know me in a different way than through school. I have poor speech, but have grade 5 in English and Norwegian. So I'm not afraid to write. In addition, I play lots of games and chat with a lot with friends.

Both children and adults want to "feel like everyone else." The girl of 14 years is using social media to keep in touch with others, and since it can be difficult for some people to understand what she is saying, it is an advantage that she can write. In the survey we considered asking the question: "Do social media mean something special for you because of your disability?" Since this question may be perceived as leading, we chose not to include it. Nevertheless, there have been a number of responses which describe the added value of social media for some disabled people.

Both severely visually impaired and mobility disabled may have challenges in relation to mobility. Being able to communicate using social media can reduce the consequences of the disability:

- Mobility impaired woman: I have a muscle disorder. For me, Facebook and MySpace are a great way to keep in touch with people when I cannot get out very often, especially in the winter.

- Mobility impaired man: I have Cerebral Palsy. Social networking sites like Facebook etc. are great media for those of us with a disability. We can have contact with friends and family without having to move around. Everything happens in your living room.
- Mobility impaired man: the web is probably one of the few arenas that is "adapted".

Human to human communication is usually based on talking to each other. For people who have hearing loss, this is challenging:

Hearing impaired woman: I am very hard of hearing. For someone who is hard of hearing the written word is better – I get much better contact with friends via Facebook than for example via the phone.

With combined vision and hearing loss, communication challenges are even greater:

I am severely hard of hearing (hearing aid user) and visually impaired. Facebook has become an extremely important arena for me to keep updated. The social aspects of visual or hearing impairments do not matter here. I use what I have learnt on Facebook when I later meet people face to face, and this has made it much easier for me to follow and understand the context of conversations. It has also become much easier to keep in touch with people I otherwise would not have had the resources to keep in contact with. For me, Facebook provides the opportunity for a more active social life out in "real life".

The above quote is very interesting! It suggests that social media actually provide a significant added value in relation to social participation in "real life". A blind woman says something like this:

I use whatever I have found on Facebook when I meet people. For example others can see that someone is pregnant and ask how it's going. I can't see this, but I have often found out about it on Facebook. Then I can ask!

In the survey many mention peer support groups as a positive consequence, where people with similar needs can meet online.

One should not forget the fact that the Internet has been and still will be the way back to mastery, and cannot be measured in money. Via the Internet, many people who otherwise would have been isolated become a tremendous resource for one another: a resource that

cannot be measured in hard cash - but guarantees huge savings for society. These are not small amounts. Indeed, they are huge! [56]

Peer support may be appropriate for someone over a long period of time. Often, however, it is put forward as being particularly important immediately after the disability occurs. The disability may occur overnight, and if it also means that one cannot talk, then there is obviously a communication problem:

I have had a laryngotomy, i.e. the larynx with vocal cord was removed after cancer. I breathe through a permanent hole in my neck and talk with a so-called esophageal voice, i.e. air that is pumped into the upper esophagus is released again for articulation in the mouth / oral cavity. I have considered getting a voice amplifier because esophageal speech has a low volume, but so far I have managed without this. However most of my acquaintances in the same situation use a vibrator (generates sound when held against the mouth and neck areas - this sound can be articulated as usual in the mouth / oral cavity). Or they use a so-called voice prosthesis - a one-way valve (type of plastic) that is inserted between the trachea and esophagus, so that exhalation produces air release similar to that achieved by swallowing air, with the difference that they can speak with full lung volume while the "orthodox" esophageal voice has only 6-8 cm³ for each "filling". The latter gives a more staccato voice. I use forums adapted for my special group. They are in the form of "peer services" for questions and answers relating to life after laryngotomy. The forums are usually in English, and this is acceptable for me (but the threshold to comment on posts would be lower if it was in Norwegian). We have tried to initiate a similar forum in Norway, but the group is too small - it requires a "critical mass" of interested parties that are larger than ours to keep the forum alive. The typical age of throat cancer patients is over 65 years, so even though older people are using the Internet for more than keeping track of their social security account, there are still many who do not dare to use it.

For people with great variation with respect to when and how much they can manage, that they themselves can take the initiative in peer support and political influence is seen as essential:

I have ME or chronic fatigue syndrome, and am for the most part housebound with a Karnofsky-score of approx. 50-60. I can take basic care of myself, but need help with most activities, cooking, transportation etc. Facebook, Twitter and other social media give me many opportunities: The ability to update on what other people I know are doing; the ability to communicate with others, even if I am not able to get out of the house, or am unable to talk on the phone; the ability to have social contact on hold, and answer when I am in good enough form; the ability to share information, events, news, etc. that I find, and discuss in relation to this.; to be introduced by friends to others who have similar interests as myself; the ability to differentiate regarding what I communicate to whom, through Friends lists,

groups, locked status, etc. Blogging has also been shown - for example in the ME case - to be a good starting point for conducting micro-politics. Bloggers "organize" on the Net, and collaborate across age, background and gender to promote interests in cases involving politicians and public health, which has yielded tangible results in the ME case. Without social media and the Internet, I would not have managed to acquire knowledge about my own illness, and learned from the experiences of others so that I can manage myself, and receive advice on treatments and strategies that can make me better. The social aspect is very important for those who, like me, are housebound and sometimes bedbound and would have been at a minimum level without social media!

A slightly different consequence of peer support is suggested by the quotation below, namely that there may be a certain therapeutic effect through being in contact through social media:

I have mental disorders (post-traumatic stress disorder and chronic fatigue syndrome). I use Blogspot blog, which is technically easy to use. Blogging gives a lot of contacts over time and is social and interactive. And it also has some therapeutic effect. I have contact with other people struggling with similar things as myself, and even "healthy" people. As an active blogger, I read many other blogs. And the blog might be read by journalists, and so one might end up in the newspaper.

Although many disabled people derive great pleasure from social media, some unfortunately also experience bullying:

Woman: There is a lot of bullying on Facebook too.

In our survey, bullying was mentioned by only one person. So we do not know from this survey whether the problem is widespread. But we know, especially from people working with the mentally retarded, that bullying does occur.

One person explicitly mentions that social media are, after all, not "real life":

Woman with chronic fatigue syndrome: It's not "real life", and many are reticent about how much and what they will post, out of consideration to personal privacy and what they want to share with "everyone". Some are concerned with creating a facade on Facebook that is not "genuine". Sometimes so much is happening that you miss out on the things you would really

like to have heard about. It may create a false sense of being “updated” in a network, although there are many who do not read what one has written.

3.4 User Competence

Partially sighted person: There should be training in the use of social media. It isn’t easy to learn this all on my own.

Computer assistive devices can be knowledge-intensive. In this study, this applies particularly to screen readers and screen magnifiers. Some people (not just visually impaired users) state directly that they have a need for training:

- Partially sighted man: I have just been on a Facebook course at Hurdal Center, and have received some training on my mobile phone (Galaxy S) through Adult Education in Bergen. But I need significantly more and better training both on the PC and on the mobile, on Twitter, Skype and Dropbox, and also more in the use of Facebook.
- Dyslexic woman: I should have had training in almost everything, through adult education. Most of this is beyond me.
- Partially sighted woman: I wouldn’t mind using Facebook but I don’t know how to go about it.
- Blind Man: We should get help from suppliers of assistive devices to learn how to use them. There is inadequate information from the Centers for assistive devices. All suppliers should help with training in the use of assistive devices. There are many times when I get stuck and can’t adjust settings, for example in Jaws, but then there is only one supplier who is good at helping me. It is difficult for the Centers to answer questions about Jaws because they know very little of our problems with the use of assistive devices. I have been refused support for training.
- Women with Downs’s syndrome (submitted by a helper): Social media are too difficult. Perhaps they would become accessible with special training?!

It is difficult for the Blind to use social media. An attempt to define which skills blind people need in order to work effectively with web-based user interfaces is found in [57]. From the responses in the survey we see clear differences in how well assistive devices are managed. Feedback of this type demonstrates quite clearly that not everyone has the necessary knowledge to work in the appropriate manner:

Blind woman: I have problems because I use the arrow keys, it’s quite possible that it can be done better in another way, I would like mail feedback with advice and hints.

This statement is really quite sad. The blind lady cannot possibly be using the web in an appropriate manner, and she must be using an unnecessarily long time to do things. This and other similar feedback shows very clearly that there is a great need for training.

Blind man: I'd like to put a photo on Facebook. But because I can't see, I don't know how I look and it's hard to know if it's a photo of myself or something else because of the file name etc.

The need for training has been identified many times before [51, 58]. Funding is however a problem, since effective training of severely disabled people must often be done on an individual basis.

Another person expresses the need for more general ICT training. This may be explicit knowledge this person has, and the statement does seem realistic, but in this survey we do not have enough data to confirm this. It may also be that many disabled people do not want to focus on their disability, and that they participate on the net without writing so much about their disability:

Mobility impaired man: I just wish more people with disabilities dared to write on Facebook. There are many disabled people who would like to use social media, but they are afraid of making fools of themselves. We should create courses for them in some way.

3.5 Change does not delight

Mobility and hearing impaired man: I want to search for Friends, but when I had managed to teach myself this, Facebook suddenly changed everything. It's hard to learn something new. I struggle until I have learnt something properly, and it's like that with everything.

Changes in the user interface are highlighted as a major problem, particularly for the visually impaired:

Facebook:

- Blind woman: I think it's difficult to get an overview, the structure is constantly changing. When you have learned to navigate the page, next time there is suddenly a different structure.

- Partially sighted man: Changes to the site are problematic.
- Partially sighted woman: Now it has been stable for a while, but there was a period when they moved menus, options and other useful features about, and this made it hopeless to learn what is where.
- Blind woman: The problem with Facebook is that they change the design too often, so I have gone over to using m.facebook.com, instead of www.facebook.com where the design was never the same as when I was there last. You go on Facebook, become familiar with a new design, and when you visit it next time, a link or service has moved somewhere else. Then you have to try and find where things are again, and if you are busy, this is very inconvenient.
- Partially sighted man: The page changes, it seems too complex. I use 4x magnification to get an overview and I read text using speech.
- Partially sighted woman: In the new software they have reduced the font size, and it has become difficult to read. It should be the way it was before.

Live Messenger:

- Partially sighted man: The newer versions are harder to use than the older versions; the text is more ambiguous and things are smaller, the program is also more complex. The version called MSN Messenger (before Microsoft took over) was better.
- Partially sighted woman: The old MSN worked well with magnification, but I downloaded the latest version and it didn't work well with magnification in Windows: there was a lot that didn't come up in the magnification field, what was being written and who was logged on. The program window is confusing. I haven't tried it with Supernova yet.
- Blind woman: The latest edition of Live Messenger works very badly with Jaws. Why must they change it? Before, I could access almost everything, but now even my contacts are not shown on the Braille display!

Skype:

- Partially sighted man: Skype has always been a bit difficult to follow; it was better before the new "fancy" Skype came.
- Blind woman: Before, in older versions of Skype, a window popped up when you received a file. Now you have to scroll until you find the appropriate contact, go into the chat window, and then accept the file. I would have liked Skype to have the window as before. I want to have group conversations, but I can't manage this, and I haven't been able to create contact groups.

But of course not everyone agrees that "everything was better before". This may be due to variation in user competence, that we are actually talking about different versions, or that the various assistive devices work differently.

- Partially sighted woman: Both speech and the Braille display work reasonably well in the latest version of Skype, in the contacts list, and particularly in chat. The chat function in Skype is the best of all the ones I've used (MSN, Facebook, Skype). Magnification follows focus very well, you can navigate using shift-tab and arrow keys, and everything is read.
- Blind Man: The newest version of Skype works much better on the Braille display. Conversation works well. Transferring files works.

From the responses in the survey, it seems that Live Messenger, Facebook and Skype have recently been launched with new user interfaces. This can be difficult for many, but is probably especially problematic for severely visually impaired people, and people with cognitive disabilities.

For the visually impaired user, changes are problematic partly because:

- Assistive technology does not necessarily support new controls.
- With high magnification or with a screen reader, only a few characters are shown at a time (or one word after another is read sequentially). To work efficiently, you must navigate by: jumping between headings and other elements, using lists of links, setting page marks, searching for text within a page etc. When the structure of the user interface changes, techniques that have been learnt may not work anymore, and the user must find new ways to navigate.

People with impaired cognitive function may have similar challenges in terms of learning to use new user interfaces. It is also common that functionality is extended in new versions, which increases complexity.

Against the above background it is easy to understand that some users are anxious that the services they use a lot will suddenly change:

Blind woman: Skype works very well on the Braille display at least for the while so I hope it stays about the same as it is now. They replaced the design with a more graphic one and now I have learnt how to use it.

Most people would probably appreciate a little more conservatism with respect to changing the user interface. It can be difficult to understand why some services change so frequently. Could it be that this is part of a strategy to keep people interested, to show that the service is being developed and to market it as being much improved ...? One thing is certain and that is that this trend is continuing. After the survey an e-mail came with the following content (13.12.2010):

Blind woman: Since the survey Facebook has changed and now I think it is worse and harder to use. More keystrokes are needed to move to writing on your Friends wall, and there is more additional information to get past. Now that the page has changed the study might not be so relevant anymore. I think it was better before. Just my opinion ...never mind, I can always get used to this too, but maybe it's bad for us visually impaired that they change the page.

3.6 Overview and lack of standards

Blind man: I wish the various vendors would follow international standards so that all versions are accessible for the visually impaired. Visually impaired are excluded in so many contexts but, if things are programmed correctly, there will be fantastic new alternatives for the visually impaired.

We have not conducted expert reviews, or conducted user tests of social media in connection with writing this paper. Some reviews done by others are given in Chapter 4. These reviews are unfortunately neither very extensive nor very new. There are relatively good accessibility guide lines for web technology [52, 53, 54, 55]. Some sampling shows clearly that the web interfaces on Facebook, Twitter and MSN do not for example follow WCAG 2.0 guidelines [52]. Errors include: graphical links without alternative text, missing or inadequate structuring (correct use of headings, tables, lists etc.), fields without a label tag, poor contrast, not possible to change the font size ... This type of error should be reasonably easy to fix. Correcting these errors is however really no more than one important step towards universal design. The guidelines are essentially about "physical" accessibility. User testing and research is needed to ensure that the services are also easy to understand and use. For more traditional applications (e.g. MSN and Skype), standards are not so established. These will increasingly require direct use of the operating system's accessibility features, (UI Automation in Microsoft Windows, etc.).

There is a need for more knowledge about impaired cognitive function and user interface. There have been some attempts to develop guide lines and solutions to specific problems [60, 61, 37, 38]. The challenge when developing guidelines and examples relating to cognition is that assumptions vary greatly from one person to another.

Partially sighted man: Many web sites and social media are more difficult to follow and get an overview when there is a lot of animation and advertising.

Many people complain that it is difficult to get an overview. Naturally, blind and severely visually impaired people feel this the most, but had we received more responses from people with cognitive disabilities, it is not unlikely that they would have reported similar experiences. Some examples:

Facebook:

- Partially sighted man: confusing pop-up messages about events, etc.
- Partially sighted man: buttons and animations around the main content are confusing and are not always easy to find when you are using magnification.
- Blind woman: A better overview of Friends in my list would have been nice. It seems a bit complex.
- Blind man: I think there are too many graphics and it takes time to maneuver to what you want to find.
- Blind woman: I find it difficult to orientate myself on the pages. I use too much time and lose my way.
- Partially sighted woman: Some features are hard to find / use because the menus are set up in a foolish way. There are also a large number of links and much helter-skelter on the page. It can all be a bit much, and slow down the user. I experience also that Facebook sometimes crashes on my computer. I don't know if this is a general problem or if it's to do with my screen reader.
- Partially sighted woman: The home page is cluttered with lots of advertising - confuses the ability to read.
- Blind man: Facebook's regular pages are perceived as complex with too much irrelevant content. The chat function is difficult to use.
- Partially sighted man: On Facebook, I think most of it is confusing and works poorly. I find it difficult to find the places you should write and it's difficult to navigate.
- Partially sighted woman: There is reduced overview with magnification; you need to do a lot of looking around in the beginning before you get to know the page. It's easier with m.facebook. But then you lose the chat function.
- Blind woman: To get a good overview, I have to look for things a lot; what I find is fairly random. Although I set page marks, I still think accessibility is limited. The use of headings is random, the picture is muddled, so I cannot be bothered to use a lot of time on it.
- Blind man: Difficult to navigate. There is a lot of content. Not all the links have names.
- Blind man: I usually use the mobile version of Facebook. This is because I find the regular page muddled and not very intuitive to use. If I don't know exactly what things are called or where they are on the page, then I feel that it takes a long time to find them. There is generally a lot of distractions and unnecessary information.

Twitter:

- Blind woman: On www.twitter.com, the home page doesn't work very well with the Braille display. There are lots of photos, and other things which could have been removed. Jaws crashes and then there is nothing I can do.
- Woman with chronic fatigue syndrome: It's confusing. You have to follow what's going on very closely to keep up in the discussions. This can be tiring.

Live messenger:

- Partially sighted man: Many windows appear if you are speaking with several people at once, making it difficult to keep track.
- Partially sighted woman: The contact list is cluttered. It's also unclear and small. I don't like that the e-mail address isn't in the "background", so that you can see who the different people are.

Skype:

- Blind man: For many events a window pops up, which is not immediately in focus, for example when you receive a file. All the advertising gives a very confusing user interface. It would be better with a simpler interface and that all the windows are in keyboard focus.
- Blind woman: The contacts list doesn't work very well. I liked Skype much better as it was before with separate boxes, now it has become so awkward. I have to use Jaws modus to accept and save files from my friends. It was much better before when it came in a separate box. Why do they have to muddle everything together? And one more thing, I use Braillex and have to switch modes on the Braille display to be able to read what people have sent in the chat window.
- Partially sighted woman: I think it can be challenging to browse through the contacts and some of the other menus and then make sure that you are making the right choice. Otherwise I think it's hard to write messages on Skype.
- Partially sighted woman: A little too much information is confusing when one doesn't see very well. The contrast is poor, light blue letters on a light background.
- Partially sighted woman: The graphical buttons on Skype (ring, answer, etc.) do not work particularly well with speech and Braille display.
- Partially sighted man: In a video conversation, I often find it difficult to navigate around the screen with large text when I use the mouse, although the picture in reality does not cover the entire screen.

Feedback from the Blind and severely visually impaired (those who state that they use a high level of magnification) seems to be fairly consistent: many feel that it is difficult to get an overview. Many also complain about small print and poor contrast:

- Partially sighted man: On Facebook you should have the possibility to have larger font size on the page itself, or slightly larger icons on the menus to the left and right.
- Partially sighted woman: It's silly that you cannot change the font type and size in the menus and other things on Facebook.
- Partially sighted man: On MSN the contrast can be poor, so it's difficult to read.
- Partially sighted woman: What's worst on Live Messenger is the poor contrast.
- Partially sighted man: The colors on Skype aren't inverted in the way I have set up Windows, and I don't get a "Voiceover" function using speech synthesis, so I have to use the menus and the few shortcuts that are available.

- Partially sighted woman: All pages should have a system where you can choose background color and font color, based on what is most pleasing to the eye.
- Partially sighted man: Some forums have poor contrast, making it difficult to read texts. And the simpler it is, the better it is to use.

On the other hand, some visually impaired point to the advantage that color and font can be changed in some applications (several have done this in Live Messenger):

Partially sighted woman: In Live Messenger, you can change font, color, size and background which makes it easier to read.

The reason why some think contrast is poor, while others report that they are satisfied that they can choose their own colors, is not clear. They may be using different versions. Variation in user competence is the more likely explanation.

Some basic functionality requires the use of photos, for example searching for people on Facebook. When several people have identical names and one cannot see the photos, it is nearly impossible to know who the right person is:

Blind man: It's hard to find people on Facebook because I can't see the photos. It is not possible to search for people based on information about them.

This can be partly compensated for by the fact that some peoples' profiles show place of residence. Mutual friends etc. may also give an indication of who it is.

3.7 Graphics in messages

Blind Lady: What I think definitely works best in Live Messenger, is that those who are speech lovers don't have so many problems using it. In addition, speech says how the smiley faces look. It doesn't for example say "Colon d" but explains the smiley face.

There is however an indication that screen readers function differently here. Other people mention this type of graphic as a problem, also the partially sighted.

Partially sighted woman: all these small things don't work very well.

3.8 Technical issues

Relatively many visually impaired people write that they have technical problems with assistive devices. It is impossible to say whether this is due to trouble with the individual PC, the version of the assistive device, the service itself or other factors:

- Partially sighted woman: I think it is important that disabled people can keep up with the rapid development in the computer world. There is a lot of frustration when you can't get to do what you want to, or assistive devices don't work.
- Visually impaired and hearing impaired woman: Facebook often crashes and the pictures aren't clear when I use the standard pages with ZoomText. Java problem?

3.9 Captcha

"CAPTCHAs (short for" Completely Automated Public Turing test to tell Computers and Humans Apart "), is a type of reverse turing test to determine whether the user is a computer or a human. The term CAPTCHA was coined in 2000 by Luis von Ahn, Manuel Blum, Nicholas J. Hopper of Carnegie Mellon University, and John Langford of IBM. A common type of CAPTCHA requires the user to type the text shown in a distorted image. [65]

Many visually impaired people state that captcha is a major accessibility problem:

- Blind Lady: The big challenge is captcha. It often excludes us both from registering (this is just a one-off occurrence, but all the same ...), and in some cases from commenting. On Netlog captcha is also used for deleting the account, my account still exists, although it should have been deleted.

- Blind man: linkedin.com has started using a security login. This involves entering text from an image or entering various words which are read out. Of course the image does not work for me and I find the audio sound isn't clear. So I don't always perceive what is said and thus enter the wrong word. This means that I sometimes spend a long time logging in. They did the same on Facebook, but I was able to deactivate it when I said I was visually impaired. I have not received any feedback from LinkedIn and I don't think this is good enough. Fortunately, I can often log straight in as I have only been using this page on one computer.
- Partially sighted man: At login one must enter some characters that are difficult to perceive as visually impaired. Profiles can be set up in various ways that can be somewhat ambiguous to interpret.
- Blind woman: One problem on Facebook is these Captcha codes that pop up every time you want to something, for example enter text on a picture. Then everything stops up for someone who is blind because we can't see these numbers or letters with speech or Braille display. I try to select the audio, but often it's not working.
- Blind woman: I had to get help to create a profile on Facebook.

Although some services (for example Facebook) offer an audio captcha, the visually impaired do not seem to be able to get this to work properly. The sound is very "scrambled" and it is difficult to understand what should be entered in the code field. Such a solution does not, of course, work for deaf-blind. Audio captcha was created in collaboration with the American Foundation for the Blind. See also Appendix 2 for a summary of what Facebook writes about accessibility.

3.10 Chat

Many people state that apps, computer games and chat are difficult or impossible to use:

- Blind man: Many Facebook apps do not work well, or take a long time to use.
- Blind woman: Nothing on Facebook is absolutely impossible, but the chat could have worked better.
- Partially sighted man: mail and chat is useless, as well as all the pages you come to when you receive "hugs" and everything else people send you... Maybe this isn't so important, but it is part of the community where you show that you are thinking about other people. .. Most of these pages on Facebook are not navigable pages, and don't have alternative text so that you can get the different functions read.. Most are pdf icons, rather than editable text. One important thing is that if you write a bit quickly like touch writers do, the letters that you write in the comment fields become hot key functions and suddenly you are writing in a completely different field.. . It can soon become tiresome to tidy it all up.

- Blind woman: I think that chatting on Facebook does not work well. It's not impossible to chat there, but it is slow because we have to go into forms mode. Also, most visually impaired use the mobile Facebook page, m.facebook.com, where there isn't chat.
- Blind woman: Facebook does not have any pages that work well for the Blind, their chat is absolutely awful! I can only read, and I cannot add links in either my status, or my messages. Also I cannot change my personal settings; I must have help from a sighted person. I think it's very annoying that I have to use Facebook's mobile site. I would certainly have liked to use their regular site had it worked.
- Partially sighted woman: There is a general problem finding focus on Messenger both when navigating and reading. It's hard to read the conversation in the chat window, especially longer text blocks. Then the magnification jumps uncontrollably. The speech and Braille display do not work at all. The Contact list only works occasionally and only with magnification.
- Partially sighted man: The chat text in Skype is not read!
- Blind woman: It is difficult to navigate on Facebook with a Braille display and virtual focus. When a "pop-up" opens (e.g. a list of mutual friends, pages etc.) it is difficult to find the focus without using the mouse. Chat is also difficult to use with a Braille display (the actual typing is straightforward, but it is difficult to navigate quickly to where the messages appear). It is completely impossible to see who is online on the home page since they started only showing photos of who is online.

It is precisely the apps, games and chat that are mentioned when disabled people are asked about the functionality they would like to use but are not able to:

- Partially sighted man: I want to use instant messaging on Facebook. Then I have to use my sight and the mouse. This is very tiring. I would also like to use some of the games that everyone's talking about: I haven't got a great overview of the possibilities, but then I haven't managed to get on the various pages.
- Visually impaired and hearing impaired woman: I want to use some applications such as games that many of my friends use. Many of them don't work well with magnification, the images suddenly jump around.
- Blind woman: I would like to use both games and chat, and I want to create fan pages, but I'm not able to do any of this.
- Blind man: So far I haven't managed to use the chat function. I cannot quite point out what doesn't work, but I find it difficult to send messages and keep track of communication. Also some of the games have become inaccessible now. It's the same with some of the applications. Again, I cannot point to exactly what it is that has changed, but I cannot get hold of all the information. It becomes unmanageable when the page is constantly refreshed and I am sent to the top of the page.

Although many severely visually impaired especially mention chat on Facebook as a big problem, one blind person says that it works well:

Blind man: I think that almost everything works well on Facebook. The chat works very well as it updates automatically.

Some also state that chat on Skype and MSN works well:

- Partially sighted man: The chat function on Skype is neat and simple.
- Blind Man: Conversation and chat works fine. There are scripts for Jaws, which make using Skype easier.
- Partially sighted woman: Live Messenger is clear and simple for the most part. Not too many unnecessary extras.

On Skype you can send instant messages. This does not seem to work well for the Blind:

- Blind man: Instant messaging works very poorly.
- Blind man: Messages are rather difficult.

4. Other Accessibility Evaluations

In [3] accessibility is reviewed for the following services: Facebook, Skype, YouTube, Flickr, Twitter, and MySpace. This review is summarized below:

- Skype is relatively accessible.
- Facebook collaborated with the American Foundation for the Blind in 2008. This resulted in among other things an audio captcha (used for registration of a new account). Facebook was considered to be fairly accessible. How valuable this evaluation is today is not known since the user interface and functionality are now quite different.
- YouTube offers a tool for subtitling of video (CaptionTube). Audio description is missing, apart from BBC which sends programs with audio description (BBC iPlayer, only for users in the UK). YouTube is considered to be fairly accessible.
- Flickr has its own accessibility lab. It is considered to be partially accessible

- Twitter is text based but there are several accessibility problems (e.g. not all the links are accessible with the keyboard).
- MySpace has only a standard captcha. The pages are created by users (are not wai standard) and are not considered to be accessible.

The problem with this type of evaluation is that it has a relatively short lived value. Whether it is about web-based interfaces or more traditional applications, the user interface could change overnight. What this review does clearly show is that parts of the services can be used by those who have enough expertise. However many disabled, for example severely visually impaired, must use systems that are far from optimal.

5. Alternative user interfaces and APIs

Blind Lady: I think it is essential for the use of social media that there is an accessible platform for the mobile phone etc. (I use the Symbian phone with Talks and iPod Touch with VoiceOver.) I have tried with Symbian, and iPod Touch. Skype does not work with Symbian, it works very well on iPod. I have not tried MSN on Symbian, reading works satisfactorily on iPod. Facebook works OK with Symbian, but there are too many key strokes to scroll. Facebook reading works satisfactorily on iPod. But writing is too time-consuming on iPod, so this solution is not completely satisfactory for me for either MSN or Facebook. A combination of touch-screen and keyboard may be ideal for this. Anyway, I think the mobile interface is a necessary supplement to the PC interface for my use of social media, I cannot sit at the PC to get everything done I want to on these media, so without mobile access use is limited.

Many people write that using the mobile phone, iPod touch, or something like this, is an important supplement or a substitute for using the PC. From responses which mention the type of equipment used, it seems that those who need assistive devices (screen reader or screen magnifier) use Symbian phones or Apple products (e.g. iPhone):

Partially sighted man: Skype works pretty well on the iPhone. I have not yet tried Live Messenger on the iPhone, but would guess that it works well. I would be dependent on an external keyboard to use it effectively.

Service providers often offer alternative web interfaces (m.facebook.com, m.twitter.com, etc.). From this study it is clear that many blind people use these mobile interfaces, especially on Facebook. Although m.facebook.com lacks simple structuring through headings etc., the pages are so "stripped" that they work well enough with a screen reader. It is obvious that "word of mouth" is used among the Blind. Otherwise it is doubtful that so many would know about the mobile option:

- Blind woman: I use Facebook's mobile site, when I have trouble using their ordinary web site. The address of the mobile page is: m.facebook.com. I can answer messages and update my status. None of the Facebook games work for the Blind, which is a shame.
- Blind woman: The mobile site for Facebook works well both with the mobile phone and the screen reader. On the regular Facebook site it is OK to read news updates and text content on the profiles, at least when I combine speech / Braille with magnification.
- Blind woman: m.facebook.com works very well for someone who is using Braille because all the graphics are removed and there is only text. Actually, the page is made for mobile phones but it works very well with Braille for those who don't want to browse through all the roses and smiley faces friends send, not only to you, but to everyone in their contact list so you get so many. I try to tell people that I cannot see all the roses etc. and they should stop, but after a few days they have forgotten! I'm okay with m.facebook.com most of the time, but sometimes you have to visit the main Facebook to fix something. But I think the mobile site is worth a lot.
- Blind man: I prefer to use the mobile Facebook site. I can get most things done there, and the pages work well with the limited functionality they have.
- ...

In addition to offering various web interfaces Facebook notifies with the help of other media (e-mail). This is seen as positive:

Partially sighted woman: It's ok to log on, accept / reject friends, share information. It's good that they have good notification by e-mail so that those of us who are not on all the time can keep updated with what is most important.

Some software interface with social media. Microsoft Live Messenger has integration with Facebook, LinkedIn, MySpace and Beep [10]. The survey indicates however that this functionality in Microsoft Live Messenger is not very accessible. However, this type of integration might be interesting, given that the software that interfaces with social media is basically accessible. When the vendors of various assistive devices have adapted their products it is possible that Live Messenger will be easier to use. It is fairly typical that screen readers have trouble when new controls first appear in the user interface.

APIs [59, 64] or source code [14] are offered for a number of the major services. Problems with the APIs can be that [1]:

- Controls are not accessible with the keyboard
- AJAX (e.g. the display is continuously updated, which is problematic for screen readers)
- Semantics are used to fix HTML problems (e.g. ambiguous links and lack of alternative text)
- Captcha
- User Generated Content

In [1] the following measures are proposed to increase accessibility:

- Texted Videos
- Picture descriptions
- Limited use of abbreviations
- Make sure that you publish on a social medium that can be displayed in alternative ways (blog, accessible video player, own picture galleries, etc.)

Existing standards / guidelines are important aids in the development of accessible and alternative user interfaces [52, 53, 54 and 55]. Tools that make it easier to offer alternative formats are also good, e.g. subtitling YouTube videos [7]. Examples of alternative and simplified user interfaces are found on Accessible Twitter [5] and Easier watching of YouTube videos [6].

Services that basically have a web-based user interface can also be accessed by standalone applications:

Blind woman: Twitter has built a nice client called Qtwitter where you can check your messages or incoming communications from anywhere in Windows. Just a quick key stroke, press Control+Windows and Up and DownArrow and you can read incoming messages from those you follow. With Control+Windows and Left or RightArrow, you can browse through various sections, such as incoming messages, messages you've sent or answered to people etc. Press Control+Windows+N for the box to write new Twitter in your status field that is automatically sent to your Twitter profile. Press Control+Windows+R to reply to someone! These are a few examples from the client. Download it from <http://www.qtwitter-client.net/download.php>. I can even give the client commands while I am in a text box on the questionnaire . Twitter also has a mobile interface similar to Facebook's mobile site: <http://m.twitter.com>.

Different platforms, user interfaces and integration solutions mean that users, including disabled people, have many possibilities to use social media. The very obvious challenge for many is to orientate themselves in this "jungle".

6. Communities for the Disabled

Visually impaired and hearing impaired women: Twitter is Ok and easy to follow, but I have stopped using it. Everyone is on Facebook, so I am there too.

Inclusiveplanet [8] and the International Friends Support Group [66] are examples of social networking sites aimed directly at the disabled. This sort of social networking site will probably still be around, but it seems to be the trend that disabled people in Norway prefer to participate in the same arenas as those who are not disabled. No-one in the survey said they used any of the examples of the communities for disabled described below.

It is natural that groups with comparable assumptions should enjoy more "closed" services. For many these will be additional services to the regular, more widespread social media. For others the closed and probably safer social media will be just what they want. In the survey several people use groups and forums on Facebook with topics that target the disabled. Some of these forums are open to all, others are closed, and many have completely private networks of friends where they take up issues related to disability. A topic that has been up for debate all the way back to BBS and News-time is travel information for mobility disabled people. These kinds of topics are also found on the Internet [9]. During the time this paper was written, [9] was down.

6.1 Dict-Sign

Dict-Sign (Sign Language Recognition, Generation and Modelling with Application in Deaf Communication) [17] is a 3 year EU project which aims to make online communications more accessible for sign language users. There are two major problems with the video: anonymity and that it is difficult to edit what others have posted compared to e.g. traditional wikis.

The project will develop three applications: a sign language-to-sign language terminology translator, a search-by-example tool, and a sign language Wiki.

6.2 Friends International Support Group (<http://friends.mosken.com>)

Friends International Support Group [66] is an organization for people with chronic pain. The daily manager is the founder Mosken Berg. The group operates peer support through an online forum, and is therefore called the "forum for chronic pain." The group has 2,000 members and many suffer from various disabilities, both reduced mobility and Sitting disability. Membership is not limited to specific diagnoses, but the target group is people who live with chronic pain.

Daily, there are about 6,000 visits from people all over the world who live with chronic pain. There are about 500 Norwegian registered members. All participants are pain patients. The organization works to ensure that members avoid isolation, obtain more knowledge, gain enhanced self-esteem, be informed of their rights, and thereby improve their quality of life. The self-help group should be a place of vitality and mastery.

Friends International Support Group has experience with peer support over a ten year period. Peer support is seen as important for the members and is a key part of the organization. Experienced members and moderators provide informal guidance both to ensure the quality of the work, and to prevent those providing support from being over taxed. Because peer support is run over the Internet, it reaches members over large geographic areas, independent of time and place. The opportunity to meet like-minded people is there around the clock and reduced mobility is not a hindrance. The forum is interactive, meaning that the site is created by the participants. No one has direct editorial responsibility in the sense that the posts are read before publication. Members like to see the service as a community, not just a discussion forum. Community feeling is an important element to help users avoid isolation.

6.3 Inclusiveplanet (www.inclusiveplanet.com)

Inclusiveplanet is an online community that is open to all interested parties. People who have difficulty reading normal printed text are the special target group. A key feature is the sharing of

information in the form of books (DAISY, word processing formats, etc.). Members can make friends, send each other messages and invite others in their contact lists for e-mail (Yahoo, G-Mail, etc.).

On www.inclusiveplanet.com there are a number of discussion forums. There are general topics such as art and music. Most courses, however, focus on being disabled in different contexts: education, employment, finance, etc.

In addition to being an online community Inclusiveplanet also offers consultation services: advice, training, validation / certification of accessibility, etc.

6.4 Bookshare

Bookshare is a digital library of books, magazines, newspapers, etc. The service is operated using donations, and is realized through an exemption from U.S. law on copyright protection. To become a member you must present confirmation that you have a disability that makes it difficult or impossible for you to read normal printed text. Organizations that work with "reading disabled" can also become members and the service is open worldwide.

Bookshare has so far collected more than 90,000 titles. Material is packed / compressed for download. Only members can download copy-protected content. Titles are collected by volunteers who upload what they have scanned, publishers / authors give digital versions, employees scan / upload books, etc.

Bookshare also offers training.

7. Summary / Conclusion

Social media have become widespread. The use of social media has become an important part of both public and private communications strategy, entertainment and communication in large and

small "private" networks. Services such as Facebook, Twitter, YouTube, Skype, etc. are used with different user interfaces and with different client devices. How useable the various interaction solutions are for different groups of disabled varies greatly. 101 people with disabilities shared their experiences through an online survey. In addition, we have searched the Internet and other sources to get an impression of what the status is with respect to social media and the disabled at the close of 2010.

Basically the Disabled want "to be where the others are" and "to use the functionality the others use". For some disabilities this may be complicated or impossible due to very inadequate user interfaces. On the other hand, there are many disabled people who do use social media, and for some, the technology can lessen the disadvantages of having a disability and provide an improved quality of life. There are special services that target one or more groups of disabled people. The need for such services is understandable, but none of those responding in the survey claim to use services that target the disabled. It seems that this need is increasingly covered by Facebook groups and / or discussion forums.

Both children and adults want to "feel like everyone else", and some disabled people (perhaps mostly the younger ones) do feel just like everyone else when they are on social media. Disability can reduce freedom of choice, for example, the freedom to choose physical activity may be limited. Social media are arena where people with severe disabilities can communicate with others, both disabled and non-disabled. In other words, social media can compensate somewhat for reduced functional ability. One person with combined vision and hearing loss said that keeping updated on social media makes it easier for her to follow what is going on and to take the initiative when meeting people in real life. Social media are for some an important tool in relation to peer support, the possibility to exert political influence and as therapy. The extent to which bullying is a problem for the disabled is not known, but the problem is mentioned in one response.

Many people expressed the need for training. Since services are often changing, user training should also include skills that the user needs to be able to cope with change, whenever this is possible. Sometimes it is the assistive technologies that cannot cope with change. "Change does not delight" is important feedback from the survey. When you have learned something well, it is frustrating to have to spend time and effort figuring out the new user interface.

Many people, particularly the visually impaired, consider social media to be complex and difficult to follow. Feedback is rather divided, which may indicate variation in assistive technologies and user skills. Given that the assistive devices are well adapted to a particular program (e.g. Live Messenger), it seems that users are satisfied, but new versions may be unusable since the assistive technology does not function with the new version. Many also state that they have technical problems with assistive devices. None of the web-based services we explicitly ask about in the survey follow WCAG or WAI-ARIA, so it is therefore not surprising that many perceive the services as difficult to use.

Captcha is a problem which the visually impaired focus on. Although there are some audio captcha, authentication is not satisfactory because the sound is "scrambled". Audio captcha will not work for deaf-blind. Chat is another function that many people struggle to use. Some screen readers are adapted to certain programs, but many people experience problems using chat, despite the fact that they write quickly using touch, and really do want to use this function. There were not many comments in relation to instant messaging, but the feedback we have received indicates that this does not work well with screen readers and screen magnifiers. Visually impaired people also point to Apps and games as something they would like to use, but at present these are not accessible.

Some service providers have created alternative web interfaces (e.g. for the mobile and for touch screen). m.facebook.com is one such interface that is used by almost 100% of those who write that they use a screen reader. Although m.facebook.com lacks basic structuring through the use of headings etc., the pages are so "stripped" that they work satisfactorily with a screen reader. Much of the additional functionality on Facebook is missing in the mobile version. APIs towards social media create new solutions: integration into corporate web sites or other software, common solutions towards several social media, stand-alone applications, solutions for various client devices etc. Overall this gives a great diversity in what is on offer, and means that most people are able to find a solution they can use. It is however difficult for people to orientate themselves in this jungle, and especially difficult for people with disabilities.

Appendix 1: Survey on social media

The survey was only available in HTML format. It was possible for people who had difficulty filling in the form to answer over the phone, but no-one used this possibility.

Background and purpose

This survey is part of the project "Web citizens". The aim of the project is to "Develop a solution that demonstrates how social media can be used to promote community participation for all". The project is supported by The Norwegian Research Council (IT Funk). The following organizations are participating in the project: Origo, The Norwegian Cerebral Palsy Association, The Norwegian Association of the Blind, The Norwegian Computing Center, Epinova, The Norwegian Association for the Hard of Hearing, Karde, Dyslexia Norway, Østfold municipality, Seniorsurf Norway, MediaLT, Delta Center, Oslo University College and Young Disabled Norway.

Participants in the survey must be disabled or have knowledge of ICT and the disabled (for example teachers, employees at the Centers for assistive devices etc.). What we want to achieve with the questionnaire is to gain knowledge about which social network services the Disabled use, what works well, and problems they perhaps encounter with the various services.

The questions are listed underneath each other. If you use a screen reader, you should go in and out of forms mode (or reading mode) as there is text between each field to be filled out.

What happens to the information about you?

All responses are treated anonymously. Sometimes we may want to clarify an answer. It is therefore best for us if you provide your name and e-mail. We bring to your attention, however, that this is completely voluntary.

If you have questions about the survey or Web-Citizens project, please contact:

Morten Tollefsen
morten@medialt.no
908 99 305

Thank you for your participation!

Part 1: Personal Information

1. If you want us to be able to contact you please state your name and email. This is voluntary.

Name:

E-mail:

2. If you have a disability, it would be good if you would give a brief description.

Disability:

Part 2: Assistive Devices

3. Describe the assistive devices, for example Braille display, screen reader or head mouse you use.

Which assistive devices do you use?

Part 3: Web services

4. Mark with a cross the web services you use at least once a month.

Use Facebook

Use Twitter

Use Live Messenger

Use Skype

Use other social media

If you use other social media, which ones do you use?

Part 4: Experiences

Below you can fill in your experiences. Skip over services you do not use.

5. Experience with Facebook

What works well on Facebook?

What does not work well on Facebook?

Is there anything on Facebook that you want to use, but are not able to do so?

6. Experiences with Twitter

What works well on Twitter?

What does not work well on Twitter?

Is there anything on Twitter that you want to use, but are not able to do so?

7. Experience with Live Messenger

What works well on Live Messenger?

What does not work well on Live Messenger?

Is there anything on Live Messenger that you want to use, but are not able to do so?

8. Experience with Skype

What works well on Skype?

What does not work well on Skype?

Is there anything on Skype that you want to use, but are not able to do so?

9. Experiences with other social media

What works well on other social media you are using?

What does not work well on other social media you are using?

Are there other social media or functionality in these media you wish to use, but are not able to do so?

Part 5: Other

Any other comments:

Appendix 2: Facebook accessibility help

The text below is from Facebook | Help center, Accessibility and Assistive Technology (09.11.2010).

How do I register with Facebook using a screen reader?

Facebook provides an audio captcha alternative to the written captcha, allowing a screen reading user to register with the site. Click the link 'an audio captcha' to switch the interface and listen to the security check. If you have any problems with the audio captcha, please email our accessibility team for assistance with setting up your account.

Do you provide a HTML only version of the site?

Yes, Facebook's mobile version of the site is HTML only and is compatible with Internet Explorer 7 (and above) and other supported browsers, like Firefox 2 (and above) and Safari 3. Please use the following link to start using the HTML only version of Facebook (<http://m.facebook.com>).

How can I report a problem with the assistive technology (i.e. screen reader) I'm using?

If you are experiencing a problem with a piece of assistive software or hardware on Facebook, please submit a report here. Please include as much information as possible so that we can best understand the issue you are experiencing. To report site bugs or other problems not related to assistive technology, please use the Bugs Troubleshooter page.

How do I access the Gift Shop using a screen reader?

When visiting the Gift Shop, you should be able to detect a link to the 'No Javascript' version of the Gift Shop. The 'No Javascript' version includes both alternative labels for each image, and reduces problems encountered with dynamic page updates.

Check out the 'No Javascript' version of the Gift Shop here.

How do I increase/decrease the font/text sizes on Facebook?

You can increase font/text sizes for Facebook from within your browser. Please follow the instructions below for your browser:

Internet Explorer 7

1. Load Internet Explorer
2. Select 'Page' from the Internet Explorer 7 browser toolbar
3. Select 'Zoom' and your desired increase/decrease
4. Shortcut: press ctrl and minus key to reduce size, press ctrl and plus key to increase size

Firefox 3

1. Load Firefox 3
2. Select 'View' from menu
3. Select 'Text Size'
4. Select your desired increase/decrease
5. Shortcut: press ctrl and minus key to reduce size, press ctrl and plus key to increase size

Safari

1. Load Safari
2. Select View
3. Select either 'Make Text Bigger' or 'Make Text Smaller'
4. Shortcut: press ctrl and minus key to reduce size, press ctrl and plus key to increase size

How do I use Facebook Chat with a screen reader?

In order to use Facebook Chat with a screen reader, you will first need to open up the pop out chat version of Facebook Chat. For JAWS, follow the below steps:

1. Press Caps Lock, Control and F to open JAWS Find.
2. Type pop out chat and press enter.
3. Activate the selected link.

At this time, Facebook Chat uses dynamic web content that may cause problems with some screen readers. We are working to resolve these problems. As an alternative, Facebook Chat now supports Jabber, so you can chat with your Facebook friends using your favorite desktop IM client (i.e. AIM 7.2).

How do I make sure that my photos are accessible to assistive technology (i.e., screen readers for blind users)?

The best way for you to ensure that images are accessible for everyone is to include a caption with your images. The caption will allow you to briefly describe the image and will ensure that users who are unable to see the image have an alternative text description of the image.

Do you provide navigational shortcut keys for the main pages on the site?

We do provide shortcuts on Facebook for keyboard-only users. If you experience any problems with the feature, please email our accessibility team [here](#). The shortcuts are browser-specific, so please refer below for your specific browser:

Internet Explorer 7 for PC:

Alt + #, then Enter

Firefox 3 for PC:

Shift + Alt + #

Safari 3 for Mac:

Ctrl + #

Firefox 3 for Mac:

Ctrl + #

Map:

0 - Help

1 - Home

2 - Profile

3 - Friends

4 - Inbox

5 – Notifications

6 – Account Settings

7 - Privacy

8 - About

9 - Terms

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